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Research Report

Occupation Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015

Occupation Forecasts and Replacement Demand Analysis for Northern Ireland 2005-2015

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Technical note:

The estimates in this survey are largely based on the Labour Force Survey. This is a sample survey with considerable variability from year to year. Three year averages have been used to smooth the volatile LFS data. The large level of detail required for flows between occupations in a replacement demand analysis prevents the full use of the Northern Ireland LFS due to its small sample size. However, the NI LFS is used to estimate overall leaving rates for employment as a whole. Differences between individual occupations have been estimated using figures from the UK LFS scaled to match NI totals.

We believe that this approach gives a reasonable approximation to future levels of job vacancies by occupation and skill.

i Forward

Regional Forecasts Limited (RFL) has produced, for the first time, detailed occupation forecasts and replacement demand estimates for Northern Ireland. This work has been conducted as part of DEL's Research Agenda.

The findings in this report are based on a robust methodology and understanding of the Northern Ireland economy and present the most likely trend in future labour market performance based on the available evidence.

Northern Ireland's impressive job creation record is well documented, with record employee levels following 19 years of consecutive growth in employee jobs – the longest uninterrupted period of growth in the UK. During this time, the majority of occupations have expanded. The largest recorded expansions over the last ten years, were in sales occupations, corporate managers and caring personal service occupations as the economy moves from the 'factory' to the 'office'.

The recent growth trends in occupations are generally expected to continue over the forecast period although growth will be slower than in the recent past. The main reasons for the projected slowdown in growth are the end of rapid growth in retail employment after a period in which Northern Ireland caught up with national trends following earlier periods of low investment during the 'troubles'. A second factor is an anticipated slowdown in public expenditure and hence slower growth in public sector employment.

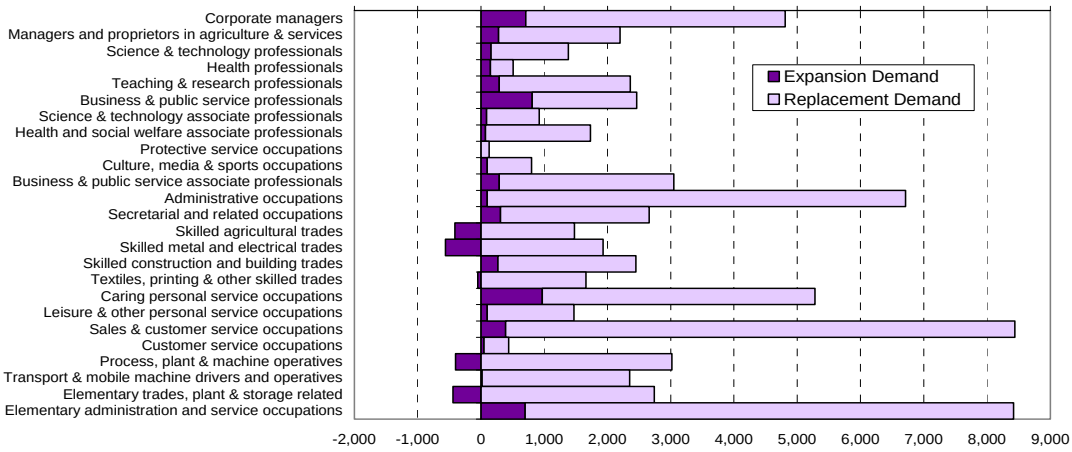
Table i.1: Forecast changes in broad occupations, 2005-2015

	Employees		Self Employed		Total Employed	
	Change (000's)	Annual average % change	Change (000's)	Annual average % change	Change (000's)	Annual average % change
Managers & Senior officials	9.3	1.5	1.5	0.7	10.8	1.3
Professional	12.1	1.5	3.4	2.3	15.5	1.6
Associate prof & technical	4.9	0.6	1.2	1.4	6.1	0.7
Administrative & Secretarial	4.2	0.4	0.3	1.3	4.5	0.5
Skilled trades	-6.1	-0.9	-2.1	-0.5	-8.2	-0.8
Personal service	10.7	2.0	1.0	1.4	11.8	1.9
Sales & customer service	4.5	0.8	0.4	1.1	4.9	0.8
Process, plant & machine	-4.1	-0.9	0.0	0.0	-4.2	-0.7
Elementary	3.3	0.4	-0.5	-1.3	2.8	0.3
Total	**38.8**	**0.6**	**5.1**	**0.5**	**43.9**	**0.6**

While occupation forecasts provide estimates of the numbers of people likely to be employed in each occupation they do not provide an indication of the wider need for employers to recruit in order to replace people lost through migration, retirement or through career changes. **Replacement demand** estimates build upon the occupation forecasts to examine these issues and provide projections of the requirements for the replacement of employees in each occupation over time.

It is immediately clear from the chart below that replacement demand dwarfs expansion demand. Over the period 2005-2015 replacement demand is projected to be just over 63,500 people per annum, compared with less than 4,000 per annum generated through expansion demand. Added together, these two figures (total requirement) mean that 67,500 people per annum are expected to be required to fill all posts created across all occupations.

Chart i.1: Expansion demand and replacement demand in Northern Ireland, annual averages, 2005-2015



In all occupations that show negative expansion demand (i.e. an overall decline in employment numbers), positive replacement demand is sufficient to result in a positive total requirement. This off- setting effect is particularly evident in skilled metal and electrical trades which are forecast to contract more than any other occupation. Replacement demand will however, create just under 2,000 openings per annum resulting in an average net requirement of around 1,400 people per annum. This shows that labour turnover creates employment opportunities even in contracting sectors.

The replacement demand analysis is a useful exercise in assessing how many vacancies are likely to be created through retirements, people migrating, becoming unemployed or leaving one occupation for another. Knowing this, the key question is 'where will the labour come from?' Recent increases in in-migration suggest that this is clearly a growing feature. Replacement demand is an important first step towards the development of a demand and supply model of Northern Ireland's labour market.

1 Introduction

1.1 As part of the Department for Employment and Learning's (DEL) research agenda, RFL were commissioned to provide **occupational forecasts** and undertake **replacement demand forecasts** for Northern Ireland. The chief potential benefit to DEL of these forecasts is that they provide a framework within which DEL's Skills Strategy can be viewed. They do this partly through acting as an early warning system for potential changes in Northern Ireland's occupational structure. They also provide 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.

1.2 These forecasts are based on a new model of the Northern Ireland economy developed by Regional Forecasts which provides annual employment projections for 24 separate occupation groups for each year until 2015. The forecasts have been updated for this report in line with the Oxford Economic Forecasting's Autumn 2005 macro-economic projections for the UK and RFL's Autumn 2005 economic projections for all UK regions.

1.3 To enhance the system further, and assist DEL in planning training needs, Regional Forecasts have developed 'replacement demand' forecasts for Northern Ireland. **Replacement demand is a measure of the likely requirement for employees in each occupation over time and is driven by factors such as retirements, people temporarily leaving the labour force, inter-occupational movements and migration**. Added to the expansion or contraction of demand for each occupation this provides estimates of the likely number of vacancies between 2005 and 2015 for each occupation.

Occupation forecasts

1.4 This is the first time that forecasts for 24 occupation groups have been produced specifically for Northern Ireland[1]. While forecasting is not an exact science forecasts do provide a consistent and informed guide to the most likely future path of employment in Northern Ireland. The forecasts presented in this report provide a baseline for what is likely to happen if policy remains substantially unchanged for the economy. If any changes in Northern Ireland's occupation structure are identified, DEL's Skills Strategy can thus be tailored accordingly.

Replacement demand

1.5 Occupation forecasts only partially depict future labour requirements as they measure only the expansion or contraction in the number of employed people in each occupation. They do not include labour turnover i.e. people moving to

[1] Although RFL produce occupation forecasts for each of the UK regions in the bi-annual regional economic outlook, the figures presented in this report differ due to the fact that they measure numbers of people and not jobs (an individual can have more than one job). Occupation forecasts for the self employed are also produced specifically for this report. The methodology employed to generate occupation forecasts is discussed in section 2 and annex 1.

another occupation or into unemployment or inactivity. Nor do they include permanent losses to the labour force due to retirement or migration. Trends in total employment in an occupation are not thus a good guide to the number and nature of job openings created each year. Information on the likely future level of job turnover in each occupation provides a valuable addition to knowledge on likely trends in total numbers in each occupation. For those concerned with the design and delivery of skills policy, job turnover is as important as change in overall numbers.

1.6 Replacement demand is increasingly used in examining the scale of needs due to both expansion and turnover[2]. The results of the analysis presented in chapter 3 show that vacancies created by people retiring, moving to another occupation, migrating or moving into unemployment or inactivity dwarf the vacancies created through an occupation's expansion. In fact, even in occupations where a decline is projected, replacement demand is usually larger than the decline.

1.7 A further useful addition to the replacement demand analysis is an analysis of qualification requirements. The replacement demand analysis is taken a step further through estimating the requirements for people at different skill levels. The benefit of this research to the Department is that it will provide an early indication of the future likely requirement for broad qualification levels within Northern Ireland and assist the Department in deciding the focus of future training policy.

Alternate futures – implications for replacement demand

1.8 RFL do not produce margins of errors for forecast results as these would be difficult in a multi-tiered system. The hierarchy of models (presented in chapter 3) means that occupation forecasts in NI depend among other things upon UK forecasts for population (which in turn depends on migration and the labour market) and sectoral employment. A change in any of these variables will therefore cascade through our models to produce revised occupation forecasts. Our models are thus best viewed as the most likely path for the economy based on current evidence.

1.9 However, to establish some 'margins of change' the replacement demand results are reproduced in Chapter 5 of this report under two alternate futures. The 'high' scenario assumes that migration into Northern Ireland is considerably higher than has been the case historically while the 'low' scenario dampens the prospects for key export sectors and assumes weaker public sector employment prospects than our central forecasts.

[2] See Willems & De Grip (1993) *Forecasting replacement demand by occupation and education*, Shah & Burke (2001) *Occupational replacement demand in Australia* and the Institute for Employment Research bulletins 60 & 73 for further information on replacement demand.

Filling vacancies

1.10 Replacement demand analysis identifies the scale of vacancies likely to be created in an occupation but does not provide estimates of sources of labour for inflows into occupations. Chapter 4 of this report suggests that forecasting which group (migrants, students etc) fills the vacancies is a complex issue as the labour market categories would all need to be dynamically modelled. It is our view that modelling the supply of people to fill vacancies would be a valuable addition to the replacement demand analysis and would provide the Department with a more powerful tool in helping to targeting policy delivery.

1.11 This report produces estimates only of the demand for occupations and skills. Although we suggest how a supply side analysis might be developed, it is beyond the scope of this study to construct estimates of the sources of supply of labour to fill vacancies. However, RFL have been examining the options for development a model of education supply as part of a scoping paper commissioned under the EDF monitoring contract (to be delivered in February 2006). These options look at supply independently of demand and explore only total supply of skills in the population, not by occupation.

1.12 Development of a fully integrated demand and supply skills forecasting model would be the most helpful policy tool. This would however require both development time and considerable investment from the Department.

Structure of the report

1.13 This report is structured as follows;

- **Background**: this section provides some contextual information about the macro economic environment and population projections in Northern Ireland's
- **Occupation forecasts:** this section briefly outlines the methodology used to produce occupation forecasts, assesses Northern Ireland's current occupation structure and presents the results of the forecasts.
- **Replacement demand**: this section introduces replacement demand, defining key concepts and presenting the results of the analysis.
- **Alternate futures – implications for replacement demand:** this section presents replacement demand results for two 'alternate futures' – a 'high' growth scenario based on increased in-migration to Northern Ireland and a 'low' growth scenario which dampens the prospects for key export sectors and assumes weaker public sector employment prospects than in the base forecasts
- **Filling vacancies – towards a supply side**: this section discusses the potential of constructing a supply side model to assess where the vacancies identified in the replacement demand analysis could be filled from.
- **Conclusion**: this section summarises the key issues arising from the research.
- **Annex 1 - Generating occupation data**: this section presents a detailed account of the methodology and data used to compile occupation data and

details the conversion of the employee jobs data series into a measure of people in employment.

- **Annex 2 - Northern Ireland's actual and standardised occupations 1981-2005:** this section presents time line plots of Northern Ireland's actual employment in each occupation compared with the employment in each occupation that would occur if Northern Ireland shared the same proportions of each occupation within sectors as the UK in each year.
- **Annex 3 – Calculating replacement demand**: detailed information of the methodology and data sources used to produce the replacement demand analysis is presented in this annex.
- **Annex 4 - Differences in NI and UK occupation leaving rates:** Analysis of the Northern Ireland and UK LFS showing significant differences in turnover for occupations.
- **Annex 5 – Additional results**: This annex provides some additional tables referred to in the main body of the report.
- **Annex 6** – **Occupational classification used in this report –** This annex provides details of the Standard Occupational Classification (SOC2000) used in this report. Examples of jobs within each occupation group are also provided.

2 Background

2.1 The current forecasts are from our Autumn 2005 forecast round. It should be noted that ongoing development work to improve the Northern Ireland Policy Simulation (NIPS) model, plus a scheduled update of our Global, UK and UK regional forecasts, will result in a revision to the projections in late spring 2006. The Department may thus wish to consider updating the replacement demand analysis at this time.

2.2 RFL do not produce margins of errors for forecast results as these would be difficult in a multi-tiered system. The hierarchy of models (presented in chapter 3) means that occupation forecasts in NI depend among other things upon UK forecasts for population (which in turn depends on migration and the labour market) and sectoral employment. A change in any of these variables will therefore cascade through our models to produce revised occupation forecasts. Our models are thus best viewed as the most likely path for the economy based on current evidence. However, to establish some 'margins of change' the replacement demand results are reproduced in Chapter 5 of this report under two alternate futures. The 'high' scenario assumes that migration into Northern Ireland is considerably higher than has been the case historically while the 'low' scenario dampens the prospects for key export sectors and assumes weaker public sector employment prospects than our central forecasts.

Macro environment

2.3 The Northern Ireland economy has been characterised by strong labour market growth since the early 1990's but has made little progress on closing the wealth gap with the UK. The charts below show this. Employee growth has been much stronger in Northern Ireland than in the UK since the beginning of the 1990's but GVA per head remains around 80% of the UK level. We expect these trends to continue in future.

Chart 2.1: GVA per head in NI, UK=100

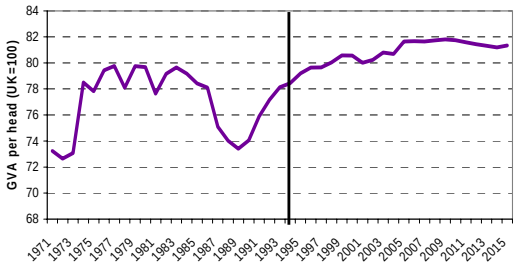
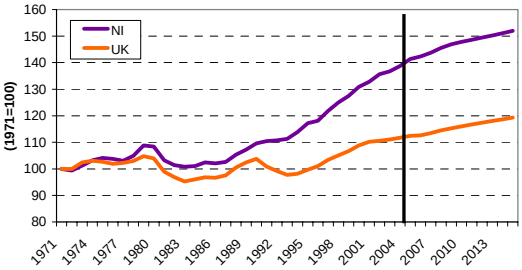


Chart 2.2: Employee growth, NI & UK, 1971=100



2.4 The strong growth in employment is partly due to 'catch-up' in retailing (as the multi national retails chains all expanded into Northern Ireland) and business services (the well documented increases in call centre employment), and partly due to growth in public services, particularly health. The impressive headline employee growth does however mask the marked decline in manufacturing

employment, although it should be noted that this decline was less severe in Northern Ireland than in the UK as a whole (table 2.1).

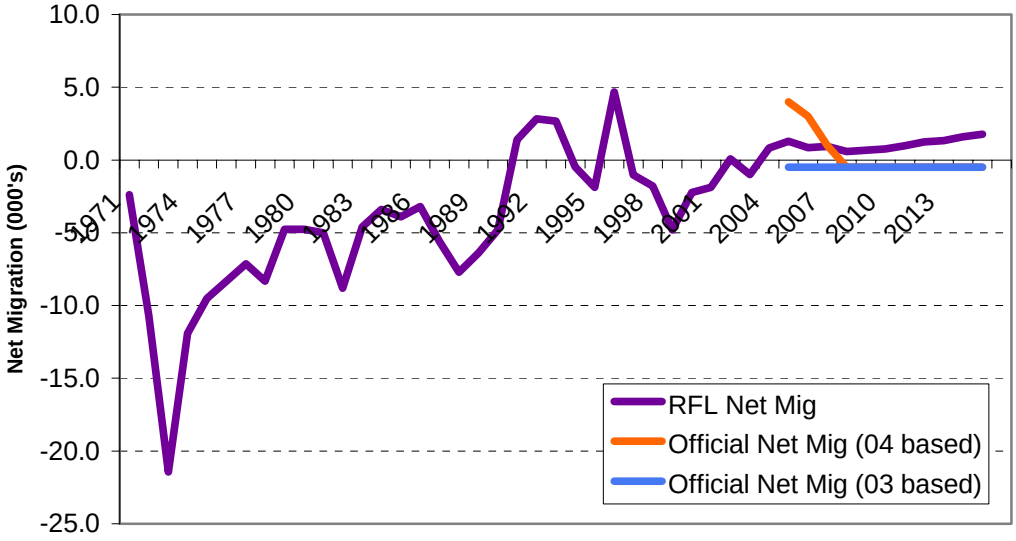
Table 2.1: Average annual % growth in employees by sector, Northern Ireland and UK, 1995-2005

	1995-2005 average annual growth	
	NI	UK
Agriculture	-1.6	-2.1
Extraction	0.3	-0.9
Electricity	-5.6	-3.5
Construction	4.6	3.3
Manufacturing	-1.8	-2.4
Distribution	3.1	1.3
Hotels	4.5	2.3
Transport & Comms	2.7	1.4
Financial intermediation	2.4	0.6
Business services	7.4	3.2
Public Admin	0.7	0.7
Education	1.4	2.0
Health	1.9	1.7
Other Services	1.5	2.6
Total	**1.9**	**1.2**

Population

2.5 The shift away from manufacturing towards service sector employment has increased the importance of population forecasts as a driver of the economy in our model. RFL does not use official population projections. Instead we use an equation of migration responding to factors such as house prices, wages, labour market performance and UK migration. The chart below shows three net migration projections. The flat line shows NISRA's official net migration projections based on 2003 mid year population estimates. These were the published projections available for RFL's Autumn 2005 forecast round. RFL felt that these projections were conservative given the large in-flows of international migration since EU enlargement and thus forecast stronger net inward migration than the official estimates (the dark line on the chart). The most recent NISRA projections have taken account of the estimated large increases in international in-migration and currently estimate a net inflow of 4,000 people in 2005.

Chart 2.3: Northern Ireland Net migration projections



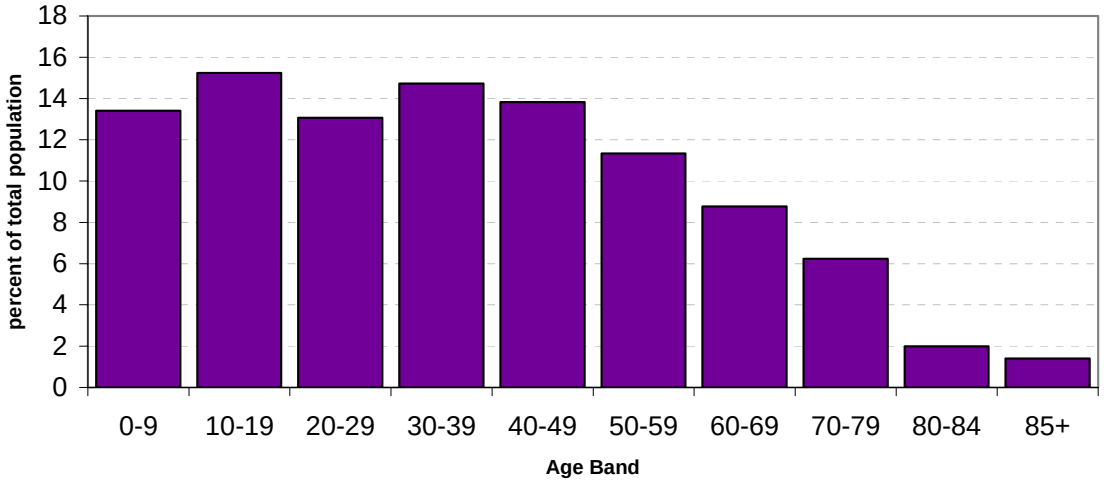
Source: RFL, NISRA

2.6 Migration data provides a substantial source of variation in population projections given the large scale revision to the official projections. In addition, the age profile of migrants, whether or not recent in-migrants prove to be permanent settlers in NI, and the family size of migrants all greatly affect the population forecast and structure. Several other risks to current population projections also exist. For example;

- Any increase in student provision could stem the flow of students leaving Northern Ireland to attend university, further altering the population structure
- The long term path in international migration is hard to predict – until now London has been the main entry point for in migrants who have then moved around the rest of the UK. The extent to which this pattern will continue is unknown.

