UKCES
UK COMMISSION FOR EMPLOYMENT AND SKILLS

Working Futures

Report for Scotland

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Intelligence › Investment › Impact

Working Futures 2010-2020: Summary report for Scotland

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Foreword

The UK Commission for Employment and Skills is a social partnership, led by Commissioners from large and small employers, trade unions and the voluntary sector. Our ambition is to transform the UK's approach to investing in the skills of people as an intrinsic part of securing jobs and growth. Our strategic objectives are to:

- Maximise the **impact** of employment and skills policies and employer behaviour to support jobs and growth and secure an internationally competitive skills base;
- Work with businesses to develop the best market solutions which leverage greater **investment** in skills;
- Provide outstanding labour market **intelligence** which helps businesses and people make the best choices for them.

The third objective, relating to intelligence, reflects an increasing outward focus to the UK Commission's research activities, as it seeks to facilitate a better informed labour market, in which decisions about careers and skills are based on sound and accessible evidence. Related to this, impartial research evidence is used to underpin compelling messages that promote a call to action to increase employers' investment in the skills of their people.

Intelligence is also integral to the two other strategic objectives. In seeking to lever greater investment in skills, the intelligence function serves to identify opportunities where our investments can bring the greatest leverage and economic return. The UK Commission's third strategic objective, to maximise the impact of policy and employer behaviour to achieve an internationally competitive skills base, is supported by the development of an evidence base on best practice: "what works?" in a policy context.

Our research programme provides a robust evidence base for our insights and actions, drawing on good practice and the most innovative thinking. The research programme is underpinned by a number of core principles including the importance of: ensuring '**relevance'** to our most pressing strategic priorities; '**salience'** and effectively translating and sharing the key insights we find; **international benchmarking** and drawing insights from good practice abroad; **high quality** analysis which is leading edge, robust and action orientated; being **responsive** to immediate needs as well as taking a longer term perspective. We also work closely with key partners to ensure a **co-ordinated** approach to research.

This current document is one of a suite of outputs from *Working Futures* 2010-2020, the most detailed and comprehensive set of UK labour market projections available. This short report provides an overview of the projections for Scotland. The results are intended to provide a sound foundation for the deliberations of all those with an interest in the future shape of the labour market. This includes individuals, employers, education and training providers, as well as public agencies and departments of government.

Sharing the findings of our research and engaging with our audience is important to further develop the evidence on which we base our work. Evidence Reports are our chief means of reporting our detailed analytical work. All of our outputs can be accessed on the UK Commission's website at www.ukces.org.uk

But these outputs are only the beginning of the process and we are engaged in other mechanisms to share our findings, debate the issues they raise and extend their reach and impact. These mechanisms include our *Changing Behaviour in Skills Investment* seminar series and use of a range of online media to communicate key research results.

We hope you find this report useful and informative. If you would like to provide any feedback or comments, or have any queries please e-mail info@ukces.org.uk, quoting the report title or series number.

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Executive Summary

Introduction

Working Futures provides detailed projections of employment for the period 2010 to 2020. This short report provides an overview of the *Working Futures* projections for Scotland. All analysis is taken from the *Working Futures* results unless otherwise stated.

Key findings

The key findings from the report can be summarised as follows:

- Employment in Scotland grew at the same rate as the UK between 2000 and 2010, but more slowly than in Northern Ireland and Wales. The rate of employment growth between 2010 and 2020 is predicted to be half as fast as in the previous decade and to be slower than for the UK as a whole.
- Output (GVA) grew at the same rate in Scotland as the UK between 2000 and 2010 but is projected to grow more slowly than the UK average between 2010 and 2020.
- Population growth is projected to be substantially slower in Scotland than in the UK as a whole and this is one of the factors underlying slower employment growth[1]. The projected growth in the number of residents in employment exceeds the projected growth in the labour force and hence unemployment is projected to fall (but more slowly than the UK as a whole) between 2010 and 2020. The economic activity rate is projected to decline faster than for the UK as a whole.
- The bulk of growth in employment is projected to be for jobs held by men while female employment is expected to remain almost static, leading to a small shift in the gender balance of employment towards men.
- Part-time working will increase its share of total employment between 2010 and 2020, although full-time employment will continue to grow in absolute terms. The growth of part-time working will be faster for males than females, while the number of women working full-time is projected to fall.
- Self-employment is projected to remain largely static but with growth for women and a decline for men.

[1] This analysis is based on population projections produced in 2008. More recent 2010-based projections suggest the base level population was higher in 2010 and that population growth in Scotland will be higher over 2010-2020 than the 2008-based projections suggest. This in turn may lead to a higher rate of employment growth than projected by the *Working Futures* 4 results.

- Relative to the UK average, the output growth performance of most industry sectors in Scotland is projected to be poorer for 2010-2020 than it was during 2000 to 2010. The fastest rate of growth for 2010 to 2020 is projected for *Business and other services*, while the *Primary sector and utilities* will continue to contract.
- The contraction of employment in the *Manufacturing* sector during 2000 to 2010 is projected to continue during 2010 to 2020, although output will grow over the period. Employment growth is projected to be fastest in *Construction* and private sector services during 2010-2020. The *Business and other services* sector is projected to be the largest industry sector in Scotland in terms of employment in 2020.
- The broad shift in the occupational profile of employment of Scotland away from lower-skilled occupations towards higher-skilled occupations is projected to continue, with particularly high rates of job loss in *Administrative and secretarial*, *Skilled trades* and *Process, plant and machine operative occupations*. The fastest projected rates of increase are in the white collar occupations of *Managers, Professionals and Associate professionals*, although significant growth is expected for the lower skilled *Caring, leisure and other service* occupational group.
- The rate of increase in higher status occupations is greater for women than men in Scotland, while *Elementary occupations* are projected to continue to provide new jobs for men.
- The qualification profile of employed people in Scotland has improved and is projected to continue improving. In 2000, more than a quarter of jobs were held by people with no or low level qualifications but by 2020 this figure is projected to fall to around one fifth. By 2020 almost one half of jobs are expected to be held by people holding higher level qualifications (level 4 and above). Scotland performs better in this regard than the other nations of the UK.
- Job openings resulting from replacement demands are projected to be many times greater than those arising from net growth in employment in Scotland over the period 2010 to 2020. Replacement demands are expected to result in job openings in all the broad occupational groups, including those projected to see net job decline.

1 Introduction

Working Futures 4 provides detailed projections of employment for the period 2010 to 2020 by industry, occupation, qualification levels, gender and employment status for the UK, for its constituent nations and for the regions of England. This short report provides an overview of the *Working Futures* projections for Scotland.

The report places the projected changes within the context of change in the economy of the UK as a whole. It relates employment to projections of the population and labour supply, yielding information on the implications of employment change for unemployment and employment rates. It also compares trends in output by industry sector for Scotland and the UK.

Most of this report is concerned with the detailed patterns of recent and projected future employment change, representing the 'expansion' demand for labour (i.e. changes in the net stock of jobs). It presents trends in employment by gender, type of working, industry, occupation and qualification level. The demand for new employees resulting from retirements and related changes ('replacement demand') is also considered.

The *Working Futures* results are intended to provide a sound statistical foundation for the deliberations of all those with an interest in the supply of and demand for skills. This includes individuals, employers, education and training providers, as well as public agencies and departments of government.

