all-island skills study

Expert Group on Future Skills Needs

Northern Ireland Skills Expert Group

all-island SKILLS study

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2008

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Naming Conventions

The following naming conventions are used throughout the report:

- The term North or abbreviation NI refer to Northern Ireland;
- The term South or abbreviation IE refer to Ireland; and
- The 'Island' or 'All-Island' is used to refer to both jurisdictions together.

Acknowledgements

Acknowledgements are due to FGS Consulting and Oxford Economics who were commissioned to carry out the research and analysis contained in the study. Thanks are also due to the many statisticians, North and South and other contributors who gave their valuable time to the study.

Foreword

Anne Heraty

Recognising that a skilled all-island workforce will be a key resource for a more competitive and prosperous economy, both Governments have agreed to work together to ensure that sufficient and appropriate skills are in place to encourage sustained growth. As a key step, the two skills expert groups, established North and South, have been working together to ensure that the evidence is available to underpin policies to help deliver the necessary workforce skills across the island.

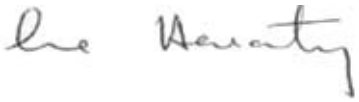
Catherine Bell

The key added value of this study is that it provides, for the first time, a comprehensive analysis of skills demand across the island of Ireland. It demonstrates that the improvement in the skills base over the last decade has made a major contribution to economic and employment growth. Improvements in skills have had a significant positive impact on productivity, competitiveness, innovation and investment. Going forward the study highlights that skills development will become even more important to all-island economic development. This is against a background of an increasingly competitive global environment where other economies are also rapidly upskilling their workforces.

The study recognises the short-term impact of the current economic difficulties but also points to more positive future growth and employment opportunities that lie ahead in many sectors. These include areas such as high value Manufacturing, Financial and Business Services, Life Sciences and Information and Communication Technology. The extent to which these opportunities can be realised will be determined by our collective efforts to increase the skills profile of our workforce to fully utilise the available skills pool on the island.

Both the Northern Ireland “Success through Skills” strategy and the “Tomorrow’s Skills” national skills strategy in the South establish challenging ambitions for skills development. There is a clear recognition of the importance of achieving these ambitions if Ireland, North and South, is to share fully in future global economic growth and prosperity. There are many common threads in the strategic directions that have been set. In particular, there is the focus on developing a clear picture of the current and future demand for skills, and tailoring education and training provision to help meet that demand effectively.

Both skills expert groups look forward to building upon the relationship that already exists and continuing collaboration aimed at enhancing the skills profile of both our labour forces. This will include building up further the evidence base on skill demand; sharing examples of good practice in the fields of education, training and employment; and building up knowledge of the skill demands in high growth sectors across the island so that their needs can be met effectively. This work, we believe, will contribute to upgrading the skills profile of our labour force which, in turn, will help sustain the future competitiveness of the enterprise base and maximise the employment opportunities available for individuals.



Anne Heraty
Chairperson
Expert Group on Future Skill Needs

Catherine Bell
Chairperson
Northern Ireland Skills Expert Group

Executive Summary

Introduction

A Comprehensive Study on the All-Island Economy commissioned by the British-Irish Intergovernmental Conference was published in 2006. The Study recognised that a skilled workforce will be a key resource for a globally competitive all-island economy. It emphasised the benefits of working together in a co-ordinated way to ensure that sufficient and appropriate skills are in place across the Island to encourage sustained growth. The two skills expert groups established North and South – the NI Skills Expert Group and the Expert Group on Future Skills Needs, agreed to work together on this All-Island Skills Study to provide the evidence to underpin policies for delivering the necessary workforce skills across the Island. The purpose of this Study is to:

- extend the understanding of skills demand across the Island of Ireland (drawing attention to key synergies and differentials where appropriate); and
- provide a robust evidence base for future partnership and effective working between the two skills expert groups by providing a comprehensive picture of skills demand on an all-island basis.

Importance of Skills

Skills are widely accepted as the key 'raw material' in the modern knowledge-based economy. The continuing move from traditional agriculture/manufacturing to higher value manufacturing and services across the Island economy ensures that there will be a change in the range and mix of skills needed. These ongoing changes will pose a significant challenge for employees, employers and policy-makers – centred upon the need to ensure that the growing demand for skilled labour can be met and that the labour force is sufficiently equipped to adapt to future business needs.

Meeting these future skill demand needs will contribute to the achievement of a range of social and economic objectives including increased competitiveness and productivity. The importance of formal qualifications and the requirement for these is a main aspect of changing skills needs. The role of core and generic skills is another increasingly important aspect. These skills facilitate flexibility and responsiveness and cover a broad range of transferable attributes ranging from numeracy and literacy to the development of soft skills such as effective communication.

The importance of skills in driving economic growth and the vision for a well-educated highly skilled population is clearly articulated by both the Expert Group on Future Skills Needs (EGFSN) in the South and the Skills Expert Group in NI. Indeed, Governments North and South, in their respective skills strategies, clearly articulate similar visions of where the respective economies wish to go – and how they intend to get there.

The Expert Group on Future Skills Needs vision for Ireland in 2020 is for a well-educated and highly skilled population which contributes optimally to a competitive, knowledge-based and inclusive economy. Delivering on the skills vision will require an additional half a million people to progress to the next level of educational attainment above their current attainment level.

In NI, delivering upon the skills agenda is the Department for Employment and Learning's (DEL) key priority. 'Success through Skills' represents the Department's vision to improve the skills levels of the population. In a wider context the recent Programme for Government's focus on growing a dynamic and innovative economy over the next 10 years has clear implications for skills. The Programme highlights key skills targets that it aims to reach by 2015 including 80 per cent of the working-age population qualified to level 2 or above (broadly equivalent to 5 GCSEs at grades A-C/ NVQ Level 2) and 60 per cent of the working-age population qualified to level 3 or above (broadly equivalent to 2 A Levels/NVQ Level 3).

This report provides an evidence base for future partnership and effective working between the two skills expert groups by providing a comprehensive picture of skills demand on an all-island basis. This is done through wide ranging data analysis and consultation to 'set the scene' in terms of the all-island economy's economic structure, performance and prospects. The report assesses the broad trends in the current and future demand for skills across industries and occupations.

Skills Demand: Trends and Prospects

Economic growth and sectoral and occupational structures all have a significant influence on skills demand trends. The openness of the all-island economy, particularly in the South which depends significantly on US foreign direct investment (FDI), also means that the demand for skills will be shaped by wider global factors – which impact on incoming FDI and exporting sectors. The crux of this study – the demand for skills – is thus assessed through a review of recent skills demand developments (economic growth, sectoral and occupational structures), current skills demand, (vacancies, skills shortages and gaps) and future skills needs (general economic prospects and employment forecasts for sectors and occupations).

Recent Trends and Factors Influencing Skills Demand

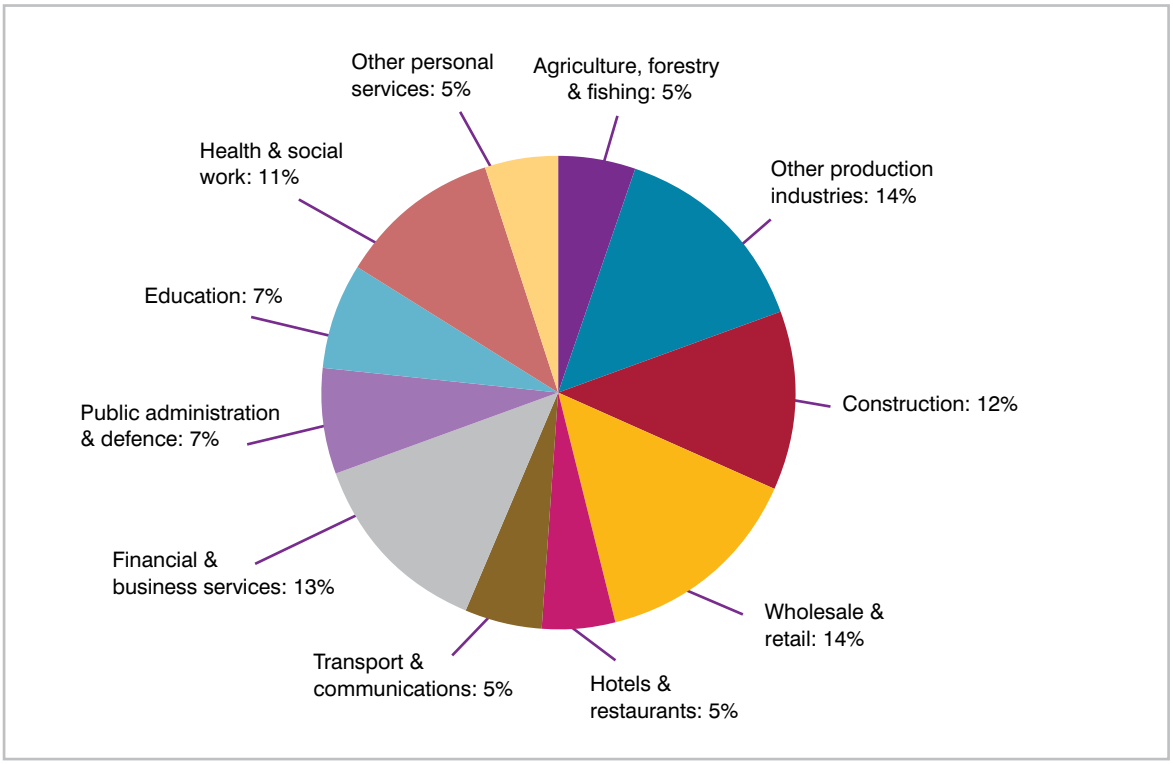
Economic Growth: The phenomenal success of the 'Celtic Tiger' years is well documented and resulted in the all-island economy achieving GDP growth of up to 9 per cent per annum in the late 1990's before moderating post 2001 to around 5 per cent per annum.

Labour Market Trends: Both economies have registered impressive rates of employment growth over the last decade. Overall total all-island employment increased from 2.0m in 1996 to 2.9m in 2007. Even with strong expansion in the size of the Island's working-age population, the working-age employment rate has risen, almost reaching the Lisbon Agenda goal of 70 per cent before the 2010 target date. With strong employment growth, the all-island unemployment rate has halved from 8.0 per cent in 1996 to 4.3 per cent in 2007. Rising education attainment has contributed to the increase in

employment rates, as rates of participation are positively correlated with attainment. Hence, improving skill levels not only plays an important role in boosting demand via channels such as inward investment, it also has a supply side effect by increasing individuals' likelihood of participating in the labour market. Migrant workers have also helped improve the skill profile of the Island.

The employment structure of the all-Island economy (Figure E.1) is relatively well-diversified with no one sector dominating and several large sectors of roughly equal importance, e.g. other production industries (which is dominated by manufacturing), construction, wholesale & retail, financial business services and health & social work, all of which have employment shares of over 10 per cent. A comparison of the structure of both economies North and South highlights the relatively greater importance of public administration, education, health & social services in NI, while the South's economy is more dependent on financial and business services and construction. In terms of occupational structure, key points to note are that almost 2 in 5 occupations are managerial and professional with less than 1 in 5 in elementary and plant & machine operator occupations.

Figure E.1: All-Island employment structure (2007)



Source: CSO QNHS, DETI LFS and Oxford Economics.

Sectoral Trends: In terms of recent trends across sectors (see Table E.1), the following key developments, which are important factors influencing skills demand, have been identified.

- The transformation of both economies from traditional agriculture/manufacturing to services is evident from the rapid expansion of financial and business services. This sector currently employs around 380,000 people on an all-island basis, and has added 209,000 jobs over the last decade. At all-island level the professional services sector has created more new jobs on a net basis than any other individual sector. Recent trends North and South in professional services employment are remarkably similar with the sector in both jurisdictions roughly doubling in size in employment terms in the last decade.

- Construction which currently employs around 325,000 people on an all-island basis, has added a large number of jobs over the last decade (just under 200,000 across the Island). The sector increased by 8 per cent per annum as both the non-residential sector expanded (due to strong economic growth) and the residential sector grew exponentially with the booming housing market fuelled by rising wealth and demand from a growing population.

- Wholesale & Retail employment, which currently employs around 400,000 people on an all-island basis, has grown consistently over the last decade (adding some 122,000 jobs). In the South, the sector increased by over 50 per cent. Despite NI's retail 'catch up' with the arrival of multinational and national retailers, its rate of growth has lagged behind the South. This is partly explained by the South's faster rate of population growth and wealth creation.

- Public administration, education, health and social services, which currently employs around 725,000 people on an all-island basis, has increased rapidly, adding 216,000 employees. In NI, growth coincided with the public sector expansion initiated by the Labour government in 1999, having held to the previous administration's spending plans for the first two years of its term. Population growth has also been a factor as many services are demand driven.

Table E.1: All-Island recent change in employment by sector

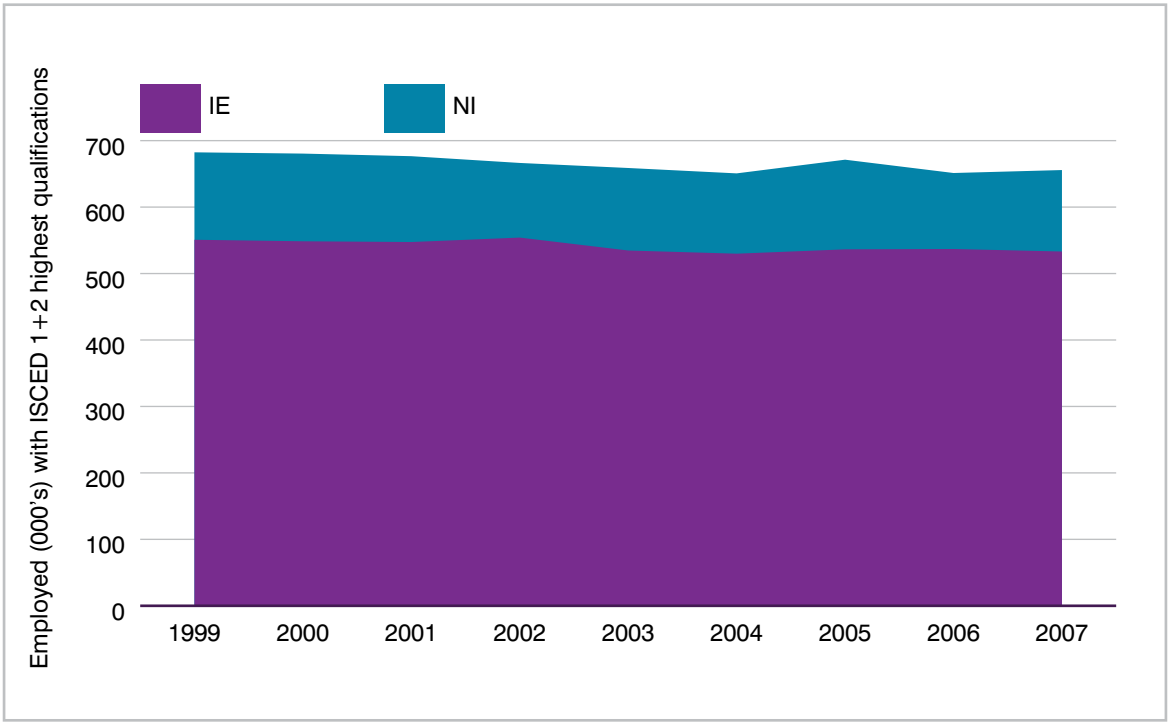
	Change 1996-2007 (000's)			Change 1996-2007 (annual average %)		
	Ireland	Northern Ireland	All-Island	Ireland	Northern Ireland	All-Island
Agriculture, forestry & fishing	-27	2	-25	-2%	1%	-1%
Other production industries	25	-3	22	1%	0%	1%
Construction	180	19	199	10%	3%	8%
Wholesale & retail	110	12	122	4%	1%	3%
Hotels & restaurants	51	-2	49	5%	-1%	4%
Transport & communications	61	6	67	7%	2%	5%
Financial & business services	152	57	209	7%	10%	8%
Public administration & defence	29	-18	11	3%	-2%	1%
Education	47	7	54	4%	1%	3%
Health & social services	98	53	151	6%	6%	6%
Other personal services	41	13	54	4%	4%	4%

Source: CSO QNHS and DETI LFS.

Occupational trends: The historical data available shows the growth in professional occupations and craft & related trade occupations and the decline in plant & machine operative occupations. Service and retail occupations have also risen steadily – these include, among other occupations, personal care workers, chefs and waiters/waitresses. The South has a higher share of managers and professionals and a lower share of elementary occupations compared to the North.

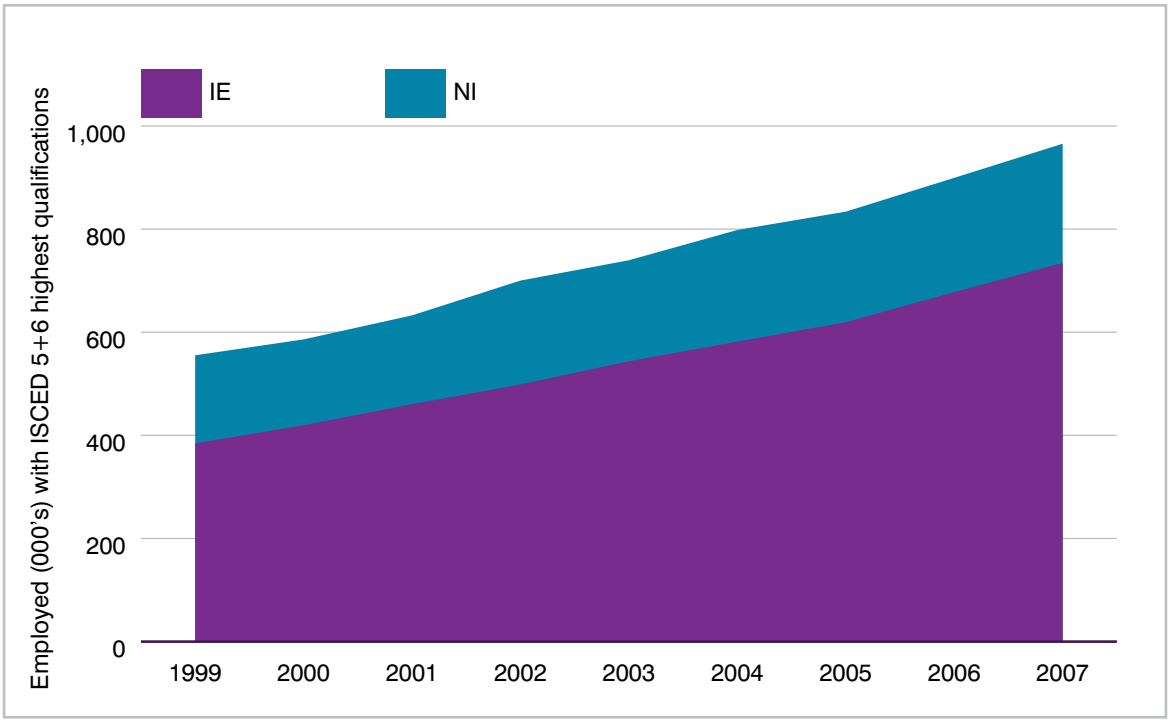
Stock of skills: The number of employed persons with below lower secondary (ISCED 1+2) qualifications, while not falling significantly in absolute numbers, currently account for fewer than one in four jobs, down from nearly a third at the beginning of this decade. This is in line with the decline in employment in traditionally low skilled sectors such as agriculture and certain manufacturing sub-sectors such as textiles, and the fall in the number of working-age persons with low attainment levels.

Figure E.2: All-Island employed persons skills trends – low qualifications (absolute numbers)



Source: CSO QNHS, DETI LFS and Oxford Economics.

Figure E.3: All-Island employed persons skills trends – high qualifications (absolute numbers)



Source: CSO QNHS, DETI LFS and Oxford Economics.

The most marked trend in employment by skill level is the rapid growth in employed persons with higher third-level graduate qualifications (ISCED level 5+6). Compared to 1999, there are now 340,000 more graduates in employment in the all-island economy. Employed persons with third-level qualifications now account for one third of the total.

Current Skills Demand Issues

Vacancy levels and skills gaps provide a useful (if incomplete) insight into the demand for skills. The South's data for 2006 generally show a broad spread of vacancies across occupations, although there was also a skewing of vacancies towards higher grade occupations. In NI, half of vacancies notified to DEL in 2006 were in two occupational groups – sales & customer service and elementary occupations.

Comparing North-South hard-to-fill vacancies, using the latest year for which comparable data are available (2005), reveals a divergent pattern. The South is skewed more towards professional and managerial occupations and NI towards elementary and personal service occupations. Notwithstanding differences in occupational classification, these patterns could be indicative of a number of trends. Reasons could include higher demand, in relative terms, for managers and professionals in the South due to sectoral patterns in growth and the quality of jobs being created; high leaving rates in NI for lower grade occupations and difficulty attracting the local non-employed and migrants to enter employment in these occupations. Alternatively hard-to-fill vacancies in the South may be more related to skill shortages and in NI to labour shortages.

Skills Demand in Specific Key Industry Sectors

In addition to the preceding data analysis, a number of key sectors important for both economies North and South were selected for more detailed analysis The sectors chosen were tourism and hospitality, construction, engineering, Information and Communication Technology (ICT) and financial services. Common themes from both jurisdictions can be summarised as follows:

- **Tourism and Hospitality:** The Tourism and Hospitality sector makes a significant contribution to the all-island economy and provides employment to around 290,000 people across a diverse range of occupations with a mix of skilled and semi-skilled employees. A recurrent theme emerging relates to the high proportion of hard-to-fill vacancies – specifically with regard to chefs – and the problems posed by high staff turnover. The sector has tended to be reliant upon migrant workers in recent years. Generic skills play an important role in the tourism and hospitality sector, both North and South. Specifically, the delivery of a high-quality product to those visiting either jurisdiction requires that staff display a range of key skills including English language competency and a focus on customer service.

- **Construction:** Around 325,000 people are employed on an all-island basis. Both jurisdictions are now experiencing a contraction in the residential property market leading to a reduction in demand for both skilled workers and labourers. There is however a demand for highly-skilled personnel with qualifications and skill-sets relating to emerging construction techniques and technologies in addition to competencies such as project management, ICT, public sector procurement and sustainable development.

- **Engineering:** The Engineering Sector accounts for a diverse range of occupations across a number of disciplines and provides approximately 110,000 jobs on an all-island basis. There is a continuing strong demand for engineers especially with regard to sourcing certain types with the qualifications required for disciplines such as the manufacture of medical devices, design and mechanical engineering. Moreover, it is important to note that there is a requirement for engineering graduates with higher qualification profiles (i.e. PhD).

- **ICT:** The Information and Communication Technology sector is a key component within the export-orientated focus of both jurisdictions. The sector provides employment across a diverse range of occupations – software engineers, analysts, systems managers, etc. and contributes in excess of 100,000 jobs to the all-island economy. Moreover, the outlook for this sector, both North and South is positive, with a continuing strong demand for high-level ICT skills. To meet this demand, there is a need to both promote the upskilling of the existing workforce and to boost the domestic supply of third–level computing and electronic engineering graduates.

- **Financial Services:** The Financial Services Sector has made a significant contribution to economic growth, both North and South in recent years. Moreover, this sector contributes approximately 170,000 jobs to the all-island economy and is an important source of high-quality job creation. It is evident from the analysis, that the sector is at different stages of 'maturity' North and South, with the North more skewed towards call centres as opposed to the well-developed international financial services in the South. This suggests different skill needs and all-island skills demand issues with demand in the South expected to focus on the recruitment of highly skilled graduates (i.e. to Masters and PhD level) with specific skill-sets such as mathematics, economics and risk management while demand in the North is likely to centre on technical staff, managers and senior officials. Of course, if the sector in the North matures into higher value added areas, skills demand issues North and South are likely to harmonise.

Future Skills Demand

Wider economic issues

Two recent global developments are acting as the main sources of the all-island economy's current economic challenges. The credit crunch has led to a re-pricing of risk and reduction in available financing to businesses, home borrowers and consumers. Secondly, continued rapid economic growth in 'commodity hungry' emerging economies such as China and India is pushing up world commodity prices, particularly oil. This has put upward pressure on production costs and inflation, thereby reducing corporate profits and increasing the cost of living for households. These factors are beginning to cool world demand and dent consumer confidence with slower growth reducing tax returns.

In the coming decade, following challenging conditions in 2008 and 2009, growth across the Island is expected to be around 3 per cent on average per annum. While this growth rate would be lower than the previous decade it would be above an expected Eurozone average of nearly 2 per cent. In the South, the Economic and Social Research Institute (ESRI), in looking at the decade ahead, suggests that the economy should recover and return to growth rates above the EU average. The prospects for Northern Ireland are not dissimilar and the extent of the short-term downturn is not expected to be as severe. The medium-term NI growth is also predicted to be above the EU average. Therefore, notwithstanding potential short-term shifts in skills demand, the broad long-term forecast for skills demand, towards higher end skills, is likely to remain unchanged.

Sectoral and occupation prospects

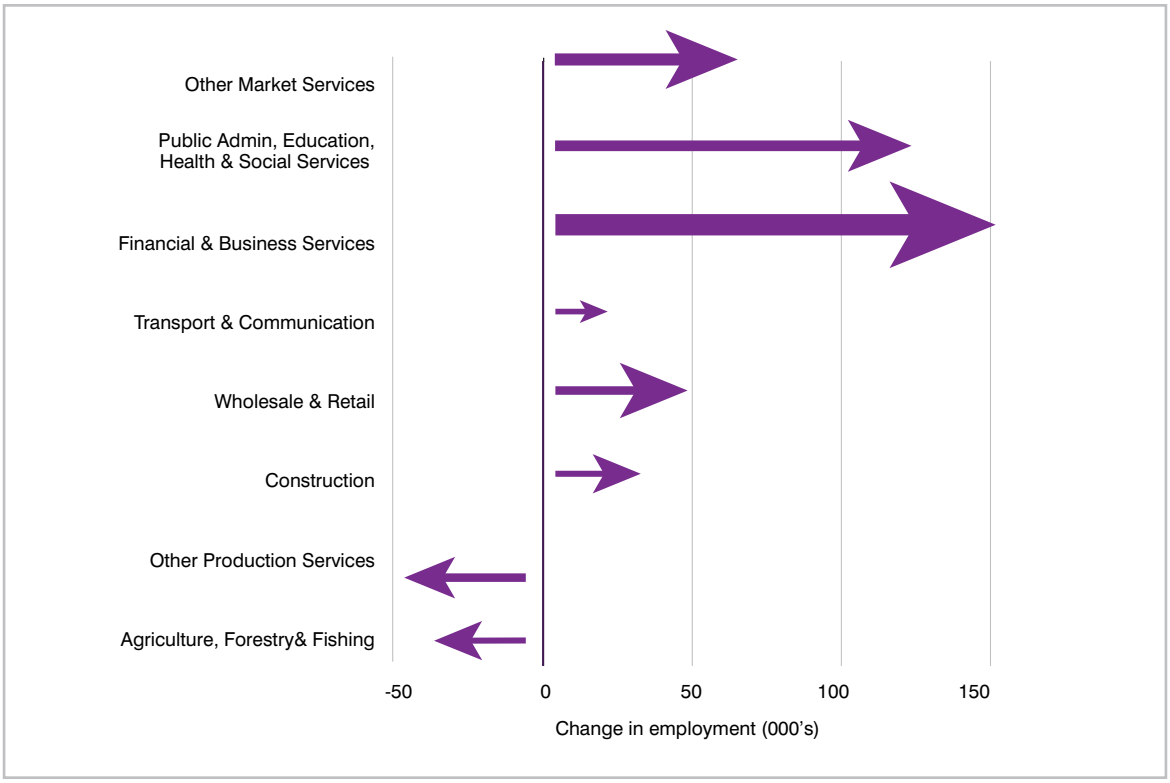
It is important to note that sectoral and occupation forecasts presented in this research are baseline forecasts. Baseline forecasts are essentially 'policy neutral' and do not build in the step change in skills provision and attainment that both the South and North are aspiring to (i.e. they are not the 'stretching' North-South targets presented in each jurisdiction's skills strategy).

Over the next decade, the economic transformation on the Island from agriculture/traditional industry towards services is forecast to continue apace. The main sectors of employment growth are expected to be financial & business services, public services, other market services and wholesale & retail. The public administration, education, health & social services sector is projected to expand by 100,000 persons as population continues to grow strongly (although this is a slower expansion than the past decade). Construction is forecast to slow down significantly (even before the emergence of recent difficulties) and then recover over the medium term.

Employment growth in NI is also forecast to remain positive, although somewhat slower than in recent times, due to factors such as an end in retail 'catch up', slowdown in public spending and shakeout in construction. Employment growth in NI will continue to be led by financial and business services.

Figure E.4 below provides indicative All-Island employment forecasts by sector over the next ten years.

Figure E 4: All-Island indicative employment forecasts by sector (next ten years)



Source: Oxford Economics.
Note: Other market services include hotel & restaurants and other personal services.

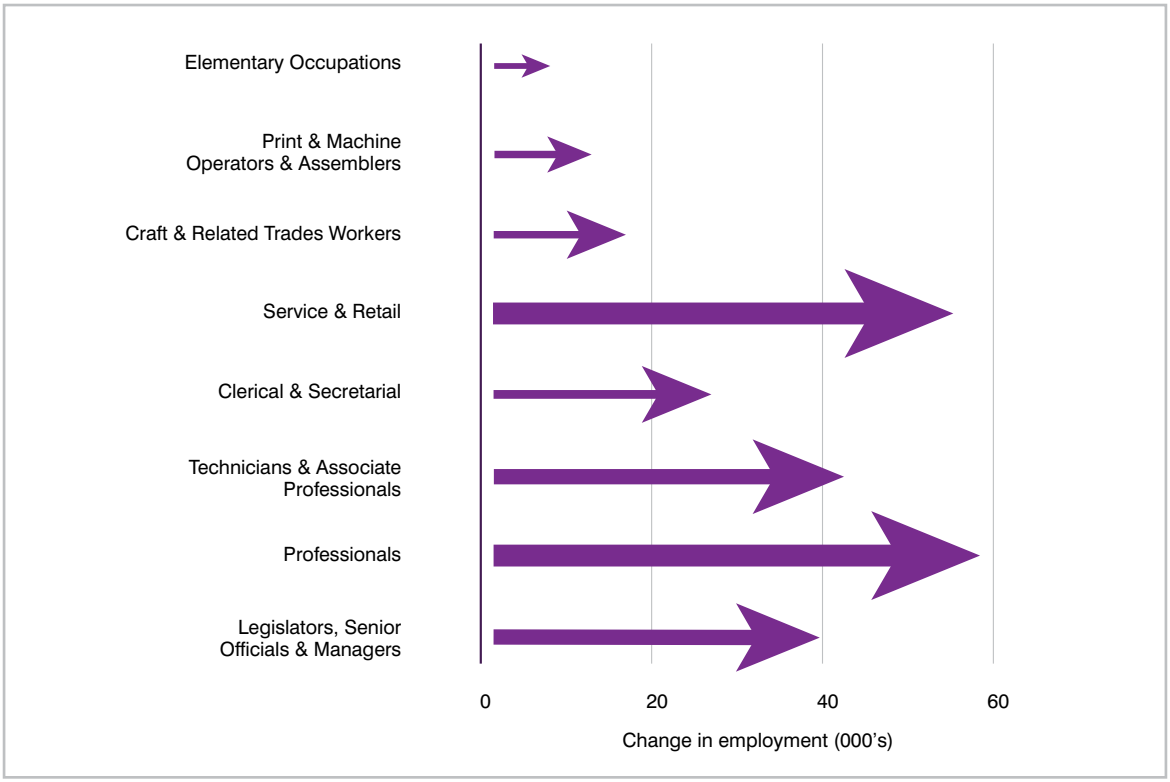
The sectoral pattern of employment growth described above will result in all-island employment growth largely concentrated in professional and managerial occupations and also in service workers and retail workers.

In terms of demand for occupations in the South, professional and managerial occupations are forecast to grow most strongly with more moderate growth in demand for lower skilled occupations. This means that there is a strong skills gradient in employment growth – that is, employment growth is forecast to be stronger in more highly skilled occupations such as professional occupations. According to the ESRI 2006 publication *'Current Trends in Occupational Employment and Forecasts for 2010 and 2020'*, this difference between growth for higher and lower skilled occupations is forecast to be greater than in the past.

In NI employment growth is forecast across most occupations, except occupations associated with the declining agriculture and manufacturing sectors. Professional occupations are expected to grow most rapidly. Personal service occupations are also expected to show large increases as recent growth in child care and residential care for the elderly continues.

Figure E.5 below provides indicative all–island employment forecasts by occupation over the next five years.

Figure E 5: All-Island indicative employment forecasts by occupation (next five years)



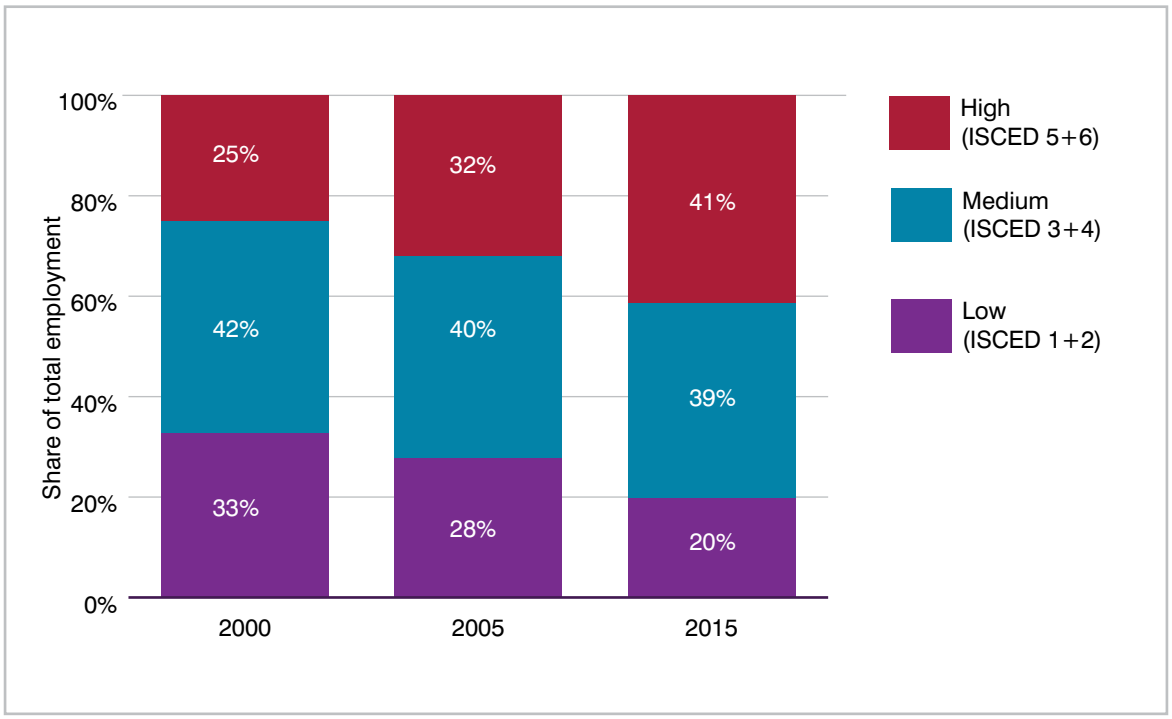
Source: Oxford Economics.
Note: Based on ISCO 88 occupation classification.

These trends are likely to have the following impact on skills demand:

- In the South, the share of employees educated to the highest skill level (ISCED 5+6) is forecast to rise from 32 per cent currently to 41 per cent by 2015;
- The share of employees with lower educational attainment is consequently forecast to decline – this decline being most marked for persons with lower qualifications; and
- A similar pattern is forecast for NI, though the increase in the share of employed persons with third level qualifications is not expected to be as large as in the South.

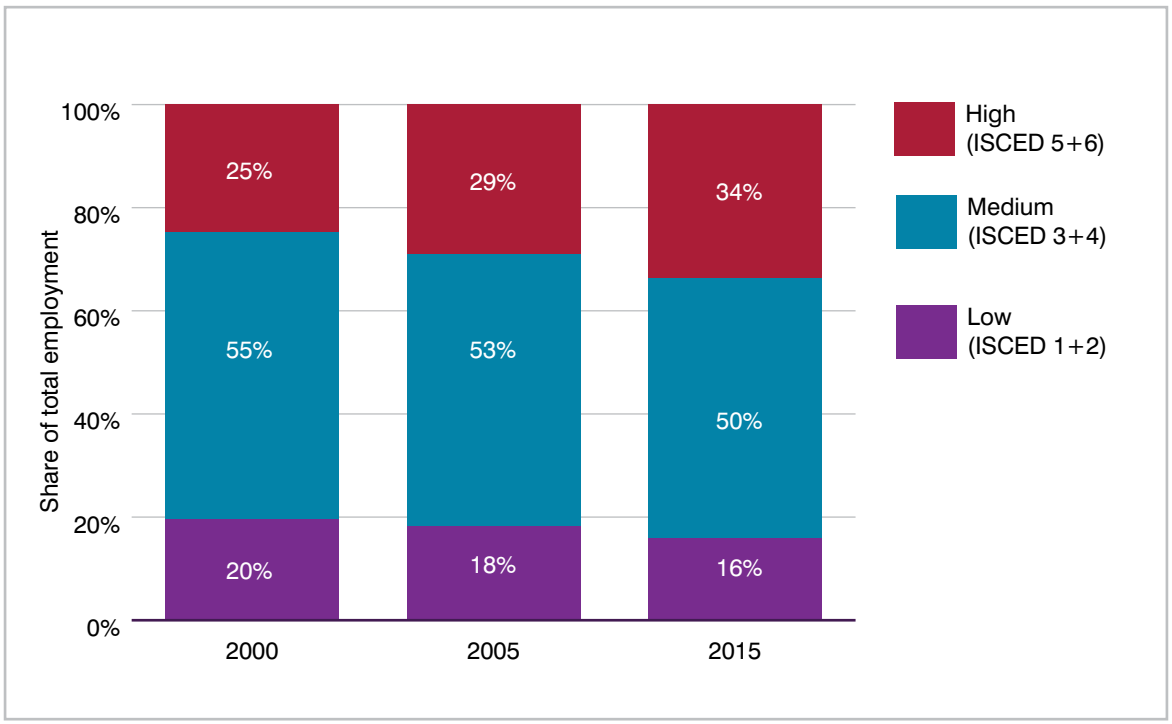
The future all-island pattern of sectoral and occupational growth as outlined above indicates a continuing increase in the proportion of jobs requiring a high skill level, and a relative decrease in those jobs requiring low qualifications. This trend can be seen in the forecasts for the South and likewise the North as presented in Figure E.6 and Figure E.7 below.

Figure E.6: Ireland recent trends and forecasts by stock of skills



Source: CSO QHNS and ESRI.

Figure E.7: Northern Ireland recent trends and forecasts by stock of skills

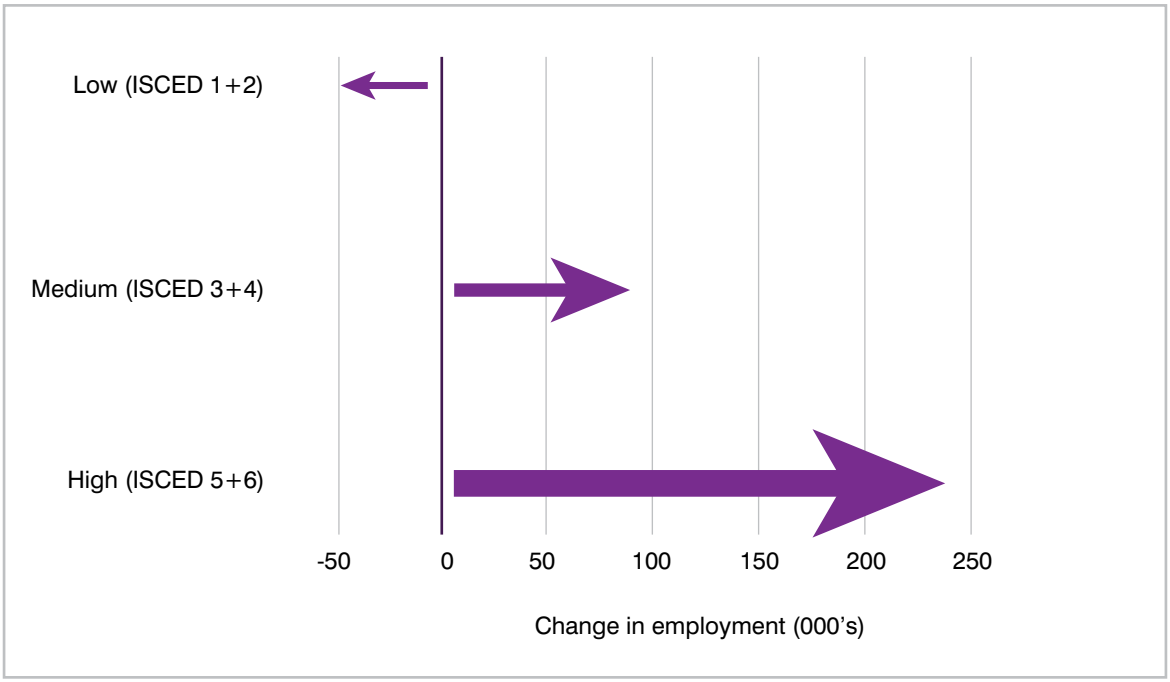


Source: LFS and Regional Forecasts/Oxford Economics.

A further determinant of the demand for skills is the extent to which people leaving jobs due to retirement or other economic inactivity, or moving to a different job, need to be replaced. This 'Replacement Demand' estimates the number of people required in each occupation and skill category to replace leavers and fill new positions created. Replacement Demand is a significant component of overall demand for occupations and skills across the Island, and will create a net positive need for lower level occupations beyond what sectoral or occupational growth analysis would suggest.

However, setting aside the issue of replacement demand, Figure E.8 below provides an indicative all-island employment forecast by skill level over the next five years.

Figure E.8: All-Island indicative employment forecasts by skill level (next five years)



Source: CSO QHNS and ESRI.

Conclusion

The analysis undertaken in this report has shown that the links between skills and economic performance are clear. Going forward, skills development will become even more important to economic performance. The importance of skills to economic performance and the capacity to attract FDI is rooted in the positive effects of a highly skilled labour force in terms of productivity, competitiveness and innovation. This Study also highlights the centrality of skills to economic development and the importance that both jurisdictions attach to ensuring improvements in the stock of skills.

It is clear from the data analysis that, across a range of factors that could impact on skills demand, a number of key similarities and differences North and South are evident. These can be summarised as follows:

Theme	Similarities	Differences
Policy Direction	Policy direction of both skill targets and aspirations are closely aligned.	
Economic Growth and Productivity	Forecast GDP/GVA growth over the next decade is expected to become more similar in both jurisdictions at 3.0 per cent per annum in the South and 2.7 per cent in the North.	Annual GDP growth in the South over the past decade was more than twice the rate of growth in the North.
		Productivity (GDP per head) has recorded notably stronger growth in the South (having been at a similar level in the mid-1990s). Productivity in the South is now 60 per cent higher than in NI (this however does not adjust for repatriated profits or differences in purchasing power which otherwise would be important adjustments).
Economic Activity	Both economies have experienced impressive rates of employment growth.	The South's inactivity rate has fallen sharply but little improvement in the North's economic inactivity rate despite impressive employment growth (the South's inactivity rate however is still slightly higher).
	North-South employment rates are converging towards 70 per cent (Lisbon Agenda 2010 target).	The South has a particularly high share of working-age population with lower secondary attainment (ISCED 1+2) or below.
	Unemployment rates have converged though unemployment has risen in 2008.	
Employment	Both economies have undergone the transformation typical of most developed economies with remarkably similar growth in business and financial services.	In terms of economic structure, the public administration, education, health and social services sector is relatively more important in the North, while the economy in the South is more dependent on business and financial services and construction.
	Both economies have experienced broadly similar occupational trends with faster growth in managerial and professional occupations.	In the South, the growth in construction and retail employment has significantly outpaced growth in the North.

Theme	Similarities	Differences
Current Skills	Broadly similar trends in skill levels of employed persons with a declining share of those with lower qualifications and a rising share with third level qualifications.	The share of higher skilled employed persons in the South has risen faster than in NI.
	Similar shares of hard-to-fill vacancies at selected periods.	Some differences in the nature of skill shortages.
	Similar trends in skill levels of the working-age population – falling proportion with low-level qualifications (ISCED 1+2) and rising proportion with high-level qualifications (ISCED 5+6) attainment.	
Future Skills	Future employment growth North and South is expected to be led by business and financial services with continued demand therefore for professional occupations and a similar future skills stock trend.	
	Replacement demand is an important component of skills demand across both jurisdictions, with important implications for lower level qualifications.	

In considering skills demand issues, it is important to take a long-term view. It is clear that 2008 and 2009 will be difficult years economically for the global and all-island economy. The openness of both economies, North and South, means that the demand for skills will be influenced by both internal economic factors such as the respective downturns in construction and wider global concerns which impact on incoming FDI and exporters.

Looking beyond immediate economic difficulties, the medium-term economic outlook suggests that both economies North and South, should recover and return to growth rates above the EU average though not the 'Celtic tiger' growth rates of recent years. This long-term view is underpinned by an increasing labour supply, favourable trends in productivity and flexible labour markets and strong global growth on the assumption that oil prices will fall and the credit crunch will end.

The broad outlook for the structure of skills demand on the Island points towards a continuing movement towards a higher skill profile of the workforce to serve the all-island economy's shift towards higher value service sector and hi-tech manufacturing activities. This is against the background that other economies competing on the world market are also rapidly upskilling their workforces. Meeting this challenge will help sustain the future competitiveness of the all-island enterprise base and maximise the employment opportunities available for individuals.

This is a challenge that both skills expert groups, North and South, can contribute towards meeting, by working together in a co-ordinated way to help ensure that sufficient and appropriate skills are in place across the Island.

1 Introduction and Background

1.1 Introduction and Purpose of the All-Island Skills Study

- A Comprehensive Study on the All-Island Economy was commissioned by the British-Irish Inter-Governmental Conference and published in October 2006. The study emphasised the critical economic and social role of skills development and the benefits of working in a co-ordinated way to ensure sufficient and appropriate skills across the Island.
- As a result, the Expert Group on Future Skills Needs in Ireland and the NI Skills Expert Group agreed to work together to ensure the evidence is available to underpin policies which will deliver the necessary workforce skills across the Island. This study provides a robust evidence base for future partnership and effective working between the two skills expert groups by providing a comprehensive picture of skills demand on an all-island basis.

The purpose of this study is therefore to:

- Extend the understanding of skills demand across the Island of Ireland (drawing attention to key synergies and differentials where appropriate); and
- Provide a robust evidence base for future partnership and effective working between the two skills expert groups.

1.2 Benefits of North-South Skills Collaboration

While in certain areas both economies, North and South, differ – some of which are highlighted in this report – in several other areas, there are important similarities and challenges. With growing and ever-changing global competition, Ireland's National Development Plan (NDP) notes that "All-Island collaboration offers a unique and relatively unexploited source of competitive advantage for both the North and South".

North-South collaboration is already well advanced in a number of areas. This includes the creation of six North-South bodies, establishment of cross-border organisations and research programmes and closer integration of industrial development and technology policy. Furthermore, Ireland's National Development Plan (NDP) has a specific chapter on All-Island Co-Operation, with key areas identified for cooperation including infrastructure; science, technology & innovation; trade, tourism & investment; human capital; enterprise promotion and the provision of public services (health and education). The cited potential benefits of North-South collaboration in these areas include: gains in trade and investment, both in terms of intra North-South flows and external trade and FDI; exploitation of economies of scale; delivery of and access to more efficient and effective public services; reduced market failures caused largely by an imperfect flow of relevant business information; development of world-class infrastructure; and removal of barriers to physical, labour and academic mobility.

In terms of human capital/skills formation co-operation, the initial benefit of all-island skills collaboration will be the provision of North-South labour market information. This will allow for improvements in information available to the public, assisting employment and education providers in both the North and South and aiding career decisions. Over the long-term, it is intended that collaboration will contribute towards ensuring the all-island economy has a flexible, well-trained, well-educated and adaptable workforce to enable it to compete in the global economy.

The Comprehensive Study of the All-Island economy noted that:

> *'As the Governments North and South respond to labour market failures, there is clear potential for strong collaborative action to enhance the efficiency of the Island's labour market and ensure that sufficient and appropriate skills are in place to encourage sustained growth. A key objective is to optimise the utilisation of the skills pool on the Island, particularly in high growth sectors such as ICT and financial services, and to address any obstacles, regulatory or otherwise, that might inhibit such optimal use of available skills.'*

As this study reveals, there are strong similarities in terms of skill strategies, ambitions and institutional structures to meet skill needs. With global economic conditions becoming more challenging and emerging economies ever more competitive, it is essential that the competitive advantage offered by collaboration is exploited so that the skills potential of the Island can be realised.

1.3 Importance of Skills to Economic Performance

The development of skills is critical to the pursuit of robust and sustainable economic growth and for positioning an economy to take advantage of new developments and innovations in the global marketplace. Consequently, it is important to recognise that investment in – and support for – the knowledge economy (i.e. education, training and upskilling) has the potential to drive an economy forward and yields real benefits, both for individuals and for communities.

Skills drive productivity, attract FDI, are a determinant of economic returns (both at a personal and economy wide level) and are commonly accepted as the key 'raw material' in the modern knowledge-based economy. To this end, skills have taken centre stage of modern economic development policy, alongside other drivers such as infrastructure and innovation. Furthermore, the changing global economic context – technological change, market liberalisation and increased global FDI flows – will ensure that skills development will become even more important to economic performance going forward. The importance of skills to economic performance and the capacity to attract FDI is rooted in the positive effects of a highly-skilled labour force on productivity, competitiveness and innovation.

1.3.1 Skills, Productivity and Innovation

Economic growth theories support the view that improving the skills and qualifications of workers both improves economic performance and drives social progress. The importance of the relationship between skills, productivity and innovation is a recurrent theme in the skills literature and policy documentation. Indeed, the EGFSN National Skills Strategy report published in 2007 notes that economic and productivity growth increasingly depend on the synergies between new knowledge and human capital.

The related themes of skills, productivity and innovation have been revisited by the UK Government on numerous occasions over the past decade. One of the latest UK Government reviews – the *Leitch Review of Skills* (2006) – sets out the role of skills in the UK economy and the value of acquiring additional skills, both to individuals and the wider economy. Improvement in skills has been identified by the UK Government as one of the key ways to meet its objective of raising the sustainable rate of economic growth, as skills improvement can contribute to increasing economic growth by both boosting productivity and increasing the overall employment rate. Indeed, skills have been selected as one of the 5 main drivers of productivity within the UK Government's framework for considering policies to improve productivity. The Leitch review also found that poor skills have constrained productivity, innovation and investment and have prevented employment from rising further. Moreover, this report goes on to articulate clearly the importance of skills to future productivity growth:

> *"In the 21st Century, our natural resource is our people – and their potential is both untapped and vast. Skills will unlock that potential. The prize for our country will be enormous – higher productivity, the creation of wealth…Without increased skills, we would condemn ourselves to a lingering decline in competitiveness, diminishing economic growth and a bleaker future for all'.*

Indeed, the available evidence indicates that where skills gaps exist between economies, potential productivity is unfulfilled. For instance, a serious skills gap has been found to exist between the UK and other economies such as France and Germany. The UK Treasury (2004) has previously noted that the lower level of skills in the UK could explain up to 20 per cent in the productivity gap between the UK and elsewhere with the remaining 80 per cent attributable to factors such as capital investment (or the available stock of physical capital) and total factor productivity (or the efficient use of resources) (CFE, 2007). On the basis of this estimation of the relationship between skills and productivity, the Leitch review stated: '*if the UK had similar skills levels as these countries, its national income would be significantly highe*r'.

1.3.2 Skills and Wages

Education and increased skills levels have a significantly positive effect on wages. Skilled workers have seen the wage premium (or real return) to higher education and training rise in recent years whilst unskilled workers have become increasingly vulnerable to job losses and declining real wages. Consequently, the extent of the wage differential between skilled and unskilled workers has risen sharply in many economies (Tan, 2005). The impact of higher skills on average wages is clear from OECD statistics which shows higher wage levels for people with tertiary level education compared to those with lower level skills. This link between wages and skills has been further demonstrated in recent work undertaken by Oxford Economics on behalf of the Department for Employment and Learning (2007) which showed that where a high percentage of the employed labour force has graduate qualifications this is associated with high wages and productivity. This report noted that average wage levels are strongly associated with the proportion of graduates and that as wage levels are generally underpinned by productivity (at least in the private sector), graduates tend to be strongly associated with higher productivity.

A key driver of these rising wage premiums for skilled labour is the complementarity between the broader effects of globalisation and the demand for skills. The former has brought about a rapid increase in technological change and increased global FDI flows. These factors, in turn, have created a higher demand for skilled labour with a consequent increase in the returns to skills (i.e. greater output and wages). Indeed, the changing economic environment has placed a greater emphasis upon the need to have the skilled labour base, which will allow an economy to take advantage of innovation.

1.3.3 Demand for Skilled Labour

The process of global economic change and development ensures that the skills requirements of any given economy will change over time and in particular, that *'as the economy increases its dependence on services and high technology manufacturing, and traditional sectors decline in importance, there will be a corresponding change in the particular skills and the balance of skills needed in the economy'* (EGFSN, 2007). To this end, the importance of training and education and the need to develop a highly skilled labour force that can compete on a global scale has been identified as an area in which the all-island economy can continue to develop competitive advantage.

Many countries and both jurisdictions on the Island included, will continue to experience a long-term trend whereby the profile and relative importance of many sectors within the economy undergo a process of significant change. According to the EGFSN (2007) sectors such as ICT, medical devices, pharmaceuticals/biotechnology, food and drink and high-value engineering will hold the potential for future economic growth, whilst services such as finance, business and marketing can be expected to continue to grow strongly.

Given the expectation that services and high value added manufacturing sectors will increase in relative importance while traditional manufacturing and agriculture will continue to decline, the Enterprise Strategy Group (2004) has previously emphasised the importance of R&D, innovation and marketing skills. Indeed, this group has noted that the rise in the incidence of knowledge-intensive occupations will result in a rise in the requirement for qualifications, skills and knowledge.

Moreover, the increasing importance of Science, Technology, Engineering, ICT and R&D – as integral elements of the knowledge-based economy – will ensure that the necessary skills will become ever more important. This has been recognised in NI through the establishment of the MATRIX panel, a business led expert group which is advising government on how best to maximise the commercial potential of R&D, science and technology capabilities.

The ongoing shift to services – whether financial services, marketing, etc. – and high-value manufacturing is likely to pose a challenge for employees, employers and policy-makers. This challenge is centred upon the need to ensure that the growing demand for skilled labour can be met and that the labour force is sufficiently equipped to adapt to changing needs and to capitalize upon the opportunities for increased competitiveness and productivity that will arise.

1.4 Ireland and Northern Ireland Skills Development Groups and Skill Strategies

In both jurisdictions, the relevant departments/agencies have developed skills strategies which set forth their ambitions with regard to skills development. In each case, these strategies provide an unambiguous declaration with regard to the importance attached to skills development and underpin this with a roadmap towards the implementation of ambitious targets. For instance, the national skills strategy for Ireland, *Tomorrow's Skills: Towards a National Skills Strategy (2007)*, sets out clear long-term objectives for the development of Ireland as 'a knowledge-based, innovation-driven, participative and inclusive economy with a highly skilled workforce by 2020' and sets out a road map for how the vision and objectives set out therein can be achieved.

Similarly, the skills strategy for NI *Success Through Skills* (2006) articulates the need to 'raise the skills level of the whole workforce; to help deliver high productivity and increased competitiveness; and to secure Northern Ireland's future in a global marketplace'. Once again, this strategy sets out a roadmap for taking these proposals forward in order to deliver on a long-term vision for skills in Northern Ireland.

As described next, the ambitious targets set by Forfás and DEL, and the strengthening North-South collaboration on skills development is a clear indication that both governments are giving the highest priority to skills development and have a clear vision of what skills are required to achieve this.

1.4.1 Ireland

Forfás, under the auspices of the Department of Enterprise, Trade and Employment, operates as the national policy advisory board for enterprise, trade, science, technology and innovation. Forfás provides secretariat and research support to the Expert Group on Future Skills Needs (EGFSN). EGFSN is a body appointed by the Irish Government to advise it on aspects of education and training related to the future skills requirements of the enterprise sector of the Irish economy. The group's mandate is to act as a central national resource on skills and labour supply for the enterprise sector and on overall strategy for enterprise training in Ireland. All Government requests for specific analysis,

sectoral or occupational, fall to the Group. Specifically, the EGFSN carries out systematic and detailed analyses in order to:

- advise Government on projected skills requirements at national and sectoral levels and make recommendations on how best to address identified needs;
- advise Government on associated priority training requirements and the most cost effective ways of responding to them;
- advise on any skills requirements that cannot be met internally at a given time and so must be met through inward migration;
- advise on developments in content and delivery systems that support excellence in training quality elsewhere and on adaptations necessary to incorporate such developments into training provision here;
- respond to any request for advice from the Minister for Enterprise, Trade and Employment on training programmes supported through the National Training Fund; and
- ensure that recommendations made are adequately assessed by the relevant and responsible authorities and periodically inform members of the EGFSN of progress made with regard to their implementation.

EGFSN has, since its inception, produced several strategic documents outlining the skills needs of key sectors. Most recently this has included the future requirement for high level skills in the ICT sector, future skills and research needs of the international financial services sector and skills needs in the medical devices.

As set out in 'Tomorrow's Skills: Towards a National Skills Strategy', if Ireland is to realise this vision of a new knowledge economy it requires enhancing the skills of the resident population, increasing participation in the workforce and continuing to attract highly skilled migrants. Key targets for 2020 outlined by the Expert Group of Future Skills Needs include:

- 48 per cent of the labour force should have qualifications at NFQ levels 6 to 10;
- 45 per cent should have qualifications at NFQ levels 4 and 5; and
- the remaining 7 per cent will have qualifications at NFQ levels 1 to 3.

In policy terms, this will require:

- an additional 500,000 individuals within the workforce will need to progress by at least an NFQ level: specifically upskill 70,000 from NFQ levels 1 & 2 to level 3; 260,000 up to levels 4 & 5 and 170,000 to levels 6 to 10;
- the proportion of the population aged 20-24 with NFQ level 4 or 5 awards should be increased to 94 per cent, either through completion of the Leaving Certificate or through equivalent, more vocationally oriented programmes. The retention rate at Leaving Certificate should reach 90 per cent by 2020;
- the progression rate to third level education will have to increase from 55 per cent to 72 per cent; and
- note the qualification mix of incoming and outgoing migrants will have a strong influence on the changing stock of skills.

1.4.2 Northern Ireland

The recent Programme for Government's focus on growing a dynamic and innovative economy over the next 10 years has identified key skill targets. The Programme highlights skill targets that it aims to reach by 2015 including:

- increase the proportion of the working-age population who are qualified to skill level 2[1] and above to 80 per cent by 2015;
- increase the proportion of the working-age population who are qualified at skill level 3 and above to 60 per cent by 2015;
- increase the proportion of Further Education enrolments at Level 2 from 29 per cent in 2005/06 to 32 per cent in 2010/11;
- increase the proportion of Further Education enrolments at Level 3 from 57 per cent in 2005/06 to 60 per cent in 2010/11;
- increase Apprenticeship training completion rates under Training for Success (and residual Jobskills) to 44 per cent at Level 3 by 2009/10);
- increase by 25 per cent, the number of students, especially those from disadvantaged communities, at graduate and postgraduate level studying Science, Technology, Engineering and Mathematics; and
- linked to the skills target is a wider economic target to achieve an employment rate of 75 per cent by 2020. i.e. in excess of the 2010 Lisbon Agenda target.

1 ***Level 2:*** *5+ CSEs (grade 1), 5+ GCSEs (grades A-C), 5+ O level passes, Senior Certificate, 1 A level, 1-3 AS levels, Advanced Senior Certificate, NVQ level 2, GNVQ Intermediate or equivalents.*

Level 3: *2+ A levels, 4+ AS levels, NVQ level 3, GNVQ Advanced or equivalents.*

In terms of government departments, the Department for Employment and Learning (DEL) has responsibility for taking forward and delivering Success through Skills, the Skills Strategy for Northern Ireland, and skills targets in the Northern Ireland Executive's Programme for Government. DEL is working with Sector Skills Councils who are developing sector skills agreements within a wide range of sectors. These agreements, many of which have been 'signed off' set out the actions which need to be taken by employers themselves and those who provide education and training, in order to ensure skills needs are met. The Skills Strategy reflects the importance of labour market information and highlights that understanding the demand for skills is vital to help improve the planning of skills training.

The role of the NI Skills Expert Group, which is similar to the EGFSN in the South, is to advise and make recommendations to DEL and other government agencies on matters affecting the Skills Strategy for Northern Ireland. The work of the group covers three main areas. These are:

- update of skills supply and demand on an ongoing and priority basis;
- identification of emerging skills needs; and
- advice on training strategy, and how to look for potential opportunities.

A further institutional development for NI is the creation of the new NI Employment and Skills Adviser. The Skills Adviser will represent NI on the new UK Commission for Employment and Skills. The adviser will also link with the NI Skills Expert Group.

Lastly, following the publication of the Leitch Report, 'Prosperity for All in the Global Economy – World Class Skills in the United Kingdom' (which was published after 'Success Through Skills'), and 'Tomorrow's Skills: Towards a National Skills Strategy in Ireland, DEL brought together a group of key stakeholders to review the potential implications, and possible lessons to be learned for NI from these contrasting strategies. A Statement of Skills was published to outline how DEL will continue to implement Success through Skills.

Following DEL's commitment to refresh the implementation plan for Success through Skills, evaluate programmes and assess progress towards achieving its vision, a report is due to be published by Spring 2009.

1.5 Existing Work Comparing North-South Economic Data

A considerable amount of statistical analysis exists for the Island economy. Much of this analysis has been compiled in the joint CSO-NISRA statistical profiles. These profiles present comparable statistics for Northern Ireland and Ireland across a range of policy areas including health, education, agriculture, the environment, the labour market and the economy.

The CSO-NISRA statistical profiles focus on areas where comparable data are readily available. The all-island Skills Study aims to build on the CSO-NISRA statistical profiles by matching data where possible, aggregating to all-island level and focusing on economic factors relevant to skills demand.

Another recent collaborative effort is the 'Atlas of the Island of Ireland' (the Atlas) – a joint venture between the All-Island Research Observatory (AIRO) and the International Centre for Local and Regional Development (ICLRD). The aim of the Atlas, which principally maps census data available in both Ireland and Northern Ireland at lower geography levels, is to present a set of data relating to the whole Island to provide an evidence base for thinking about social and economic questions affecting both jurisdictions and informing cross-border planning. As the Atlas spells out, for various technical and scientific reasons, one cannot simply add the two main sets of data together. One of the issues of most relevance to this study is that of data interoperability which concerns the extent to which datasets sourced separately can be used in conjunction with one another. If two sets of data cannot be used together because they do not share common attributes, then they are said to have poor interoperability.

The Atlas identifies datasets that can be exactly matched, part-matched or reclassified so they broadly match, and datasets that have no equivalent. This is broadly the approach adopted in this study and it is described in detail in Annex A: Technical Data Matching Annex.

1.6 Methodology Used to Compare and Match Relevant North-South Skill Demand Data

1.6.1 North-South Technical Data Issues

Technical issues surrounding North-South data are set out in Annex A. Key points to note are:

- Ireland has a statistical obligation to produce a full set of real, fiscal, external and monetary statistical accounts, as well as participate in European-wide economic surveys and produce EU-wide comparative national economic data across a range of themes. Notwithstanding devolution, Northern Ireland, as a region of the UK – has fewer statistical collection and dissemination obligations and does not have a full set of economic accounts.
- Related to these points, approaches to classifying data tend to be more aligned to European classifications e.g. NACE industrial classification with NI more aligned to UK classifications e.g. SIC industrial classification.
- Other comparability issues include the differences in occupation classification (SOC 1990 for Ireland and SOC 2000 for NI).
- Finally, both jurisdictions have quite different education and training systems and therefore different highest education categories and highest qualification classifications.

1.6.2 Matching North-South Data

The methodology adopted for investigating the comparability and matching North-South data has been rigorous. A full understanding of the methodology for collecting the data, time period referred to, classifications used and definition of indicators has been sought. Where data are part-comparable and can be matched with alignment or adjustment, the approach taken has been to use international statistical mapping guidelines and techniques. This is as opposed to providing a unique mapping technique. Below is a summary of the different classifications of data comparability and examples of where indicators fit into the classification.

- **Exactly (or almost exactly) matched data:** Consistent with the CSO-NISRA statistical profiles for All-Island, this study confirmed that several indictors can be exactly (or 99 per cent) matched (and added together) and can be benchmarked internationally e.g. population; components of population change; entrepreneurial activity and innovation; employment by broad industry and unemployment (ILO definitions); PISA student skill assessments; median wages by sector and graduate starting salaries.

- **Aligned to match data:** Several other indicators can be aligned to match exactly (in definition terms) and be added together. These include converting NI GVA at basic prices in £ sterling to GDP at market prices in Euro (notwithstanding GDP versus GNP issues for Ireland and purchasing power parity issues); aligning SOC 1990 occupational data (Ireland) and SOC 2000 occupational data (NI) to a common occupational classification (ISCO 88); and converting North-South highest education/qualification attainment levels of the working-age population and people in employment into an internationally recognised classification system (UNESCO's ISCED 1997 which is used in the OECD Education at a Glance reports).

- **Broadly matched data and credible to compare:** A number of other indicators broadly match and although it is not recommended to add many of them together at this stage, it is certainly worthwhile and credible to present a North-South comparison e.g. VAT registered business stock, registrations and de-registrations; highest education attainment of school leavers; employment by sector, occupational and skill demand forecasts; and total vacancies and hard-to-fill vacancies by occupation.

A detailed description of the methodology used in this research is set out in the Technical Annex. This focuses primarily on key data sources and North-South similarities/differences and the approach adopted to match data on a North-South basis (where alignments and adjustments are required).