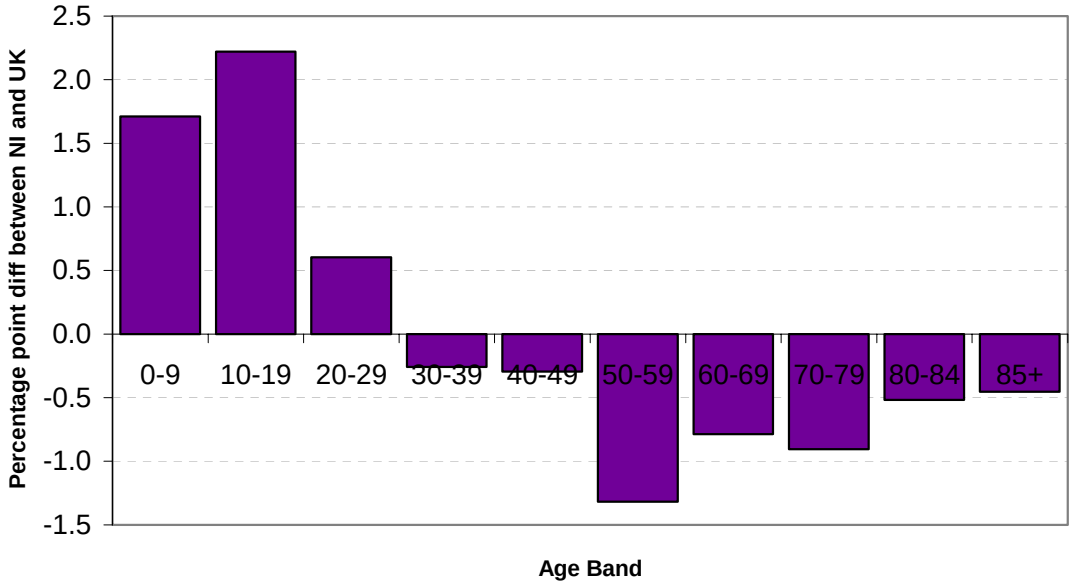
2.7 Nevertheless, at present NI's age structure is more heavily skewed towards young people. This is shown in charts 2.4 and 2.5 below. More than half of Northern Ireland's population are aged less than 40. Compared to the UK, Northern Ireland's has proportionately more people the under 30 and less people in every age band above 30.

Chart 2.4: Population structure in Northern Ireland 2004



Source: NISRA

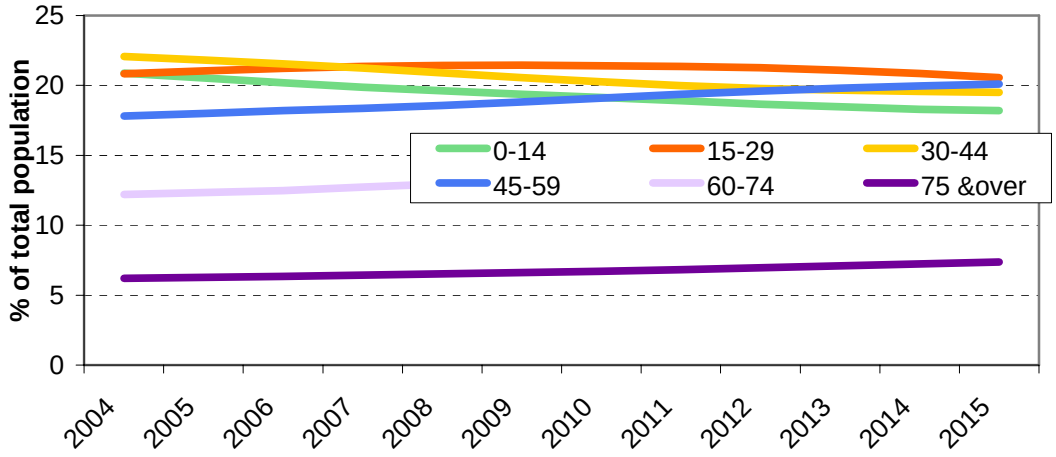
Chart 2.5: Differences between Northern Ireland and UK population structure



Source: NISRA, ONS

2.8 RFL produces forecasts for working age population and total population but does not currently produce population forecasts for different age bands. The chart below therefore uses NISRA's population projections by age band. These are likely to show a similar pattern to any age forecasts that we might produce ourselves, except that in our case net in-migration would be higher and hence the proportion of young adults would be slightly higher than in the NISRA projections. The declining proportion of young people is evident in the NISRA projections. By 2015, NISRA forecast that people under 15 will account for 18% of the population, down from 21% in 2005. The proportion of people over 45 will increase by 6%.

Chart 2.6: Official population projections by age broad age group

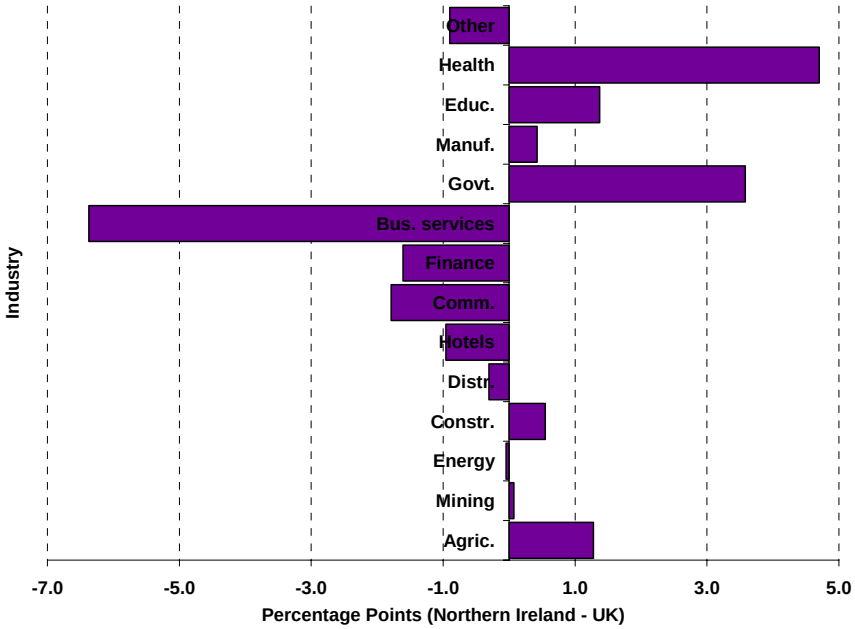


Source: NISRA

Northern Ireland employment structure

2.9 Chart 2.2 and table 2.1 showed Northern Ireland's impressive employment growth since the early 1990's. This section looks at the sectoral structure resulting from that growth. The chart below shows the difference between Northern Ireland's employment structure and the UK's. It is apparent that Northern Ireland remains more heavily dependent on the public sector and manufacturing than does the rest of the UK.

Chart 2.7: Difference in employment structure (Northern Ireland – UK) 2004



2.10 Although there is evidence of a shift from lower to higher value added private services, this is happening relatively slowly. Looking forward, the switch from manufacturing to private services employment is likely to continue although the slow down in consumer spending is likely to impact on the prospects for retail employment. In addition, there is little evidence to suggest that the public sector will decline in importance as a provider of employment.

2.11 The charts below present Northern Ireland employment[3] by occupation. As might be expected given the sectoral balance, Northern Ireland has more employment in administrative and skilled trade occupations than the UK and fewer corporate managers.

[3] To allow comparison with the UK, charts 2.9 and 2.10 present *jobs* not *people* in employment. At DEL's request, the occupation forecasts and replacement demand analysis presented throughout this report measure people in employment.

Chart 2.8: Northern Ireland's occupation structure, numbers employed, 2005

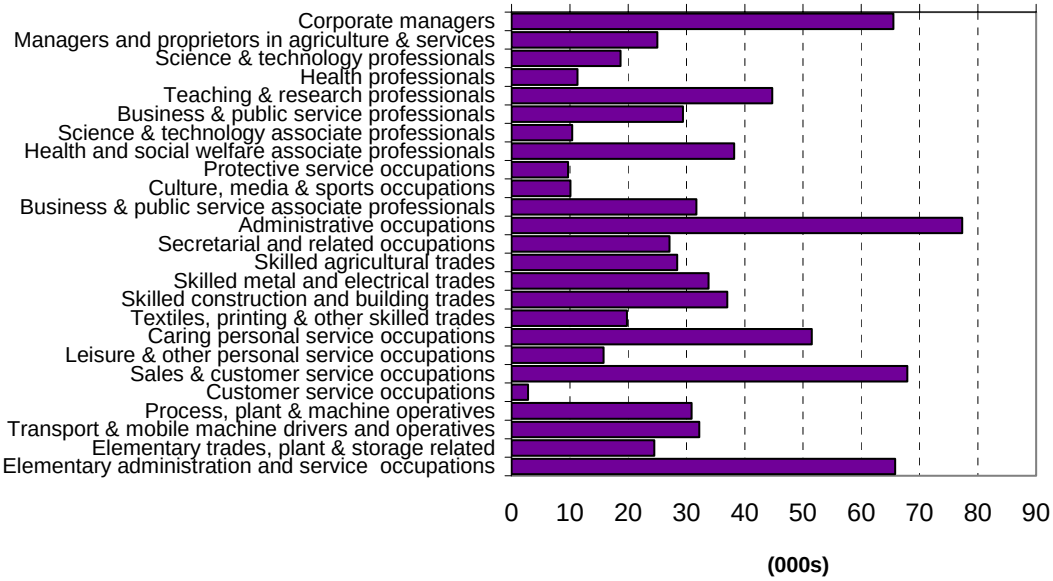
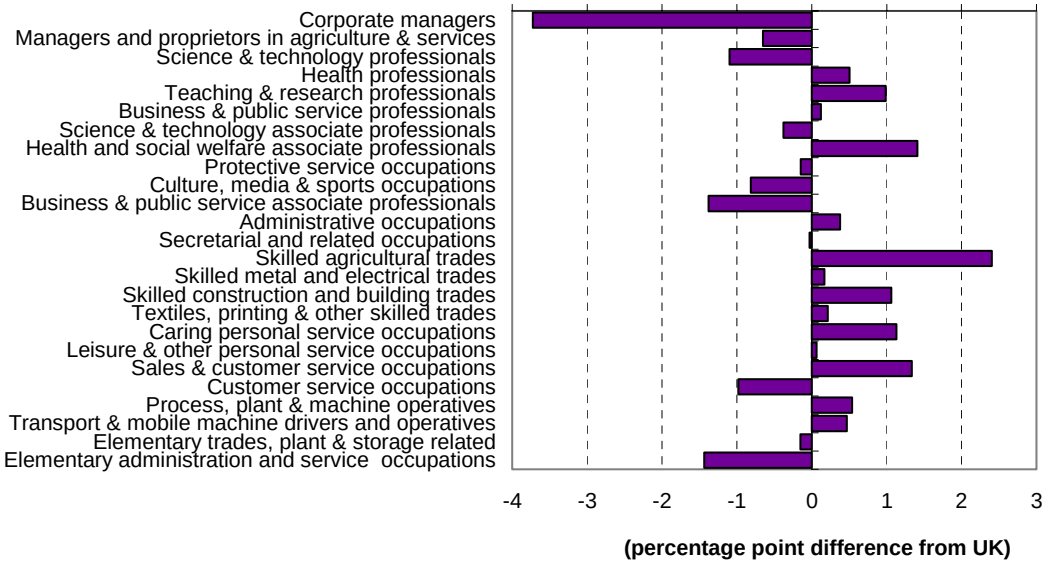
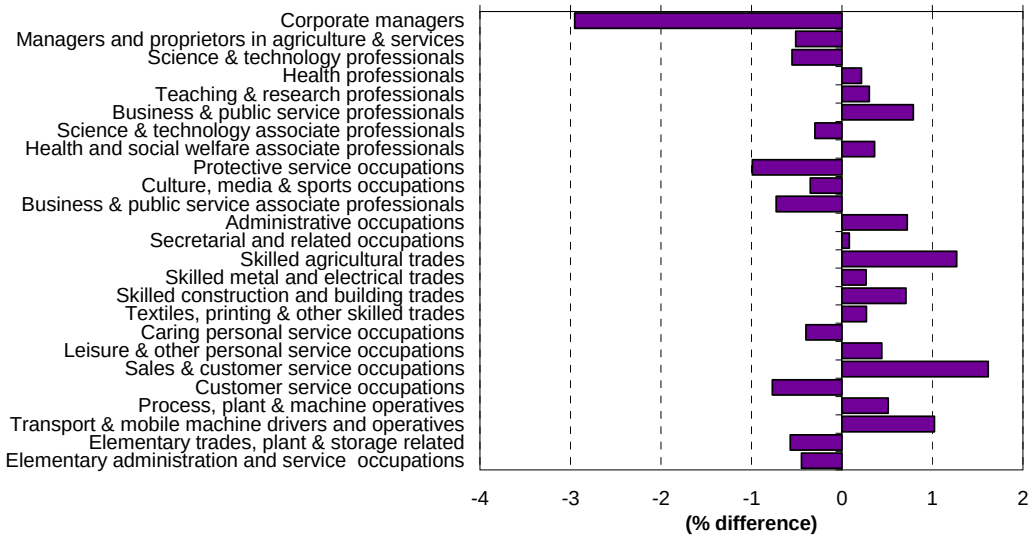


Chart 2.9: Difference in Northern Ireland and UK occupation structure



2.12 It was mentioned above that Northern Ireland's high proportion of employment in administrative and skilled trade occupations was unsurprising given the sectoral structure of the Northern Ireland economy. The chart below shows the percentage point difference in Northern Ireland's actual occupation structure and the standardised occupation structure.

Chart 2.10: Percentage point difference between Northern Ireland's actual and expected occupation structure, 2005



- Chart 2.10 shows the difference between Northern Ireland and the UK occupation structure which is due to occupational differences within each sector rather than differences in sectoral structure. For example, the proportion of corporate managers in employment is 3 percentage points lower than it would be if Northern Ireland shared the same occupation structure within each sector as the UK.
- The impact of differences in the importance of each sector between NI and the UK average can be measured by comparing charts 2.9 and 2.10. For instance, in NI corporate managers comprise 3.7% less of employment than in the UK as a whole (chart 2.9). Chart 2.10 tells us that almost 3% of this is due to lower proportions of corporate managers within sectors. The difference between these two figures, i.e. 0.7%, is due to differences between NI and the UK in the importance of individual sectors. In this case, NI has less employment in sectors that tend to employ most corporate managers. Hence, most of NI's shortfall of corporate managers is due to NI firms employing fewer corporate managers than other UK firms in the same sectors.
- Other notable occupations with lower concentrations of employment include culture, media and sports occupations, business and public service associate professionals, customer service occupations and elementary occupations. In most of these cases it is a lack of the occupations within sectors that causes NI's shortfall rather than a lack of sectors in which these occupations are well represented.
- There are several occupations in which Northern Ireland employment is more concentrated than the UK, such as skilled agricultural trades transport and mobile machine drivers and operatives and health associate professionals (e.g. nurses). Most of these differences are due to the larger size of the relevant sectors in NI.

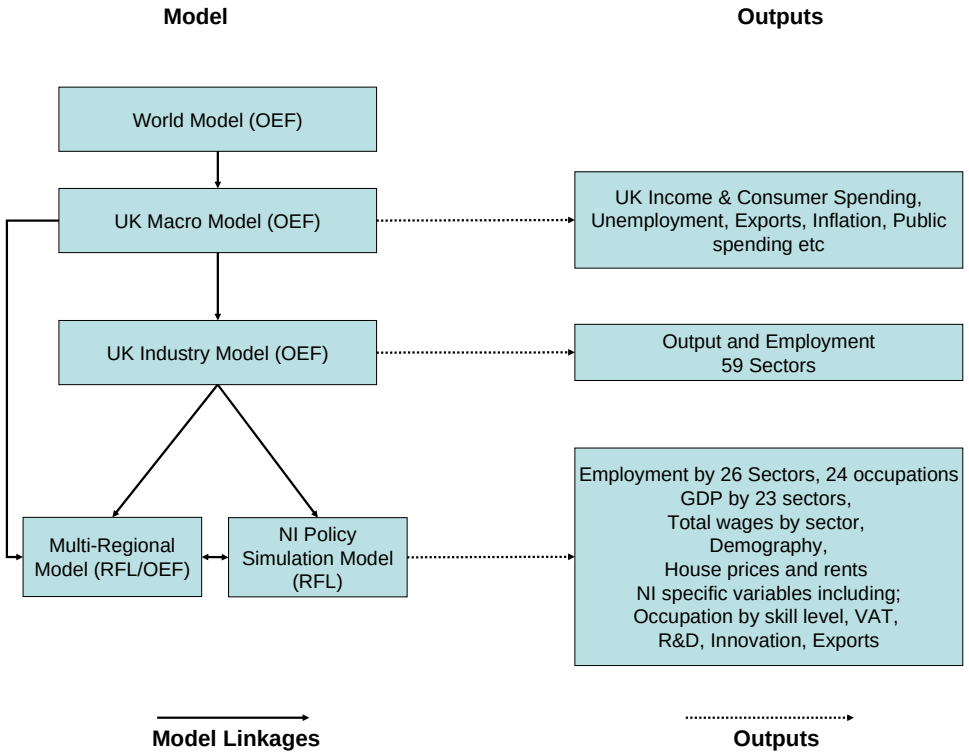
2.13 It is within the context of the recent NI economic performance outlined in this chapter that the remainder of this report presents occupation forecasts and replacement demand analysis.

3 Occupation forecasts

Context of the NIPS model

3.1 The occupation forecasts have been developed within the existing Northern Ireland Policy Simulation (NIPS) model[4], recently developed by RFL to provide monitoring and forecasting of the Economic Development Forum targets for the Northern Ireland economy. This model is itself nested in the bi-annual UK Multi-Regional -Model produced by RFL / Oxford Economic Forecasting (OEF) and consequently the hierarchy of macro forecasts produced by OEF. The broad structure of these model interactions is set out in the figure below:

Figure 3.1: Hierarchy of forecast models



3.2 This hierarchy provides a robust framework for the occupation forecasts produced in this report and ensures that they are consistent with, and responsive to, changes in OEF's macro and sectoral forecasts.

Methodology and data overview

3.3 RFL's standard occupational forecasts, produced as an output of the regional forecast model are for total employment (employee jobs plus the self employed). As the employee data series measures jobs (of which people can have more than

[4] The Leitch review of Skills presented UK occupation forecasts produced by Cambridge Econometrics. A comparison of these forecasts with RFL's UK forecast of employment in broad occupation groups is presented in annex 6.

one) and self employment is a measure of people[5], the forecasts for employment by occupation do not measure numbers of people in each occupation. It is rather closer to a measure of the number of jobs in each occupation.

3.4 As part of this project, the model has been developed[6] so that the employment forecasts are estimates of numbers of people employed and self employed rather than the number of jobs. One drawback of this approach is that Northern Ireland's employment by occupation will not be comparable to other regions as their occupation forecasts remain based on employee jobs.

3.5 In brief, the method used to convert employee jobs into numbers of people employed is to adjust the numbers of part-time employees by the fraction required to equate employment estimates for 2001 with number of employed people recorded in the 2001 Census.

3.6 There are two data sources to draw upon for occupation employment data – the Census of Population and the Labour Force Survey. LFS data provides proportions of 25 occupations within 14 sectors for 2002 to 2005 (three year moving averages are used to smooth data volatility). Prior to 2002, Census information is used and inter census years are interpolated. We use University of Warwick Institute of Employment Research figures for 1971-91, and have constructed our data from census and LFS sources for 1991-2005.

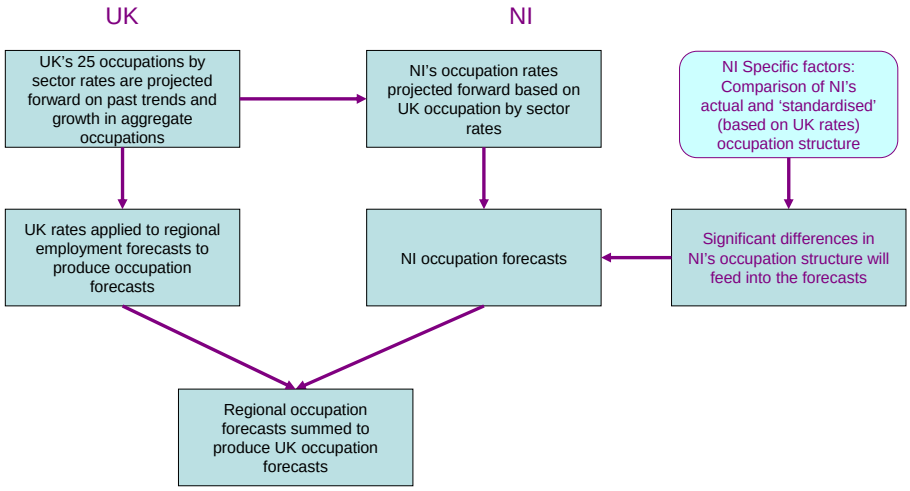
Generating occupation forecasts

3.7 The steps taken to generate occupation forecasts are summarised in figure 3.2 and explained in greater detail in annex 1. The key issue to note from this figure is that projections for occupation proportions within each sector in Northern Ireland are initially based on growth in the UK's proportions within each sector. To assess how representative this initial estimate is likely to be for Northern Ireland, actual occupation data for Northern Ireland is compared to 'standardised'[7] occupation estimates over the past based on UK occupation proportions within each sector. These comparisons are plotted in annex 2. Although the charts of NI's actual and standardised occupations in annex 2 contain some differences in the numbers within some occupations, we are most interested in the 'path' of each plot. If the actual and standardised occupations follow a similar path (rising and falling at similar times and by the same magnitude) then we feel it is sensible to apply UK growth rates to NI.

3.8 This analysis has two benefits. Firstly, it identifies the extent to which Northern Ireland's occupation employment is based on factors specific to Northern Ireland. Secondly, if the differences between actual and standardised occupation employment are shown to be large and diverging over time, then the Northern Ireland forecasts are adjusted to reflect this divergence in trend. The results of this analysis are summarised following a brief outline of Northern Ireland's current occupation structure.

[5] A self employed jobs measure is available but it is not used in the regional forecast model.
[6] A detailed description of the data used and the model development work undertaken to generate employment by occupation is provided in annex 1.
[7] Standardised occupation data is calculated by applying UK occupation proportions by sector employment in each year to Northern Ireland's employment structure.