The future cannot be predicted with precision or certainty. But all the participants in the labour market make plans for the future, even if these are simply based on the default assumption that the future will be the same as the past. The rationale behind *Working Futures* is that a comprehensive, systematic, consistent and transparent set of projections can help to inform everyone about the world they are likely to face.

As with all projections and forecasts, the results presented in *Working Futures* should be regarded as indicative of likely trends and orders of magnitude given a continuation of past patterns of behaviour and performance, rather than precise forecasts of the future.

Although the UK economy currently faces an unprecedented period of uncertainty, past experience shows that *patterns* of employment, including occupational structure, are determined chiefly by longer-term, structural, drivers, such as technological and organisational change, rather than the cyclical position of the economy.

The reader should therefore focus on the relative position of sectors, and occupations in 2020 and treat the projected values as broad indicators of scale rather than exact predictions.

2 Background

Working Futures 4 is the latest in a set of labour market assessments which provide detailed projections of the UK labour market. It provides a picture of the labour market in 2020 and the changes which are likely to occur over the period 2010 to 2020. Employment projections are produced for industries, by gender, employment status, occupation and qualification level, which are related to labour supply and the demand for labour occasioned by workers leaving the labour force.

The baseline macroeconomic forecast underlying the results was developed in the first half of 2011 and assumes that a gradual recovery in confidence will bring about a fairly strong rebound from the deep recession of 2008-9, then settling down (in the medium term) to a pattern of modest growth, with only moderate rates of inflation. For the UK as a whole, the annual average rate of GVA growth is projected to be about 80 per cent higher between 2010 and 2020 than for 2000 to 2010.

However, Wales, Scotland and Northern Ireland are projected to continue to experience lower rates of growth than England. The highest rates of annual GVA growth are projected for London and neighbouring regions in the south and east of England. There is a relative deterioration in economic growth relative to England in Scotland, but an improvement in Wales, while the relative position of Northern Ireland is projected to remain about the same during 2010-2020 as for 2000-2010.

The projections for the individual nations of the UK, particularly Northern Ireland and Wales, should be treated with some caution as they are based on small sample sizes. The results are based upon the analysis of long-term trends in the UK economy and provide a probable view of its evolution. The results for the individual countries (and English regions) are constrained to match the overall UK projections published in *Working Futures 4*. It should also be noted that the projections do not take into account the effect of economic fluctuations which had not been anticipated at the time the projections were prepared, such as the ongoing economic instability in the Eurozone. In addition, since the current iteration of the model was produced in early 2011, it should be noted that some of the key data that inform the model have since been revised. All of these factors could have a significant impact on the employment projections presented in this report in terms of levels of employment. However, the overall patterns of employment by occupation and qualification level are unlikely to be significantly affected.

A summary of the model and the methodology employed is provided in the Technical Appendix to this document and full details are provided in the *Working Futures* Technical Report, available at www.ukces.org.uk/ourwork/working-futures

Sub-national data for Scotland are also available at the level of Enterprise Regions. These consist of benchmark estimates and projections. Access to these microdata is restricted to ensure that users take account of guidelines around statistical reliability and data confidentiality. Further details are available at the above web address.

3 Headline employment and output changes

For the UK as a whole, output (measured by Gross Value Added) is projected to increase quite strongly over the period 2010 to 2020, at an average rate of 2.7 per cent per annum, which is much faster than the annual average rate of 1.5 per cent for 2000 to 2010 (Table 1). However, the average for the earlier period is based on quite rapid growth in the first part of the decade, followed by a deep recession during 2008-9. A return to long-term average rates of growth is projected for the second decade of the century.

The pattern is slightly different for Scotland. GVA grew at the same rate as England (faster than for Wales and Northern Ireland) between 2000 and 2010. The projected annual average rate of GVA growth is 50 per cent higher for 2010-2020, equal to the growth rate of Wales, but much slower than for England, Northern Ireland and the UK as a whole.

The annual average rate of growth of employment in Scotland was also the same as the average for the UK during 2000-2010, but slower than both Wales and Northern Ireland. Employment in Scotland is projected to grow only half as fast between 2010 and 2020, more slowly than for all other nations of the UK.

Table 1: Overall employment and output change in the UK and constituent nations (annual average percentage rates of change)

	GVA		Employment	
	2000-2010	2010-2020	2000-2010	2010-2020
England	1.5	2.7	0.4	0.5
Wales	0.9	2.2	0.7	0.5
Scotland	1.5	2.2	0.4	0.2
Northern Ireland	1.4	2.5	1.0	0.5
United Kingdom	1.5	2.7	0.4	0.5

Source: Working Futures

4 Trends in labour supply and demand, 2010-2020

This section sets the projected employment changes for Scotland within the context of projected changes in the population and labour force using a range of measures[2]. Though employment is projected to grow relatively slowly, the population of Scotland is also projected to grow more slowly than the UK average (see Table 2; Figure 1).

The Scottish population is projected to be 208,000 (4.0 per cent) larger in 2020 than 2010, but the projected rate of UK population growth is 50 per cent faster, at 6.1 per cent over the decade[3]. The population aged 16 and over is projected to increase by 182,000 (4.2 per cent), but the working age population will grow slightly faster (by 4.6 per cent), because the number of young people reaching economically active age in Scotland will outnumber the number of people reaching retirement age.

Table 2: Change in population, working age population, labour force, activity rate, unemployment and employment

Indicator	Scotland				UK	
			Change 2010-2020		Change 2010-2020	
	2010	2020	Change	%	Change	%
Total population (000s)	5,209	5,417	208	4.0	3,786	6.1
Aged 16+ (000s)	4,301	4,483	182	4.2	3,009	6.0
Working age population (000s)	3,259	3,408	149	4.6	2,581	6.7
Labour Force (000s)	2,677	2,737	60	2.2	1,442	4.6
Workforce (000s)	2,685	2,727	42	1.6	1,376	4.3
Economic activity rate (%)	62.2	61.1	-1.2		-0.8	
ILO Unemployment (000s)	208	195	-13	-6.1	-247	-10.0
ILO unemployment rate (%)	7.8	7.1	-0.6		-1.1	
Claimant unemployment (000s)	136	127	-9	-6.3	-149	-10.0
Claimant unemployment rate (%)	5.1	4.7	-0.4		-0.6	
Employed residents (000s)	2,469	2,542	73	2.9	1,689	5.8
Workplace employment (000s)	2,542	2,593	51	2.0	1,533	5.0

Source: Working Futures

Note: Figure for workplace employment includes HM Forces

[2] Definitions of the terms used are contained in Box 1 of the Technical Appendix.
[3] This analysis is based on population projections produced in 2008. More recent 2010-based projections suggest the base level population was higher in 2010 and that population growth in Scotland will be higher over 2010-2020 than the 2008-based projections suggest. This in turn may lead to a higher rate of employment growth than projected by the *Working Futures* 4 results.