1.7 Report Structure

The remainder of this report is structured as follows:

- Section 2 presents an economic context, placing the all-island economy in an international context in terms of key demographic and economic trends and forecasts;
- Section 3 presents a skills and labour market context, focusing on trends in economic activity and the skills profile of the working-age population;

Note sections 2 and 3 are essentially background context for the main section in the report on demand for skills;

- Section 4, the main focus of the report, presents the demand for skills across the Island, and is split into four parts:
  - Part A: Recent skills demand trends;
  - Part B: Current skills demand issues;
  - Part C: Skills demand in specific key industry sectors; and
  - Part D: Future skills demand trends.
- Annex A is the detailed Technical Annex;
- Annex B contains notes to charts and tables;
- Annex C presents sources of information on vacancies, skills shortages, gaps and utilisation of skills;
- Annex D critiques existing skills forecast research and explains replacement demand;
- Annex E is the bibliography of references;
- Annex F presents a glossary of acronyms;
- Annex G lists EGFSN membership;
- Annex H lists Northern Ireland Skill Expert Group membership; and
- Annex I lists Steering Group membership.

2 Economic Context

2.1 Introduction

This chapter 'sets the scene' by providing broad commentary on the wider economic context in terms of recent all-island economic and demographic performance, current domestic and global challenges and the longer-term economic outlook. Specifically, the chapter covers the following:

- North-South and all-island demographic trends with international comparisons of total and working-age population growth and components of population change;
- North-South, all-island and international comparisons of recent and forecast economic growth and productivity (in terms of GDP per capita); and
- North-South, all-island and international comparisons for FDI, enterprise and innovation.

2.2 All-Island Facts

Over the course of the previous decade, both economies, North and South have performed strongly, particularly the South, and in doing so, have made impressive progress in many spheres including job creation and attracting FDI. Indeed, although both economies are in the midst of a slowdown – due to domestic and external economic factors – the medium-term outlook remains positive with continued economic transformation and movement 'up the value chain' suggesting sustained demand for high-end skills.

The analysis presented in this chapter highlights a range of key all-island facts:

- population on the Island has increased from 5.3m to 6.0m over the past decade (fuelled by net inward migration) and is forecast to reach 6.6m in 2016. Both North and South have become net inward migration economies in recent years;
- All-Island economic growth rates have ranged from 9 per cent during the 'Celtic Tiger' years to current real growth of 5-6 per cent (2007) as both economies enjoyed a long period of sustained economic growth;
- the size of the all-island economy, at $280bn in nominal terms (2006), is similar to Denmark and larger than Finland. The South contributes 80 per cent to all-island GDP;
- All-Island economic growth is forecast to be below trend growth in 2008 and 2009 although it is expected to recover thereafter. Over the next decade, the all-island economy is expected to grow at approximately 3.0 per cent per annum. While this is lower than in the recent past, it is still one percentage point faster than forecast for the Eurozone economy. The gap in North-South growth rates is forecast to be lower over the next decade; and

- productivity measured as GDP per head on the Island compares favourably with international comparators, well ahead of both the Eurozone and UK averages, at €37,000 per head (2006). Though there is a large North-South productivity gap. Purchasing power parity and net factor income adjustments would reduce the size of the gap.

2.3 Wider Economic Context

2.3.1 All-Island Recent Economic Performance

As shown later in the chapter, the all-island economy has been performing exceptionally well over the last decade, growing at an average rate of over 7 per cent (real market price GDP). This places the all-island economy well ahead of other industrialised economies such as the US, Australia, Germany and UK in rankings of economic growth. Only China of the comparators included has grown faster. Growth has been predominantly southern-led, not only in terms of the economy in the South being four times larger than the NI economy, but by the rate of economic growth in the South being double the rate of NI during the so-called 'Celtic tiger' years. Economic growth in the South has however slowed since the turn of the century with the gap in North-South economic growth rates declining.

2.3.2 Current Global and All-Island Economic Challenges

At global level and for the all-island economy there have been two key, but distinct macro developments which are the main sources of current economic difficulties. Firstly the credit crunch has led to a re-pricing of risk and reduction in available financing to businesses, home borrowers and consumers, which has had a knock on impact to the already fragile housing markets. This has hit the economy in the South particularly hard given the relatively large size of its construction sector and dependence on US economic performance where the credit crunch originated. Secondly continued rapid economic growth in 'commodity hungry' emerging economies such as China and India is pushing up world commodity prices, particularly oil. This is putting upward pressure on production costs and inflation, thereby reducing corporate profits and increasing the cost of living for households (with wage increases not sufficient to offset rising living costs).

These developments, along with challenges closer to home, are contributing to the current slowdown which is having a short-term impact on the scale and nature of skill demand.

2.3.3 All-Island Long-term Economic Outlook

A look further into the decade ahead by the ESRI however suggests that the economy in the South should recover quite quickly and return to growth rates above the EU average. The *Medium-Term Review 2008-2015* noted that the economy will rebound from the current below trend growth within 18 to 24 months and predicts growth of 5 per cent by 2010.

Moreover, the ESRI has forecast that the economy is heading towards a real economic growth rate averaging 3.75 per cent annually over the next decade. Therefore notwithstanding potential short-term falls in demand for a range of skills, the broad long-term forecast for skills demand, towards higher end skills, is likely to remain unchanged.

The prospects for Northern Ireland are not dissimilar and the extent of the short-term downturn is not expected to be as sharp, although some commentators are expecting a harder 'landing' than presented in this report. The medium-term NI growth forecast is predicted to be above the EU average and closer to long-term trends.

It is important to note that most long-term growth forecasts which show a rebound assume a fall in world oil prices, easing of inflationary pressures and easing of credit conditions. Needless to say if these improvements do not materialise, the global outlook could be quite different. In addition there is a risk that recent events could have longer-term impacts on FDI, for example in graduate 'hungry' hi-tech manufacturing and international financial services. If inward investment in these sectors was to take longer to recover, the all-island upward skills profile gradient of new employment growth may be less pronounced.

2.4 Key Demographic and Economic Trends and Forecasts

In order to set the context within which the demand for skills will be assessed later in this report, the remainder of this chapter provides an overview of recent economic performance for key macroeconomic indicators including population, output, entrepreneurship, innovation and FDI.

2.4.1 Population

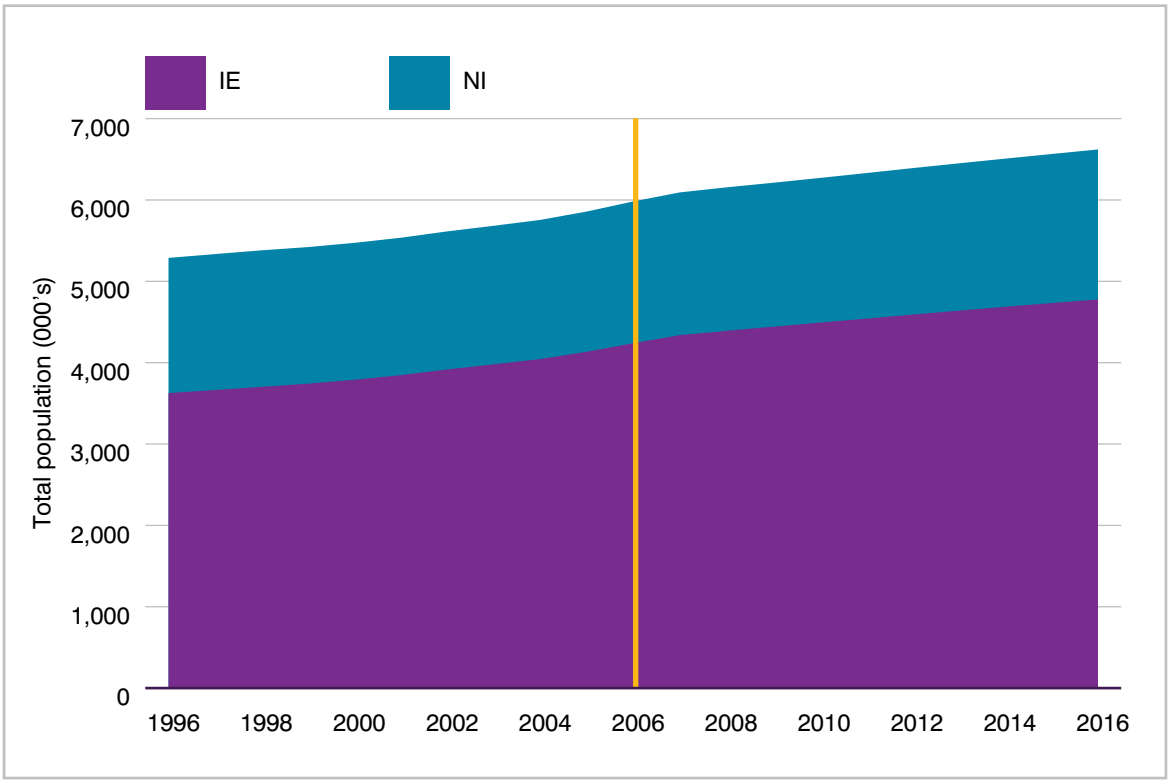
The figures below show recent and expected future trends in population (based on assumptions of natural change and migration[2]). The trend over the past decade is one of consistent growth across the Island with population rising from 5.3m to 6.0m (Figure 2.1). Growth has been stronger in the South where population has grown by 1.6 per cent per annum on average compared to 0.5 per cent per annum in NI. Much of the growth in the South has occurred since the beginning of this decade, driven by sharp increases in migration – a factor that has only become a more significant driver of population growth in the North during the past two years.

The all-island population is expected to continue growing over the coming decade, reaching 6.6m by 2016 (Figure 2.1). Interestingly, growth in NI over the next decade is expected to be slightly faster (0.6 per cent pa) than in the previous decade while growth in the South is expected to be slightly slower (1.2 per cent pa, Table 2.1). Much of this growth will however depend on migration, which in turn depends on relative economic conditions. (Note Oxford Economics' population projections presented below in Figures 2.1-2.3 compare closely to official North-South projections from NISRA and CSO. For example, the Oxford Economics baseline projections for the South fall between the high and low fertility-migration scenario CSO projections, while the official NI population projections are only slightly higher due to assumed higher net migration).

2 *Population forecasts presented are Oxford Economics forecasts and not official projections from CSO and NISRA. This is to ensure a consistent approach throughout as almost all other economic forecasts presented are sourced from Oxford Economics and population is one of the key driving factors for economic growth.*

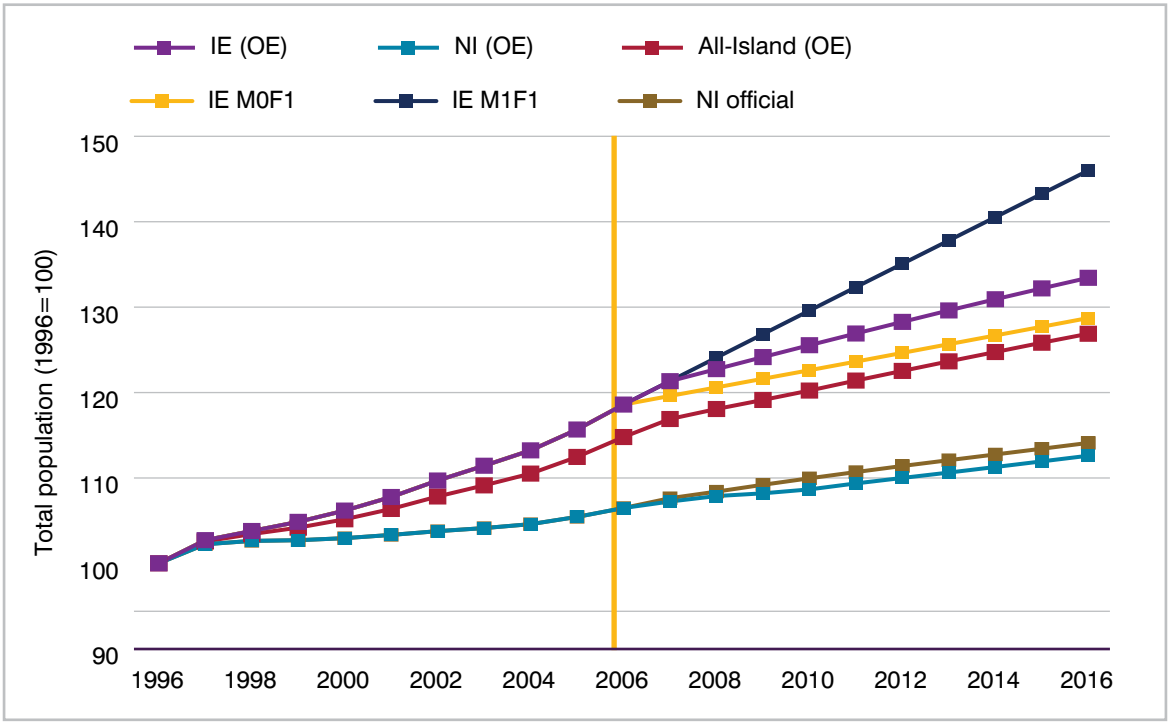
All-Island population growth is even more significant when placed in an international context. As Figure 2.4 shows, the Island taken as a whole grew faster than all other comparators, and three times faster than the Eurozone in per cent growth terms.

Figure 2.1: All-Island population trends and forecasts (absolute numbers)



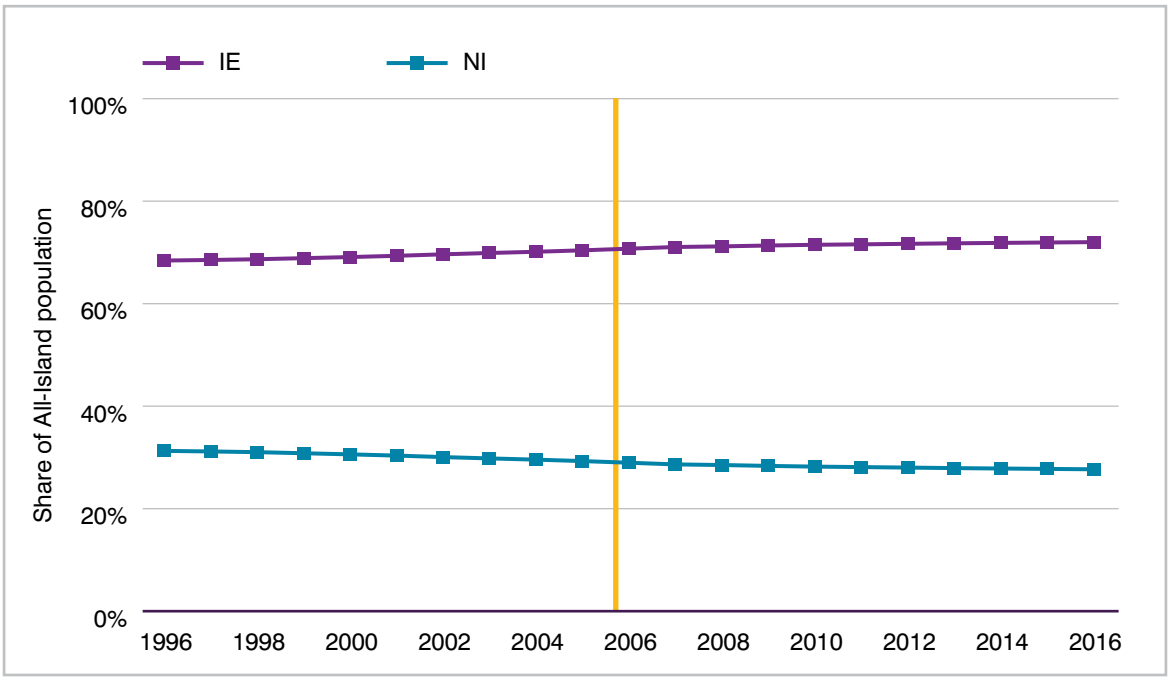
Source: CSO, NISRA and Oxford Economics.

Figure 2.2: All-Island population trends and forecasts (index 1996=100)



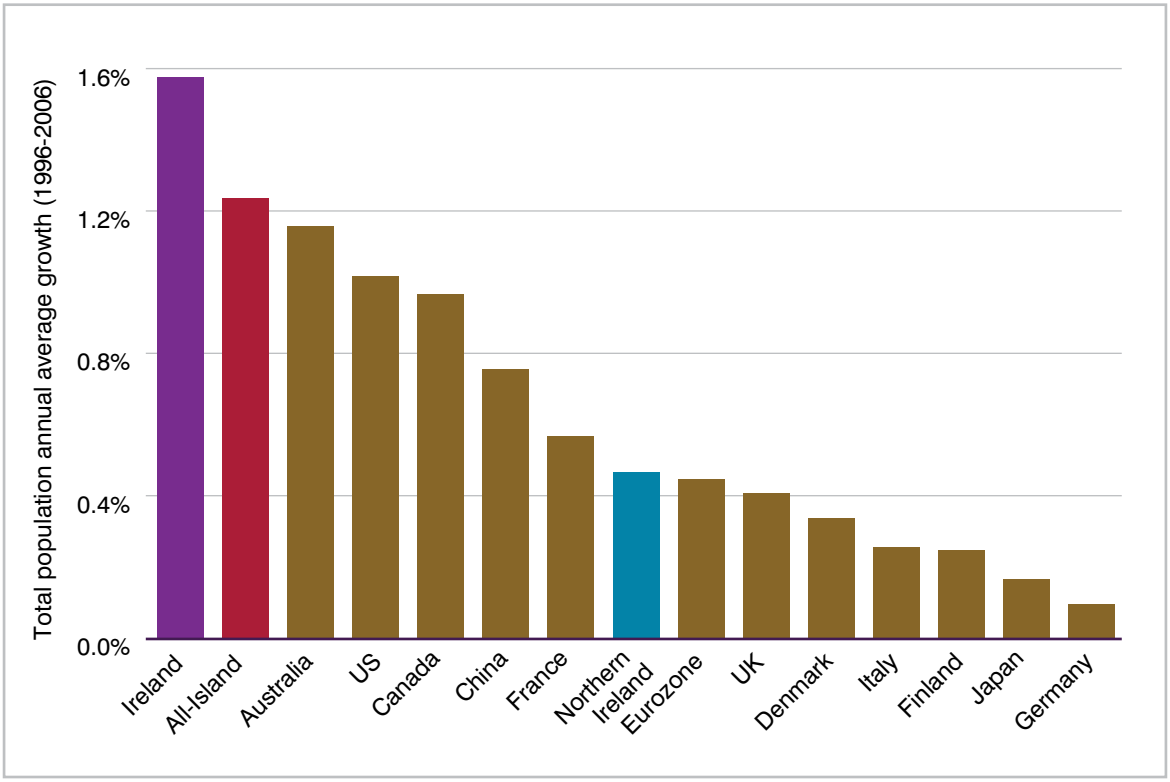
Source: CSO, NISRA and Oxford Economics.

Figure 2.3: All-Island population trends and forecasts (share of All-Island total)



Source: CSO, NISRA and Oxford Economics.

Figure 2.4: International comparison of recent population trends



Source: CSO, NISRA and Haver Analytics.

Table 2.1: International comparison of recent population trends and forecasts

	1996-2006	2006-2016	Change pp
Australia	1.2%	1.0%	-0.2
Canada	1.0%	0.9%	-0.1
China	0.8%	0.6%	-0.2
Denmark	0.3%	0.2%	-0.2
Eurozone	0.4%	0.2%	-0.2
Finland	0.2%	0.2%	0.0
France	0.6%	0.4%	-0.2
Germany	0.1%	0.0%	-0.1
Italy	0.3%	0.0%	-0.2
Japan	0.2%	-0.1%	-0.3
UK	0.4%	0.7%	0.3
US	1.0%	0.9%	-0.2
Ireland	**1.6%**	**1.2%**	**-0.4**
Northern Ireland	**0.5%**	**0.6%**	**0.1**
All-Island	**1.2%**	**1.0%**	**-0.2**

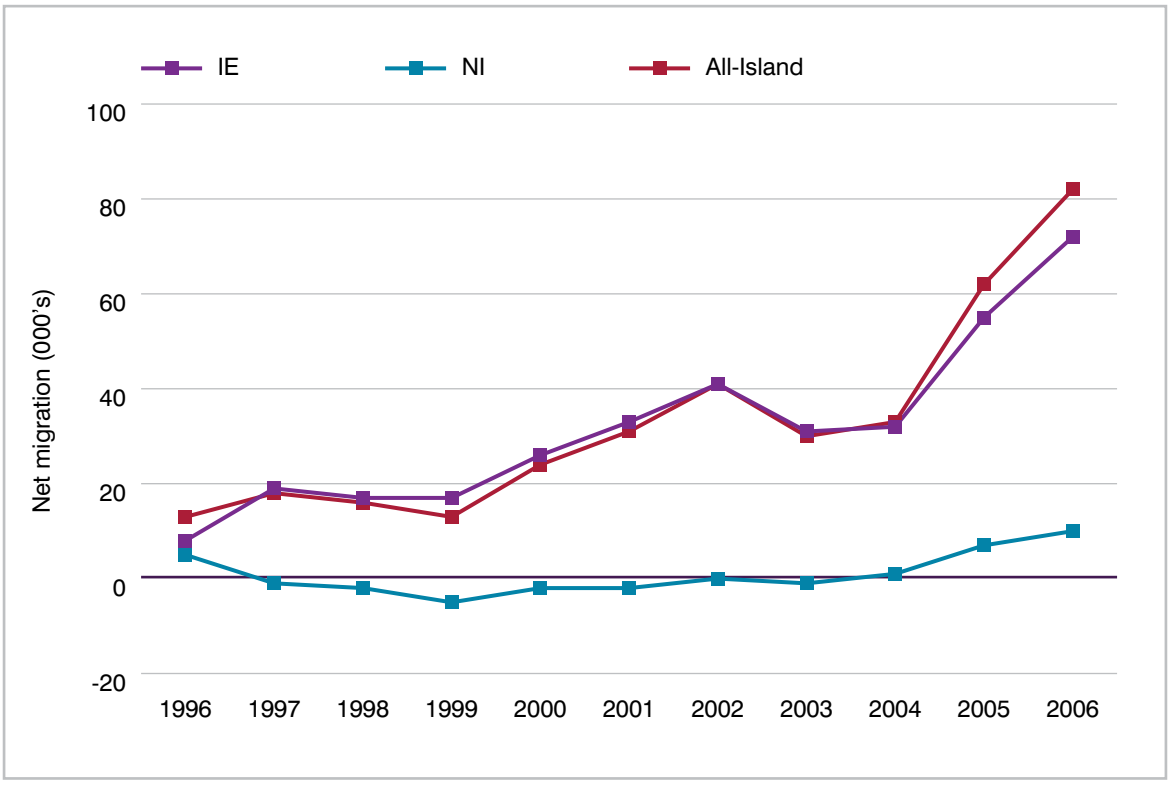
Source: CSO, NISRA, Haver Analytics and Oxford Economics.

2.4.2 Migration

Recent trends in migration have been a strong driver of population growth and have helped to alleviate skills shortages in key sectors, North and South. In addition, a recent report by the OECD noted that migrants to Ireland have tended to have higher qualifications than those already resident, thus raising the overall skills profile of the Island.

Net migration into the Island was 82,000 in 2006 (Figure 2.5), equivalent to 1.4 per cent of the all-island population (Figure 2.6). Net migration has been considerably higher in the recent past due to the accession of Eastern European counties into the EU and lower levels of emigration. This marks a significant turnaround from the early 1990s and before when the Island suffered net emigration of skills due to limited domestic job opportunities and the Troubles in the North.

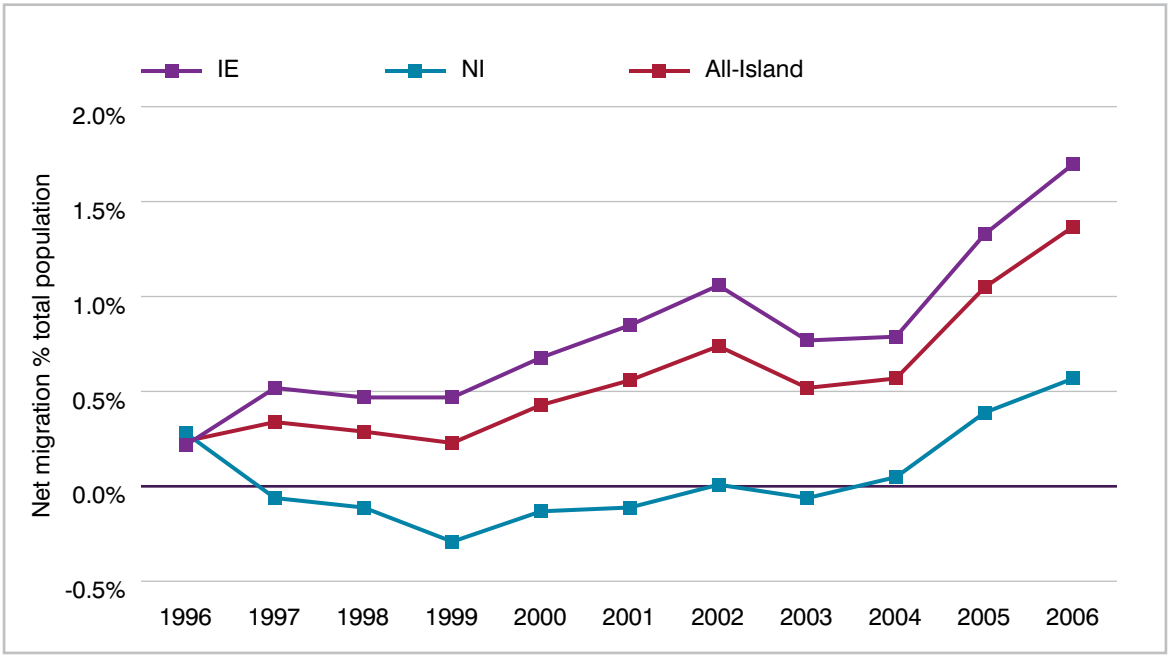
Figure 2.5: All-Island net migration trends (absolute numbers)



Source: CSO and NISRA.

Note: At all-island level, North-South migration flows are effectively netted off by summing data of both jurisdictions. For example, an outflow from Ireland to NI (-ve) is recorded as a positive inflow in NI and both should in theory be equal as they are jointly based on the same CSO/NISRA source.

Figure 2.6: All-Island net migration trends (per cent of total population)



Source: CSO and NISRA.

Table 2.2: International comparison of recent net migration trends (annual average 2001-2005 inclusive)

	Net migration (000's)	Net migration % total population
Australia	119	0.6%
Canada	208	0.7%
China	-380	0.0%
Denmark	8	0.1%
Finland	7	0.1%
France	148	0.2%
Germany	160	0.2%
Italy	377	0.7%
Japan	54	0.0%
UK	181	0.3%
US	1,299	0.4%
Ireland	**38**	**1.0%**
Northern Ireland	**1**	**0.1%**
All-Island	**39**	**0.7%**

Source: CSO, NISRA, Eurostat, World Bank and Oxford Economics.

Table 2.3: International comparison of recent net migration trends (2006)

	Net migration (000's)	Net migration % total population
Australia	159	0.8%
Canada	197	0.6%
Denmark	7	0.1%
Finland	11	0.2%
France	90	0.1%
Germany	24	0.0%
Italy	377	0.6%
Japan	0	0.0%
UK	178	0.3%
US	1,090	0.4%
Ireland	**72**	**1.7%**
Northern Ireland	**10**	**0.6%**
All-Island	**82**	**1.4%**

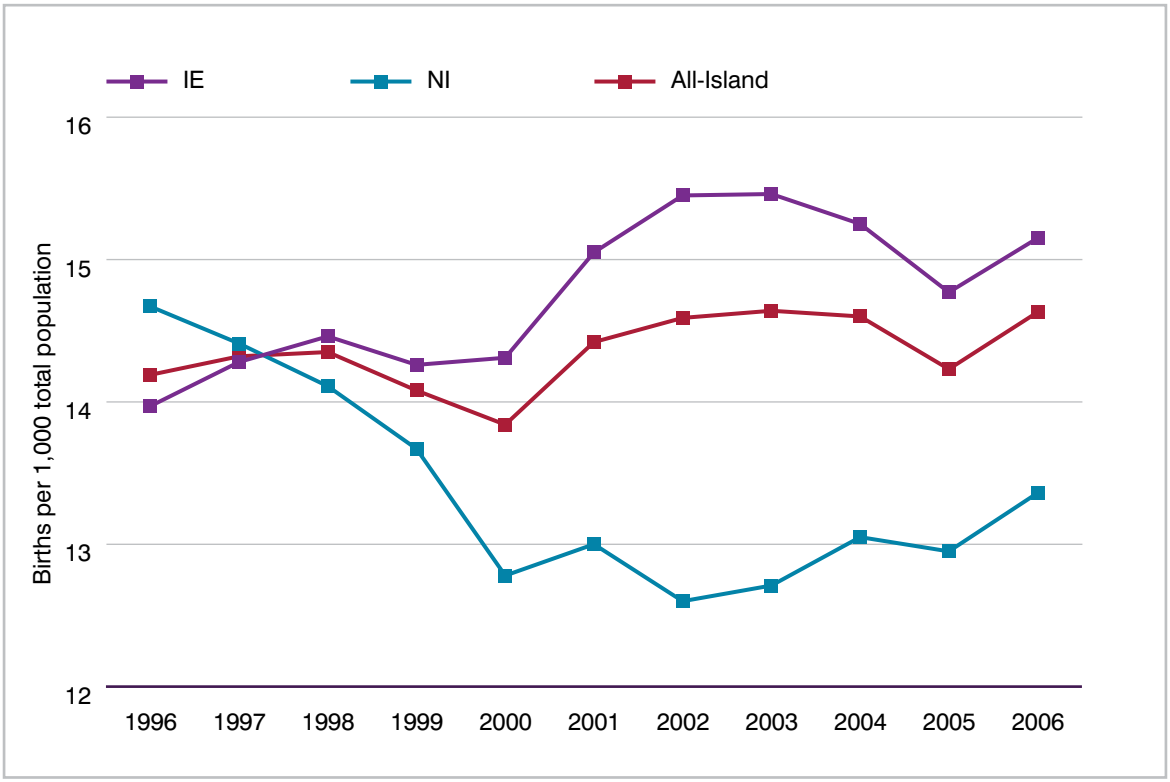
Source: CSO, NISRA, Eurostat, World Bank and Oxford Economics.

International comparisons of net migration are more meaningful when presented as a proportion of a country's total population. Net migration into the Island has been considerable in an international context (Table 2.3). Averaging 0.7 per cent of total population per annum for the five years to 2005, the Island is on a par with Canada and Italy and half a percentage point higher than the UK, Germany and France. The low share for NI brings down the overall all-island share. Looking at the latest year's data available (2006) across all comparators, none come close to the level of relative net migration into the Island.

2.4.3 Natural Increase

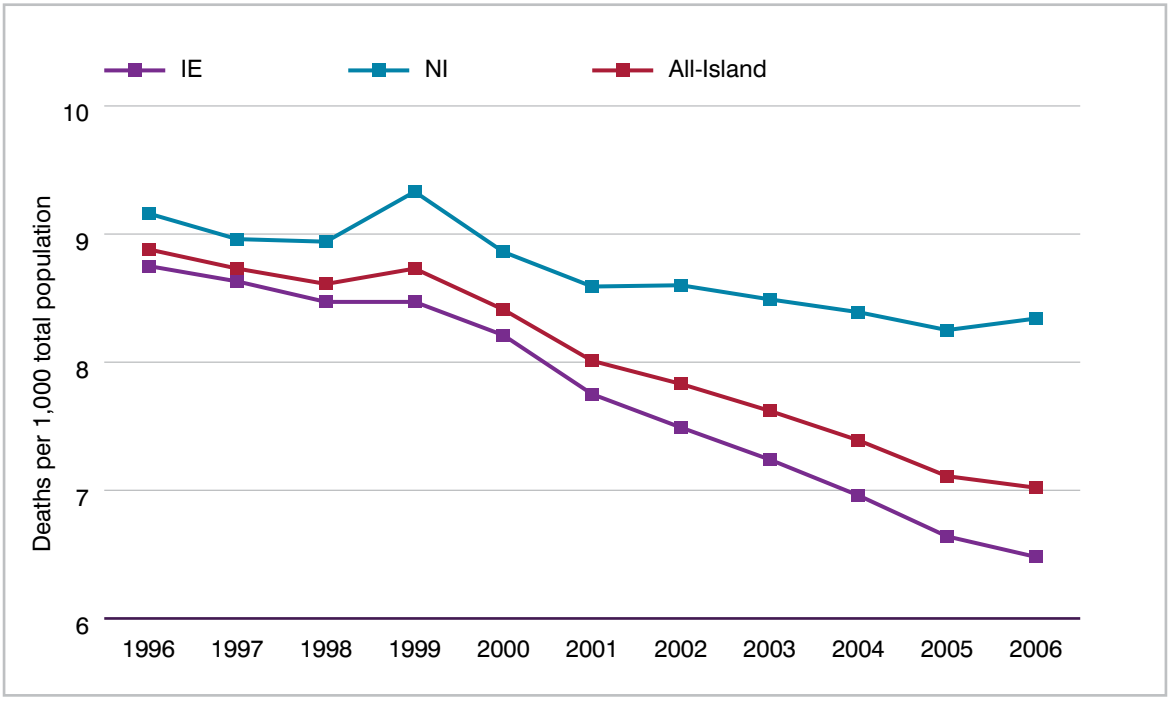
Birth rates have been reasonably steady over the last decade on the Island, at approximately 14 births per annum per 1,000 residents (Figure 2.7). There is a slight difference in birth rates for the North and the South with the South recording 2 more births per 1,000 people on average. Turning to death rates, these have been falling steadily since 1999 and are currently 7 per 1,000 people per annum across the Island (Figure 2.8).

Figure 2.7: All-Island birth rate trends



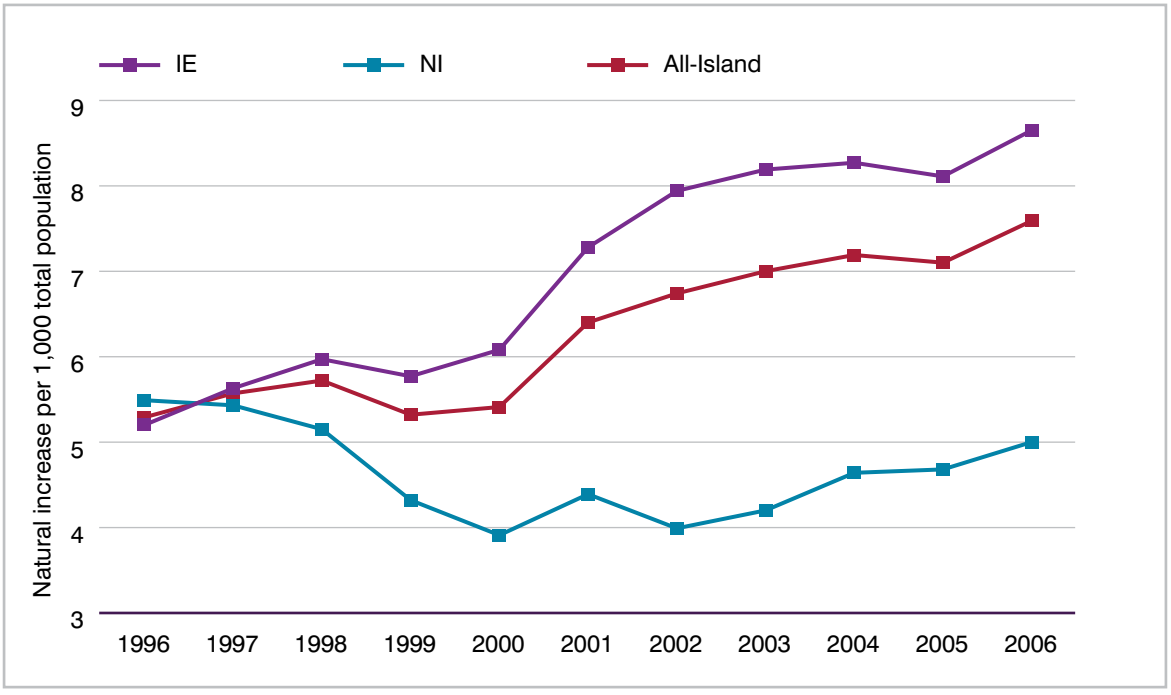
Source: CSO and NISRA.

Figure 2.8: All-Island death rate trends



Source: CSO and NISRA.

Figure 2.9: All-Island rate of natural increase trends



Source: CSO and NISRA.

Table 2.4: International comparison of recent birth rate trends (per 1,000 of total population)

	1996	2006	Change
Australia	13.9	12.9	-1.0
Canada	12.0	10.7	-1.3
China	17.0	11.9	-5.1
Denmark	12.9	12.0	-0.9
Finland	11.9	11.2	-0.6
France	12.6	12.8	0.2
Germany	9.9	8.2	-1.7
Italy	9.2	9.7	0.5
Japan	9.6	8.7	-0.9
UK	12.5	12.2	-0.3
US	14.8	14.1	-0.7
Ireland	**14.0**	**15.2**	**1.2**
Northern Ireland	**14.7**	**13.4**	**-1.3**
All-Island	**14.2**	**14.6**	**0.4**

Source: CSO, NISRA, World Bank and Oxford Economics.

Table 2.5: International comparison of recent death rate trends (per 1,000 of total population)

	1996	2006	Change
Australia	7.0	6.5	-0.5
Canada	7.3	7.2	-0.1
China	6.6	6.5	-0.1
Denmark	11.6	10.2	-1.4
Finland	9.6	9.2	-0.4
France	9.2	8.5	-0.7
Germany	10.8	10.2	-0.6
Italy	9.5	9.3	-0.2
Japan	7.1	8.6	1.5
UK	10.9	9.7	-1.2
US	8.8	8.3	-0.5
Ireland	**8.7**	**6.5**	**-2.3**
Northern Ireland	**9.2**	**8.3**	**-0.8**
All-Island	**8.9**	**7.0**	**-1.9**

Source: CSO, NISRA, World Bank and Oxford Economics.

Table 2.6: International comparison of recent rate of natural increase trends (per 1,000 of total population)

	1996	2006	Change
Australia	6.9	6.4	-0.5
Canada	4.7	3.5	-1.2
China	10.4	5.4	-5.0
Denmark	1.3	1.8	0.5
Finland	2.3	2.1	-0.2
France	3.4	4.3	0.9
Germany	-0.9	-2.0	-1.1
Italy	-0.3	0.4	0.7
Japan	2.5	0.1	-2.4
UK	1.6	2.5	0.9
US	6.0	5.9	-0.1
Ireland	**5.2**	**8.7**	**3.4**
Northern Ireland	**5.5**	**5.0**	**-0.5**
All-Island	**5.3**	**7.6**	**2.3**

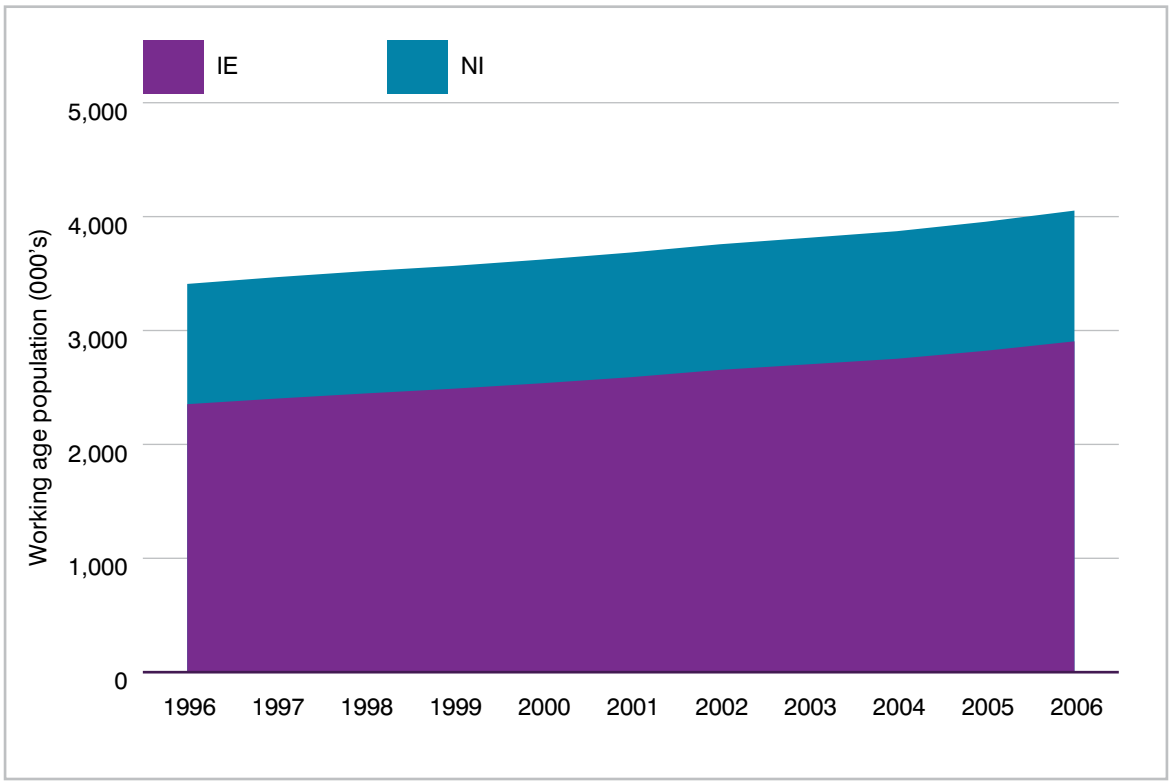
Source: CSO, NISRA, World Bank and Oxford Economics.

Birth rates on the Island are high relative to the international comparator regions (Table 2.4). In addition, the Island has not experienced the downward trend in birth rates that has been recorded across most other international comparator countries. (Note however that birth rates had been falling in NI up until 2002.)

2.4.4 Age Structure

Working-age population on the Island has been increasing as a share of the total population (Figure 2.11), due mainly to the recent increases in migration (as migrants are, in the main, of working-age), and the young population age cohort progresses to working age. Working-age persons account for two-thirds of the all-island total population. There is however some difference between North and South with NI's working-age population accounting for 66 per cent of total population compared to 69 per cent in the South. This is based on the Eurostat definition of working-age population for both jurisdictions – male and female 15-64. The standard working-age definition for NI is typically male 16-64 and female 16-59 – for purposes of comparability the Eurostat definition is also used for NI.

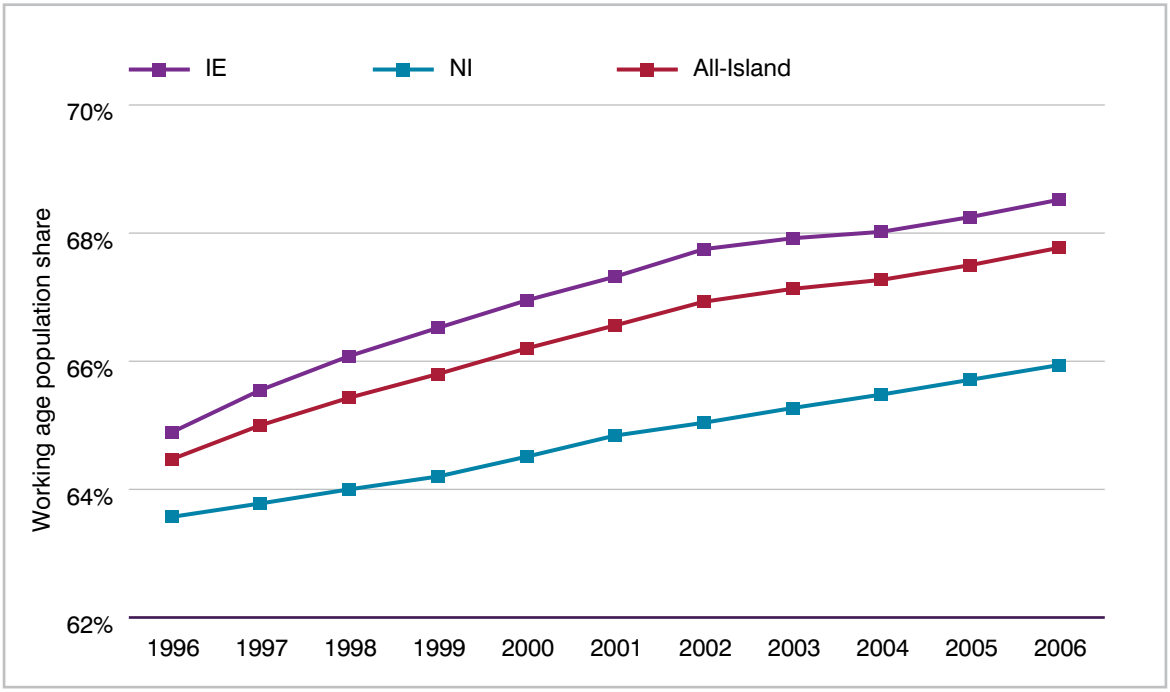
Figure 2.10: All-Island working-age population trends



Source: CSO and NISRA.

Note: For North-South comparability, working-age definition for both jurisdictions is based on Eurostat definition – male and female 15-64. Northern Ireland working-age definition is typically male 16-64 and female 16-59.

Figure 2.11: All-Island working-age population trends (North-South share of total population)



Source: CSO and NISRA.

Table 2.7: International comparison of age structure (2005)

	0-24	25-44	45+
Australia	33%	29%	38%
Canada	31%	29%	39%
China	38%	34%	28%
Denmark	30%	28%	42%
Finland	30%	26%	44%
France	31%	28%	41%
Germany	26%	29%	45%
Italy	24%	31%	45%
Japan	25%	28%	47%
UK	31%	28%	41%
US	35%	28%	37%
Ireland	**36%**	**31%**	**33%**
Northern Ireland	**35%**	**28%**	**37%**
All-Island	**36%**	**30%**	**34%**

Source: CSO, NISRA and UN.

Note: 2006 data from the UN are not available for more recent comparison.

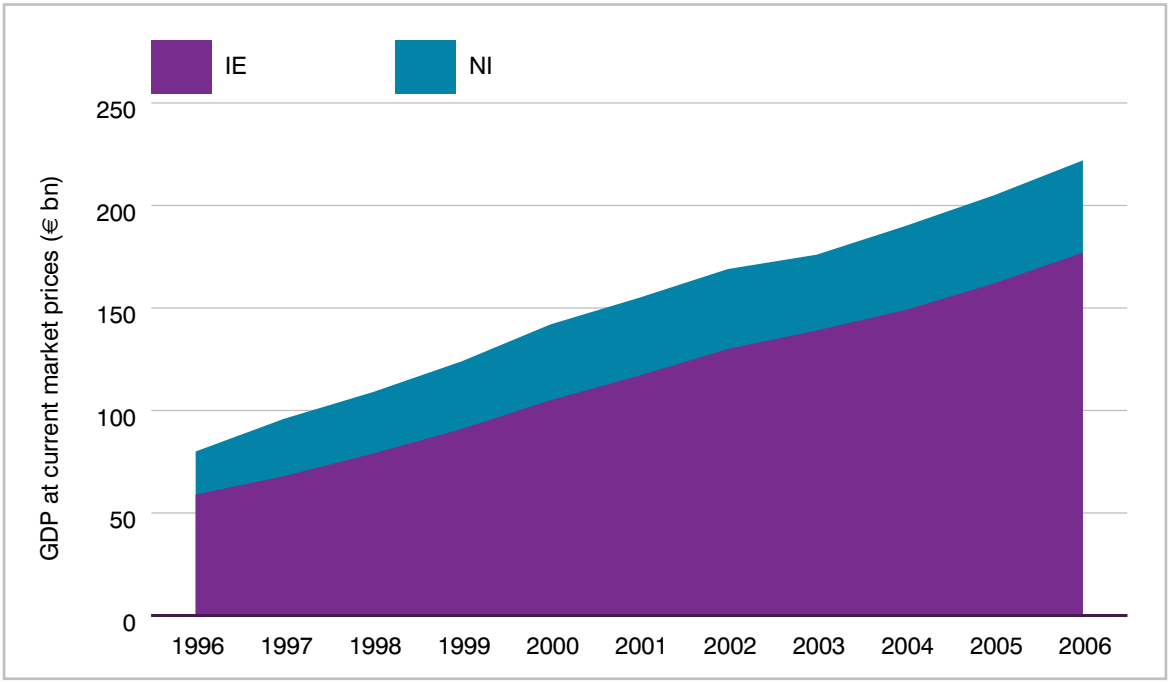
For all international comparator countries, with the exception of China, the proportion of people aged over 45 years is higher than for the Island economy (Table 2.7). The Island has one of the highest proportions of population aged 0-24, behind only China. This has important implications for the scale of replacement demand needs whereby workers retiring (and the skills they leave with) need to be replaced.

2.4.5 Output and Productivity

GDP[3] on the Island, in nominal terms, was US$279bn in 2006 with the southern economy considerably larger than the North's. Based on GDP and measured in common currency terms, the South's economy accounts for 80 per cent of total all-island GDP (Figure 2.14). Note gross national product (GNP) in the South which adjusts for net factor income from the rest of the world, is approximately 15 per cent less than GDP. This partly reflects the large outflow of expatriated profits from foreign-owned businesses located in the South. It is not possible to calculate GNP for NI as it does not have its own separate balance of payment accounts.

GDP has been growing across the Island for the last decade, although as Figure 2.13 shows, this growth has been at a declining rate. Growth on the Island has ranged from around 9 per cent in the mid to late 1990s to current levels of approximately 5 per cent. This growth has been predominantly led by growth in the South, with growth in the North peaking at around 4 per cent in the late 1990s compared to average recent growth in the South of over 6 per cent.

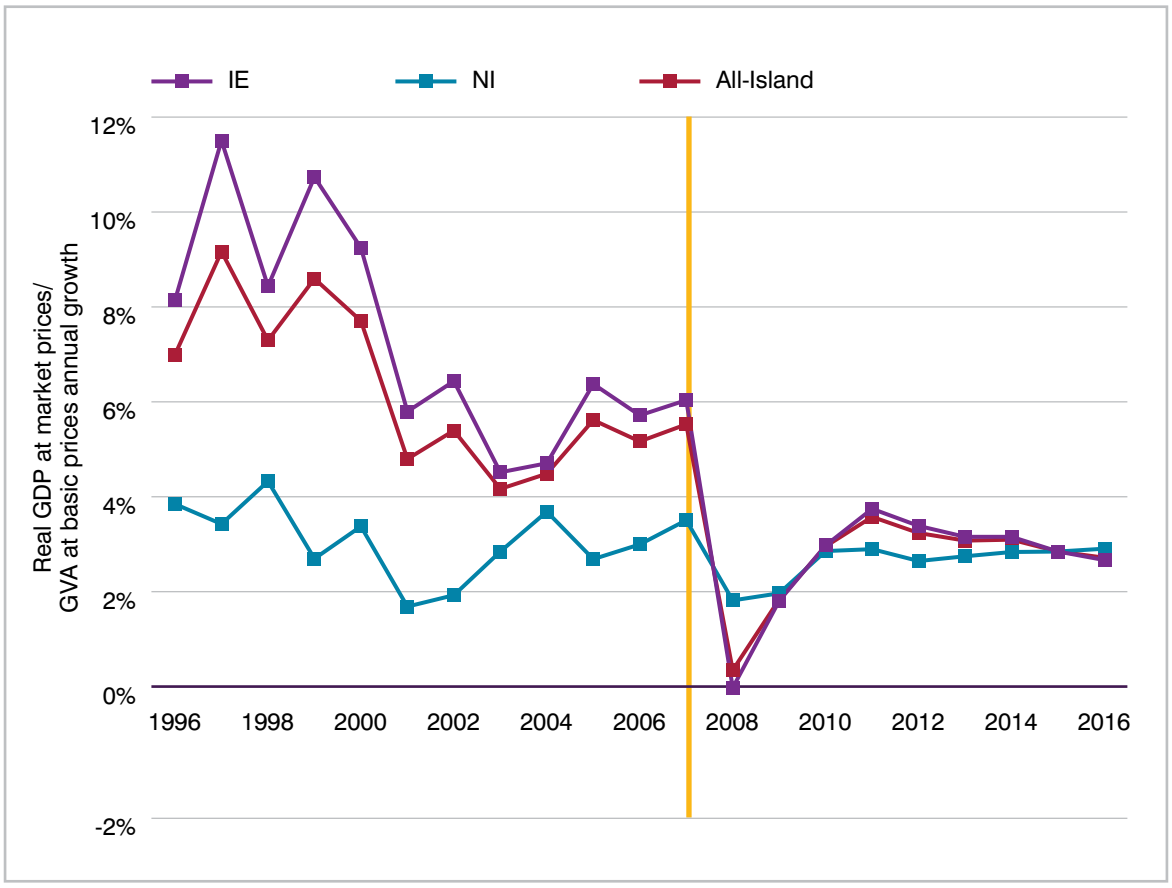
Figure 2.12: All-Island nominal GDP at market prices (€ billion)



Source: CSO, ONS Regional Accounts and Oxford Economics.

3 *Estimates of GDP at market prices for NI are calculated by following Eurostat s approach of using population shares to pro rata the value of national indirect taxes minus subsidies across the 12 UK regions.*

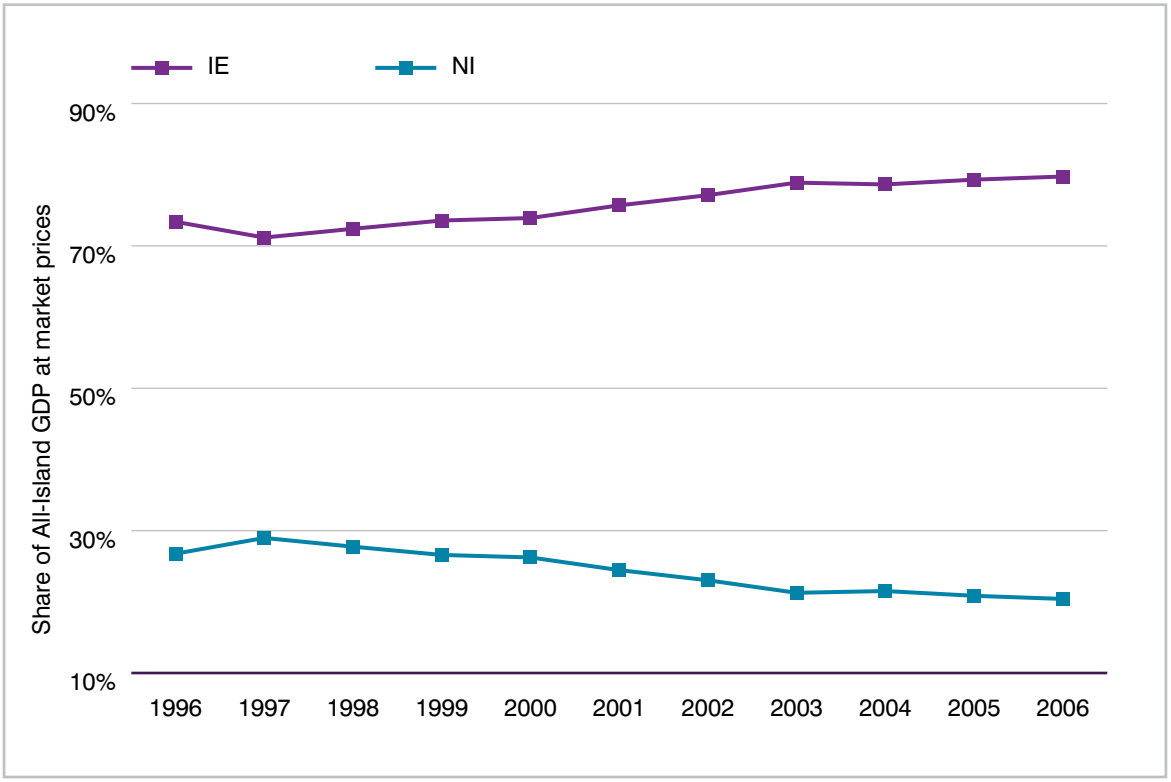
Figure 2.13: All-Island economic growth rates (real % per annum) (latest Oxford Economics forecasts)



Source: CSO, ONS Regional Accounts and Oxford Economics.

Note: Economic growth rates are annual growth in constant market price GDP (Ireland) and constant basic price GVA (Northern Ireland) in home currency. All-Island growth is a weighted average of Ireland and NI growth. NI constant price series calculated by Oxford Economics using UK industry deflators. Forecasts are from Oxford Economics.

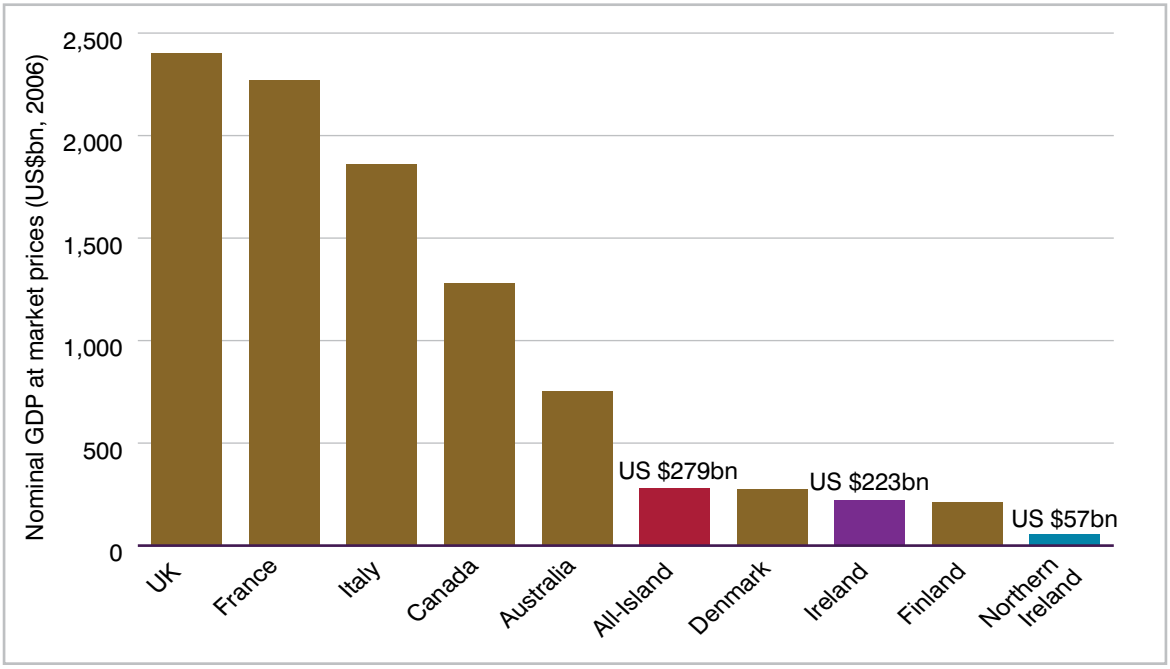
Figure 2.14: All-Island nominal GDP at market prices (North-South share of All-Island total)



Source: CSO, ONS Regional Accounts and Oxford Economics.

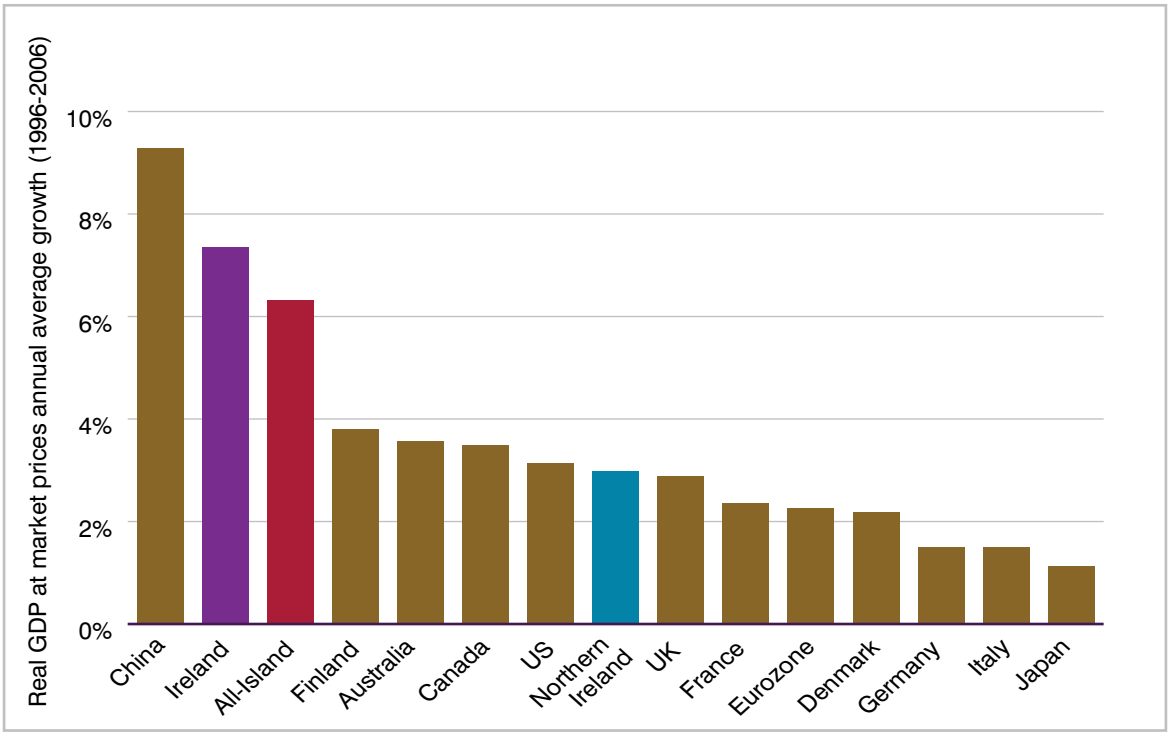
The Island economy is roughly equal in size to Denmark's economy and slightly larger than Finland's (Figure 2.15). Average growth rates between 1996 and 2006 were second only to China, reiterating the success of the all-island economy (Figure 2.16). Annual GDP growth in the South over the past decade was however more than twice the rate of growth in Northern Ireland (Table 2.8). Growth is expected to be lower in the coming decade with challenging economic conditions ahead in 2008 and 2009. In addition, growth across the Island is expected to be much more comparable over the decade ahead at between 2.7-3.0 per cent on average per annum.

Figure 2.15: International comparison of economic size ($, nominal)



Source: CSO, ONS Regional Accounts, Haver Analytics and Oxford Economics.

Figure 2.16: International comparison of recent economic growth rates (real, annual average 1996-2006)



Source: CSO, ONS Regional Accounts, Oxford Economics and Haver Analytics.

Table 2.8: International comparison of recent economic growth rates and forecasts

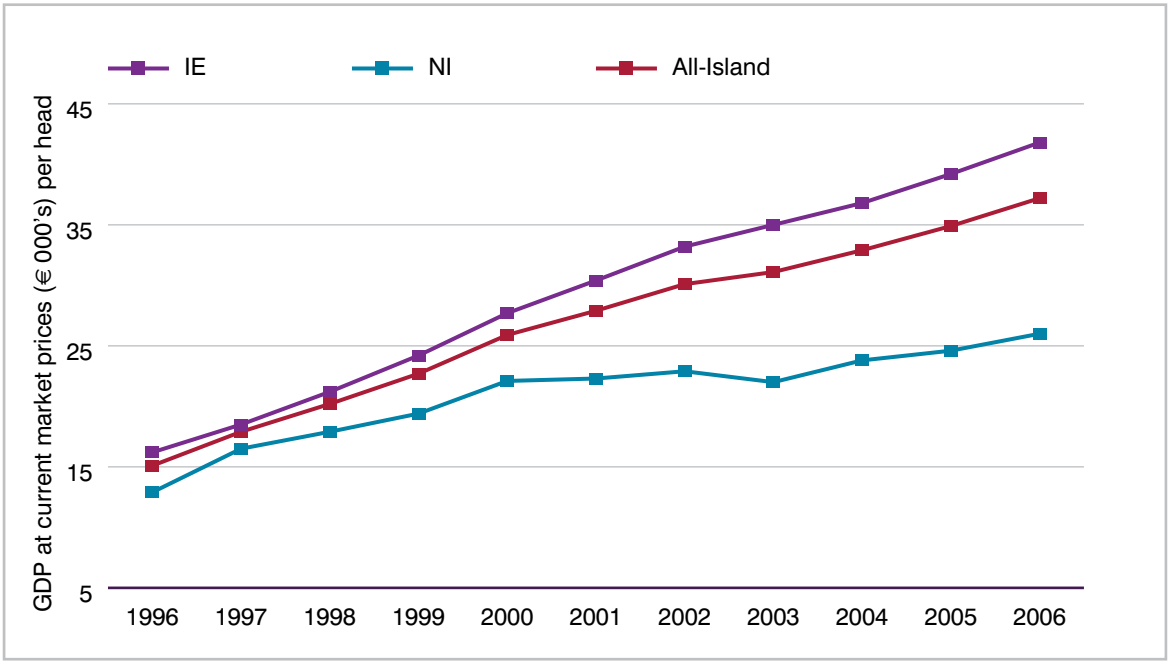
	1996-2006	2006-2016	Change pp
Australia	3.5%	3.5%	0.0
Canada	3.5%	2.7%	-0.8
China	9.3%	9.2%	-0.1
Denmark	2.2%	2.0%	-0.2
Eurozone	2.2%	1.9%	-0.3
Finland	3.8%	2.7%	-1.1
France	2.3%	1.9%	-0.4
Germany	1.5%	1.6%	0.2
Italy	1.5%	1.1%	-0.3
Japan	1.1%	1.9%	0.8
UK	2.8%	2.6%	-0.3
US	3.1%	2.6%	-0.5
Ireland	**7.3%**	**3.0%**	**-4.4**
Northern Ireland	**3.0%**	**2.7%**	**-0.3**
All-Island	**6.3%**	**2.9%**	**-3.4**
Ireland GNP (ESRI)	–	4.0%	–

Source: CSO, ONS Regional Accounts, Oxford Economics and Haver Analytics.

Note: Economic growth rates are annual growth in constant market price GDP per head except for NI (constant basic price GVA per head) and in home currency. Forecasts from Oxford Economics. ESRI 10-year forecast calculated as an average of 2005-2010 and 2010-2015 forecasts presented in the May 2008 MTR.