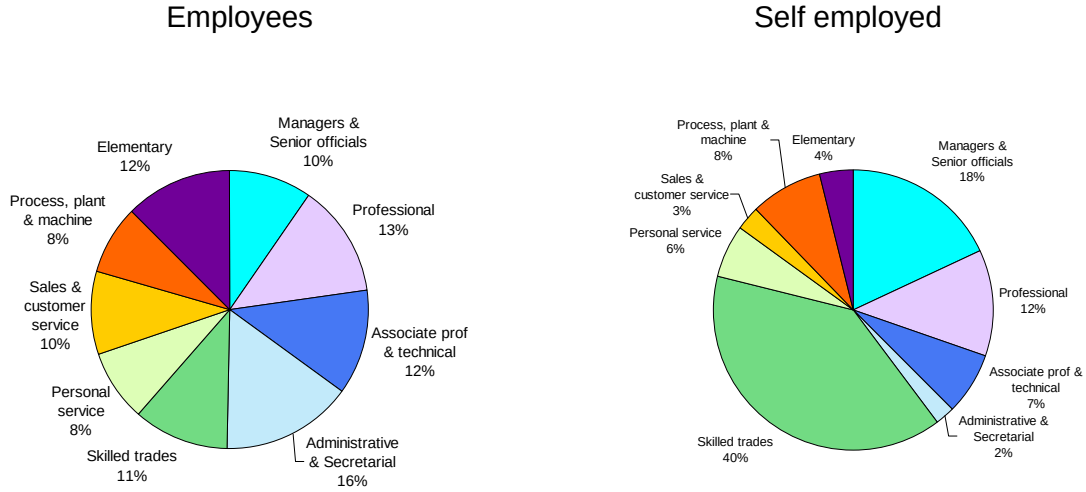
Figure 3.2: Forecasting occupations



Current occupation structure

3.9 Northern Ireland's broad (9 occupations) occupation structure is shown in chart 3.1[8]. The largest occupation group among employees is administrative and secretarial occupations, reflecting Northern Ireland's reliance on public sector employment. The structure of self employed occupations is significantly different than that for employees with 40% of the self employed in skilled trades occupations. There is also a much higher proportion of managers (18%) amongst the self employed.

Chart 3.1: Broad occupation structure, employees and self employment (2005)



3.10 Northern Ireland's reliance on public sector employment becomes even more apparent when the occupation structure is disaggregated into 25 occupation groups (charts 3.2 and 3.3), with administrative occupations, teaching occupations and elementary administration services contributing to roughly one quarter of the employee total. Again, the differences in the self employment

[8] Data in this report measure numbers of people in employment, not employee jobs.

structure are evident with large proportions of the self employed in agricultural and construction activities.

Chart 3.2: Detailed occupation structure, employees (2005)

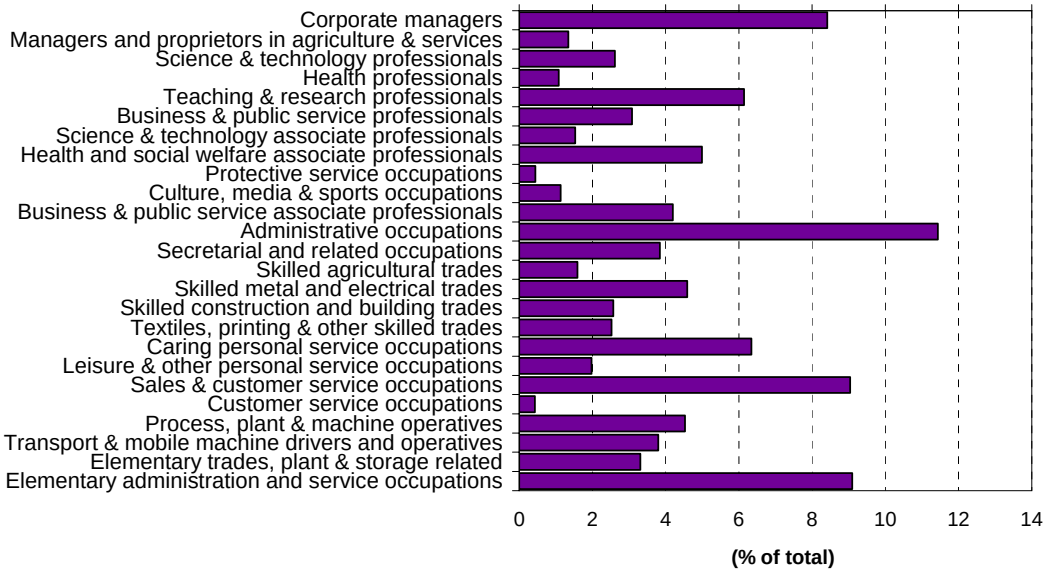
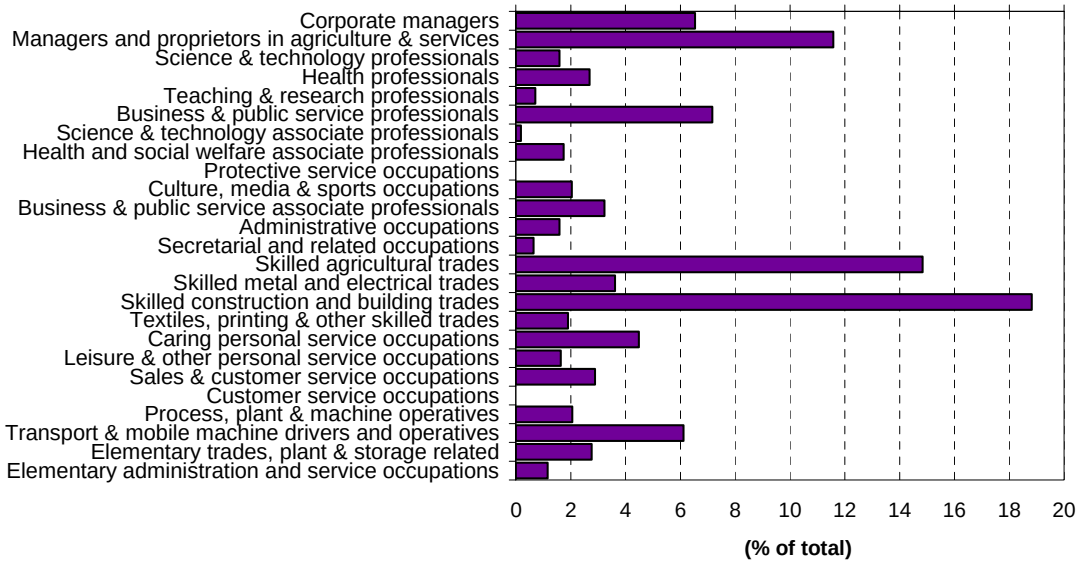


Chart 3.3: Detailed occupation structure, self employed (2005)



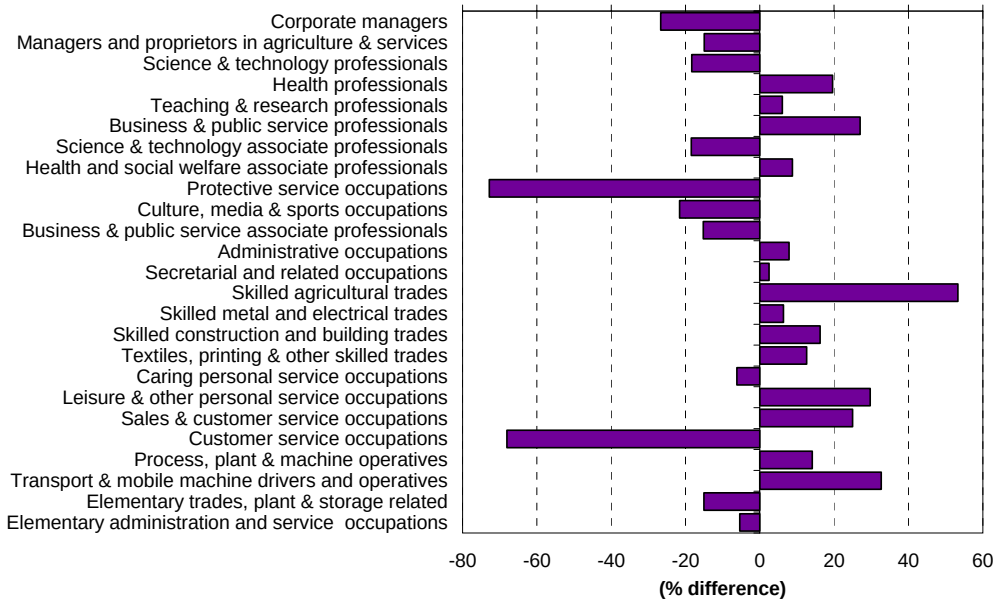
Actual and standardised occupations

3.11 In this section we examine how Northern Ireland's occupational structure differs from that of the UK as a whole. This is done through measuring the gap between numbers in each Northern Ireland occupation and the numbers that would occur if Northern Ireland had the same occupation structure within sectors as the UK as a whole. We are thus using the observed mix of sectors in Northern Ireland and asking how the numbers in each Northern Ireland

occupation differs from that which would occur in each sector if Northern Ireland had the UK occupational proportions.

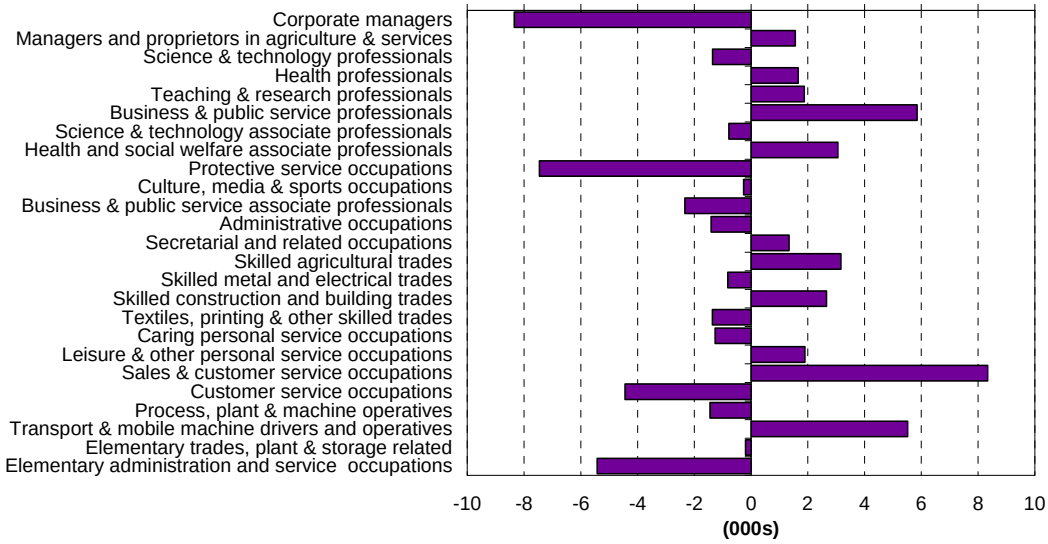
3.12 This analysis was discussed in chapter 2 but it is worth reintroducing it here as it is useful in assessing how realistic it is to use trends in UK occupation proportions to drive the forecasts of employment in occupations for Northern Ireland. The results are presented in chart 3.4 and 3.5. Time line plots of all Northern Ireland's actual and standardised occupations are presented in annex 2.

Chart 3.4: Percentage difference between actual and standardised occupations, total employed (2005)



- Corporate management is the most under represented occupation Northern Ireland (aside from protective service occupations and customer service occupations for which there are LFS data concerns, discussed below)
- The corporate managers occupation is almost 30% smaller than it would be if each Northern Ireland sector followed the UK occupation structure.
- Over the last decade, corporate managers have displayed strong growth in Northern Ireland. However, this growth is around 8,000 less than if Northern Ireland shared the UK's occupation proportions within each sector (chart 3.5).
- Other notable areas of under-representation include culture, media and sports occupations, business and public service associate professionals, customer service occupations and elementary occupations.
- There are several occupations in which Northern Ireland has a greater concentration than the UK, reflecting Northern Ireland's high relative concentrations of employment in the public sector, manufacturing and agriculture.
- For example, skilled agricultural trades is over represented by 50%, while transport and mobile machine drivers and operatives and business and public service professionals are over represented by more than 20% each.

Chart 3.5: Difference between changes in actual and standardised occupations, total employed (1995 - 2005)



3.13 The conclusion from this analysis is that applying the annual growth in UK occupation by sector rates is a sensible approach, as in most cases the observed differentials appear stable with little evidence of diverging trends (annex 2). This is not true however of protective and customer service occupations. The former includes the police and army, and the reform of the police in Northern Ireland and cutbacks in the army have caused declining numbers in Northern Ireland. This is not the whole story. The measured decline in annex 2 is too large to be plausible in the period since 2001. This is the period for which we use LFS data and the likelihood is that security staff in Northern Ireland deliberately mis-represent their true occupation. The corollary of this is that other occupations may be over-reported.

3.14 Northern Ireland's lagging performance in customer service occupations is less easy to understand. This occupation includes call centres, in which Northern Ireland was under-represented until the paramilitary cease fires in 1997. The collapse in numbers since 2003 is not plausible and again may reflect misreporting of customer services as sales occupations. It is not apparent that the decline in either of these occupations represents a changing trend, rather a blip in the data. RFL will continue to monitor these occupations as new data becomes available.

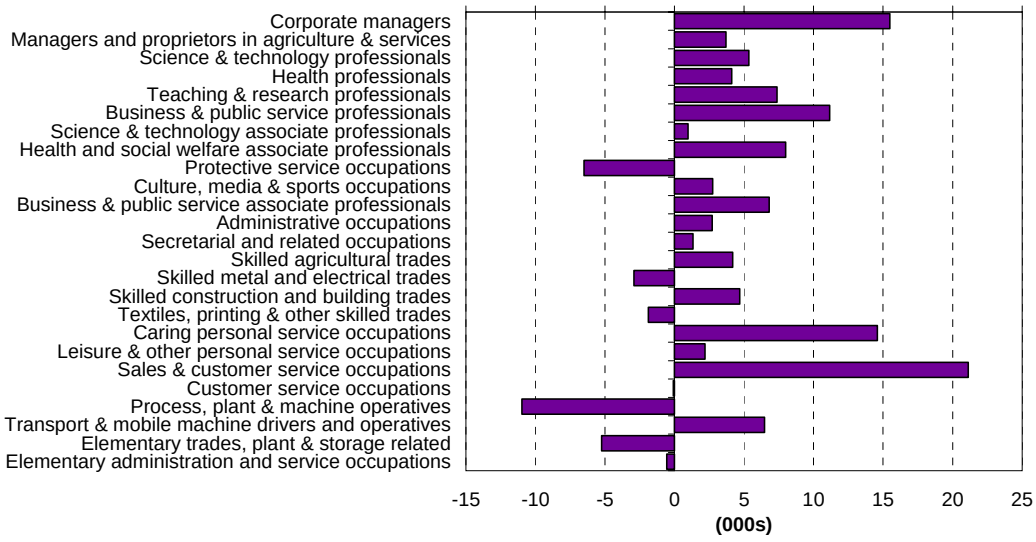
Recent occupation changes

3.15 Northern Ireland's impressive job creation record is well documented, with record employee levels following 19 years of consecutive growth in employee jobs – the longest uninterrupted period of growth in the UK. The charts below focus on the last ten years and show that the majority of occupations have expanded, both in employee and self employment terms. The largest recorded expansion over the last ten years, was in sales occupations (21,000), closely

followed by corporate managers (15,500) and caring personal service occupations (14,500).

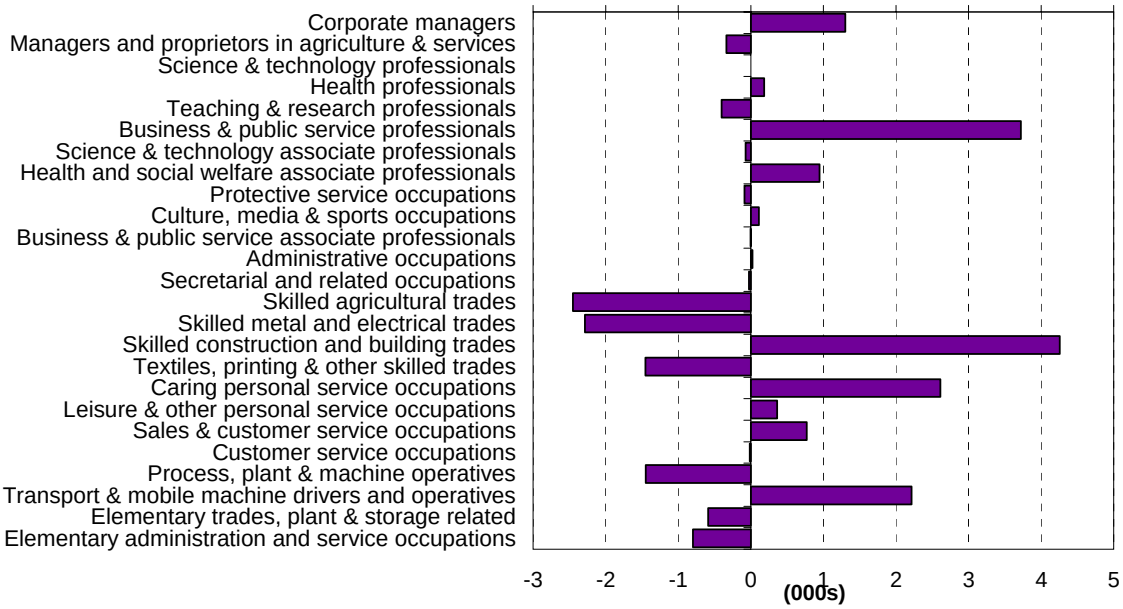
3.16 Not all occupations experienced growth in the last decade. The most notable job losses came in process, plant and machine operatives which lost 11,000. These patterns of expansion and contraction reflect the well established decline in manufacturing and the rise of the service sectors as a source of employment.

Chart 3.6: Change in employees 1995-2005



3.17 There were 10 occupations in self employment that experienced declines in the last decade compared to 7 in the employee analysis. The largest losses came in the skilled occupations such as skilled agricultural trades, skilled metal trades and textiles. On a more positive note there was enough expansion in other occupations to offset these losses. Skilled construction occupations increased by 4,300 people while business and public service professional occupations increased by 3,700.

Chart 3.7: Change in self employment 1995-2005



3.18 In percentage terms (table 3.1) total employment growth has averaged 1.5% per annum, chiefly driven by the expansion of employees, rather than the self employed. Business and public service professionals have experienced the fastest growth in total employment over the last decade (8.6% per annum). Caring and sales occupations have also enjoyed strong annual average growth since 1995. The largest decline has been in protective occupations, although almost all this decline occurred in 2001 and as mentioned, this is likely to reflect mis-recording of occupations as well as real declines.

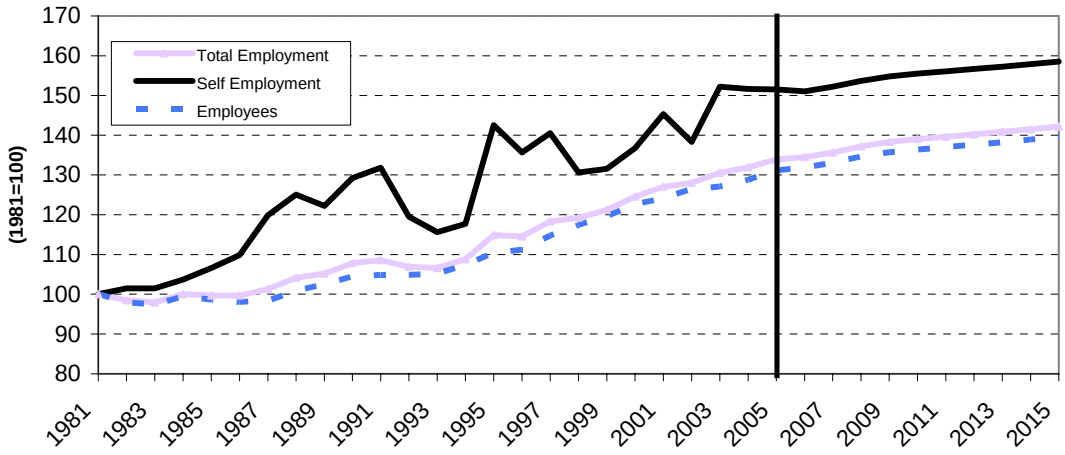
Table 3.1: Average annual growth in occupations (% per annum), 1995-2005

	Employees	Self Employed	Total Employment
Corporate managers	3.7	2.0	3.5
Managers and proprietors in agriculture & services	6.3	-0.3	1.8
Science & technology professionals	4.2	0.0	3.7
Health professionals	10.6	0.6	6.3
Teaching & research professionals	2.2	-4.1	2.1
Business & public service professionals	9.6	6.6	8.6
Science & technology associate professionals	1.1	-3.0	1.0
Health and social welfare associate professionals	3.1	7.0	3.3
Protective service occupations	-11.7	0.0	-11.8
Culture, media & sports occupations	5.3	0.5	3.9
Business & public service associate professionals	3.2	0.0	2.7
Administrative occupations	0.4	0.1	0.4
Secretarial and related occupations	0.6	-0.4	0.6
Skilled agricultural trades	5.9	-1.4	0.7
Skilled metal and electrical trades	-1.0	-4.4	-1.5
Skilled construction and building trades	3.7	2.3	2.9
Textiles, printing & other skilled trades	-1.2	-5.1	-1.7
Caring personal service occupations	4.9	7.8	5.2
Leisure & other personal service occupations	2.1	2.2	2.1
Sales & customer service occupations	5.0	2.8	4.9
Customer service occupations	-0.3	-16.4	-0.4
Process, plant & machine operatives	-3.3	-4.8	-3.4
Transport & mobile machine drivers and operatives	3.4	4.1	3.5
Elementary trades, plant & storage related occupations	-2.3	-1.7	-2.2
Elementary administration and service occupations	-0.1	-4.7	-0.2
Total	**1.7**	**0.6**	**1.5**

Occupation forecasts

3.19 The recent growth trends in occupations are generally expected to continue over the forecast period although growth will be slower than in the recent past. The main reasons for the projected slowdown in growth are the end of rapid growth in retail employment after a period in which Northern Ireland caught up with national trends following earlier periods of low investment during the 'troubles'. A second factor is an anticipated slowdown in public expenditure and hence slower growth in public sector employment. Growth in total employment is expected to be driven by growth in both employees and self employment (chart 3.8).