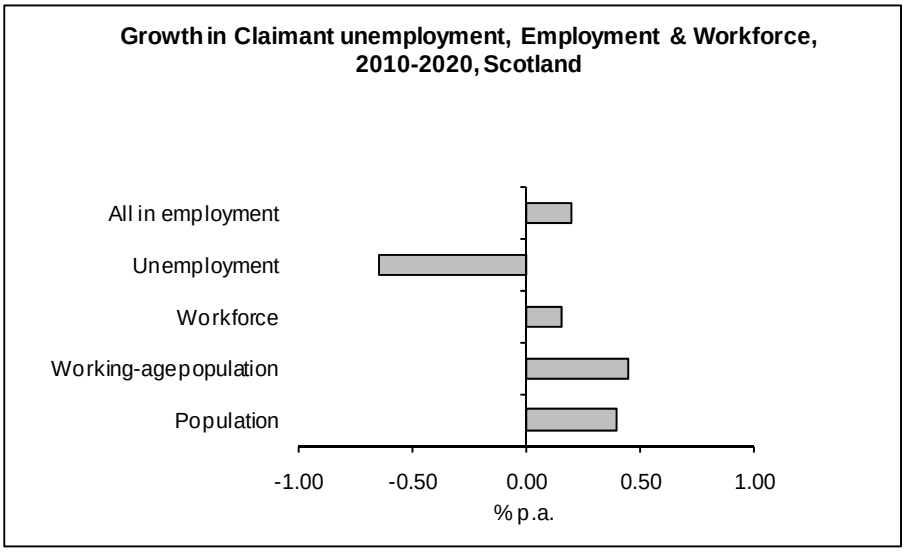
Workplace employment (the total number of jobs in Scotland) is projected to increase very slowly (by 51,000 or 2.0 per cent, compared with 5.0 per cent growth for the UK). Meanwhile growth in the number of employed residents is expected to be slightly faster than the rate of jobs growth at 2.9 per cent. (The difference in the numbers of jobs and employed residents is accounted for by "double jobbing" and net commuting across Scotland's boundaries.)

Unemployment (on both the ILO definition and claimant count) is projected to fall by just over 6 per cent, slightly more slowly than in the UK as a whole[4].

The labour force (measured as residents in work or those unemployed on the ILO definition) is projected to increase by 60,000, or 2.2 per cent, around half the UK average rate.

Since the labour force is projected to increase more slowly than the population, the economic activity rate (defined as the labour force expressed as a percentage of the population aged 16 years and over) is projected to fall by 1.2 percentage points, 50 per cent greater than the projected decline for the UK as a whole.

Figure 1: Projected labour supply and demand change in Scotland, 2010-2020



Source: Working Futures

[4] ILO unemployment in the UK was slightly higher in 2010 (7.9 per cent rate versus 7.8 per cent in Scotland) and so had further to fall.

5 Change in employment by gender, full and part-time working and self-employment

Males formed a small majority of all employment in Scotland in 2010 (52.2 per cent). Since the number of males in work is projected to increase more than the number of female employees between 2010 and 2020, a small increase in the male share of employment is projected (Table 3). There is also projected to be a slow shift away from full-time towards part-time employees during this decade, with the percentage of jobs held by full-time employees falling from 61.2 per cent to 60.6 per cent between 2010 and 2020. Within this overall pattern, there is a small shift from female to male employment, with the number of male full-time employees projected to grow by 2.7 per cent while female full-time employment is projected to decline, by 2 per cent.

For men, full-time and part-time employment are both projected to increase between 2010 and 2020, but projected growth in part-time employment exceeds that in full-time employment. Female part-time employment is projected to barely grow (by 0.4 per cent) over the period 2010-2020.

Nearly an eighth (11.9 per cent) of those in work were self-employed in 2010, but the number of self-employed is projected to decline marginally by 2,000 (-0.7 per cent) between 2010 and 2020. Within this overall change, there is a shift from female to male self-employment as male self-employment is projected to decline by 7.1 per cent while female self-employment is projected to increase by 12 per cent.

Industry sectors have quite different patterns of employment in terms of gender and status. The differing fortunes of the sectors are one of the key drivers of change in overall gender / status employment patterns. This is examined in more detail in the UK report of *Working Futures*.

Table 3: Projected employment change by gender and status in Scotland, 2010-2020

	2010		2020		2010-2020	
	000s	Percent	000s	Percent	Change (000s)	% change
Male	1,320	52.2	1,368	53.0	48	3.6
Male Full-Time	956	37.8	982	38.1	26	2.7
Male Part-Time	162	6.4	199	7.7	36	22.3
Male Self-Employed	201	8.0	187	7.3	-14	-7.1
Female	1,208	47.8	1,211	47.0	3	0.2
Female Full-Time	592	23.4	580	22.5	-12	-2.0
Female Part-Time	516	20.4	518	20.1	2	0.4
Female Self-Employed	100	4.0	113	4.4	12	12.4
Full-Time employees	1,548	61.2	1,563	60.6	14	0.9
Part-time employees	678	26.8	717	27.8	39	5.7
Employees	2,226	88.1	2,279	88.4	53	2.4
Self-employed	302	11.9	300	11.6	-2	-0.7
Total employment	2,528	100.0	2,579	100.0	51	2.0

Source: Working Futures

Employment and GVA change by industry

Table 4 presents a comparison of annual average rates of output change by industry sector for Scotland and the UK. Between 2000 and 2010, GVA in Scotland grew at the same rate as the UK as a whole. However, growth in output is projected to be slower than the UK average from 2010 to 2010.

In Scotland, GVA declined in the *Primary and utilities* and *Manufacturing* sectors between 2000 and 2010, the former performing worse than the UK average and the latter better (Table 4). The fastest rates of GVA growth were recorded by the *Business and other services* and *Non-market services* sectors. In both of these and the *Construction* sector the rate of output growth was faster than in the UK as a whole.

The pattern of projected change in output for 2010 to 2020 for Scotland is quite similar to that for the UK. The only sector in which output is projected to decline is the *Primary and utilities* sector, in contrast to slow growth in the UK as a whole. The fastest rate of projected growth is for *Business and other services,* which is expected to grow at the same rate as during 2000 to 2010, but more slowly than the UK average for the sector. All other sectors except *Non-market services* (for which the projected rate of growth mirrors the UK in being much slower than for 2000 to 2010) experience a marked improvement in growth compared with 2000 to 2010. With the exception of *Manufacturing* (projected to grow slightly faster than the UK average), all other sectors are projected to have slightly slower growth rates than the sector averages for the UK as whole.

Table 4: Average annual rate of change in GVA by industry sector, Scotland and the UK 2000-2020

Industry sector	Scotland		UK	
	2000-2010	2010-2020	2000-2010	2010-2020
Primary sector and utilities	-2.3	-0.4	-1.9	0.5
Manufacturing	-0.6	2.5	-1.2	2.4
Construction	1.6	2.1	1.4	2.4
Trade, accomod. and transport	1.6	2.7	1.6	3.0
Business and other services	3.3	3.3	2.9	3.8
Non-market services	1.7	0.6	1.6	0.7
All industries	1.5	2.2	1.5	2.7

Source: Working Futures

Between 2000 and 2010, employment declined only in the *Manufacturing* and *Construction* sectors, but each of these two sectors performed less positively than the UK average for the sector (Table 5). Employment grew more slowly than the UK average in the *Primary and utilities* and *Non-market services* sectors but grew faster than the UK average in the *Trade, accommodation and transport* and *Business and other services* sectors. The rate of employment increase was highest in *Business and other services* and *Non-market services*.