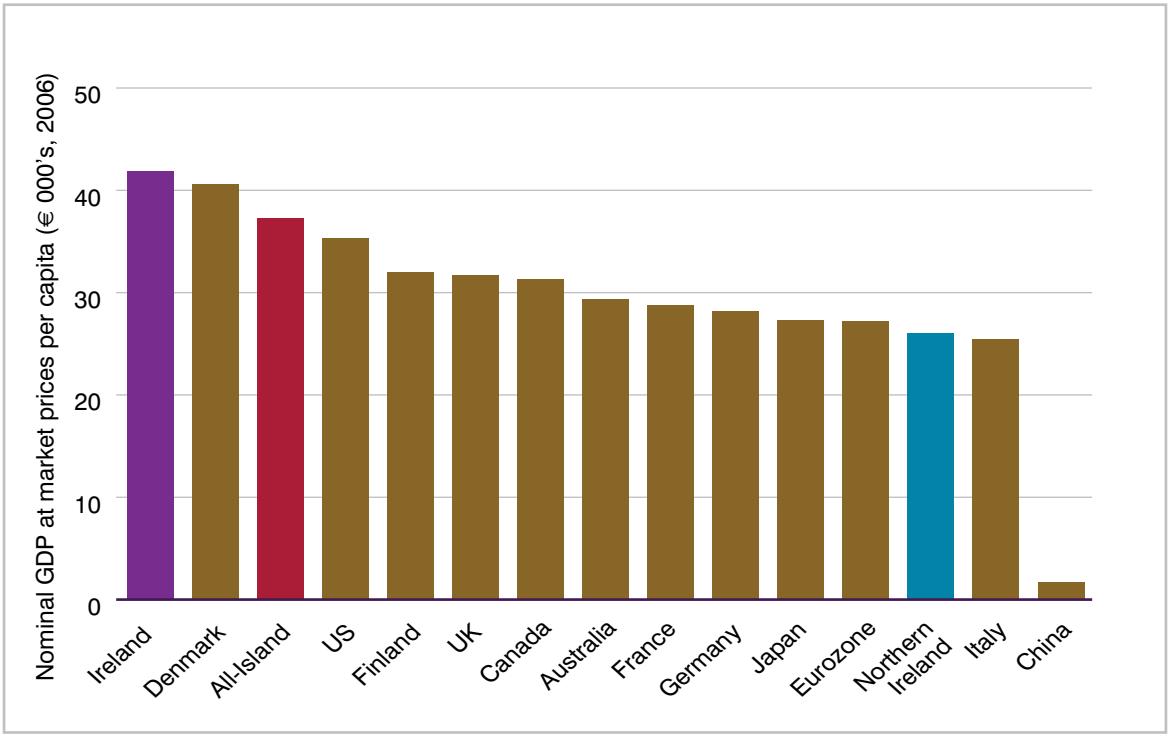
Turning now to productivity in Figures 2.17-2.18, there are North-South differences in productivity growth rates and levels. GDP per head has been on a strong upward path over the past decade in the South, with real productivity growth averaging over 5 per cent per annum (Figure 2.19). This is twice the rate of NI, whose rate of productivity growth is more comparable to the UK and Canada. The strong growth in the South means that GDP per head for the all-island economy is only behind Denmark of the international comparator countries at close to €40,000 (Figure 2.18). The difference in GDP per head between the North and South is approximately €15,000 in 2006. Note this difference in common currency terms is dependent on the prevailing exchange rate at the time and would be lower if PPP and net factor income adjustments were made.

Figure 2.17: All-Island trends in GDP per head



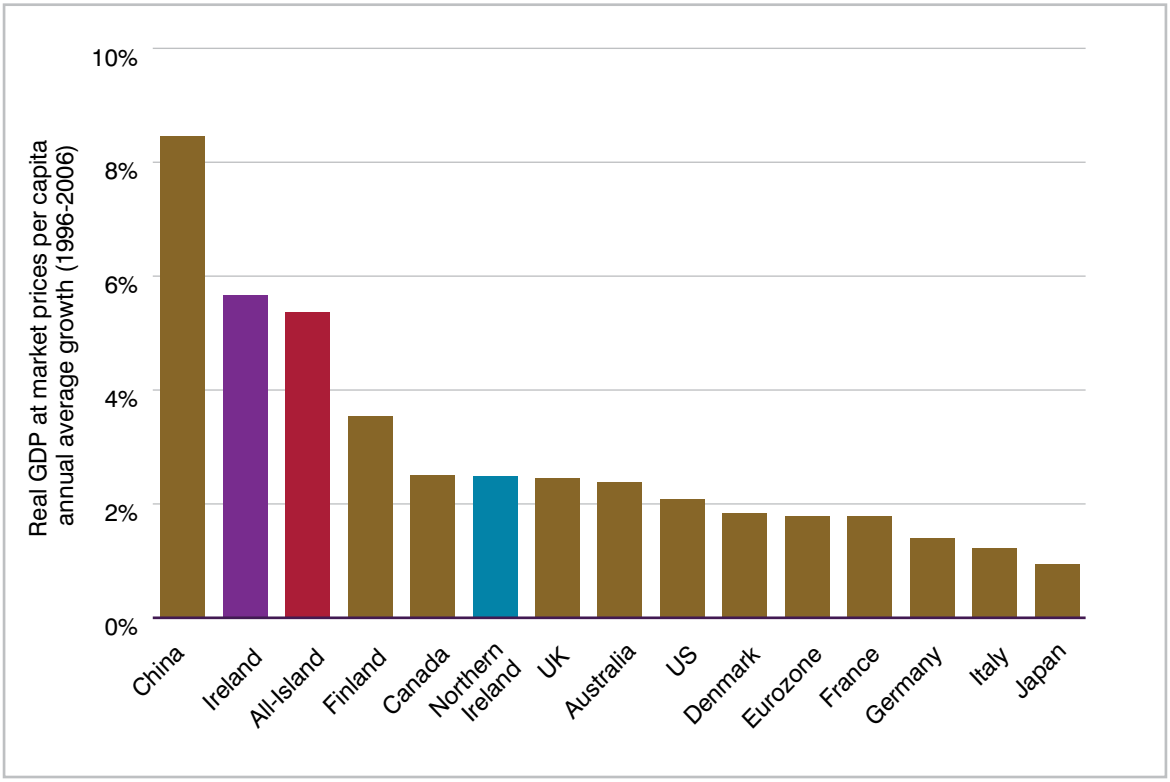
Source: CSO, ONS Regional Accounts, NISRA and Oxford Economics.

Figure 2.18: International comparison of nominal GDP per head



Source: CSO, ONS Regional Accounts, NISRA, Oxford Economics and Haver Analytics.

Figure 2.19: International comparison of recent real GDP per head growth



Source: CSO, ONS Regional Accounts, NISRA, Oxford Economics and Haver Analytics.

Note: Growth rates are annual growth in constant market price GDP per head except for NI (constant basic price GVA per head) and in home currency.

Table 2.9: International comparison of recent real GDP per head growth and forecasts

	1996-2006	2006-2016	Change pp
Australia	2.4%	2.5%	0.2
Canada	2.5%	1.8%	-0.6
China	8.4%	8.6%	0.2
Denmark	1.8%	1.8%	0.0
Eurozone	1.8%	1.7%	-0.1
Finland	3.5%	2.5%	-1.0
France	1.8%	1.5%	-0.3
Germany	1.4%	1.6%	0.2
Italy	1.2%	1.1%	-0.1
Japan	0.9%	2.1%	1.1
UK	2.4%	1.9%	-0.5
US	2.1%	1.8%	-0.3
Ireland	**5.7%**	**1.7%**	**-3.9**
Northern Ireland	**2.5%**	**2.1%**	**-0.4**
All-Island	**5.3%**	**1.8%**	**-3.6**
Ireland GNP (ESRI)	–	2.5%	–

Source: CSO, ONS Regional Accounts, NISRA, Oxford Economics and Haver Analytics.

Note: Growth rates are annual growth in constant market price GDP per head except for NI (constant basic price GVA per head) and in home currency. Forecasts from Oxford Economics. ESRI 10-year forecast calculated as an average of 2005-2010 and 2010-2015 forecasts presented in the May 2008 MTR.

With its improving skills base, rate of corporation tax and infrastructure offering, the South has attracted high levels of FDI over the past decade. Relative to the choice of international comparators and measured as a share of GDP, Ireland has attracted the highest level of FDI with only Denmark coming close in relative terms (Table 2,10). This FDI has tended to be in high value added sectors such as pharmaceuticals, software and international financial services, which has contributed significantly to the South's productivity growth and increased demand for high level qualifications.

No comparable FDI data exists for NI as it does not have its own set of balance of payment accounts. Though for context only and bearing in mind that this figure cannot be compared to the annual average of US$9bn below for Ireland, Invest NI's 2005/06 Annual Report highlights that "sponsors of the 14 new foreign direct investment (FDI) projects secured will invest nearly £155 million in the local economy". This suggests that FDI into NI is significantly below levels in the South.

Table 2.10: International comparison of FDI inflows

	FDI inflows (US$bn annual average, 1997-2006 inclusive)	FDI inflows % market price GDP in US$ (2006)
Australia	9	1.2%
Canada	28	2.2%
China	53	2.0%
Denmark	9	3.3%
Finland	5	2.6%
France	48	2.1%
Germany	47	1.6%
Italy	15	0.8%
Japan	5	0.1%
UK	80	3.3%
US	157	1.2%
Ireland	**9**	**3.9%**
Northern Ireland	**na**	**na**
All-Island	**na**	**na**

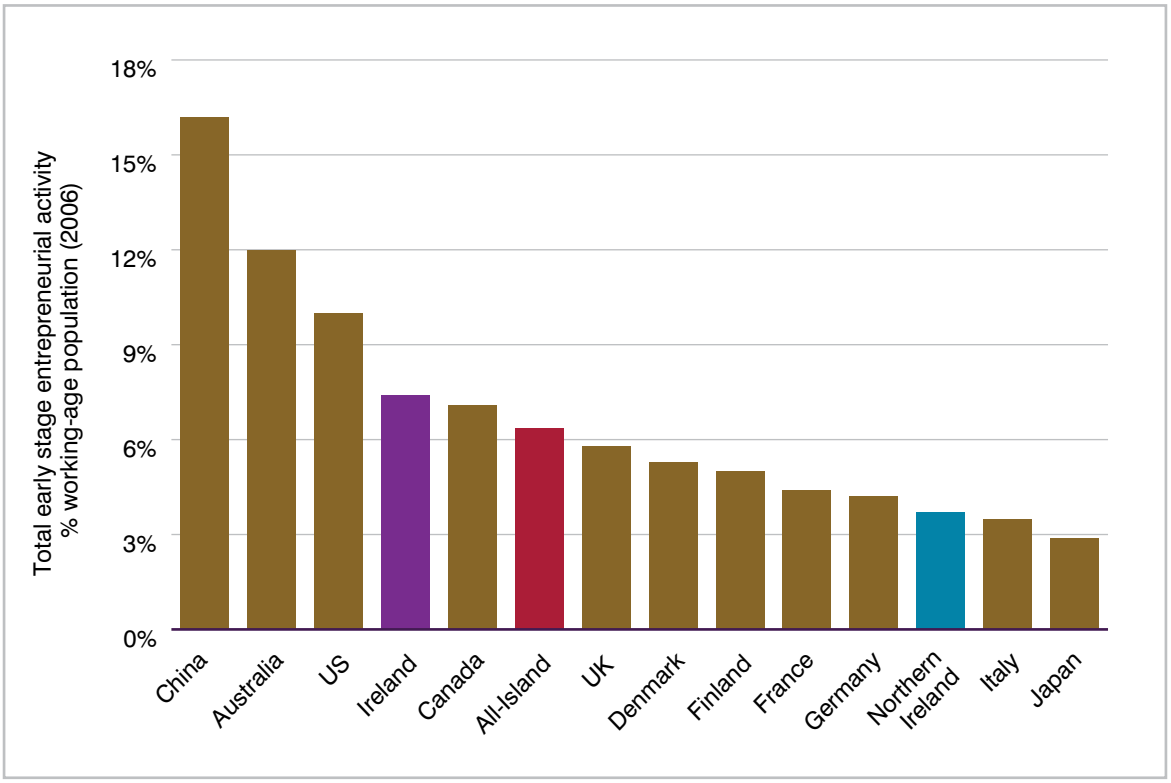
Source: UNCTAD, CSO and Haver Analytic.

2.4.6 Enterprise and Innovation

The Global Entrepreneurship Monitor (GEM) 2006 recognises the South as one of the most entrepreneurial countries in the EU but indicates that entrepreneurial activity is lower than world leaders such as the US. The GEM research also indicates a lower level of entrepreneurial activity in NI (Figure 2.20).

This suggested high level of entrepreneurial activity in Ireland is borne out by the large increase in VAT registered businesses in the South over the last decade (Figure 2.21) and the fact that registrations per annum are the equivalent of just over 10 per cent of total businesses (Figure 2.22). Note North-South VAT business registration data cannot be directly compared due to differences in VAT thresholds.

Figure 2.20: International comparison of early stage entrepreneurial activity



Source: Global Enterprise Monitor (GEM).

Note: All-Island total early stage entrepreneurial activity rate calculated as the weighted average of Ireland and NI rates using adult population shares.

Figure 2.21: All-Island VAT registered business stock

Source: Irish Revenue Commissioners, BERR, CSO, NISRA and, Oxford Economics.

Note: See Annex A which explains why North-South VAT registration data are not directly comparable due to differences in VAT thresholds.

Figure 2.22: All-Island VAT Registrations and De-Registrations as a percentage of total VAT registered business

Source: Irish Revenue Commissioners and BERR.

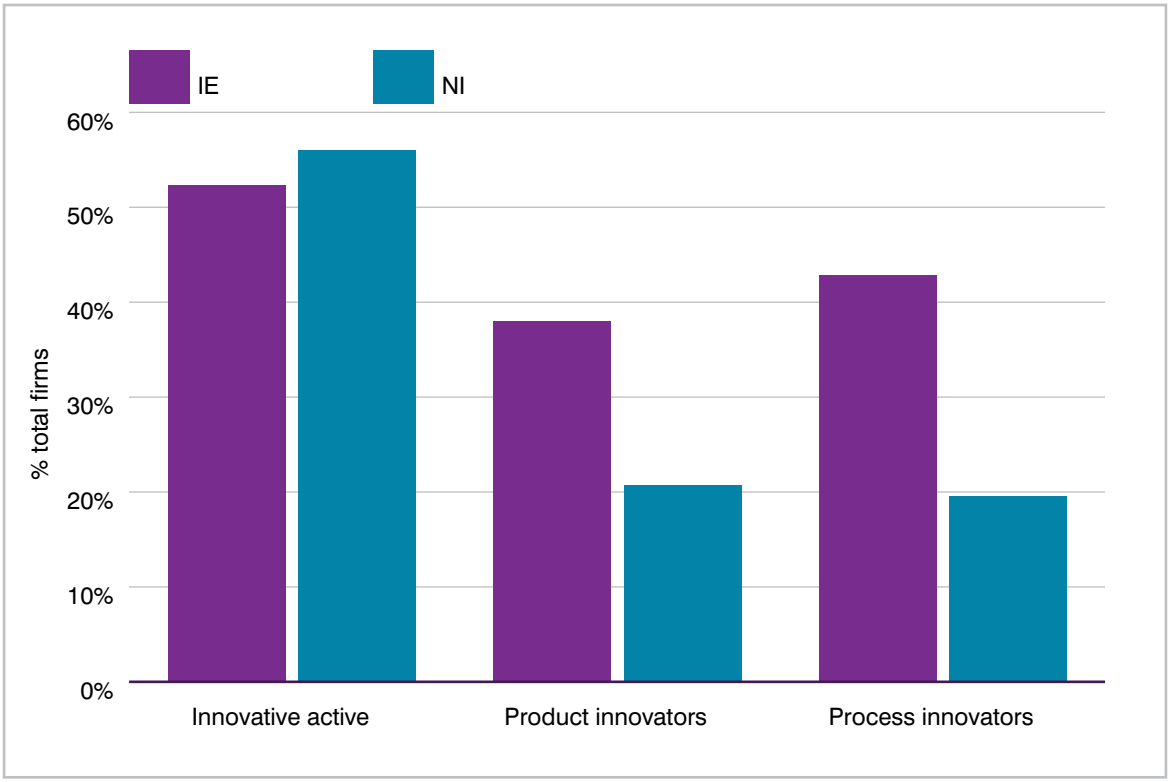
Note: See note for Figure 2.21.

Innovation is a vital ingredient in raising the productivity, competitiveness and growth potential of modern economies. Figure 2.23 and Table 2.11 present innovative activity in the South and North and place it in an international context.

The proportion of firms with innovative activities gives a measure of firms' propensity to engage in innovation activity and includes innovative initiatives that were incomplete or abandoned. The proportion of firms that are innovative active is marginally higher in NI than in the South (Figure 2.23).

Product and process innovators are firms that introduced significantly improved or new processes. The statistics show that the proportion of 'product and process innovator' firms is significantly higher in the South. In an international context, the South compares favourably, only lagging behind Germany in the three indicators while Northern Ireland is broadly comparable with the UK, France and Italy.

Figure 2.23: All-Island innovation (2002-2004)



Source: Forfás 4th CIS and DETI Innovation Survey 2005.

Table 2.11: International comparison of innovation (1998-2000 unless stated)[4]

	% enterprises with innovation activities	% enterprises with product innovations	% enterprises with process innovations
Denmark	44%	37%	26%
Finland	45%	35%	24%
France	41%	29%	21%
Germany	61%	42%	34%
Italy	36%	25%	26%
UK	36%	21%	17%
Ireland (2002-2004)	**52%**	**38%**	**43%**
Northern Ireland (2002-2004)	**56%**	**21%**	**19%**

Source: Forfás 4th CIS, DETI Innovation Survey 2005 and DTI.

2.5 Summary

The key points to note on the all-island economy from this chapter can be summarised as:

- The global (and indeed all-island) economy is working its way through uncertain times with below trend growth (and possible recession) in 2008 and 2009. The medium term picture does however suggest a reasonably early return to robust growth though most economic forecasters are not predicting a return to 'tiger' rates in the South. The gap in North-South economic growth rates is forecast to be considerably less in the decade ahead.

- Population on the Island has increased from 5.3m to 6.0m over the past decade. This growth of 1.2 per cent per annum was three times faster than population growth in the Eurozone. Both North and South became net inward migration economies in recent years. Population is expected to continue growing over the next decade.

- The all-island economy has been growing strongly over the last decade, with economic growth rates ranging from 9 per cent during the 'Celtic tiger' years to current real growth of 5-6 per cent (2007). Growth over the next decade is expected to be lower than in the recent past at around 3.0 per cent per annum. While this is less than half the average annual growth of recent years, it is still one percentage point faster than forecast for the Eurozone economy.

- Productivity (GDP per head) on the Island compares favourably with international comparators, well ahead of both the Eurozone and UK averages at close to €40,000 per head. There is however a large North-South productivity gap.

4 *Caveat: Survey response rates to the various innovation surveys across EU countries varied considerably. Results are based on responses from a sample of firms – the sample is chosen to be representative of the population as a whole, but there is still an element of uncertainty attached to the estimates not accounted for in the presentation. As a result, it is likely that perceived small differences in results between countries are not statistically significant. There are also some methodological differences across countries. Not all countries use an official business register to draw their sample and different methods are applied to treat missing values. Figures are weighted to be representative of the population of firms from which they were selected. Each firm's response is given an equal weight, and hence overall figures will be heavily influenced by SME responses.*

- Based on available evidence, the South has attracted significantly more FDI and according to the information presented, the South has higher levels of entrepreneurial activity and product and process innovation.

The analysis has also highlighted some key similarities and differences between the North and South economies. These are presented in the box below.

North-South similarities/differences in demography, economic growth, productivity, enterprise and innovation

North-South similarities	North-South differences
■ Both have become net inward migration economies. ■ Up until recently, both NI and the South enjoyed a long period of sustained unbroken economic growth. ■ Population growth across both jurisdictions expected to continue. ■ Forecast GDP/GVA growth over the next decade is expected to be more similar in both jurisdictions at 3.0 per cent per annum in the South and 2.7 per cent in NI compared to the last decade.	■ Population growth was one percentage point faster per annum in the South in the last decade. ■ The South has a higher working-age population share. ■ Annual GDP growth in the South over the past decade was more than twice the rate of growth in Northern Ireland. ■ Productivity (GDP per head) has recorded notably stronger growth in the South and having been at a similar level in the mid-1990s, productivity in the South is now 60 per cent higher than in NI (this however does not adjust for expatriated profits or differences in purchasing power which otherwise would be important adjustments). ■ Entrepreneurship levels in the South are more than twice the rate in the North according to the GEM survey. ■ Based on available evidence, the South has attracted significantly more FDI and has higher levels of product and process innovation.

3 Labour Market and Skills Context

3.1 Introduction

Similar to the previous chapter, this chapter's primary purpose is as a 'scene setter' for the skill demand chapter next. It covers:

- North-South and all-island total employment trends and international comparisons of recent employment growth;
- trends in working-age employment rates, unemployment and rates of economic inactivity;
- North-South and all-island trends in the highest education attainment/qualification level of the working-age population (based on the ISCED classification framework used in the OECD 'Education at a glance' reports) and international comparisons of skill levels;
- North-South comparisons of wages by sector and starting graduate salaries;
- North-South and international comparisons of PISA scores for reading, maths and science; and
- comparison of the most recent highest educational attainment and destinations of school leavers (the data only part-matches so aggregated all-island data are not presented on this).

3.2 All-Island Facts

As expected given the impressive growth record described in the previous chapter, the all-island economy has also registered some notable labour market success. Employment levels have risen North and South and despite strong growth in working-age population, partly fuelled by migration, the all-island working-age employment rate has been rising and is approaching the Lisbon Agenda target rate. Unemployment has also fallen sharply though has recently risen. Much credit for this success must go to the improving skills profile of the Island's working-age population. The number and share of university qualified persons has risen rapidly. Upskilling has two effects that boost employment levels. First on the demand-side, upskilling attracts FDI and is correlated with higher entrepreneurial activity as explained in the introduction chapter. Secondly, on the supply-side upskilling at all levels increases participation in the labour market.

Economic Activity Status

- 2.9m persons in employment in 2007, up from 2.0m in 1996.
- Recent rate of employment growth faster than all international comparators – more than three times the rate of employment growth in the UK.
- Just under three-quarters of all-island jobs are in the South in 2007 (2.1m).
- Working-age employment rate of 68 per cent in 2007, close to the Lisbon Agenda 2010 target of 70 per cent.
- Unemployment rate halved from 8.0 per cent in 1996 to 4.3 per cent in Q2 2007. 126,000 persons were unemployed based on ILO definition in Q2 2007 though unemployment has increased sharply in 2008 in the South according to the monthly live register (QNHS) and to a lesser extent in the North in terms of claimant count data (NI).
- The number of economically inactive working-age persons was 1.1m in 2007 or 28 per cent of working-age population. Although the all-island inactivity rate has fallen, the stock has changed little since the mid 1990s (1.1m in 1996.)

Skills Stock

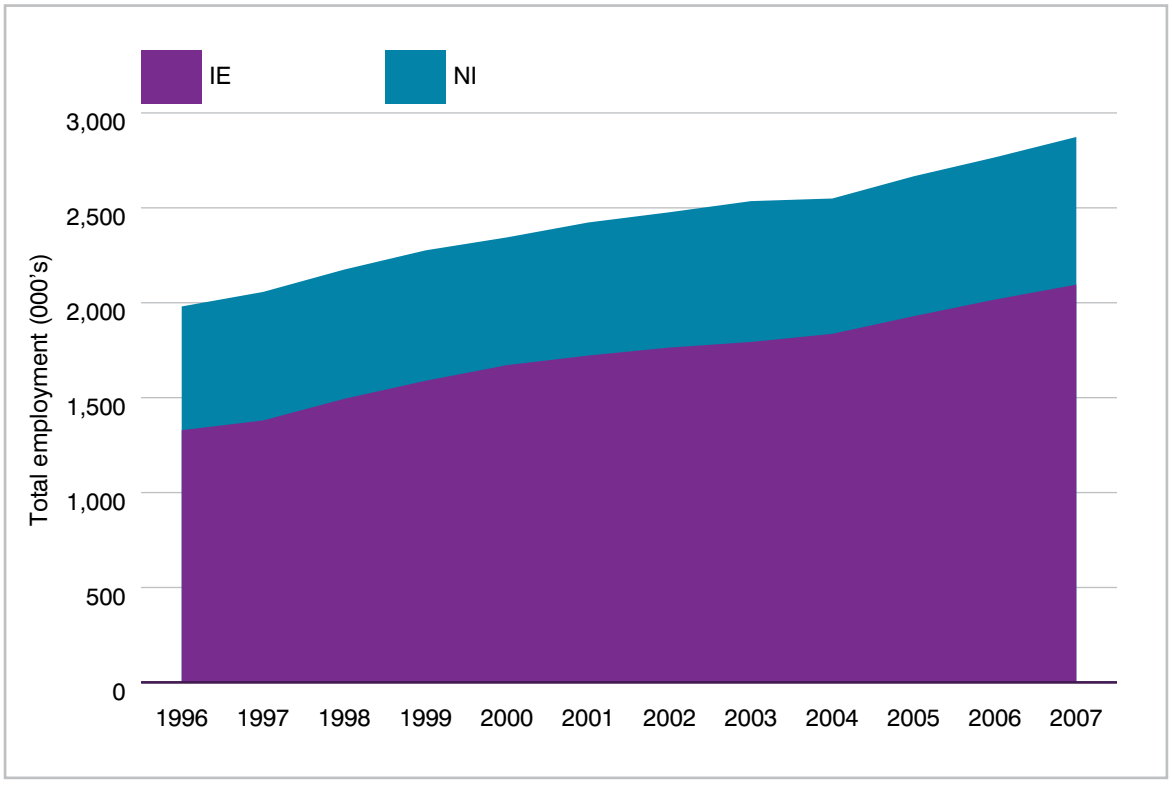
- Current working-age skills stock – 1.3m with low qualifications (31 per cent), 1.7m with medium qualifications (42 per cent) and 1.1m with higher qualifications (27 per cent).
- Share of working-age with low qualifications has fallen from 40 per cent in 1999 (1.4m).
- Share of working-age with third level qualifications is up from 18 per cent in 1999 (0.6m).
- In international terms the Island has a high share of working-age persons with low qualifications and a low – but significantly improving – share of third level qualified working-age persons.
- The Island's skill structure (share of third level qualified working-age persons) is improving faster than each of the international comparators presented in the report and qualifications amongst the Island's young working-age are on a par with international comparators.

3.3 Labour Market Trends

3.3.1 Employment

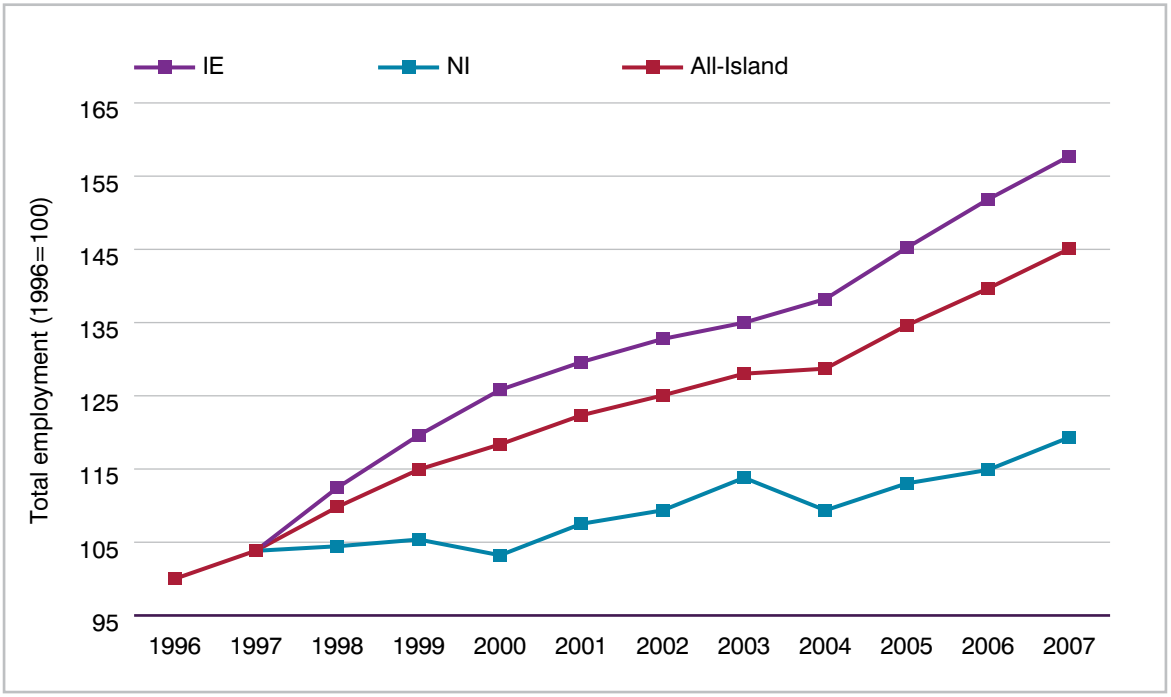
Both economies North and South have registered impressive rates of employment growth over the last decade (Figure 3.1). The number of persons employed in NI has grown by 19 per cent between 1996 and 2007 (Figure 3.2) according to the LFS (over 125,000 net additional people in work). The rate of employment growth in the South has been even more impressive (Figure 3.2) and not surprising given the 'tiger' rates of economic growth in the mid to late-90s presented in the economic context analysis. The number of persons employed in the South has increased by over 55 per cent between 1996 and 2007, equivalent to almost 770,000 more people in work on a net basis. Overall total all-island employment has increased from 2.0m in 1996 to 2.9m in 2007 (Figure 3.1). As a result of faster employment growth in the South, its share of total all-island employment has risen from two-thirds in the mid-1990s to just below three-quarters in the latest year's data (Figure 3.3).

Figure 3.1: All-Island total employment trends (absolute numbers)



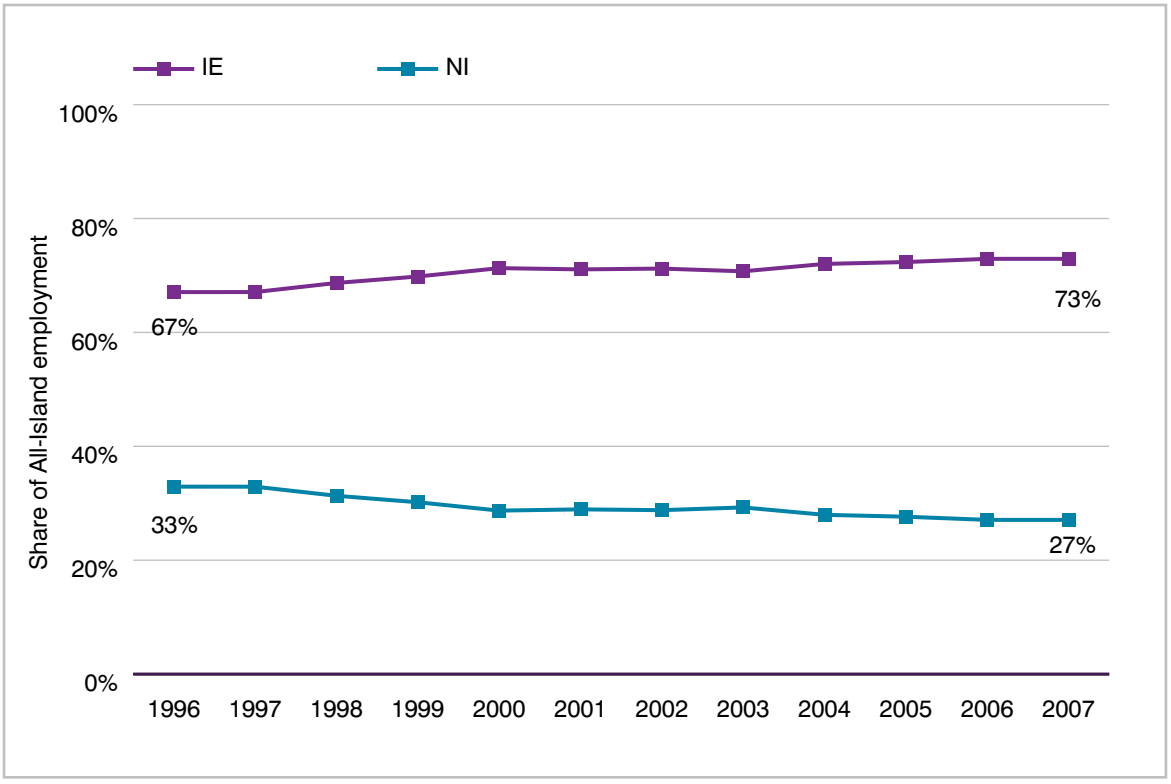
Source: CSO QNHS and DETI LFS.

Figure 3.2: All-Island total employment trends (index 1996=100)



Source: CSO QNHS and DETI LFS.

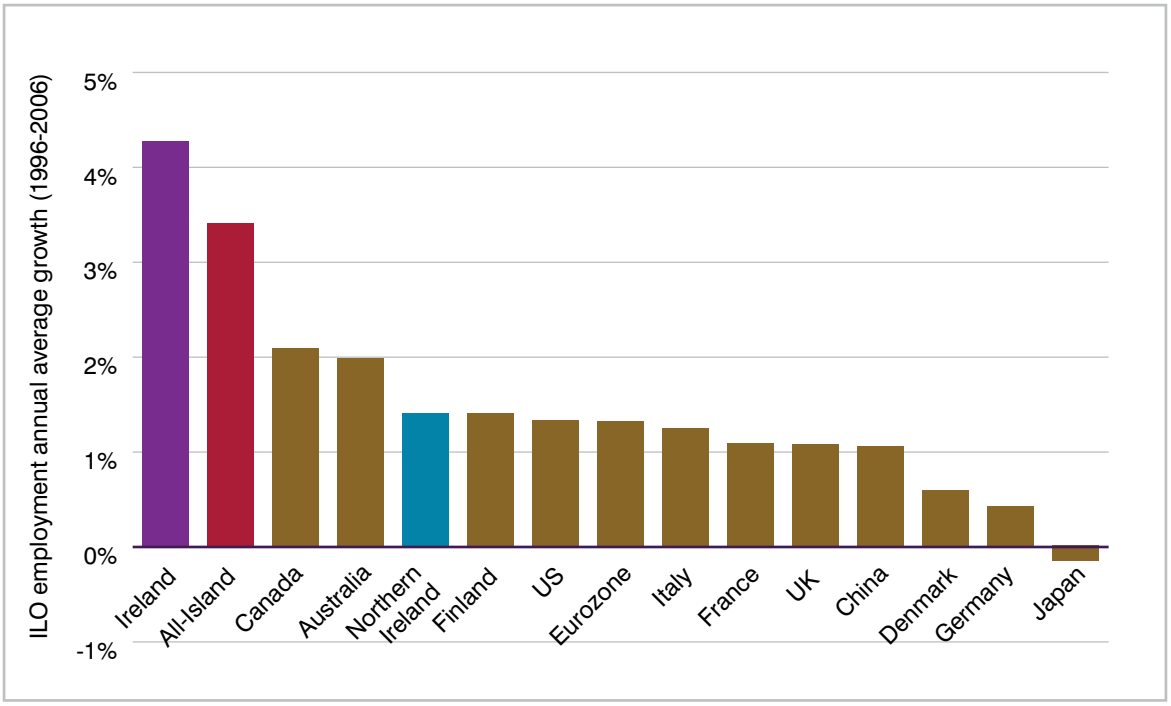
Figure 3.3: All-Island total employment trends (share of All-Island total)



Source: CSO QNHS and DETI LFS.

Internationally the all-island economy's employment growth performance, very much like its economic growth performance, has been amongst the highest of the selected choice of industrialised and emerging economies (Figure 3.4). NI's recent employment record, while somewhat overshadowed by that in the South, is nevertheless still more impressive than several other of the major European economies such as France and Germany.

Figure 3.4: International comparison of recent employment growth 1996-2006

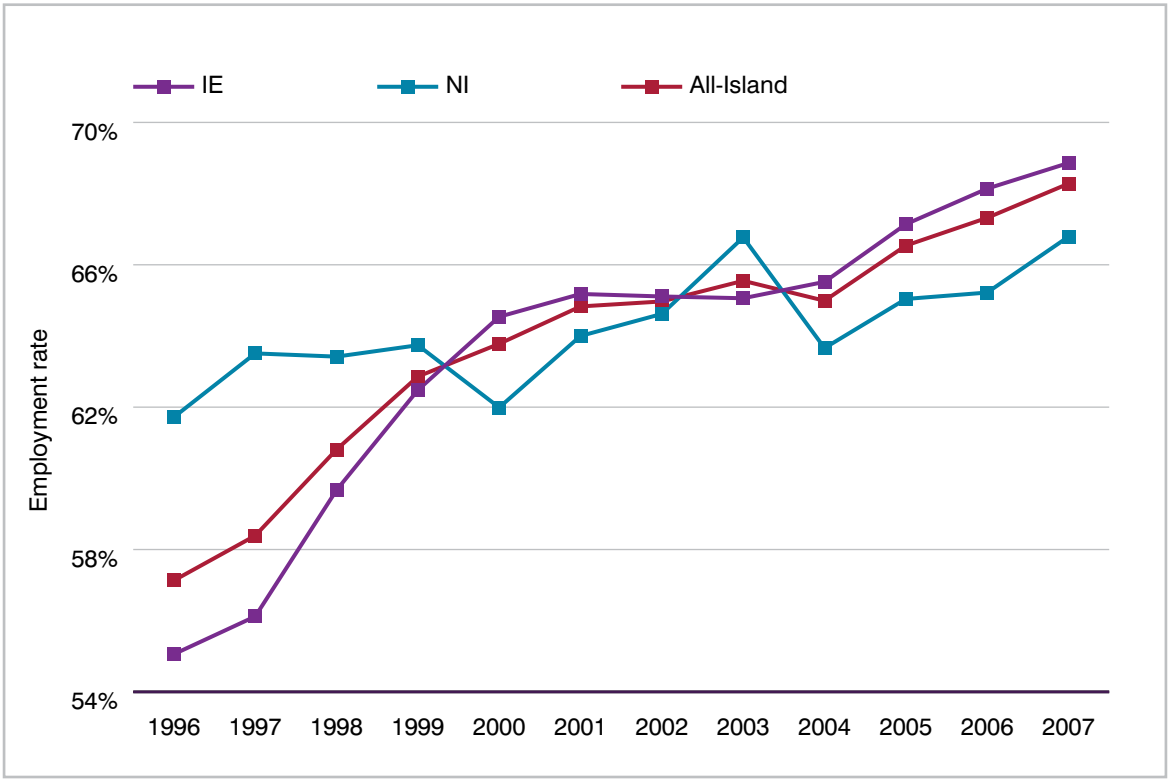


Source: CSO QNHS, DETI LFS and Haver Analytics.

Despite growing working-age populations, partly fuelled by migration, both the North and the South economies have created sufficient new jobs to get people into employment at a faster rate than the growth in working-age population. This has meant employment rates have risen across both jurisdictions and by implication for the all-island economy as a whole (Figure 3.5).

The uplift has been more striking for the South though it did start from a lower employment rate in the mid-1990s before rising above NI in 2004 (Figure 3.5). The all-island employment rate is now moving towards 70 per cent – the Lisbon Agenda target for 2010, which is significantly higher than countries such as Italy and Australia. Rising education attainment has helped here as rates of participation are positively correlated with attainment. Meeting the Lisbon Agenda target in the coming years will however depend on the extent and duration of the economic slowdown and the extent to which migrants may either remain, return home or move elsewhere. Migrants are a sizeable element of the employment rate denominator and if a large majority became unemployed and remained in the South and the North (or if non-migrant workers became unemployed), employment rates could fall in the short-term as there would be fewer jobs (numerator) for the same working-age population (denominator).

Figure 3.5: All-Island working-age employment rate trends 1996-2007



Source: CSO QNHS, DETI LFS and Oxford Economics.

Note: Working-age employment rate equal to working-age persons in employment divided by working-age population. Based on Eurostat working-age definition (15-64 male and female) for both jurisdictions. Annual data refers to Q2 for Ireland and spring for NI.

Table 3.1: International comparison of working-age employment rate trends

	1996	2007	Change pp
Australia	58%	62%	3.8
Denmark	74%	77%	3.3
Eurozone	58%	66%	7.5
Finland	62%	70%	7.9
France	60%	65%	5.1
Germany	64%	69%	5.3
Italy	51%	59%	7.5
UK	69%	71%	2.3
US	73%	72%	-0.9
Ireland	**55%**	**69%**	**13.8**
Northern Ireland	**62%**	**67%**	**5.1**
All-Island	**57%**	**68%**	**11.2**

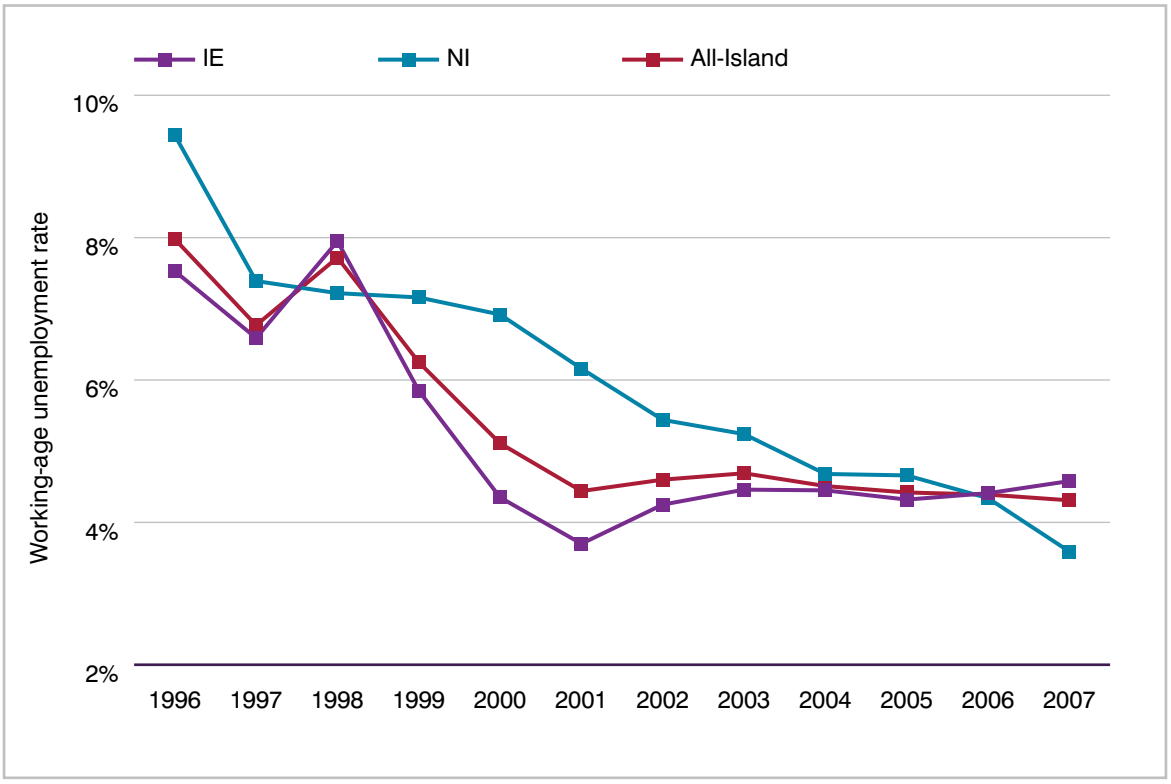
Source: CSO QNHS, DETI LFS and Eurostat.

Note: Working-age employment rate equal to working-age persons in employment divided by working-age population. Based on Eurostat working-age definition 15-64 male and female (including for Northern Ireland). US employment rate is for 2006.

3.3.2 Unemployment and Inactivity

The spill over of all-island economic growth has benefited not only in-coming migrants but also previously unemployed residents as evident by Figure 3.6 below. ILO unemployment rates North and likewise the South have followed a similar declining path and are now converging to historic low rates of less than 5 per cent. With only the UK, Japan and Denmark from the list of comparisons having an unemployment rate less than 4 per cent (Table 3.2), this relative 'tightness' in the labour market has important implications for future labour supply and wage inflation and helps somewhat to explain the skills and labour shortage issues identified in the next chapter.

Figure 3.6: All-Island ILO unemployment rate trends 1996-2007

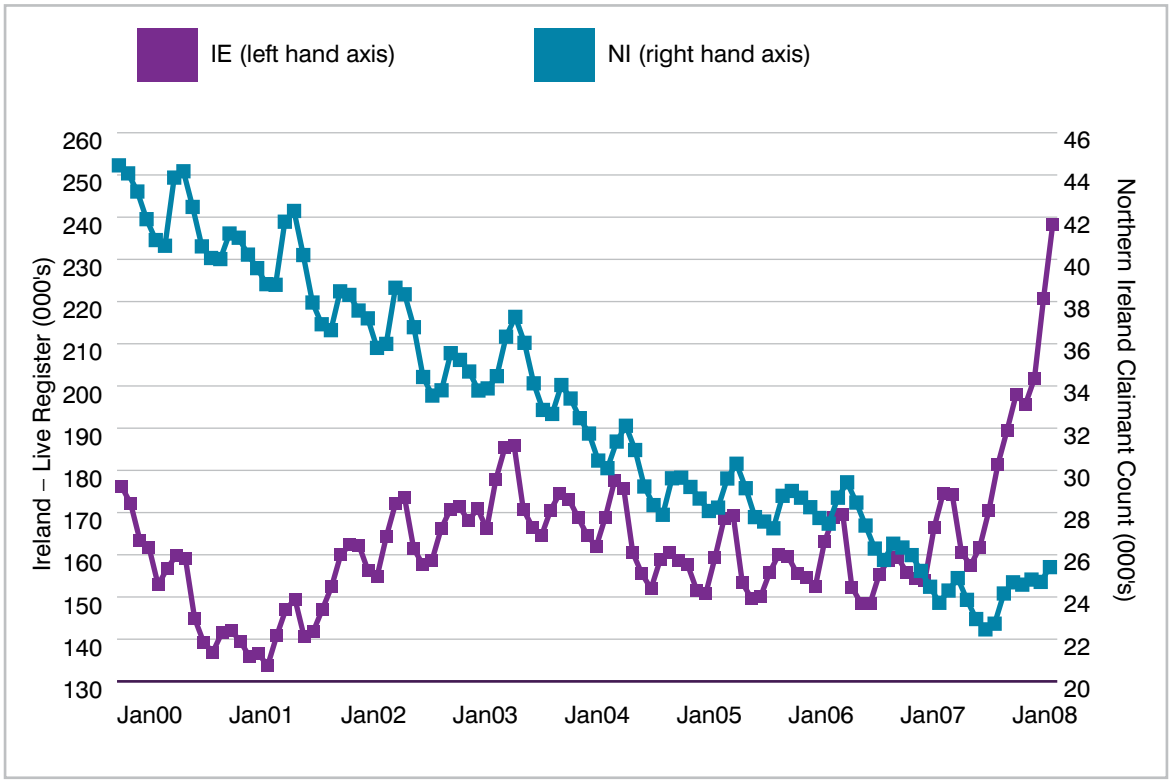


Source: CSO QNHS and DETI LFS.

Note: Working-age ILO unemployed divided by working-age economically active. ILO definition of unemployment – all persons above a specified age who during the reference period were: without work, that is, were not in paid employment or self employment during the reference period; currently available for work, that is, were available for paid employment or self-employment during the reference period; and seeking work, that is, had taken specific steps in a specified recent period to seek paid employment or self-employment. Based on Eurostat working-age definition (15-64 male and female) for both jurisdictions. Annual data refers to Q2 for Ireland and spring for NI.

The long-term trend of declining all-island unemployment has however reversed since the turn of 2008 in response to weakening economic conditions, in particular job losses in construction (Figure 3.7). The number claiming jobseekers' and other allowances in the South jumped by half in the space of just seven months, from 160,000 to 240,000, according to the live register. Note the live register[5] is not the official definition of unemployment in the South – the QNHS ILO unemployed figure is. While not as marked, the number claiming jobseekers' benefits in NI has risen by 3,000, up from 22,000 in November 2007.

Figure 3.7: All-Island recent unemployment trends (live register and claimant count)



Source: CSO and NOMIS.

Note: The live register is not designed to measure unemployment in the South. Unemployment in Ireland is measured by the QNHS.

5 *The live register includes part-time, seasonal and casual workers entitled to Jobseekers Benefit or Allowances.*

Table 3.2: International comparison of ILO unemployment rate trends

	1996	2007	Change pp
Australia	8.2%	4.4%	-3.9
Canada	9.6%	6.0%	-3.6
China	3.0%	4.0%	1.0
Denmark	8.9%	2.8%	-6.1
Eurozone	10.6%	7.4%	-3.2
Finland	14.6%	6.9%	-7.7
France	10.6%	7.9%	-2.6
Germany	10.4%	9.0%	-1.4
Italy	11.2%	6.2%	-5.0
Japan	3.4%	3.9%	0.5
UK	6.9%	2.7%	-4.2
US	5.4%	4.6%	-0.8
Ireland	**7.5%**	**4.6%**	**-3.0**
Northern Ireland	**9.4%**	**3.6%**	**-5.9**
All-Island	**8.0%**	**4.3%**	**-3.7**

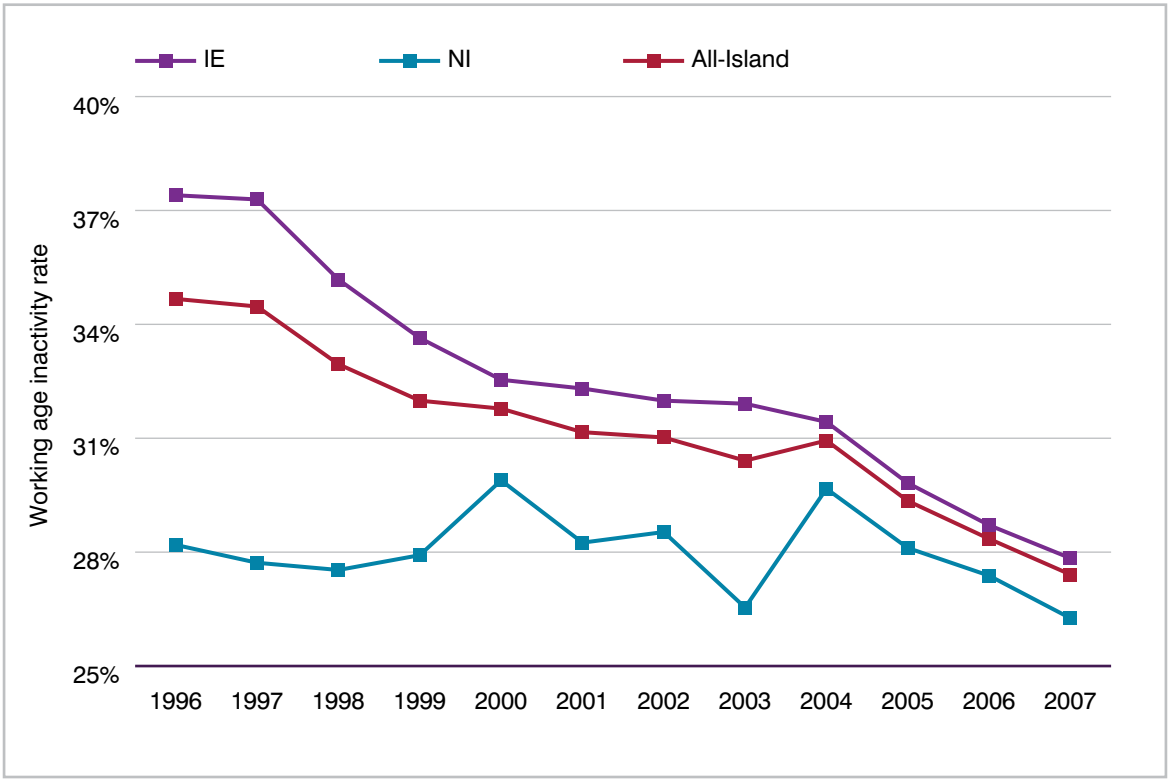
Source: CSO QNHS, DETI LFS and Haver Analytics.

Note: Working-age ILO unemployed divided by working-age economically active. Based on Eurostat working-age definition 15-64 male and female (including for Northern Ireland).

The one important difference in labour market trends between the North and the South has been the trends in rates of economic inactivity. The South's economic inactivity rate, which in the mid-1990s was almost 10 per cent higher, has fallen sharply and is now just above the NI rate – although the number of inactive in the South has fallen by much less than the stock of unemployment. Despite NI's impressive employment creation record, its rate of economic inactivity has remained relatively unchanged (Figure 3.8).

This may be explained by 'benefit trap' issues and the financial trade off between working and earning and not working and living off benefits, which may have been exacerbated by the recent record house prices and rental costs. Analysis later in the report shows that wages are higher in the South when measured in a common currency, indicating a potential for greater financial reward from working in the South. In addition the divergent trends in manufacturing employment – the South's decline has been less severe- has potentially left NI with a larger pool of labour with skills that do match the needs of many of the new service economy jobs.

Figure 3.8: All-Island economic inactivity rate trends



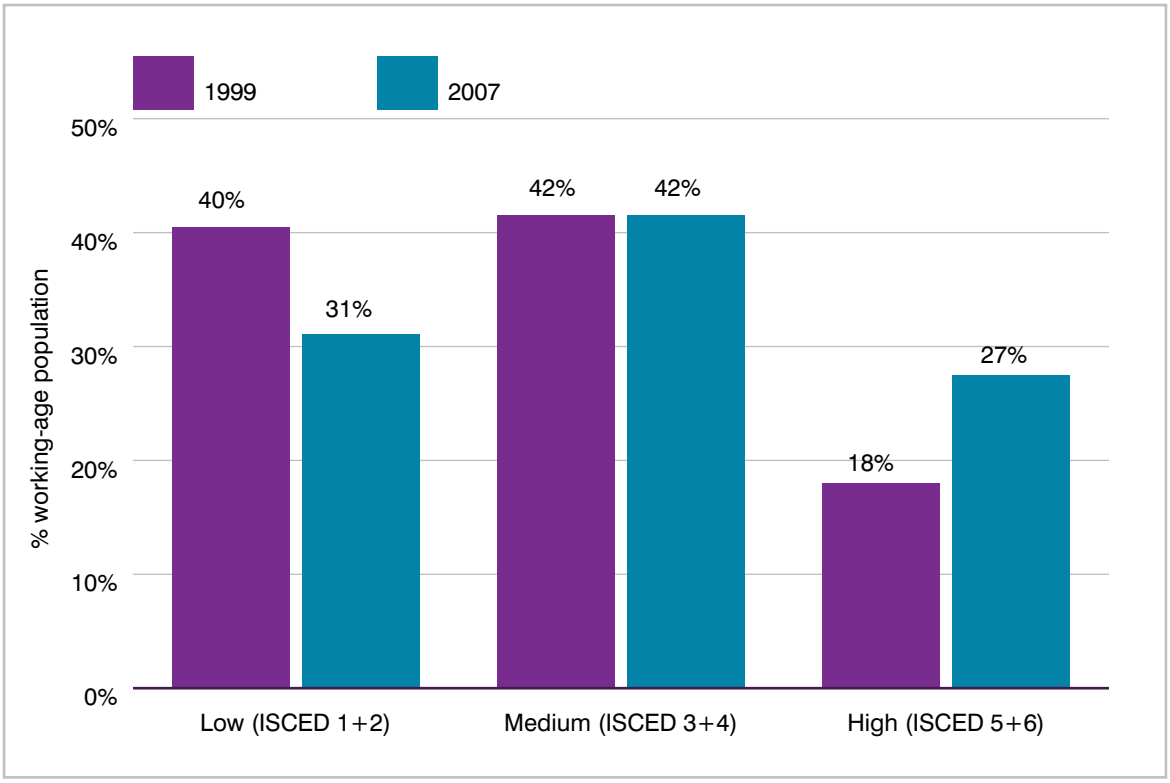
Source: CSO QNHS and DETI LFS.

Note: Working-age economically inactive divided by working-age population. NI inactivity rate based on official definition of working-age population (male 16-64; female 16-59). Including inactive females aged 60-64 for would, in the authors' view, over-estimate economic inactivity in NI. Annual data refers to Q2 for Ireland and spring for NI.

3.4 Skills Profile of Working-Age Population

As set out in the introduction, it has been possible to align QNHS and LFS education/qualification categories into the internationally recognised and comparable ISCED categories devised by UNESCO and used in the OECD 'Education at a Glance' reports. North-South and aggregated all-island skill profiles are presented next for the working-age population and in the next chapter for persons in employment. Figure 3.9 provides a summary of recent trends which are commentated on in more detail next.

Figure 3.9: All-Island working-age skill trends – share of total



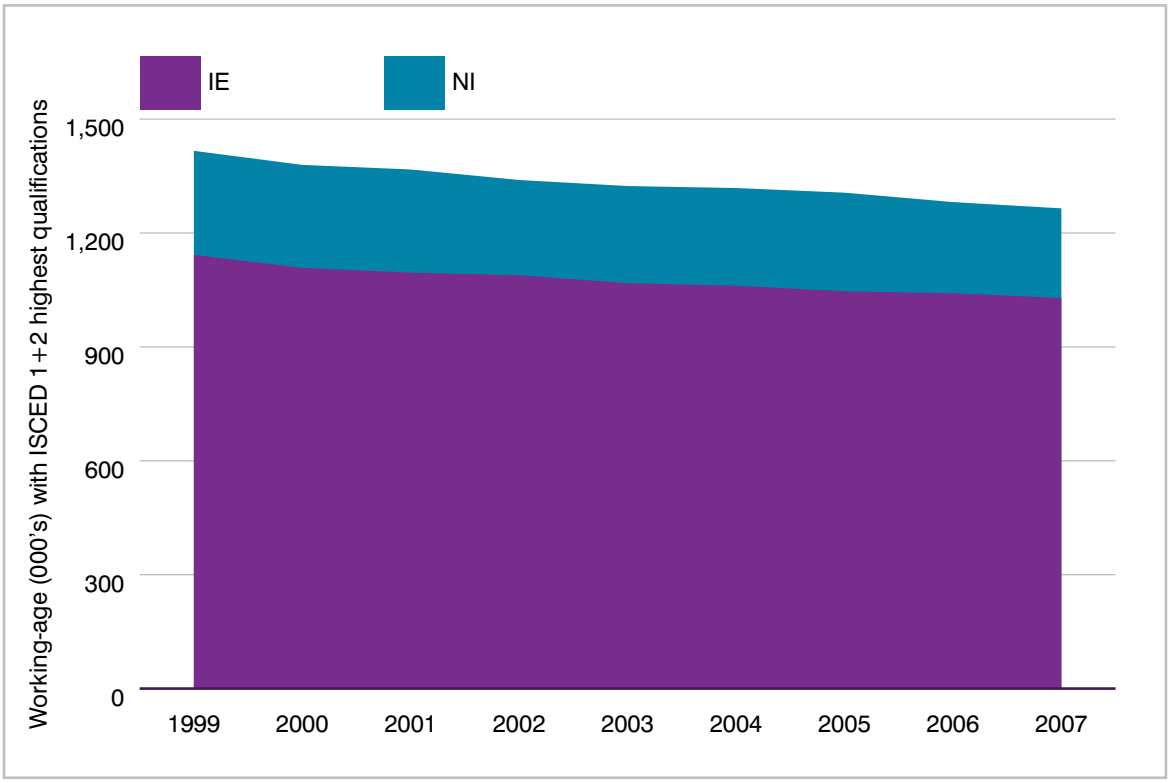
Source: CSO QNHS, DETI LFS and Oxford Economics.

Note: See Annex A for the approach to align of QNHS and LFS qualification/attainment levels to the UNESCO International Standard Classification of Education 1997 (ISCED 1977) and for the definition and description of ISCED categories. Annual data refers to Q2 for Ireland and spring for NI.

The number of working-age adults with low qualifications has fallen in absolute and share terms across both jurisdictions (Figure 3.10 and 3.11). The decline is even more dramatic when extending the analysis back further in time. This reflects the effect of older, poorly qualified age cohorts retiring and being replaced by a younger, better qualified cohort with rising rates of staying on at school and entering further and higher education.

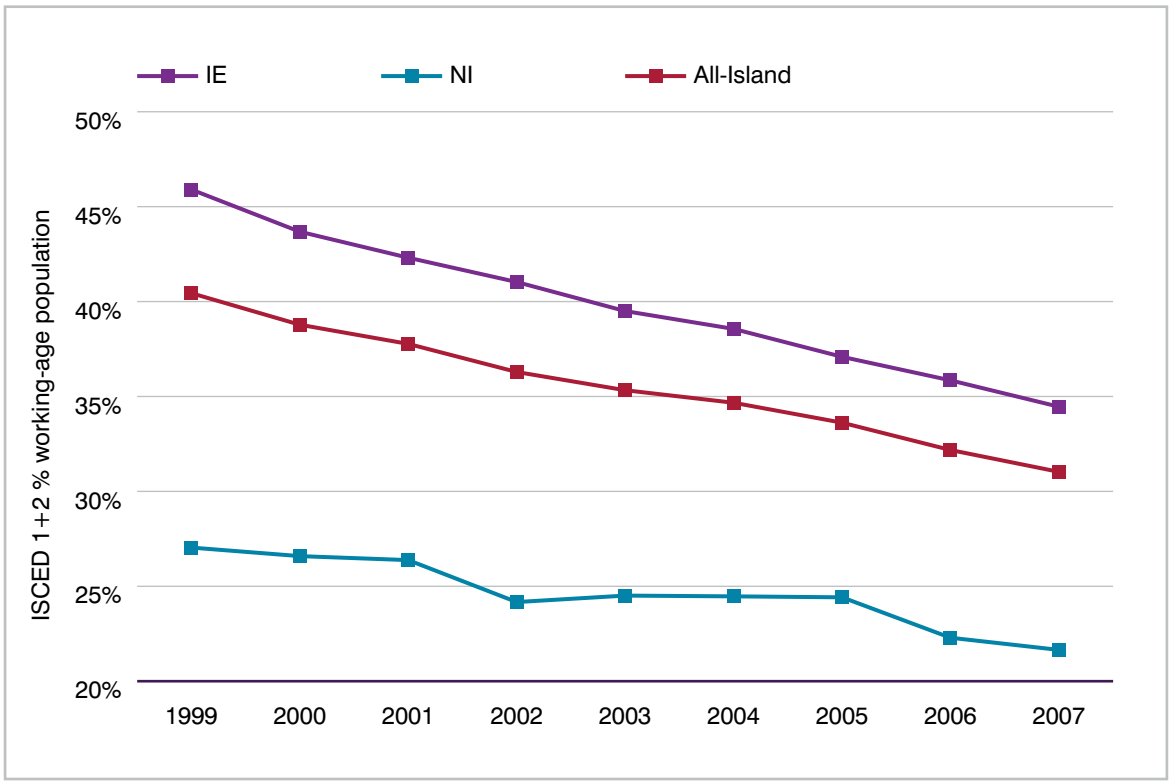
Despite this improvement, Ireland (and consequently all-island) still has a significantly higher share of working-age population with low qualifications compared to NI and international comparators (Table 3.9). Part of the reason for this dates back to Ireland's relatively late education expansion with for example, free post-primary education not being introduced to the late 1960s. One implication of this is that qualification levels among Ireland's older adult age cohorts are particularly low. For example just under half of the 60-64 population have no formal or primary education according to the QNHS Q2 2007.

Figure 3.10: All-Island working-age skill trends – low qualifications – absolute numbers



Source: CSO QNHS, DETI LFS and Oxford Economics.

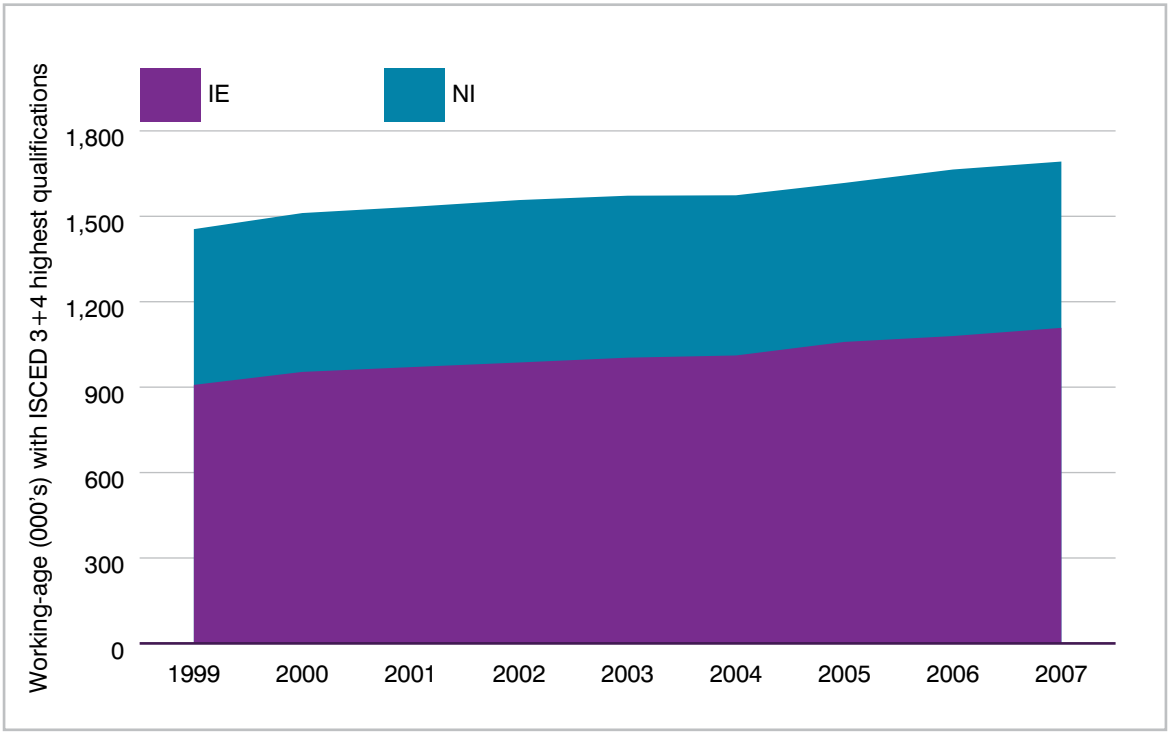
Figure 3.11: All-Island working-age skills trends – low qualifications – share of working-age population



Source: CSO QNHS, DETI LFS and Oxford Economics.