Chart 3.8: Trends in employment, 1981-2015



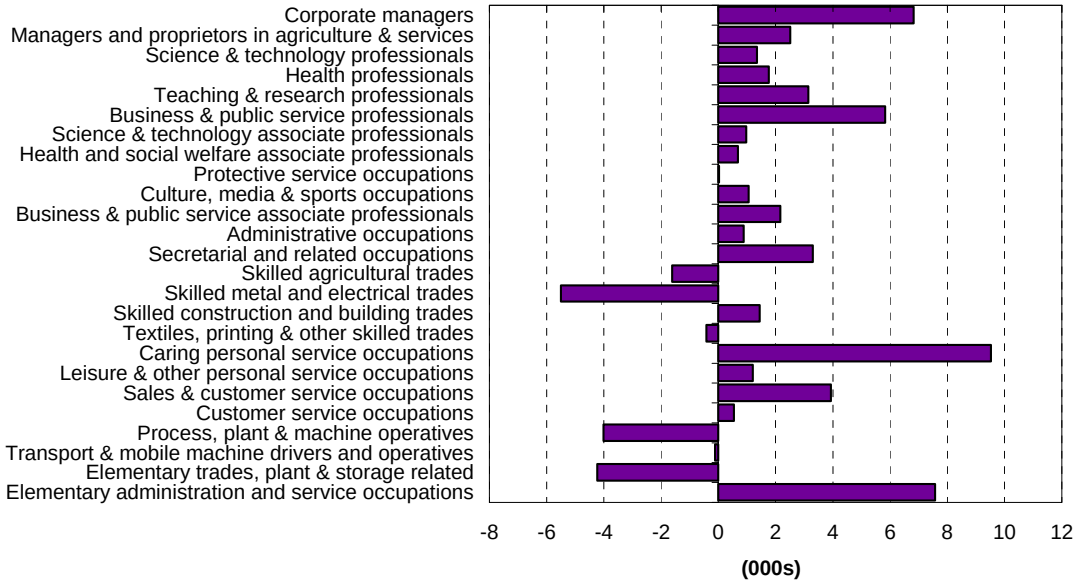
3.20 Professional occupations are expected to increase most - by 15,500 in total employment (table 3.2). Personal service occupations are also expected to show large increases as recent growth in child care and residential care for the elderly continues. Significant declines are again evident in the skilled trades occupations and process plant and machine occupations, reflecting the continuing shift away from lower value added manufacturing.

Table 3.2: Forecast changes in broad occupations, 2005-2015

	Employees		Self Employed		Total Employed	
	Change (000's)	Annual average % change	Change (000's)	Annual average % change	Change (000's)	Annual average % change
Managers & Senior officials	9.3	1.5	1.5	0.7	10.8	1.3
Professional	12.1	1.5	3.4	2.3	15.5	1.6
Associate prof & technical	5	1	1.2	1.4	6.1	1
Administrative & Secretarial	4.2	0.4	0.3	1.3	4.5	0.5
Skilled trades	-6.1	-0.9	-2.1	-0.5	-8.2	-0.8
Personal service	10.7	2.0	1.0	1.4	11.8	1.9
Sales & customer service	4.5	0.8	0.4	1.1	4.9	0.8
Process, plant & machine	-4.1	-0.9	0.0	0.0	-4.2	-0.7
Elementary	3.3	0.4	-0.5	-1.3	2.8	0.3
Total	**38.8**	**0.6**	**5.1**	**0.5**	**43.9**	**0.6**

3.21 The charts below show more detailed occupation forecasts for employees and the self employed respectively. Within the personal service occupations, caring occupations rather than leisure occupations are expected to create the vast majority of the extra jobs. In fact, caring occupations are forecast to grow by 10,000 employees and just over 1,000 self employed over the next decade.

Chart 3.9: Forecast change in employees, 2005-2015

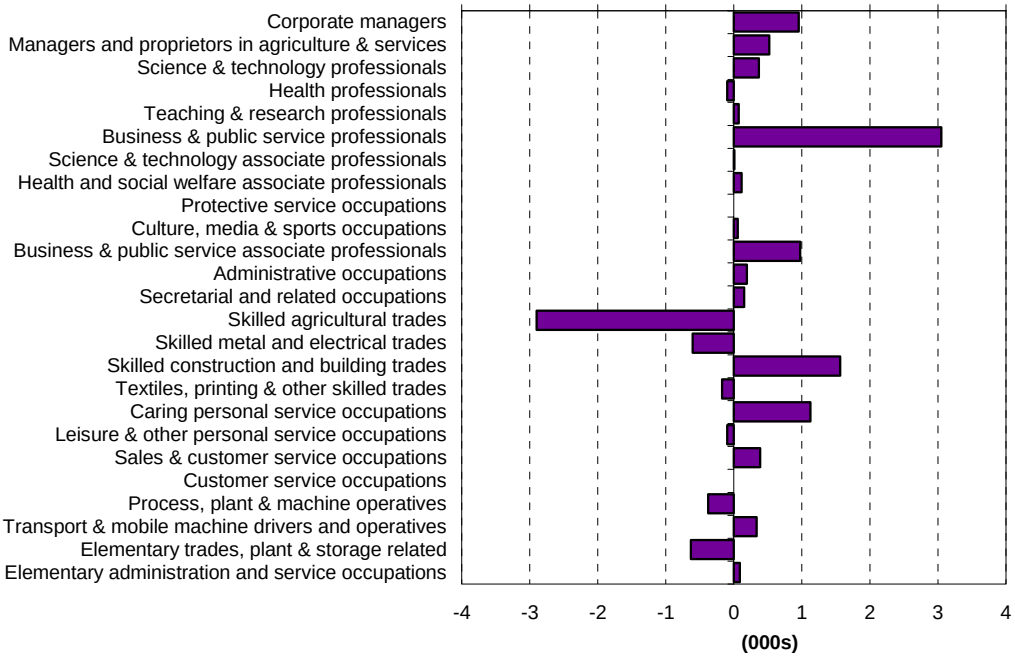


3.22 Our forecasts also show larger increases in elementary administration and service occupations over the next decade than in the previous decade. This is largely due to our outlook for the hotels sector (where many of these occupations are located) which we project to grow faster in the medium term than in the recent past.

3.23 The changing sectoral pattern for employees in Northern Ireland's private sector is away from low value added towards higher value added employment. This is reflected in significant predicted gains for both corporate managers and business professionals and predicted continued declines for the more manufacturing focused occupations such as skilled metal and electrical trades, elementary trades and process plant and machine trades.

3.24 The greatest source of potential growth in self employment is also in business and public service professional occupations which are expected to create over 5,000 jobs over the next decade. Conversely, skilled agricultural occupations are forecast to decline by around the same amount. It should be noted however that the small sample size available for self employment by occupations increases the margin of error. Care should be taken in drawing conclusions from the self employment occupation forecasts.

Chart 3.10: Forecast change in self employed, 2005-2015



3.25 Average annual growth in employment over the next decade at less than 1% (table 3.3) is not expected to be as strong as in the previous decade. Business and public service professionals, which has experienced close to 10% per annum growth in total employment over the last decade is expected to grow by an average of 3% over the next 10 years. Caring occupations, which are forecast to create the most jobs for employees over the next decade, are expected to grow by around 2.2% per annum, as the recent strong crèche and care home provision continues. Protective occupations, which experienced an exceptional decline in employment in 2001 is expected to return to slight growth over the next decade, although this is expected to average only 0.1% per annum.

Table 3.3: Average annual % forecast growth in occupations, 2005-2015

	Employees	Self Employed	Total Employment
Corporate managers	1.3	1.3	1.3
Managers and proprietors in agriculture & services	2.8	0.4	1.4
Science & technology professionals	0.8	1.9	0.9
Health professionals	2.4	-0.3	1.6
Teaching & research professionals	0.8	0.9	0.8
Business & public service professionals	2.8	3.3	2.9
Science & technology associate professionals	1.0	0.5	1.0
Health and social welfare associate professionals	0.2	0.6	0.2
Protective service occupations	0.1	0.0	0.1
Culture, media & sports occupations	1.5	0.3	1.2
Business & public service associate professionals	0.8	2.4	1.0
Administrative occupations	0.1	1.0	0.2
Secretarial and related occupations	1.3	2.0	1.4
Skilled agricultural trades	-1.8	-1.9	-1.9
Skilled metal and electrical trades	-2.2	-1.6	-2.1
Skilled construction and building trades	0.9	0.7	0.8
Textiles, printing & other skilled trades	-0.3	-0.9	-0.3
Caring personal service occupations	2.2	2.1	2.2
Leisure & other personal service occupations	1.0	-0.6	0.8
Sales & customer service occupations	0.7	1.1	0.7
Customer service occupations	1.9	-4.0	1.9
Process, plant & machine operatives	-1.6	-1.8	-1.6
Transport & mobile machine drivers and operatives	0.0	0.5	0.1
Elementary trades, plant & storage related occupations	-2.4	-2.3	-2.3
Elementary administration and service occupations	1.3	0.7	1.3
Total	**0.6**	**0.5**	**0.6**

Conclusions

3.26 The key findings from this section can be summarised as follows;

Past trends

- The largest occupation group in 2005 among employees is administrative and secretarial occupations, most likely reflecting Northern Ireland's reliance on public sector employment.
- The largest occupation group in 2005 among the self employed is skilled trades occupations, driven by the large proportion of self employment in construction.
- Over the last decade, an additional 101,000 people have gained employment.
- The largest expansion of employees over the last decade (21,000) was sales occupations, closely followed by corporate managers (15,500) and caring personal service occupations (14,600).
- 10 occupations in self employment experienced declines in the last decade compared to 7 in the employee analysis. The largest losses came in the skilled occupations such as skilled agricultural trades (-2,500), skilled metal trades (-2,300).
- Other occupations expanded sufficiently to offset these losses. Skilled construction increased by 4,300 people while business and public service professionals increased by 3,700.

Future trends

- An additional 44,000 people are expected to be in employment in 2015.
- Average annual growth in employment over the next decade is predicted to be around 1% – lower than in the previous decade – due largely to our view that retail employment has 'caught up' with the UK (thus leaving less scope for growth) and that public spending increases will be more modest than in the recent past.
- Business and public service professionals, which have experienced close to 10% per annum growth in total employment over the last decade are expected to grow by an average of 2.9% over the next 10 years.
- Caring occupations, which are forecast to create the most jobs for employees over the next decade, are expected to grow by around 2.2% per annum.
- Professional occupations are expected to increase by over 15,500 in total employment terms.
- Significant declines are again evident in the skilled trades occupations (except in construction) and process plant and machine occupations.

4 Replacement Demand

4.1 The projections presented in the previous section provide estimates of the numbers of people likely to be employed in each occupation. While these estimates provide a useful indication of which occupations gain or lose from employment change, they do not provide an indication of the wider need for employers to recruit in order to replace people lost through migration, retirement or through career changes.

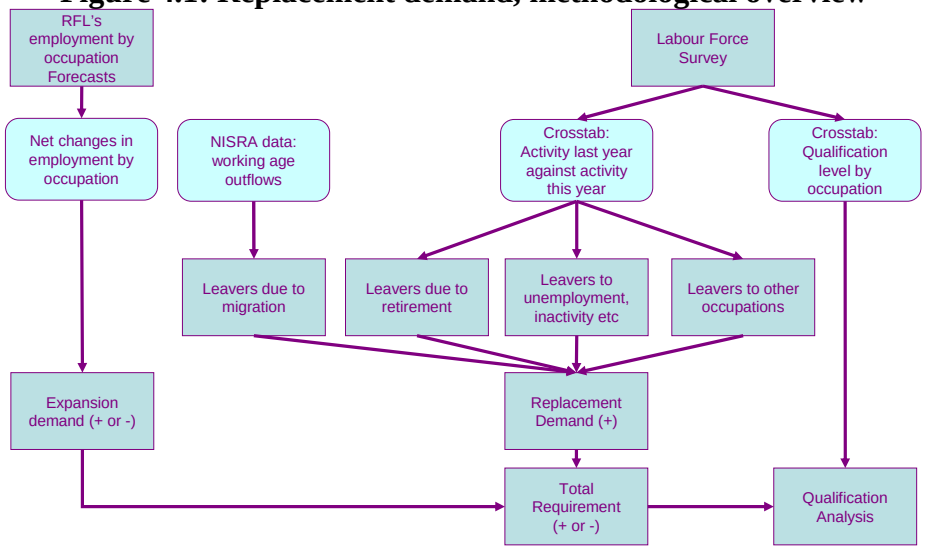
4.2 Our estimates of replacement demand build upon the occupation forecasts to examine these issues and provide projections of the requirements for the replacement of employees in each occupation over time. A further step, considering the skills structure within each occupation provides a further useful contextual framework for projecting future training needs in Northern Ireland.

Overview

4.3 The diagram below summarises the steps taken to produce replacement demand figures (for a fuller discussion of the methodology, refer to annex 3). Replacement demand relies on concepts which must first be defined before describing the results of the research. These are;

- **Expansion demand** – Expansion demand is the net change in total employment over the forecast period and can therefore be a positive or negative figure (this is the forecast change in total employed people discussed in the previous chapter).
- **Leavers due to migration** - Those who leave employment in Northern Ireland to move to a destination outside Northern Ireland.
- **Leavers due to retirement** – the number of people permanently leaving the labour force.
- **Leavers to inactivity or unemployment** –the number of people leaving employment for reasons other than retirement.
- **Leavers to other occupations –**The number of people leaving an occupation for employment in another occupation.
- **Replacement demand** – The total number of job openings created by retirees, outflows to other occupations, outflows to inactivity or unemployment and outward migration.
- **Total requirement –** Replacement demand plus expansion demand.
- **Qualification analysis –** Total requirement by qualification levels.

Figure 4.1: Replacement demand, methodological overview



4.4 The diagram shows the Labour Force Survey as a key data source for the replacement demand analysis. Due to the small sample size of the Northern Ireland Labour Force Survey, crosstabulation analysis of occupation last year and occupation/economic status this year was conducted on the UK sample. The analysis was conducted for each of the last three years and an average taken to smooth volatility in the data. Although the Northern Ireland Labour Force Survey sample proved too small for detailed assessment of individual occupations, it is clear that there is a large difference between Northern Ireland and UK in job leaving rates for all occupations taken together. The UK figures have thus been scaled to better reflect this. The overall leaving rates thus reflect the sampled evidence for NI. However, differences between individual occupations in their leaving rates are estimates based on the UK sample. This is discussed further in annex 4[9].

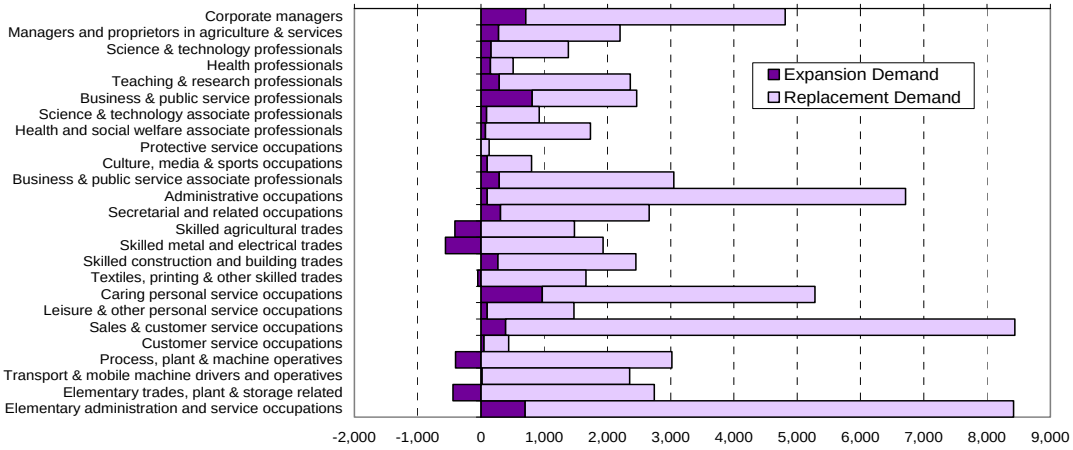
Results

4.5 It is immediately clear from the chart below that replacement demand dwarfs expansion demand. Over the period 2005-2015 replacement demand is projected to be just over 63,500 people per annum (around one in ten people employed[10]), compared with less than 4,000 per annum generated through expansion demand. Added together, these two figures (total requirement) mean that 67,500 people per annum are expected to be required to fill all posts created across all occupations.

[9] The UK leaving rates for each occupation have been scaled by the ratio of Northern Ireland's whole economy leaving rate to the UK leaving rate. This could result in overstating leaving rates in some occupations and understating leaving rates in others but in the absence of sufficient data RFL feel this is the most appropriate approach.

[10] Although not included in the replacement demand analysis, if people who change their job but remain in the same occupation (intra-occupation movers) are included, this provides a 'total job turnover' of around 104,000 per annum (approximately 15% of the work force).

Chart 4.1: Expansion demand and replacement demand in Northern Ireland, annual averages, 2005-2015



4.6 In all occupations that show negative expansion demand (i.e. a decline), positive replacement demand is sufficient to result in a positive total requirement. This off- setting effect is particularly evident in skilled metal and electrical trades which are forecast to contract more than any other occupation. Replacement demand will however, create just under 2,000 openings per annum resulting in an average net requirement of around 1,400 people per annum. This shows that labour turnover creates employment opportunities even in contracting sectors.

Components of replacement demand

Table 4.1: Components of replacement demand, annual average 2005-2015

	Leavers to another occupation	Permanent Retirements	Leavers to unemployment /inactivity	Leavers to Migration	Replacement Demand
Corporate managers	1,830	560	1,000	710	4,100
Managers and proprietors in agriculture & services	820	250	590	260	1,920
Science & technology professionals	520	130	350	210	1,220
Health professionals	80	70	90	120	360
Teaching & research professionals	530	510	570	450	2,070
Business & public service professionals	630	250	410	350	1,650
Science & technology associate professionals	420	90	210	110	830
Health and social welfare associate professionals	620	230	430	370	1,660
Protective service occupations	60	10	20	30	130
Culture, media & sports occupations	260	40	280	110	700
Business & public service associate professionals	1,580	240	590	350	2,760
Administrative occupations	3,130	770	1,880	820	6,610
Secretarial and related occupations	940	480	630	300	2,350
Skilled agricultural trades	540	200	480	270	1,480
Skilled metal and electrical trades	720	210	670	330	1,930
Skilled construction and building trades	590	350	800	430	2,180
Textiles, printing & other skilled trades	810	190	460	200	1,660
Caring personal service occupations	1,630	440	1,690	560	4,310
Leisure & other personal service occupations	620	160	430	160	1,370
Sales & customer service occupations	4,080	680	2,600	690	8,050
Customer service occupations	230	20	110	30	390
Process, plant & machine operatives	1,370	300	1,030	320	3,020
Transport & mobile machine drivers and operatives	920	370	700	340	2,330
Elementary trades, plant & storage related occupations	1,190	230	1,080	230	2,740
Elementary administration and service occupations	3,290	990	2,750	700	7,720
All occupations	**27,410**	**7,770**	**19,850**	**8,450**	**63,540**

Note: A more detailed version of this table which includes expansion demand and total requirements is included in annex 5.

Leavers to other occupations

4.7 Table 4.1 above presents each component of replacement demand for each occupation. It shows that the largest replacement demand requirements are found in sales and customer service occupations, and elementary

administration and service occupations. The majority of vacancies created in these occupations are due to people leaving for other occupations. In fact, as table 4.2 shows, just over 7% of sales occupations leave each year for another occupation suggesting that this occupation is commonly used as an entry point to employment before moving onto other occupations.

4.8 In total, around 27,000 vacancies per annum are expected to be created through people leaving for another occupation, suggesting an occupation 'churn' rate of only around 4%, reflecting Northern Ireland's high job retention rates[11].

Table 4.2: Leavers to other occupations, broad occupation groups, annual average 2005-2015

2005 to 2015	Employed 2005	Leavers to another occupation	% leaving to another occupation
Managers & Senior officials	78750	2650	3.4
Professional	91190	1760	1.9
Associate prof & technical	81930	2940	3.6
Administrative & Secretarial	94510	4070	4.3
Skilled trades	111080	2660	2.4
Personal service	56880	2250	4.0
Sales & customer service	60220	4310	7.2
Process, plant & machine	59170	2290	3.9
Elementary	79020	4480	5.7
Total	**712750**	**27410**	**3.8**

4.9 Because the people leaving one job for another are already in employment, it is an interesting exercise to remove them from the net requirement figure to see how many opportunities are likely to be available for people currently outside the labour market. Doing this suggests that there will be just over 40,000 vacancies per annum for people outside the labour market. Where the people might come from to fill these vacancies is discussed further in section 6.

Retirements

4.10 The results of the LFS crosstabulations reveal an overall retirement rate of around 1.1% (table 4.3). This is a lower retirement rate than would be expected given that the cohort of males aged 64/65 and females aged 59/60 in Northern Ireland account for just close to 3% of the working age population. The LFS is thus considerably underestimating the total retirement rate (which would be 2.5% per annum for a 40 year working life). One reason for this difference is that the LFS crosstabulation records only those moving directly from jobs into retirement. This does not therefore capture people who move from unemployment or inactivity into retirement. The suggestion is that many formerly employed people move into unemployment before finally 'retiring'. Alternatively the LFS may simply under-record those retiring from employment.

[11] Annex 4 presents evidence from the LFS of significant differences in job leaving rates between Northern Ireland and the UK.