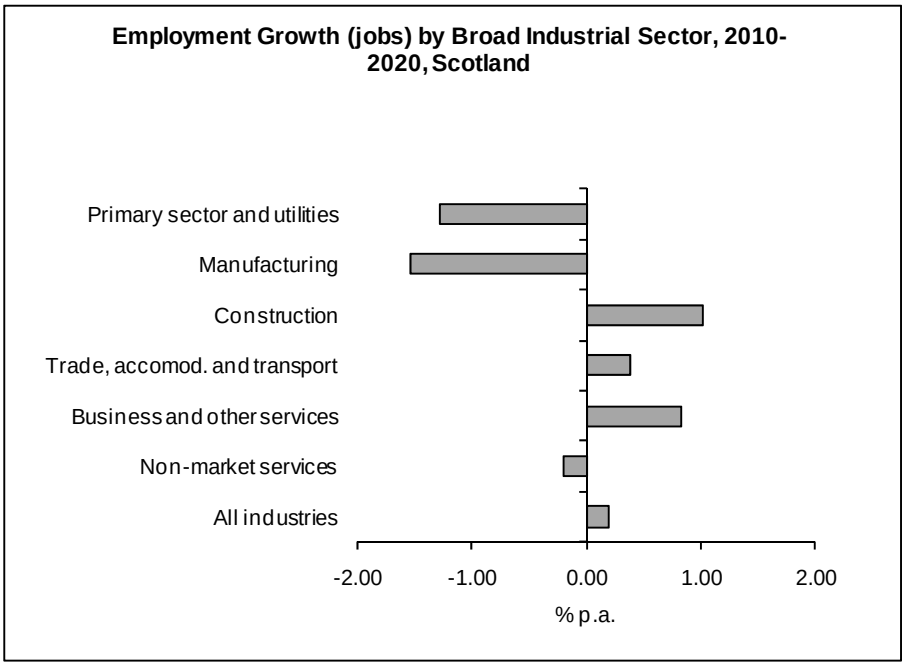
For the 2010 to 2020 period (Figure 2), employment is projected to decline much more quickly than in the UK as a whole in the *Primary and utilities* and *Manufacturing* sectors, and to decline slightly faster in the *Non-market services* sector. In the other three sectors, employment is projected to grow, but more slowly than the sector average for the UK as a whole. The deterioration in rates of employment growth is greatest for the *Business and other services* and *Non-market services* sectors. The fastest rate of projected employment increase is for the *Construction* sector. Only the *Manufacturing* and *Construction* sectors see an improvement in employment performance over the previous decade.

Table 5: Average annual rate of change in employment by industry sector, Scotland and the UK 2000-2020

Industry sector	Scotland		UK	
	2000-2010	2010-2020	2000-2010	2010-2020
Primary sector and utilities	0.2	-1.3	0.3	-0.3
Manufacturing	-5.2	-1.5	-4.5	-0.7
Construction	-0.4	1.0	0.8	1.1
Trade, accomod. and transport	0.5	0.4	0.0	0.5
Business and other services	1.6	0.8	1.3	1.3
Non-market services	1.6	-0.2	2.0	-0.1
All industries	0.4	0.2	0.4	0.5

Source: Working Futures

Figure 2: Projected annual average rate of employment change by sector, 2010-20



Source: Working Futures

Table 6 shows how the industrial profile of Scotland has changed from 1990 to 2010 and is expected to change between 2010 and 2020. The *Primary and utilities* and *Manufacturing* sectors together already accounted for only just over a fifth of employment in 1990. While the employment share of the former is projected to be only 0.8 percentage points smaller in 2020 than 1990, the precipitous decline of *Manufacturing* between 2000 and 2010 results in this sector being projected to account for only 5.9 per cent of employment in 2020. The *Construction* sector is projected to continue to decline, so that the first three sectors together account for only 17.6 per cent of employment in 2020, compared with almost 30 per cent in 1990. The *Trade, accommodation and transport* sector represents just over a quarter of employment throughout the period 1990 to 2020, but is projected to be overtaken as the largest sector by *Business and other services* by 2020. The share of employment in this sector increased steadily from 1990 to 2010, but the projected increase in employment share between 2010 and 2020 is smaller than for previous decades. The *Non-market* services sector increased its share of employment during both 1990-2000 and 2000-2010. This is projected to reverse during 2010 to 2020, but it will still account for more than a quarter of employment in Scotland in 2020.

Table 6: Change in employment profile for Scotland, 1990 to 2020

Industry sector	Percentage share of total employment			
	1990	2000	2010	2020
Primary sector and utilities	4.8	4.7	4.6	4.0
Manufacturing	16.0	12.6	7.1	5.9
Construction	8.7	7.7	7.1	7.7
Trade, accomod. and transport	27.4	27.0	27.3	27.8
Business and other services	19.4	23.5	26.5	28.2
Non-market services	23.6	24.5	27.4	26.4
All industries (000s)	2,388	2,424	2,528	2,579

Source: Working Futures

6 Occupational employment change

The pattern of projected employment change between 2010 and 2020 for males and females is presented in Table 7 and Figure 3. The broad pattern of occupational employment change for Scotland is similar to the UK as a whole, characterised by growth in higher skilled non-manual occupations and employment loss in less skilled or more routine occupations. Compared with the UK there is more similarity in Scotland in rates of projected employment change between the three highest status occupations; at the same time rates of employment increase for these occupations are lower than for the UK as a whole. With regard to the remaining occupations, the only groups in which employment is projected to increase are *Caring leisure and other services* and *Elementary occupations*, in each case more slowly than in the UK as a whole. The number of jobs in *Administrative and secretarial* and *Skilled trades* occupations is projected to decline slightly faster than in the UK as a whole. The highest projected rate of decline in employment is for *Process, plant and machine operatives* and *Administrative and secretarial occupations*, both seeing rates of decline that are faster than in the UK as a whole. The number of people working in *Elementary occupations* is projected to increase more slowly than the UK average and the number working in *Sales and customer services* is projected to decline, in contrast to the projected static position for the UK as a whole.

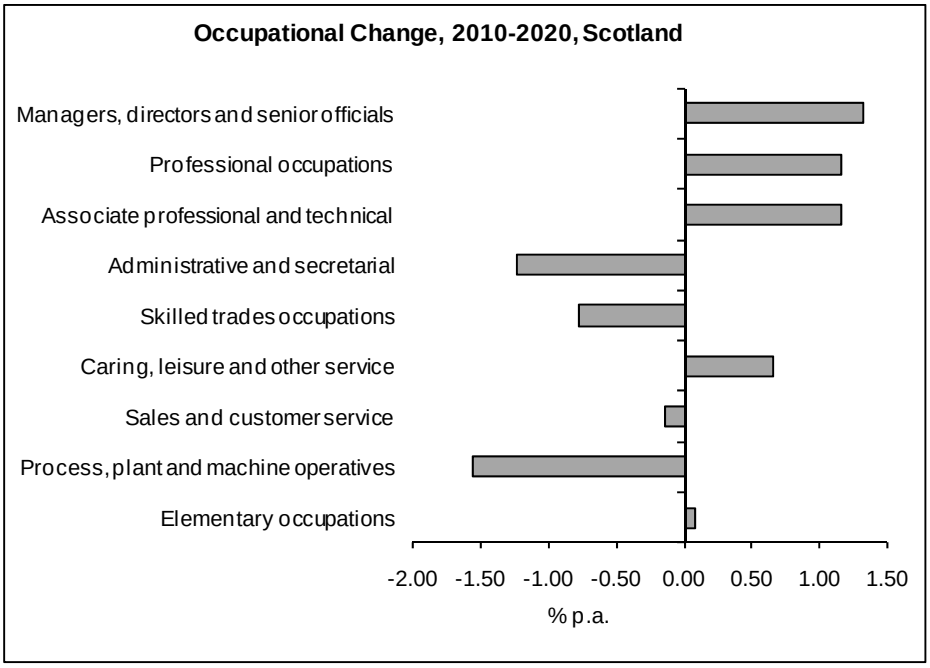
Table 7: Change in employment by occupation in Scotland, 2010-2020