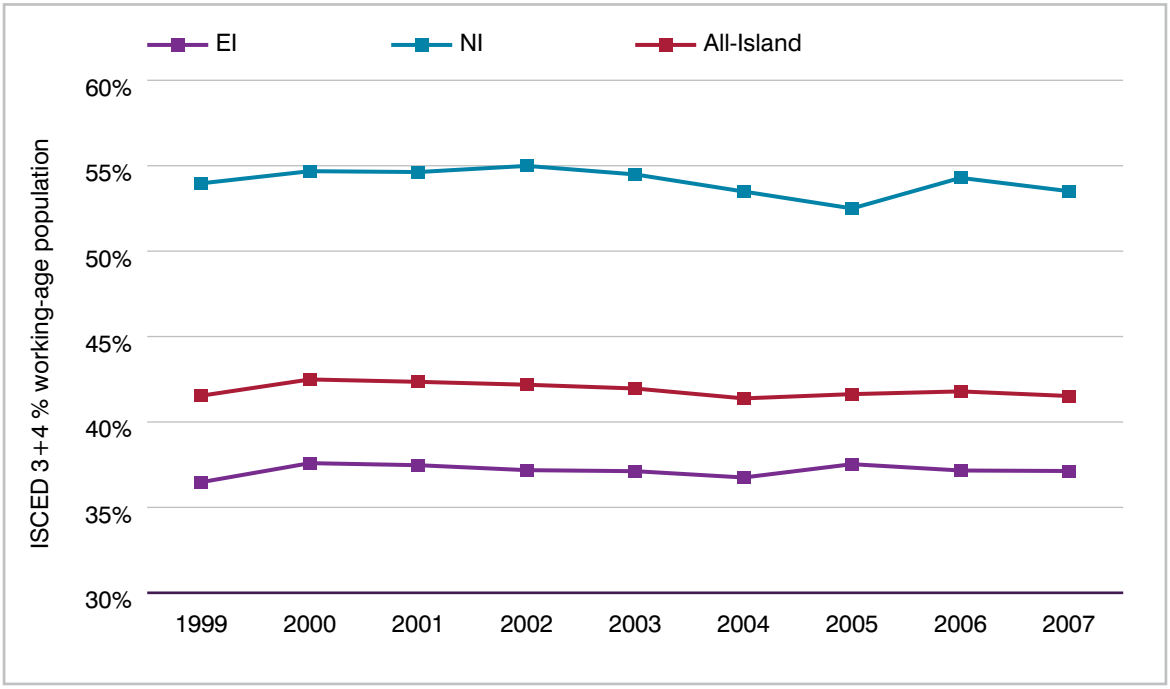
The share of working-age population with medium qualifications has remained relatively flat in both NI and Ireland (Figure 3.13). As the working-age population moves up the 'education hierarchy' more people move from having only primary or lower secondary qualifications into this category, while at the same time more school leavers increasingly go on to higher education and migrants arrive with university qualifications.

Figure 3.12: All-Island working-age skills trends – medium qualifications – absolute numbers



Source: CSO QNHS, DETI LFS and Oxford Economics.

Figure 3.13: All-Island working-age skills trends – medium qualifications – share of working-age population

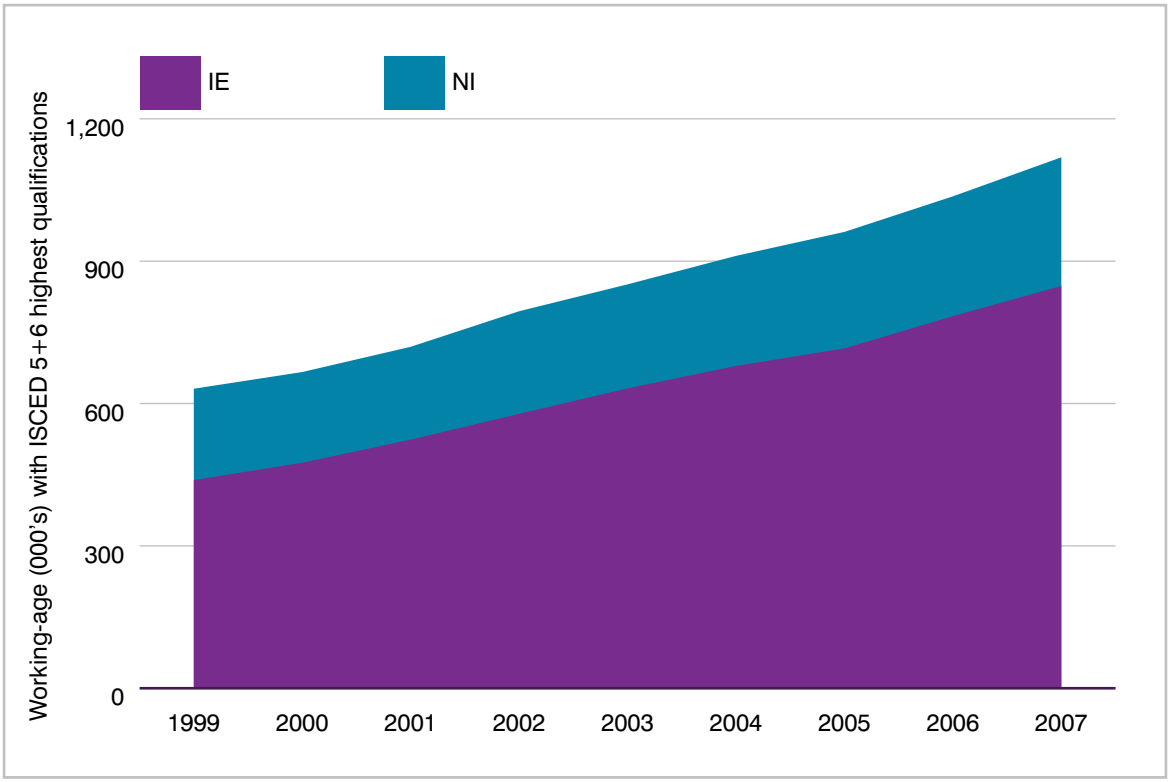


Source: CSO QNHS, DETI LFS and Oxford Economics.

The effect of (1) older, poorly qualified age cohorts retiring and (2) being replaced by a younger, better qualified cohort with rising rates of staying on at school, along with (3) expanded tertiary provision and (4) record numbers of migrants with many having third level qualifications, is a rapid rise in the share and number of working-age persons with third level qualifications. Both North and South's share of university qualified working-age population has moved in parallel with NI now having 80,000 more higher qualified adults and Ireland 410,000 more since 1999 (Figure 3.14). The qualifications of migrants has also played an important role here.

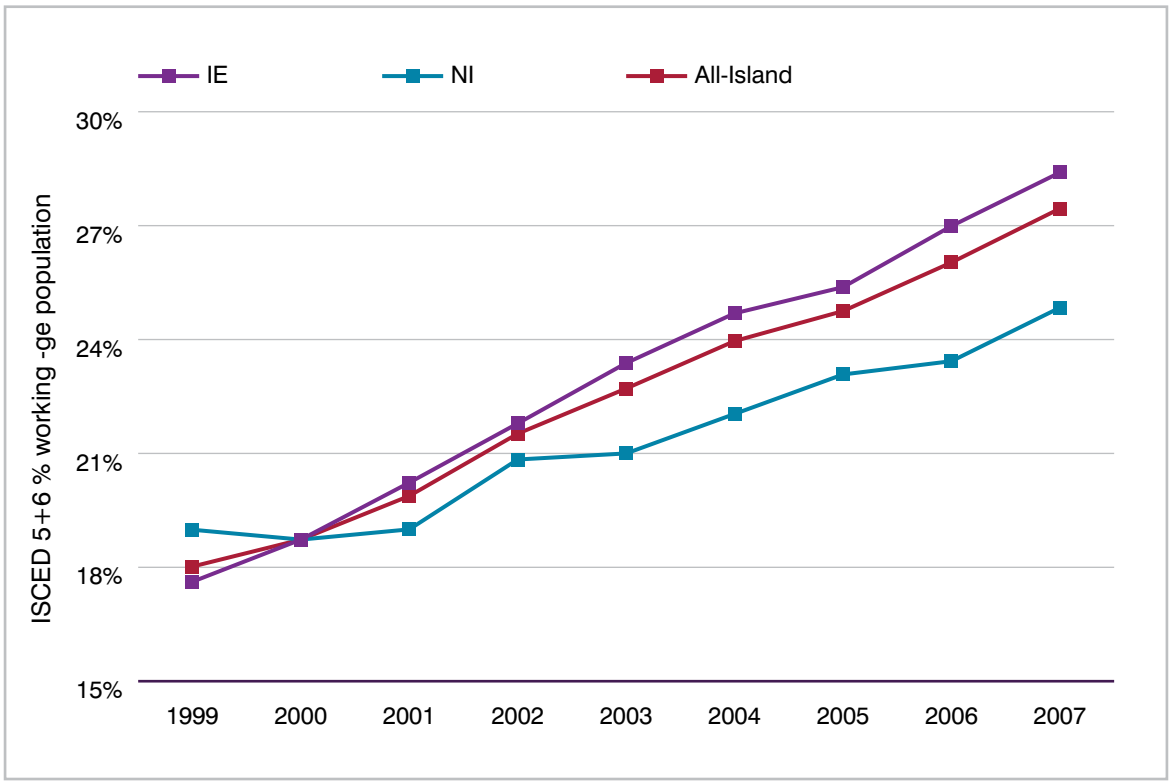
This expansion of third level qualified adults has been a critical factor behind the economic success in both jurisdictions and indeed a pre-requisite for the transition to a service-led knowledge-based economy. 'Tomorrow's Skills – Towards a National Skills Strategy' describes how increases in labour quality (due to higher levels of education attainment) have been estimated to contribute almost one-fifth of total economic growth in Ireland during the 'tiger' economy years.

Figure 3.14: All-Island working-age skills trends – high qualifications – absolute numbers



Source: CSO QNHS, DETI LFS and Oxford Economics.

Figure 3.15: All-Island working-age skills trends – high qualifications – share of working-age population



Source: CSO QNHS, DETI LFS and Oxford Economics.

In an international context, Ireland and consequently the all-island economy, stand out as having high shares of their adult population with low qualifications (see Table 3.3 below). Ireland's share (35 per cent) is for example three times the US' share. At the higher end of the skills spectrum Ireland rates better (and has improved significantly) though the all-island economy as a whole still has some way to go before catching up with Canada, US and Japan in terms of the share of adults with higher qualifications.

Table 3.3: International comparison of adult 25-64 qualifications (2005)

	Low (ISCED 1+2)	Medium (ISCED 3+4)	High (ISCED 5+6)
Australia	35%	33%	32%
Canada	15%	39%	46%
Denmark	17%	49%	33%
Finland	21%	44%	35%
France	34%	41%	25%
Germany	17%	59%	25%
Italy	49%	38%	12%
Japan	0%	60%	40%
UK	14%	56%	30%
US	12%	49%	39%
Ireland	**35%**	**36%**	**29%**
Northern Ireland	**26%**	**48%**	**26%**
All-Island	**33%**	**39%**	**28%**

Source: Oxford Economics and OECD.

Note: Ireland figures are based on authors' estimates and are not taken directly from the OECD Education at a Glance report though the figures match closely.

Table 3.4: International comparison of change in adult 25-64 higher qualification level

	ISCED 5+6 (1999)	ISCED 5+6 (2005)	Change pp
Australia	30%	32%	1.6
Canada	43%	46%	3.2
Denmark	29%	33%	3.9
Finland	35%	35%	-0.1
France	24%	25%	0.6
Germany	26%	25%	-1.9
Italy	13%	12%	-0.4
Japan	33%	40%	6.5
UK	28%	30%	1.8
US	39%	39%	0.2
Ireland	**20%**	**29%**	**8.7**
Northern Ireland	**21%**	**26%**	**4.9**
All-Island	**21%**	**28%**	**7.6**

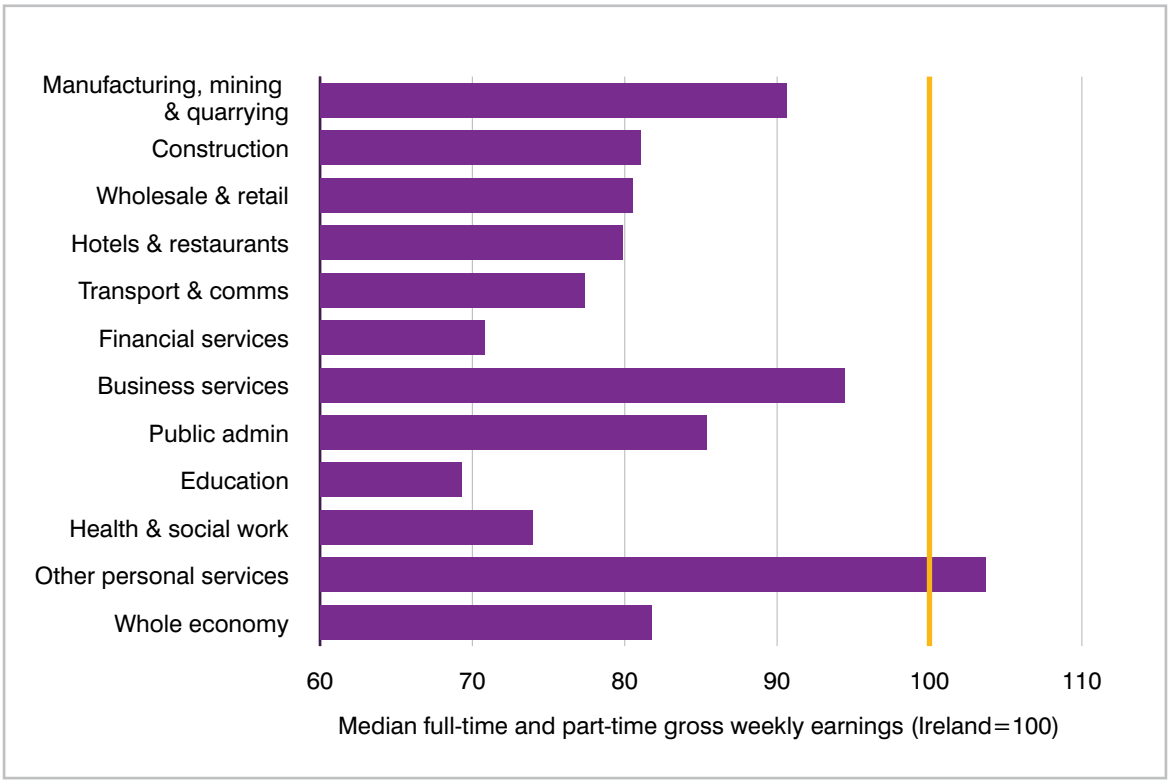
Source: Oxford Economics and OECD.

Note: See note for Table 3.3.

3.5 Earnings

North-South data on average full-time wages are available from the CSO National Employment Survey and DETI's ASHE for a comparable set of sectors. As Figure 3.16 shows, wage levels in the South are higher than NI across each sector when measured in a common currency, except for other personal services. The gap ranges from less than 10 per cent for manufacturing and business services to over 30 per cent in education. For the whole economy average, wages in NI are approximately 20 per cent lower. Note while part of the difference may be explained by differences in full/part-time working shares, it is also important to highlight that the cost of living in NI is generally considered to be lower. A recent report from the National Consumer Agency in the South revealed that a basket of goods is 30 per cent cheaper in Northern Ireland. It is also worth highlighting again that North-South monetary comparisons depend on the exchange rate at the time of comparison.

Figure 3.16: All-Island average wages by sector (2006, Ireland=100)



Source: CSO National Employment Survey, DETI ASHE and Oxford Economics.

Starting graduate wages, while still marginally lower in NI, are more comparable (Table 3.5). Note NI graduate salaries refer to graduates from NI institutions working in NI. One reason for NI's relatively high starting graduate wages is the large number of graduates entering employment in the civil service which tends to offer higher initial salaries than most other sectors. Again as a caveat comparisons are affected by prevailing exchange rates and differences in costs of living should be considered.

Table 3.5: All-Island graduate salaries (2005)

Ireland		Northern Ireland	
Level	**Euro**	**Level**	**Euro**
Certificate level 6	23,000		
National diploma level 7	24,000		
Bachelors degree level 8	26,000	Undergraduate	24,000
Graduate/postgraduate diploma level 9	29,000	Postgraduate	28,000
Masters degree – taught level 9	27,000	Masters	27,000
Masters degree – research level 9	29,000		
Doctorate level 10	33,000	PhD	34,000

Source: HEA 'What do graduates do? Class of 2005', HESA and Oxford Economics.

Note: NI salaries converted to Euro using ECB average year exchange rate for 2005. Ireland graduate salary data calculated as weighted average from salary band mid-points and frequency shares and rounded to the nearest thousand. HEA Graduate Survey undertaken 9 months after graduation; HESA First Destination Leaver Survey undertaken 6 months after graduation. This is not considered by the authors to pose a serious data matching problem as a high proportion of pay rises are unlikely between months 6 and 9 of the first year of graduate employment.

3.6 Education Qualifications and Destinations

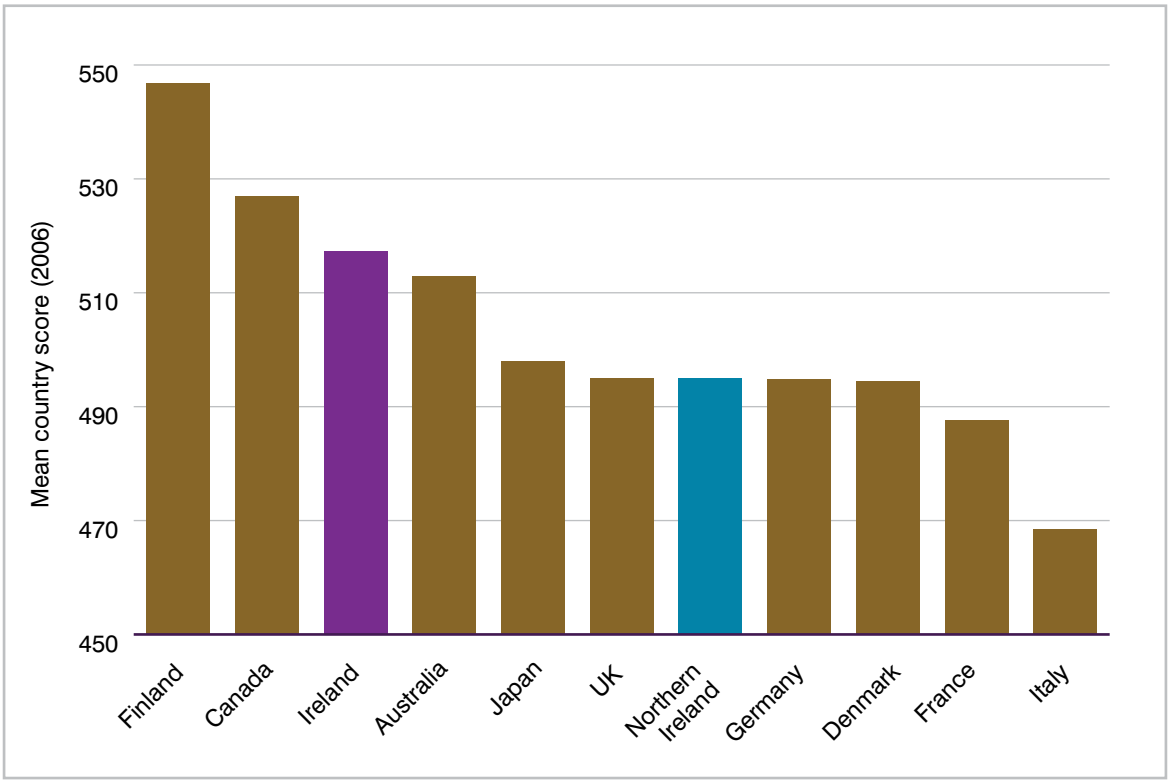
3.6.1 PISA Assessment[6]

The most recent PISA survey was undertaken in 2006 across OECD member and a selection of non-member countries (the next survey is due to be undertaken in 2009). Both Ireland and NI (part of the UK survey) were covered by the 2006 PISA survey.

Generally 15-year olds in the South slightly outperform students in NI with the South performing particularly strongly in reading (Figure 3.17). However it should be borne in mind that due to sample sizes, not all differences are statistically significant such as the difference in between NI's and Ireland's mathematics scores. Canada and Finland perform well above the OECD average across all domains.

It should also be noted within country mean scores there can be wide disparities in attainment. For example for science, as well as high achievers, NI has a substantial 'tail' of low-scoring students whereas in the South, the spread of attainment was much narrower and was close to the average for OECD countries.

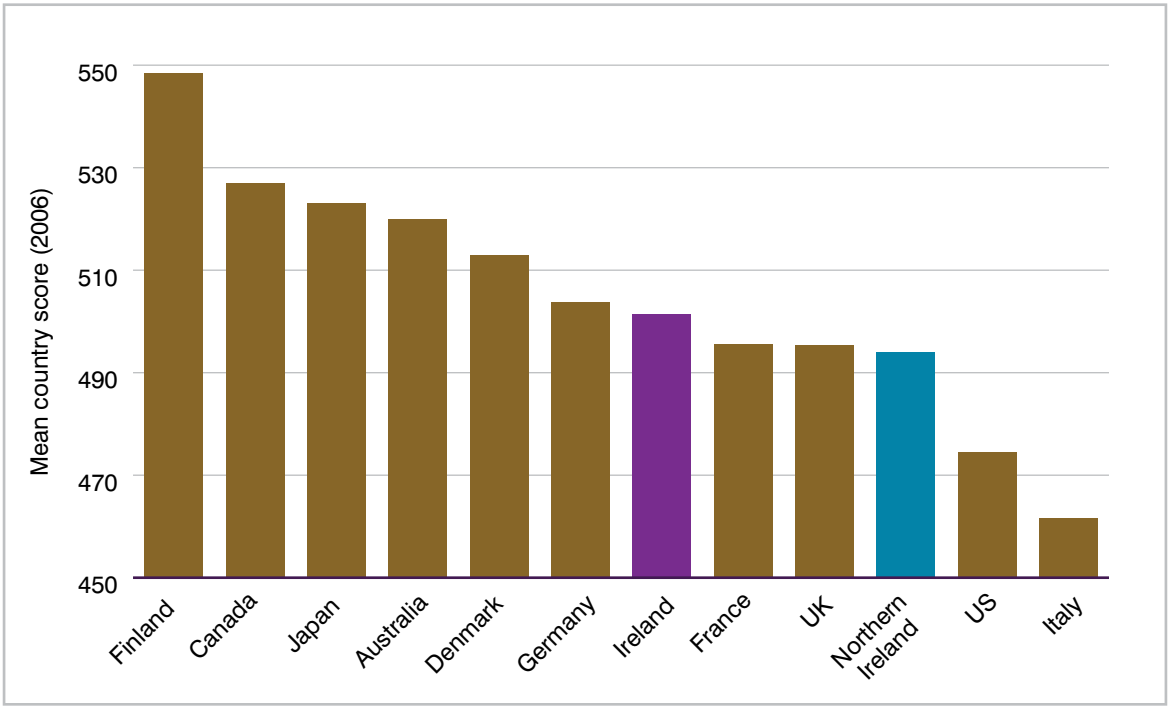
Figure 3.17: PISA mean score – Reading (2006)



Source: OECD PISA.

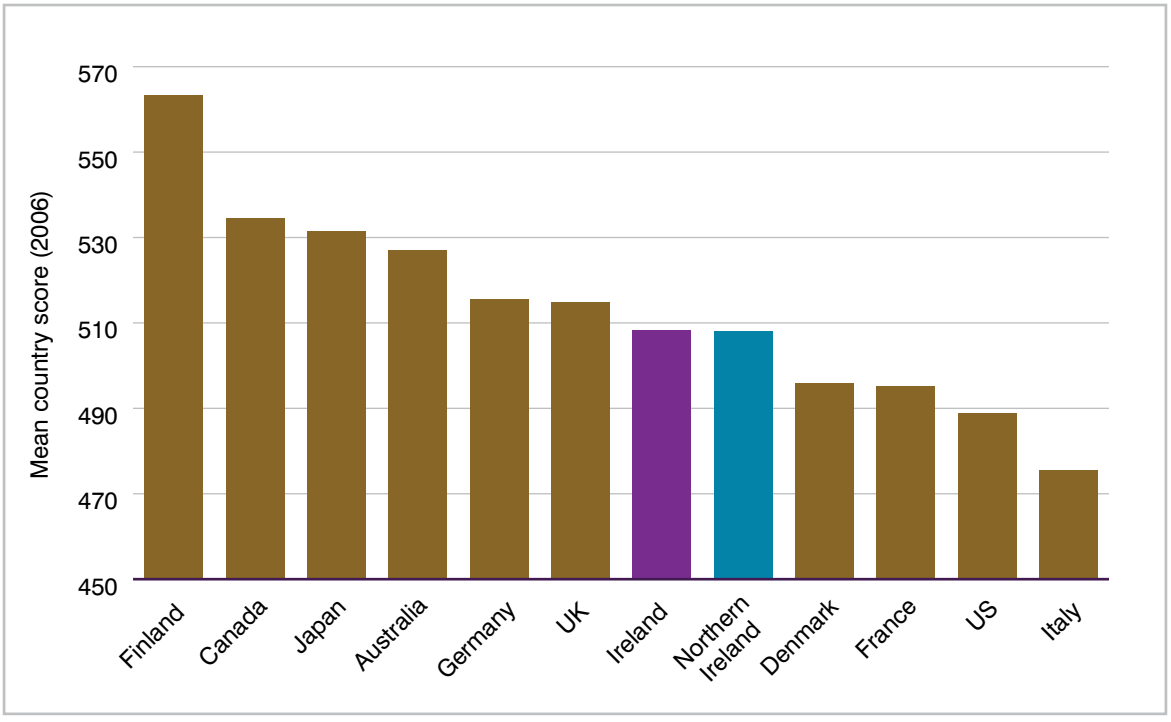
6 *The Programme for International Student Assessment (PISA) is an internationally standardised assessment that was jointly developed by participating countries. It is administered to 15-year-olds in schools every three years. PISA assesses the degree to which students near the end of compulsory education have the skills needed for society in terms of how well equipped they are to analyse, reason and communicate effectively and their capacity to continue learning throughout life. Students are assessed on their competence to address real life challenges involving reading, mathematical and scientific literacy. This aim differentiates PISA from other student assessments which measure their 87 mastery of school subjects.*

Figure 3.18: PISA mean score – Maths (2006)



Source: OECD PISA.

Figure 3.19: PISA mean score – Science (2006)



Source: OECD PISA.

3.6.2 School Leaver Qualifications and Destinations[7]

Though useful to present, it is important to note that North-South levels of highest education attainment are not directly comparable due to differences in the education systems. While the shares obtaining no qualifications or no GCSEs are almost identical, the shares sitting the Leaving Cert and A-Levels are quite different (Table 3.6)[8]. Note there have been significant improvements in school leaver qualifications over time. For example in NI the share of leavers gaining more than 3 A-Levels has increased from 23 per cent in 1992 to 40 per cent in 2006.

Table 3.6: Highest education attainment of school leavers (2005)

Ireland		Northern Ireland	
Education attainment level	**% total**	**Education attainment level**	**% total**
No qualifications	4%	No GCSEs	5%
Junior Certificate	14%	GCSEs	49%
		1-4 GCSE A*-G or equivalent	9%
		5+ GCSE A*-G or equivalent	40%
Leaving Certificate (including plus PLC)	82%	A-Level	46%
		1 A-Level	2%
		2 A-Levels or equivalent	5%
		3+ A-Levels or equivalent	39%

Source: ESRI School Leavers' Survey and DENI Annual School Leavers' Survey.

Note: North-South education attainment levels are not wholly comparable at the level of detail provided.

Destination data also have a significant comparability issue in relation to the timing of school leaver surveys. The school leaver survey in Ireland is normally undertaken 12-18 months after students leave school (though the most recent one was undertaken 20-24 months after). The NI school leaver survey is undertaken 6 months after students leave. It is critical to bear this timing difference in mind when interpreting the Table 3.7 below. NI data are more likely to indicate initial destination on leaving school as it takes place soon after the start of the academic year following leaving. The data from Ireland capture longer-term destinations. For example those who entered training or further education after leaving school but have subsequently started a job will be recorded as being in work. This may explain why the surveys show that Ireland records a higher share of leavers in employment.

7 *The Department of Education collects data annually on the highest qualification and destination of Northern Ireland grammar and secondary school leavers. In addition to the qualifications and destination data, other information such as year group, sex, ethnicity, religion, free school meal entitlement, special educational needs and the pupil s home postcode are also collected.*

ESRI, on behalf of the Department of Education and Science, also undertakes a similar school leaver survey. The survey, which includes the Post Leaving Certificate (PLC) sector, provides an insight into the position, experiences, and attitudes of school leavers approximately one year after leaving second-level education.

8 *This is partly because the NI grammar school system caters for only two-fifths of the school population (where most students study for A-Levels and have aspirations for higher education). In Ireland secondary schools cater for a much higher share of the school population which means that a higher proportion of students sit the Leaving Cert, which is the main entry examination test for proceeding to higher education.*

The share of school leavers going on to higher education in both jurisdictions is broadly the same at approximately 40 per cent. Note this figure is different to the official higher education age participation rate figures which are calculated on different bases and are not directly comparable North and South[9].

Table 3.7: Destination of school leavers (2005)

Ireland		Northern Ireland	
Destination	**% total**	**Destination**	**% total**
Further study	42%	Further study	
		Higher education institutions	38%
		Further education institutions (including HE courses)	27%
Employment	42%	Employment	10%
Unemployment	7%	Unemployment	4%
Training	4%	Training	18%
Other	6%	Unknown	2%

Source: ESRI School Leavers' Survey Report and DENI Annual School Leavers' Survey.

Note: Although North-South destinations are broadly comparable, the difference in timing of the respective surveys mean that destination results are not directly comparable.

3.7 Summary

The key skills and labour market points to note on the all-island economy from this chapter can be summarised as:

- All-Island employment has grown at an impressive rate over the last decade with 0.9m more in employment in 2007 compared to 1996;
- Even with strong expansion in the size of the Island's working-age population, the working-age employment has risen and is moving towards the Lisbon Agenda goal of 70 per cent before the 2010 target date;
- With strong employment growth, the all-island unemployment rate has halved from 8.0 per cent in 1996 to 4.3 per cent in 2007. However, there has been a very noticeable increase in the live register in the South and the claimant count in NI in the first of 2008;
- The Island's working-age skills structure has improved markedly with a fall in the share with lower level qualifications and a sharp rise in the share with higher level qualifications;

9 *For the South Higher Education participation rates are calculated using the number of students entering Leaving Certificate examinations as the denominator. In the North the official Higher Education participation rate reflects the number of young people from NI (aged under 21) entering full-time undergraduate higher education as a percentage of the NI 18 year-old population. It should be noted that Table 3.7 uses all school leavers as the denominator, which include school leavers at earlier stages of education.*

- Despite these improvements, the Island's skills structure still lags behind international comparators, but it is catching up; and
- Wage levels are higher in the South though differences in the cost of living and volatility of exchange rates complicates direct comparisons.

The analysis has also highlighted some key similarities and differences between the North and South economies. These are presented below.

North-South similarities/differences in employment trends, economic activity status, working-age skills and education

North-South similarities	North-South differences
■ Both economies have experienced impressive rates of employment growth (although growth in the South, as for GDP growth, has been noticeably faster). ■ North-South employment rates moving towards 70 per cent (Lisbon Agenda 2010 target), though NI has a slightly lower employment rate. ■ Unemployment rates falling though recently rising. ■ Similar trends in skill levels of the working-age population – falling proportion with low qualifications and rising proportion with high qualifications. ■ Scores for PISA assessment of mathematics and science similar (not statistically different).	■ The South's inactivity rate has fallen sharply but there has been little or no improvement in NI's economic inactivity rate despite impressive employment growth (the South's inactivity rate however is still slightly higher). ■ The South has a particularly high share of working-age population with low qualifications, which is partly a legacy impact of the late introduction of free post-primary education. ■ The South scores better for PISA assessment of reading. ■ Earnings are higher in the South across most sectors (though cost of living and exchange rate caveats).

4 Demand for Skills

4.1 Introduction

This chapter is the main focus of the study and in recognition of its importance, it is split into four parts:

- **Part A: Recent skill demand trends** – looks at current employment structure and recent employment trends by industry, occupation and skill level for both jurisdictions and the all-island economy as a whole, including international comparisons of trends in employment skill levels;
- **Part B: Skill demand issues** – analysis of North-South vacancies (including hard-to-fill vacancies), skill shortages and a review of the importance of generic skills. Note information on labour shortages, skill gaps and utilisation of skills is not presented as it is not available in sufficient detail across both jurisdictions;
- **Part C: Skills demand in specific key industry sectors** – skills demand issues in five key priority industries based on consultations with industry players and desk-based research of industry-specific literature; and
- **Part D: Future skill demand trends** – critique/comparability of North-South research on skills and occupation forecasts by FÁS/ESRI and Regional Forecasts (now part of Oxford Economics), including presentation of headline forecast predictions (Note these forecasts have not been updated in line with the latest economic outlook for the Island economy and cannot be matched precisely to produce all-island forecasts – see explanation in Part D).

4.2 All-Island Facts

The preceding chapters have looked at high level macroeconomic indicators at all-island and North-South level such as population, GDP and total employment. This chapter, and the 'All-Island facts' presented below, are more focused on the detailed economic trends which have most influence on skill demand. These are primarily the sectoral and occupational pattern of employment growth, although upskilling trends within occupations and the growing importance of generic non-formal skills also matters.

Recent Employment, Occupation and Skill Demand Trends

- The all-island economy is reasonably well diversified, with no one sector dominating and several large sectors of roughly equal importance (greater than 10 per cent of total employment).

- Like most other developed economies, the all-island economy has undergone a transformation from traditional agriculture/manufacturing to services with 209,000 net new jobs in business and financial services since 1996 and a shedding of jobs in less competitive manufacturing sub-sectors. This transformation has had a major influence on the nature of skill demand in the economy as in the past, many factory or farm jobs required little in the way of formal qualifications compared to for example international financial services where university degrees are a minimum requirement for the majority of positions. Though importantly the South has successfully developed its hi-tech manufacturing sector, which similar to financial and business services, tends to be graduate 'hungry'.

- Public administration, education, health and social services and construction have also grown rapidly, creating 215,000 net new jobs respectively since 1996. The growth in construction, particularly in the South, has been a source of demand for more elementary skills and migrant workers (though many construction positions require a minimum level 2 qualification), partly offsetting falling demand for low skills from the decline in more traditional production sectors.

- Recent all-island employment trends share some similarities with international comparators though the fact that the economy has grown strongly across so many sectors makes it more difficult to compare. The US, UK and France, like the all-island economy, have experienced employment growth in construction, retail, financial & business services and public services (mainly education and heath). The main difference, with the exception of rates of growth, is that the all-island economy has not shed jobs in other production industries and also the relative size of the contribution of construction growth to overall employment growth on the Island.

- Of the total of 2.9m persons employed on the Island, roughly 1m are employed in the 'higher end' manager, professional and associate professional occupations, an increase of 100,000 since 2001.

- The key occupational trends at all-island level are the strong growth in professional, craft & related trade and service & shop/market sale occupations and the decline in plant & machine operative occupations. Growth in managerial occupations in director and specialist managerial posts has been somewhat offset by the decline in production and operation managers, which is linked to declines in some manufacturing sub-sectors.

- The number of employed persons with low qualifications, while falling in share terms, has not fallen significantly in absolute numbers and is still high at 650,000 in 2006. This will partly be explained by the strong growth in construction over the last decade which creates demand for a whole range of skill levels.

- The most rapid employment expansion has been in the number persons with higher qualifications, up 340,000 since 1999 to 900,000 in 2006. This reflects partly the transformation of the economy, upskilling within sectors and occupations and the increased supply of university qualified persons, including migrants. The skills trends of persons in employment is not a complete picture of skill demand as it is very difficult to precisely ascertain if workforce skills reflect actual demand or available supply or a combination of both. Within an economy there can be instances of both skill gaps and under-utilised skills.

Future Employment, Occupation and Skill Demand Trends

- Existing skills forecasting research does not permit all-island aggregation of North-South industry, occupation and skill stock employment forecasts. An explanation for this is provided in Part D. While it is not possible at this stage to provide quantified all-island forecasts, the direction and relative scale of forecasts by sector, occupation and skill level have been indicatively estimated using existing research.

- This analysis suggests that in terms of expansion demand, (that is the change in stock of employment):

  - the transformation from traditional agriculture/industry to services is forecast to continue apace, with financial & business services and public administration, education, health and social services expected to be the main sources of employment growth in the all-island economy. Importantly for skills forecasting, construction employment growth is forecast to slow considerably, and indeed latest forecasts for the South predict short-term job losses in construction (though these are not the forecasts presented in the report);

  - this sectoral pattern will result in employment growth being largely concentrated in managerial and professional occupations and also in service & shop/market sale occupations. Minimal employment growth is forecast for elementary and plant & machine operative occupations;

  - this pattern of sectoral and occupation growth, as over the last decade, has a strong skills profile gradient with a high proportion of jobs forecast to need graduate qualifications and job losses predicted for employment requiring low qualifications. However, there will be some lower grade and low skilled occupations with growth opportunities as overall wealth levels in the economy rises, for example in personal services; and

  - this pattern of skill needs from expansion demand analysis will however be altered to a degree when replacement demand needs are included. As leaving rates tend to be higher for lower grade and lower skilled occupations and joining rates higher for higher grade occupations, the dynamics of the labour market means that the future need for lower qualifications will be higher than predicted by expansion demand forecasts alone.

4.3 Part A – Recent Skills Demand Trends

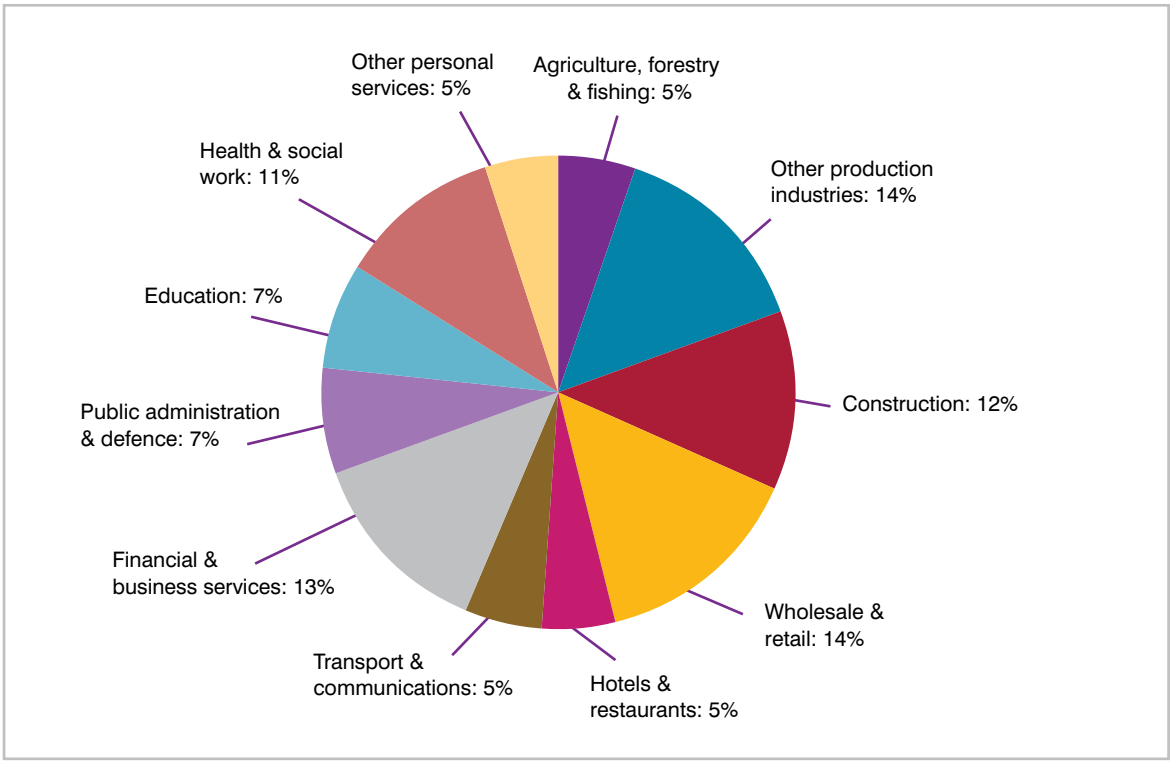
Part A presents recent trends in employment by industry and occupation. As highlighted above but worth re-emphasising, the changing structure of the all-island economy and the growing importance of particular occupations within industries are key factors influencing skill demand. These trends encapsulate the concepts of increasing sophistication, upskilling and moving up the value chain, all developments which are taking place in the all-island economy and shifting the pattern of skill demand towards higher qualifications.

4.3.1 Industry Recent Trends

Employment structure

Before presenting sectoral employment trends, it is useful to first present the employment structure of the Island economy. Figure 4.1 shows that the all-island economy is relatively well-diversified with no one sector dominating and several large sectors of roughly equal importance e.g. manufacturing which is a main component of other production industries, construction, wholesale & retail, financial and business services and health all have employment shares of over 10 per cent.

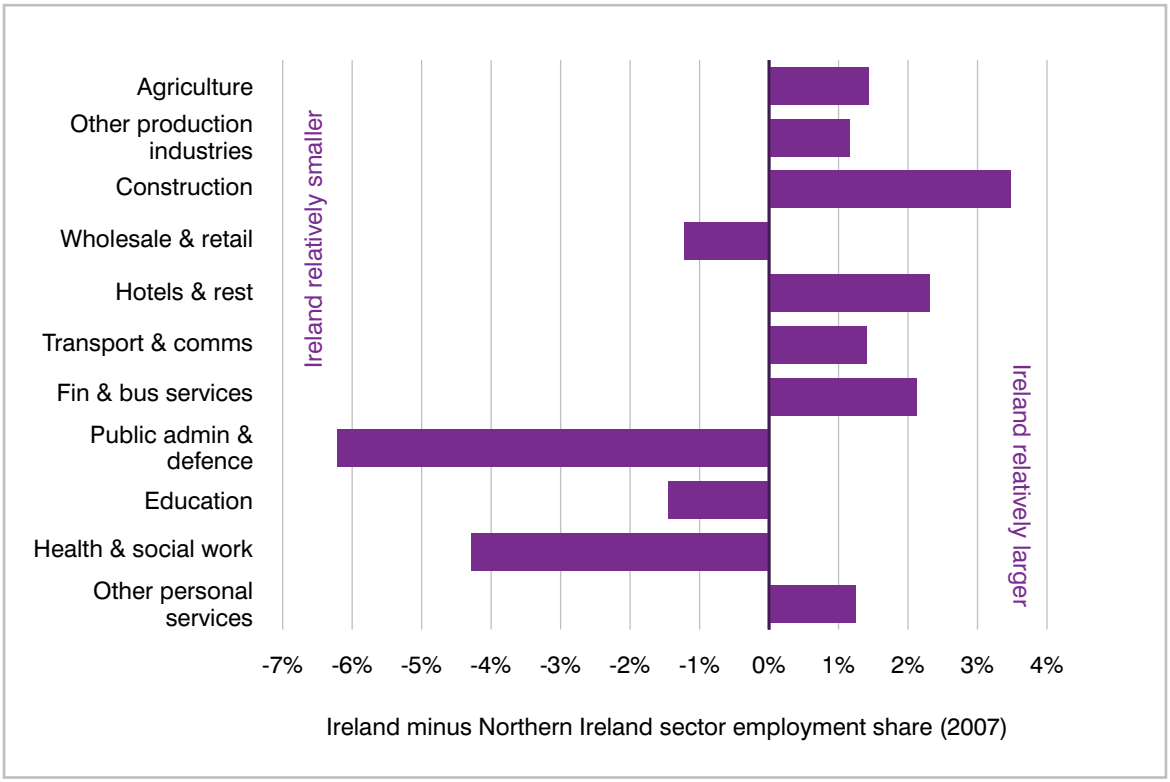
Figure 4.1: All-Island employment structure (2007)



Source: CSO QNHS, DETI LFS and Oxford Economics.

Comparing Ireland's employment structure with NI (Figure 4.2) clearly highlights NI's greater dependence on the public sector (specifically public administration and health) and less well-developed business and financial services sector. Ireland's recent construction boom, as in some other economies such as Spain, has seen the economy become more dependent on construction and consequently more vulnerable to the current downturn in the housing market. While in some areas the structure of the two economies differs, the nature of skills demand, as is shown later, need not be wholly different as public services employment has similar skill demand needs, based on skills in employment, to financial and business services. An important caveat to this analysis is that this report does not go into the detail of comparing the sub-sector structure of broader sectors. For example the financial and business services sector in the South is skewed more towards international financial services whereas in the North call centres activities are more prevalent.

Figure 4.2: Ireland minus Northern Ireland employment structure (2007)



Source: CSO QNHS and DETI LFS.

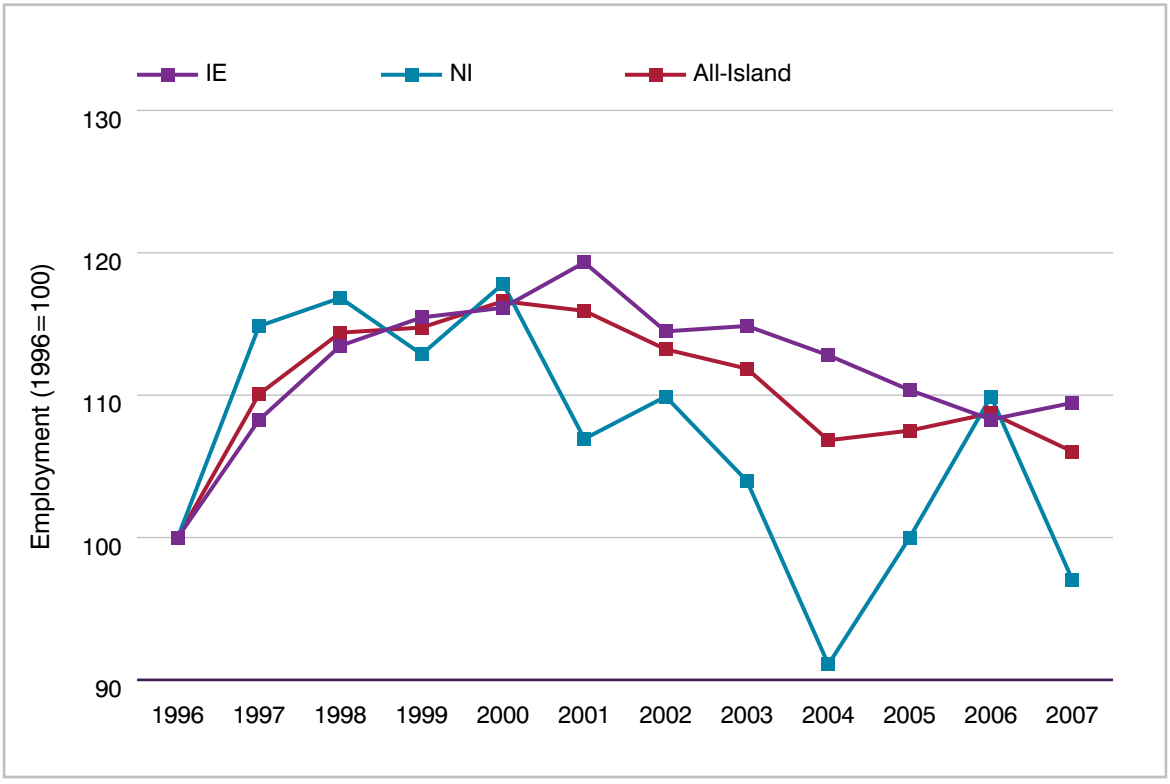
Note: Bars to the right of the Y axis indicate that the sector is relatively larger in share terms in Ireland compared to Northern Ireland. For example Ireland's construction share of total employment in 2007 is 13 per cent compared to 10 per cent in Northern Ireland – the difference is +3 per cent, meaning the bar is to the right of the Y axis (more dependent/relatively larger).

Turning now to employment trends by industry, presented below are a selection of recent North-South and all-island trends for the following sectors; other production, construction, wholesale & retail, financial & business services and public services (public administration & defence, education and health & social services). The sectoral pattern of employment growth has key implications for skills demand, which is presented later in the report. Some caution should be exercised in interpreting year-on-year employment trends due to sample size issues.

Other production industries

Employment in other production industries, which are dominated by manufacturing, expanded in the late 1990s before declining (Figure 4.3). While the Island has been successful in attracting hi-tech manufacturing FDI, this has been more than offset recently by declines in lower value added manufacturing sectors. The large jump in manufacturing employment in 2005 and 2006 in NI, which appears to have been partly corrected in 2007, may be due to sampling issues. Though employment in production industries is declining overall, there are several niche manufacturing sectors where the all-island economy remains competitive. Growth opportunities in these sub-sectors, such as pharmaceuticals have important implications for the demand for higher level qualifications and skills. Recently the South's employment performance in other production industries has been stronger.

Figure 4.3: All-Island other production industries employment trends



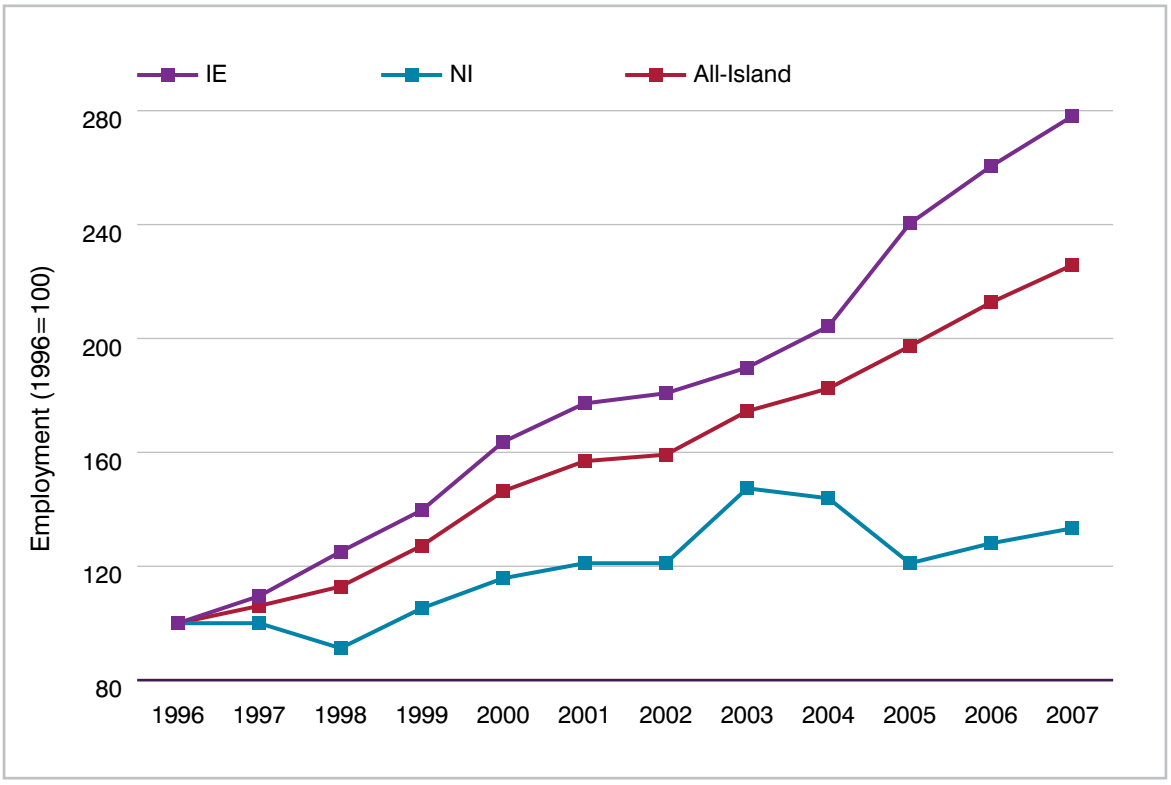
Source: CSO QNHS and DETI LFS.

Note: See note for Figure 3.1. Other production industries include manufacturing, utilities and mining & quarrying.

Construction

As Figure 4.4 shows, Ireland's construction sector enjoyed a period of remarkable growth over the last decade as both the non-residential sector expanded (due to strong economic growth) and the residential sector grew exponentially with the booming housing market fuelled by rising wealth. NI has enjoyed a construction boom somewhat later than Ireland though this does not show up fully in the LFS data which may be due to sampling issues. As explained earlier, growth in construction has created employment opportunities for a range of skilled labour, including those with lower skills.

Figure 4.4: All-Island construction employment trends

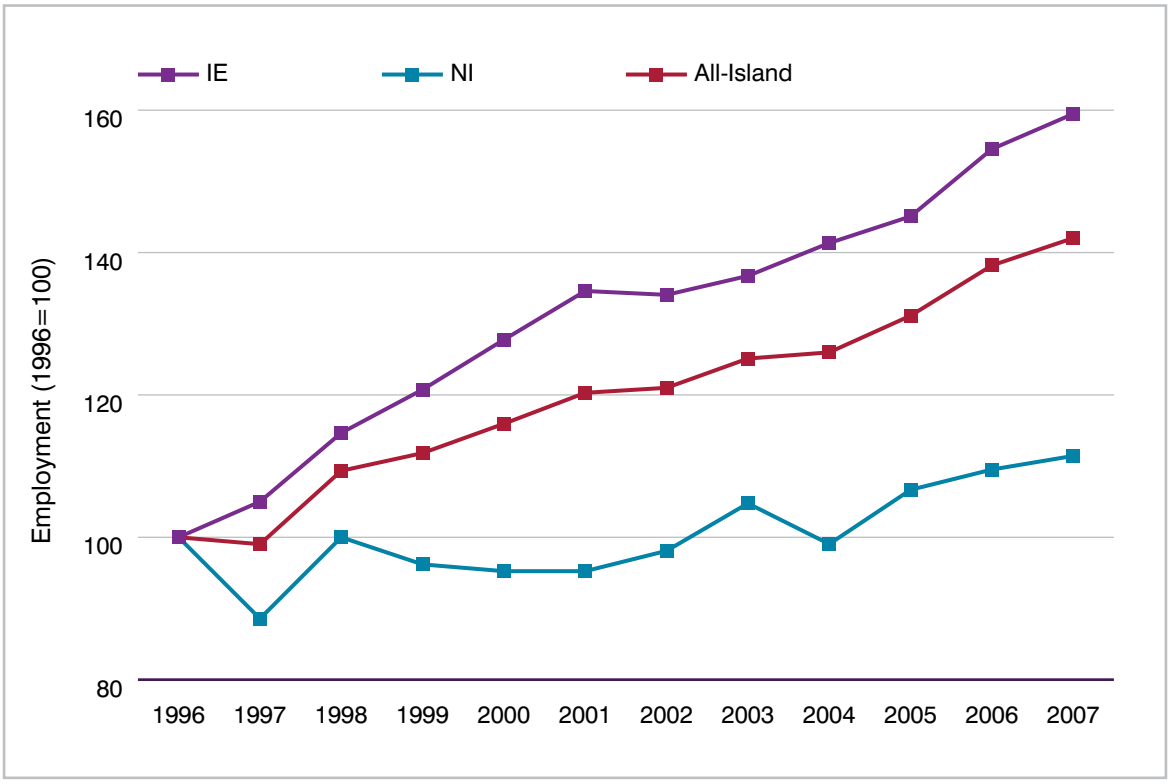


Source: CSO QNHS and DETI LFS.

Wholesale & retail

Wholesale & retail employment has grown consistently over the last decade in Ireland, expanding by over 55 per cent (Figure 4.5). The number of persons employed in retail in NI has also increased, with the growth more marked if measured from 1997. Despite NI's retail 'catch up' with the arrival of multinational and national retailers, its rate of growth has lagged behind Ireland. This is partly explained by Ireland's faster rate of population growth which is a driver of growth in secondary sectors such as retail and construction. In addition the stronger performance of manufacturing in the South will have driven faster growth in the distribution element of the sector.

Figure 4.5: All-Island wholesale and retail employment trends

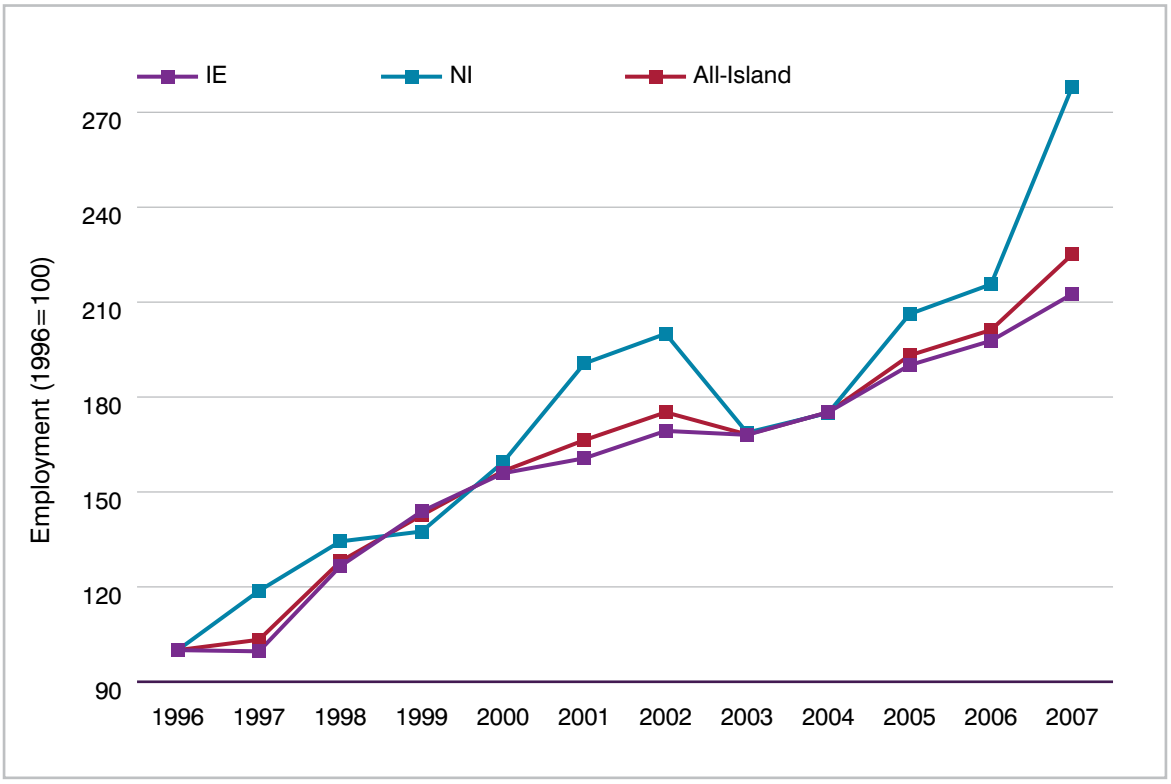


Source: CSO QNHS and DETI LFS.

Financial and business services

The transformation from traditional agriculture/manufacturing to services in both economies is most evident from the rapid expansion of financial and business services. Recent trends North and South in business and financial services employment are remarkably similar with the sector in both jurisdictions roughly doubling in size in employment terms in the last decade, due to FDI and the sector becoming more export orientated. Although NI started from a lower base and its financial and business service sector is more skewed towards call centres as opposed to international financial services which have different skill needs.

Figure 4.6: All-Island financial and business service employment trends

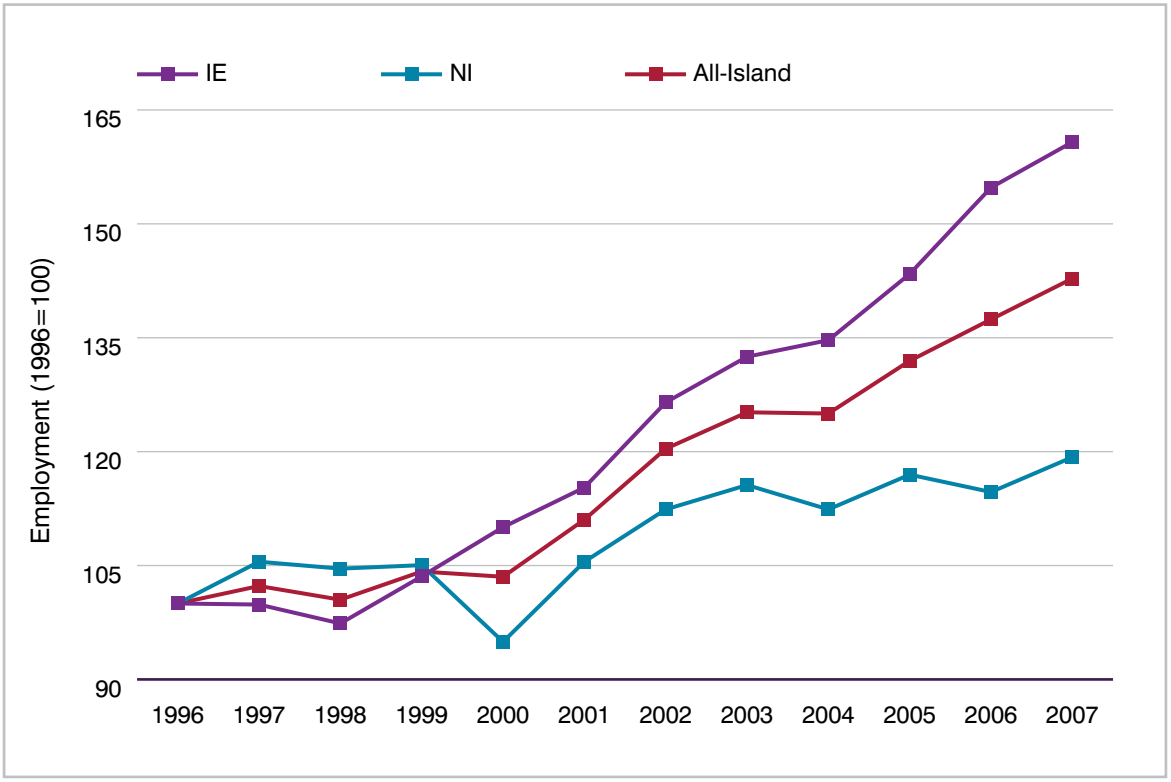


Source: CSO QNHS and DETI LFS.

Public administration & defence, education and health & social work

Public administration, education, health and social work employment in Northern Ireland increased by 20 per cent over the last decade. Note this definition includes elements of private education and health that are difficult to remove from the data. This phase coincided with the public sector expansion initiated by the incoming Labour government in 1997 after its initial moratorium on increased spending. Ireland's expansion in public services employment has been even faster, with particularly strong growth in health, though the sector started from a smaller base and in relative terms is still smaller than NI's large public sector. Again this growth is partly linked to the need to provide public services to the faster growing population. While public administration employment is less driven by population than education and health, even here the provision of police officers, staff in benefit officers etc. will depend somewhat on population trends.

Figure 4.7: All-Island public administration, education, health & social services employment trends



Source: CSO QNHS and DETI LFS.

Note: See note for Figure 3.1. This definition will include elements of private education and health which are difficult to remove from the data.

A summary of recent employment change for the South, North and the all-island, in absolute and per cent growth terms, is provided in Table 4.1 below.

Table 4.1: All-Island recent change in employment by sector

	Change 1996-2007 (000's)			Change 1996-2007 (annual average %)		
	Ireland	Northern Ireland	All-Island	Ireland	Northern Ireland	All-Island
Agriculture, forestry & fishing	-27	2	-25	-2%	1%	-1%
Other production industries	25	-3	22	1%	0%	1%
Construction	180	19	199	10%	3%	8%
Wholesale & retail	110	12	122	4%	1%	3%
Hotels & restaurants	51	-2	49	5%	-1%	4%
Transport & communications	61	6	67	7%	2%	5%
Financial & business services	152	57	209	7%	10%	8%
Public administration & defence	29	-18	11	3%	-2%	1%
Education	47	7	54	4%	1%	3%
Health & social work	98	53	151	6%	6%	6%
Other personal services	41	13	54	4%	4%	4%

Source: CSO QNHS and DETI LFS.

International comparison of sectoral trends

Recent all-island employment trends share some similarities with international comparators though the fact that the economy has grown strongly across so many sectors makes it more difficult to compare. The US, UK and France, like the all-island economy, have experienced growth in construction, retail, financial & business services and public admin, education, health and social services (Table 4.2). The main difference, with the exception of rates of growth, is that the all-island economy has not shed jobs in other production industries and also the size of the contribution of construction growth to overall employment growth.

Table 4.2: All-Island recent change in employment by sector – international comparison

	% change (1996-2007)				
	All-Island	**US**	**Germany**	**UK**	**France**
Agriculture, forestry & fishing	-15%	6%	-5%	-15%	1%
Other production industries	6%	-17%	-9%	-30%	-10%
Construction	126%	38%	-37%	39%	25%
Wholesale & retail	42%	14%	8%	15%	23%
Transport & communications	75%	7%	2%	14%	13%
Financial & business services	125%	29%	41%	39%	44%
Government & community services	52%	23%	7%	25%	11%

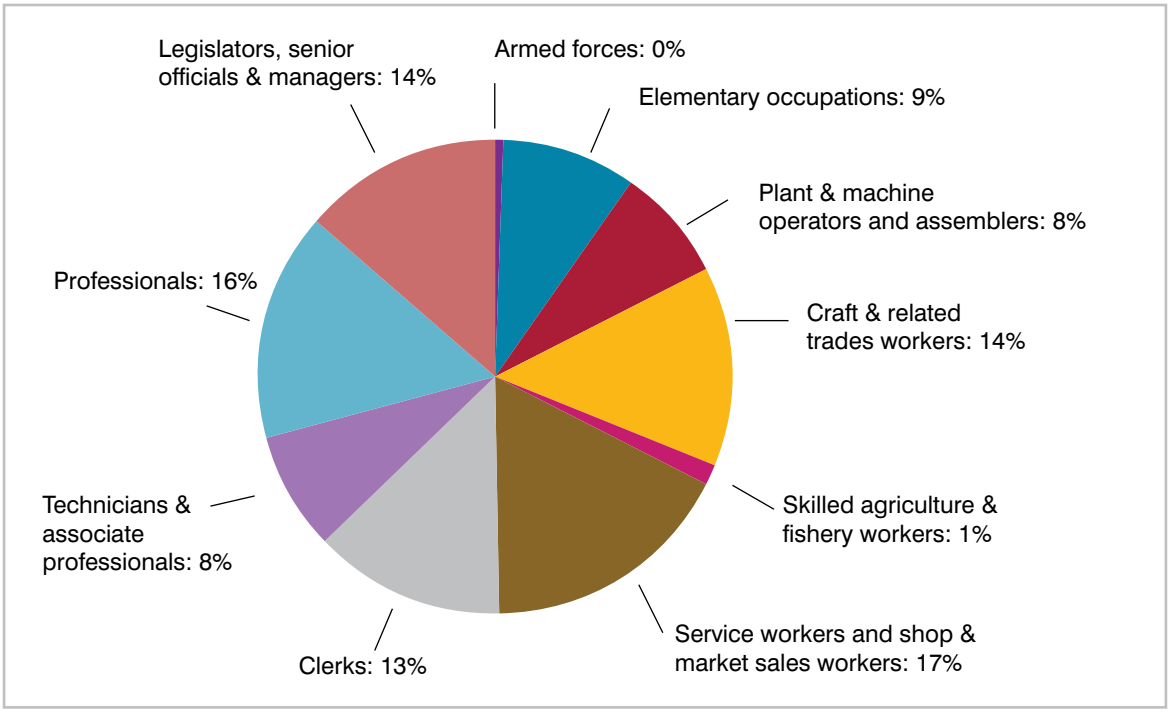
Source: CSO QNHS, DETI LFS and Haver Analytics.