Table 4.3: Leavers due to retirement, broad occupation groups, annual average 2005-2015

2005 to 2015	Employed 2005	Permanent Retirements	% leaving due to retirements
Managers & Senior officials	78750	810	1.0
Professional	91190	960	1.1
Associate prof & technical	81930	610	0.7
Administrative & Secretarial	94510	1250	1.3
Skilled trades	111080	950	0.9
Personal service	56880	600	1.1
Sales & customer service	60220	700	1.2
Process, plant & machine	59170	670	1.1
Elementary	79020	1220	1.5
Total	**712750**	**7770**	**1.1**

4.11 The largest number of retirees, recorded by the LFS are expected to come in elementary administration and service occupations. This is not surprising, as analysis of the age profile of occupations from the 2001 Census reveals that close to one third of this occupation are over 50 (see annex 5 for an occupation by age profile).

Leavers to unemployment / inactivity

4.12 Many job vacancies in elementary and sales occupations will be created by people leaving to unemployment or inactivity. More detailed analysis of the LFS reveals that a greater proportion of this occupation than any other leave employment to look after the home.

Table 4.4: Leavers due to unemployment/inactivity, broad occupation groups, annual average 2005-2015

2005 to 2015	Employed 2005	Leavers to unemployment /inactivity	% leaving to unemployment /inactivity
Managers & Senior officials	78750	1590	2.0
Professional	91190	1420	1.6
Associate prof & technical	81930	1530	1.9
Administrative & Secretarial	94510	2510	2.7
Skilled trades	111080	2410	2.2
Personal service	56880	2120	3.7
Sales & customer service	60220	2710	4.5
Process, plant & machine	59170	1730	2.9
Elementary	79020	3830	4.8
Total	**712750**	**19850**	**2.8**

4.13 The large number of vacancies created in sales and customer service occupations (4.5% of the occupation per annum) by people leaving to inactivity is due to the relatively high proportion of people leaving this occupation to become students (close to 1% of this occupation leave to become students per annum. This is more than in any other occupation). This suggests that the introduction of student fees may result in people working before embarking on a degree course. Further research would however be required to assess the true extent to which this is occurring.

Migrants

4.14 Out migration is expected to create around 8,500 job openings per annum between 2005 and 2015. As outlined in the methodology annex, in the

absence of data on out migration by occupation, the estimates of total employed out migrants are assumed to come proportionately from each occupation. The result is that vacancies created from out migration are largest in the larger occupations such as administrative occupations.

Table 4.5: Leavers due to migration, broad occupation groups, annual average 2005-2015

2005 to 2015	Employed 2005	Leavers to Migration	% leaving due to migration
Managers & Senior officials	78750	970	1.2
Professional	91190	1130	1.2
Associate prof & technical	81930	970	1.2
Administrative & Secretarial	94510	1120	1.2
Skilled trades	111080	1230	1.1
Personal service	56880	720	1.3
Sales & customer service	60220	720	1.2
Process, plant & machine	59170	660	1.1
Elementary	79020	930	1.2
Total	**712750**	**8450**	**1.2**

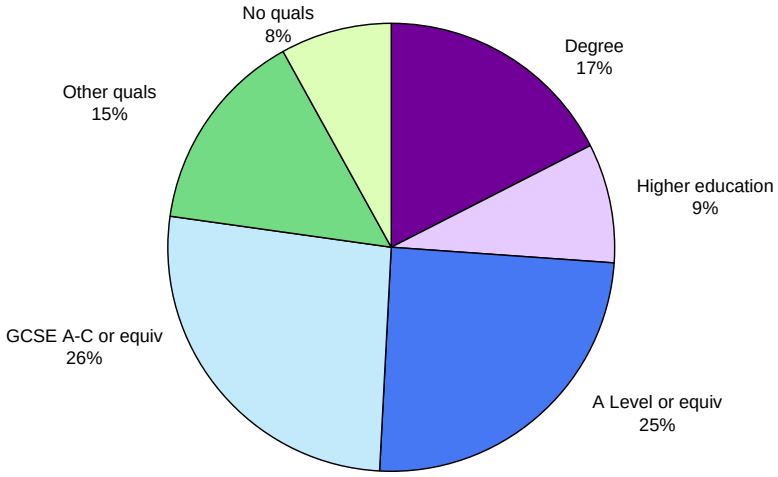
Qualifications

4.15 The analysis has thus far shown that there will be a total requirement to fill over 67,500 vacancies on average per annum between 2005 and 2015. The replacement demand analysis is taken a step further through estimating the requirements for people at different skill levels.

4.16 The total requirement figures are applied to a matrix of occupation by highest level of qualification to produce an estimate of the likely skills requirements over the forecast period. The matrix is generated using the UK LFS (see annex 3 for a fuller description). Rather than use the current qualification structure of all employed people the analysis uses LFS data only for those people who were in employment one year ago and who changed their job. This qualification structure of 'inflows' is used to try and capture the fact that entry requirements to occupations have increased over time and therefore differs to the qualification structure of the 'stock'[12] of occupations. Chart 4.2 shows the breakdown of the demand for qualifications for these job openings.

[12] Forecasting the stock of skills within each occupation over time would require the development of a 'stocks and flows' model to capture the changing skills requirements of the labour market. For example, the current stock of skills will include people in their late 40's and early 50's who did not require the same qualification levels to enter employment that someone in their 20's would require today. Over time, as these people retire, the stock of skills will increase. A 'stocks and flows' model is beyond the scope of this project but we feel it would be a useful area for future research.

Chart 4.2: The demand for qualifications, annual average, 2005-2015



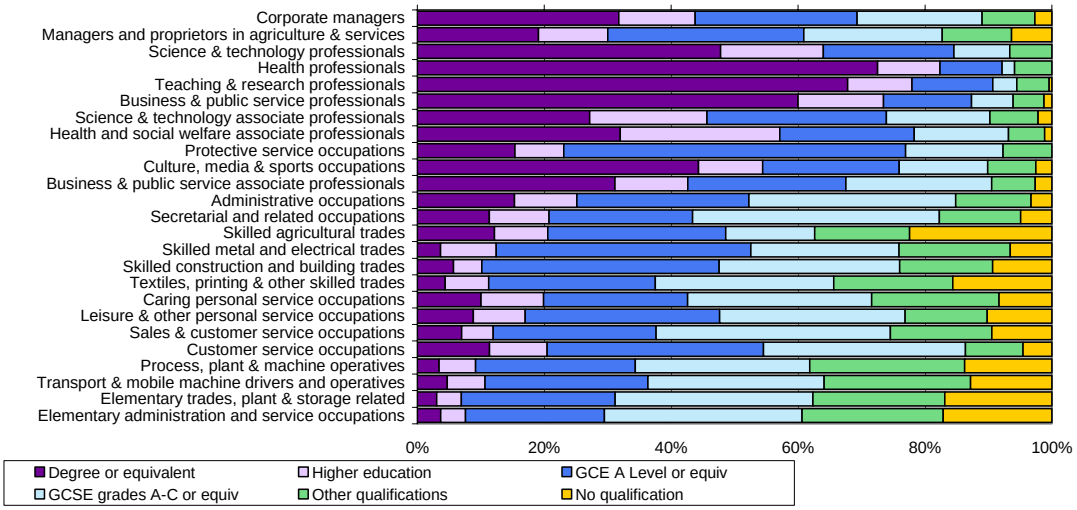
4.17 The chart illustrates that there will be a high demand for entrants with formal qualifications. There will be a particularly strong focus on the demand for intermediate level qualifications (GCSE A-C and A level in the chart above), with just over half (51%) of those jobs to be filled requiring persons to be qualified to this broad standard.

4.18 It is expected that 17% of all demand will require people educated to degree level or equivalent. It is also significant that there will still be a need for people with no qualifications – 8% of all openings. This shows that the labour market will continue to present diverse job opportunities for a range of people with different levels of skills and experience.

4.19 The chart below summarises the demand for qualifications within each occupation. It is apparent from the chart that the greatest demand for highly qualified labour will be in professional occupations such as health and teaching. In addition, the demand for intermediate qualifications will be strong among most occupations and particularly so in occupations such as skilled trades, as modern apprenticeships and NVQ qualifications increasingly become the standard entry route to these occupations.

4.20 There will also continue to be employment opportunities for people with no qualifications in areas such as the elementary occupations and sales and customer service occupations although these occupations offer lower rewards in terms of average wages than the occupations that require highly qualified staff.

Chart 4.3: Demand for qualifications by occupation, 2005-2015, annual averages



Note: These figures do not represent the changing net demand for skills. The net demand for graduates will continue to rise while the net demand for no qualifications will contract. The figures here include the recycling of skills from one occupation to another and not just the net change.

Conclusions

4.21 The key findings from this section can be summarised as follows;

- Replacement demand dwarfs expansion demand. Over the period 2005-2015 replacement demand will equate to just over 63,500 jobs per annum, compared with less than 5,000 per annum generated through expansion demand.
- Across all occupations, the vast majority of openings are expected to be created by people leaving for other occupations (27,000 vacancies per annum).
- The largest net requirements are found in sales and customer service occupations and elementary administration and service occupations.
- There will be a high demand for entrants with formal qualifications, particularly intermediate level qualifications (GCSE A-C and A level), with over half of those jobs to be filled on average per annum requiring persons to be qualified to this standard.
- 17% of all demand will require people educated to degree level or equivalent.
- 8% of all demand will require people with no qualifications.

5 Alternate futures – implications for replacement demand

Introduction

5.1 The replacement demand results presented in chapter 4 of this report are based on RFL's Autumn 2005 forecast round and represent the most likely path for the economy based on evidence available at the time the forecasts were produced.

5.2 However, in order to establish some 'margins of change' from these 'base' forecasts, this chapter presents replacement demand results for two 'alternate futures'. These are;

- **'high growth scenario' –** This scenario is based on **increased in-migration** to Northern Ireland
- **'low growth scenario'** – This scenario **dampens** the **prospects** for key **export sectors** and assumes **weaker public sector employment prospects** than in the base forecasts.

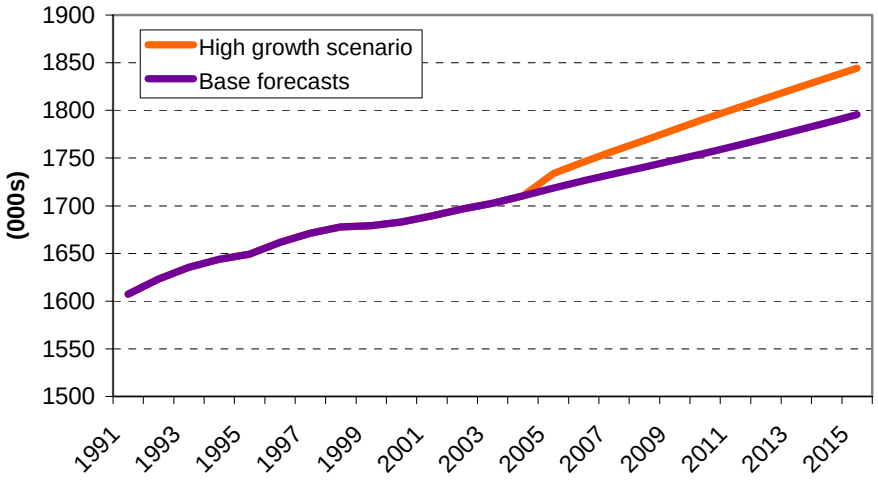
Each scenario is explained in more detail below.

High population scenario

5.3 Current population projections from NISRA suggest inward migration of +4,000 people in 2005 before returning to more traditional levels of -1,000 over the longer term. However, recent statistics from the workers registration scheme and from national insurance applications suggest that over the last 18 months, there have been between 15,000 and 30,000 migrants into Northern Ireland. In-migration on this scale is unprecedented in Northern Ireland and NISRA are currently considering the issue before the release of their revised population projections. It is not clear at present how the worker registration figures will translate into actual population numbers as not all of these in-migrants may be considered permanent residents.

5.4 In light of the unprecedented levels in in-migration, our high growth scenario adds an additional 15,000 people to migration in 2005 and, rather than revert to traditional levels of migration after this point, we assume that NISRA's projection of +4,000 migrants in 2005 continues throughout the forecast period from 2006 onwards. The chart below shows how these assumptions affect Northern Ireland's population compared to our base forecasts.

Chart 5.1: Population projections, base forecasts and high population scenario



5.5 By 2015, population in the high growth scenario is close to 50,000 higher than in the base scenario. This results in close to 19,000 more people in employment in 2015 (table 5.1). The additional jobs are relatively evenly spread across the broad occupation groups as more people stimulate additional employment in shops and restaurants, schools and hospitals. In addition, workers are likely to be attracted due to favourable job prospects[13].

Table 5.1: Total employment in the high population scenario, 2015

	Employed 2015	Difference from base
Managers & Senior officials	92,180	2,620
Professional	109,170	2,500
Associate prof & technical	90,080	2,090
Administrative & Secretarial	101,400	2,360
Skilled trades	104,880	1,990
Personal service	70,540	1,910
Sales & customer service	66,540	1,460
Process, plant & machine	55,810	800
Elementary	84,820	2,990
Total	775,420	18,720

Note: Total employed counts people, not jobs

5.6 It is notable that total employment increases are slightly less than half the level of population increases. The remainder of the increased population are therefore accounted for through increased unemployment and inactivity. There are several factors driving this. Firstly, in-migrants may have spouses (and children) who do not work. Secondly, the model assumes that much of the in-migration is replacing a lot of local labour in lower value added employment. The local labour thus flows into unemployment or inactivity. It is entirely possible however that rising unemployment would reduce in-migration in the long run, but because this scenario imposes fixed levels of in-

[13] It is not yet clear how sensitive migration is to labour market trends. It is likely, given the cost of travel and choices of destination to be highly sensitive.

migration on the model, the interactions between unemployment levels and levels of migration are suspended.

Replacement demand in the high growth scenario

5.7 Over the period 2005-2015 replacement demand is projected to be just over 64,500 people per annum, compared with around 5,500 per annum generated through expansion demand. Added together, these two figures (total requirement) mean that 70,250 people per annum are expected to be required to fill all posts created across all occupations (table 5.2).

5.8 This is as expected as the higher job projections lead directly to expansion demand. The replacement demand increases are fuelled by the fact that the increased size of the existing workforce leads to higher levels of retirements/occupational mobility as these are estimated proportionate to the size of the occupation group.

5.9 Under the high population scenario, it is expected that an additional 2,700 vacancies per annum will be generated through replacement demand and expansion demand. Just over half of these additional jobs will be due to expansion demand with close to 1,700 additional jobs being created per annum compared to the base forecasts.

Table 5.2: Replacement demand under the high growth scenario, annual average 2005-2015

2005 to 2015	Replacement Demand	Difference from base	Expansion Demand	Difference from base	Total Requirement	Difference from base
Managers & Senior officials	6,140	120	1,220	230	7,360	350
Professional	5,370	70	1,630	220	7,010	310
Associate prof & technical	6,180	100	740	190	6,910	280
Administrative & Secretarial	9,110	150	620	210	9,730	360
Skilled trades	7,340	90	-560	190	6,770	280
Personal service	5,790	110	1,240	170	7,030	280
Sales & customer service	8,550	110	570	130	9,130	240
Process, plant & machine	5,390	40	-300	80	5,090	120
Elementary	10,690	230	520	260	11,220	500
Total	64,560	1,020	5,680	1,680	70,250	2,720

Note: A more detailed version of this table which includes information on the components of replacement demand for 25 occupations is available in annex 5.

Low growth scenario

5.10 The low growth scenario is based on two assumptions. Firstly, we assume that the prospects for public sector employment are weaker than in the base forecasts due to more severe reductions in public expenditure under the comprehensive spending review. Secondly, we assume a weaker global economy. The impact of this is a 'dampening' of employment prospects in the main exporting sectors compared to the base forecasts[14].

5.11 A consequence of implementing the two assumptions outlined in the previous paragraph is a return to out migration. This results in around 10,000 fewer

[14] Indeed a reduction in public expenditure is likely to be accelerated by a global slow down as the exchequer's tax return would decline and benefit outlay rise, thus increasing budget pressures.

people in 2015 in the low growth scenario and a further reduction in the employment prospects of sectors such as distribution and hotels and restaurants whose prospects rely, at least in part, on people. Tables 5.3 and 5.4 show the sectoral employment impact of this low growth scenario on firstly employment numbers by sector and secondly occupations.

Table 5.3: Sectoral employment impact of low growth scenario (000s)

	Change 2005-2015 employees		
	Low growth	Base forecasts	difference from base
Agriculture, For. & Fish.	-4.12	-3.91	-0.22
Extraction	-0.76	-0.76	0.00
Manufacturing	-20.38	-18.73	-1.65
Electricity, Gas & Water Sup.	-0.55	-0.55	0.00
Construction	0.61	1.97	-1.36
Distribution	2.47	5.50	-3.02
Hotels & Restaurants	6.28	10.55	-4.27
Transport & Communications	1.84	2.04	-0.20
Financial Intermediation	0.76	1.87	-1.11
Real Estate, Rent.& Business	23.23	28.76	-5.53
Public Admin. & Defence	-2.61	-0.01	-2.60
Education	6.73	9.72	-2.99
Health & Social Work	11.42	14.06	-2.65
Other Personal Services	0.93	1.13	-0.20
Total	25.85	51.64	-25.79

Note: Employees in employment

Table 5.4: Total employment in occupations the low growth scenario, 2015

	Employed 2015	**Difference from base**
Managers & Senior officials	86,200	-3,360
Professional	102,610	-4,060
Associate prof & technical	85,070	-2,920
Administrative & Secretarial	95,180	-3,860
Skilled trades	99,690	-3,200
Personal service	66,910	-1,720
Sales & customer service	63,040	-2,040
Process, plant & machine	53,730	-1,280
Elementary	78,240	-3,590
Total	730,670	-26,030

Note: Total employed counts people, not jobs

5.12 There are just over 25,000 fewer employee jobs in 2015 as a result of the low growth scenario. The weaker prospects for the public sector (and subsequent decline in population projections) result in job losses in public administration and defence of just over 2,500 (compared to a static performance in the base forecasts). In addition, education and health and social work are expected to create close to 6,000 fewer jobs than in the base forecasts.

5.13 Employment prospects for business services suffer more than any other sector in the low growth scenario. Although the sector is forecast to create over 23,000 jobs in the low growth scenario, our assumption that a global slowdown will impact most on exporting sectors means that this is 5,500 fewer than in our base forecasts. Employment prospects in key manufacturing export sectors (machinery and equipment and transport equipment) have also been impacted, resulting in 1,600 fewer employees.

Replacement demand in the low growth scenario

5.14 Over the period 2005-2015 replacement demand is projected to be just over 62,300 people per annum, compared with around 1,600 per annum generated through expansion demand. Added together, these two figures (total requirement) mean that 64,000 people per annum are expected to be required to fill all posts created across all occupations (table 5.4).

5.15 Under the low growth scenario, it is expected that 3,500 fewer vacancies per annum will be generated through replacement demand and expansion demand than in the base forecasts. Two thirds of this reduction will be due to expansion demand with just over 2,300 fewer jobs being created per annum compared to the base forecasts.

5.16 This is as expected as the dampened employment prospects reduce expansion demand. The replacement demand decreases are fuelled by the fact that the decreased size of the existing workforce leads to lower numbers of retirements/occupational mobility as these are estimated proportionate to the size of the occupation group.

Table 5.5: Replacement demand under the low growth scenario, annual average 2005-2015

2005 to 2015	Replacement Demand	Difference from base	Expansion Demand	Difference from base	Total Requirement	Difference from base
Managers & Senior officials	5,890	-130	680	-310	6,580	-430
Professional	5,170	-130	1,040	-370	6,220	-480
Associate prof & technical	5,960	-120	280	-270	6,230	-400
Administrative & Secretarial	8,750	-210	70	-340	8,820	-550
Skilled trades	7,130	-120	-1,040	-290	6,090	-400
Personal service	5,610	-70	910	-160	6,520	-230
Sales & customer service	8,290	-150	260	-180	8,550	-340
Process, plant & machine	5,270	-80	-490	-110	4,780	-190
Elementary	10,220	-240	-70	-330	10,150	-570
Total	62,290	-1,250	1,640	-2,360	63,940	-3,590

Note: A more detailed version of this table which includes information on the components of replacement demand for 25 occupations is available in annex 5.

Conclusion

5.17 This chapter presents replacement demand results for two 'alternate futures' – a 'high' growth scenario based on increased in-migration to Northern Ireland and a 'low' growth scenario which dampens the prospects for key export sectors and assumes weaker public sector employment prospects than in the base forecasts.

5.18 The key findings from each scenario are:

- **High population growth scenario**: Over the period 2005-2015 replacement demand is projected to be just over 64,500 people per annum – 1,700 *higher* than the base forecasts.

- **Low growth scenario:** Over the period 2005-2015 replacement demand is projected to be just over 62,200 people per annum – 1,200 *lower* than the base forecasts.

5.19 Based on current evidence it would be fair suggest that the risks to the base projections are on the 'upside' largely as a result of migration trends. As such, the higher population growth scenario is the more likely 'alternate future'.

6 Filling Vacancies – towards a supply side

Introduction

6.1 The focus of this research has been on forecasting occupations between 2005 and 2015 and also assessing how many vacancies are likely to be created through retirements, people migrating, becoming unemployed or leaving one occupation for another.

6.2 A valuable element of further research would entail estimating the inflows to each occupation from migration, unemployment, inactivity, education and from other occupations.

6.3 One element of the supply of labour required to fill the vacancies is known – inflows from other occupations – as the LFS crosstabulations run for this project include data on these inflows. At an aggregate level, inflows from occupations must equate to outflows from occupations. Within occupations there will be obviously be differences between the occupation flows, with higher level occupations likely to attract more people from other occupations than they lose, as people move up the career ladder. Netting off the occupation flows reduces the replacement demand considerably (table 5.1) to leave just over 40,000 vacancies on average per annum for people currently outside the labour market. Further research would be required to assess the inflows to each occupation to provide a clearer picture of remaining demand for labour at each occupation level.