SOC2010 Major group	Males		Females		% change in total employment 2010-2020	
	change 000s	% change	change 000s	% change	Scotland	UK
Managers, directors and senior officials	17	11.9	14	17.6	13.9	18.0
Professional occupations	16	7.4	42	16.4	12.2	14.9
Associate professional and technical	9	5.8	26	20.2	12.2	14.0
Administrative and secretarial	5	6.3	-42	-17.3	-11.7	-10.5
Skilled trades occupations	-15	-5.3	-9	-21.2	-7.4	-6.5
Caring, leisure and other service	12	22.9	1	0.7	6.8	11.5
Sales and customer service	3	3.9	-6	-3.8	-1.4	0.1
Process, plant and machine operatives	-18	-11.6	-7	-39.5	-14.6	-10.9
Elementary occupations	19	11.3	-17	-10.9	0.8	3.2
All occupations	48	3.6	3	0.2	2.0	5.1

Source: Working Futures

There are notable differences in projected employment changes by gender, with rates of projected employment change generally magnified for women relative to men. Women are projected to experience particularly high rates of employment increase in higher status occupations (particularly *Professional* and *Associate professional and technical* occupations), but also a much higher rate of job loss in *Skilled trades* and *Process, plant and machine operatives* occupations. Female employment is projected to decline in *Administrative and secretarial* and *Elementary occupations* while male employment is projected to grow in these occupations. For men, the highest projected rate of job increase is in *Caring, leisure and other service* occupations, though the largest projected number of new jobs will be in *Elementary occupations.*

Figure 3: Projected annual average rate of employment change by occupation, 2010-20



Source: Working Futures

Table 8: Employment shares by occupation, 1990 to 2020

SOC2010 Major group	Percentage share of employment			
	1990	2000	2010	2020
Managers, directors and senior officials	6.8	7.6	8.8	9.8
Professional occupations	14.6	16.0	18.9	20.8
Associate professional and technical	9.9	11.4	11.4	12.6
Administrative and secretarial	14.4	13.9	12.5	10.8
Skilled trades occupations	16.1	13.7	12.5	11.4
Caring, leisure and other service	4.9	6.6	7.5	7.9
Sales and customer service	8.5	8.4	8.5	8.2
Process, plant and machine operatives	10.5	8.5	7.0	5.8
Elementary occupations	14.4	13.9	12.9	12.7
All occupations (000s)	2,388	2,424	2,528	2,579

Source: Working Futures

Table 8 shows how the occupational profile of employment in Scotland has evolved and is projected to continue to change over the period 1990 to 2020. The share of employment accounted for by *Managers, directors and senior officials* and *Professional occupations* has steadily increased, so that the latter is projected to account for more than a fifth of employment in 2020. The increase in share of employment in *Associate professional and technical occupations* was very small between 2000 and 2010 but is projected to be larger between 2010 and 2020. Overall, the share of employment accounted for by jobs in SOC Major Groups 1 to 3 is estimated to increase from 31.3 per cent in 1990 to 43.2 per cent in 2020. The share of employment in *Administrative and secretarial* occupations has been declining since 1990, at an increasing rate. The decline in the share of *Skilled trades* occupations and *Process, plant and machine operative* occupations is projected to continue to decline, but the share of *Elementary occupations* is predicted to be similar in 2020 to that in 2010, still representing about an eighth of those in employment. The share of employment in *Caring, leisure and other service* occupations is projected to continue its steady increase to 2020, while the share of *Sales and customer service* occupations is projected to fall slightly between 2010 and 2020.

7 Qualification profile

Skill supply, as measured by the highest formal qualifications held by those economically active, is rising rapidly. Many more young people in particular have been encouraged to stay on in education longer and to acquire more qualifications at a higher level. The demand for skills as measured by occupation and qualification is also projected to rise. The numbers of jobs in occupations typically requiring a degree continue to grow while the graduate intensity of many other jobs is rising steadily.

Figure 4 presents the estimated and projected pattern of highest qualifications held in Scotland for 2000, 2010 and 2020 by Qualifications and Credit Framework (QCF) level[5].

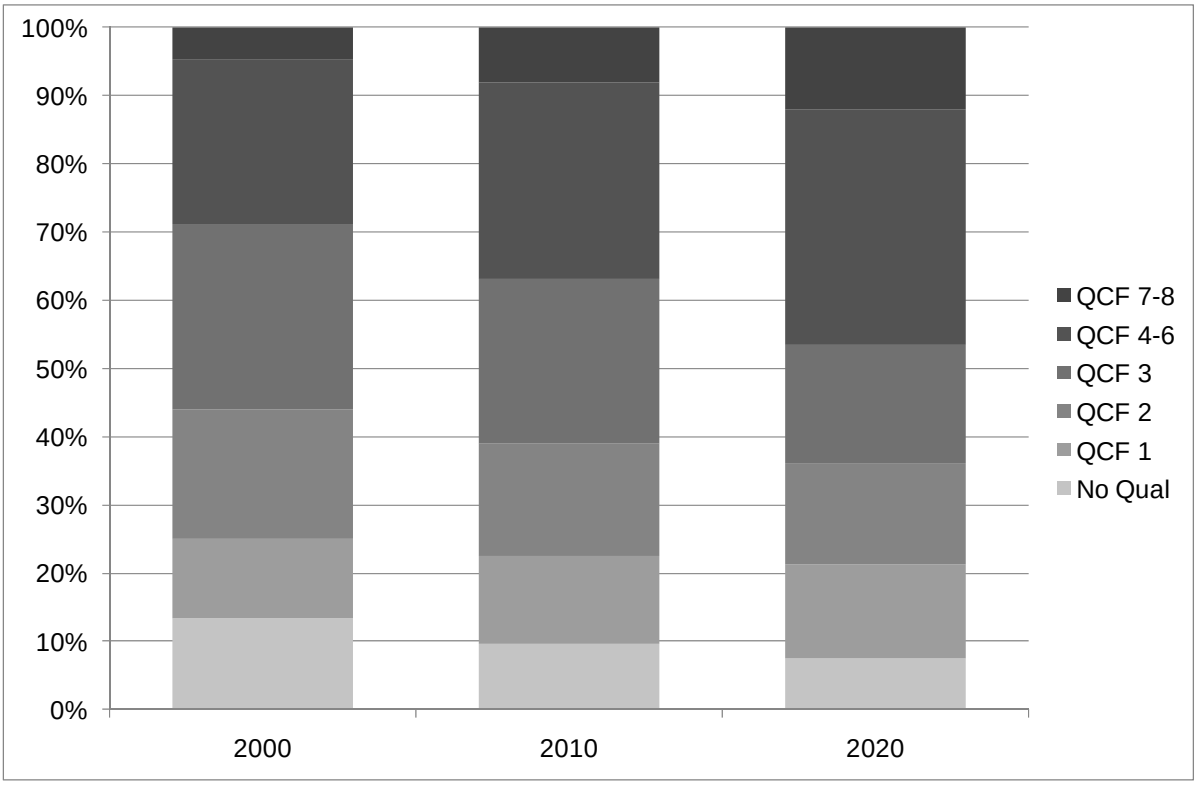
It is estimated that around 37 per cent of jobs in Scotland in 2010 were held by people qualified at a high level (QCF4 and above). This represents a substantial improvement on the figure of 29 per cent registered in 2000. It is projected that the proportion qualified at level 4 and above will continue to increase, reaching a point close to half of all employment by 2020.