4.3.2 Occupation Recent Trends

Occupation structure

Figure 4.8 below summarises the occupation structure of all-island employment at 1-digit ISCO 88 level. Almost 2 in 5 occupations are managerial and professional (38 per cent) with less than 1 in 5 in elementary and plant & machine operator occupations (17 per cent). This impacts directly on the current stock of skills in employment as different occupations generally have quite distinct skill profiles.

Figure 4.8: All-Island occupation structure (2007)

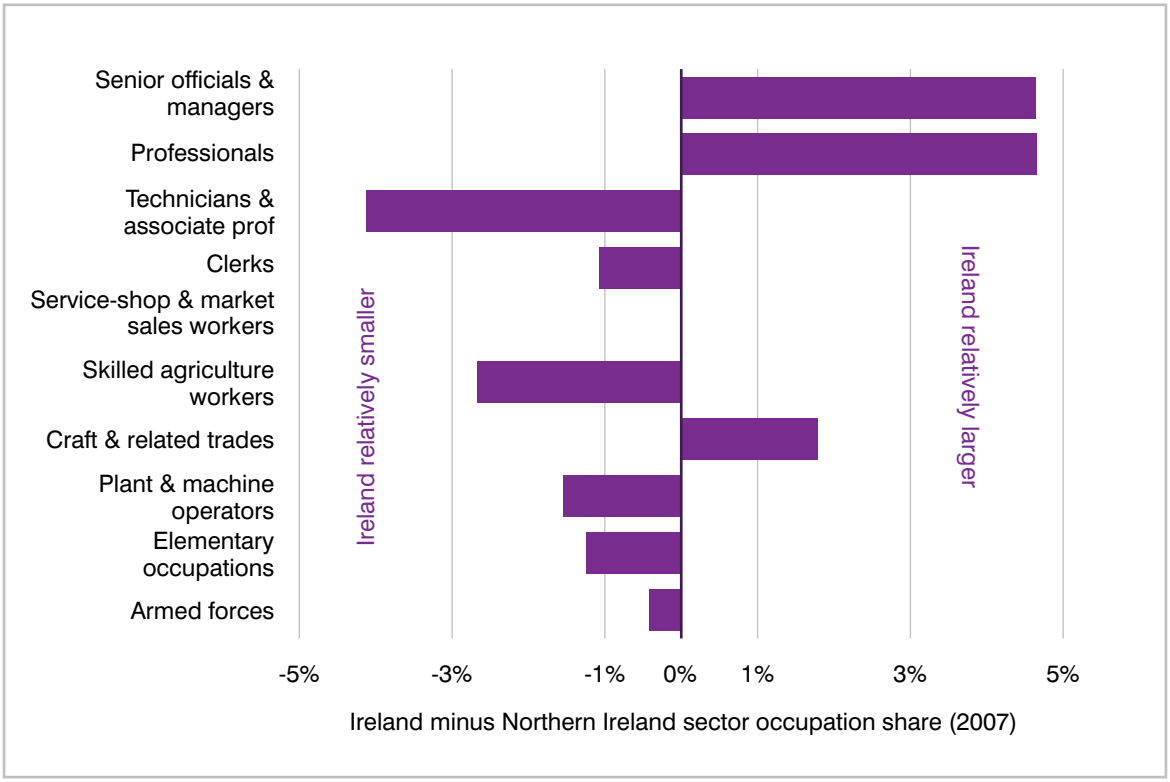


Source: CSO QNHS, DETI LFS and Oxford Economics.

Note: Occupation classification based on ISCO 88.

Comparing Ireland to NI occupations, Figure 4.9 below shows that the South has a higher share of managers and professionals (though NI has a higher share of associate professionals) and a lower share of elementary occupations. Differences between professional and associate professionals should be interpreted with caution and partly represent differences in CSO and ONS' mapping of occupations to ISCO 88. For example CSO classifies all of nursing and midwifery as professional whereas ONS classifies nursing and midwifery as associate professional. There are also some other differences in classification. For example previously it was shown that the South has a relatively larger agriculture sector though Figure 4.9 shows NI to have a relatively higher share of skilled agriculture workers.

Figure 4.9: Ireland minus Northern Ireland occupation structure (2007)



Source: CSO QNHS, DETI LFS and Oxford Economics.

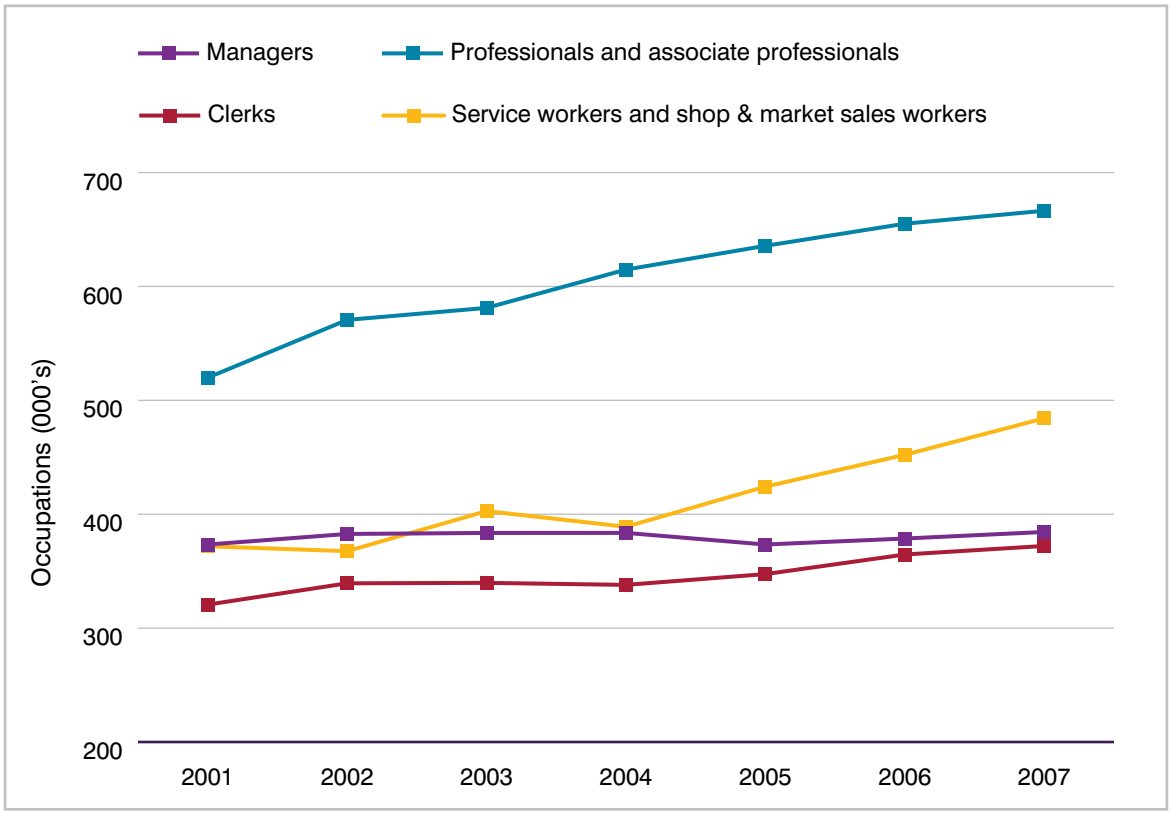
Note: Occupation classification based on ISCO 88. Bars to the right of the Y axis indicate that the occupation is relatively larger in Ireland in share terms compared to Northern Ireland.

Occupational trends

Comparisons of occupational trends over time are limited by the starting point for analysis. The SOC 2000 classification was only introduced to NI in 2001, the start point for the charts below. While technically NI occupation data pre-2001 (SOC 1990) could be aligned to ISCO 88, this would create a break in the occupation data.

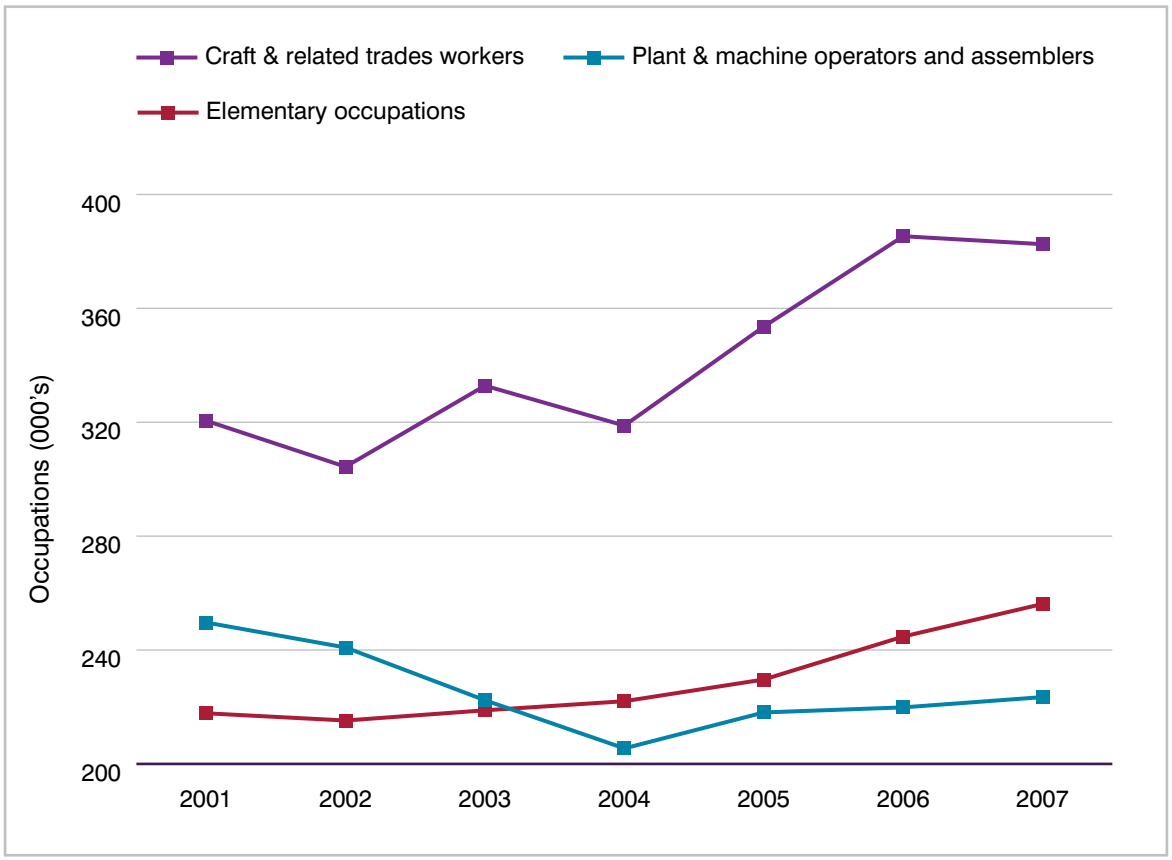
The key trends are the growth in professional occupations and craft & related trade occupations and decline in plant & machine operative occupations (Figure 4.10 and 4.11). Service and shop & market sale occupations have also risen steadily – these include, among other occupations, personal care workers, chefs and waiters/waitresses. The relative lack of growth in managerial occupations is explained by the decline in production and operation managers in industry partly offsetting growth in director/chief executive and specialist managerial occupations.

Figure 4.10: All-Island occupational trends (1)



Source: CSO QNHS, DETI LFS and Oxford Economics.

Figure 4.11: All-Island occupational trends (2)



Source: CSO QNHS, DETI LFS and Oxford Economics.

More detailed 2-digit ISCO 88 occupation data and trends are presented in Tables 4.3 and 4.4. 3-digit ISCO 88 occupation data for the All-Island, Ireland and Northern Ireland is presented in Annex A. Table 4.3, which estimates occupation shares of total employment, reveals some differences between North-South occupation structures such as the aforementioned issue of health professionals and health associate professionals (e.g. nurses and midwives). Table 4.4 reports absolute and per cent changes in occupations. It clearly shows how higher skilled occupations have been growing while employment in lower skilled occupations such as plant and machine operators has been declining, with the main exception being labourers in construction etc.

Note the observed trends in employment by industry, occupation and skills are closely inter-linked. The growth in professional occupations is linked to employment growth in business and financial services and other graduate hungry sectors such as hi-tech manufacturing and health, which in turn feeds through to growth in employment of persons with higher qualifications. Though it should also be noted that supply factors, such as expansion in the number of graduates from universities, can also directly affects the skills mix of persons employed, whether or not the level of skills is actually fully utilised.

Table 4.3: All-Island employment by occupation (2007)

	Ireland (000's)	Northern Ireland (000's)	All-Island (000's)	Ireland % total	Northern Ireland % total	All-Island % total	Ireland % minus Northern Ireland %
Legislators and senior officials	5	1	6	0.2%	0.1%	0.2%	0.1%
Corporate managers	300	72	372	14.7%	9.3%	13.2%	5.3%
Managers of small enterprises	0	6	6	0.0%	0.8%	0.2%	-0.8%
Physical, mathematical and engineering science professionals	81	24	104	3.9%	3.0%	3.7%	0.9%
Life science and health professionals	77	10	87	3.7%	1.3%	3.1%	2.4%
Teaching professionals	96	32	128	4.7%	4.1%	4.5%	0.6%
Other professionals	93	29	122	4.5%	3.8%	4.3%	0.7%
Physical and engineering science associate professionals	29	17	46	1.4%	2.1%	1.6%	-0.7%
Life science and health associate professionals	13	32	45	0.6%	4.2%	1.6%	-3.6%
Teaching associate professionals	9	3	12	0.4%	0.4%	0.4%	0.0%
Other associate professionals	90	33	122	4.4%	4.2%	4.3%	0.1%
Office clerks	209	85	295	10.2%	11.0%	10.4%	-0.8%
Customer services clerks	55	23	77	2.7%	2.9%	2.7%	-0.3%
Personal and protective services workers	224	78	302	10.9%	10.1%	10.7%	0.8%
Models, salespersons and demonstrators	128	55	182	6.2%	7.1%	6.5%	-0.9%
Skilled agricultural and fishery workers	14	26	40	0.7%	3.4%	1.4%	-2.7%
Extraction and building trades workers	191	55	246	9.3%	7.2%	8.7%	2.1%
Metal, machinery and related trades workers	71	31	102	3.5%	4.0%	3.6%	-0.5%
Precision, handicraft, craft printing and related trades workers	11	3	14	0.5%	0.4%	0.5%	0.2%

	Ireland (000's)	Northern Ireland (000's)	All-Island (000's)	Ireland % total	Northern Ireland % total	All-Island % total	Ireland % minus Northern Ireland %
Other craft and related trades workers	15	5	20	0.7%	0.7%	0.7%	0.0%
Stationary plant and related operators	13	6	19	0.6%	0.8%	0.7%	-0.1%
Machine operators and assemblers	48	30	78	2.3%	3.8%	2.7%	-1.5%
Drivers and mobile plant operators	92	34	127	4.5%	4.4%	4.5%	0.1%
Sales and services elementary occupations	77	55	132	3.7%	7.1%	4.7%	-3.4%
Agricultural, fishery and related labourers	12	2	14	0.6%	0.3%	0.5%	0.3%
Labourers in mining, construction, manufacturing and transport	90	20	110	4.4%	2.6%	3.9%	1.8%
Armed forces	6	6	12	0.3%	0.7%	0.4%	-0.4%
Total	**2,048**	**774**	**2,822**	**100.0%**	**100.0%**	**100.0%**	**0.0%**
Occupation not stated	47	4	52	–	–	–	
Total persons in employment	2,095	778	2,873	–	–	–	

Source: CSO QNHS, DETI LFS and Oxford Economics.

Note: Occupation classification based on ISCO 88. Cells shaded in blue in final column indicate Ireland occupation share more than 1 per cent higher than NI occupation share. Cells shaded in lilac in final column indicate Ireland occupation share is more than 1 per cent less than NI occupation share.

Table 4.4: All-Island recent change in employment by occupation

	Change 2001-2007 (000's)			Change 2001-2007 (annual average %)		
	Ireland	Northern Ireland	All-Island	Ireland	Northern Ireland	All-Island
Legislators and senior officials	1	0	1	4%	2%	3%
Corporate managers	8	3	11	0%	1%	1%
Managers of small enterprises	0	-1	-1	0%	-3%	-3%
Physical, mathematical and engineering science professionals	19	5	24	5%	4%	4%
Life science and health professionals	17	1	18	4%	2%	4%
Teaching professionals	19	2	21	4%	1%	3%
Other professionals	24	11	35	5%	8%	6%
Physical and engineering science associate professionals	3	5	8	2%	6%	3%
Life science and health associate professionals	3	8	11	5%	5%	5%
Teaching associate professionals	6	1	6	18%	3%	12%
Other associate professionals	18	6	24	4%	3%	4%
Office clerks	34	7	41	3%	1%	3%
Customer services clerks	5	5	11	2%	5%	3%
Personal and protective services workers	69	2	71	6%	0%	5%
Salespersons, demonstrators and models	32	9	41	5%	3%	4%
Skilled agricultural and fishery workers	-1	9	8	-1%	7%	4%
Extraction and building trades workers	61	7	68	7%	2%	6%
Metal, machinery and related trades workers	2	0	2	1%	0%	0%
Precision, handicraft, craft printing and related trades workers	-1	-1	-1	-1%	-3%	-1%

	Change 2001-2007 (000's)			Change 2001-2007 (annual average %)		
	Ireland	Northern Ireland	All-Island	Ireland	Northern Ireland	All-Island
Other craft and related trades workers	-6	-1	-7	-5%	-4%	-5%
Stationary plant and related operators	-11	1	-10	-10%	2%	-7%
Machine operators and assemblers	-37	4	-33	-9%	2%	-6%
Drivers and mobile plant operators	14	3	17	3%	1%	2%
Sales and services elementary occupations	16	2	18	4%	1%	2%
Agricultural, fishery and related labourers	-2	-1	-3	-2%	-8%	-4%
Labourers in mining, construction, manufacturing and transport	32	-8	24	8%	-6%	4%
Armed forces	0	2	2	-1%	9%	3%
Total	**328**	**77**	**405**	**3%**	**2%**	**3%**

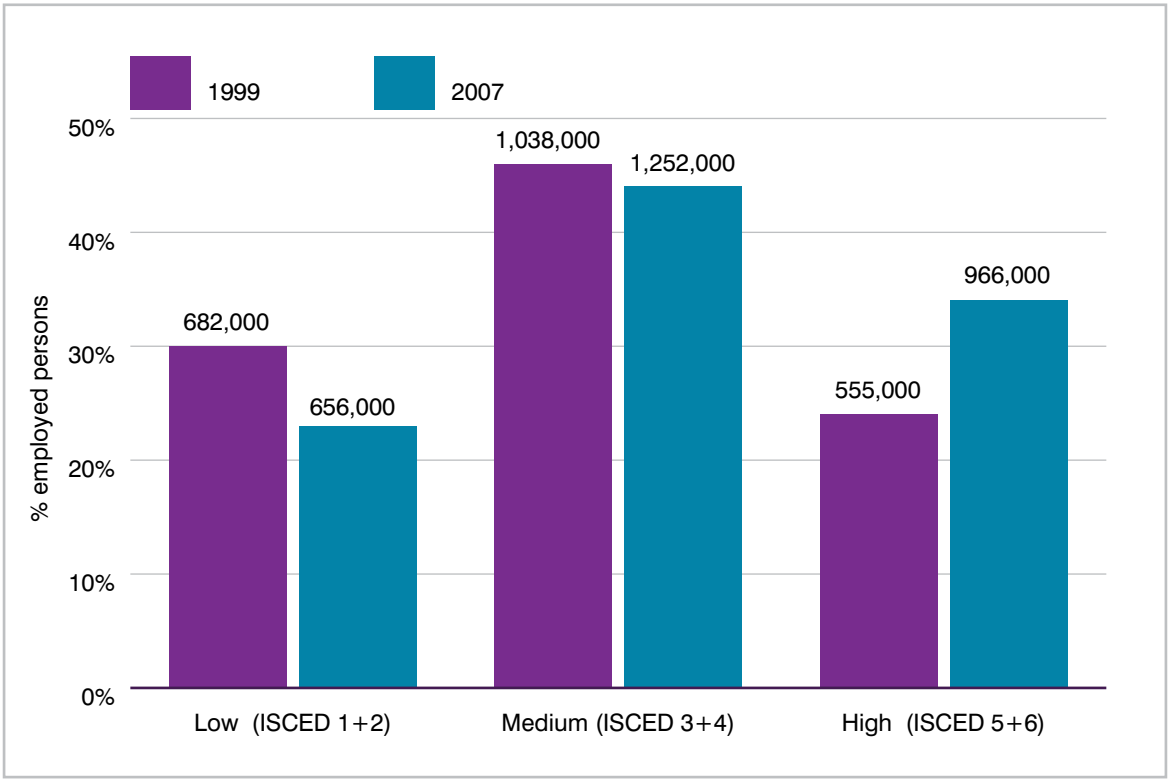
Source: CSO QNHS, DETI LFS and Oxford Economics.

Note: Occupation classification based on ISCO 88. Cells shaded in blue in final three columns indicate an annual average growth rate of more than 3 per cent. Cells shaded in lilac in final three columns indicate an annual average growth rate of less than 3 per cent.

4.3.3 Employed Skills Recent Trends

Figure 4.12 below provides a high level summary of recent all-island trends by share and absolute numbers of employed skill levels. These trends are discussed in depth next, emphasising the growth in employment of persons with high qualifications.

Figure 4.12: All-Island employed persons skills trends – share of total

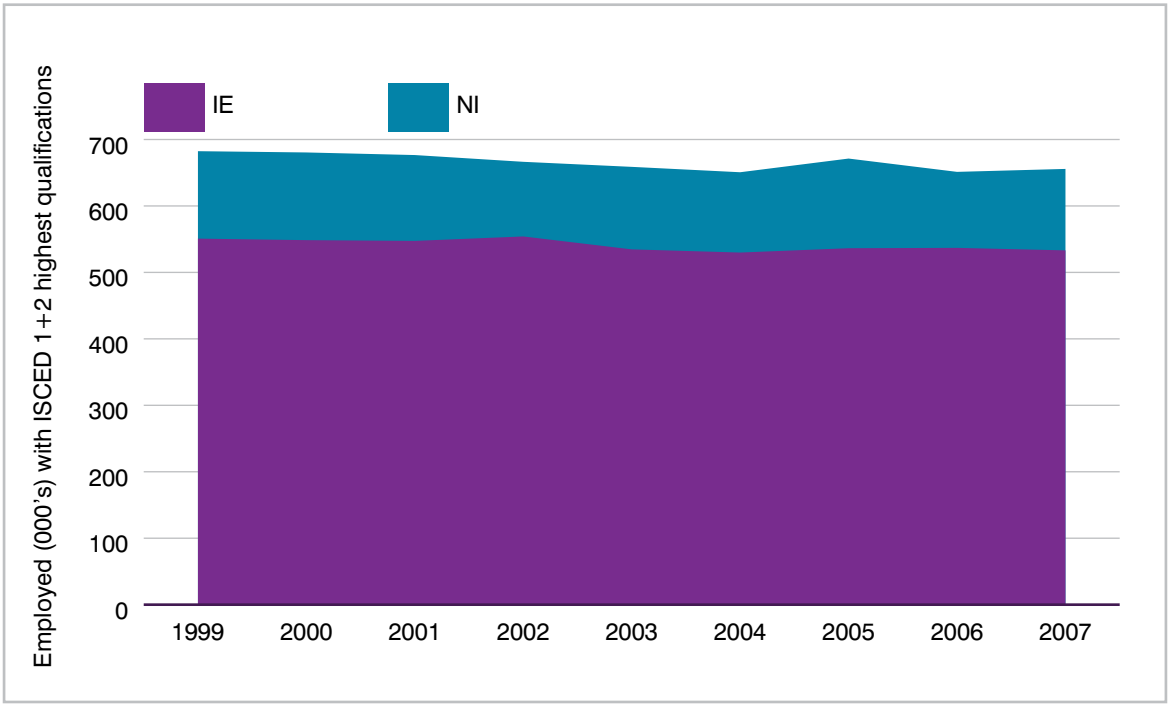


Source: CSO QNHS, DETI LFS and Oxford Economics.

Low qualifications

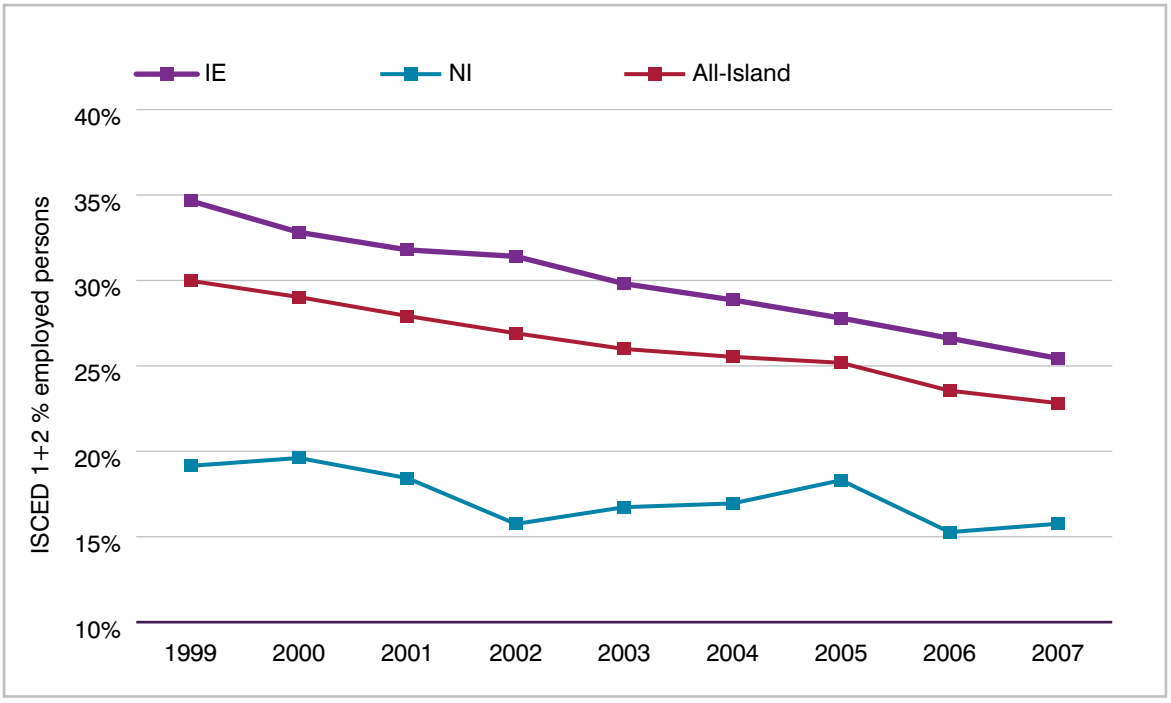
The number of employed persons with low qualifications, while falling in share terms, has not fallen as significantly in absolute numbers as might be expected (Figure 4.13 and 4.24). This is despite the transformation in the all-island economy with the decline in employment in traditionally low skilled sectors such as agriculture and manufacturing sub-sectors such as textiles, and a fall in the number of working-age persons with low attainment levels. The decline overall has been less than 4 per cent in number terms. Much of the explanation for this may be the rapid growth in construction employment which is not forecast to be repeated. Nevertheless this recent evidence of continued, albeit reduced demand for employees with lower level skills is important to bear in mind for forecasting future skill needs.

Figure 4.13: All-Island employed persons skills trends – low qualifications (absolute numbers)



Source: CSO QNHS, DETI LFS and Oxford Economics.

Figure 4.14: All-Island employed persons skills trends – low qualifications (share of total employment)

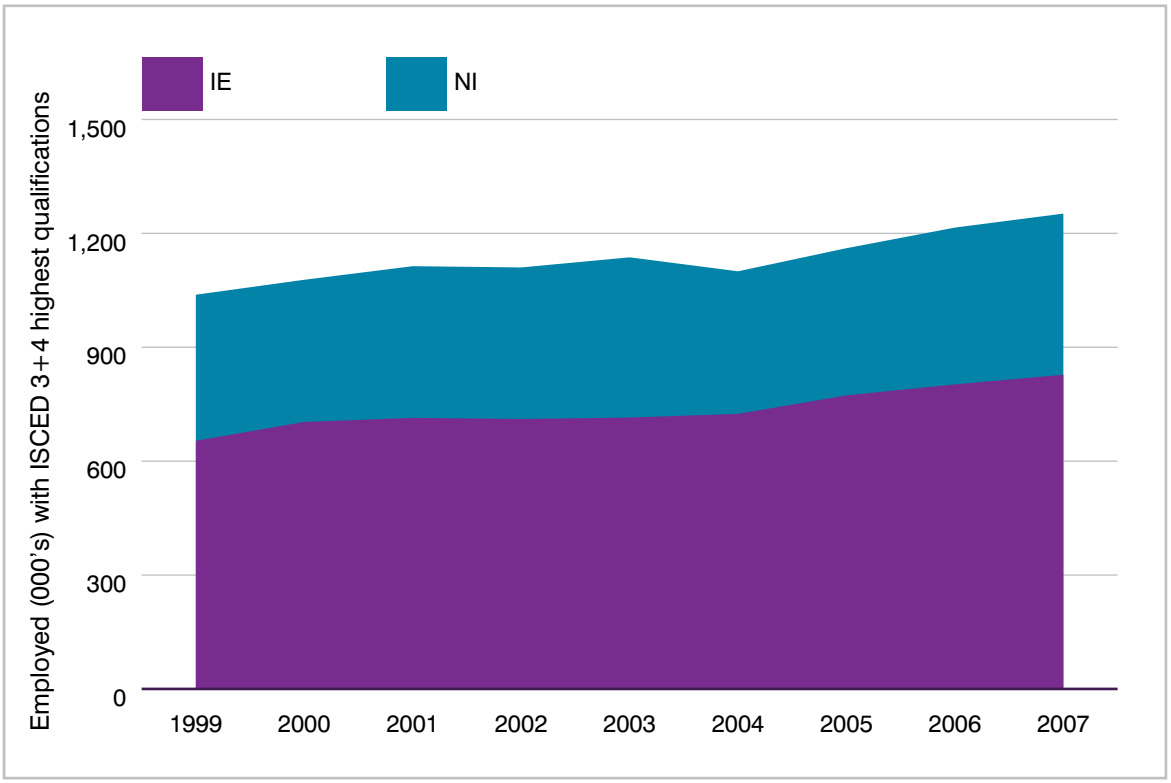


Source: CSO QNHS, DETI LFS and Oxford Economics.

Medium qualifications

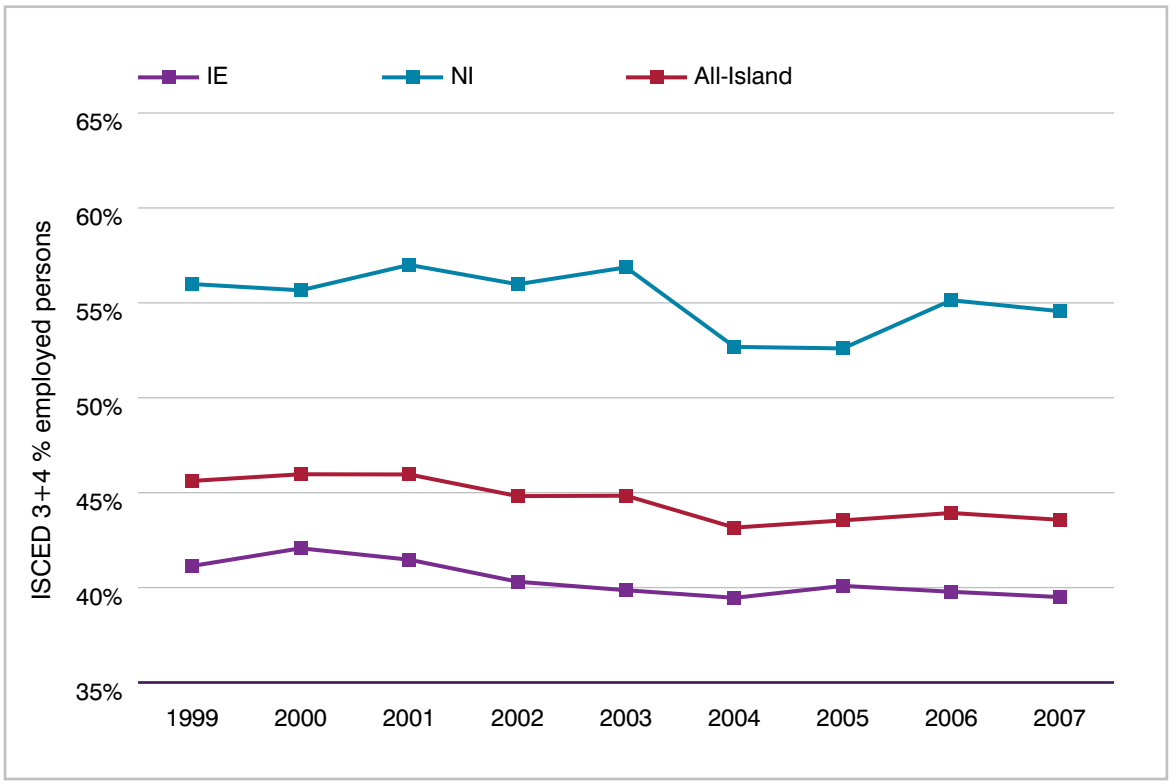
The number of employed persons with medium qualifications has risen moderately though declined slightly in share terms (Figure 4.15 and 4.16). This is a similar trend to that observed for the working-age population as a whole.

Figure 4.15: All-Island employed persons skills trends – medium qualifications (absolute numbers)



Source: CSO QNHS, DETI LFS and Oxford Economics.

Figure 4.16: All-Island employed persons skills trends – medium qualifications (share of total employment)

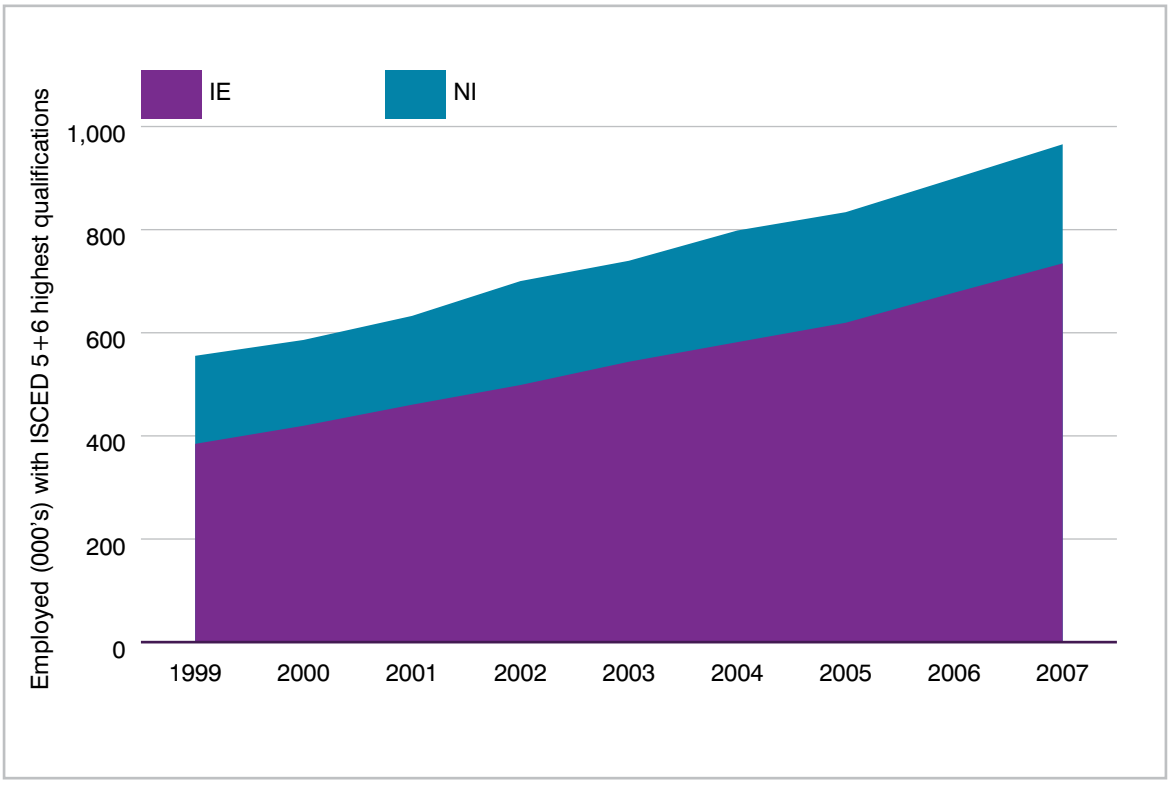


Source: CSO QNHS, DETI LFS and Oxford Economics.

High qualifications

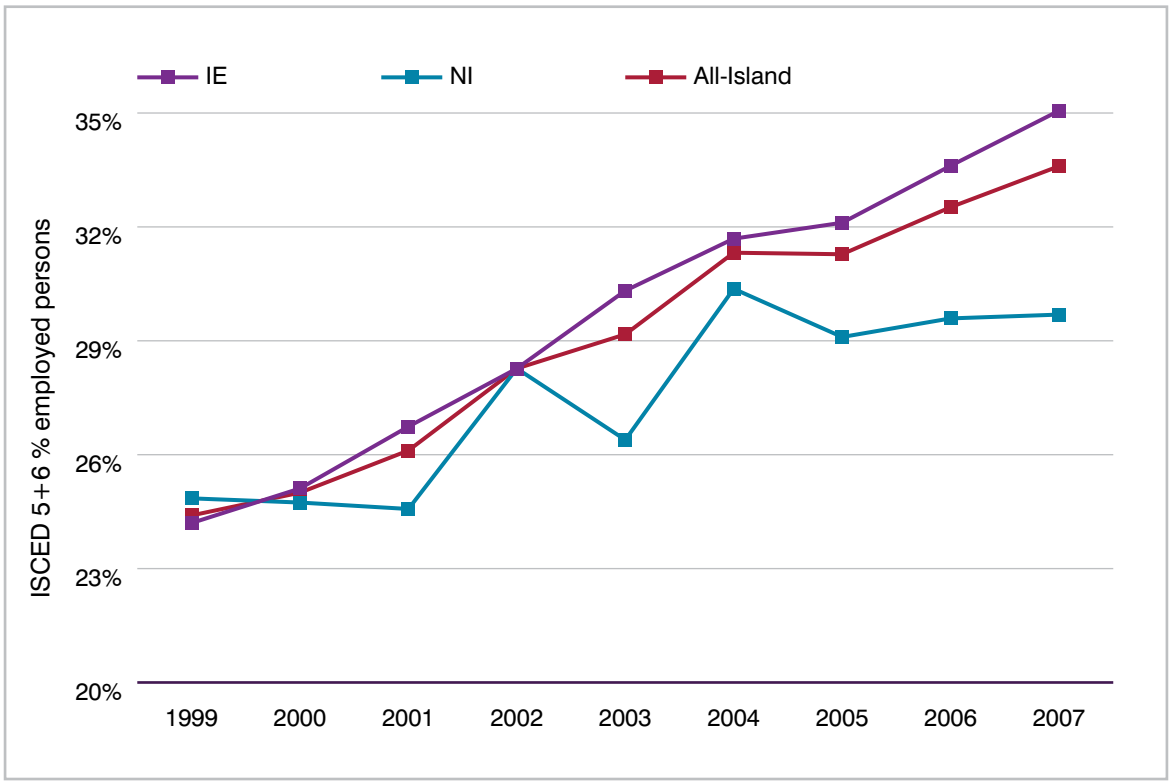
Like the working-age skill trends in the previous chapter, the most marked trend in employment by skill level is the rapid growth in employed persons with third level higher qualifications (Figure 4.17 and 4.18). Again the North and South's shares have moved closely together, although NI's share of employed persons with higher qualifications has remained flat since 2004 according to the LFS. Compared to 1999, the QNHS and LFS estimate that there are now 340,000 more graduates in employment in the All-Island economy.

Figure 4.17: All-Island employed persons skills trends – high qualifications (absolute numbers)



Source: CSO QNHS, DETI LFS and Oxford Economics.

Figure 4.18: All-Island employed persons skills trends – high qualifications (share of total employment)



Source: CSO QNHS, DETI LFS and Oxford Economics.

International comparison of employed skill trends

The CEDEFOP report on 'Future Skill Needs in Europe' presents for the first time a consistent and medium-term forecast along with a historical series of employment and skill needs across the whole of Europe. Table 4.5 below reports historical growth rates in employment by ISCED skill level for the EU25 economies combined from the CEDEFOP report alongside the comparative growth rates for Ireland and Northern Ireland. Broadly-speaking the same pattern of skills employment exists for the EU25 and all-island economy – highest growth for higher qualifications and slight decline in demand for persons with low qualifications.

While NI growth rates are reasonably close to EU25, Ireland has experienced much faster expansion in employment of persons with both medium and higher qualifications and a slower decline in employment of persons with lower qualifications. This is consistent with an earlier point made, that relative to other economies, there was strong growth in the South's economy across a range of sectors with divergent skill needs.

Table 4.5: All-Island employed persons skills trends – comparison with EU25 (annual average growth 1999-2006)

	Ireland	Northern Ireland	All-Island	EU 25
Low (ISCED 1+2)	-0.4%	-2.0%	-0.7%	-1.4%
Medium (ISCED 2+4)	3.0%	1.0%	2.3%	1.4%
High (ISCED 5+6)	8.4%	3.8%	7.1%	2.8%

Source: CSO QNHS, DETI LFS, Oxford Economics and CEDEFOP.

Note a summary of North-South similarities and differences in recent skill demand trends is presented at the end of Part D alongside similarities and differences in future skill demand trends.

4.4 Part B – Skills Demand Issues

This section introduces a more micro and 'on the ground' dimension to skill demand issues and starts to relate demand to supply. In addition it covers the importance of generic skills and in doing so, extends the analysis beyond formal ISCED qualification categories. The section addresses the following skill demand issues:

- Vacancies;
- Hard-to-fill vacancies;
- Skills shortages; and
- The importance of generic skills.

Note data and qualitative commentary on skill demand issues does not refer to the current period as this information is not yet fully available. The most up-to-date information is though presented provided it is available for the same year for both jurisdictions. This should be borne in mind given that the situation for some sectors has changed quite significantly.

4.4.1 Definition of Skill Demand Issues

- **Vacancies** – vacancies provide a useful indicator of the current demand for skills in the economy. Vacancies arise from either the creation of a new position by an employer (expansion demand) or through a person leaving an already existing position (replacement demand). It is not possible to determine whether a vacancy is due to expansion or replacement demand though vacancy data do provide an indication of what sectors and occupations are reporting vacancies and changes over time.

- **Hard-to-fill vacancies** – it is to be expected that some vacancies will prove easier for employers to fill than others. Surveys North and South (see source details in Annex C) are both specifically interested in finding out more about vacancies that employers reported as proving difficult to fill. Note there is no formal definition of a 'difficult to fill' vacancy – this is normally defined in terms of the individual business questioned and their current situation.

- **Skill shortages** – skill shortages are defined as those vacancies difficult to fill due to a lack of skills, a lack of qualifications required or a lack of work experience that the employer requires.

- **Labour shortages** – defined as difficult to fill vacancies where there is an insufficient number of individuals willing to take up employment opportunities.

Note the EGFSN defines skill and labour shortages in relation to the existing Irish workforce as mobile migrant labour is often relied upon to fill vacancies due to either skill or labour shortages.

Countries tend to minimise skill and labour shortages by having points-based migration policies and explicit policies to import labour, e.g. some of the Arab oil states. Were it not for the influx of Eastern European and other migrants to Ireland and later Northern Ireland with wide ranging skills, the All-Island economy would likely have grown slower due to major skill and labour shortages. Note there are often 'blurred edges' between labour and skill shortages and the terms are sometimes used inter-changeably which is incorrect. For clarity it is preferable to think of labour shortages in terms of lack of people (who could be relatively easily trained to fill a position) and skill shortages in terms of lack of appropriately qualified and experienced people. This is the principle used in the FÁS National Skills Bulletin 2007.

- **Skill gaps** – another skills issue, often confused with but differentiated from skill shortages, is that of skill gaps. Skill gaps exist not where there are hard-to-fill vacancies but within the workplace where there is a gap between an employee's current skill level and what is needed to meet work objectives (i.e. a similar concept to over-employment, opposite of under-employment).

- **Utilisation of skills** – closely related to skill gaps, but from the opposite perspective, is utilisation of skills. This refers specifically to workers in possession of a higher (or lower) qualification than is required for the job currently occupied.

  Analysis of skill gaps and utilisation of skills is not presented in this study due to lack of comparable information across both jurisdictions. Although it is interesting to make the point that in NI, according to the 'Skills at Work in NI 2006' report, a third of workers are in possession of a qualification which is higher than the qualification required for the job they currently occupy (according to respondent's view). Note this is not necessarily a disadvantage for an employer as 'over qualification' may lead to higher productivity or a better service. The prevalence of lack of utilisation of skills is quite striking given other evidence on skill shortages and skill gaps. Job and skill matching may therefore be a problem in terms of matching people and their skills to jobs that require them. No economy can expect perfect job matching but moving towards the most efficient use of labour and skills and minimising labour shortages and skill shortages and gaps is clearly central to the skills agenda.

- **Generic and 'soft' skills** – these skills, which are increasingly recognised alongside more formal qualifications, facilitate flexibility and responsiveness and encompass a broad range of transferable attributes ranging from numeracy and literacy to the development of soft skills such as inter-personal understanding and effective communication.

A brief outline and description of the main sources for these skill demand issues is provided as an annex chapter (Annex C).

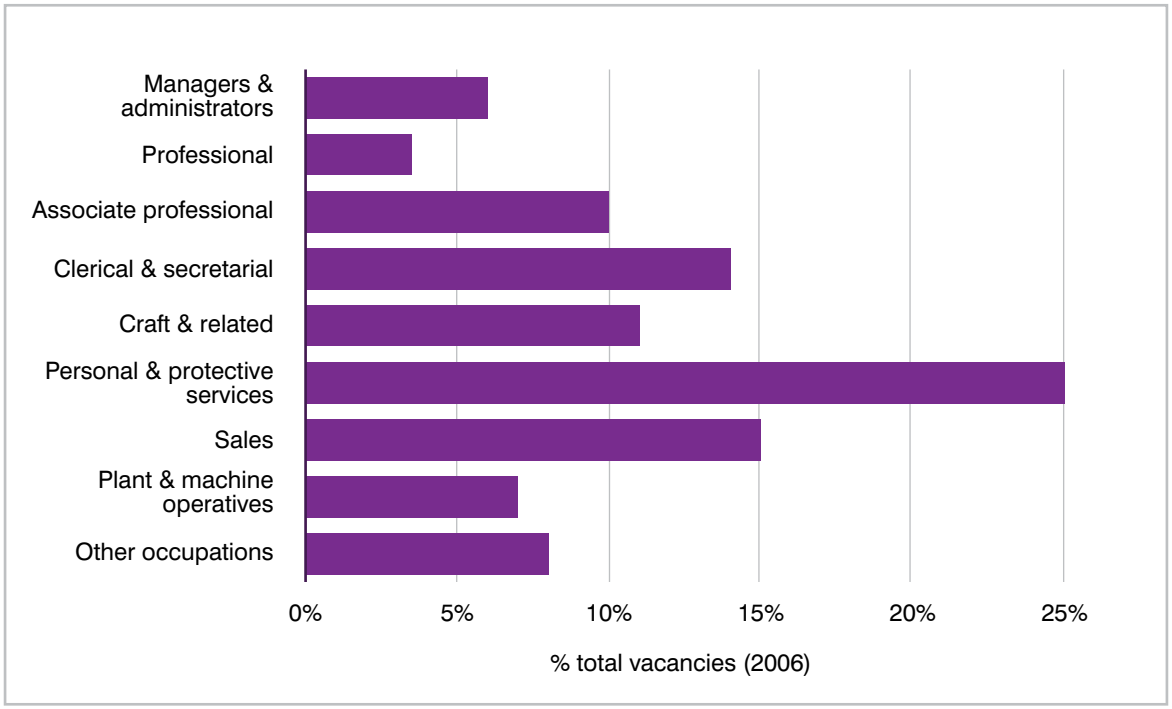
4.4.2 Vacancies

Ireland

FÁS vacancy data for 2006 generally show a broad spread of vacancies across occupations, though for the year in question there was a noticeably higher number in personal & protective service and sales occupations (Figure 4.19). The broad range of vacancies is consistent with the recent pattern of employment growth in the South across a number of sectors.

The Irishjobs.ie vacancy data for the same period in contrast shows a different pattern, with vacancies skewed towards higher grade occupations (Figure 4.20). This should not be seen as conflicting evidence with FÁS vacancy data since the two sources serve somewhat different markets and neither are entirely comprehensive.

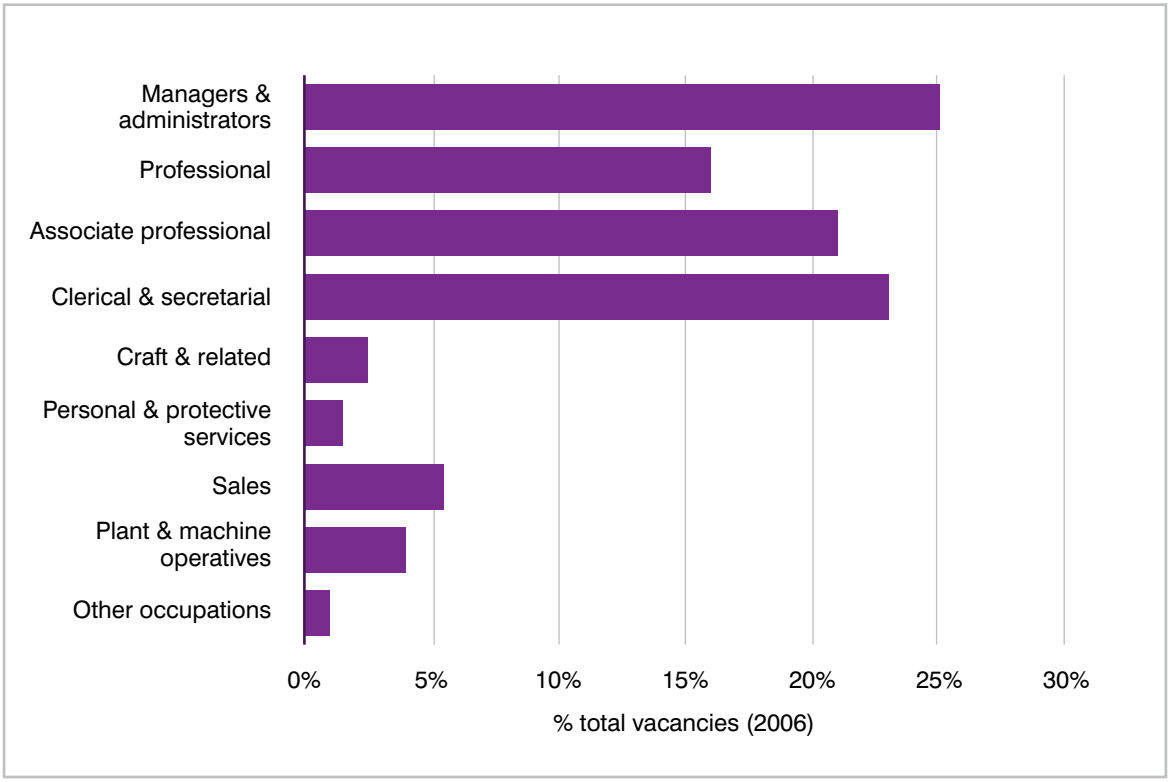
Figure 4.19: Ireland vacancies by occupation – FÁS (2006)



Source: FÁS (FÁS/EGFSN National Skills Bulletin 2007).

Note: Based on SOC 1990 occupation classification. Vacancies recorded are those notified to FÁS.

Figure 4.20: Ireland vacancies by occupation – Irishjobs.ie (2006)



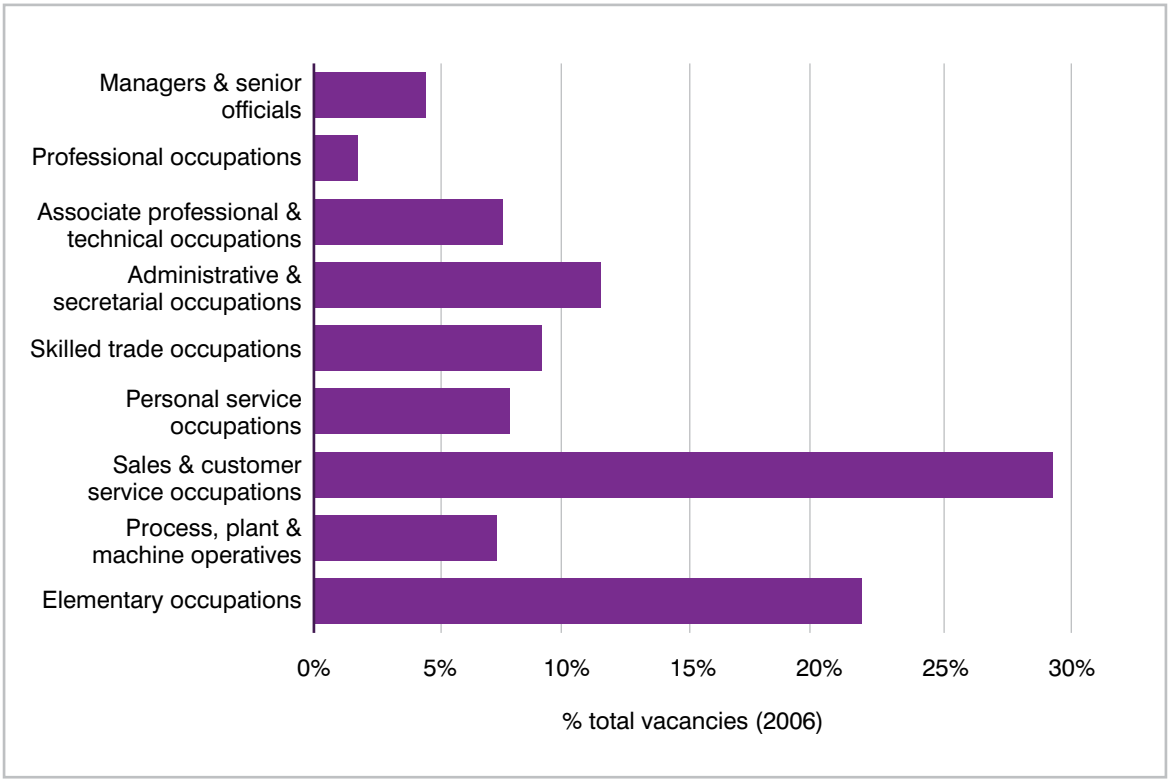
Source: Irishjobs.ie (FÁS/EGFSN National Skills Bulletin 2007).

Note: Based on SOC 1990 occupation classification. Vacancies recorded are those advertised in Irishjobs.ie.

Northern Ireland

Half of all vacancies notified to DEL in 2006 were in two occupations – sales & customer service and elementary occupations (Figure 4.21). This distribution is similar in one respect to FÁS vacancies (sales occupations) and different in another – fewer elementary vacancies in the South. The latter may be explained in part by to the timing of economic cycles with NI experiencing a later boom in construction (i.e. construction labourers in elementary occupations). Though note also that different occupational classifications are used (SOC 1990 and SOC 2000) so an exact North-South comparison is not possible. DEL also collects information on 'executive' jobs advertised in the Belfast Telegraph by industry though this is not comparable to the Irishjobs.ie vacancies as it is exclusively focused on 'executive' jobs.

Figure 4.21: Northern Ireland vacancies by occupation – DEL (2006)



Source: DEL.

Note: Based on SOC 2000 occupation classification. Vacancies are those vacancies notified to Jobcentre/Jobs & Benefits offices of DEL. The statistics do not represent the total unsatisfied demand for staff by employers within Northern Ireland but are only those vacancies notified by employers to the Department. The reported statistics represent the original number of vacancies notified by each employer. Employers may subsequently amend the original amount by adding or cancelling vacancies. The reported statistics do not take into account such amendments.

Note it is also not possible to sum of FÁS and DEL vacancies in 2006 as FÁS vacancy data in the EGFSN National Skills Bulletin are only provided by occupational shares of the total.

4.4.3 Hard-to-fill Vacancies

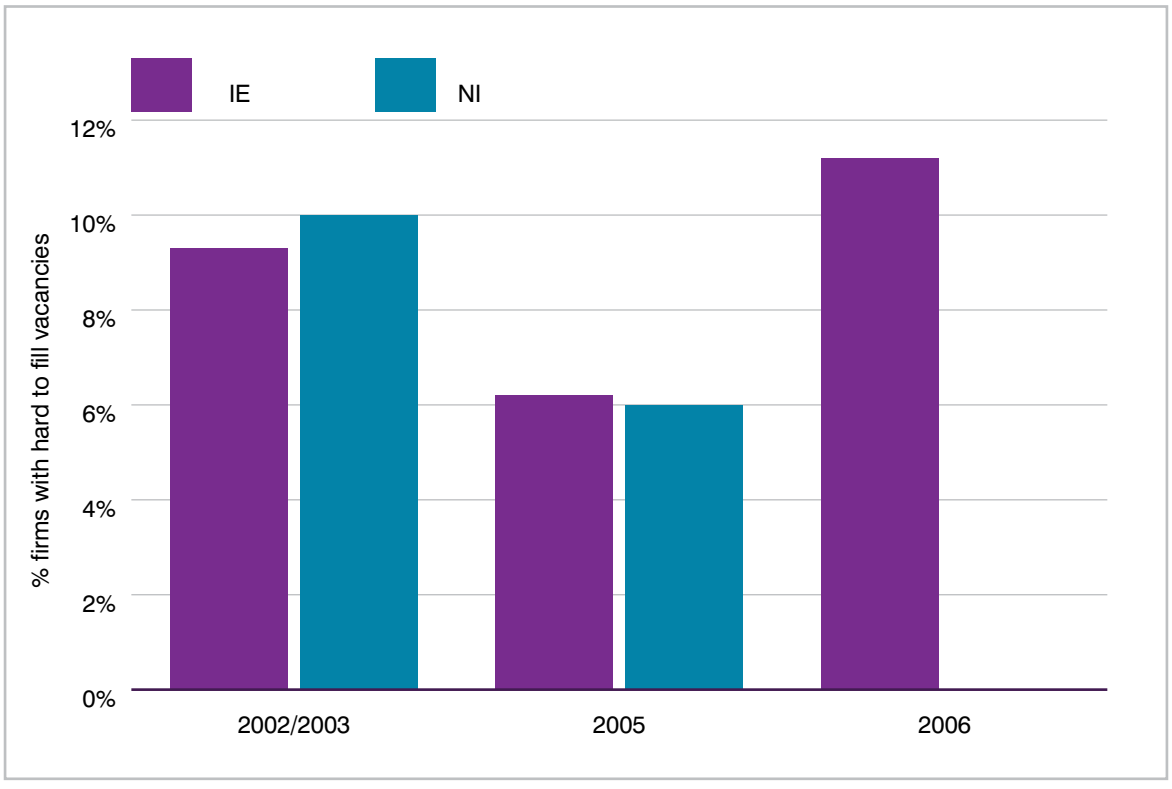
Ireland

The share of firms reporting hard-to-fill vacancies (i.e. mentions) fell in 2005 before rising to just over 11 per cent in 2006 (Figure 4.22). The fall in 2005 relative to 2003 may be explained by an influx of migrant labour to fill labour and skill shortages. Ireland's growth in hard-to-fill vacancies between 2005 and 2006 has been largely in industry, with engineering positions in particular most difficult to fill.

Northern Ireland

The shares of firms with hard-to-fill vacancies in NI also fell between 2002 and 2005. No data are available for NI since 2005 though we might expect, at least towards the end of 2006 during the main influx of migrants to NI, that hard-to-fill vacancies would not have increased to the same degree as for the South, even though the NI economy was growing strongly during this period.

Figure 4.22: All-Island hard-to-fill vacancies



Source: FÁS/ESRI and NI Skills Monitoring Survey.

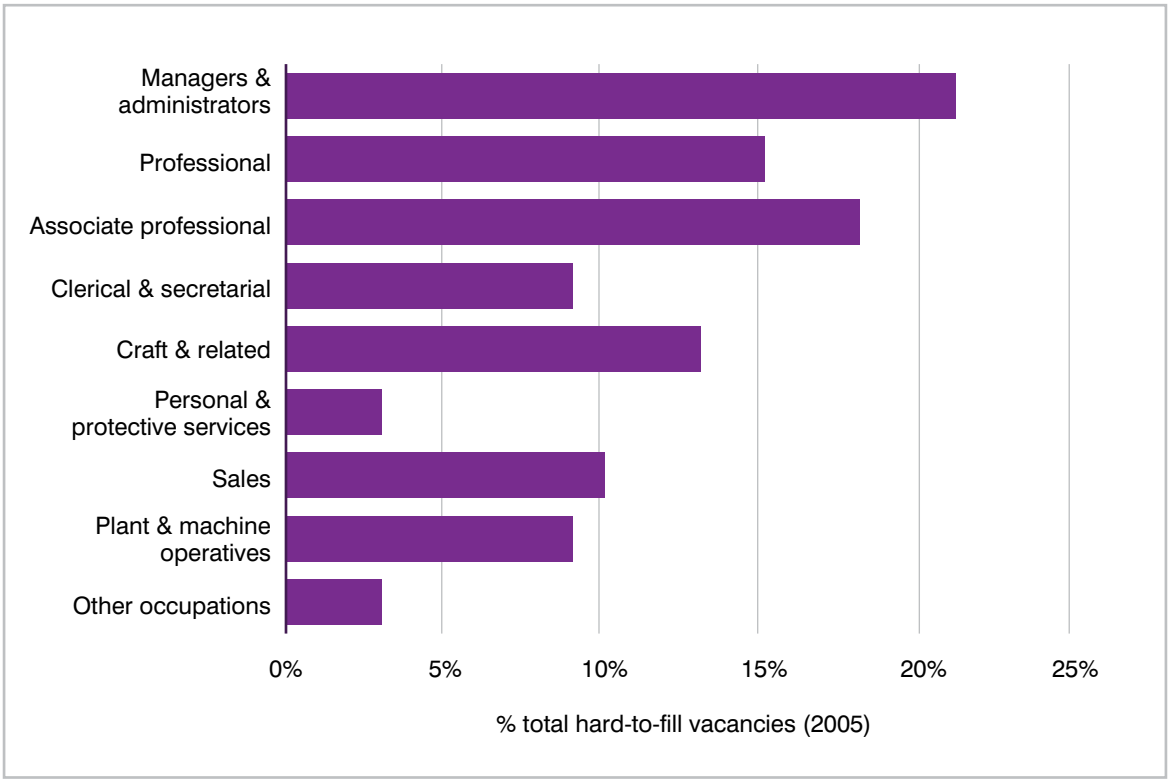
Note: Northern Ireland data refers to 2002 and 2005. Ireland refers to 2003, 2005 and 2006.

Hard-to-fill vacancies by occupation

Comparing North-South hard-to-fill vacancies by occupation for the latest year data are available (2005)[10], again a divergent pattern emerges with the South's hard-to-fill vacancies more skewed towards professional and managerial occupations and the North's towards elementary and personal service occupations (Figure 4.23 and 4.24).

Notwithstanding the differences in occupation classification, these differences are important and could be indicative of a number of trends worthy of further consideration. These could include higher demand, in relative terms, for managers and professionals in the South due to sectoral patterns in growth and the quality of jobs being created; high leaving rates in NI for lower grade occupations and the difficulty attracting the local non-employed and migrants to enter employment in these occupations, or a shortage of migrants in NI. Another way to para-phrase this situation might be to say that hard-to-fill vacancies in the South may be more related to skill shortages and in NI to labour shortages but more up-to-date data would be required to confirm this.