Table 6.1: Discounting leavers to other occupations in replacement demand analysis, 2005-2015

	Factor	All occupations
A	Size of occupation 2005	712,760
B	Size of occupation 2015	756,680
C (B-A)	Expansion demand (average per annum)	4,000
D	Permanent retirements (average per annum)	7,770
E	Leavers to another occupation (average per annum)	27,410
F	Leavers to unemployment/inactivity (average per annum)	19,850
G	Leavers to migration (average per annum)	8,450
H (D+E+F+G)	Replacement demand (average per annum)	63,550
I (B+H)	Total requirement (average per annum)	67,540
J	Joiners from other occupations (average per annum)	27,420
K (I-J)	Requirement for people outside the labour market (average per annum)	40,120

Towards a supply side

6.4 The remaining 40,000 vacancies identified above can be filled from a number of sources, such as;

- The recruitment of school, further education or university leavers

- The recruitment of the inactive who are engaging in the labour market for the first time
- The recruitment of returnees - people rejoining the labour market after a period of inactivity (such as those looking after a family)
- The recruitment of migrants
- The recruitment of current retirees – this is unlikely but may become an important issue in the future.

6.5 An assessment of which group fills the vacancies is a complex issue as the labour market categories would all need to be dynamically modelled. That is, education outputs, the inactive, unemployment stocks and migration inflows would need to be forecast year on year to ensure that interaction between demand and supply could be balanced. Such a system would be a powerful addition to this analysis and could help address a key issue, namely the demand for migrant labour. Recent evidence from the UK suggests demand for migrants has risen sharply even though large numbers of inactive people (many on incapacity benefit) are potentially available to join the labour force, and even though unemployment has begun to rise again. Unemployment has risen each month this year in the UK while employment continues to grow. One reason offered for this is that although there are fewer people joining unemployment, there are also fewer people leaving unemployment as employers chose job ready migrants over claimants, many of who are not job ready[15]. This is an issue that would require greater investigation before applying it to any potential supply side model but it does demonstrate the complexity of modelling the labour supply.

6.6 It is our view that a supply side model would be a valuable addition to the replacement demand analysis and would provide the Department with a more powerful tool in helping to targeting policy delivery. RFL are happy to discuss these views further.

[15] This view was expressed in an article in *The Sunday Times*, 30th October 2005 and is based on an employer survey conducted by the Chartered Institute of Personnel and Development.

7 Conclusion

7.1 This report presents detailed occupation forecasts for Northern Ireland for the first time and has revealed that the outlook for Northern Ireland remains positive and its recent strong job creation is expected to continue but at a slower rate than in the previous decade. A number of factors are influencing this slower growth outlook:

- **Slowdown in the consumer spending** – the boom in consumer spending experienced throughout the UK over the recent past has drawn to a close and house price inflation appears to have moderated. This will curb the rapid expansion in retailing, though it may last slightly longer in Northern Ireland than in other regions as house price growth remains robust.
- **'Catch-up' nearly over** - The Northern Ireland economy has 'caught up' significantly in under-represented sectors over the last decade. From a position of relative under-development in many private sectors the region is beginning to reach 'expected' levels of employment in sectors such as retailing. Scope for further development remains in the business service sector which remains relatively small in Northern Ireland despite recent rapid growth.
- **Acceleration of manufacturing decline –** Northern Ireland is expected to lose significant manufacturing jobs over the next decade, more than in the last decade, reducing overall levels of growth, but not by as much as was formerly the case when manufacturing was a larger employer.
- **Anticipated slower growth in public expenditure** and employment at the end of the current public expenditure round.

7.2 These influences are directly reflected in the projected decline of some occupations. For example declining demand for same the skilled manual occupations such as process plant and machine occupations, reflects the decline in manufacturing. Continued growth in business services is reflected in the projected expansion in business and public service professional occupations, which are expected to grow by an average of 2.8% over the next decade.

7.3 This report has argued that focusing solely on occupation forecasts can be misleading in considering future training needs, as they fail to capture job vacancies created through people moving to other occupations, retiring, becoming unemployed/inactive or migrating. The analysis in this report went beyond occupation forecasts to introduce replacement demand. Replacement demand examines the scale of retirements, etc. and provides a useful projection of the requirement for people in each occupation over time.

7.4 Our analysis reveals that replacement demand could create around 63,550 vacancies per annum between 2005 and 2015, suggesting a 'churn' rate of 10% of the workforce (if people who change jobs – but remain in the same occupation – are included, this figure increases to 15% of the workforce).

7.5 The results of the analysis show that replacement demand is highest in sales, and administrative occupations. To place the scale of these future vacancies

in context, over the next 10 years, the vacancies that will be created in these occupations are greater than the current size of each sector. This provides some idea of the potential levels of training that might be required to be delivered.

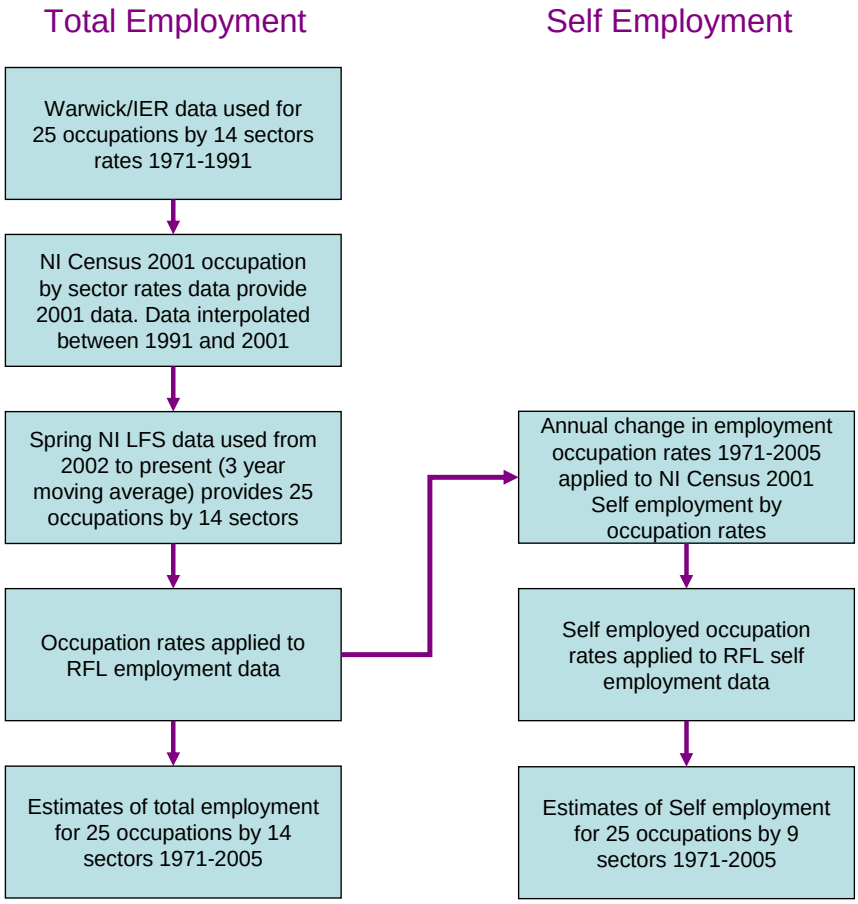
7.6 Across all occupations, the largest component of replacement demand is from people moving between occupations. If this element of labour inflow is netted off, the figures show that there will be 40,000 vacancies per annum for people outside the labour market.

7.7 It is important for DEL to consider where the supply of labour will come from to meet this element of replacement demand and to consider the order in which each pool of labour (migrants, the unemployed/inactive, students) is accessed. The answer to this issue will pose important challenges as to where to focus future departmental Skills Strategies.

Annex 1: Generating occupation data

The following diagrams and discussion outline how the occupation data was generated for the period 1971-2005.

Figure A1.1: Construction of Northern Ireland historical data for employment by occupation data



- **IER pre 1991:** Warwick/Institute for Employment Research data is used from 1971-1991 to calculate proportions of 25 occupation within 14 sectors rates from 1971-1991.
- **Northern Ireland Census 2001:** Occupation proportions with sectors for 2001 are obtained from the Census of Population. These are used to interpolate data between 1991 and 2001.
- **Annual LFS:** Spring Northern Ireland LFS data provides proportions of 25 occupations within 14 sectors for 2002 to 2005. Three year moving averages are used to smooth the volatility of the data series.
- **Application to RFL data:** The occupation proportions by sector formed from the three sources discussed in the previous steps are applied to RFL's employment data for 14 sectors to generate estimates of 25 occupations by 14 sectors from 1971-2005.

The RFL employment data referred to in the diagram has been converted from our standard measure of employee jobs to a measure of people. To do this, data for full-time and part-time employees by sector was input into the model and forecasts generated by projecting shares of part-time work across sectors nationally. The key

assumption in converting jobs to people is that full-time employees only have one job while part-time employees can have multiple jobs. The part-time employee jobs are therefore adjusted to account for this assumption and added to the full-time employee figures and self employment to generate a people in employment data series. The number of people with jobs is benchmarked to the 2001 Census and the part-time job adjustment factor is held constant. The steps taken to complete this conversion are explained below.

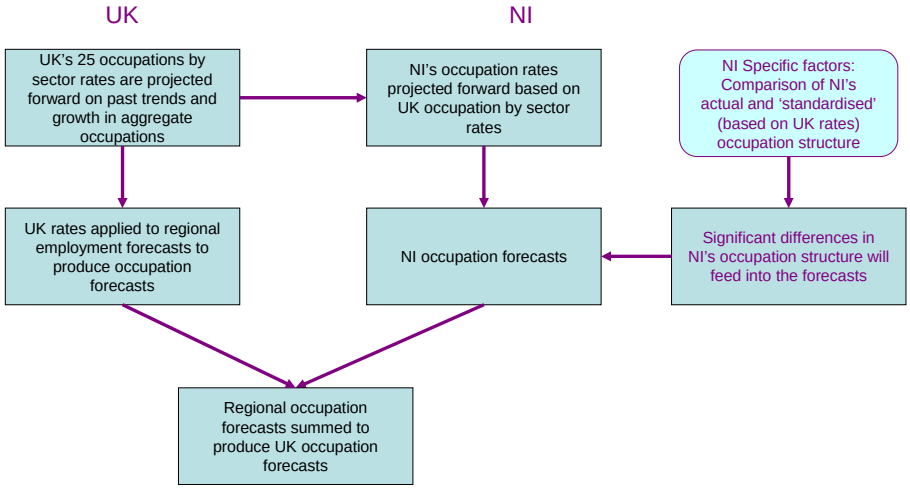
Converting employee jobs into employed people

The key assumption made when converting a jobs based measure of employees into a people based measure is that full-time employees only have one job while part-time employees can have multiple jobs. To estimate the number of people employed in RFL's forecast model for Northern Ireland thus required two strands of development;

- **Full–time/part–time:** the employee information in the model was disaggregated into full-timers and part-timers. To do this, the percentage of each sector's employment that is part-time was calculated for every UK region based on historical employee information from NOMIS (and DETI for Northern Ireland data). These percentages of part-timers in each sector were applied to RFL's regional employee by sector dataset and then summed to provide UK part-time employees by sector. The percentage of each sector that is part-time at a national (UK) level was calculated and projected forward based on past trends. Regionally, the part-time share of each sector was projected forward based on national trends and applied to employee data for each sector. Full-time employees are calculated as the difference between total employees in a sector and the part-timers.
- **Converting part-time workers:** the part-time employee jobs, of which a person can have more than one, must be converted into a number of people. Census 2001 provides information on people employed. The adjustment factor required to convert part-time jobs to people is calculated by firstly, subtracting the RFL estimates of full-time employees and self employment from the Census people employed data. This provides an estimate of part-time people employed (a data series which is unfortunately unavailable from the Census). Secondly, this estimate of Census part-time employees is divided by the RFL part time jobs figure to produce the ratio of people with part-time jobs to part-time jobs. This ratio (or 'double jobbing' adjustment factor) is held constant over the future and is applied to the forecasts of part-time employees to convert them into people. This methodology ensures that the number of people employed in the RFL model matches the number of people employed in Census 2001.

Generating occupation forecasts

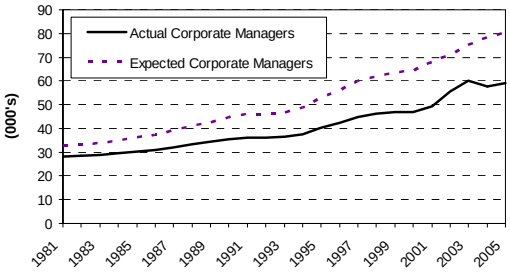
Figure A1.2: Forecasting occupations

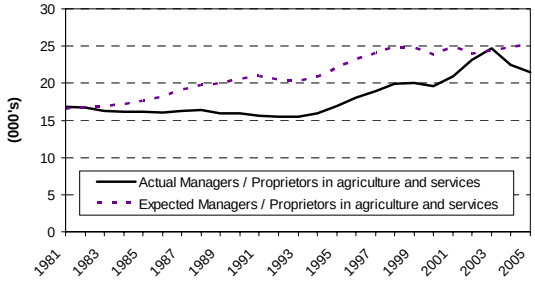


Regional occupation by sector data for the past is summed to generate UK estimates of occupations by sector. The UK's occupation by sector rates calculated from these numbers are projected forward, based on past trends and the growth in UK aggregate occupations (this approach ensures that minor occupations are easily projected and over 400 series are not required to be examined in detail). For the UK regions (except Northern Ireland), occupations are projected by applying UK occupation by sector rates to regional employment forecasts (benchmarked to the 2001 Census/LFS). However, for this project Northern Ireland specific occupation by sector rates are applied to Northern Ireland employment data.

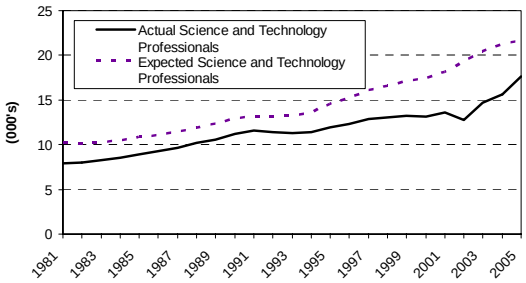
Annex 2: Northern Ireland's actual and standardised occupations 1981-2005[16]

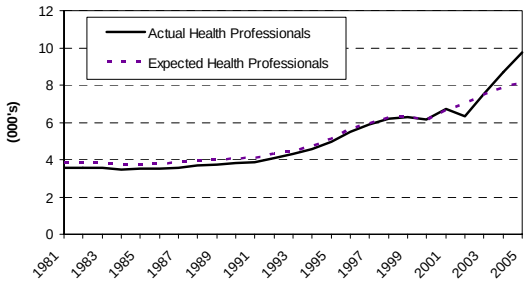
Managers & Senior Officials

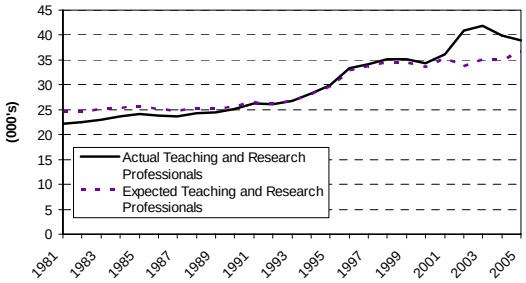


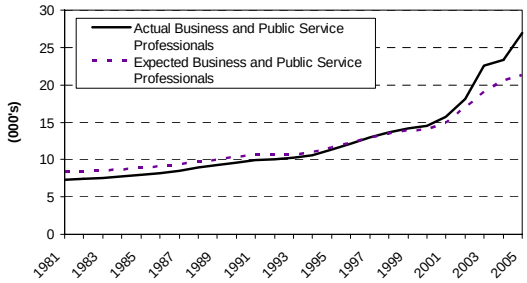


Professionals



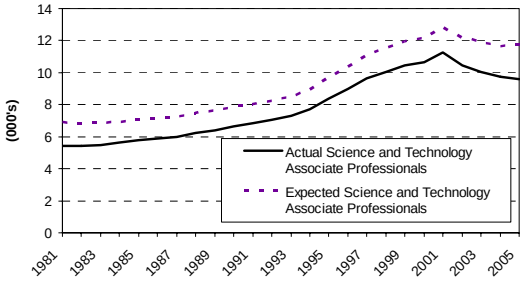


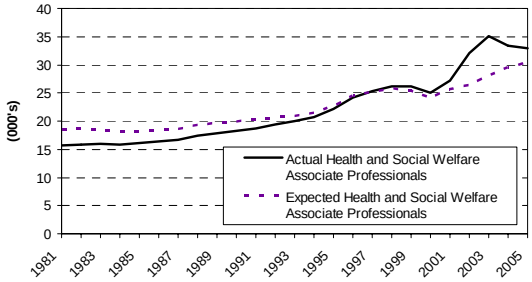


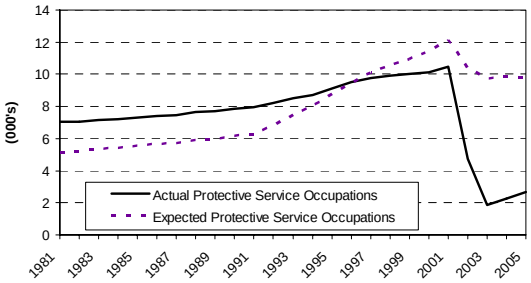


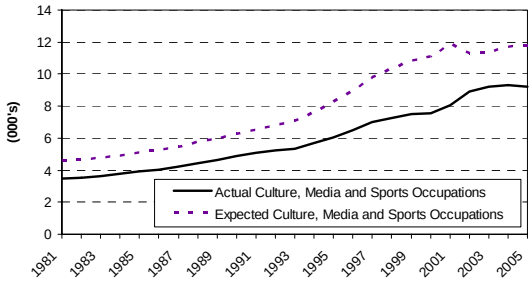
16 'Actual' occupation data is generated using the methodology outlined in Figure 2.2 of this report. 'Standardised' occupations are calculated by applying the UK's occupation by sector rates to Northern Ireland's employment data. The volatility of the LFS data is evident from the following charts (data post 2001), even though the data has been smoothed by taking a 3 year average.