At the other end of the spectrum the proportion of jobs held by people with no formal qualifications or only low level qualifications below QCF2 is projected to fall to around one-fifth by 2020, compared with more than a quarter in 2000.

The proportion of jobs held by people qualified at intermediate level (QCF2 and QCF3) is set on a long-term downward trend, falling from more than two-fifths of people in employment in 2000 to a projected share of around one-third by 2020.

[5]The Qualifications and Credit Framework (QCF) is the framework currently used for vocational qualifications in England, Wales and Northern Ireland and is used here for reasons of consistency. Scotland has its own qualification framework, the Scottish Credit and Qualifications Framework (SCQF), and its own system of levels. Levels can be readily mapped across the two frameworks. Correspondences between the levels used in QCF / NQF and the SCQF are mapped in Qualifications can cross boundaries (SCQF, 2011). See Annex A for further details.

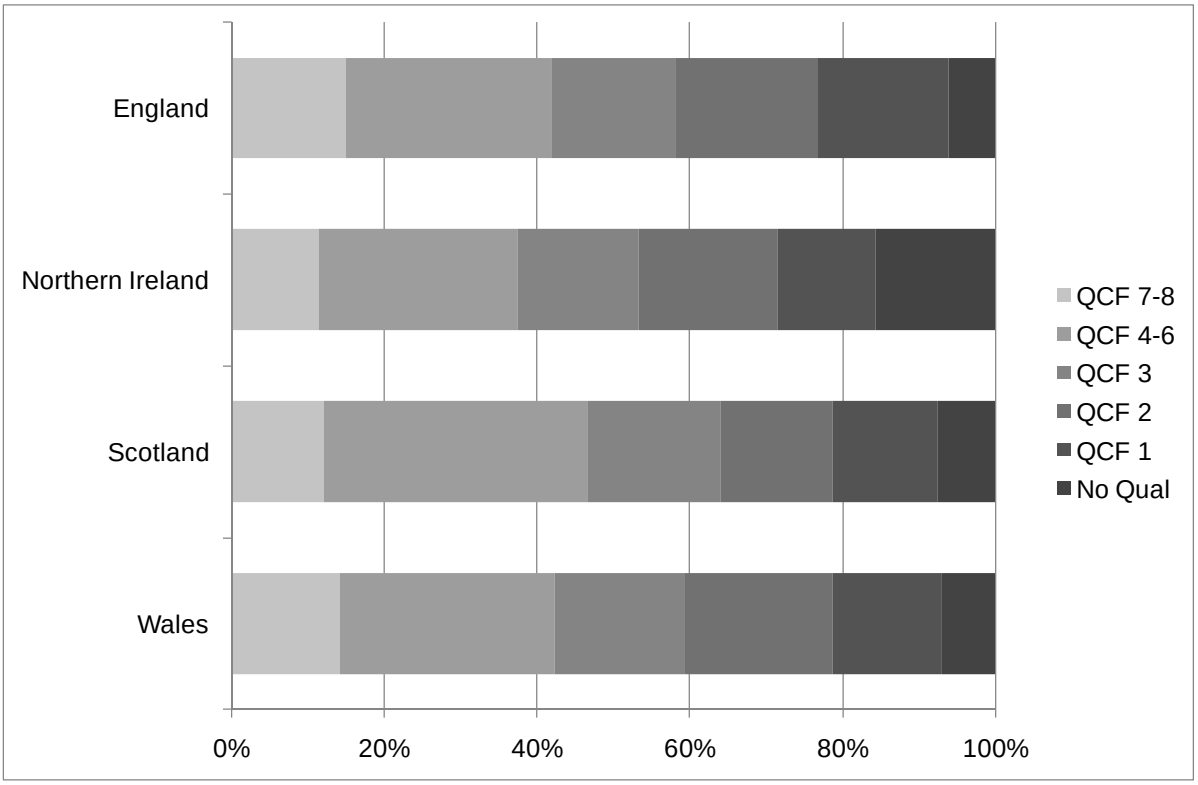
Figure 4: Profile of employment by level of highest qualification held, Scotland, 2000 to 2020



Source: Working Futures

Figure 5 compares the projected qualification profile of Scotland with that of the other nations of the UK in 2020. The proportion of those employed at a high level (QCF4 and above) is expected to be higher in Scotland than in any other nation. The percentage with no qualifications is projected to be slightly higher than in England and Wales but much smaller than in Northern Ireland. On the other hand, the proportion of employed people with a highest qualification below QCF3 is projected to be smaller than for the other three countries of the UK in 2020.

Figure 5: Profile of employment by level of highest qualification held by nation, 2020



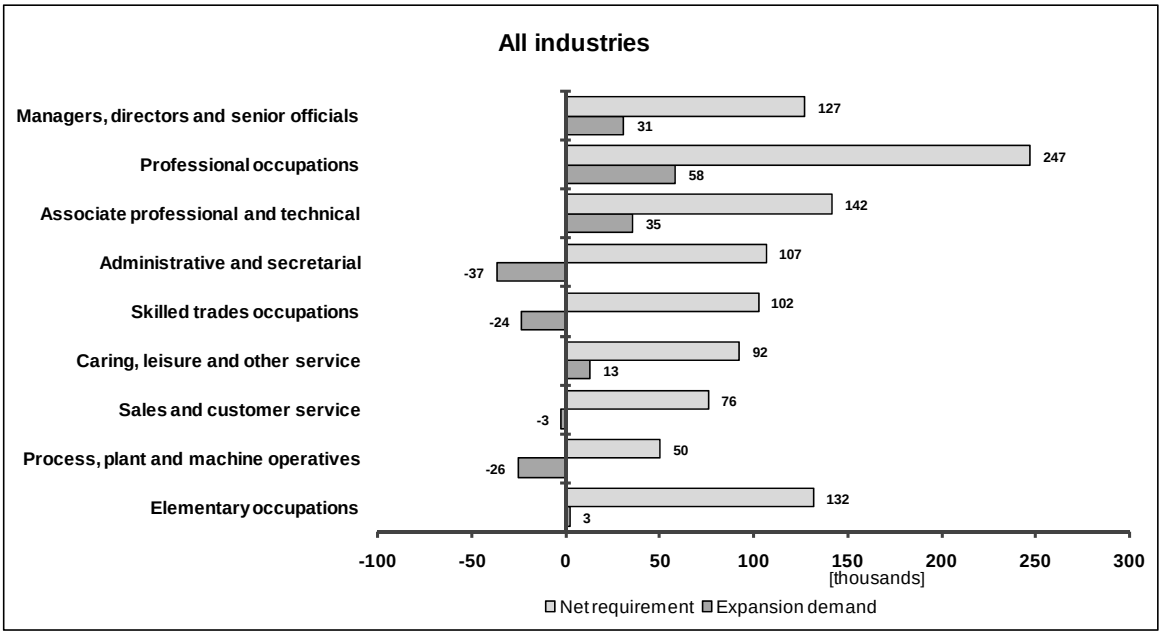
Source: Working Futures

8 Replacement demand

The *Working Futures* projections also include estimates of employers' need to replace workers due to mortality, retirement, career moves, or other reasons. For the UK as a whole, this so called "replacement demand" is almost eight times larger than the net change in employment projected over the decade to 2020 (mainly due to the effect of people born between 1945 and 1954 reaching retirement age). In Scotland, projected replacement demand for the period 2010 to 2020, at more than 1m job openings, is equivalent to more than 40 per cent of the opening stock of employment in 2010. Due to the relatively low projected level of expansion demand in Scotland, replacement demand is expected to be 20 times the size of net employment growth for the period.