Figure 4.23: Ireland hard-to-fill vacancies by occupation (2005)

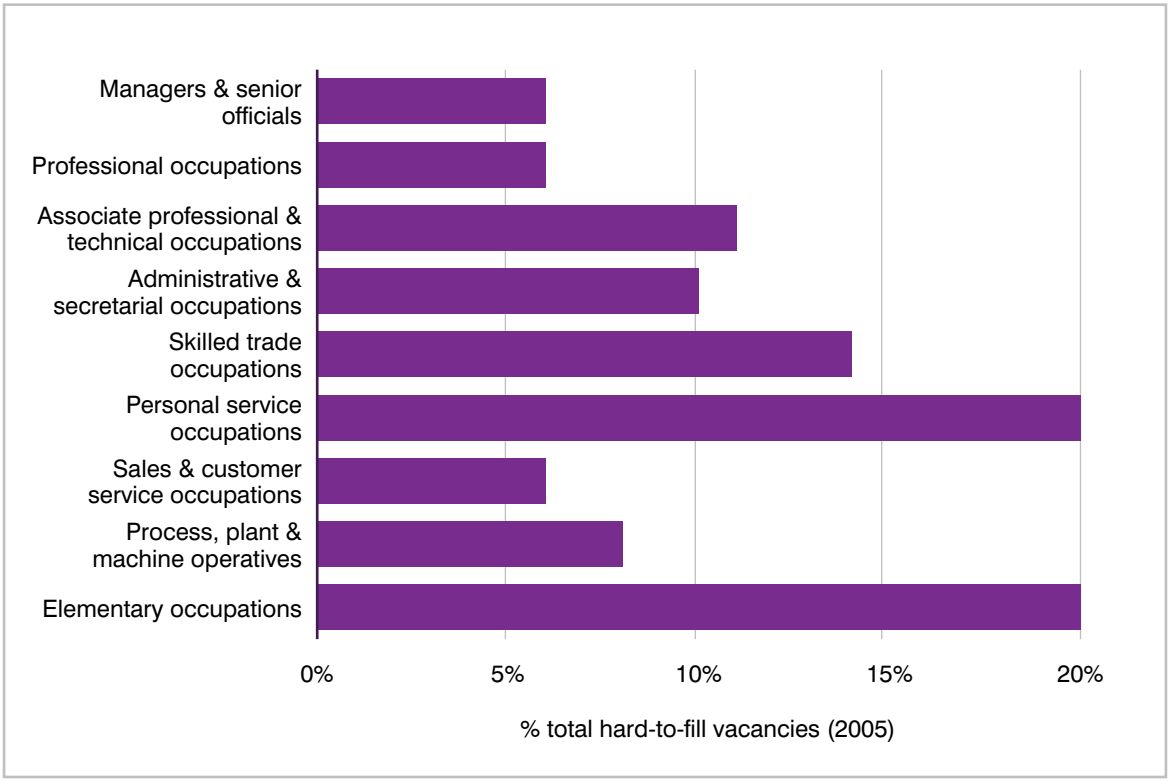


Source: FÁS/ESRI.

Note: Based on SOC 1990 occupation classification.

10 More recent data for 2006 is available for the South but is not presented as it is preferable to make North-South comparisons for the same period.

Figure 4.24: Northern Ireland hard-to-fill vacancies by occupation (2005)



Source: NI Skills Monitoring Survey.

Note: Based on SOC 2000 occupation classification.

Further analysis of NI's hard-to-fill vacancies in 2005 from the NI Skills Monitoring Survey revealed the following characteristics: larger employers with 50 or more staff were more likely to report a current difficult to fill vacancy; the financial services sector had the highest incidence of employers reporting difficult to fill vacancies; the most frequently mentioned main reason for difficulty in filling these vacancies were the lack of skills that the company demands (20 per cent) and not enough people interested in that type of work (20 per cent); and difficulties in recruitment clearly had an impact on business – over half of the difficult to fill vacancies caused difficulties in meeting customer service objectives.

4.4.4 Skill Shortages

Ireland

It is understood that actual quantitative analysis of skill shortages has not been undertaken for the South (or at least it is not presented in the EGFSN National Skills Bulletin). However the bulletin does provide a very useful and detailed table of demand and shortage indicators for a wide range of occupations at the time of publication, which indicates whether an occupation has no shortage, a labour shortage or a skill shortage. As expected, labour shortages are more common in lower grade occupations e.g. private security occupations, domestic child minders, sales assistants, labourers in agriculture and construction. Skill shortages in contrast arise more frequently for higher grade occupations and were identified in the following sectors/professions according to the FÁS/EGFSN National Skills Bulletin. To reiterate an important point made earlier, this analysis below relates to the date of publication of the bulletin. Skill shortages in some sectors are likely to be different at the time of writing this report. A more up-to-date picture of skill issues on some of the sectors below is presented in Part C.

- **Construction:** At the time of publication there was a shortage of experienced quantity surveyors and building managers (site managers and construction project managers). Current skill issues are discussed under priority industry section of this chapter (Part C).
- **Financial services:** Demand in the international segment of the sector is driven by two forces: the expansion of back office activities which represent a core platform of the sector and the demand which is arising from the expansion of middle and front office activities which are associated with higher added value and higher skills. In terms of specific skills, there were skill shortages in the areas of accounting (financial reporting and audit), quantitative finance (risk and investment analysis) and compliance (regulatory issues).
- **Engineering:** There was evidence of skill shortages of engineers of all types.
- **Information technology:** There were shortages of software engineers and computer analysts/ programmers with employers continuously sourcing IT skills from abroad.
- **Health:** There was evidence of shortages in many healthcare occupations including medical practitioners, dentists, various types of therapists and radiographers. Despite a recent increase in supply from the education system, work permit data indicated that many nurses continue to be sourced from abroad, suggesting difficulties at the time in attracting and retaining staff in the profession.
- **Sales:** Marketing managers were being increasingly sourced from non-Irish stock indicating a skills shortage in this area.
- **Manufacturing:** In terms of specific job titles, there were shortages of aircraft mechanics, lift installation engineers and sheet metal mechanics.

Northern Ireland

According to the 2005 NI Skills Monitoring Survey, overall 34 per cent of difficult to fill vacancies were due to skill shortages, sometimes termed external shortages. Skill shortages in NI in 2005 were more prevalent within the transport and communications (63 per cent of difficult to fill vacancies in that sector), construction (53 percent) and business services (51 per cent) sectors. In terms of occupations, skill shortages were most prevalent for sales staff (72 per cent) as well as managers and senior officials (67 per cent). The most common skills reported by employers as lacking from applicants were other technical and practical skills (35 per cent of external skill shortages), communication skills (30 per cent) and customer handling skills (22 per cent of skill shortage vacancies).

North-South comparison of skill shortages

Clearly the evidence on skill shortages from the NI Skills Monitoring Survey is more quantitative, relative to the information in Ireland's National Skills Bulletin. This makes it difficult to make direct skill shortage comparisons as for Ireland it is difficult to conclude, based on qualitative evidence, which sectors have a greater skill shortage problem. However some North-South commonalities are evident in that some of the same sectors (at the time of publication) reported skill shortages (construction and professional services) and these tended to be for higher grade occupations. Further information on commonalities and difference in skill shortages in priority industries is presented in Part C.

4.4.5 Importance of Generic and 'Soft' Skills

When considering the varying dynamics behind the demand for skills – particularly in the context of a rapidly changing environment – it is necessary to address the importance of generic skills and the changing nature and role of such skills. These skills facilitate flexibility and responsiveness and encompass a broad range of transferable attributes ranging from numeracy and literacy to the development of soft skills such as inter-personal understanding and effective communication. Indeed these skills are considered to be useful predictors of effective workplace performance and have become increasingly relevant to jobs at all skills levels. The importance of such skills for an employee's future employability and for both employers and the economy in general is recognised in the international literature.

The growing understanding of the centrality of generic skills to the modern workplace reflects the ongoing impact of globalisation and the requirements of today's knowledge economy and to this end, the traditional economic focus on production has been superseded by a greater emphasis upon maintaining market competitiveness by delivering innovative, consumer-centred services with a consequent need for greater skills, particularly in terms of team-working and innovation.

The importance of transferable skills such as good communication, inter-personal skills and team-working reflects a well-trained and capable workforce, albeit a flexible one. This importance is clearly articulated by Joyce (2001):

> *"Generic skills, soft skills….key competencies….people skills – many names for the same thing. Basically, they can be defined as those skills that are common to many vocations and are not specific to one job or industry".*

The EGFSN has also noted the importance of such skills in Tomorrow's Skills – Towards a National Skills Strategy (2007). This report underscores the rapidly changing nature of the current environment and the emerging importance of knowledge work. A continuing shift towards the services and value-added manufacturing sectors is a feature of this environment in tandem with an associated rise in the incidence of managerial, professional and services employment. In line with this trend towards knowledge work and the demand for those with high-level skills, there is now a greater emphasis upon those generic skills, which are the hallmark of a flexible and responsive workforce including literacy, numeracy and the use of ICT.

Given the changing nature of both work and the skills required in the modern workplace, attributes such as individual initiative, judgement and continuous learning have come to be seen as increasingly necessary. As a result it has become ever more important for employees to 'acquire a range of generic and transferable skills and attitudes' (EGFSN, 2007). To this end, the aforementioned report concluded that the following should form part of any generic skills portfolio:

- **Basic/fundamental skills** — such as literacy, numeracy, IT literacy;
- **People-related skills** — such as communication, interpersonal, team-working and customer-service skills; and
- **Conceptual/thinking skills** — such as collecting and organising information, problem solving, planning and organising, learning-to-learn skills, innovation and creativity skills, systematic thinking.

The emergence of the knowledge economy has also shaped the type of generic skills which employers consider essential. In other words, employees are increasingly required to build upon basic skills – such as literacy and numeracy – and to master ICT, innovation and learning how to learn in order to maintain their employability. The changing nature and increasing importance of specific generic skills is more clearly understood within the context of changing economic realities and Carnevale and Desrochers (1999) have noted:

> *"... the new service-orientated manufacturing economy and growing services economy demand a more complex set of performance standards".*

4.4.6 Summary of Current Skills Demand Issues

North-South similarities/differences in skills demand issues

Similarities	Differences
■ Similar share of firms reporting hard-to-fill vacancies in 2002/03 and 2005. ■ Although difficult to make direct North-South comparisons of skill shortages based on the available information, some commonalities are evident in that some of the same sectors (at the time of publication of reports) identified skill shortages (construction and professionals services) and these tended to be for higher grade occupations.	■ Evidence in 2006 suggested NI vacancies were more concentrated in lower grade occupations whereas vacancies in the South in the same period were more broadly spread across occupations (FÁS). This may be partly due to the later influx of migrants to NI to fill positions in lower grade occupations. ■ There was a divergent pattern in the nature of hard-to-fill vacancies for the latest comparable year (2005). Hard-to-fill vacancies in the South were more skewed towards managerial and professional occupations and in NI towards elementary and personal service occupations.

4.5 Part C – Skills Demand in Specific Key Industry Sectors

In addition to the preceding investigation of the comparability of North-South data, a programme of consultations with representatives of a number of key industry sectors was undertaken in order to develop an up-to-date picture of skills demand on an all-island basis in five key sectors.

The purpose of these consultations was to develop a greater insight into:

- current skills demand for each sector;
- trends in skills demand over time for each sector; and
- drivers of change in skills demand.

These consultations sought to gain greater insights into the all-island nature of the current and future demand for skills and to identify commonalities between North and South. In doing so, they help draw out any divergent trends and/or causalities between the neighbouring jurisdictions but also place the overall evidence within an all-island context. This work has also drawn from the extensive literature that exists both North and South on each of these sectors and that work is referenced in Annex E. This analysis does not seek to duplicate that work, rather it seeks to draw upon it to identify key all-island skills issues.

4.6 Sectors for Consideration

Five sectors were selected for the purposes of a more detailed analysis of skills demand. These sectors are likely to play a key role in promoting economic growth across the Island of Ireland in the years to come. The sectors chosen for more detailed consideration were Tourism and Hospitality, Construction, Engineering, ICT and Financial Services. The rationale for their inclusion is presented in Table 4.6.

As well as a number of consultations with sectoral representatives, cognisance was also taken of a range of published sources including:

- various publications by the Expert Group on Future Skills Needs (EGFSN) into the skills needs of specific sectors;
- the National Skills Bulletin 2007;
- ESRI Current Trends in Occupational Employment and Forecasts for 2010 and 2015 (September 2006);
- relevant Sector Skill Council reports in NI; and
- the Northern Ireland Skills Monitoring Survey 2005.

It should also be noted that each sector under review has a large 'footprint', covering a wide range of different industries and occupations. As a result, the 3-digit ISCO 88 occupation data for All-Island, Ireland and NI presented in Annex A is not sufficiently detailed permit a comprehensive or comparable occupational assessment of each sector under review. For example, Restaurant managers are classified within ISCO's 'Production and operations managers' occupation – an aggregation of 20 other occupations such as Bank Managers and Managers in Building. For this reason the, statistical information for each sector assessed here is limited to an overview.

Table 4.6: Sectors for consideration

Sector	Rationale
ICT	**The National Skills Bulletin cites:** *Shortages of Software Engineers.* *Shortages of Computer Analysts.* *Projected Strong Growth in IT employment.*
	E-skills UK (in NI Skills Monitoring report) cites: *Higher than average Percentage of Difficult to Fill Vacancies due to External Skills Shortages.* *Higher than average Skills Shortage Vacancy Gap.*
Engineering/Life Sciences	**The National Skills Bulletin cites:** *Shortages of Engineers of all types.* *Declining science uptake at university suggests future shortages.* *Technician level occupations reporting hard to fill vacancies.*
	Summit Skills (in NI Skills Monitoring report) cites: *Higher than average 'Percentage of Difficult to Fill Vacancies due to External Skills Shortages'.* *Higher than average 'Skills Shortage Vacancy Gap'.* *Higher than average 'Skills Gap Rate'.*
	SEMTA (in NI Skills Monitoring report) cites: *Higher than average 'Percentage of Difficult to Fill Vacancies due to External Skills Shortages'.* *Higher than average 'Skills Shortage Vacancy Gap'.*
Construction	**The National Skills Bulletin cites:** *Current shortage of architects not expected to continue in medium term.* *Significant Shortage of Experienced Quantity Surveyors.* *Shortage of site managers/project managers.* *NDP expected to exacerbate skills shortages in civil engineering.*
	Construction Skills (in NI Skills Monitoring Report) cites: *Higher than average 'Percentage of Difficult to Fill Vacancies due to External Skills Shortages'.* *Higher than average 'Skills Shortage Vacancy Gap'.* *Higher than average 'Skills Gap Rate'.*

Sector	Rationale
Financial Services	**The National Skills Bulletin cites:** *Reported shortages in accounting, Quantitative Finance and Compliance.*
	Financial Services Skills Council (in NI Skills Monitoring Report) cites: *Higher than average 'Percentage of Difficult to Fill Vacancies due to External Skills Shortages'.* *Higher than average 'Skills Shortage Vacancy Gap'.* *Higher than average 'Skills Gap Rate'.*
Tourism and Hospitality	**Economically significant sector for the Island economy:** *Higher than average 'skills gap rate'.*

4.7 Tourism and Hospitality

The tourism and hospitality sector covers a wide range of occupations including the following:

■ Bar staff	■ Commis Chef
■ Chef	■ Travel and flight attendants
■ Waiter	■ Travel agency manager
■ Hotel and accommodation managers	■ Kitchen Porter
■ Publicans	■ Concierge
■ Hotel receptionist	■ Leisure club manager
■ Front of house manager	■ Retail travel consultation
■ Conference and banqueting manager	■ Restaurant manager

4.7.1 Sector Size

Ireland

In 2005, the tourism-related industry in the South accounted for a total employment of approximately 246,000 jobs. The strong growth in both incoming visitor numbers and domestic tourism – combined with substantial capital investment – means that tourism has been a major source of job creation with 17,000 jobs (or 7 per cent) added between 1999 and 2005. By 2005, tourism-related activities (i.e. restaurants and licensed premises) accounted for more than 60 per cent of these jobs with the balance comprising accommodation and tourist attractions.

Northern Ireland

In NI, the Sector Skills Council, People 1st, suggests that close to 46,000 people work across the tourism and hospitality sectors with almost one third of these employees working in restaurants. Two-thirds of the employees are female and close to 40 per cent of total employees are working in elementary occupations such as kitchen assistants, waiting staff and bar staff.

All-Island

The Tourism and Hospitality sector makes a significant contribution to the all-island economy and provides employment to around 290,000 people across a diverse range of occupations.

4.7.2 Trends in Skills Demand

Ireland

The National Skills Bulletin (FÁS, 2007) suggests the trend in demand for personnel varies between occupations in this sector. For instance, the number of persons in occupations such as chefs, waiting staff and bar staff experienced strong annual average growth of 4 per cent over the period 2001/06. By contrast, the number of persons working as restaurant managers (-1 per cent), hotel managers (-5 per cent) and flights attendants (-8 per cent) declined over the same period. When considering these trends in demand for staff it is important to note that the hospitality and tourism sector has traditionally been characterised by a high staff turnover with approximately 5,000 vacancies per annum. This, in turn, has tended to drive an ongoing demand for skilled (and semi-skilled) personnel across the sector.

In recent years employers have frequently cited vacancies for both chefs (particularly commis chefs) and waiting staff as difficult to fill and that these occupations had become particularly reliant upon migrant labour. Nevertheless, the feedback received as part of the consultative process indicates that these trends have begun to change within the context of the altered macroeconomic climate. This has led to a reduced reliance upon migrant workers parallel to a greater focus upon those factors which can drive higher staff productivity including the importance of generic skills (i.e. customer service, supervisory skills, etc.).

Northern Ireland

People 1st is currently reporting that across the UK, the sector is characterised as suffering from a high proportion of hard-to-fill vacancies, relatively low skill shortages and high levels of skills gaps within the current workforce. In their Northern Ireland profile (2008) People 1st quotes the 2005 NI Skills Monitoring Survey which shows that there were 1,800 vacancies and 900 ‘hard to fill’ vacancies in NI, with 10 per cent of employers in the sector reporting skills gaps.

The aforementioned published information was also supplemented through discussions with representatives of these sectors in NI. The key message coming from these discussions is that there remain hard to fill vacancies and that this is particularly prevalent among chefs and reception staff. Indeed, one reason offered for the shortage of head chefs was a lack of 'flow through' from more junior levels (i.e. poor staff retention).

Moreover, the growth in contact centre employment was cited as a reason for the difficulties in recruiting reception staff given that this is viewed as a major competitor for the types of skills required for hotel reception work (personable, IT literate, customer focused).

4.7.3 Tourism Skills Demand: All-Island Perspective

A series of common issues are clear in the tourism sector from an all-island perspective. Firstly, a recurrent theme emerging from this research relates to the high proportion of hard-to-fill vacancies – specifically with regard to chefs – and the problems posed by high staff turnover within the sector (i.e. poor staff retention), both North and South. Similarly, the sector has tended to be reliant upon migrant labour in recent years although the current economic slowdown may be a key determinant of the easing of such pressures.

Generic skills play an important role in the tourism and hospitality sector, both North and South. Specifically, the delivery of a high-quality product to those visiting either jurisdiction requires that staff display a range of key skills including English language competency and a focus upon customer service.

Finally, the tourism and hospitality sector will continue to play a significant role in the All-Island economy and in doing so, will act as an important driver of future economic growth. As part of this process, the sector will continue to be a source of demand for a broad mixture of skills and in order to ensure that this demand is met, the sector will need to address a range of issues relating to staff turnover, the importance of generic skills and the scope for productivity improvements.

4.8 Construction

The construction sector covers a wide range of occupations including the following:

■ Senior & executive managers	■ Floorers
■ Business process managers	■ Glaziers
■ Construction managers	■ Specialist building operatives
■ Office-based staff (excl. managers)	■ Scaffolders
■ Other professional/technical staff & IT	■ Plant operatives
■ Wood trades & interior fit-out	■ Plant mechanics/fitters
■ Bricklayers	■ Steel erectors/structural
■ Building envelope specialists	■ Labourers
■ Painters & decorators	■ Electrical trades & installation
■ Plasterers & dry liners	■ Plumbing & HVAC trades
■ Roofers	■ Logistics
■ Construction profess& tech staff	■ Civil engineering operatives

4.8.1 Sector Size

Ireland

By 2007, the construction industry in the South provided 280,000 direct jobs (or 13 per cent of total employment), a significantly higher proportion than for comparable European economies. This increase in employment is a relatively recent phenomenon with current levels approximately double levels in 1998. More than two-fifths of employment within the construction sector in the South was accounted for by those engaged in craft-related occupations. In addition, management and professional grades accounted for 14 per cent whilst skilled and semi-skilled grades contributed a further 26 per cent).

Northern Ireland

According to the Quarterly Employment Survey, the sector employs close to 45,000 people (not including the self employed). This is approximately 45 per cent higher than in 1998 and the sector currently accounts for just over 6 per cent of employees.

All-Island

Construction makes a significant contribution to the all-island economy and provides employment to around 325,000 people across a diverse range of occupations.

4.8.2 Trends in Skills Demand

Ireland

The forthcoming EGFSN Review of the Employment and Skills Needs of the Construction Industry in Ireland (2008) will note while that employment in new house building is forecast to fall by approximately 70,000 in the short-term it is anticipated that construction industry employment will recover by 2013 to reach 259,000 jobs. It is also expected that the restructuring of the industry will create changes in the skills profile. Moreover, given the construction industry employment opportunities in markets such as the UK and Poland – specifically for craft workers – it is expected that job losses in the industry will not result in equivalent rises in unemployment.

This report will also note that 'the skills which will be most adversely affected by the contraction in new house building – bricklaying, plastering, plumbing, carpentry and painting – are not required to the same degree' in the expanding areas of the industry (i.e. civil engineering, general contracting, house improvements) and that new building technologies will play an important role in the changing skills mix in the industry: 'new forms of construction – usually involving some aspect of off-site manufacturing – are becoming the norm in respect of large construction projects in general contracting in both the public and private sphere'.

The feedback received as part of the consultative process has re-iterated many of the findings of the National Skills Bulletin with regard to continued difficulties recruiting experienced quantity surveyors. A clear message was with regard to the negative impact of the contraction in house building upon demand for craft and semi-skilled personnel (i.e. bricklaying, plastering, plumbing, carpentry, etc.). However, it is recognised that some of the excess capacity may be absorbed by the expansion of regeneration, remedial and extension-related construction activity.

Pressures relating to demand for skilled construction personnel which had characterised the sector in recent years have eased in light of the current slowdown and similarly, the reliance upon migrant workers has been reduced significantly. However, this sector continues to experience a strong demand for personnel skilled in new building technologies and techniques – particularly green building techniques – in addition to those qualified and experienced with regard to the current health and safety requirements and public procurement procedures with a strong multi-disciplinary background (i.e. project management, etc.).

Northern Ireland

The *Annual Recruitment Requirement* produced by the Construction Industry Training Board for the construction sector in the North is estimated at 2,980 per annum between 2008 and 2012. The largest requirements are likely to be in wood trades and interior fit out, bricklayers, building envelope staff and office based staff. However, it should be noted that these requirements were estimated before the current downturn and are likely to have changed significantly.

In a report prepared by PricewaterhouseCoopers in February 2007, 508 construction companies in NI were asked for their views on skills shortages, gaps and hard to fill vacancies. The key findings from this report were:

- a shortage of skilled workers to accommodate the existing workload was a particular issue amongst the bricklaying and joinery sectors;
- almost one-third of the firms who had experienced difficulty with the recruitment of new staff were of the opinion that general operatives/labourers were difficult to recruit;
- just less than 20 per cent cited that recruiting staff into the wood trades was difficult, with approximately 10 per cent stating plasterers, bricklayers and plumbers as difficult to source occupations;
- nearly half of all respondents who had experienced recruitment problems stated the lack of applicants with the required skills as the main reason for the problems they experienced; and
- just less than 30 per cent of the 156 firms who had experienced recent difficulties reported that there were an insufficient number of applicants with the required experience and/or qualifications. A general lack of interest in the job type and a lack of the required attitude and/or motivation were cited by approximately 20 per cent of respondents as the key reason for the recruitment difficulties they had experienced.

Again published information has been supplemented with discussions with key sectoral representatives. In the first instance, these suggest that although the current slowdown has heralded a reduction in the demand for skills such as bricklaying, difficulties remain with regard to the recruitment and retention of highly-skilled personnel.

While the current downturn could impact on skills demand in construction, the Royal Institution of Chartered Surveyors believes the slowdown could lead to a skills shortage in the long-term if experienced workers and training schemes are lost in the wake of the slow down. The RICS believes that the long term prospects for the sector are very good, as regeneration and investment in significant infrastructure projects continue. This includes the large number of capital projects flowing from the planned Investment Strategy for Northern Ireland. In this context, firms should continue to invest in training staff, thus safeguarding the future of skills in the industry.

4.8.3 Construction Skills Demand: All-Island Perspective

A series of common issues are clearly impacting on skills demand on an all-island basis. For example, a recurrent theme emerging from this research relates to the reduction in the challenge posed by the recruitment of both skilled workers and labourers in addition to the reduced reliance upon migrant labour. However, difficulties continue to remain with regard to the recruitment and retention of highly-skilled personnel. Specifically, demand remains strong for those with the qualifications and skill-sets relating to emerging construction techniques and technologies in addition to competencies such as project management, ICT, public sector procurement and sustainable development.

However, it is important to note that the construction sector will continue to make a significant contribution to economic growth and job creation, North and South, given the positive medium-term forecasts for the economy.

4.9 Engineering

Engineering is a more diverse career than many imagine covering a wide range of disciplines. The broader engineering sector covers a wide range of occupations including the following:

■ Mechanical Engineer	■ Civil Engineer
■ Electrical Engineer	■ Planning and Quality Control Engineer
■ Maintenance	■ Chemical Engineers
■ Design and Development Engineer	■ Engineering Technician

4.9.1 Sector Size

Ireland

In 2006, engineers and allied trade workers accounted for almost 80,000 jobs in the South. Employment in a number of these engineering sectors has grown significantly since 2001. For example chemical engineers employment has increased by 9.1 per cent, design and development engineers by 7.8 per cent and mechanical engineers by 7.5 per cent.

Northern Ireland

Engineering is one of the most important sectors in NI. SEMTA, the Sector Skills Council for engineering reports that the sector employs over 33,200 people (39,600 if self employed people and casual labour are included). Aerospace, for instance, is an important area of engineering in the North. Northern Ireland currently has approximately 30-40 companies in this sub-sector employing approximately 7,000 people.

All-Island

The engineering sector accounts for a diverse range of occupations across a number of disciplines and provides approximately 110,000 jobs on an all-island basis.

4.9.2 Trends in Skills Demand

Ireland

The National Skills Bulletin 2007 identified evidence of employers experiencing difficulties in sourcing engineers. Demand for engineers is expected to continue to be strong in the coming years due to the projected strong performance of the pharmaceutical, medical devices and IT sectors; on the supply side a decline in enrolments in engineering courses in recent years is expected to contribute to future shortages of engineering skills.

At technician level, there is an issue with a decline in supply, and resulting shortages, due to a fall in the uptake of engineering courses in general and the increased progression from higher certificate and ordinary degree (technician) to honours degree (professional) level.

An important sub sector of the Irish economy, with export sales of approximately €6bn – the medical devices sector – is an important determinant of the demand for engineers, given the focus upon the manufacture of medical and surgical instruments, appliances and supplies – in addition to R&D. The Expert Group on Future Skills Needs (EGFSN) has identified in a recent report that the volume of engineering graduates with a specific focus upon design is insufficient to meet demand within the medical devices sector and that the sector is also experiencing a shortage of engineers with 'the skills to design end-to-end automated medical devices production processes' (EGFSN, 2008). Similarly, this sector is currently recruiting PhDs across a range of disciplines, particularly biomedical and mechanical engineering, although the output of the Irish higher education institutions remains less than the absorptive capacity of this sector.

Feedback received as part of the consultative process provides further interesting skills demand insights. For instance, sectoral representatives have expressed concern that the shortage of highly-skilled personnel arises from an image problem. This, in turn, has given rise to the perception that engineering is heavy factory work and thus an unattractive option to students. Consequently, this sector continues to experience a paucity of engineers with specialised skills (i.e. plastics) and with qualifications in associated fields such as logistics and business management.

A key theme to emerge was the perceived need for more engineering graduates going forward. The steady supply of engineering graduates with advanced qualifications is considered an important prerequisite for the South to avail of the process of global technological transfer and R&D and to position itself at the forefront of the development of innovative products and production.

Northern Ireland

Discussions with key sector representatives provided an insight into the critical skills supply and demand issues facing the engineering sector in NI. These issues have been published in the 'Skills Balance Sheet' published by SEMTA, in June 2008. The key findings from this report are:

- over 2,500 people were recruited into the engineering industry in NI between March 2006 and 2007;
- there were an estimated 535 hard-to-fill vacancies within engineering establishments in NI over this period, the majority relating to skilled trades/craft (56 per cent) and professional (16 per cent) vacancies;
- the main reasons cited for hard-to-fill vacancies were a lack of applicants with required qualifications and skills, a lack of applicants with required work experience and a general lack of applicants;
- 23 per cent of engineering establishments in NI reported skill gaps, higher than the proportion within the UK (21 per cent);
- employers in NI expected skills gaps for operators, crafts-persons and technicians would have the most significant effect on their business;
- the main skills cited as lacking in employees was technical and engineering skills at all levels; 72 per cent of those engineering establishments in NI reporting skill gaps;
- the main technical skills gaps for the engineering sector in NI related to welding, CNC machine operations, mechanical engineering skills, metal working and electrical engineering skills;
- the generic skills gaps highlighted were for management skills, key or core personal skills and marketing or selling skills;
- together with changes in skill requirements, qualifications demanded by employers are likely to change, with an increasing requirement for intermediate and higher level qualifications; and
- over the period 2008-2014 there is expected to be a net requirement within the engineering industry in NI for about 1,700 people at NVQ Level 2, about 1,900 people at NVQ Level 3, about 1,600 at NVQ Level 4 and about 400 at NVQ Level 5.

The Skills Balance Sheet concludes that for the engineering sector in NI there is a potential upskilling requirement for more than 14,000 people across management and core technical occupations, consisting of:

- 950 managers requiring development to Level 3 and above;
- 150 professional engineers requiring development to Level 4 and above;
- 1,650 technicians requiring development to Level 4 and above;
- 3,300 skilled trades (craft) requiring development to Level 3 and above;

- 8,200 operators requiring development to Level 2 and above; and
- additionally, there is an annual requirement for training about 1,350 new recruits across all occupations into the engineering sector in NI, to replace those retiring.

Finally, the NI administration, in recognising that there are reduced student numbers choosing key science technology engineering and mathematics (STEM) courses has launched a comprehensive review of STEM. This review is intended to establish a vision for STEM, establish how to promote an understanding and acceptance of STEM and the importance of investing in STEM education to society in NI.

4.9.3 Engineering Skills Demand: All-Island Perspective

With regard to the evidence reviewed for the purposes of this report, a number of common themes arise.

A recurrent theme emerging from this research relates to the continuing strong demand for engineers and the presence of skills gaps and the difficulty with regard to sourcing engineers. In particular, these difficulties focus upon the paucity of engineers with the qualifications required for disciplines such as the manufacture of medical devices, design and mechanical engineering. Moreover, it is important to note that there is a requirement for engineering graduates with higher qualification profiles (i.e. PhD) and that there are continuing concerns with regard to the capacity of the 3rd level sector to deliver sufficient output.

Again it is important to note that the engineering sector has significant potential to make a major contribution to the economy, both North and South. Indeed, given the strong demand for highly-skilled personnel and the related investment in new technologies and R&D this sector is likely to be an important driver of productivity and economic growth going forward.

4.10 ICT

The Information and Communication Technology sector covers a wide range of occupations including the following:

■ Computer/data processing mangers	■ Systems managers
■ Software consultants	■ Analysts/programmers
■ Software and electronic engineers	■ Database mangers
■ Web masters	■ Systems administrators
■ Telecomm engineers	■ Telephone technicians

4.10.1 Sector Size

Ireland

The ICT sector employs a total of 70,000 people in the South and is of strategic economic importance in terms of inward investment and exports. Both productivity and profitability in the sector are rising and the picture is if a vibrant sector which is forecast to increase in employment over the coming years.

Northern Ireland

The sector skills council for IT, E-Skills, estimates that there are currently 14,600 people in the IT workforce in Northern Ireland (9,300 in the IT industry itself and 5,200 IT professionals working in other industries).

All-Island

The ICT sector is a key component within the export-orientated focus of both jurisdictions. The sector provides employment across a diverse range of occupations – software engineering, analysts, systems managers, etc. – and contributes in excess of 100,000 jobs to the all-island economy.

4.10.2 Trends in Skills Demand

Ireland

A recent study by The EGFSN on the Future Requirements for High-level ICT Skills in the ICT Sector (2008) provides a vital insight into skills demand trends in ICT. The report finds that the projected domestic supply of high-level graduates alone will not be sufficient to meet whole economy demand under either of the two more positive demand scenarios presented in the report. This should be seen against the background of a global shortage of high-level ICT staff. The shortages projected range up to some several hundreds per annum for electronic engineers qualified to Honours Bachelor Degree level and up to an average of about 2,000-3,000 per annum for computing graduates qualified to this level. Inward migration will continue to be required to bridge the gap. A number of recommendations have been made to boost the domestic supply of high-level ICT graduates.

Northern Ireland

Demand for ICT skills in NI is forecast to grow considerably over the next decade. In fact, work undertaken for the NI ICT Sector Skills Action Plan 2007-2010 indicated that approximately 1,900 people will be required to enter the ICT workforce each year until 2021. The Sector Skills Action Plan notes that much of the growth in NI's IT sector is in 'high value' roles that require skills in business, client relationships and project management alongside deep technical competencies.

Discussions with key sector stakeholders confirmed the existence of skills gaps and shortages in Northern Ireland's ICT sector with hard to fill vacancies centred on web support, business analysis and IT architecture. In addition, engagement with the Sector Skills Council widened the scope of IT skills to encompass all users of IT in the workforce rather than those directly employed as IT professionals. A key issue when including these people is that there is a significant need for upskilling to level 2 and level 3.

4.10.3 ICT Skills Demand: All-Island Perspective

With regard to the evidence reviewed for the purposes of this report, a number of commonalities have arisen.

A recurrent theme emerging from this research relates to the likely continuation of the strong demand for ICT skills and the need to promote ongoing upskilling of the workforce in addition to higher domestic take-up at 3rd level (including at Masters and PhD level) in order to meet this demand. Specifically, the available evidence indicates the presence of a shortage of skilled ICT professionals globally and a need for the all-island economy to continue to draw upon skilled migrant workers.

4.11 Financial Services

The Financial Services sector covers a wide range of occupations including the following:

■ Structured credit analyst	■ Market risk analyst
■ Portfolio administrator	■ Treasury accountant
■ Tax specialist	■ Underwriter – private lines
■ SPV Accountant	■ Underwriter – commercial lines
■ Pricing administrator	■ Underwriter – product specialist
■ Treasury Manager	■ Life claims administrator
■ Treasury analyst	■ Customer service administrator
■ Treasury dealer	■ Financial reporting accountant
■ Treasury MIS	■ Risk Control Surveyor
■ Credit risk analyst	■ Fraudulent claims specialist

4.11.1 Sector Size

Ireland

According to the Expert Group on Future Skills Needs (EGFSN), there are currently a total of almost 150,000 persons employed in financial services-related occupations in the South. This includes 22,000 employees in International Financial Services (IFS), a sector which has grown dramatically over the past 2 decades.

Northern Ireland

The Financial Services sector in Northern Ireland employs around 22,000 individuals in over 1,200 companies across the region. Belfast is the main centre for financial services in NI and has had recent strong performance in attracting FDI through companies such as Citi, Allstate Corporation, and Liberty Mutual.

All-Island

The Financial Services Sector has made a significant contribution to economic growth both North and South in recent years. Moreover, this sector contributes approximately 170,000 jobs to the all-island economy and is an important source of high-quality job creation.

4.11.2 Trends in Skills Demand

Ireland

The National Skills Bulletin 2007 noted that the Financial Services sector continues to experience shortages with regard to specific skill areas such as accounting, quantitative finance and compliance. Indeed, a comparison of the supply and demand of financial services-related skills has noted that the sector is experiencing ongoing skills shortages. This was attributed to a range of factors including a shortage of personnel with particular international financial services-related qualifications (i.e. insurance, finance, etc.) and the low number of graduates choosing a career in international financial services.

The EGFSN (2007) has noted that Ireland continues to be viewed as an attractive investment proposition by foreign multinationals and has projected that IFS employment will increase by almost 50 per cent by 2012. Consequently, the need to continue to invest in the Irish educational system has been identified as critical in order to ensure a sufficient supply of skilled graduates to meet this projected growth.

Discussions with key sector stakeholders underscored the above EGFSN findings with regard to a likely rise in the future demand for IFS-related skills and current shortages. It is believed that this likely demand will be focused upon specific skill-sets such as mathematics, economics and risk management amongst others. Moreover, the shortage identified is particularly acute with regard to the recruitment of highly skilled graduates (i.e. to Masters and PhD level) due to the low level of such graduates coming through from the Irish 3rd level sector.

An interesting finding of these discussions was that although the high demand for skilled graduates has eased in the past 12 months, the requirement for highly qualified professionals in the fields of portfolio management, actuarial and insurance has remained unchanged.

Northern Ireland

The Financial Services Sector Skills Council (FSSC) is currently completing work for DEL on a 'Skills Bill for Financial Services in Northern Ireland'. As part of this work, a survey of financial services establishments was conducted. This survey suggests that increasingly, growth across the UK financial services industry as a whole will be driven by product innovation, contingent on the strength and changing geography of the global economy, the impact of technological advancements and the needs of a wealthier, ageing population. It will focus on higher value-added occupations in higher value-added sectors, and those parts of the UK that can establish and maintain strong financial services clusters will reap most of its benefits. This growth will be more balanced than in the past and will depend less on the property market and consumer credit.

The outlook for Northern Ireland is cautiously positive, although the growth rates of the very recent past may not be repeated over the next few years, according to the FSSC. Much depends on the fortunes of Belfast as a financial services centre, as it is clusters of financial services that will drive financial services skills demand. The FSSC believes that the main skills demand issues will centre around technical staff, managers and senior officials although demand for these occupations tends to be volatile.

4.11.3 Financial Services: All-Island Perspective

It was noted in Part A of this chapter that recent trends North and South in business and financial services employment are remarkably similar with the sector in both jurisdictions roughly doubling in size in employment terms in the last decade, due to FDI and the sector becoming more export orientated.

It is also evident from the analysis that the sector is at different stages of 'maturity' with NI more skewed towards call centres as opposed to international financial services which have different skill needs. All-Island skills demand issues will therefore likely cover a wide range with demand in the South expected to focus on the recruitment of highly skilled graduates (i.e. to Masters and PhD level) with specific skill-sets such as mathematics, economics and risk management amongst others while demand in the North is likely to centre on technical staff, managers and senior officials. Of course, if the North is successful in growing the financial services sector in higher value added areas, skills demand issues are likely to harmonise North and South.

4.12 Part D – Future Skills Demand Trends

This chapter has focused on past skill demand trends and current skill demand issues. Part D now looks briefly at sectoral and occupational employment trends over the next decade and implications for skill demand North and South and at all-island level. It is important not to assume, without rigorous analysis that past skill demand trends will automatically be repeated. For example, as the long-term economic outlook for some sectors may change relative to the previous decade and new occupational patterns may emerge within industries as the sub-sector structure evolves and the nature of FDI potentially shifts.

Box 4.1: Baseline Not Aspirational Forecasts Presented

The future trends presented in Part D are baseline forecasts. Baseline forecasts are essentially 'policy neutral'. That is, they reflect the most likely future path in the absence of a change in policy and should be seen as a guide rather than precise estimates and are subject to unforeseen changes in the economy. Baseline forecasts do not build in the step change in skills provision and attainment that both Ireland and NI are aspiring to. As such, they are not the aspirational North-South targets presented in the first chapter from the NI Programme for Government and Ireland's 'Tomorrow's Skills: Towards a National Skills Strategy'.

In addition, as explained later, the forecasts presented do not reflect the latest All-Island economic outlook. Work to update skills forecasts North and South has been undertaken/ is currently underway but is not available at the time of writing. It is not expected that this will materially change the pattern of future skills demand as, for example, a slowdown in construction was already previously built into the forecasts, although absolute forecast numbers will change – an issue which is of relevance for numerical skill targets.

4.12.1 Existing Skills Forecasting Research

Before presenting employment forecasts for both jurisdictions by industry, occupation and skill level, some brief details are provided below on existing North-South skills forecasting research. However, it should be noted that they rely on differing methodologies and assumptions which limit the extent to which direct comparisons can be made.

Ireland skills forecasting research

- ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006).
- FÁS/ESRI Manpower Forecasting Studies Report No. 12 'Occupational Employment Forecasts 2012' (July 2007).

- FÁS/ESRI Manpower Forecasting Studies Report No. 9 'Estimating Labour Force Flows, Job Openings and Human Resource Requirements, 1990-2005' (April 2001).
- CEDEFOP 'Future Skills Needs in Europe' (2008).

Northern Ireland skills forecasting research

- Regional Forecasts 'Occupation Forecasts and Replacement Demand Analysis for NI 2005-2015' (February 2006).

Annex D provides a summary of what the research by FÁS/ESRI and Regional Forecasts covers and the methodologies used. The focus is only on the above reports from which figures are presented in this report. Note the latest forecast report for Ireland is not referred to as this is more up-to-date, and therefore not comparable to the NI research from 2006, which is currently being revised.

Comparability of North-South existing skills forecasting research

While FÁS/ESRI and Regional Forecasts (now Oxford Economics) models adopt differing forecasting methodologies and assumptions, there are nevertheless several similarities in the two approaches which make it possible to compare North-South forecast trends. These include:

- the macro forecasts driving the sector, occupation and skill forecasts were published at close to the same – FÁS/ESRI (December 2005) and Regional Forecasts/Oxford Economics (Autumn 2005). This methodological issue is therefore considered to be broadly comparable. While the short to medium term macroeconomic forecasts for each jurisdiction have changed markedly, the focus here is on long-term trends and patterns, which will not have materially changed. Absolute forecast change in employment numbers are of less importance for this general research though they do matter significantly for actual skill targets;
- methodologies employed to forecast occupations North and South are broadly the same and are linked to macro employment forecasts by sector and assumptions on change in occupation shares by sector, which both measure the number of people in employment as opposed to jobs. While FÁS/ESRI sectoral employment forecasts for Ireland are based on a supply-demand equilibrium and Regional Forecasts' for NI are purely demand forecasts, it is not believed that the differences would be large as NI faces few supply-side constraints with wage levels remaining low despite record employment growth;
- methodologies to forecast net replacement demand are broadly the same, including who is captured under leavers and joiners to occupations. However attrition assumptions used for the South are due to be updated and may explain some of the differences in net replacement demand rates. There may also be subtle but critical differences in the components of replacement demand; and

- ESRI research forecasts how the stock of employment by education level will change between 2005 and 2020. Regional Forecasts' research looks only at the qualification profile of the total requirement in the context of both expansion demand and replacement demand flows and applies the qualification share of those people who are new entrants to the labour market, as opposed to the current qualification structure of all employed people. Regional Forecasts' research does not estimate the stock demand for qualifications by occupation. Additional work has been undertaken to show how the skills structure of NI employment is forecast to change in the decade ahead against which comparisons with the South can be made. Additional analysis to translate the replacement demand flows by occupation for the South into skill requirements was also undertaken using the qualification structure of all employed people in the occupation from the expansion demand stock analysis. The results of this additional analysis should be seen as indicative.

Box 4.2: Why Existing Research Does not Permit Development of All-Island Employed Skill Forecasts

Notwithstanding the above commonalities in producing North-South skill it is not recommended at this stage adding North-South forecasts to produce all-island employed skill stock forecasts or adding replacement demand forecasts.

There are two key differences between the historical and forecast employment and occupation series. Firstly the NI employment and occupation forecasts from Regional Forecasts are not based on the LFS but instead on employment data from other sources – DETI Quarterly Employment Survey (occupation shares are based on the Census and trended in line with the LFS).

Secondly to align SOC 1990 and SOC 2000 forecasts to ISCO 88 requires highly detailed occupation data (for example down to 3-digit for the South). The occupation forecasts by FÁS/ESRI and Regional Forecasts are not available at this level of detail for both NI and Ireland.

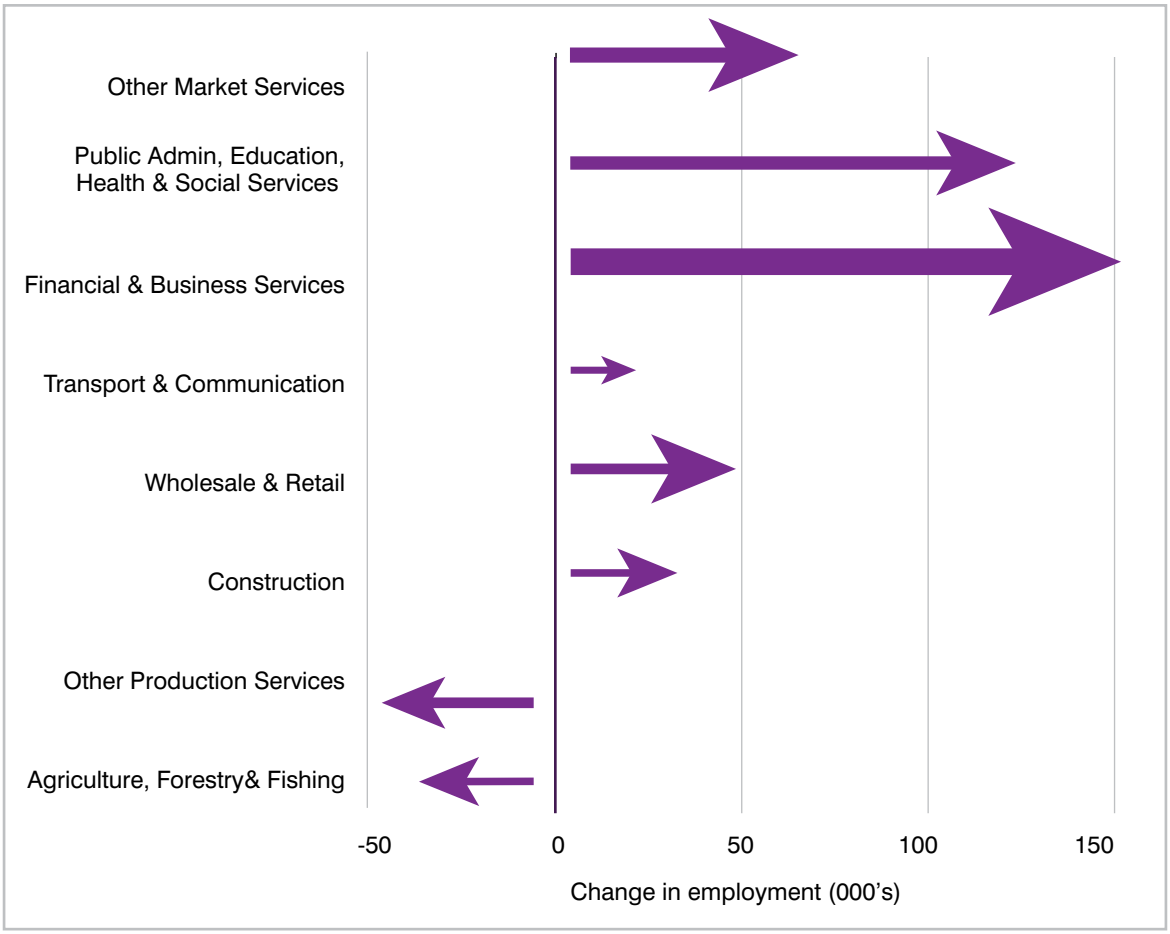
However in order to give an indicative picture of the pattern and scale of future trends at all-island levels, without quantifying the trends precisely, 'arrow' diagrams are provided for all-island future trends in employment by industry, occupation and skill level (Figures 4.25, 4.28 and 4.31).

4.12.2 Industry forecasts

All-Island

The economic transformation from traditional agriculture/industry to services is forecast to continue apace on the Island, with financial & business services and public services expected to be the main sources of employment growth in the all-island economy over the next decade. Importantly for skills forecasting, construction employment growth is forecast to slow considerably, and indeed the very latest forecasts North and South predict short-term job losses in construction (though these are not the forecasts presented in the report).

Figure 4.25: All-Island indicative employment forecasts by sector (next ten years)



Source: Oxford Economics.

Ireland

Employment growth in the South has been driven primarily by three sectors over the last decade – construction, financial and business services and the public services (Figure 4.26). Other service sectors have performed relatively strongly and other production industries, despite losses in less competitive manufacturing sub-sectors such as textiles, have registered a small net gain in employment when comparing 1995 to 2005. Agriculture, forestry and fishing are the only sectors to have experienced a decline in the number of persons employed.

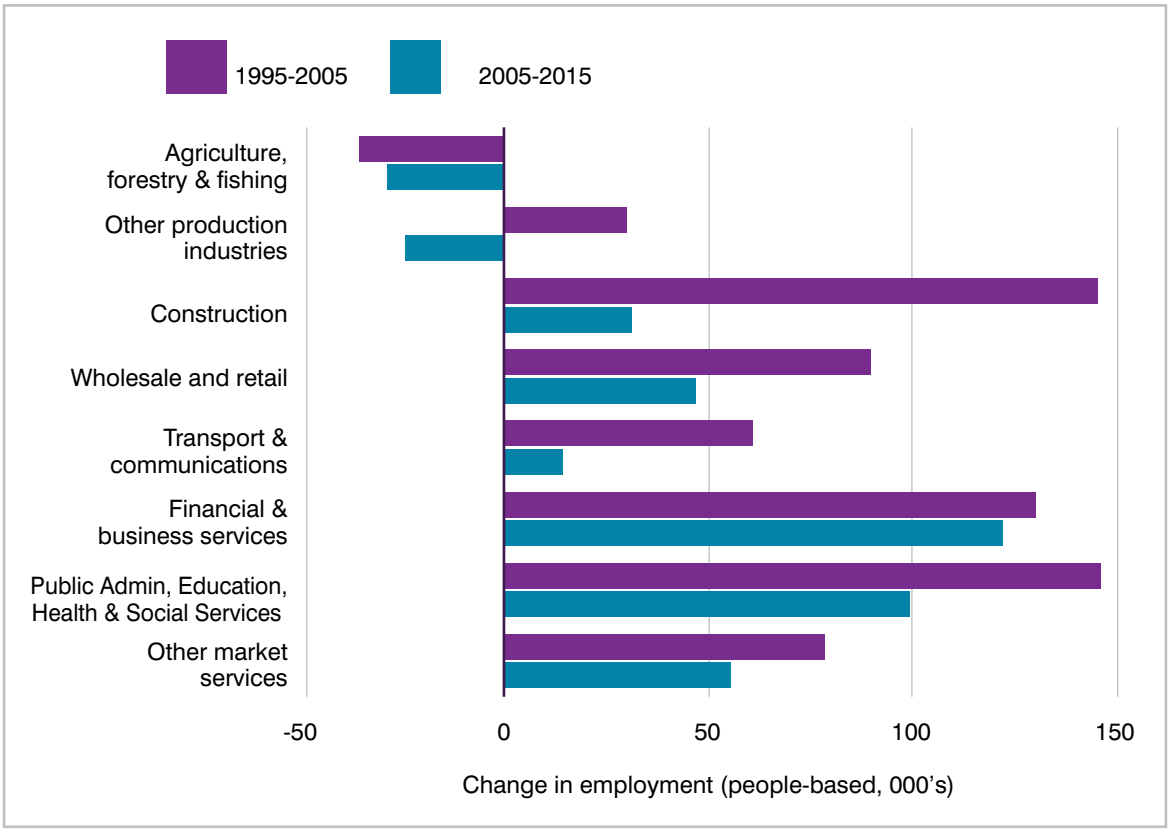
Over the next decade financial and businesses services are projected to create more employment than any other single sector in the South (Figure 4.26). The wider public sector, which includes here education and health, is still projected to expand strongly as population continues to grow although slower that the expansion over the past decade. Growth in all sectors is expected to slow down though remain robust, with construction forecast to slow down significantly even before the recent difficulties emerged. In fact as highlighted in Part C, a forthcoming report by EGFSN predicts that given new house building is forecast to fall by approximately 70,000 in the short-term, construction employment is expected to be 11,000 lower than in 2006.

Northern Ireland

Employment growth in NI has similarly relied on financial and business services and public administration/education health & social services but less so construction (Figure 4.27). Manufacturing has declined as unlike Ireland, NI has not been able to attract sufficient hi-tech manufacturing to compensate for losses in less competitive sub-sectors.

Employment growth in the North, like the South is forecast to slow down across sectors, due to factors such as an end in retail 'catch up', slowdown in public spending and shake out in construction. Growth will continue to be led by financial and business services and the wider public sector, primarily education and health, which is a similar forecast pattern to the South.

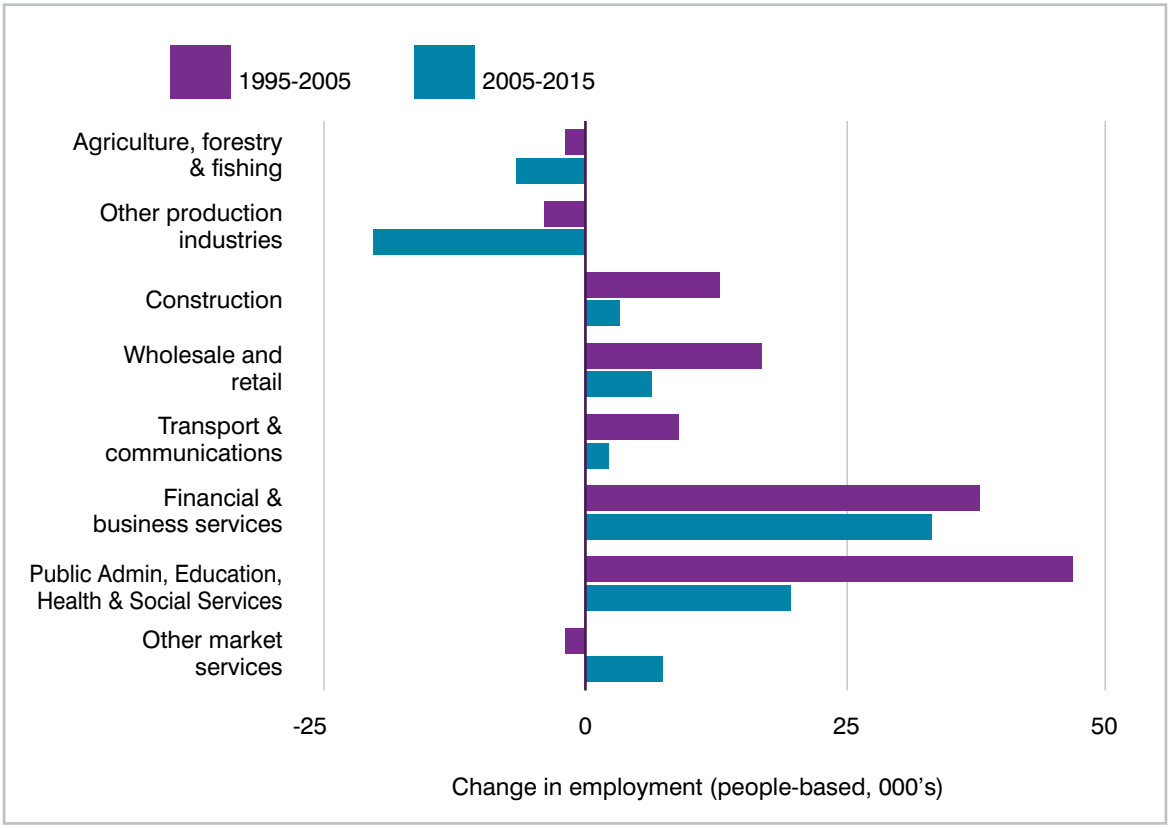
Figure 4.26: Ireland recent employment trends and forecasts by sector



Source: CSO QHNS and ESRI.

Note: Based on NACE industrial classification. Historical data from QNHS. Forecasts from ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006). 2015 figures average of 2010 and 2020 figures from ESRI report.

Figure 4.27: Northern Ireland recent employment trends and forecasts by sector



Source: DETI QES, LFS and Regional Forecasts/Oxford Economics.

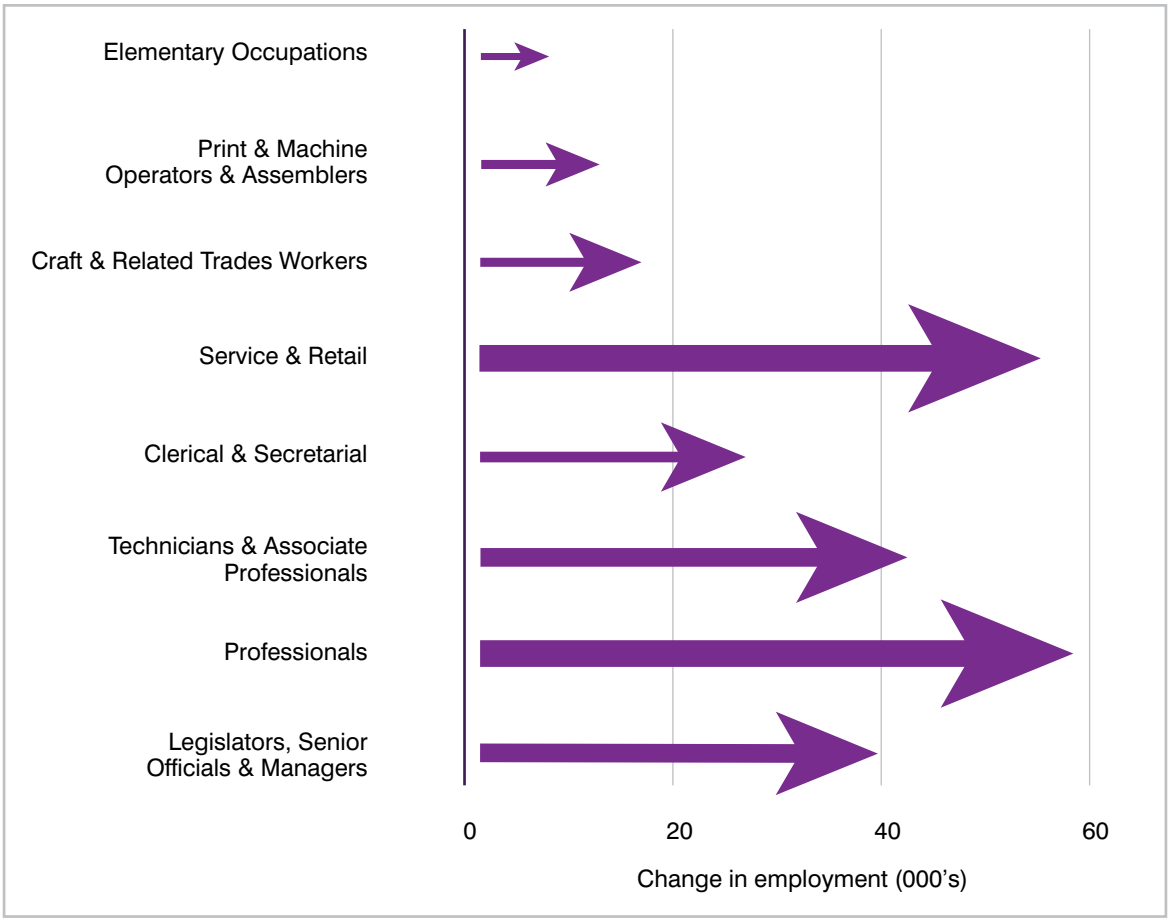
Note: Based on SIC 2003 industrial classification. Employment refers to people in employment for historical trends and for most sectors in the forecasts. Historical data from LFS as presented earlier in the report. Forecasts from Regional Forecasts 'Occupational Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015' (February 2006) – based on historical employment series from QES and only uses LFS for self-employment so not directly comparable to historical LFS series.

4.12.3 Occupation Forecasts

All-Island

The sectoral pattern of employment growth described above will result in employment growth being largely concentrated in managerial and professional occupations and also in service & shop/market sale occupations. Minimal employment growth is forecast for elementary and plant & machine operative occupations (Figure 4.28). The forecast concentration of employment in higher grade occupations is more pronounced than the recent past, partly due to the changing performance of the construction industry.

Figure 4.28: All-Island indicative employment forecasts by occupation (next five years)



Source: Oxford Economics.

Note: Based on ISCO 88 occupation classification.

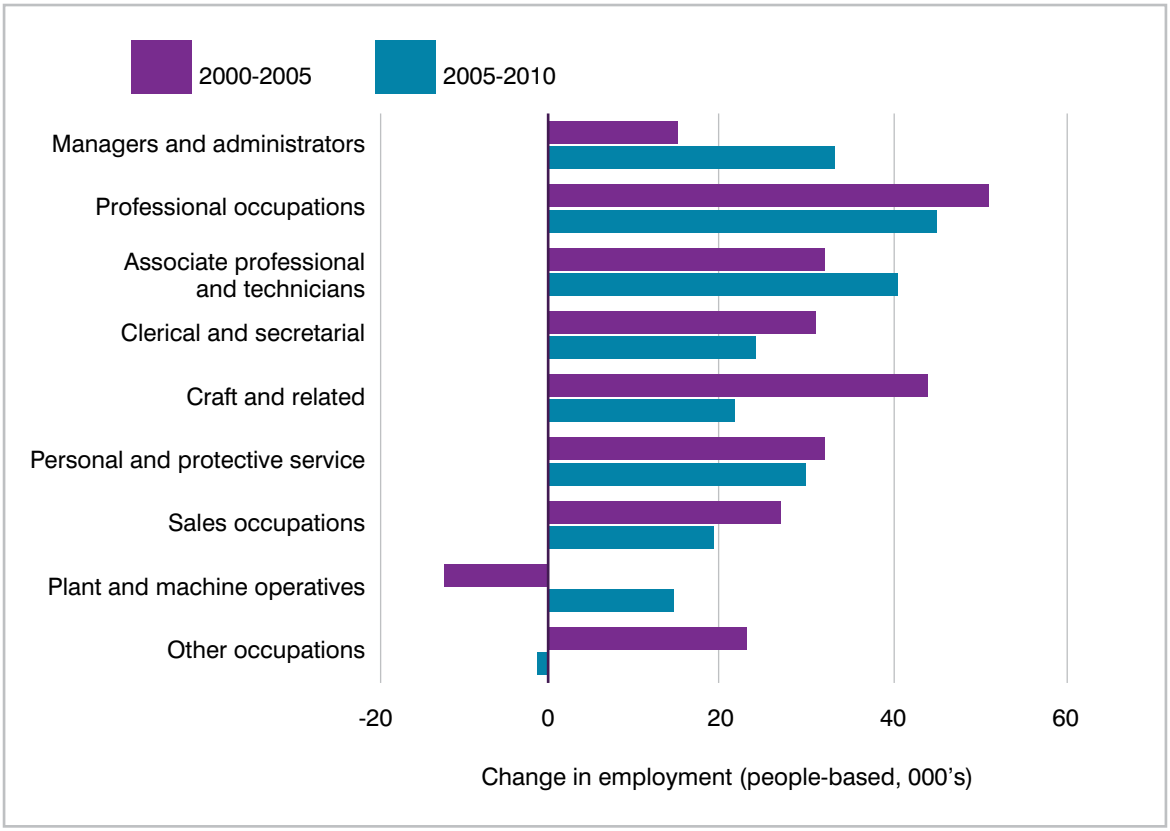
Ireland

In terms of demand for occupations in Ireland, professional, associate professional and managerial occupations are forecast to grow strongest with more moderate growth in demand for lower grade occupations. Robust growth is also forecast for personal and protective service occupations. This means that there is a strong upward skills profile gradient in employment growth (see below) – that is, employment growth is forecast to be stronger in more highly skilled occupations. According to FÁS/ ESRI, this difference between growth for higher and lower skilled occupations is forecast to be greater than in the past.

Northern Ireland

In NI employment growth is forecast across most occupations, bar occupations associated with the declining agriculture and manufacturing sectors. Professional and associate professional occupations are expected to grow fastest. Personal service occupations are also expected to show large increases as recent growth in child care and residential care for the elderly continues.

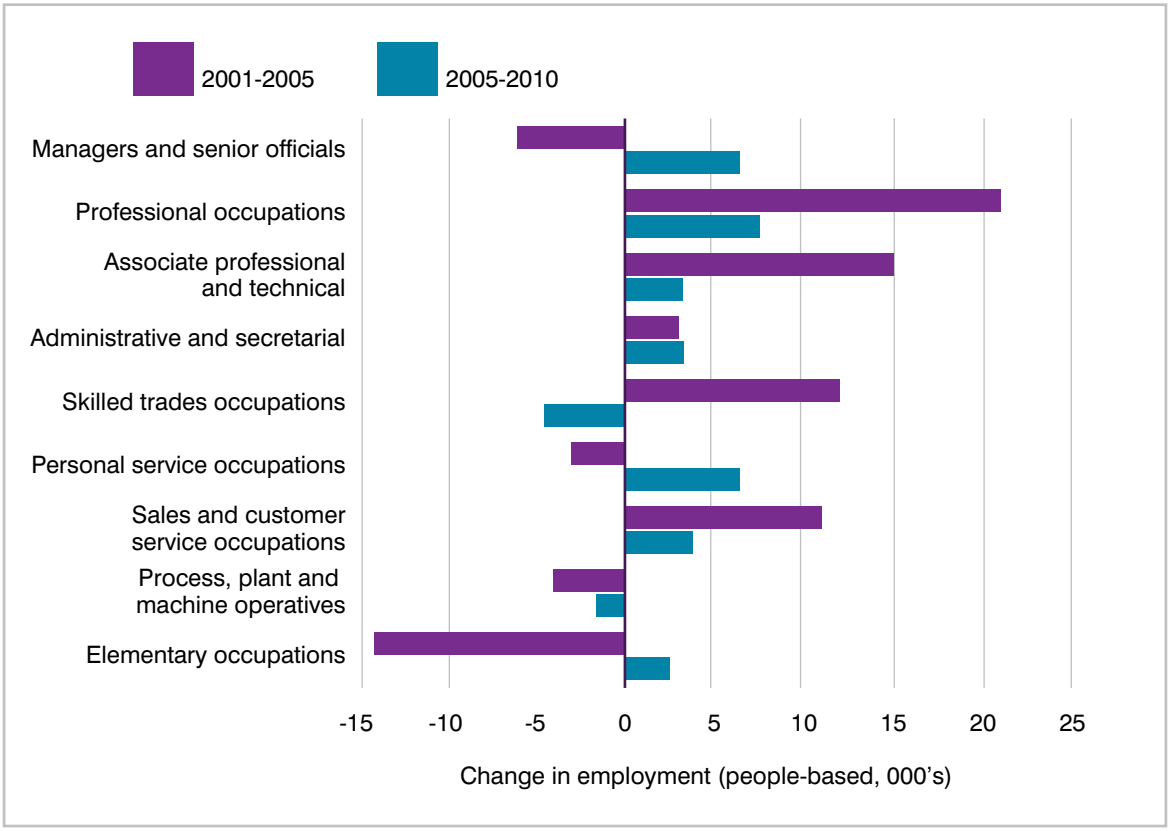
Figure 4.29: Ireland recent employment trends and forecasts by occupation



Source: CSO QHNS and ESRI.