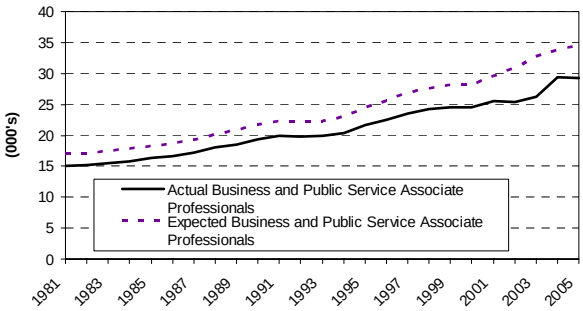
Associate professionals & technical



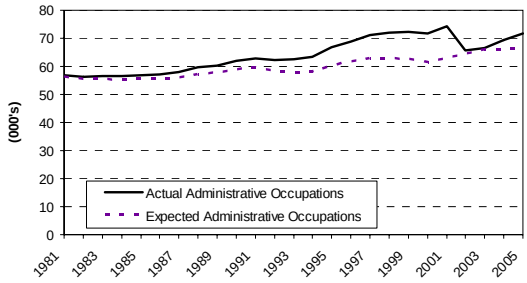


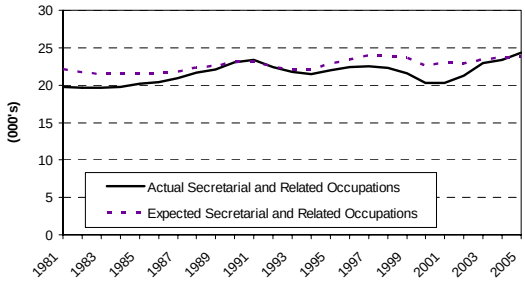




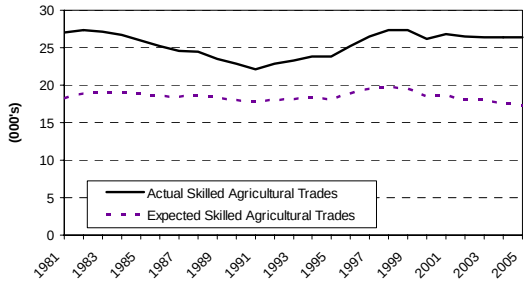


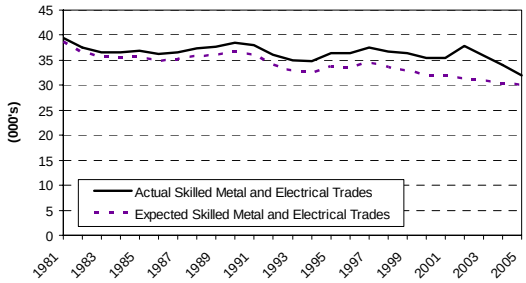
Administrative & secretarial

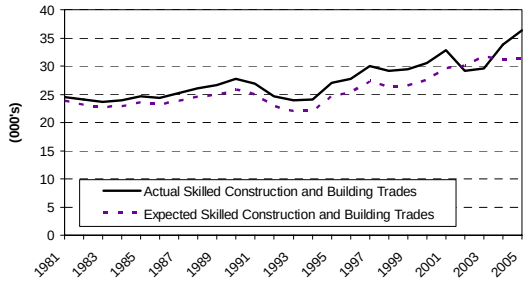


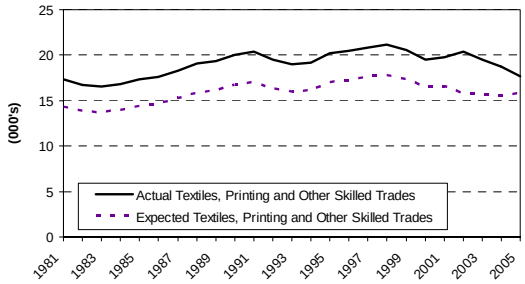


Skilled trades

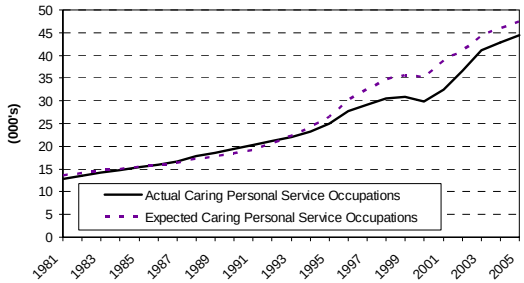


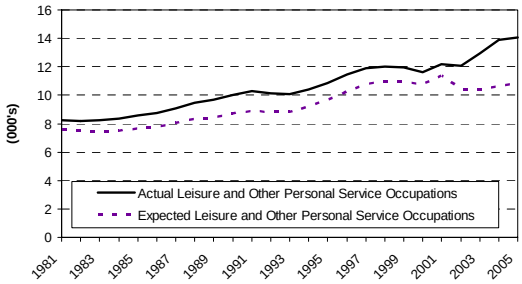




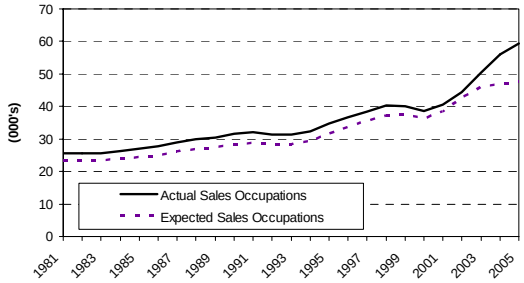


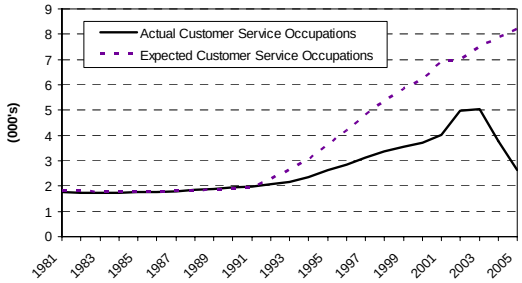
Personal service



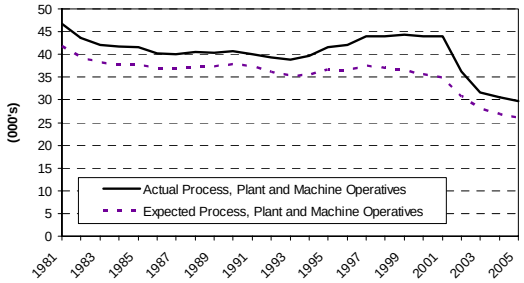


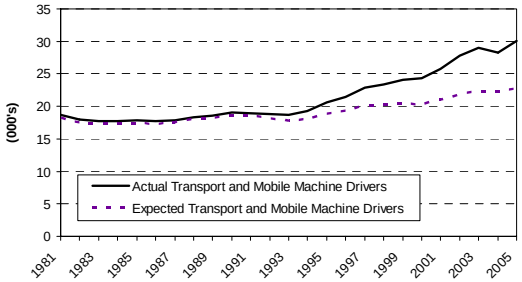
Sales & customer service



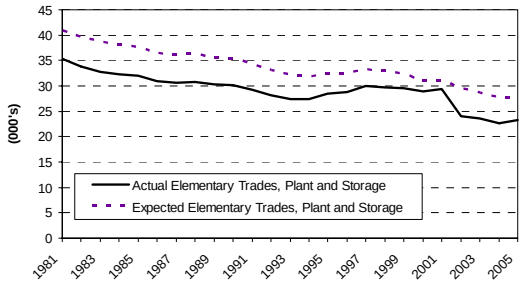


Process, plant & machine operatives





Elementary occupations



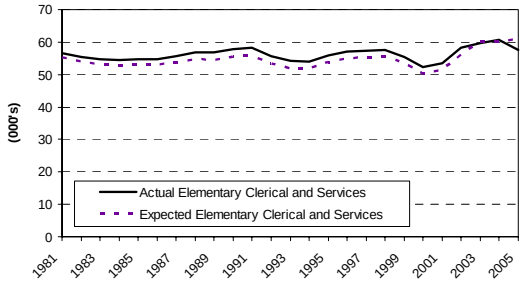


Table A2.1: Actual and expected occupations, total employed (2005)

	Actual Occupation	Expected Occupation	Difference (000's) (actual expected)	Expected occupation structure (%)
Corporate managers	57.9	79.0	-21.0	11.1
Managers and proprietors in agriculture & services	20.8	24.5	-3.7	3.4
Science & technology professionals	17.5	21.4	-3.9	3.0
Health professionals	9.5	7.9	1.5	1.1
Teaching & research professionals	37.8	35.6	2.2	5.0
Business & public service professionals	26.5	20.8	5.6	2.9
Science & technology associate professionals	9.4	11.5	-2.1	1.6
Health and social welfare associate professionals	32.0	29.4	2.6	4.1
Protective service occupations	2.6	9.7	-7.1	1.4
Culture, media & sports occupations	9.1	11.5	-2.5	1.6
Business & public service associate professionals	28.8	34.0	-5.2	4.8
Administrative occupations	70.6	65.5	5.1	9.2
Secretarial and related occupations	23.9	23.3	0.6	3.3
Skilled agricultural trades	26.0	16.9	9.0	2.4
Skilled metal and electrical trades	31.6	29.7	1.9	4.2
Skilled construction and building trades	36.2	31.2	5.0	4.4
Textiles, printing & other skilled trades	17.3	15.4	1.9	2.2
Caring personal service occupations	43.2	46.0	-2.8	6.5
Leisure & other personal service occupations	13.7	10.6	3.1	1.5
Sales & customer service occupations	57.6	46.1	11.5	6.5
Customer service occupations	2.6	8.1	-5.5	1.1
Process, plant & machine operatives	29.5	25.9	3.6	3.6
Transport & mobile machine drivers and operatives	29.6	22.3	7.3	3.1
Elementary trades, plant & storage related occupations	23.0	27.0	-4.1	3.8
Elementary administration and service occupations	56.1	59.2	-3.2	8.3
Total	**713**	**713**	**0.0**	**100**

Annex 3: Calculating replacement demand

The calculation methods and assumptions used in the analysis are as follows;

- **Expansion demand** – Expansion demand figures are generated through the RFL forecast model and have been reported on in section 2. The replacement demand analysis deals solely with total employed people and makes no distinction between employees and self employed.
- **Leavers due to migration** – In the absence of published age breakdown information for out migrants (only net migration by age is produced for Northern Ireland) NISRA were able to provide data for working age out migrants for three years since 2001 (16,000 people on average). To estimate the number of out migrants that left employment, an estimate of students that leave Northern Ireland to study in GB (4,000 according to UCAS)[17] was subtracted from the working age out migration data. A three year average of the working age employment rate from the LFS was then applied to this estimate[18] to provide an estimate of employed out migrants. The current occupation structure was applied to the estimate of employed out migrants to provide estimates of out migration from each occupation. Finally, the estimate of out migrants by occupation is used to produce the percentage of out migration from each occupation[19]. This percentage[20] is applied to annual occupation forecasts to produce total leavers due to migration.
- **Leavers due to retirement** – An LFS crosstabulation analysis of occupation *last* year and occupation/economic status *this* year provides an estimate of the proportion within each occupation moving into retirement. Crosstabulations are run using the UK LFS (the Northern Ireland sample proved too small[21]) for each of the last three years and the average[22] percentage of each occupation leaving to go to retirement is applied to annual occupation forecasts to produce job vacancies created due to retirees data. Constructing a retirement rate based on occupation by age information from the 2001 Census was considered but the methodology used produced results that appeared to underestimate the levels of retirements. It was thus decided to continue to use the LFS.
- **Leavers to inactivity or unemployment –** The LFS crosstabulation analysis of occupation *last* year and occupation/economic status *this* year also provides an estimate of the proportion within each occupation moving into unemployment or inactivity. The three year average percentage of each

[17] Information on the number of students that leave NI to study in institutions outside GB would reduce the 'working' out migrants further.
[18] Further research into the economic status of out migrants might reveal a more robust assumption if, for example, it can be shown that a greater proportion of out migrants are unemployed and are leaving to find work.
[19] Knowledge of working age out migrants by occupation, if available, would enhance this analysis.
[20] The percentage of out migrants by occupation are 'plugged' into the LFS crosstabulation matrix of economic status this year against economic status last year which obviously contains no information on out migration. All the data is this matrix is then scaled to ensure that the proportion of people who stay in their occupation and the proportion of people estimated to leave always sum to 100%.
[21] Although the Northern Ireland LFS sample size is too small, it did reveal significant differences in leaving rates compared to the UK. As a result, the UK LFS matrix has been scaled to reflect Northern Ireland's lower job leaving rates. This is discussed further in annex 3.
[22] A three year average is used to smooth highly volatile LFS data.

occupation that leaves to go to inactivity or unemployment is applied to annual occupation forecasts.

- **Leavers to other occupations** – The LFS crosstabulation analysis of occupation *last* year and occupation/economic status *this* year also provides an estimate of the proportion within each occupation that moves into another occupation. Again, the average percentage of each occupation that leaves to go to another occupation is applied to annual occupation forecasts to produce numbers out-flowing to other occupations.
- **Replacement demand** – The total number of job openings created by leavers due to migration, retirees, leavers to other occupations and leavers to inactivity or unemployment are summed to produce an estimate of total replacement demand (sometimes referred to as total vacancies).
- **Total requirement –** Total replacement demand and expansion demand are summed to produce net occupation demand.
- **Qualification analysis –** The net occupation demand figures are applied to an occupation by highest level of qualification matrix to produce an estimate of the likely skills requirements over the forecast period. The matrix is generated using the UK LFS (the Northern Ireland sample was too small). The data is filtered to select only those people who were in employment one year ago and who changed their job. A crosstabulation is run on this sample for each of the last three years and taking a three year average. Rather than use the current qualification structure of all employed people, the qualification structure of 'inflows' is used to try and capture the fact that entry requirements to occupations have increased over time. In other words, it is entirely possible that current corporate managers who are approaching retirement may have climbed up the career ladder without having any formal qualifications whereas, to become a corporate manager now will most likely require a degree or similar formal qualification.

Annex 4: Differences in NI and UK occupation leaving rates

Table A4.1: Components of job leavers in Northern Ireland and the UK, 2005

		of leavers			
	Total Leavers (% of workforce)	Job Movers (same occupation)	% to other occupations	% to unemployment /inactivity	% to retirement
NI	8.4	21.9	35.5	38.7	3.9
UK	16.0	29.5	38.0	26.3	6.2

As the table shows, there is a significant difference between leaving rates for Northern Ireland and the UK. To better reflect Northern Ireland's lower leaving rates in the analysis, the leaving rates for the UK generated in the LFS crosstabulations of occupation last year and occupation/economic activity this year have been scaled down.

The small sample size in the Northern Ireland LFS crosstabulation has prevented an analysis of leaving rate differences within occupations (for example, there are 2 people reported in Northern Ireland crosstabulation for customer service occupations in 2005 and a leaving rate of 0% compared to 20% in the UK). As a result, the leaving rate for each occupation has been scaled down by the ratio of NI's whole economy leaving rate to the UK leaving rate. We accept that this could result in overstating leaving rates in some occupations and understating leaving rates in others but in the absence of sufficient data we feel this is the most appropriate approach.

It should be noted that the retirement figures for the UK continue to be used in the analysis as the sample size for Northern Ireland is too small to allow for any assessment to be made as to whether there are significant differences between NI and the UK.

Annex 5: Additional results

Table A5.1: Detailed occupation structure, employees (2005)

	Employees (000's)	Employees (%)	Self Employed (000's)	Self Employed (%)	Total Employed (000's)	Total Employed (%)
Corporate managers	50.706	8.4	7.2	6.5	57.9	8.1
Managers and proprietors in agriculture & services	8.1	1.3	12.8	11.6	20.8	2.9
Science & technology professionals	15.7	2.6	1.8	1.6	17.5	2.5
Health professionals	6.5	1.1	3.0	2.7	9.5	1.3
Teaching & research professionals	37.0	6.1	0.8	0.7	37.8	5.3
Business & public service professionals	18.6	3.1	7.9	7.2	26.5	3.7
Science & technology associate professionals	9.2	1.5	0.2	0.2	9.4	1.3
Health and social welfare associate professionals	30.1	5.0	1.9	1.7	32.0	4.5
Protective service occupations	2.6	0.4	0.0	0.0	2.6	0.4
Culture, media & sports occupations	6.8	1.1	2.3	2.0	9.1	1.3
Business & public service associate professionals	25.3	4.2	3.6	3.2	28.8	4.0
Administrative occupations	68.9	11.4	1.8	1.6	70.6	9.9
Secretarial and related occupations	23.2	3.8	0.7	0.6	23.9	3.3
Skilled agricultural trades	9.6	1.6	16.4	14.8	26.0	3.6
Skilled metal and electrical trades	27.6	4.6	4.0	3.6	31.6	4.4
Skilled construction and building trades	15.5	2.6	20.8	18.8	36.2	5.1
Textiles, printing & other skilled trades	15.2	2.5	2.1	1.9	17.3	2.4
Caring personal service occupations	38.2	6.3	5.0	4.5	43.2	6.1
Leisure & other personal service occupations	11.9	2.0	1.8	1.6	13.7	1.9
Sales & customer service occupations	54.5	9.0	3.2	2.9	57.6	8.1
Customer service occupations	2.6	0.4	0.0	0.0	2.6	0.4
Process, plant & machine operatives	27.3	4.5	2.3	2.1	29.5	4.1
Transport & mobile machine drivers and operatives	22.9	3.8	6.7	6.1	29.6	4.2
Elementary trades, plant & storage related occupations	19.9	3.3	3.1	2.8	23.0	3.2
Elementary administration and service occupations	54.8	9.1	1.3	1.2	56.1	7.9
Total	**602.4**	**100**	**110.3**	**100**	**713**	**100**

Table A5.2: Detailed occupation structure, employees (2015)

	Employees (000's)	Employees (%)	Self Employed (000's)	Self Employed (%)	Total Employed (000's)	Total Employed (%)
Corporate managers	57.5	9.0	8.2	7.1	65.7	8.7
Managers and proprietors in agriculture & services	10.6	1.6	13.3	11.5	23.9	3.2
Science & technology professionals	17.1	2.7	2.1	1.8	19.2	2.5
Health professionals	8.3	1.3	2.9	2.5	11.1	1.5
Teaching & research professionals	40.2	6.3	0.9	0.7	41.0	5.4
Business & public service professionals	24.4	3.8	11.0	9.5	35.3	4.7
Science & technology associate professionals	10.2	1.6	0.2	0.2	10.4	1.4
Health and social welfare associate professionals	30.7	4.8	2.0	1.8	32.8	4.3
Protective service occupations	2.7	0.4	0.0	0.0	2.7	0.4
Culture, media & sports occupations	7.9	1.2	2.3	2.0	10.2	1.3
Business & public service associate professionals	27.4	4.3	4.5	3.9	32.0	4.2
Administrative occupations	69.8	10.9	1.9	1.7	71.7	9.5
Secretarial and related occupations	26.5	4.1	0.9	0.8	27.3	3.6
Skilled agricultural trades	8.0	1.2	13.5	11.7	21.4	2.8
Skilled metal and electrical trades	22.1	3.5	3.4	2.9	25.5	3.4
Skilled construction and building trades	16.9	2.6	22.3	19.3	39.2	5.2
Textiles, printing & other skilled trades	14.8	2.3	1.9	1.7	16.7	2.2
Caring personal service occupations	47.8	7.4	6.1	5.3	53.8	7.1
Leisure & other personal service occupations	13.1	2.0	1.7	1.5	14.8	2.0
Sales & customer service occupations	58.4	9.1	3.6	3.1	62.0	8.2
Customer service occupations	3.1	0.5	0.0	0.0	3.1	0.4
Process, plant & machine operatives	23.3	3.6	1.9	1.6	25.2	3.3
Transport & mobile machine drivers and operatives	22.8	3.6	7.1	6.1	29.8	3.9
Elementary trades, plant & storage related occupations	15.7	2.4	2.4	2.1	18.1	2.4
Elementary administration and service occupations	62.3	9.7	1.4	1.2	63.7	8.4
Total	**641.3**	**100**	**115.4**	**100**	**757**	**100**

Chart A5.1: Detailed occupation structure, employees (2005)

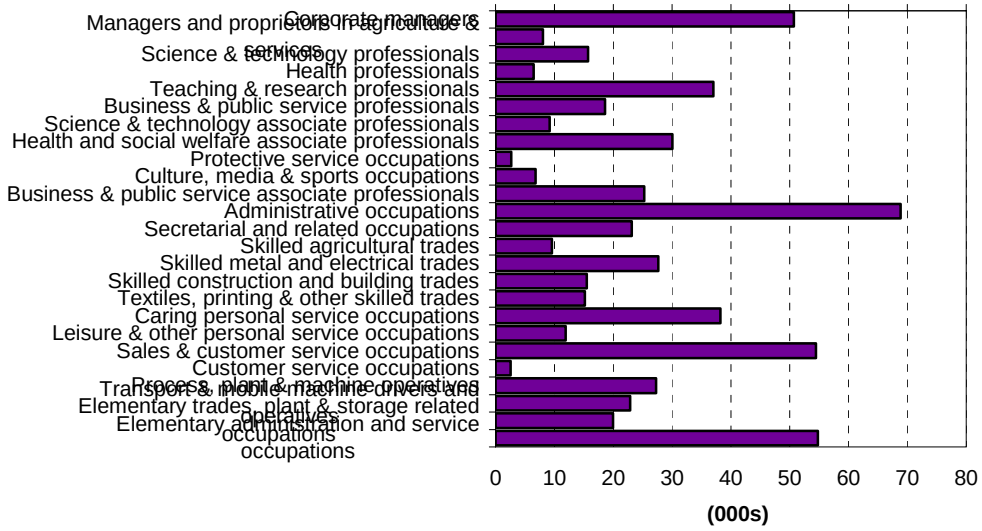


Chart A5.2: Detailed occupation structure, self employed (2005)

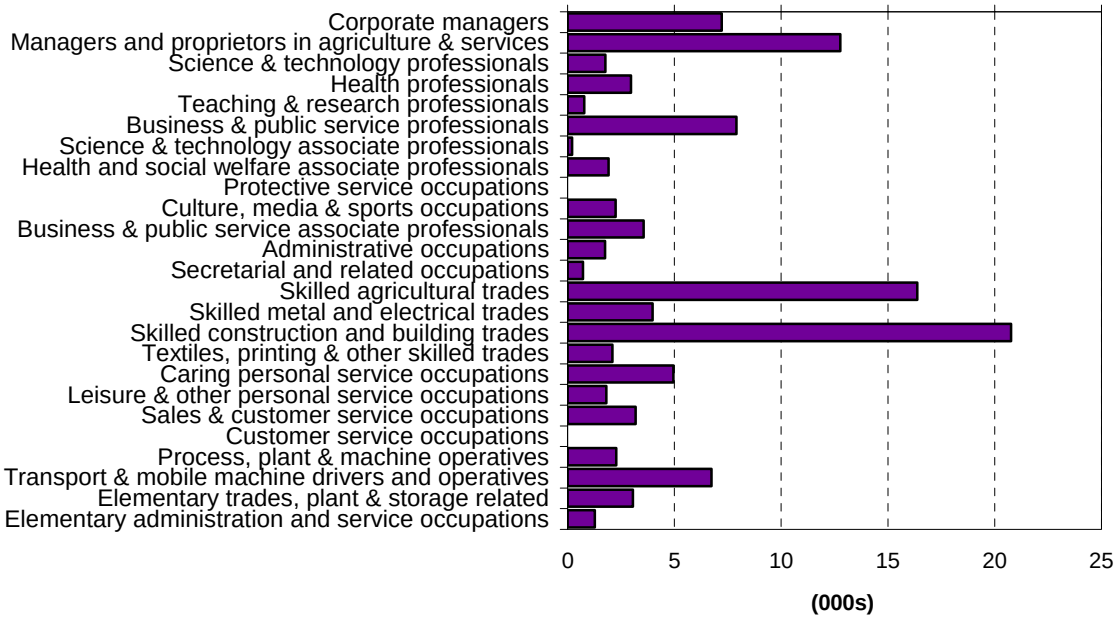


Table A5.3: Occupation by age, % of all persons in employment 16-74, Census 2001

	16 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 64	Over 65
Corporate managers	1	18	33	27	17	3	1
Managers and proprietors in agriculture & services	2	15	28	26	21	5	3
Science & technology professionals	2	37	30	17	10	2	2
Health professionals	0	23	34	24	13	3	2
Teaching & research professionals	0	17	25	31	22	3	1
Business & public service professionals	0	20	30	27	17	4	3
Science & technology associate professionals	4	33	28	21	12	2	0
Health and social welfare associate professionals	1	18	34	30	15	2	1
Protective service occupations	5	32	38	18	6	0	0
Culture, media & sports occupations	3	29	30	22	12	3	2
Business & public service associate professionals	2	27	31	22	14	3	1
Administrative occupations	3	27	30	24	13	2	1
Secretarial and related occupations	4	24	28	23	17	3	1
Skilled agricultural trades	2	11	21	22	23	9	12
Skilled metal and electrical trades	9	27	24	23	14	3	1
Skilled construction and building trades	12	25	27	20	13	3	1
Textiles, printing & other skilled trades	7	25	29	21	13	3	1
Caring personal service occupations	6	24	26	25	17	2	1
Leisure & other personal service occupations	10	27	24	16	16	4	2
Sales & customer service occupations	20	31	20	14	11	2	1
Customer service occupations	9	49	23	14	6	1	0
Process, plant & machine operatives	7	28	27	20	14	3	1
Transport & mobile machine drivers and operatives	1	16	31	25	20	5	1
Elementary trades, plant & storage related occupations	9	26	27	19	15	4	2
Elementary administration and service occupations	11	19	22	21	20	5	2
Total	**6**	**24**	**28**	**23**	**16**	**3**	**2**