For *Administrative & secretarial* occupations, *Skilled trades*, and *Process, plant and machine operatives*, positive replacement demand outweighs negative expansion demand. For *Managers, directors and senior officials, Professionals, Associate professionals* and *Caring, leisure and other service* occupations, replacement demand reinforces the structural increase in employment to create even higher net requirements for new job entrants.

Figure 6: Replacement demand and expansion demand by SOC Major Group, Scotland 2010-2020



Source: Working Futures

Figure 6 illustrates the net recruitment requirement (equivalent to total job openings and calculated as the sum of replacement demand plus expansion demand) compared with expansion demand alone (net change in employment) over the period 2010 to 2020 for the nine SOC major groups. There is a need to replace employees leaving due to retirement in all occupations, including those in which overall employment is projected to decline. The largest component of replacement demand is in *Professional occupations*, and the lowest is for *process, plant and machine operatives*. Replacement demands tend to be larger in the white-collar occupations, though there is a substantial replacement demand for *Elementary occupations*.

9 Conclusion

Employment in Scotland is projected to grow more slowly between 2010 and 2020 than the UK as a whole and to experience a somewhat different pattern of employment change. Most industries are projected to increase their output more slowly and all are expected to perform more poorly than the UK average in employment terms between 2010 and 2020. Scotland is projected to continue to gain employment in *Construction* and private sector services. Indeed, the *Business and other services* sector is projected to replace *Non-market services* as the largest sector in employment terms by 2020. There is projected to be a substantial shift in employment from less-skilled to more skilled occupations, which coincides with a marked increase in the educational qualification level of the workforce. However, *Elementary occupations* will remain an important source of new jobs for men in the period 2010 to 2020.

The population of Scotland is projected to grow at a slower rate than the UK as a whole, and the labour supply will also grow slowly. While unemployment is projected to fall more slowly than in the UK as a whole, the economic activity rate is projected to decline more quickly. The age structure of the population, with the large cohort born in the decade following World War 2 reaching retirement age, means that there will be strong demand for new employees in all occupations, which may be met by young people entering the labour force. Even those occupations in overall employment decline will need to replenish their workforces over the decade 2010 to 2020, and hence there is a continued need to train workers for all occupations.

Technical Appendix

The prime focus of *Working Futures* is to develop quantitative projections, concentrating on anticipating changing skill needs, as measured by changing occupational and qualification employment structure, in the context of changes in general economic conditions. Projections of occupational employment are driven by an underlying view of sectoral prospects (both output and productivity) in the geographical area concerned.

The foundation for the present set of projections is results from the well-established multi-sectoral macroeconomic model of the UK economy developed by CE and detailed occupational and qualification forecasting modules developed by IER. This approach formed the basis for the previous *Working Futures* series of labour market projections.

The cornerstone of the projections is CE's Multi-regional Multi-sectoral Dynamic Model (RMDM), which is used to generate estimates of output, productivity and employment for all the main industrial sectors in the UK and its nations and regions. The sectoral output forecasts are based on an integrated, one-model approach in which the detailed industry and national / regional analysis is consistent with the macro analysis. In the model, key drivers (investment, productivity, prices, technical change, competitiveness, imports and exports) are modelled separately for each industry and nation / region. Sectoral productivity is determined within the model by a set of employment functions based on best practice time series analysis econometric approaches, using co-integration methods.

Employment is treated as the demand for labour, derived from the national / regional demand for goods and services. National / regional employment equations are estimated which relate employment in each industry (at a detailed level) to industrial output and wage rates relative to output prices in the nation / region, and to national variables such as average hours worked. Econometric methods are applied to estimate long-run relationships and to estimate dynamic error-correction equations to allow for short-run dynamic adjustments. This analysis is conducted at a detailed level distinguishing over 40 industries, further disaggregated using simpler methods to 79 detailed industries. The *Working Futures* results are based on 79 categories defined in terms of SIC2007 divisions. The approach to industry classification is set out in Table A.1 of this appendix.

The use of RMDM ensures that, by industry and nation / region, productivity over the forecast period reflects structural changes in the economy. Productivity is determined by a complex set of behavioural and technical relationships at a detailed industry level. These relationships are captured in the model by a set of econometric equations linking employment and output, relative wage rates and average hours worked. They reflect economic thinking about the key drivers of labour demand and productivity. The results are not therefore simple extrapolations of past trends Because these functions are defined for each industry sector in each nation / region, RMDM is able to capture the impact on productivity of the changing structure of the economy and the impact of new technologies and changes in organisational and individual behaviour, as well as major economic "shocks".

The determination of output depends upon the demand for that sector's products and services from: consumers; other producers (for investment goods and intermediate inputs); government; and from abroad. This in turn depends on prices and costs. The approach explicitly incorporates projected changes in the input-output structure of the economy over the forecast period. This is one of the key ways in which technological change affects the real economy. Relative price and wage movements and international competition are also key drivers of changes in the structure of industry output. The impact of major events, such as the London Olympics, or the effects of the comprehensive spending review, including the possible effects of localised shocks, are therefore captured automatically by building in any changes to demand for goods and services that these impose.

RMDM solves as a single system in which macroeconomic results are built up from the more detailed results at sectoral and national / regional level. The long-term growth rate for the economy therefore reflects the expected performance of individual industries. This includes their rates of productivity growth and the demands for their output (including their international trade performance). The model is a combination of orthodox time-series econometric relationships and cross-sectional input-output relationships.

Aggregate demand is modelled in a Keynesian manner, with a consumption function and investment equations. However, the model also includes equations for average earnings by industry and nation / region. Other aspects of the supply side come in through the export and import equations, in which capacity utilisation affects trade performance. The detailed set of industry employment equations allows relative wage rates and interest rates to affect employment and industry-level productivity growth.

The occupational projections are developed using largely extrapolative methods, based on data from the 2001 Census of Population and Labour Force Survey (LFS) releases up to 2011. Estimates of occupational employment within industries are produced by linking the sectoral employment results (again at a detailed level) to the IER's occupational and national / regional models. These models are based on research about the factors expected to influence occupational structure at sectoral level. The occupational classification of employment has been extended on to a SOC2010 basis using detailed converters developed by IER in collaboration with ONS.

The estimates also include replacement needs. The Replacement Demand estimates are based on quite limited data on age structures and outflow rates from the LFS. There are real problems in obtaining estimates differentiated by all the various dimensions of interest, notably sector and geographical area in tandem. It is obtaining consistent estimates, cross-classified by both dimensions simultaneously, which stretches the data beyond its limits. The estimates should therefore be regarded as indicative rather than precise indications of the likely scale of replacement demands.

Projections of labour supply are provided for each of the countries and regions of the UK, by gender. The modelling work is undertaken by detailed age-band so also delivers projections disaggregated by age-band.