Note: Based on SOC 1990 occupation classification. Employment refers to people in employment as opposed to jobs. Historical data from QNHS. Forecasts from ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006). Only 5-year performance and forecasts presented as ESRI report does not present 1995 figures.

Figure 4.30: Northern Ireland recent employment trends and forecasts by occupation



Source: Census Office for NI, LFS and Regional Forecasts/Oxford Economics.

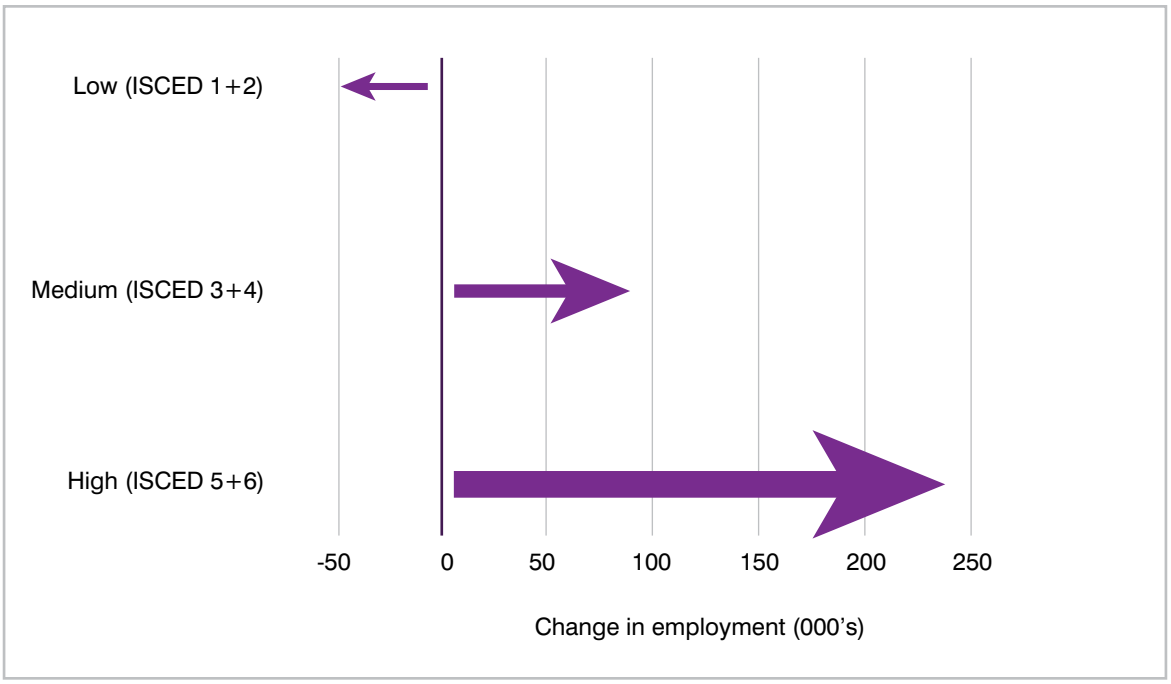
Note: Based on SOC 2000 occupation classification. Employment refers to people in employment. Historical data from LFS. Forecasts from Regional Forecasts 'Occupational Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015' (February 2006) – based on Regional Forecasts' constructed occupation figures which are not directly comparable to historical LFS series.

4.12.4 Employed skills forecasts

All-Island

This future pattern of sectoral and occupation growth, much as over the last decade, has a strong skills profile gradient with a high proportion of jobs forecast to need higher level graduate qualifications and job losses predicted overall for employment requiring low qualifications. Although there will be some specific lower grade and low skilled occupations with growth opportunities, for example 'luxury' employment occupations (e.g. private housekeepers and gardeners) as both economies become wealthier.

Figure 4.31: All-Island indicative employment forecasts by skill level (next five years)



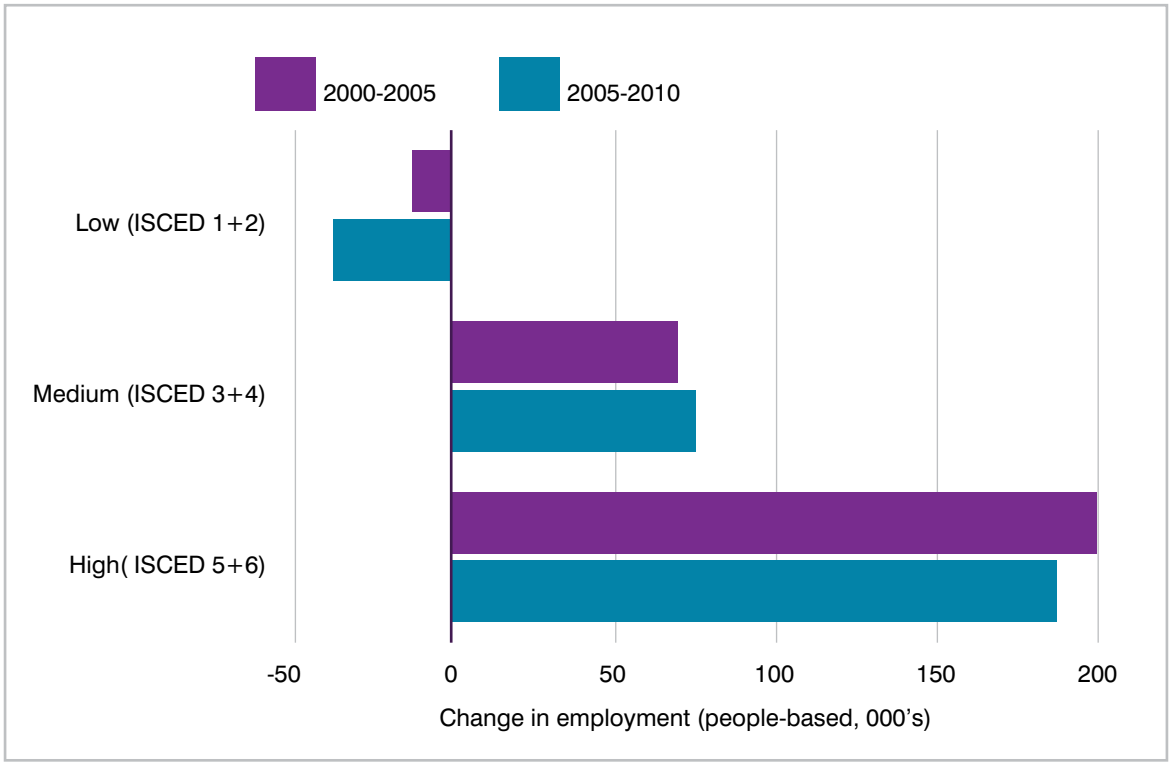
Source: CSO QHNS and ESRI.

Ireland

The skills gradient in Ireland's employment growth, both recent and forecast, is clearly illustrated by Figure 4.32 below. This is broadly consistent with the baseline skills profile from 'Tomorrow's Skills – Towards a National Strategy' (2007) though not directly comparable as the forecasts presented here are not based around the Ireland's National Qualification Framework and the forecast period differs. Recall again that the forecasts presented are not the ambitious targets set out in Chapter 1.

A key point however to note is that historical and forecast qualification levels of persons employed may not reflect the desired or minimum level of qualification required by employers, merely that achieved and supplied by the education system and migrants. This can mask both an under-employment of workers in jobs that do not require their level of skills for example migrants with graduate qualifications working in food processing, and an over-employment of workers whose skills are below that desired for their occupation in a particular industry, known as an internal skill gap. This is why information on skills gaps and utilisation of skills is important to enhance understanding of true skills demand.

Figure 4.32: Ireland recent employment trends and forecasts by skill level

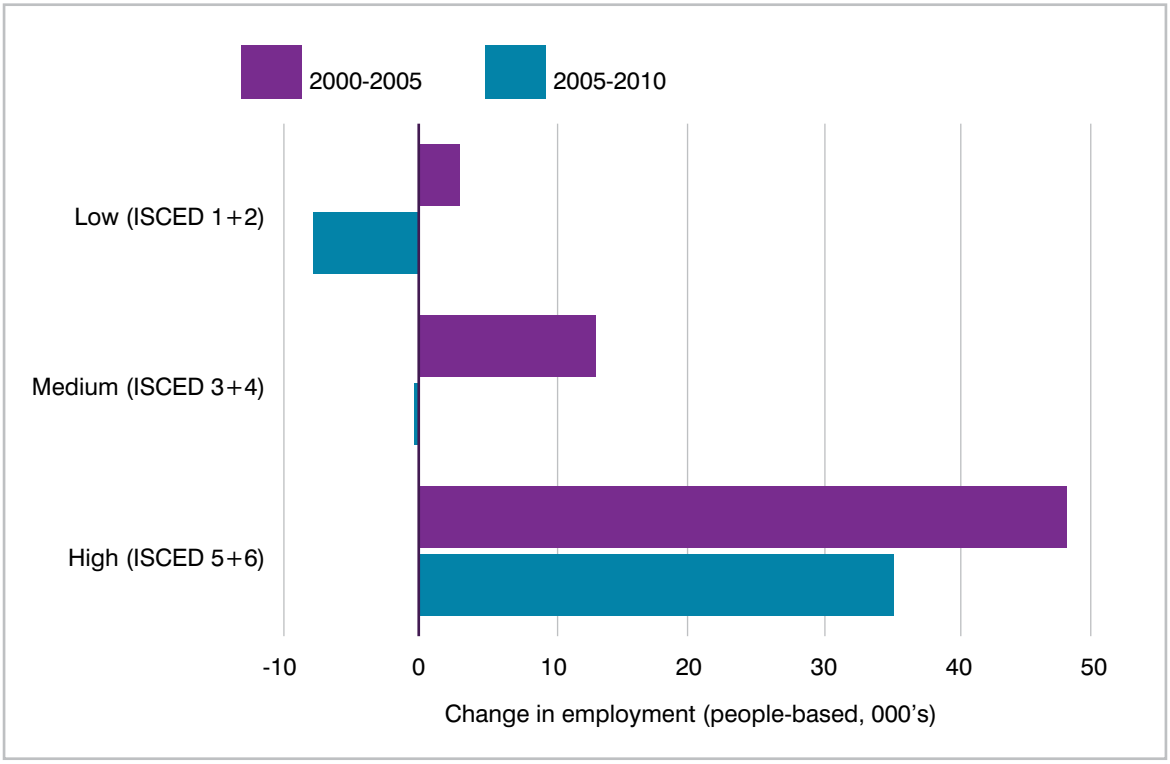


Source: CSO QHNS and ESRI.

Northern Ireland

The skills profile gradient in the NI employment forecasts is broadly the same as for Ireland, except for less forecast growth for employment requiring medium qualifications (Figure 4.33). As explained below, NI skill forecasts are indicative and should be treated with caution.

Figure 4.33: Northern Ireland recent employment trends and forecasts by skill level



Source: LFS and Regional Forecasts/Oxford Economics.

4.12.5 Employed Skill Stock Forecasts

Ireland

The impact of the above recent employment trends by skill level on the stock of persons employed has been to increase the share of university qualified workers in Ireland from 25 per cent in 2000 to 32 per cent in 2005 (Figure 4.34). The share is forecast to rise further to 41 per cent by 2015 under the baseline forecast. The shares of persons employed with lower education attainment are consequently declining, though the rate of decline is much more marked for persons with lower qualifications.

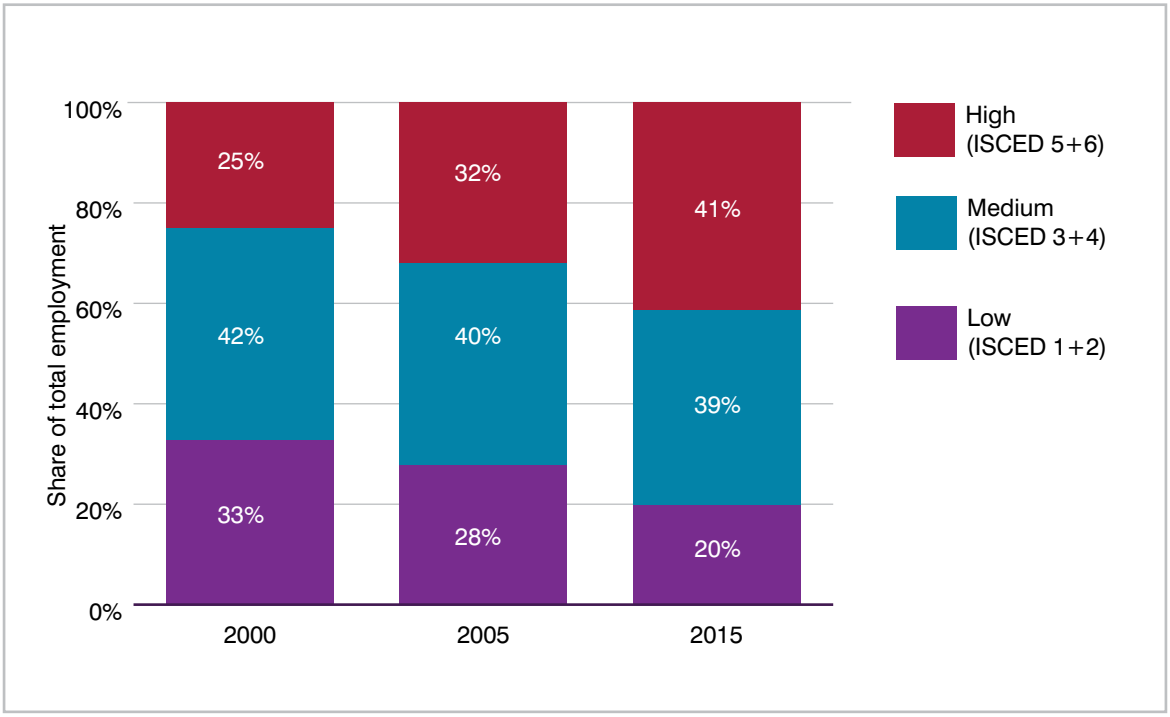
Northern Ireland

The trend in stock of employed skills is similar in NI, though the share of persons employed with higher qualifications is not forecast to grow as quickly (Figure 4.35).

It should be noted that NI skill stock forecasts were not previously estimated in the original Regional Forecasts research and have been roughly estimated for use in this report[11]. Ideally additional primary research would have been undertaken to do this more accurately. Caution should thus be exercised in quoting the NI skill stock forecasts.

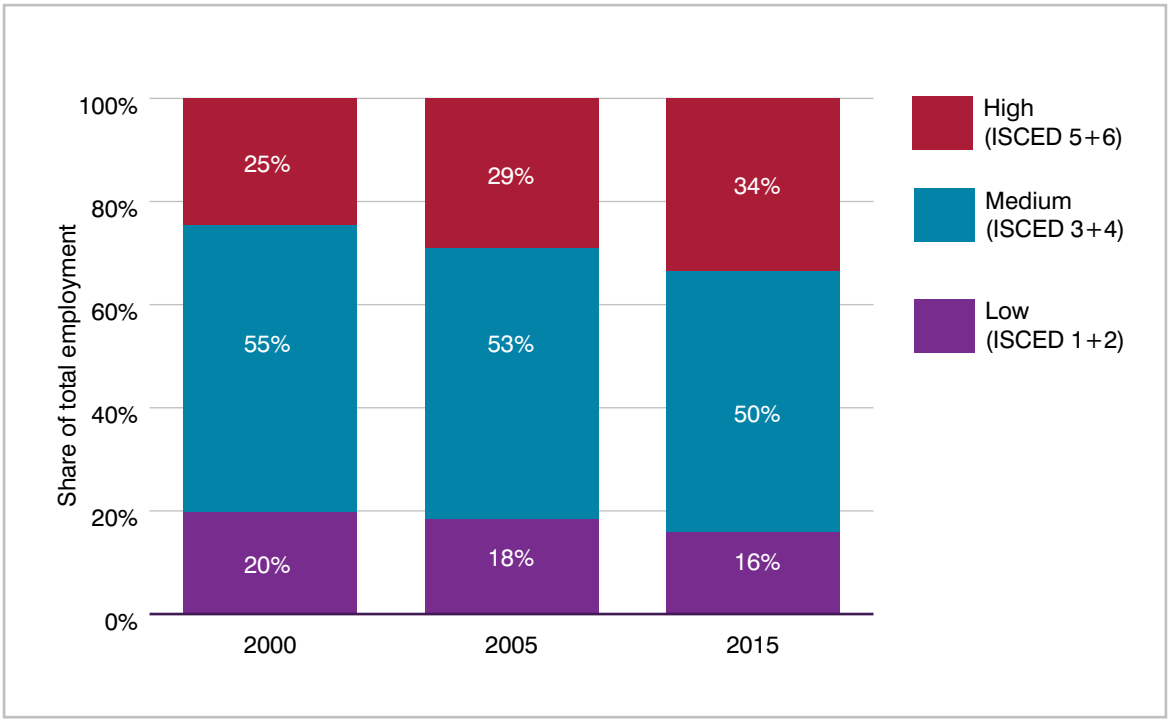
11 The approach used was to translate occupation stock forecasts into skill forecasts using the occupation-skill matrix from the 2001 Census and basing up-skilling assumptions within occupations on recent economy-side LFS trends.

Figure 4.34: Ireland recent employment trends and forecasts by stock of skills



Source: CSO QHNS and ESRI.

Figure 4.35: Northern Ireland recent employment trends and forecasts by stock of skills



Source: LFS and Regional Forecasts/Oxford Economics.

4.12.6 Replacement Demand Forecasts

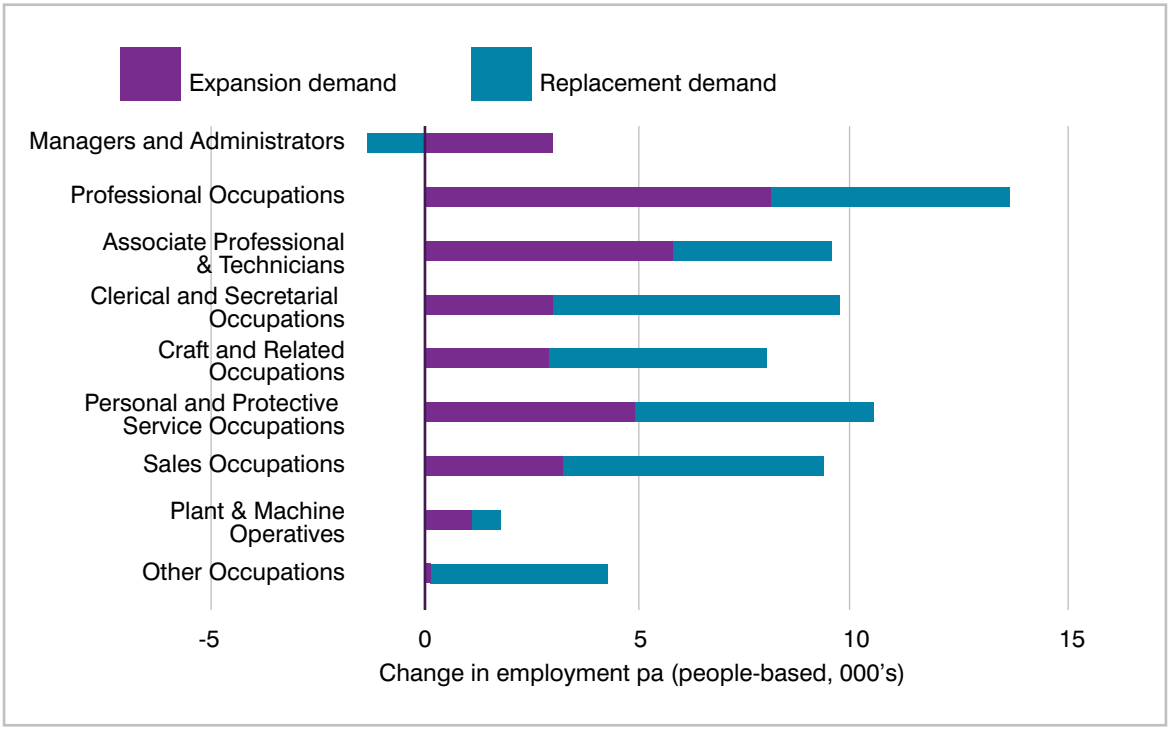
The final analysis of this section is replacement demand analysis. Annex D provides a detailed explanation of what replacement demand analysis is and why it is important. Essentially replacement demand estimates the number of people required in each occupation and skill category to replace leavers. The net requirement for workforce skills at economy-wide level is then the sum of:

- **Expansion demand** – the increase (or decrease) in employment stock (known as expansion demand); and
- **Net replacement demand** – the number of jobs vacated by those leaving employment to (1) retirement; (2) death; (3) unemployment/inactivity; (4) out migration, minus the number of people joining employment from unemployment/inactivity.

For both Ireland and Northern Ireland replacement demand flows are an important component of overall demand for occupations and skills and at economy wide level, are larger than expansion demand, particularly for lower grade occupations as shown in Figure 4.36 and Figure 4.37. However a comparison of the ratio of replacement to expansion demand between the North and South is not advised due to possible differences in what inflows and outflows are included in the calculations.

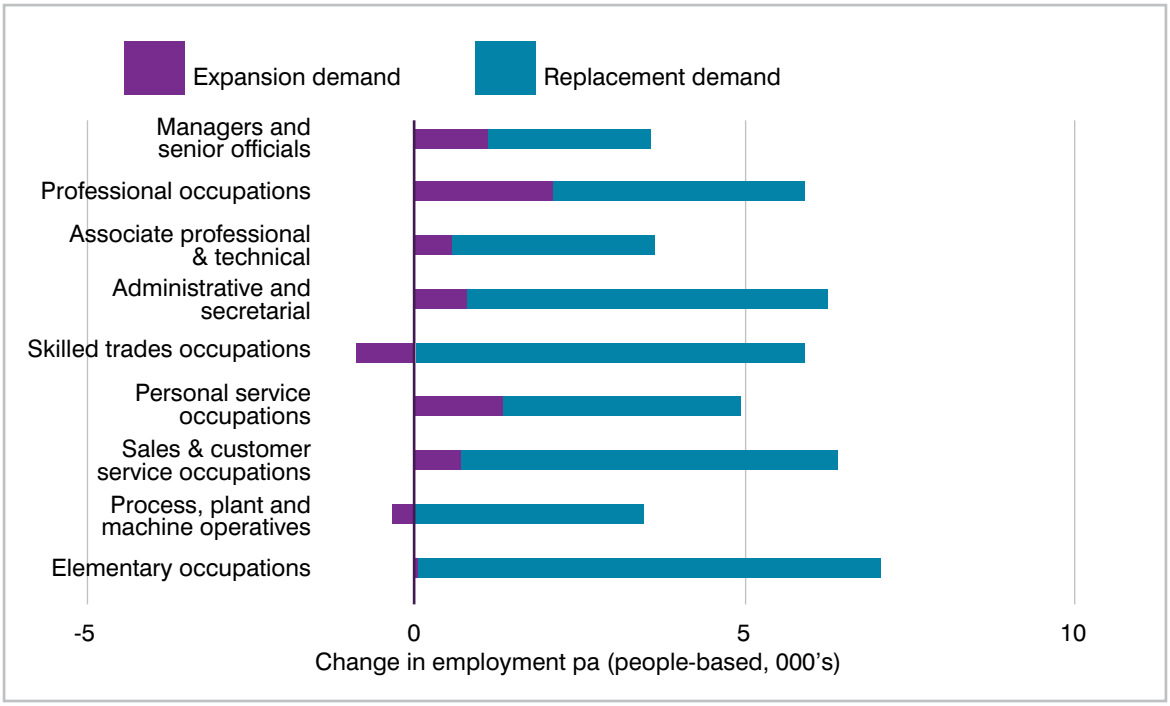
Replacement demand analysis helps to explain why a large number of vacancies arise for low skilled jobs in declining sectors. It also influences the pattern of future skill needs as indicated by Figures 4.38 and 4.39. As leaving rates tend to be greater for lower skilled occupations and joining rates higher for higher skilled occupations, the dynamics of the labour market means that the future need for lower qualifications will be higher than predicted by expansion demand forecasts alone.

Figure 4.36: Ireland expansion demand and replacement demand forecasts by occupation (annual average demand 2005-2015)



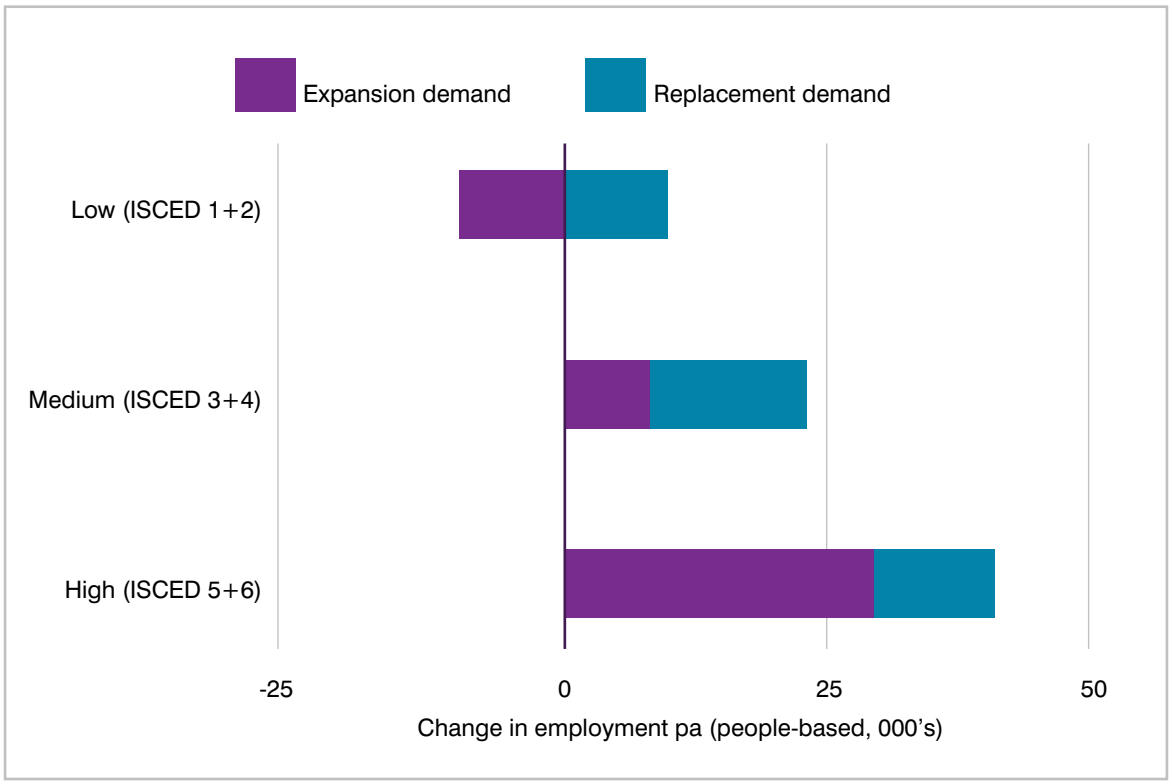
Source: ESRI.

Figure 4.37: Northern Ireland expansion demand and replacement demand forecasts by occupation (annual average demand 2005-2015)



Source: Regional Forecasts/Oxford Economics.

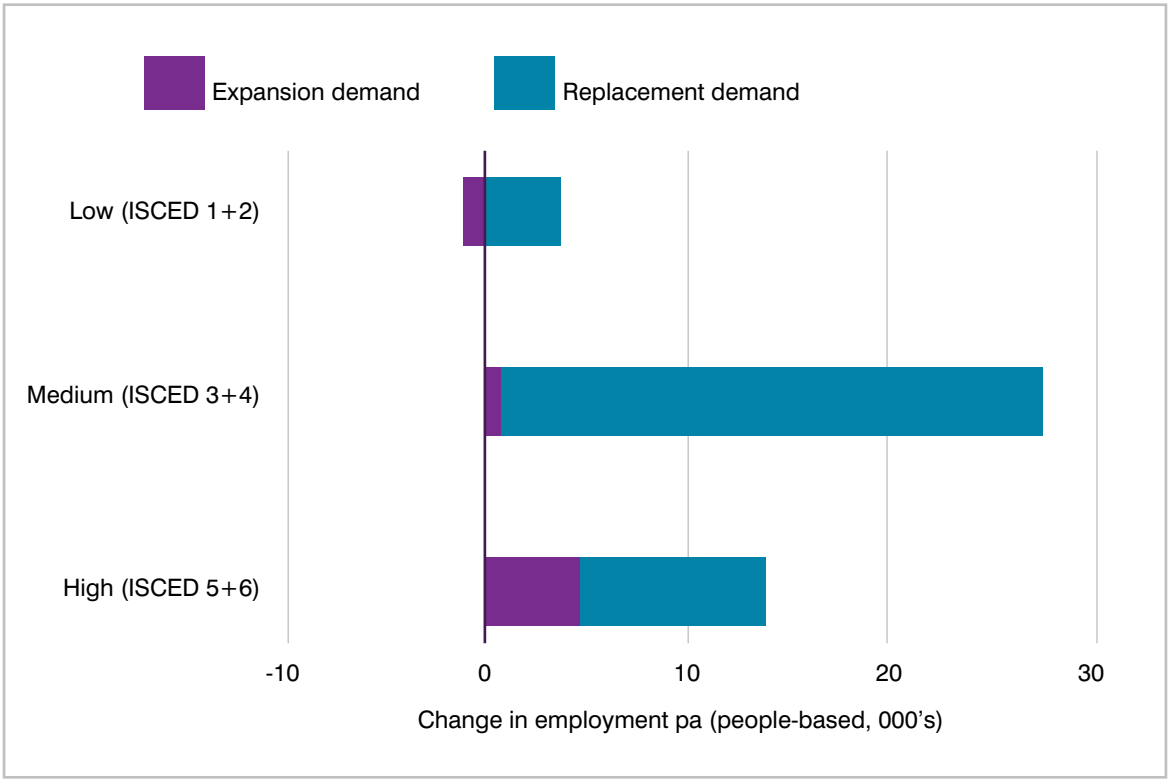
Figure 4.38: Ireland expansion demand and replacement demand forecasts by skill level (annual average demand 2005-2015)



Source: ESRI.

Note: Forecasts from ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006). 2015 figures average of 2010 and 2020 figures from ESRI report. Replacement demand skill estimates estimated by Oxford Economics using ESRI occupation by skill forecast shares.

Figure 4.39: Northern Ireland expansion demand and replacement demand forecasts by skill level (annual average demand 2005-2015)



Source: Regional Forecasts/Oxford Economics.

Note: Forecasts from 'Occupational Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015' (February 2006) – based on Regional Forecasts' constructed occupation figures (used to forecast skill levels) which are not directly comparable to historical LFS series,

4.13 Summary

The key points to note on the All-Island economy from this chapter can be summarised as:

- Like most other developed economies, the all-island economy has undergone a transformation from traditional agriculture/manufacturing to services with strong growth in business and financial services employment and a shedding of jobs in less competitive manufacturing sub-sectors. This transformation has had a major influence on the nature of skill demand in the economy. The South has successfully developed its hi-tech manufacturing sector, which similar to financial and business services, tends to be graduate 'hungry'.
- The growth in construction, particularly in the South, has however been one of the main sources of demand for low skills and migrants, offsetting falling demand for low skills from the decline in more traditional production sectors.

- Recent all-island employment trends share some similarities with international comparators. The US, UK and France, like the all-island economy, have experienced employment growth in construction, retail, financial & business services and the public sector. The main difference, with the exception of rates of growth, is that the all-island economy has not shed jobs in other production industries. Also the scale of the contribution of construction growth to overall employment growth on the Island.

- The key occupational trends at all-island level are the strong growth in professional, craft & related trade and service & shop/market sale occupations and the decline in plant & machine operative occupations.

- The number of employed persons with low qualifications, while falling in share terms, has not fallen significantly in absolute numbers. As said above, this will partly be explained by the strong growth in construction over the last decade which creates demand for a whole range of skill levels.

- The most rapid employment expansion has been in the number persons with higher qualifications. This partly reflects the transformation of the economy, upskilling within sectors and occupations and the increased supply of third level qualified persons, including migrants. It should be noted that skill trends of persons in employment is not a complete picture of skill demand as it is very difficult to precisely ascertain if workforce skills reflect actual demand or available supply or a combination of both. Within an economy there can be instances of both skill gaps and under-utilised skills.

- The transformation from traditional agriculture/industry to services is forecast to continue apace, with financial & business services and public services expected to be the main sources of employment growth in the all-island economy. Importantly, construction employment growth is forecast to slow considerably, and indeed latest forecasts North and likewise the South predict short-term job losses in construction (though for methodological reasons these are not the forecasts used in the report).

- This sectoral pattern will result in employment growth being largely concentrated in managerial and professional occupations and also in service & shop/market sale occupations. Minimal employment growth is forecast for elementary and plant & machine operative occupations.

- Much as over the last decade, the pattern of future sectoral and occupational employment growth has a strong skills profile gradient with a high proportion of jobs forecast to need graduate qualifications and job losses predicted overall for employment requiring low qualifications. Although there will be some specific lower grade and low skilled occupations with growth opportunities, for example ‘luxury’ employment occupations.

- This pattern of skill needs from expansion demand analysis will however be altered to a degree when replacement demand needs are included. As leaving rates tend to be higher for lower grade and lower skilled occupations and joining rates higher for higher grade occupations, the dynamics of the labour market means that the future need for lower qualifications will be higher than predicted by expansion demand forecasts alone.

North-South similarities/differences in sectoral, occupation and skill employment trends and forecasts

Similarities	Differences
■ Both economies have undergone the transformation from traditional agriculture/ manufacturing to services typical of most developed economies with similar strong growth in business and financial services. ■ Both economies have consequently experienced similar occupational trends, with stronger growth in professional occupations, and similar trends in skill levels of persons employed with a declining share of those with lower qualifications and a rising share with higher qualifications (though the South's share of higher skilled employed persons has risen faster with the NI share in recent years remaining flat). ■ Future employment growth North and South expected to continue to be led by financial and business services and education & health with continued demand therefore for professional occupations and a similar future skills stock trend, with a high proportion of net additional jobs requiring higher qualifications. ■ Replacement demand is an important component of skills demand across both jurisdictions.	■ In terms of economic structure, the public sector is relatively more important in the North, while the South economy is more dependent on business and financial services and construction. ■ Within sectors, although not analysed in this study, there are likely to be important differences with implications for the nature of skill demand. For example the South's financial and business service sector has a larger international financial services element whereas NI will have a higher share of call centre employment. ■ The South's growth in construction and retail employment has significantly outpaced growth in NI, which has had key implications for migrant labour. ■ The South has been more successful in attracting hi-tech manufacturing FDI which has meant it has experienced a less pronounced decline in manufacturing employment.

Annex A: Technical Data Matching

As explained in the introduction chapter, there have to date been limited initiatives to combine economic data on a North-South basis. There are of course good reasons why North-South economic data have not been aggregated to all-island level. These include:

- From a pure demand perspective all-island policy collaboration and close integration of the two economies are only a relatively recent phenomenon and the creation of All-Island economic data would not have been required to the same extent by governments, researchers and businesses in both jurisdictions as it is now.
- From a technical perspective concerns about data interoperability have rightly held back statisticians from simply adding together data across both jurisdictions. In fact this cautious stance is preferable as the deficiencies of merged but incomparable North-South datasets would discredit the process of developing all-island data.
- **Reporting latest data and forecasts:** Considerable amounts of data related to this research had already been collected and kindly provided by government statisticians North and South. However this exercise was undertaken some 6-9 months before the time of writing this report and through the course of this research some of these data have been revised and data for more recent periods have been published. Given the understandable preference to present the most current up-to-date picture, the most recent data have been collected. The latest Oxford Economics NI, Ireland and international forecasts are provided in the report (July 2008).
- **International comparators:** In order to benchmark Northern Ireland, Ireland and the all-island economy, international comparisons are provided throughout the report. The choice of international comparison countries is based on a mix of European and non-European industrialised economies both large and small and one emerging economy, China.

Data sources and North-South similarities/differences

Table A.1 below sets out the main data sources in each jurisdiction for each indicator presented in the main report. Indicators are listed in the order they are presented. The focus here is only on official historical/actual data sources and not forecasts. Comparability of forecasting research is dealt with in Annex D.

Note also that this annex does not include sources for international comparator data or a discussion of data similarities/differences. The latter is not necessary as only directly comparable international data are presented in the main report.

Table A.1 includes a column on classification of data comparability. This classification is based on the 'Atlas of the Island of Ireland' categories of datasets that can be exactly or 99 per cent matched, aligned so they broadly match, part-matched and are worthy of including for context and datasets that have no equivalent. By and large the conclusions on data comparability are generally consistent with Forfás/DEL's original classification. An additional column is included in Table A.1 to identify 'notes of caution' with using data – see details at the bottom of Table A.1 on these notes.

The key messages from Table A.1 are that:

- North-South data for half of the indicators already match exactly and can be summed together to produce at all-island figures;
- A number of key other indicators can be aligned to match and aggregate – GDP/GVA, occupations and highest education attainment/qualification levels of the working-age population and persons in employment;
- A number of other indicators part-match and provide an informative North-South comparison, if not quite matching sufficiently at this stage for aggregating at all-island level; and
- Some other indicators do not yet have equivalent datasets or methodologies to collect the data.

Table A.1: Key North-South data sources and classification of comparability

Indicator	Date source		Classification of comparability	Note of caution
	Ireland	Northern Ireland	Oxford Economics	
Economic context				
Total population	CSO	NISRA	Exactly (or 99%) matched	
Net migration	CSO	NISRA	Exactly (or 99%) matched	
Natural increase (births and deaths)	CSO	NISRA	Exactly (or 99%) matched	
Population by age band	CSO	NISRA	Exactly (or 99%) matched	
Population by gender	CSO	NISRA	Exactly (or 99%) matched	
GDP at current market prices	CSO	ONS Regional Accounts and Oxford Economics	Aligned to match	*
GDP/GVA at constant market prices	CSO	ONS Regional Accounts and Oxford Economics	Aligned to match	
VAT registrations	Irish Revenue Commissioners	BERR	Exactly (or 99%) matched	*

Indicator	Date source		Classification of comparability	Note of caution
	Ireland	Northern Ireland	Oxford Economics	
Entrepreneurial activity	GEM	GEM	Exactly (or 99%) matched	
Innovation	Forfás Community Innovation Survey	DETI Innovation Survey	Exactly (or 99%) matched	*
Skills/labour market context				
Total employment	CSO QNHS	DETI LFS	Exactly (or 99%) matched	
Working-age employment rate	CSO QNHS	DETI LFS	Exactly (or 99%) matched	
Unemployment rate	CSO QNHS	DETI LFS	Exactly (or 99%) matched	
Economically inactive rate	CSO QNHS	DETI LFS	Part-matched	*
Working-age by highest education attainment/ qualification	CSO QNHS	DETI LFS	Aligned to match	
Earnings	CSO National Employment Survey	DETI Annual Survey of Hours and Earnings (ASHE)	Exactly (or 99%) matched	
Earnings (recent graduates)	HEA	HESA	Exactly (or 99%) matched	
Programme for International Student Assessment (PISA)	OECD	OECD	Exactly (or 99%) matched	
School leaver highest education attainment	ESRI School Leavers' Survey	DENI Annual School Leavers' Survey	Part-matched	*
School leaver highest education destination	ESRI School Leavers' Survey	DENI Annual School Leavers' Survey	Part-matched	*
Demand for skills				
Employment by industry	CSO QNHS	DETI LFS	Exactly (or 99%) matched	
Employment by occupation	CSO QNHS	DETI LFS	Aligned to match	
Employment by highest education attainment/qualification	CSO QNHS	DETI LFS	Aligned to match	
Vacancies (total)	FÁS, Irish Times and Irishjobs.ie	DEL	Part-matched	*
Vacancies (hard-to-fill)	FÁS/ESRI	DEL NI Skills Monitoring Survey	Part-matched	*

Indicator	Date source		Classification of comparability	Note of caution
	Ireland	Northern Ireland	Oxford Economics	
Skill shortages	Qualitative only from FÁS/EGFSN	DEL NI Skills Monitoring Survey	No equivalent dataset	
Skill gaps	None	DEL NI Skills Monitoring Survey	No equivalent dataset	
Utilisation of skills	None	NI Skills at Work	No equivalent dataset	
Generic skills/soft skills/ cross cutting skills	None	NI Skills at Work	No equivalent dataset	

Classification colour coding:

Exactly (or 99%) matched
Aligned to match
Part-matched
No equivalent dataset

Explanation of note of caution:

GDP at current market prices:	GDP versus GNP.
VAT registrations:	Differences in VAT turnover thresholds.
Innovation:	Potential differences in response rates across the jurisdictions which may reduce representativeness of samples.
Economically inactive rate:	Exclude females 60-64 from Northern Ireland economically inactive – included for Ireland.
School leaver highest education attainment:	North-South education attainment levels are not wholly comparable at the level of detail provided.
School leaver highest education destination:	Although North-South destinations are broadly comparable, the difference in timing of the respective surveys mean that destination results are not directly comparable. The Ireland survey is normally undertaken 12-18 months after students leave school (though the most recent one was 20-24 months after.) The NI survey is normally taken 6 months after the student leave school.
Vacancies (total and hard-to-fill):	Based on different occupation classifications (SOC 1990 and SOC 2000).

Table A.2 summarises the main similarities and differences between North-South data for each indicator. Key differences worthy of note, which are the focus of the matching data section next, are:

- GDP data not available for NI, nor is a constant price GVA at basic price series;
- Different occupation classification – Ireland's employment data by occupation from the QNHS are classified by SOC 1990 and NI occupation data, since 2001, are classified by the more recent SOC 2000 classification; and
- Different education attainment/qualification classification of working-age population and persons in employment.

Table A.2: Key North-South data similarities and differences

Indicator	Similarities	Differences
Economic context		
Total population	Annual estimates refer to broadly the same point during the year – Ireland (April); NI (June). Linked to Census population figures.	CSO count all persons present on day of Census in Ireland; in NI NISRA count usually resident population. This is a minor difference – the magnitude of the difference has been investigated and is very small, and CSO are moving to the same definition as NISRA from 2007 onwards.
Net migration	Annual gross flows counted up to broadly same point in year – Ireland (April); NI (June). Methodologies use broadly same sources such as health registrations and passenger surveys.	
Natural increase (births and deaths)	Annual births and deaths counted up to broadly same point in year – Ireland (April); NI (June). Methodologies use broadly same sources (returns to local registrars).	CSO include births to non-resident mothers; NISRA exclude births to non-resident mothers. This is a minor difference – the number of births to non-resident mothers in Ireland is assumed to be small.
Population by age band	See total population.	See total population.
Population by gender	See total population.	See total population.
GDP at current market prices	Nominal GVA data available in both jurisdictions.	GDP data not available for NI, only GVA, as regional indirect tax minus subsidies data are not available at regional level. Ireland GDP measured in Euro, NI GVA measured in £ sterling. Ireland's GVA/GDP includes substantial expatriated profit element (approximately 15 per cent of GDP). Purchasing power parity (PPP) differences were not considered as part of this study.
GDP/GVA at constant market prices		NI constant price GVA data (used to calculate economic growth of NI economy) not available from ONS Regional Accounts, only current price data. Oxford Economics estimate a constant price GVA series for NI using UK industry deflators.

Indicator	Similarities	Differences
VAT registrations	Data available across jurisdictions for VAT registered business stock, new registrations and de-registrations.	Ireland and NI have different VAT turnover thresholds which, based on the recommendation of the Irish Revenue Commissioners, would make comparisons misleading. NI VAT turnover threshold is £67k from April 2008 (previously £64k in April 2007 and £61k previously). Ireland threshold is €35k for businesses supplying services and €70k for companies supplying goods.
Entrepreneurial activity	Data for both jurisdictions from Global Enterprise Monitor (GEM) based on the same methodological approach, applying the same definitions and available for the same year.	
Innovation	Data collected using the same EU-wide approach and applying the same definitions (Community Innovation Survey).	
FDI	Not immediately available in both jurisdictions.	
Labour market and skills context		
Total employment	The two sources (QNHS and LFS) use the same ILO definition of employment, measure people in employment as opposed to jobs and the data presented are not seasonally adjusted. Annual estimates refer to broadly same point in year – Ireland (Q2); NI (Spring).	NI LFS has a smaller sample size than the QNHS which makes its estimates more volatile.
Working-age employment rate	Assume a comparable working-age definition consistent with Eurostat (male and female 15-64).	Strictly speaking NI working-age definition is males 16-64 and females 16-59 although the UK working-age may change in future with an increase in the age of retirement.
Economically inactive rate	Number of economically inactive in both jurisdictions calculated as working-age population minus working-age employed and unemployed. Denominator for inactivity rate in both jurisdictions is working-age population. Annual estimates refer to broadly same point in year – Ireland (Q2); NI (Spring).	Use the typical working-age definition for NI as in the author's view, including inactive females aged 60-64 for would over-estimate economic inactivity in NI.
Working-age by highest education attainment/ qualification	Based on comparable sources (QNHS and LFS) and refers to highest education attainment/qualification level. Annual estimates refer to broadly same point in year – Ireland (Q2); NI (Spring).	Different education attainment/qualification classification (though can be aligned to ISCED categories).

Indicator	Similarities	Differences
Earnings	Data available in both jurisdictions for median gross weekly wages of full-time and part-time jobs for the same year and across the same range of sectors.	Ireland wages measured in Euro, NI wages measured in £ sterling (can be easily converted to a common currency). Purchasing power parity (PPP) differences were not considered as part of this study.
Graduate earnings	Data available for the same year and for comparable levels of tertiary attainment.	HEA Graduate Survey undertaken 9 months after graduation; HESA First Destination Leaver Survey undertaken 6 months after graduation (this is not considered to be a significant difference as a high proportion of pay rises are unlikely between months 6 and 9 of the first year of graduate employment).
Programme for International Student Assessment (PISA)	Data collected using the same international approach, applying the same definitions and producing the same set of results. Results available for the same year.	
School leaver highest education attainment and destination	Destination categories match closely (further study, employment etc.). Results available for the same year.	Different education attainment levels (insufficient attainment detail is published to match). Although North-South destinations are broadly comparable, the difference in timing of the respective surveys mean that destination results are not directly comparable. Ireland's survey is normally undertaken 12-18 months after students leave school (though the most recent one was 20-24 months after). The NI survey is undertaken 6 months after students leave.
Demand for skills		
Employment by industry	The two sources (QNHS and LFS) use the same ILO definition of employment. Annual estimates refer to broadly same point in year – Ireland (Q2); NI (Spring). Industrial classification in both jurisdictions is different (Ireland – NACE and NI – SIC) but an EC regulation was made in 1990 to ensure that SIC 2003 follows NACE exactly up to 4-digit level (where necessary and helpful, SIC adds an extra 5th digit of detail but 5-digit employment data are not of interest to this study).	NI LFS has a smaller sample size which makes estimates more volatile.

Indicator	Similarities	Differences
Employment by occupation	The two sources (QNHS and LFS) use the same ILO definition of employment. Annual estimates refer to broadly same point in year – Ireland (Q2); NI (Spring).	Occupation classification in two jurisdictions is different (Ireland – SOC 1990 and NI – SOC 2000) According to the ONS, though the SOC 2000 classification still has a similar number of major groups, there have been considerable changes which means that it is not possible to make a meaningful comparison. (The main features of the revision included: a tighter definition of managerial occupations; overhaul of computing and related occupations; introduction of specific occupations associated with the environment and conservation; changes linked to the upgrading of skills but de-skilling of manufacturing processes; and recognition of the development of customer service occupations and emergence of remote service provision through the operation of call centres) The main priority of the revised classification was to bring it up-to-date to reflect changes in society, industry and occupations. Backcasting is difficult because it is not meaningful to apply a classification with new occupations to data for a time period which did not have these new occupations. SOC 1990 and 2000 occupations can however be aligned (provided sufficient detail is available) using the ONS and CSO SOC to ISCO 88 mapping frameworks.
Employment by highest education attainment/ qualification	Based on comparable sources (QNHS and LFS) and refers to highest education attainment/qualification level. Annual estimates refer to broadly same point in year – Ireland (Q2); NI (Spring).	Different education attainment/qualification classification (though can be aligned to ISCED categories).
Vacancies (total)	Data available for same year and FÁS & DEL sources and methodologies are broadly comparable.	Different occupational classification for comparing vacancies by occupation (SOC 1990 and SOC 2000).
Vacancies (hard-to-fill)	Data available for same year and FÁS/ ESRI & DEL NI Skills Monitoring survey sources and methodologies are broadly comparable.	Different occupational classification for comparing vacancies by occupation (SOC 1990 and SOC 2000).

Indicator	Similarities	Differences
Skill shortages	Not immediately available for both jurisdictions.	
Labour shortages	Not immediately available for both jurisdictions.	
Skill gaps	Not immediately available for both jurisdictions.	
Utilisation of skills	Not immediately available for both jurisdictions.	
Generic skills/soft skills/cross cutting skills	Not immediately available for both jurisdictions.	

Methodology to Match North-South data

As outlined above, the three main areas where it has been necessary to align data to ensure matching are as follows. (2) and (3) are particularly critical to this work.

1. NI GDP and constant price GVA series;

2. Occupations; and

3. Highest education attainment/qualification level.

(1) NI GDP and constant price GVA series

Since the European System of Accounts (ESA 95) was introduced, GDP at market prices has become the primary measure of the value of economic output and for international comparisons, and is also a key indicator for identifying regions eligible for EU structural funding support.

GDP at market prices is available for Ireland but not NI. This is because a breakdown of UK indirect taxes and subsidies is not available regionally, and understandably so. (GDP at market prices is equal to GVA at basic prices plus indirect taxes minus subsidies).

While GVA at basic prices/factor cost is available for both jurisdictions, it is considered preferable to estimate a more internationally comparable All-Island figure (GDP at market prices). It is possible to estimate GDP at market prices for NI by following Eurostat's approach to pro-rata, using population shares, the value of national indirect taxes minus subsidies across the 12 UK regions[12]. This is the approach adopted in this study although this may over-estimate NI's GDP per head as it will likely allocate too much of southern England's indirect taxes and not deduct enough of NI's subsidies. Common currency figures are easily calculated using ECB average year exchange rates. Producing PPP GDP figures, which could be done using UK and Ireland PPP ratios from Eurostat, is beyond the scope of this study.

One additional issue worth flagging up in relation to GDP is the large difference between Ireland's GDP and GNP due to the large net negative outflows of net factor income of approximately €25bn in 2006 or 15 per cent of GDP. These flows largely represent repatriation of profits overseas which strictly

12 *Eurostat Regional Yearbook 2007, pg 31 (Methodological notes).*

speaking, are not part of the wealth of Irish residents. Chapter 2 shows that GDP per head in Ireland is over 50 per cent higher than the comparative NI figure in common currency terms. If Ireland GNP per head is compared to NI GDP per head, the difference falls to 35 per cent. GDP is used at market price figures for NI and Ireland as it is not possible to estimate GNP for NI[13], which while not strictly measuring national wealth, does measure national output.

Oxford Economics' constant price GVA series for NI is used to measure rates of economic growth. This is calculated using ONS Regional Accounts current price GVA data by sector, deflated by the respective UK industry deflators.

(2) Occupations

As stated in Table A.2, occupation classifications in the two jurisdictions differ. Ireland's QNHS is still based on SOC 1990 while NI's LFS made the transition to SOC 2000 in 2001.

Although the SOC 2000 classification still has a similar number of major groups, there have been considerable changes which make a meaningful direct comparison between SOC 1990 and SOC 2000 not possible. Table A.2 should be referred back to for the detailed differences. However it is possible to align both SOC 1990 and SOC 2000 occupations to a common classification – ISCO 88 (International Standard Classification of Occupations). ISCO 88 is also the occupation classification used in the CEDEFOP work on 'Future skill needs in Europe', which means in future it would technically be possible to compare All-Island occupation forecasts to this work. The individual approaches taken to align Ireland and NI occupation data are explained below.

- **Ireland** – starting with 3-digit SOC 1990 occupation data from the QNHS, convert to 3-digit ISCO 88 occupations using CSO's SOC 1990-ISCO 88 harmonisation framework kindly provided by Kieran Walsh (and further aggregate ISCO 88 occupations to 2-digit and 1-digit level).

- **Northern Ireland** – ONS' Occupational Information Unit kindly provided a mapping framework to align 4-digit SOC 2000 occupations into 4-digit ISCO 88 occupations. The only remaining problem is that NI LFS occupation data, due to its limited sample size and disclosure thresholds, is in its most detailed form only available for a limited number of 3-digit occupations averaged over a three-year period. 2001 Census occupation data are however available by 4-digit level and was kindly obtained by DEL. To circumvent the lack of detail in the LFS, the share of 4-digit SOC 2000 occupations in each 2-digit SOC 2000 occupation, for which LFS data are available annually, was estimated from the Census and these shares were held constant from 2001 onwards to estimate an annual series of 4-digit SOC 2000 occupations. The estimates were cross-checked with the limited 3-digit LFS data to identify if any adjustments to the 'constant share' approach were necessary. It was positive to find few discrepancies so no adjustments were made. As for Ireland's occupations, NI ISCO 88 4-digit occupations were aggregated to 3-digit, 2-digit and 1-digit level. This means that it was possible to develop a highly detailed 3-digit All-Island occupation dataset.

13 *UK net factor income is a much smaller share of GDP, ranging from 0.2 per cent to 0.8 per cent in recent years so it is unlikely that GDP would differ significantly from GNP in NI if GNP could be estimated.*

3-digit ISCO 88 occupation data for the All-Island, Ireland and NI is presented below.

Table A.3: All-Island 3-digit ISCO 88 occupations (2001-2007, 000's)

	Code	2001	2002	2003	2004	2005	2006	2007
Armed forces	100	10	11	10	10	10	9	12
Legislators and senior government officials	111	3	5	5	8	5	5	4
Senior officials of special-interest organisations	114	2	2	3	2	1	2	2
Directors and chief executives	121	3	5	2	13	8	12	11
Production and operations managers	122	281	286	288	280	274	271	273
Other specialist managers	123	77	79	78	74	82	82	88
Managers of small enterprises	131	8	6	7	6	3	7	6
Physicists, chemists and related professionals	211	5	5	5	5	6	6	6
Mathematicians, statisticians and related professionals	212	1	1	1	2	2	1	2
Computing professionals	213	30	33	31	34	31	30	31
Architects, engineers and related professionals	214	45	47	49	54	56	58	65
Life science professionals	221	4	4	4	6	6	5	6
Health professionals (except nursing)	222	21	19	23	26	32	24	26
Nursing and midwifery professionals	223	44	49	51	52	53	55	55
College, university and higher education teaching professionals	231	16	19	18	17	20	20	20
Secondary education teaching professionals	232	38	44	42	39	45	46	43
Primary and pre-primary education teaching professionals	233	36	41	39	40	40	44	42
Special education teaching professionals	234	1	1	2	1	1	1	1
Other teaching professionals	235	17	20	19	22	23	23	22
Business professionals	241	33	40	40	49	46	53	51
Legal professionals	242	11	11	12	13	12	15	16
Archivists, librarians and related information professionals	243	4	3	3	5	4	2	4

	Code	2001	2002	2003	2004	2005	2006	2007
Social science and related professionals	244	6	10	8	12	12	14	15
Writers and creative or performing artists	245	14	13	13	14	16	16	16
Religious professionals	246	6	7	7	8	7	7	8
Public service administrative professionals	247	13	13	13	13	14	13	12
Physical and engineering science technicians	311	30	31	28	32	30	30	32
Computer associate professionals	312	2	2	2	2	2	2	3
Optical and electronic equipment operators	313	4	4	5	4	7	5	5
Ship and aircraft controllers and technicians	314	0	0	3	3	1	2	2
Safety and quality inspectors	315	2	3	4	4	4	4	4
Life science technicians and related associate professionals	321	0	0	0	0	0	0	0
Health associate professionals (except nursing)	322	13	15	13	14	14	16	19
Nursing and midwifery associate professionals	323	21	26	25	22	21	24	26
Primary education teaching associate professionals	331	0	0	0	0	0	0	0
Pre-primary education teaching associate professionals	332	3	4	4	5	7	7	9
Special education teaching associate professionals	333	0	0	0	0	0	0	0
Other teaching associate professionals	334	3	3	4	4	4	5	3
Finance and sales associate professionals	341	64	63	70	74	75	80	75
Business services agents and trade brokers	342	0	0	0	1	2	1	2
Administrative associate professionals	343	4	3	7	5	5	4	5
Customs, tax and related government associate professionals	344	2	1	1	1	1	1	1
Police inspectors and detectives	345	0	0	0	0	0	0	0

	Code	2001	2002	2003	2004	2005	2006	2007
Social work associate professionals	346	12	15	16	11	12	14	15
Artistic, entertainment and sports associate professionals	347	17	21	19	19	27	26	25
Religious associate professionals	348	0	0	0	0	0	0	0
Secretaries and keyboard-operating clerks	411	61	60	58	58	65	67	55
Numerical clerks	412	37	40	40	42	44	42	46
Material-recording and transport clerks	413	22	23	20	23	22	24	26
Library, mail and related clerks	414	24	23	24	20	21	24	22
Other office clerks	419	111	126	130	124	123	133	146
Cashiers, tellers and related clerks	421	40	39	42	44	45	44	46
Client information clerks	422	27	28	27	28	28	30	31
Travel attendants and related workers	511	7	4	5	4	3	5	5
Housekeeping and restaurant services workers	512	92	93	102	91	96	105	114
Personal care and related workers	513	85	83	93	87	102	112	118
Other personal services workers	514	21	18	23	24	24	27	29
Protective services workers	516	26	29	29	31	31	32	37
Fashion and other models	521	0	0	0	0	0	0	0
Shop, stall and market salespersons and demonstrators	522	141	140	152	152	168	171	182
Market gardeners and crop growers	611	14	14	14	14	17	16	15
Animal producers and related workers	612	0	0	0	0	0	0	0
Crop and animal producers	613	14	21	17	20	31	16	21
Forestry and related workers	614	2	1	2	0	1	2	2
Fishery workers, hunters and trappers	615	3	4	3	3	3	2	3
Miners, shotfirers, stone cutters and carvers	711	0	0	1	0	1	2	2
Building frame and related trades workers	712	91	84	101	104	119	126	132
Building finishers and related trades workers	713	70	67	75	74	86	99	93
Painters, building structure cleaners and related trades workers	714	17	15	17	14	18	18	20

	Code	2001	2002	2003	2004	2005	2006	2007
Metal moulders, welders, sheet-metal workers, structural-metal preparers, and related trades workers	721	22	22	23	20	22	23	23
Blacksmiths, tool-makers and related trades workers	722	3	3	3	3	3	3	2
Machinery mechanics and fitters	723	55	53	56	50	53	56	56
Electrical and electronic equipment mechanics and fitters	724	20	20	21	19	18	20	21
Precision workers in metal and related materials	731	1	2	1	0	2	3	2
Potters, glass-makers and related trades workers	732	2	3	3	3	2	1	0
Handicraft workers in wood, textile, leather and related materials	733	3	3	4	4	3	3	3
Craft printing and related trades workers	734	9	8	6	7	7	8	9
Food processing and related trades workers	741	14	13	13	12	12	14	11
Wood treaters, cabinet-makers and related trades workers	742	7	7	6	5	4	6	5
Textile, garment and related trades workers	743	6	5	5	3	3	3	3
Pelt, leather and shoemaking trades workers	744	0	0	0	0	0	0	0
Mining and mineral-processing-plant operators	811	0	0	0	0	0	0	1
Metal-processing plant operators	812	3	2	1	2	2	2	1
Glass, ceramics and related plant operators	813	2	2	1	1	1	1	1
Wood-processing- and papermaking-plant operators	814	3	3	2	1	1	1	1
Chemical-processing-plant operators	815	13	14	14	11	10	10	10
Power-production and related plant operators	816	8	7	8	6	6	8	6
Industrial robot operators	817	0	0	0	0	0	0	0
Metal- and mineral-products machine operators	821	11	14	15	13	13	14	13

	Code	2001	2002	2003	2004	2005	2006	2007
Chemical-products machine operators	822	1	1	0	0	0	1	2
Rubber- and plastic-products machine operators	823	8	6	4	3	5	4	4
Wood-products machine operators	824	3	2	2	2	1	1	1
Printing-, binding- and paper-products machine operators	825	1	0	1	1	0	0	0
Textile-, fur- and leather-products machine operators	826	16	14	11	9	8	8	8
Food and related products machine operators	827	21	22	22	16	21	21	22
Assemblers	828	43	33	27	22	22	20	20
Other machine operators not elsewhere classified	829	6	6	6	5	6	6	7
Locomotive engine drivers and related workers	831	0	0	0	0	0	0	0
Motor vehicle drivers	832	85	90	85	90	95	97	101
Agricultural and other mobile plant operators	833	23	22	22	23	24	24	25
Ships' deck crews and related workers	834	0	0	0	0	1	0	0
Street vendors and related workers	911	8	7	7	5	6	6	5
Shoe cleaning and other street services elementary occupations	912	0	0	0	0	0	0	0
Domestic and related helpers, cleaners and launderers	913	69	68	74	65	75	77	86
Building caretakers, window and related cleaners	914	12	10	10	10	9	9	10
Messengers, porters, doorkeepers and related workers	915	23	23	26	21	24	24	28
Garbage collectors and related labourers	916	1	1	2	1	2	2	3
Agricultural, fishery and related labourers	921	18	17	16	14	13	14	14
Mining and construction labourers	931	42	41	39	34	40	47	49
Manufacturing labourers	932	31	35	34	58	51	55	52
Transport labourers and freight handlers	933	14	14	11	13	10	12	9

Source: QNHS, LFS and Oxford Economics.

Note: Occupations may not add up to employment totals due to missing or unknown occupations. Figures are rounded to nearest 1,000. Therefore occupations with less than 500 will be recorded as zero.

Table A.4: Ireland 3-digit ISCO 88 occupations (2001-2007, 000's)

	Code	2001	2002	2003	2004	2005	2006	2007
Armed forces	100	7	7	7	7	7	6	6
Legislators and senior government officials	111	3	4	5	8	4	5	4
Senior officials of special-interest organisations	114	1	1	2	1	0	1	1
Directors and chief executives	121	3	5	2	13	8	11	11
Production and operations managers	122	229	232	233	228	226	218	220
Other specialist managers	123	61	60	60	57	64	65	70
Managers of small enterprises	131	0	0	0	0	0	0	0
Physicists, chemists and related professionals	211	3	4	4	4	4	5	5
Mathematicians, statisticians and related professionals	212	1	1	1	2	2	1	2
Computing professionals	213	24	27	26	26	24	25	24
Architects, engineers and related professionals	214	34	36	39	38	44	46	50
Life science professionals	221	3	3	3	4	4	4	5
Health professionals (except nursing)	222	13	14	16	17	17	16	17
Nursing and midwifery professionals	223	44	49	51	52	53	55	55
College, university and higher education teaching professionals	231	9	10	11	11	12	12	14
Secondary education teaching professionals	232	28	29	30	28	31	33	32
Primary and pre-primary education teaching professionals	233	26	27	29	30	27	33	32
Special education teaching professionals	234	0	0	1	0	0	0	0
Other teaching professionals	235	14	17	17	19	19	20	19
Business professionals	241	27	33	33	40	39	44	42
Legal professionals	242	8	8	8	8	9	10	11
Archivists, librarians and related information professionals	243	3	2	2	4	3	1	3
Social science and related professionals	244	3	5	5	6	7	9	9
Writers and creative or performing artists	245	12	11	11	12	13	13	14

	Code	2001	2002	2003	2004	2005	2006	2007
Religious professionals	246	4	4	4	4	4	3	3
Public service administrative professionals	247	12	12	13	12	13	12	11
Physical and engineering science technicians	311	23	22	21	23	23	23	22
Computer associate professionals	312	0	0	0	0	0	0	0
Optical and electronic equipment operators	313	2	2	4	3	5	3	3
Ship and aircraft controllers and technicians	314	0	0	3	3	0	2	1
Safety and quality inspectors	315	1	2	2	2	3	3	3
Life science technicians and related associate professionals	321	0	0	0	0	0	0	0
Health associate professionals (except nursing)	322	8	9	7	10	10	11	13
Nursing and midwifery associate professionals	323	1	1	2	2	1	2	0
Primary education teaching associate professionals	331	0	0	0	0	0	0	0
Pre-primary education teaching associate professionals	332	3	4	4	5	7	7	9
Special education teaching associate professionals	333	0	0	0	0	0	0	0
Other teaching associate professionals	334	0	0	0	0	0	1	0
Finance and sales associate professionals	341	49	48	48	55	55	58	57
Business services agents and trade brokers	342	0	0	0	1	1	1	1
Administrative associate professionals	343	3	2	5	3	4	2	4
Customs, tax and related government associate professionals	344	1	0	0	0	0	0	0
Police inspectors and detectives	345	0	0	0	0	0	0	0
Social work associate professionals	346	7	8	10	6	7	9	9
Artistic, entertainment and sports associate professionals	347	12	15	12	14	16	17	19
Religious associate professionals	348	0	0	0	0	0	0	0
Secretaries and keyboard-operating clerks	411	42	43	42	41	47	47	40

	Code	2001	2002	2003	2004	2005	2006	2007
Numerical clerks	412	27	28	27	30	32	31	33
Material-recording and transport clerks	413	19	20	17	20	19	22	23
Library, mail and related clerks	414	19	18	18	15	16	19	17
Other office clerks	419	68	80	80	76	78	88	96
Cashiers, tellers and related clerks	421	32	31	33	36	37	36	38
Client information clerks	422	17	16	14	16	19	17	17
Travel attendants and related workers	511	5	3	3	3	2	3	3
Housekeeping and restaurant services workers	512	72	75	81	76	81	86	96
Personal care and related workers	513	39	41	48	47	56	67	72
Other personal services workers	514	14	13	15	16	18	19	20
Protective services workers	516	24	27	27	29	29	31	33
Fashion and other models	521	0	0	0	0	0	0	0
Shop, stall and market salespersons and demonstrators	522	95	97	103	101	113	123	128
Market gardeners and crop growers	611	11	10	11	10	10	12	11
Animal producers and related workers	612	0	0	0	0	0	0	0
Crop and animal producers	613	0	0	0	0	0	0	0
Forestry and related workers	614	2	1	2	0	1	2	2
Fishery workers, hunters and trappers	615	2	3	2	2	1	2	2
Miners, shotfirers, stone cutters and carvers	711	0	0	1	0	1	2	2
Building frame and related trades workers	712	67	66	77	80	92	96	103
Building finishers and related trades workers	713	50	49	55	56	66	77	71
Painters, building structure cleaners and related trades workers	714	12	11	12	9	13	12	14
Metal moulders, welders, sheet-metal workers, structural-metal preparers, and related trades workers	721	15	14	15	14	16	15	16
Blacksmiths, tool-makers and related trades workers	722	1	2	1	2	2	2	1
Machinery mechanics and fitters	723	38	35	37	37	40	39	40
Electrical and electronic equipment mechanics and fitters	724	14	14	14	14	13	14	15

	Code	2001	2002	2003	2004	2005	2006	2007
Precision workers in metal and related materials	731	0	1	0	0	1	2	1
Potters, glass-makers and related trades workers	732	2	2	2	2	2	0	0
Handicraft workers in wood, textile, leather and related materials	733	2	2	3	3	2	2	2
Craft printing and related trades workers	734	7	7	5	6	6	6	7
Food processing and related trades workers	741	10	9	9	10	9	10	8
Wood treaters, cabinet-makers and related trades workers	742	5	5	4	4	3	5	4
Textile, garment and related trades workers	743	5	3	4	2	2	2	3
Pelt, leather and shoemaking trades workers	744	0	0	0	0	0	0	0
Mining and mineral-processing-plant operators	811	0	0	0	0	0	0	0
Metal-processing plant operators	812	3	2	1	2	2	2	1
Glass, ceramics and related plant operators	813	1	1	0	0	0	0	0
Wood-processing- and papermaking-plant operators	814	2	2	1	0	0	0	0
Chemical-processing-plant operators	815	11	12	11	9	8	8	7
Power-production and related plant operators	816	7	7	7	5	5	8	5
Industrial robot operators	817	0	0	0	0	0	0	0
Metal- and mineral-products machine operators	821	5	8	9	8	8	8	6
Chemical-products machine operators	822	1	1	0	0	0	1	2
Rubber- and plastic-products machine operators	823	6	4	3	2	3	2	2
Wood-products machine operators	824	3	2	2	2	1	1	1
Printing-, binding- and paper-products machine operators	825	1	0	1	1	0	0	0
Textile-, fur- and leather-products machine operators	826	10	9	7	5	4	3	2
Food and related products machine operators	827	16	17	17	12	16	15	16

	Code	2001	2002	2003	2004	2005	2006	2007
Assemblers	828	42	32	26	21	21	19	19
Other machine operators not elsewhere classified	829	0	0	0	0	0	0	0
Locomotive engine drivers and related workers	831	0	0	0	0	0	0	0
Motor vehicle drivers	832	60	64	63	68	71	73	74
Agricultural and other mobile plant operators	833	17	16	17	17	18	19	18
Ships' deck crews and related workers	834	0	0	0	0	1	0	0
Street vendors and related workers	911	6	5	5	3	3	4	3
Shoe cleaning and other street services elementary occupations	912	0	0	0	0	0	0	0
Domestic and related helpers, cleaners and launderers	913	38	40	41	40	47	51	54
Building caretakers, window and related cleaners	914	8	8	7	6	6	6	7
Messengers, porters, doorkeepers and related workers	915	8	9	9	8	9	10	12
Garbage collectors and related labourers	916	0	0	1	0	1	1	2
Agricultural, fishery and related labourers	921	14	14	13	11	10	10	12
Mining and construction labourers	931	31	31	29	24	31	37	40
Manufacturing labourers	932	23	28	27	50	45	47	47
Transport labourers and freight handlers	933	4	5	3	4	4	3	3

Source: QNHS and Oxford Economics.