Table A5.4: Skills within Occupation, 2005

2005	Degree or equivalent	Higher education	GCE A Level or equiv	GCSE grades A-C or equiv	Other qualifications	No qualification	Total
Corporate managers	31	12	25	17	4	10	100
Managers and proprietors in agriculture & services	15	11	26	22	7	20	100
Science & technology professionals	56	16	22	4	0	1	100
Health professionals	99	1	0	0	0	0	100
Teaching & research professionals	81	16	2	1	0	0	100
Business & public service professionals	75	9	8	6	1	1	100
Science & technology associate professionals	19	18	25	24	8	5	100
Health and social welfare associate professionals	29	58	4	6	1	3	100
Protective service occupations	6	12	36	32	4	10	100
Culture, media & sports occupations	42	7	28	10	5	7	100
Business & public service associate professionals	35	12	19	20	7	7	100
Administrative occupations	16	11	25	36	6	5	100
Secretarial and related occupations	9	5	21	44	17	5	100
Skilled agricultural trades	2	5	13	14	7	59	100
Skilled metal and electrical trades	4	7	74	7	2	6	100
Skilled construction and building trades	1	2	72	11	3	11	100
Textiles, printing & other skilled trades	0	3	44	22	11	20	100
Caring personal service occupations	5	11	24	28	9	22	100
Leisure & other personal service occupations	9	3	31	24	8	26	100
Sales & customer service occupations	5	3	24	35	9	24	100
Customer service occupations	38	7	15	26	8	6	100
Process, plant & machine operatives	2	3	31	19	11	33	100
Transport & mobile machine drivers and operatives	1	2	25	19	15	37	100
Elementary trades, plant & storage related occupations	2	1	22	20	12	44	100
Elementary administration and service occupations	2	2	19	25	10	42	100
All occupations	20	10	26	20	7	18	100

Table A5.5: Detailed replacement demand results (base forecasts)

2005 to 2015	Employed 2005	Employed 2015	Expansion Demand	Permanent Retirements	Leavers to another occupation	Leavers to unemployment/inactivity	Leavers to Migration	Replacement Demand	Total Requirement
Corporate managers	**57,920**	65,700	710	560	1,830	1,000	710	4,100	4,810
Managers and proprietors in agriculture & services	**20,830**	23,860	280	250	820	590	260	1,920	2,200
Science & technology professionals	**17,480**	19,200	160	130	520	350	210	1,220	1,380
Health professionals	**9,450**	11,120	150	70	80	90	120	360	510
Teaching & research professionals	**37,790**	41,010	290	510	530	570	450	2,070	2,360
Business & public service professionals	**26,470**	35,340	810	250	630	410	350	1,650	2,450
Science & technology associate professionals	**9,410**	10,390	90	90	420	210	110	830	920
Health and social welfare associate professionals	**31,990**	32,780	70	230	620	430	370	1,660	1,730
Protective service occupations	**2,640**	2,670	0	10	60	20	30	130	140
Culture, media & sports occupations	**9,050**	10,170	100	40	260	280	110	700	800
Business & public service associate professionals	**28,840**	31,980	290	240	1,580	590	350	2,760	3,040
Administrative occupations	**70,640**	71,710	100	770	3,130	1,880	820	6,610	6,710
Secretarial and related occupations	**23,870**	27,330	310	480	940	630	300	2,350	2,660
Skilled agricultural trades	**25,950**	21,440	-410	200	540	480	270	1,480	1,070
Skilled metal and electrical trades	**31,630**	25,520	-560	210	720	670	330	1,930	1,370
Skilled construction and building trades	**36,220**	39,230	270	350	590	800	430	2,180	2,450
Textiles, printing & other skilled trades	**17,280**	16,700	-50	190	810	460	200	1,660	1,600
Caring personal service occupations	**43,180**	53,830	970	440	1,630	1,690	560	4,310	5,280
Leisure & other personal service occupations	**13,700**	14,800	100	160	620	430	160	1,370	1,470
Sales & customer service occupations	**57,640**	61,960	390	680	4,080	2,600	690	8,050	8,450
Customer service occupations	**2,580**	3,120	50	20	230	110	30	390	440
Process, plant & machine operatives	**29,550**	25,160	-400	300	1,370	1,030	320	3,020	2,620
Transport & mobile machine drivers and operatives	**29,620**	29,850	20	370	920	700	340	2,330	2,350
Elementary trades, plant & storage related occupations	**22,970**	18,120	-440	230	1,190	1,080	230	2,740	2,300
Elementary administration and service occupations	**56,050**	63,710	700	990	3,290	2,750	700	7,720	8,420
All occupations	**712,750**	**756,700**	**4,000**	**7,770**	**27,410**	**19,850**	**8,450**	**63,540**	**67,530**

Table A5.6: Detailed replacement demand results (high population growth scenario)

2005 to 2015	Employed 2005	Employed 2015	Expansion Demand	Permanent Retirements	Leavers to another occupation	Leavers to unemployment/inactivity	Leavers to Migration	Replacement Demand	Total Requirement
Corporate managers	**57,920**	67,140	840	570	1,860	1,020	720	4,160	5,000
Managers and proprietors in agriculture & services	**20,830**	25,040	380	260	850	610	270	1,980	2,360
Science & technology professionals	**17,480**	19,510	180	140	530	360	210	1,230	1,420
Health professionals	**9,450**	11,410	180	70	80	100	120	360	540
Teaching & research professionals	**37,790**	42,120	390	520	540	580	460	2,110	2,500
Business & public service professionals	**26,470**	36,130	880	260	640	410	360	1,670	2,550
Science & technology associate professionals	**9,410**	10,600	110	90	420	210	120	840	950
Health and social welfare associate professionals	**31,990**	33,670	150	240	640	440	380	1,690	1,840
Protective service occupations	**2,640**	2,740	10	10	70	20	30	140	140
Culture, media & sports occupations	**9,050**	10,380	120	40	270	290	110	710	830
Business & public service associate professionals	**28,840**	32,690	350	240	1,600	600	360	2,800	3,150
Administrative occupations	**70,640**	73,410	250	790	3,180	1,910	830	6,720	6,970
Secretarial and related occupations	**23,870**	27,990	370	490	960	640	300	2,390	2,760
Skilled agricultural trades	**25,950**	21,500	-400	200	540	480	270	1,490	1,080
Skilled metal and electrical trades	**31,630**	25,920	-520	220	730	670	330	1,950	1,430
Skilled construction and building trades	**36,220**	40,130	360	360	600	810	440	2,210	2,560
Textiles, printing & other skilled trades	**17,280**	17,330	0	190	830	470	200	1,690	1,700
Caring personal service occupations	**43,180**	55,280	1,100	450	1,660	1,710	570	4,390	5,490
Leisure & other personal service occupations	**13,700**	15,260	140	160	630	440	170	1,400	1,540
Sales & customer service occupations	**57,640**	63,360	520	690	4,140	2,630	700	8,160	8,680
Customer service occupations	**2,580**	3,180	50	20	240	110	30	390	450
Process, plant & machine operatives	**29,550**	25,340	-380	300	1,370	1,040	320	3,030	2,650
Transport & mobile machine drivers and operatives	**29,620**	30,470	80	380	930	710	350	2,360	2,440
Elementary trades, plant & storage related occupations	**22,970**	18,380	-420	230	1,200	1,090	240	2,760	2,350
Elementary administration and service occupations	**56,050**	66,440	940	1,020	3,380	2,810	720	7,930	8,870
All occupations	**712,750**	**775,420**	**5,680**	**7,940**	**27,890**	**20,160**	**8,610**	**64,560**	**70,250**

Table A5.7: Detailed replacement demand results (low growth scenario)

2005 to 2015	Employed 2005	Employed 2015	Expansion Demand	Permanent Retirements	Leavers to another occupation	Leavers to unemployment/inactivity	Leavers to Migration	Replacement Demand	Total Requirement
Corporate managers	**57,920**	63,490	510	550	1,790	990	700	4,020	4,530
Managers and proprietors in agriculture & services	**20,830**	22,710	170	240	800	580	250	1,870	2,050
Science & technology professionals	**17,480**	18,490	90	130	510	350	210	1,190	1,290
Health professionals	**9,450**	10,870	130	70	70	90	120	350	480
Teaching & research professionals	**37,790**	39,530	160	500	520	560	440	2,030	2,190
Business & public service professionals	**26,470**	33,720	660	240	620	400	340	1,600	2,260
Science & technology associate professionals	**9,410**	10,010	50	90	410	200	110	810	860
Health and social welfare associate professionals	**31,990**	31,960	0	230	610	430	360	1,640	1,630
Protective service occupations	**2,640**	2,560	-10	10	60	20	30	130	120
Culture, media & sports occupations	**9,050**	9,850	70	40	260	280	110	690	760
Business & public service associate professionals	**28,840**	30,690	170	230	1,540	580	340	2,690	2,860
Administrative occupations	**70,640**	68,940	-150	760	3,060	1,850	800	6,460	6,310
Secretarial and related occupations	**23,870**	26,240	220	470	920	610	290	2,290	2,510
Skilled agricultural trades	**25,950**	20,950	-450	200	530	480	260	1,470	1,020
Skilled metal and electrical trades	**31,630**	24,840	-620	210	710	660	320	1,900	1,280
Skilled construction and building trades	**36,220**	37,930	150	350	580	790	420	2,140	2,290
Textiles, printing & other skilled trades	**17,280**	15,970	-120	190	790	450	190	1,620	1,500
Caring personal service occupations	**43,180**	52,430	840	430	1,600	1,660	550	4,250	5,090
Leisure & other personal service occupations	**13,700**	14,480	70	160	610	430	160	1,360	1,430
Sales & customer service occupations	**57,640**	60,030	220	670	4,010	2,560	680	7,910	8,130
Customer service occupations	**2,580**	3,010	40	20	230	100	30	380	420
Process, plant & machine operatives	**29,550**	24,470	-460	290	1,340	1,020	310	2,970	2,510
Transport & mobile machine drivers and operatives	**29,620**	29,260	-30	370	910	690	340	2,300	2,270
Elementary trades, plant & storage related occupations	**22,970**	17,620	-490	230	1,180	1,070	230	2,700	2,210
Elementary administration and service occupations	**56,050**	60,620	420	970	3,190	2,680	680	7,520	7,940
All occupations	**712,750**	**730,670**	**1,640**	**7,650**	**26,850**	**19,530**	**8,270**	**62,290**	**63,940**

Annex 6: Comparing RFL's forecasts with Cambridge Econometrics (CE)

Table A6.1: CE's UK occupation forecasts (000s)

	1984	1994	2004	2009	2014	2020
Managers and Senior Officials	3,096	3,629	4,609	4,897	5,212	5,499
Professional Occs	2,165	2,674	3,539	3,871	4,225	4,518
Associate Professional and Technical	2,593	3,218	4,302	4,521	4,754	4,978
Administrative and Secretarial	3,843	3,955	3,790	3,649	3,485	3,433
Skilled Trades	4,211	3,642	3,433	3,328	3,247	3,256
Personal Services	1,054	1,509	2,244	2,473	2,700	2,881
Sales and Customer Service	1,565	1,872	2,412	2,608	2,805	2,972
Machine and Transport Operatives	3,018	2,596	2,367	2,293	2,231	2,234
Elementary Occs	4,131	3,680	3,403	3,070	2,729	2,559
Total	25,676	26,775	30,099	30,709	31,389	32,330

Table A6.2: RFL's UK occupation forecasts (000s)

	1984	1994	2004	2009	2014	2020
Managers and Senior Officials	2,879	3,598	4,632	4,861	5,127	5,407
Professional Occs	2,110	2,611	3,658	3,968	4,308	4,662
Associate Professional and Technical	2,674	3,312	4,086	4,271	4,451	4,633
Administrative and Secretarial	3,986	4,004	3,813	3,925	3,988	4,028
Skilled Trades	4,207	3,712	3,289	3,151	3,041	2,925
Personal Services	970	1,421	2,112	2,323	2,484	2,684
Sales and Customer Service	1,575	1,823	2,501	2,627	2,719	2,821
Machine and Transport Operatives	2,815	2,440	2,071	1,911	1,767	1,610
Elementary Occs	4,277	3,817	3,873	3,945	4,012	4,085
Total	25,492	26,739	30,036	30,982	31,896	32,855

Key point: Total employment grows more rapidly in the RF forecast (by 6.2% 2004-14 compared with 4.2% for CE). Differences in occupation structure within these totals are assessed below.

Table A6.3: CE's occupation structure (% of employment in each occupation)

	1984	1994	2004	2009	2014	2020
Managers and Senior Officials	12	14	15	16	17	17
Professional Occs	8	10	12	13	13	14
Associate Professional and Technical	10	12	14	15	15	15
Administrative and Secretarial	15	15	13	12	11	11
Skilled Trades	16	14	11	11	10	10
Personal Services	4	6	7	8	9	9
Sales and Customer Service	6	7	8	8	9	9
Machine and Transport Operatives	12	10	8	7	7	7
Elementary Occs	16	14	11	10	9	8
Total	100	100	100	100	100	100

Table A6.4: RFL's occupation structure (% of employment in each occupation)

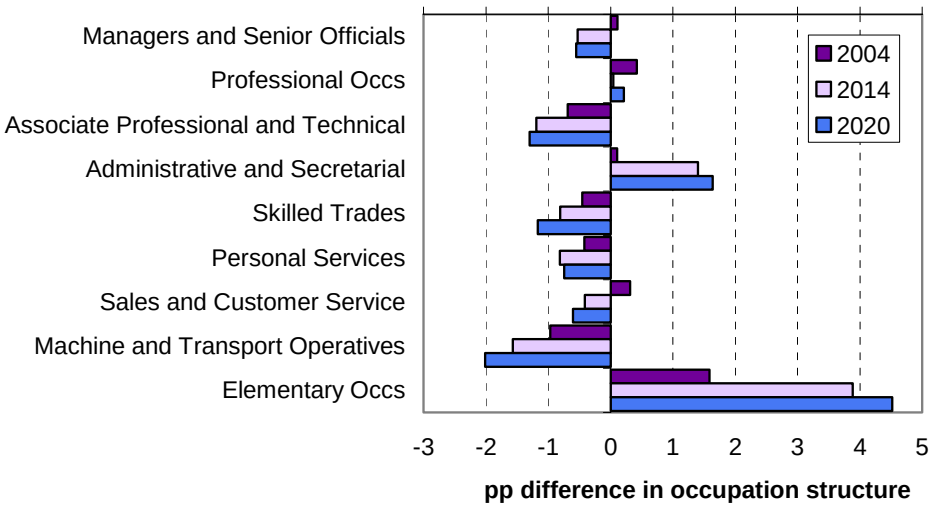
	1984	1994	2004	2009	2014	2020
Managers and Senior Officials	11	13	15	16	16	16
Professional Occs	8	10	12	13	14	14
Associate Professional and Technical	10	12	14	14	14	14
Administrative and Secretarial	16	15	13	13	13	12
Skilled Trades	17	14	11	10	10	9
Personal Services	4	5	7	7	8	8
Sales and Customer Service	6	7	8	8	9	9
Machine and Transport Operatives	11	9	7	6	6	5
Elementary Occs	17	14	13	13	13	12
Total	100	100	100	100	100	100

Table A6.5: percentage point difference in occupation structure (RFL-CE)

	1984	1994	2004	2009	2014	2020
Managers and Senior Officials	-1	0	0	0	-1	-1
Professional Occs	0	0	0	0	0	0
Associate Professional and Technical	0	0	-1	-1	-1	-1
Administrative and Secretarial	1	0	0	1	1	2
Skilled Trades	0	0	0	-1	-1	-1
Personal Services	0	0	0	-1	-1	-1
Sales and Customer Service	0	0	0	0	0	-1
Machine and Transport Operatives	-1	-1	-1	-1	-2	-2
Elementary Occs	1	1	2	3	4	5
Total	0	0	0	0	0	0

Note: a positive figure means RFL predict more than CE in that occupation

Figure A6.1: percentage point difference in occupation structure (RFL-CE)



Key points:

- Historical occupation structure is broadly similar in both sets of data
- Total employment grows more rapidly in the RF forecast
- Little difference in RFL and CE's projections for high end occupation concentrations
- CE's reduction in Elementary occupations is much faster than RFL's
- CE's reduction in machine occupations slower than RFL's
- CE's reduction in admin and secretarial faster than RFL's
- CE's reduction in skilled trades is slower than RFL's

Annex 7: Comparing RFL's forecasts for NI 2004-14 with 'Working Futures'

Occupation forecasts and Replacement Demand estimates were published for Northern Ireland in Labour Market Bulletin 19 published in December 2005. The article, 'Where are we going? – Labour market forecasts 2004-2014' uses data from the forthcoming update of the Working Futures report published by the Sector Skills Development Agency. As yet, the updated Working Futures report has not been published. This prevents us from conducting a more detailed comparison of their results. A brief comparison of the expansion demand forecasts and replacement demand is presented below.

Table A 7.1: Regional Forecasts and Working Futures occupation projections, 2004-2014 (000s)

	Regional Forecasts		Working Futures	
	Expansion Demand	Net Requirement	Expansion Demand	Net Requirement
Managers and Senior Officials	10	76	12	45
Professional Occs	19	77	18	53
Associate Professional and Technical	5	72	12	49
Administrative and Secretarial	8	105	-2	38
Skilled Trades	-8	72	-8	27
Personal Services	12	74	14	45
Sales and Customer Service	7	98	10	33
Machine and Transport Operatives	-3	56	-6	13
Elementary Occs	0	116	-22	11
Total	51	746	28	314

At first glance the differences in forecasts seem considerable – RFL predict around twice as much employment growth and net requirement figures. It should be noted that RLF's figures measure people and not jobs. It seems clear that the Working Futures methodology measures jobs. This issue would not however be sufficient to explain the differences in employment projections. Although information on the methodology and assumptions made in the Working Futures report is not yet available some important assumptions they use are known. For example,

- the Working Futures report predicts a population increase in Northern Ireland of 26,000 between 2004 and 2014. (RFL's Autumn 2005 forecast predicted an increase of close to 70,000. The official projections estimate an increase of around 60,000 people in Northern Ireland over the same period).

The considerable difference between the population projections helps explains the difference in expansion demand since much employment in the service sectors depends on local demand and hence on population. The CE population increase is much slower than in the past and appears to be too low. The CE employment forecast is also correspondingly too low in our view. Again the level of projected job creation is much lower than in the recent past.

The difference in the total net requirement figure appears to be due more to other methodological differences. The Labour Market Bulletin article, from which the Working Futures data is drawn, notes that the replacement demand estimates exclude 'replacement needs arising as a consequence of both occupational and geographical mobility'. Our replacement demand estimates measure the impact of both these issues, together accounting for replacement demand of close to 400,000 between 2005 and 2015.

Although a detailed comparison of RFL's forecasts with the forecasts presented in the Working Futures update has not been possible, the key differences appear to be driven by different population projections and different replacement demand methodology. It might however be worth revisiting this issue in more detail when the Working Futures report is published.

Annex 8: Occupational classification used in this Report

9 Groupings	25 Occupations	Detailed classification
Managers & senior officials	Corporate managers	General & specialist managers, clerk of works, senior police officers, senior public sector officials, etc.
	Managers in agric. & services	Farm owners & managers, sports managers, publicans, registrars, salon managers, etc.
Professional	Science & technology professionals	Natural scientists, mechanical, etc. engineers, civil engineers, IT & software professionals
	Health professionals	GPs., surgeons, dentists, vets., opticians, pharmacists, etc.
	Teaching & research professionals	Lecturers, school teachers, specialist teachers, scientific & social science researchers
	Business and public service professionals	Lawyers, judges, accountants, architects, planners, surveyors, librarians, social workers, clergy, etc.
Associate professionals & technical	Science & technology associate professionals	Engineering technicians, draughtspersons, programmers & IT technicians, etc.
	Health & social welfare associate professionals	Nurses, dispensing opticians, physiotherapists, etc., housing & welfare officers
	Protective services	NCOs, police officers, fire officers, prison service officers & protective service professionals
	Culture media & sports	Artists, authors, design & media associate professionals, sport and fitness occupations
	Business & public service associate professionals	Air traffic controllers, pilots, legal, business, sales and other public service associate professionals
Administrative & secretarial	Administrative	Administrative clerks, filing clerks, local government clerks, etc.
	Secretarial & related	Secretaries, receptionists, personal assistants, typists
Skilled trades	Skilled agricultural trades	Gardeners, farmers & agricultural trades
	Skilled metal & electrical trades	Machine setters, car mechanics, tool makers, fitters, metal workers, welders, electricians etc.
	Skilled construction & building trades	Roofers, bricklayers, carpenters, plasterers, plumbers, painters and decorators
	Textiles, printing & other skilled trades	Upholsterers, tailors, printers, butchers, bakers, chefs, goldsmiths, etc.
Personal service	Caring personal services	Care assistants, playgroup leaders, medical auxiliaries, veterinary nurses, etc.
	Leisure and other personal services	Travel agents, hairdressers, beauticians, caretakers, pest control officers, etc.
Sales & customer service	Sales	Sales assistants, retail cashiers, rent collectors, etc.
	Customer service	Call centre operators, customer care occupations
Process plant & machine operatives	Process, plant & machine operatives	Process plant & machine tool operatives, assemblers & lineworkers, routine inspectors, scaffolders, etc.
	Transport & mobile machine drivers & operatives	Bus & taxi drivers, rail staff, crane drivers, fork lift operators, etc.
Unskilled	Elementary trades, plant & storage related	Farm workers, building labourers, packers, bottlers, canners, dockers etc.
	Elementary administration & service	Postal workers, hospital porters, bar staff, leisure attendants, cleaners, security guards, etc.

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