Note: See note for Table A.3.

Table A.5: Northern Ireland 3-digit ISCO 88 occupations (2001-2007, 000's)

	Code	2001	2002	2003	2004	2005	2006	2007
Armed forces	100	3	4	3	3	3	3	6
Legislators and senior government officials	111	0	0	0	0	0	0	0
Senior officials of special-interest organisations	114	1	1	1	1	1	1	1
Directors and chief executives	121	0	0	0	0	0	0	0
Production and operations managers	122	52	54	55	52	48	53	53
Other specialist managers	123	16	19	18	18	19	17	18
Managers of small enterprises	131	8	6	7	6	3	7	6
Physicists, chemists and related professionals	211	1	1	1	1	1	1	1
Mathematicians, statisticians and related professionals	212	0	0	0	0	0	0	0
Computing professionals	213	6	6	5	8	7	5	7
Architects, engineers and related professionals	214	11	11	10	16	12	12	15
Life science professionals	221	2	1	1	2	2	1	2
Health professionals (except nursing)	222	8	6	7	9	14	8	8
Nursing and midwifery professionals	223	0	0	0	0	0	0	0
College, university and higher education teaching professionals	231	6	9	7	7	8	8	7
Secondary education teaching professionals	232	11	14	12	11	14	13	11
Primary and pre-primary education teaching professionals	233	10	13	11	10	13	12	10
Special education teaching professionals	234	1	1	1	1	1	1	1
Other teaching professionals	235	3	4	3	3	3	3	3
Business professionals	241	6	7	7	9	7	9	9
Legal professionals	242	3	4	3	5	4	5	5
Archivists, librarians and related information professionals	243	1	1	1	1	1	1	1
Social science and related professionals	244	4	4	4	6	5	5	6
Writers and creative or performing artists	245	2	2	2	2	4	3	2

	Code	2001	2002	2003	2004	2005	2006	2007
Religious professionals	246	2	3	2	4	3	4	4
Public service administrative professionals	247	1	1	1	1	1	1	1
Physical and engineering science technicians	311	7	8	7	8	7	7	10
Computer associate professionals	312	2	2	2	2	2	2	3
Optical and electronic equipment operators	313	1	2	2	1	2	2	2
Ship and aircraft controllers and technicians	314	0	0	1	1	1	1	1
Safety and quality inspectors	315	1	1	2	1	1	2	1
Life science technicians and related associate professionals	321	0	0	0	0	0	0	0
Health associate professionals (except nursing)	322	5	6	5	5	5	5	6
Nursing and midwifery associate professionals	323	20	25	23	20	20	22	26
Primary education teaching associate professionals	331	0	0	0	0	0	0	0
Pre-primary education teaching associate professionals	332	0	0	0	0	0	0	0
Special education teaching associate professionals	333	0	0	0	0	0	0	0
Other teaching associate professionals	334	3	3	4	4	4	4	3
Finance and sales associate professionals	341	15	15	22	20	20	22	18
Business services agents and trade brokers	342	0	0	0	0	0	0	0
Administrative associate professionals	343	1	1	2	1	1	2	1
Customs, tax and related government associate professionals	344	1	1	1	1	1	1	1
Police inspectors and detectives	345	0	0	0	0	0	0	0
Social work associate professionals	346	5	6	6	5	5	6	7
Artistic, entertainment and sports associate professionals	347	5	7	7	5	11	8	6
Religious associate professionals	348	0	0	0	0	0	0	0
Secretaries and keyboard-operating clerks	411	19	17	15	17	18	20	15

	Code	2001	2002	2003	2004	2005	2006	2007
Numerical clerks	412	11	12	13	12	11	11	12
Material-recording and transport clerks	413	3	3	3	3	3	3	3
Library, mail and related clerks	414	4	5	5	5	5	5	5
Other office clerks	419	42	46	50	48	45	46	50
Cashiers, tellers and related clerks	421	7	8	8	8	8	8	8
Client information clerks	422	10	12	13	12	10	12	14
Travel attendants and related workers	511	2	1	2	2	1	2	2
Housekeeping and restaurant services workers	512	20	18	21	15	15	19	18
Personal care and related workers	513	45	42	44	40	46	45	46
Other personal services workers	514	8	5	8	8	6	7	8
Protective services workers	516	2	2	2	1	1	1	4
Fashion and other models	521	0	0	0	0	0	0	0
Shop, stall and market salespersons and demonstrators	522	46	42	49	51	55	49	55
Market gardeners and crop growers	611	3	4	3	4	6	3	4
Animal producers and related workers	612	0	0	0	0	0	0	0
Crop and animal producers	613	14	21	17	20	31	16	21
Forestry and related workers	614	0	0	0	0	0	0	0
Fishery workers, hunters and trappers	615	1	1	1	1	2	1	1
Miners, shotfirers, stone cutters and carvers	711	0	0	0	0	0	0	0
Building frame and related trades workers	712	24	18	23	24	27	30	28
Building finishers and related trades workers	713	20	18	20	18	19	22	21
Painters, building structure cleaners and related trades workers	714	5	4	5	5	5	6	6
Metal moulders, welders, sheet-metal workers, structural-metal preparers, and related trades workers	721	7	8	8	6	6	7	7
Blacksmiths, tool-makers and related trades workers	722	1	1	2	1	1	1	1
Machinery mechanics and fitters	723	17	18	18	13	13	17	16
Electrical and electronic equipment mechanics and fitters	724	6	7	7	5	5	6	6

	Code	2001	2002	2003	2004	2005	2006	2007
Precision workers in metal and related materials	731	1	1	1	0	0	1	0
Potters, glass-makers and related trades workers	732	1	1	1	0	0	1	0
Handicraft workers in wood, textile, leather and related materials	733	1	1	1	1	1	1	1
Craft printing and related trades workers	734	2	1	2	1	1	2	1
Food processing and related trades workers	741	4	4	4	3	3	4	3
Wood treaters, cabinet-makers and related trades workers	742	2	2	2	1	1	2	1
Textile, garment and related trades workers	743	1	1	1	1	1	1	1
Pelt, leather and shoemaking trades workers	744	0	0	0	0	0	0	0
Mining and mineral-processing-plant operators	811	0	0	0	0	0	0	1
Metal-processing plant operators	812	0	0	0	0	0	0	0
Glass, ceramics and related plant operators	813	1	1	1	1	1	1	1
Wood-processing- and papermaking-plant operators	814	1	1	1	1	1	1	1
Chemical-processing-plant operators	815	2	2	2	2	2	2	3
Power-production and related plant operators	816	1	1	1	1	1	1	1
Industrial robot operators	817	0	0	0	0	0	0	0
Metal- and mineral-products machine operators	821	6	6	5	5	6	6	7
Chemical-products machine operators	822	0	0	0	0	0	0	0
Rubber- and plastic-products machine operators	823	2	2	1	1	1	2	2
Wood-products machine operators	824	0	0	0	0	0	0	0
Printing-, binding- and paper-products machine operators	825	0	0	0	0	0	0	0
Textile-, fur- and leather-products machine operators	826	5	5	5	4	5	5	6
Food and related products machine operators	827	5	5	5	4	5	5	6

	Code	2001	2002	2003	2004	2005	2006	2007
Assemblers	828	1	1	1	1	1	1	1
Other machine operators not elsewhere classified	829	6	6	6	5	6	6	7
Locomotive engine drivers and related workers	831	0	0	0	0	0	0	0
Motor vehicle drivers	832	25	26	23	23	24	23	27
Agricultural and other mobile plant operators	833	6	6	5	5	6	6	7
Ships' deck crews and related workers	834	0	0	0	0	0	0	0
Street vendors and related workers	911	2	2	2	2	2	2	2
Shoe cleaning and other street services elementary occupations	912	0	0	0	0	0	0	0
Domestic and related helpers, cleaners and launderers	913	31	27	33	25	28	26	32
Building caretakers, window and related cleaners	914	4	3	4	4	3	3	4
Messengers, porters, doorkeepers and related workers	915	16	14	17	13	14	13	16
Garbage collectors and related labourers	916	1	1	1	1	1	1	1
Agricultural, fishery and related labourers	921	4	3	3	4	3	3	2
Mining and construction labourers	931	11	10	10	10	9	10	9
Manufacturing labourers	932	8	7	7	8	6	7	5
Transport labourers and freight handlers	933	9	8	8	9	7	9	6

Source: LFS and Oxford Economics.

Note: See note for Table A.3.

(3) Highest education attainment/qualification level

Highest education attainment/qualification categories of people in employment and of the working-age population are sourced from the QNHS and LFS. It is critical to note that at this point in time, these sources ultimately determine the level of detail possible in relation to education attainment and qualifications. While DETI have been able to provide some further data on the more detailed 50 qualification categories in the LFS, a further breakdown beyond the 5 categories set out below was not obtained from CSO. However according to the Department of Education and Science, it is possible to request a special run of the QNHS split by ISCED categories.

QNHS education/qualification categories (Ireland)	LFS education/qualification categories (NI)
■ Primary	■ No qualifications
■ Lower secondary	■ Other qualifications
■ Higher secondary, post leaving certificate and other non-third level	■ GCSE grades A-C or equivalent
■ Third level diplomas and certificates	■ GCE A-Level or equivalent
■ Third level degrees and higher	■ Other higher below degree
■ Other/not stated	■ Degree or equivalent

It is therefore important for readers to understand that this exercise is altogether different to ongoing work to develop national and internationally comparative qualification frameworks which are much more detailed e.g. the Ireland version has 10 levels, but for which data are not yet collected or possible to estimate from the QNHS or LFS.

However this does not mean that it is not feasible to align North-South education/attainment categories[14]. The International Standard Classification of Education 1977 (ISCED) was designed by UNESCO to serve as 'an instrument suitable for assembling, compiling and presenting statistics of education both within international countries and internationally'. A definitional note on ISCED is provided at the outset of the report.

ISCED provides a methodology that translates national education programmes into an internationally comparable set of categories for levels of education and field of education, which the OECD uses to present results in its annual 'Education at a Glance' reports. The OECD results include Ireland, which allows a cross-check of the approach used here with published figures. Relevant LFS qualification data for the UK were also obtained to estimate ISCED education shares and compare to published OECD figures for the UK. This allowed a cross-check of the approach for the UK which is identical to the

14 Government statisticians expressed some concern that data for the South is presented by level of education and NI by highest qualification level. This is not seen as a major conceptual difference.

approach used for NI given the same data are available. Below are the definitions for the six ISCED education categories:

- **ISCED 0 – pre-primary education:** Programmes at level 0 (pre-primary), defined as the initial stage of organised instruction, are designed primarily to introduce young children to a school type environment, to provide a bridge between the home and a school-based atmosphere. Upon completion of these programmes, children continue their education at level 1 (primary education).

- **ISCED 1 – primary education or first stage of basic education:** Programmes at level 1 are normally designed on a unit or project basis to give students a sound basic education in reading, writing and mathematics, along with an elementary understanding of other subjects such as history, geography, natural science, social science, art and music. In some cases religious instruction is featured. The core at this level consists of education provided for children, the customary or legal age of entrance being not younger than five years or older than seven years. This level covers, in principle, six years of full-time schooling.

- **ISCED 2 – lower secondary education or second stage of basic education:** The contents of education at this stage are typically designed to complete the provision of basic education which began at ISCED level 1. In many, if not most countries, the educational aim is to lay the foundation for lifelong learning and human development. The programmes at this level are usually on a more subject-oriented pattern using more specialised teachers and more often several teachers who conduct classes in their field of specialisation. The full implementation of basic skills occurs at this level. The end of this level often coincides with the end of compulsory schooling where it exists.

- **ISCED 3 – (upper) secondary education:** This level of education typically begins at the end of full-time compulsory education for those countries that have a system of compulsory education. More specialisation may be observed at this level than at ISCED level 2 and often teachers need to be more qualified or specialised than for ISCED level 2. The entrance age to this level is typically 15 to 16 years. The educational programmes included at this level typically require the completion of some nine years of full-time education (since the beginning of level 1) for admission or a combination of education and vocational or technical experience.

    - ISCED 3A – programmes designed to provide direct access to ISCED 5A.

    - ISCED 3B – programmes designed to provide direct access to ISCED 5B.

    - ISCED 3C – programmes not designed to lead to ISCED 5A or 5B.

- **ISCED 4 – post-secondary non tertiary education:** ISCED 4 captures programmes that straddle the boundary between upper secondary and post-secondary education from an international point of view, even though they might clearly be considered as upper secondary or post-secondary programmes in a national context. These programmes can, considering their content, not be regarded as tertiary programmes. They are often not significantly more advanced than programmes at ISCED 3 but they serve to broaden the knowledge of participants who have already completed a programme at level 3. Typical examples are programmes designed to prepare students for studies at level 5 who, although having completed ISCED level 3, did not follow a curriculum which would allow entry to level 5, i.e. pre-degree foundation courses or short vocational programmes.

- **ISCED 5 – first stage of tertiary education (not leading directly to an advanced research qualification):** This level consists of tertiary programmes having an educational content more advanced than those offered at levels 3 and 4. Entry to these programmes normally requires the successful completion of ISCED level 3A or 3B or a similar qualification at ISCED level 4A. They do not lead to the award of an advanced research qualification (ISCED 6). These programmes must have a cumulative duration of at least two years.

- ISCED 5A – programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements.

- ISCED 5B – programmes that are practically oriented/occupationally specific and are mainly designed for participants to acquire the practical skills and know-how needed for employment in a particular occupation or trade or class of occupations or trades, the successful completion of which usually provides participants with a labour-market relevant qualification.

- **ISCED 6 – second stage of tertiary education (leading to an advanced research qualification):** This level is reserved for tertiary programmes which lead to the award of an advanced research qualification. The programmes are, therefore, devoted to advanced study and original research and not based on course-work only. They typically require the submission of a thesis or dissertation of publishable quality which is the product of original research and represents a significant contribution to knowledge. They prepare graduates for faculty posts in institutions offering ISCED 5A programmes, as well as research posts in government, industry etc.

As explained in the definitional note, it is often the case that cross-country comparisons group together ISCED categories into ISCED 0+1+2, ISCED 3+4 and ISCED 5+6. This is the approach adopted in this study and used in the CEDEFOP report on 'Future Skill Needs in Europe' although more detailed underlying data are available[15]. Often this is because some ISCED categories are not relevant to individual countries (for example ISCED 1 or 4 to NI) or views on classification of attainment levels into narrow categories are mixed and better met by presenting broader results. In reality too, with increased retention rates at school and more school leavers entering higher education, employment is becoming more polarised between jobs demanding graduate qualifications (ISCED 5+6) and those requiring little or no qualifications (ISCED 1+2) so further detail is not always required. In fact what may be more important is more detailed analysis of skill needs within the higher qualification category. For example by subject or undergraduate versus PhD.

Throughout the report, these aggregated categories are named as follows, which is consistent with the CEDEFOP report:

- Low qualification – ISCED 0+1+2 (pre-primary, primary and lower secondary).

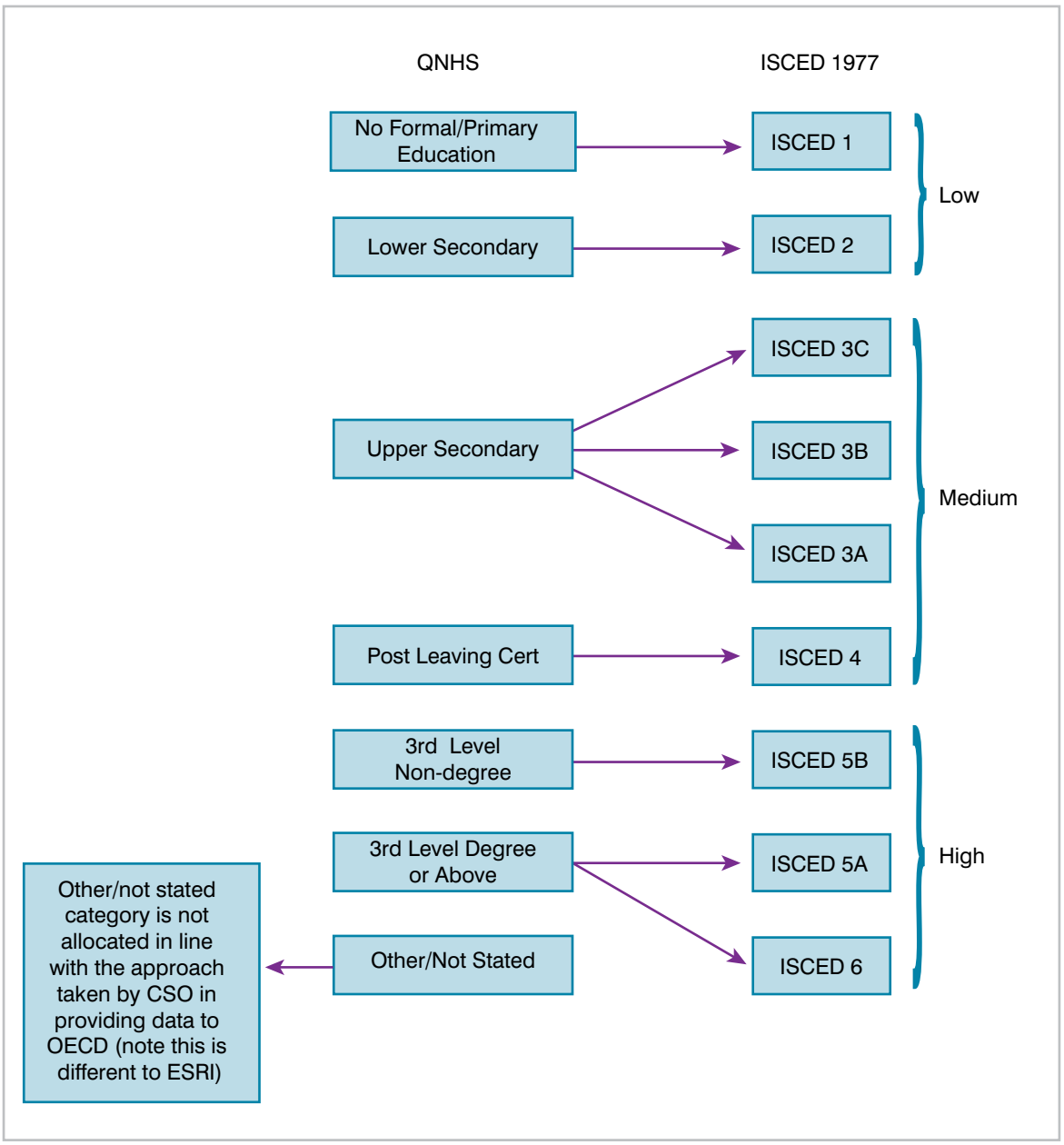
- Medium qualification – ISCED 3+4 (upper secondary and post-secondary non-tertiary education).

- High qualification – ISCED 5+6 (university educated).

15 As stated earlier, it is understood that CSO are able to provide QNHS data for the 6 ISCED categories.

The classification system to convert QNHS and LFS education/qualifications levels to ISCED categories is summarised in the diagrams below. This is based directly on the OECD Implementation Manual (1999 Edition) for classifying educational programmes in OECD countries (Ireland and UK), and guidance from the Department of Education and Science in Ireland. Note carefully the assumptions to allocate the other/not stated category across ISCED categories. For Ireland, the other/not stated category is not allocated as this is the approach taken by CSO in supplying data to OECD[16].
The NI split of the other category is based on the UK Department for Children, Schools and Families' 'equivalence tables'.

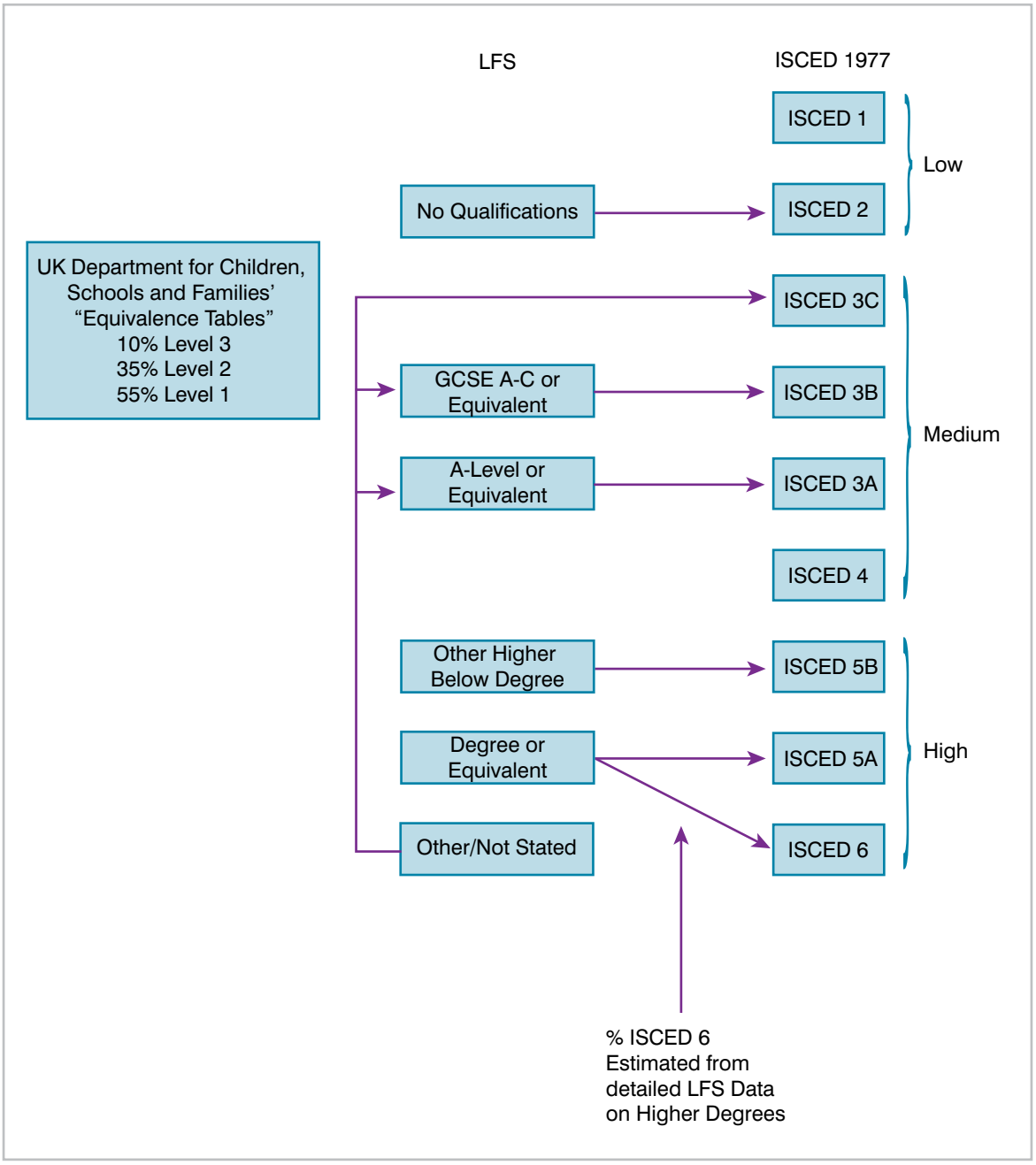
Figure A.1: Converting QNHS (Ireland) education attainment levels to ISCED categories



Source: OECD and Oxford Economics.

16 *ESRI do allocate the other/not stated category however the Department of Education and Science do not believe there is sufficient evidence to do so.*

Figure A.2: Converting LFS (NI) qualification levels to ISCED categories



Source: OECD and Oxford Economics.

Key Data Limitations

While the progress made by this study in matching North-South economic and skills data can be viewed a success, it would have been unrealistic from the outset to expect to be able to match all indicators.

Furthermore where data are not immediately comparable, the development of 'proxy' indicators is difficult as in some cases data available in one jurisdiction are collected from unique, bespoke surveys which obviously cannot be replicated in the other jurisdiction without additional survey/primary research. To give an example, the NI's Skills Monitoring Survey and 'Skills at Work in NI 2006' report, which quantify among other skill factors, skill gaps and utilisation of skills, are more comprehensive and quantitative-based than the existing FÁS/ESRI surveys and other results presented in the FÁS/EGFSN National Skills Bulletins. This means that it is not possible to develop matching North-South and All-Island datasets on skill shortages, gaps and utilisation of skills. The upside of this at least is that it does identify gaps in North-South data which could guide future priorities for new data collection.

The lack of 4-digit NI SOC 2000 occupation data from the LFS, beyond the 2001 Census, is a slight problem for aligning to ISCO 88 though not major. Indeed having actual 4-digit data would likely make little difference.

While there are advantages in using the QNHS and LFS in terms of their international comparability and counting of people in employment as opposed to jobs (which in some instances policy makers are more interested in), the small sample size of the NI LFS results in some volatile data trends from year-to-year.

Annex B: Notes to Charts and Tables

	Technical note
Charts	
Chapter 2	
Figure 2.1: All-Island population trends and forecasts (absolute numbers)	Population forecasts are from Oxford Economics and not official projections from CSO and NISRA.
Figure 2.2: All-Island population trends and forecasts (index 1996=100)	Population forecasts are from Oxford Economics and not official projections from CSO and NISRA.
Figure 2.3: All-Island population trends and forecasts (North-South share of All-Island total)	Population forecasts are from Oxford Economics and not official projections from CSO and NISRA.
Figure 2.4: International comparison of recent population trends	Haver Analytics, who specialise in database and software products for economic analysis, is Oxford Economics' official supplier of outturn economic data. Primary sources for Haver Analytics include national statistical organisations and multi-lateral institutions such as the UN.
Figure 2.5: All-Island net migration trends (absolute numbers)	At all-island level, North-South migration flows are effectively netted off by summing data of both jurisdictions. For example, an outflow from Ireland to NI (-ve) is recorded as a positive inflow in NI and both should in theory be equal as they are jointly based on the same CSO/NISRA source.
Figure 2.6: All-Island net migration trends (North-South per cent of total population)	See note for Figure 2.5.
Figure 2.7: All-Island birth rate trends	Birth rate is total births per 1,000 total population.
Figure 2.8: All-Island death rate trends	Death rate is total deaths per 1,000 total population.
Figure 2.9: All-Island rate of natural increase trends	Rate of natural increase is total births minus deaths per 1,000 total population.
Figure 2.10: All-Island working-age population trends	For North-South comparability, working-age definition for both jurisdictions is based on Eurostat definition – male and female 15-64. Northern Ireland working-age definition is typically male 16-64 and female 16-59.
Figure 2.11: All-Island working-age population trends (North-South share of total population)	See note for Figure 2.10.
Figure 2.12: All-Island nominal GDP at market prices (Euro bn)	ECB average year exchange rates applied to convert to common currency.

	Technical note
Figure 2.13: All-Island economic growth rates	Economic growth rates are annual growth in constant market price GDP (Ireland) and constant basic price GVA (Northern Ireland) in home currency. All-Island growth is a weighted average of Ireland and NI growth. NI constant price series calculated by Oxford Economics using UK industry deflators. Forecasts are from Oxford Economics.
Figure 2.14: All-Island nominal GDP at market prices (North-South share of All-Island total)	See note for Figure 2.12.
Figure 2.15: International comparison of economic size	See note for Figure 2.12.
Figure 2.16: International comparison of recent economic growth rates (1996-2006)	Growth rates are annual growth in constant market price GDP except for NI (constant basic price GVA) and in home currency.
Figure 2.17: All-Island recent trends in GDP per head	See note for Figure 2.12.
Figure 2.18: International comparison of nominal GDP per head	ECB and Haver Analytic average year exchange rates applied to convert nominal market price GDP to common currency.
Figure 2.19: International comparison of recent real GDP per head growth	Growth rates are annual growth in constant market price GDP per head except for NI (constant basic price GVA per head) and in home currency.
Figure 2.20: International comparison of early stage entrepreneurial activity	Total early stage entrepreneurial activity refers to the total rate of early stage entrepreneurial activity among the adult population and includes both nascent and new firm entrepreneurs. In some instances, this rate is less than the combined percentages for nascent and new firm entrepreneurs. This is because, in circumstances where respondents qualify as both a nascent and a new firm entrepreneur, they are counted only once. Nascent entrepreneurs are those actively planning a new venture. These entrepreneurs have done something during the previous twelve months to help start a new business, that he or she will at least part own. Activities such as organising the start-up team, looking for equipment, saving money for the start-up, or writing a business plan would all be considered as active commitments to starting a business. Wages or salaries will not have been paid for more than three months in respect of the new business. Many of these individuals are still in full-time employment.
	New firm entrepreneurs are entrepreneurs who at least part own and manage a new business that is between 4 and 42 months old and have not paid salaries for longer than this period. These new ventures are in the first 42 months after the new venture has been set up. All-Island total early stage entrepreneurial activity rate calculated as the weighted average of Ireland and NI rates using adult population shares.

	Technical note
Figure 2.21: All-Island VAT registered business stock	See Annex A which explains why North-South VAT registration data are not directly comparable due to differences in VAT thresholds.
Figure 2.22: All-Island VAT registrations and de-registrations	See note for Figure 2.21.
Figure 2.23: All-Island innovation (2002-2004)	Innovation activities indicate that the firm reported the introduction of a new product or process and/or had innovation activities that were incomplete or abandoned over the period in question. The proportion of firms with innovative activities gives a measure of firms' propensity to engage in innovation activity, be it through the introduction of a new product to the market or the implementation of a new means of production or supply of goods and services. Product innovators are firms that reported the introduction of new or significantly improved goods or services over the period in question. Process innovators are firms that used new or significantly improved technology for production or the supply of goods or services. This indicator gives a measure of the extent to which firms bring in new ways of producing or supplying their goods or services.
Chapter 3	
Figure 3.1: All-Island total employment trends (absolute numbers)	Employment refers to people in employment as opposed to jobs. Based on ILO definition of employment – persons in employment comprise all persons above a specified age who during a specified brief period, either one week or one day, were in the following categories – paid employment and self-employment. Annual data refers to Q2 for Ireland and spring for NI.
Figure 3.2: All-Island total employment trends (index 1996=100)	See note for Figure 3.1.
Figure 3.3: All-Island total employment trends (North-South share of All-Island total)	See note for Figure 3.1.
Figure 3.4: International comparison of recent employment growth	See note for Figure 3.1.
Figure 3.5: All-Island working-age employment rate trends	Working-age employment rate equal to working-age persons in employment divided by working-age population. Based on Eurostat working-age definition (15-64 male and female) for both jurisdictions. Annual data refers to Q2 for Ireland and spring for NI.
Figure 3.6: All-Island ILO unemployment rate trends	Working-age ILO unemployed divided by working-age economically active. ILO definition of unemployment – all persons above a specified age who during the reference period were: without work, that is, were not in paid employment or self employment during the reference period; currently available for work, that is, were available for paid employment or self-employment during the reference period; and seeking work, that is, had taken specific steps in a specified recent period to seek paid employment or self-employment. Based on Eurostat working-age definition (15-64 male and female) for both jurisdictions. Annual data refers to Q2 for Ireland and spring for NI.

	Technical note
Figure 3.7: All-Island recent unemployment trends (live register and claimant count)	The live register is not designed to measure unemployment in the South. Unemployment in Ireland is measured by the QNHS.
Figure 3.8: All-Island economic inactivity rate trends	Working-age economically inactive divided by working-age population. NI inactivity rate based on official definition of working-age population (male 16-64; female 16-59). Including inactive females aged 60-64 for NI would, in the authors' view, over-estimate economic inactivity in NI. Annual data refers to Q2 for Ireland and spring for NI.
Figure 3.9: All-Island working-age skill trends	See Annex A for the approach to align QNHS and LFS qualification/ attainment levels to ISCED and for the definition and description of ISCED categories. Annual data refers to Q2 for Ireland and spring for NI.
Figure 3.10: All-Island working-age skill trends – low qualifications (absolute numbers)	See note for Figure 3.9.
Figure 3.11: All-Island working-age skill trends – low qualifications (share of working-age population)	See note for Figure 3.9.
Figure 3.12: All-Island working-age skill trends – medium qualifications (absolute numbers)	See note for Figure 3.9.
Figure 3.13: All-Island working-age skill trends – medium qualifications (share of working-age population)	See note for Figure 3.9.
Figure 3.14: All-Island working-age skill trends – high qualifications (absolute numbers)	See note for Figure 3.9.
Figure 3.15: All-Island working-age skill trends – high qualifications (share of working-age population)	See note for Figure 3.9.
Figure 3.16: All-Island average wages by sector (2006, Ireland=100)	ECB 2006 average year exchange rates applied to convert to common currency.
Figure 3.17: PISA mean score – reading (2006)	–
Figure 3.18: PISA mean score – maths (2006)	–
Figure 3.19: PISA mean score – science (2006)	–

	Technical note
Chapter 4	
Figure 4.1: All-Island employment structure (2007)	See note for Figure 3.1.
Figure 4.2: Ireland minus Northern Ireland employment structure (2007)	Bars above the x-axis indicate that the sector is relatively larger in share terms in Ireland compared to Northern Ireland. For example Ireland's construction share of total employment in 2007 is 13% compared to 10% in Northern Ireland – the difference is +3%, meaning the bar is above the x-axis (more dependent/ relatively larger).
Figure 4.3: All-Island other production industries recent employment trends	See note for Figure 3.1. Other production industries include manufacturing, utilities and mining & quarrying.
Figure 4.4: All-Island construction recent employment trends	See note for Figure 3.1.
Figure 4.5: All-Island wholesale & retail recent employment trends	See note for Figure 3.1.
Figure 4.6: All-Island financial & business services recent employment trends	See note for Figure 3.1
Figure 4.7: All-Island Public Admin/ education, Health and social Services recent employment trends	See note for Figure 3.1. Public sector includes public administration & defence, education and health & social work. This definition will include elements of private education and health which are difficult to remove from the data.
Figure 4.8: All-Island occupation structure (2007)	Occupation classification based on ISCO 88.
Figure 4.9: Ireland minus Northern Ireland occupation structure (2007)	Occupation classification based on ISCO 88. Bars above the x-axis indicate that the occupation is relatively larger in Ireland in share terms compared to Northern Ireland.
Figure 4.10: All-Island recent occupational trends (1)	See note for Figure 4.8.
Figure 4.11: All-Island recent occupational trends (2)	See note for Figure 4.8.
Figure 4.12: All-Island employed person skill trends	See note for Figure 3.9.
Figure 4.13: All-Island employed persons skill trends – low qualifications (absolute numbers)	See note for Figure 3.9.
Figure 4.14: All-Island employed persons skill trends – low qualifications (share of total employment)	See note for Figure 3.9.
Figure 4.15: All-Island employed persons skill trends – medium qualifications (absolute numbers)	See note for Figure 3.9.

	Technical note
Figure 4.16: All-Island employed persons skill trends – medium qualifications (share of total employment)	See note for Figure 3.9.
Figure 4.17: All-Island employed persons skill trends – high qualifications (absolute numbers)	See note for Figure 3.9.
Figure 4.18: All-Island employed persons skill trends – high qualifications (share of total employment)	See note for Figure 3.9.
Figure 4.19: Ireland vacancies by occupation – FÁS (2006)	Based on SOC 1990 occupation classification. Vacancies recorded are those notified to FÁS.
Figure 4.20: Ireland vacancies by occupation – Irishjobs.ie (2006)	Based on SOC 1990 occupation classification. Vacancies recorded are those advertised in Irishjobs.ie.
Figure 4.21: Northern Ireland vacancies by occupation – DEL (2006)	Based on SOC 2000 occupation classification. Vacancies are those vacancies notified to Jobcentre/Jobs & Benefits offices of DEL. The statistics do not represent the total unsatisfied demand for staff by employers within Northern Ireland but are only those vacancies notified by employers to the Department. All statistics are derived from the DEL Client Management System (CMS). Vacancies are counted on the date the vacancy was notified to the Jobcentre/Jobs & Benefits office. The reported statistics represent the original number of vacancies notified by each employer. Employers may subsequently amend the original amount by adding or cancelling vacancies. The reported statistics do not take into account such amendments.
Figure 4.22: All-Island recent hard-to-fill vacancy trends	Northern Ireland data refers to 2002 and 2005. Ireland refers to 2003, 2005 and 2006.
Figure 4.23: Ireland hard-to-fill vacancies by occupation (2005)	Based on SOC 1990 occupation classification.
Figure 4.24: Northern Ireland hard-to-fill vacancies by occupation (2005)	Based on SOC 2000 occupation classification.

	Technical note
Figure 4.25: All-Island indicative employment forecasts by sector (next ten years)	It was not recommended by the authors to aggregate North-South employment forecasts by industry, occupation and skill level, or to aggregate replacement demand estimates. There are 2 key differences between the historical and forecast employment data which prevent North-South matching as was done for the historical data. (1) NI employment and occupation forecasts are not directly based on the LFS but instead on other employment sources (occupation shares are based on the Census and trended in line with LFS) – Ireland forecasts by ESRI are though still based on the QNHS. (2) To align SOC 1990 and SOC 2000 forecasts to ISCO 88 requires highly detailed occupation data (for example down to 3-digit for Ireland). The occupation forecasts are not available at this level of detail for both jurisdictions. The arrows however give a broad indication of all-island forecast trends (NACE and SIC industry classifications match up to 4-digit).
Figure 4.26: Ireland recent employment trends and forecasts by sector	Based on NACE industrial classification. Employment refers to people in employment as opposed to jobs. Historical data from QNHS. Forecasts from ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006). 2015 figures average of 2010 and 2020 figures from ESRI report.
Figure 4.27: Northern Ireland recent employment trends and forecasts by sector	Based on SIC 2003 industrial classification. Employment refers to people in employment for historical trends and for most sectors in the forecasts. Historical data from LFS as presented earlier in the report. Forecasts from Regional Forecasts 'Occupational Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015' (February 2006) – based on historical employment series from QES so not directly comparable to historical LFS series.
Figure 4.28: All-Island indicative employment forecasts by occupation (next five years)	See note for Figure 4.25. Based on ISCO 88 occupation classification.
Figure 4.29: Ireland recent employment trends and forecasts by occupation	Based on SOC 1990 occupation classification. Historical data from QNHS. Forecasts from ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006). Only 5-year performance and forecasts presented as ESRI report does not present 1995 figures.
Figure 4.30: Northern Ireland recent employment trends and forecasts by occupation	Based on SOC 2000 occupation classification. Employment refers to people in employment. Historical data from LFS. Forecasts from Regional Forecasts 'Occupational Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015' (February 2006) – based on Regional Forecasts' constructed occupation figures which are not directly comparable to historical LFS series.
Figure 4.31: All-Island indicative employment forecasts by skill level (next five years)	See note for Figure 4.25.

	Technical note
Figure 4.32: Ireland recent employment trends and forecasts by skill level	Historical data from QNHS. Forecasts from ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006). 2015 figures average of 2010 and 2020 figures from ESRI report.
Figure 4.33: Northern Ireland recent employment trends and forecasts by skill level	Historical data from LFS. Forecasts from Regional Forecasts 'Occupational Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015' (February 2006) – based on RF constructed occupation figures (used to forecast skill levels) which are not directly comparable to historical LFS series.
Figure 4.34: Ireland recent employment trends and forecasts by stock of skills	See note for Figure 4.32.
Figure 4.35: Northern Ireland recent employment trends and forecasts by stock of skills	See note for Figure 4.33.
Figure 4.36: Ireland expansion demand and replacement demand forecasts by occupation (annual average demand 2005-2015)	Based on SOC 1990 occupation classification. Forecasts from ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006). 2015 figures average of 2010 and 2020 figures from ESRI report.
Figure 4.37: Northern Ireland expansion demand and replacement demand forecasts by occupation (annual average demand 2005-2015)	Based on SOC 2000 occupation classification. Forecasts 'Occupational Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015' (February 2006) – based on Regional Forecasts' constructed occupation figures (used to forecast skill levels) which are not directly comparable to historical LFS series.
Figure 4.38: Ireland expansion demand and replacement demand forecasts by skill level (annual average demand 2005-2015)	Forecasts from ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020' (September 2006). 2015 figures average of 2010 and 2020 figures from ESRI report. Replacement demand skill estimates estimated by Oxford Economics using ESRI occupation by skill forecast shares.
Figure 4.39: Northern Ireland expansion demand and replacement demand forecasts by skill level (annual average demand 2005-2015)	Forecasts from 'Occupational Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015' (February 2006) – based on Regional Forecasts' constructed occupation figures (used to forecast skill levels) which are not directly comparable to historical LFS series.
Tables	
Chapter 2	
Table 2.1: International comparison of recent population trends and forecasts	Population forecasts are from Oxford Economics and not official projections from CSO and NISRA.
Table 2.2: International comparison of recent net migration trends (annual average 2001-2005 inclusive)	Ireland data from CSO. NI data from NISRA. Other European country data from Eurostat. Non-European country data from World Bank (only published as summed across five-year periods). Eurostat net migration estimated as population change minus natural increase and therefore includes other components of population change such as movement of armed forces etc. although other components of population change are likely to be small.

	Technical note
Table 2.3: International comparison of recent net migration trends (2006)	See note for Table 2.2.
Table 2.4: International comparison of recent birth rate trends	Birth rate is total births per 1,000 total population.
Table 2.5: International comparison of recent death rate trends	Death rate is total deaths per 1,000 total population.
Table 2.6: International comparison of recent rate of natural increase trends	Rate of natural increase is total births minus deaths per 1,000 total population.
Table 2.7: International comparison of age structure (2005)	2006 data from the UN is not available for more recent comparison.
Table 2.8: International comparison of recent economic growth rates and forecasts	Economic growth rates are annual growth in constant market price GDP per head except for NI (constant basic price GVA per head) and in home currency. Forecasts from Oxford Economics. ESRI 10-year forecast calculated as an average of 2005-2010 and 2010-2015 forecasts presented in the May 2008 MTR.
Table 2.9: International comparison of recent real GDP per head growth and forecasts	Growth rates are annual growth in constant market price GDP per head except for NI (constant basic price GVA per head) and in home currency. Forecasts from Oxford Economics. ESRI 10-year forecast calculated as an average of 2005-2010 and 2010-2015 forecasts presented in the May 2008 MTR.
Table 2.10: International comparison of FDI inflows	–
Table 2.11: International comparison of innovation (1998-2000 unless stated)	Northern Ireland and Ireland figures relate to 2002-2004. Other country data relates to 1998-2000. To the best of our understanding more recent data are not available as the CIS is only undertaken every 4 years and results are published with a lag. Innovation activities indicate that the firm reported the introduction of a new product or process and/or had innovation activities that were incomplete or abandoned over the period in question. The proportion of firms with innovative activities gives a measure of firms' propensity to engage in innovation activity, be it through the introduction of a new product to the market or the implementation of a new means of production or supply of goods and services. Product innovators are firms that reported the introduction of new or significantly improved goods or services over the period in question. Process innovators are firms that used new or significantly improved technology for production or the supply of goods or services. This indicator gives a measure of the extent to which firms bring in new ways of producing or supplying their goods or services.

	Technical note
Chapter 3	
Table 3.1: International comparison of working-age employment rate trends	Working-age employment rate equal to working-age persons in employment divided by working-age population. Other country data from Eurostat. Based on Eurostat working-age definition 15-64 male and female (including for Northern Ireland). US employment rate is for 2006.
Table 3.2: International comparison of ILO unemployment rate trends	Working-age I LO unemployed divided by working-age economically active. Based on Eurostat working-age definition 15-64 male and female (including for Northern Ireland).
Table 3.3: International comparison of adult 25-64 qualification levels (2005)	Ireland figures are based on authors' estimates and are not taken directly from the OECD Education at a Glance report though the figures match closely.
Table 3.4: International comparison of change in adult 25-64 higher qualification levels	See note for Table 3.3.
Table 3.5: Graduate salaries (2005)	NI salaries converted to Euro using ECB average year exchange rate for 2005 and are based on graduates from NI higher education institutions working in NI. Ireland graduate salary data calculated as weighted average from salary band mid-points and frequency shares and rounded to the nearest thousand. HEA Graduate Survey undertaken 9 months after graduation; HESA First Destination Leaver Survey undertaken 6 months after graduation. This is not considered by the authors to pose a serious data matching problem as a high proportion of pay rises are unlikely between months 6 and 9 of the first year of graduate employment.
Table 3.6: Highest education attainment of school leavers (2005)	North-South education attainment levels are not wholly comparable at the level of detail provided.
Table 3.7: Destination of school leavers (2005)	Although North-South destinations are broadly comparable, the difference in timing of the respective surveys mean that destination results are not directly comparable.
Chapter 4	
Table 4.1: All-Island recent change in employment by sector	Employment refers to people in employment as opposed to jobs. Annual data refers to Q2 for Ireland and spring for NI.
Table 4.2: International comparison of recent change in employment by sector	Based on NACE industrial classification for international comparators.
Table 4.3: All-Island employment by 2-digit ISCO 88 occupation (2007)	Occupation classification based on ISCO 88. Cells shaded in blue in final column indicate Ireland occupation share more than 1 per cent higher than NI occupation share. Cells shaded in lilac in final column indicate Ireland occupation share more than 1 per cent less than NI occupation share.

	Technical note
Table 4.4: All-Island recent change in employment by 2-digit ISCO 88 occupation	Occupation classification based on ISCO 88. Cells shaded in blue in final three columns indicate an annual average growth rate of more than 3 per cent. Cells shaded in lilac in final three columns indicate an annual average growth rate of less than 3 per cent.
Table 4.5: All-Island employed person skill trends – comparison with EU25 (annual average growth 1999-2006)	See note for Figure 3.9.
Table 4.6: Sectors for consideration	–
Annex A	
Table A.1: Key North-South data sources and classification of comparability	–
Table A.2: Key North-South data similarities and differences	–
Table A.3: All-Island 3-digit ISCO 88 occupations (2001-2007, 000's)	Occupations may not add to employment totals due to missing or unknown occupations.
Table A.4: Ireland 3-digit ISCO 88 occupations (2001-2007, 000's)	See note for Table A.3.
Table A.5: Northern Ireland 3-digit ISCO 88 occupations (2001-2007, 000's)	See note for Table A.3.

Annex C: Sources on Vacancies, Skill Shortages, Labour Shortages Gaps and Utilisation of Skills

Ireland

- **FÁS/EGFSN National Skills Bulletin** – the National Skills Bulletin 2007 by FÁS/the Expert Group on Future Skills Needs (EGFSN) covers analysis of the following labour market and skills themes: employment and occupational trends; employment permits issued to non-EU nationals by the Department of Enterprise, Trade and Employment; information on difficulties in filling positions from the monthly FÁS/ESRI Vacancy Survey; movements in the number of vacancies advertised through FÁS, the Irish Times and Irishjobs.ie; and estimation of the supply emerging from the Irish education and training system. By synthesizing all of the above information, the bulletin comments on the balance between the demand and supply for each occupation and recent and current skill shortages defined in terms of their characteristics.

- **FÁS vacancy data** – the Skills and Labour Market Research Unit (SLMRU) of FÁS collects vacancy data from various sources. These include vacancies notified to FÁS, the Irish Times and Irishjobs.ie. FÁS, in conjunction with the ESRI, also carries out a monthly survey of employers on difficult to fill vacancies. As these data sources are available on a monthly basis, they can provide up-to-date information on the current demand for skills. It is important to note that a duplication issue arises when examining vacancy data: the same vacancy may reappear in the same vacancy stock and/or can be advertised simultaneously through various sources.

Northern Ireland

- **NI Skills Monitoring Survey** – the NI Skills Monitoring Survey 2005 was designed to provide a comprehensive snapshot of current skill needs of NI employers in the non-agricultural sectors. The survey provides an overview of issues connected with skill shortages, skill gaps and training, from an employer's perspective. Of particular interest are those areas where recruitment difficulties are related to external skill shortages and therefore subject to a 'skills' solution.

- **Skills at Work in NI** – the 'Skills at Work in NI 2006' report presents evidence on work skills in NI, on which hitherto evidence was lacking, drawn from data collected for the 2006 UK Skills Survey[17]. The survey's aim was to gather information on the skills used at work via questions directed at workers themselves.

- **DEL vacancy data** – vacancies recorded by DEL are those vacancies notified to Jobcentres/Jobs & Benefits offices. The figures do not represent the total unsatisfied demand for staff by employers within NI but are only those vacancies notified by employers to DEL. Employers may subsequently amend the original amount by adding or cancelling vacancies. The reported statistics do not take into account such amendments. DEL vacancy figures should be broadly comparable to the vacancy data collected by the Skills and Labour Market Research Unit (SLMRU) of FÁS.

17 *The 2006 Skills Survey is a survey of jobs, where the main features of the jobs are reported by the individuals themselves who carry them out. It is supported by a consortium formed by the Economic and Social Research Council (ESRC) and several government agencies: the Department for Education and Skills, the Department for Trade and Industry, the Learning and Skills Council, the Sector Skills Development Agency, Scottish Enterprise and Future Skills Wales. This consortium is supplemented by the East Midlands Development Agency, Highlands and Islands Enterprise and the Department for Employment and Learning (Northern Ireland) who have funded additional regional samples. The Department for Employment and Learning supported funding for a target of 500 interviews within Northern Ireland.*

Annex D: Existing Skills Forecasting Research and Explanation of Replacement Demand

Critique of Existing Skills Forecasting Research

	Ireland	NI
Research	**ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020'**	**Regional Forecasts 'Occupation Forecasts and Replacement Demand Analysis for NI 2005-2015'**
Research coverage	**Objective:** Examines and forecasts the changing pattern of occupations and identifies variations in skill requirements across broad occupational areas of the economy. 'Tomorrow's Skills: Towards a National Skills Strategy' contains forecasts from this report. **Time period:** Longer-term forecasts spanning from 2005-2020. **Key results presented:** ■ Employment by nine NACE 1 industry sectors. ■ Employment by 18 ISCO 88 (or ISCO 88 compatible) occupations. ■ Expansion and net replacement demand by 18 ISCO 88 occupations (2005-2010 and 2005-2020) (replacement demand forecasts are considered tentative and to be treated with caution). ■ Employment by 10 ISCO 88 occupations by 5 education levels (2000, 2005, 2010 and 2020) – stock based measure of education demand.	**Objective:** Provides occupation and replacement demand forecasts to form a framework within which DEL's Skill Strategy can be viewed. Total net requirement figures produced are a measure of the scale of likely job vacancies in each occupation caused by labour turnover as well as by the expansion or contraction of demand for particular occupations. Replacement demand analysis is taken a step further through estimating the requirement for people at different skill levels. **Time period:** Forecasts spanning from 2005-2015. **Key results presented:** ■ Employment by SIC 03 section industry sectors. ■ Employment by 24 SOC 2000 occupations and broad occupations. ■ Expansion and total replacement demand by 24 SOC 2000 occupations (2005-2015) (net replacement demand, subtracting joiners from other occupations, is available for the whole economy though was not presented in detail in the report). ■ Total requirement (expansion and replacement demand) by highest qualification level 0-5 (2005-2015) – flow based measure of qualification demand.

	Ireland	NI
Research	**ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020'**	**Regional Forecasts 'Occupation Forecasts and Replacement Demand Analysis for NI 2005-2015'**
Methodology	Essentially an extension of the forecasts in the joint FÁS/ESRI Manpower Forecasting publication series. The occupation forecasts are based on sectoral employment projections derived from the December 2005 ESRI Medium-Term Review (MTR). The MTR macro forecasts (which normally include high and low growth scenarios) are based on a range of assumptions related to the world and domestic economy. (Given the openness of the South's economy, developments in the global economy, particularly in the US, exerts a significant influence). Note that the MTR employment forecasts by industry are not projections for demand for labour – rather they are projections based on equilibrium between supply and demand. Demand for labour is based on output and differentials in labour costs relative to other countries. Supply is based on working-age population changes (including migration) and labour market participation. Overall employment is then determined by relative equilibrium wages which affects competitiveness of Ireland's industries and output growth (recently labour supply has become 'less elastic). The MTR macro forecasts used are the high growth scenario up to 2010 (assumes US economy continues to grow strongly) and the low growth scenario between 2010 and 2020 [which is based on a gradual US adjustment towards balanced fiscal and external accounts (closing of current account deficit), which has knock-on impacts to the South's economic growth]. Adjustment in the US would immediately be felt in the South's exporting high-tech manufacturing firms, followed by an even larger domestic demand impact on non-tradable sectors such as construction and services.	Forecasts were based on a new model of the NI economy (NI_PS) which provides annual employment projections for 24 separate occupation groups. Forecasts are in line with Oxford Economics' Autumn 2005 UK macro and regional outlook. NI_PS monitors and forecasts the Economic Development Forum targets for the NI economy and is nested within Oxford Economics' UK region al and macro models and consequently the hierarchy of Oxford Economics' suite of global models (global factors therefore factor down to NI, similar to the links to world economy assumptions in the ESRI macro model). Occupations measure the number of people in employment, as specifically requested by DEL. The method used to convert jobs into people is to adjust the numbers of part-time employees by the fraction required to equate employment estimates for 2001 with the number of people recorded in employment in the 2001 Census. Occupation forecasts within each sector in NI are initially based on growth in the UK's proportions within each sector. Total replacement demand includes leavers to migration, retirement, inactivity/unemployment and other occupations (this excludes leavers to death and leavers to other sectors but to the same occupation). Net replacement demand includes joiners from other occupations. The LFS is the key data source for replacement demand analysis. Due to the small NI sample size, UK LFS data is used and smoothed over 3 years. The UK figures are however scaled to reflect the difference between NI and UK job leaving rates for all occupations taken together.

	Ireland	NI
Research	**ESRI 'Current Trends in Occupational Employment and Forecasts for 2010 and 2020'**	**Regional Forecasts 'Occupation Forecasts and Replacement Demand Analysis for NI 2005-2015'**
Methodology (cont.../)	Occupational profiles within industry sectors are estimated from the Census of Population and QNHS and projected based on past trends and expectations as to the likely development of occupations over the forecast period. Expansion demand is net change in employment stock. Net replacement demand estimates are based on occupational attrition ratios from 'Estimating Labour Force Flows, Job Openings and Human Resource Requirements, 1990-2005'. The attrition ratios are all-inclusive in order to reflect exits from the labour force due to retirement, death, emigration and leavers to unemployment/inactivity, as well as inter-occupational movements. The attrition ratios, now somewhat out-dated, were estimated using LFS data 1990-1997. (These ratios are certainly worth updating given the decline in emigration and recent influx of migrants to Ireland, and difference between NI and Ireland replacement demand rates according to the two reports). Past educational profiles for the period 1999-2005 for occupational groups were analysed and projected to 2020, mainly on the basis of linear or logarithmic forecasting methods. Projected profiles were then applied to the forecast numbers employed in each occupational group.	Total requirement figures are applied to a matrix of occupations by highest qualification to produce an estimate of the likely skill requirement over the forecast period. The matrix is generated using the UK LFS. Rather than use the current qualification structure of all employed people (the approach used by ESRI for stock forecasts/expansion demand), the analysis uses data only for those people who were in not in employment one year ago/ new entrants.

Replacement Demand Explanation

Replacement demand is an attempt to estimate workforce occupation and skill needs (demand) against which current and planned education outputs and migrant numbers can be compared (supply). It estimates the number of people required in each occupation and skill category to replace net leavers. In other words it is a tool to model the dynamics and complexity of modern labour markets.

People will be coming into new jobs or into jobs vacated by people who leave jobs in the sector to move into such things as retirement, unemployment or inactivity. Another group of people leave their existing job or else change their occupation within the firm.

The net requirement for workforce skills at economy-wide level is the sum of:

- The increase (or decrease) in employment stock (known as expansion demand); and
- Plus the number of jobs vacated by those leaving employment to (1) retirement; (2) death; (3) unemployment/inactivity; (4) out migration, minus the number of people joining employment from unemployment/inactivity (net replacement demand).

The residual net requirement here is joiners from education (schools, FE colleges, universities etc.) and joiners from in migration. Breaking down the total net requirement into these two components and annualising provides important targets against which to measure education outputs and migrant numbers, particularly under points-based migration systems. In this sense replacement demand estimates are more useful for policy than change in stock figures from expansion demand.

At economy-wide level, movers to other occupations (usually referred to as occupational mobility) and sectors (sectoral mobility) are not always considered separately because inflows may balance the outflow e.g. if a worker up skills through lifelong learning or training and is promoted. Such balancing is however unlikely to occur for individual occupations (usually leaving rates are higher for lower occupational levels and joining rates higher for higher grade occupations as people move for promotion opportunities) and sectors. This has important implications for overall skill demand as it tends to increase need for lower qualifications and reduce need for higher qualifications compared to what expansion demand suggests. A good illustration of replacement demand is manufacturing which while declining in employment often still has a positive net need for workers due to retirees and people leaving to other sectors and occupations.

On a cautionary note however, it is important to know that precise estimation of these various flows is complex, and is often difficult to carry out.

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Annex F: Glossary of Acronyms

ASHE	Annual Survey of Hours and Earnings (Northern Ireland).
BERR	(Department for) Business, Enterprise and Regulatory Reform (UK).
CEDEFOP	European Centre for the Development of Vocational Training.
CIS	Community Innovation Survey (EU).
CSO	Central Statistics Office (Ireland).
DEL	Department for Employment and Learning (Northern Ireland).
DENI	Department of Education Northern Ireland (Northern Ireland).
DETI	Department of Enterprise, Trade and Investment (Northern Ireland).
EGFSN	Expert Group on Future Skills Needs (Ireland).
EHECS	Earnings, Hours and Employment Costs Survey (Ireland).
ESRI	Economic and Social Research Institute (Ireland).
FÁS	Foras Aiseanna Saothair. Training and Employment Authority (Ireland).
FDI	Foreign Direct Investment.
GDP	Gross Domestic Product.
GEM	Global Entrepreneurship Monitor.
GNP	Gross National Product.
GVA	Gross Value Added.
HEA	Higher Education Authority (Ireland).
HESA	Higher Education Statistics Authority (UK).
ILO	International Labour Organisation.
ISCED	International Standard Classification of Education.
ISCO	International Standard Classification of Occupations.
LFS	Labour Force Survey.
NFQ	National Framework of Qualifications.
NISRA	Northern Ireland Statistics & Research Agency (Northern Ireland).
NDP	National Development Plan (Ireland).
OECD	Organisation for Economic Co-operation and Development.
ONS	Office for National Statistics (UK).
PISA	Programme for International Student Assessment.
PPP	Purchasing Power Parity.
QES	Quarterly Employment Survey (Northern Ireland).
QNHS	Quarterly National Household Survey (Ireland).
SIC	Standard Industrial Classification.
SOC	Standard Occupational Classification.
UNCTAD	United Nations Conference on Trade and Development.
UNESCO	United Nations Educational, Scientific and Cultural Organisation.

Annex G: EGFSN Membership

Representative	Organisation
Ms. Anne Heraty	CPL Resources PLC, Chairperson
Mr. George Bennett	Globally Traded Business, Financial Services, IDA Ireland
Ms. Ruth Carmody	Assistant Secretary, Department of Education and Science
Ms. Anne Forde	Principal Officer, Department of Education and Science
Ms. Liz Carroll	Training and Development Manager, ISME
Mr. Fergal Costello	Head of IoT Designation, Higher Education Authority
Mr. Ned Costello	Chief Executive, Irish Universities Association
Mr. Brendan Ellison	Principal Officer, Department of Finance
Mr. Roger Fox	Director of Planning and Research, FÁS
Ms. Una Halligan	Director, Hewlett Packard
Mr. David Hedigan	Manager, Sectoral Enterprise Development Policy, Enterprise Ireland
Mr. Gary Keegan	Director, Acumen
Mr. John Martin	Director for Employment, Labour & Social Affairs, OECD
Mr. Dermot Mulligan	Assistant Secretary, Department of Enterprise, Trade and Employment
Mr. Pat Hayden	Principal Officer, Department of Enterprise, Trade and Employment
Mr. Frank Mulvihill	President, Institute of Guidance Counsellors
Dr. Brendan Murphy	President, Cork Institute of Technology
Mr. Alan Nuzum	CEO, Skillnets
Mr. Tony Donohoe	Head of Education, Social and Innovation Policy, IBEC
Mr. Peter Rigney	Industrial Officer, ICTU
Ms. Jacinta Stewart	Chief Executive, City of Dublin VEC
Mr. Martin Shanahan	Divisional Manager, Science Technology and Human Capital, Forfás
Ms. Marie Bourke	Head of Human Capital and Labour Market Policy, Forfás (also Head of Secretariat)

Annex H: Northern Ireland Skills Expert Group Membership

Representative	Organisation
Catherine Bell	Deputy Permanent Secretary, Department for Employment and Learning (Chair)
Dr Aideen McGinley	Permanent Secretary, Department for Employment and Learning
John Simpson	Economist
Michael Maguire	EDF Skills sub-group
Tom Gillen	ICTUNI
Tracy Meharg	Managing Director, Invest NI
Roger W.B. Fox	Foras Áiseanna Saothair
Nuala Kerr	DEL Skills Director, Department for Employment and Learning
John D'Arcy	Association of Northern Ireland Colleges
Victor Dukelow	Senior Economist, Department for Employment and Learning
Prof. K.D. Brown	Pro Vice Chancellor, Queen's University Belfast
Prof. Norman Black	University of Ulster
John Spangler	Managing Director, Seagate Technology
Bro McFerran	Managing Director, Northbrook Technology (NI)
John Toner	Managing Director, Slieve Donard Resort & Spa
Graham Whitehurst	Michelin Tyre plc
Donald Hackett	Managing Director, Classic Marble (Showers) Ltd
Martin Lancester	ex North Carolina Regional College
Mike Campbell	UKCES

Annex I: Steering Group Membership

Representative	Organisation
Mr. Pat Hayden	Department of Enterprise Trade & Employment
Mr. Roger Fox	FÁS – Training & Employment Authority
Mr. Michael Gould	Department for Employment and Learning
Mr. Victor Dukelow	Department for Employment and Learning
Mr. Kieran Mannion	Department for Employment and Learning
Mr. Dave Rogers	Department for Employment and Learning
Ms. Gayle Kennedy	Department for Employment and Learning
Mr. Martin Shanahan	Forfás
Ms. Marie Bourke	Forfás
Mr. Gerard Walker	Forfás

Expert Group on Future Skills Needs Secretariat
c/o Forfás
Wilton Park House
Wilton Place
Dublin 2
Ireland

Tel: +353 1 607 3000
Fax: +353 1 607 3030
Email: egfsn@forfas.ie
Website: www.skillsireland.ie

Northern Ireland Skills Expert Group Secretariat
c/o Department of Employment and Learning
Adelaide House
39-49 Adelaide Street
Belfast BT2 8FD
Northern Ireland

Tel: +44 28 9025 7609
Fax: +44 28 9025 7696
Email: del@nics.gov.uk
Website: www.delni.gov.uk

Forfás

Department for Employment and Learning
www.delni.gov.uk