A set of stochastic behavioural equations to forecast economic activity rates by nation / region and age-band/gender has been incorporated into RMDM. These include a number of explanatory variables including unemployment. These are generally national / regional-specific variables, rather than age-band/gender specific. The differences between age-bands/genders are picked up in a constant specific to those groups. A strong effect coming from the characteristics of the nation / region is incorporated (notably, how tight the labour market is, and how expensive it is to live there). The equations are estimated across nations / regions, since that is where the variation is largest.

The model required to construct the projections of overall labour supply indicators consists of a number of accounting equations to derive labour supply and unemployment from the existing labour market and demographic projections in RMDM.

The key stages to determine the labour supply indicators can be summarised as follows:

i. work-place based employment is determined using the existing RMDM equations;
ii. national / regional labour force is determined by activity rates multiplied by working-age population;

iii. national / regional activity rates (by age-band/gender) are modelled as a function of unemployment and other variables, *e.g.* house prices relative to wages;
iv. national / regional unemployment (ILO) = is determined from national / regional unemployment (claimant count);
v. the Labour Force Survey measure of employment is determined from national / regional labour force minus national / regional unemployment (ILO);
vi. the labour market residual (one component of which is net commuting) is determined from workforce (workplace) employment minus the Labour Force Survey measure of employment.

The difference between the Labour Force Survey (LFS) measure and the workforce measure of employment is accounted for in the labour market residual. This includes “double jobbing” (people who have more than one job) and net commuting which results from people travelling from their place of residence, across national / regional boundaries to their place of work.

In RMDM, total working-age population for each nation / region is determined by the natural increase in working-age population plus net working-age migration. National / regional in and out-migration of working-age population are both assumed to be affected by the same economic factors. The migration is modelled as occurring from the nation / region to the outside world and vice versa. The explanatory variables used include a measure of national / regional surplus labour relative to the UK, the mortgage rate, relative wages and a linear time trend.

ONS projections of population are used to calculate shares by gender and by age-band. These shares are applied to the RMDM forecasts of total population to produce projections of population by gender and by age-band.

Having established a very detailed employment database it is important to appreciate its limitations. Such detailed breakdowns can only ever be indicative, since they are based on survey estimates that were not designed to produce precise estimates at this level of detail. It is also important to recognise that without enormous resources it is not possible to monitor and quality assure every one of these series (over 140,000 time series in the core results for this latest update to *Working Futures,* and more than 850,000 if qualification is also included). Although IER/CE have carried out checks to ensure that the basic trends and structural features of the data are sound, it is impossible to check and validate every time series.

The estimates contained in *Working Futures* are all based on published official data on employment but they have been adjusted to produce a consistent set of estimates across all the dimensions of interest (sector, occupation, qualification, gender, status [full-time and part-time employee or self-employed]) and nation / region.

Where there are inconsistencies between official sources, the industrial information is given precedence. All the employment data are constrained to match headline figures published by ONS in the Economic and Labour Market Review (ELMR) and similar publications.[6] This is achieved using so called RAS iterative methods, as described in the *Working Futures Technical Report*. Where no official data are published, estimates are generated by assuming common patterns to the next level of aggregation up at which official estimates are available. Occupational estimates, information on qualifications and self-employment estimates are based primarily on information from the LFS.

The sectoral and spatial level data are consistent with ONS estimates available at the time the analysis was conducted (the summer of 2011). Information on occupations and qualifications is based on LFS data available at the same time. The latter are constrained to match the sectoral data, using the RAS process described above. One important point to note here is that the *Working Futures* estimates refer to June and the data for all areas are made consistent with the level above. So the data for nation / regions are consistent with the GB data but also with the ONS released data for the nations / regions for aggregate sectors. All scaling is done by type.

As a result the *Working Futures* numbers may no longer match the original information, although the general patterns are fully consistent. The numbers by sector, nation / region, occupation and qualification may differ from the latest ONS published estimates for a number of reasons:

- Revisions and changes made by ONS since the analysis was conducted;
- Inconsistencies in the various official estimates from different sources;
- Differences in classification – the published *Working Futures* database is entirely on SIC2007 and SOC 2010;
- Differences in timing (mid-year (June) as opposed to other periods);
- Modifications introduced as a result of the RAS process (this affects only the occupational and qualification patterns).

[6] ONS ceased publishing the ELMT as separate document in May 2011, focusing instead on making data available via its main website which delivers statistics and articles online.

The estimates from the *Working Futures* database provide a complete and consistent picture across all dimensions of employment that is not available from any other source.

Box 1: Definitions of Employment and Related Labour Market Indicators

Alternative Definitions

There are various ways of looking at employment. For example, a distinction can be made between the number of people in employment (head count) and the number of jobs. These two concepts represent different things, as one person may hold more than one job. In addition, a further distinction can be made between area of residence and area of workplace.

Similarly there are various different definitions of unemployment, the labour force, workforce and population. In Working Futures 2010-2020 the following definitions are used:

Residence basis: measured at place of residence (as in the Labour Force Survey (LFS)).

Workplace basis: measured at place of work (as in the Annual Business Inquiry (ABI) and Business Register and Employment Survey (BRES)).

Workplace employment (number of jobs): these are typically estimated using surveys of employers, such as the ABI and BRES, focusing upon the numbers of jobs in their establishments. In this report references to employment relate to the number of jobs unless otherwise stated.

Employed residents (head count): the number of people in employment. These estimates are based primarily on data collected in household surveys, e.g. the LFS. People are classified according to their main job. Some have more than one job.

ILO unemployment: covers people who are out of work, want a job, have actively sought work in the previous four weeks and are available to start work within the next fortnight (or out of work and have accepted a job that they are waiting to start in the next fortnight).

Claimant Unemployed: measures people claiming Job Seeker's Allowance benefits.

Workforce: the size of the workforce is obtained by summing workplace employment (employee jobs and self-employment jobs), HM Forces, government-supported trainees and claimant unemployment.

Labour Force: employed residents plus ILO unemployment.

Labour market participation or Economic activity rate: the number of people who are in

employment or (ILO) unemployed as a percentage of the total population aged 16 and over.

Labour Market Accounts Residual: workplace employment minus Residence employment. The main cause of the residual at national level is "double jobbing". At a more disaggregated spatial level, net commuting across geographical boundaries is also very significant. The difference will also reflect data errors and other minor differences in data collection methods in the various sources.

Total Population: the total number of people resident in an area (residence basis).

Population 16+: the total number of people aged 16 and above (residence basis).

Working-age population: the total number of people aged 16-64 (males) or 16-64 (females), (residence basis). The retirement age of females increases from 59 in 2011 to 64 in 2020.

Industry classification

Table A.1: Broad Sectors (SIC2007)

Broad Sector	SIC2007 Section	SIC 2007 Division	Industry full name	Ind 22	Ind 79
1. Primary sector & utilities	A	01-03	Agriculture, forestry and fishing	1, 2, 6, 7	1-4, 28-31
	B	05-09	Mining and quarrying		
	D	35	Electricity, gas, steam and air conditioning		
	E	36-39	Water supply, sewerage, waste management		
2. Manufacturing	C	10-33	Manufacturing	3-5	5-27
3. Construction	F	41-43	Construction	8	32-34
4. Trade, accomod. & transport	G	45-47	Wholesale and retail trade; repair of motor vehicles	9-11	35-44
	H	49-53	Transport and storage		
	I	55-56	Accommodation and food activities		
5. Business & other services	J	58-63	Information and communication	12-17, 21-22	45-67, 73-79
	K	64-66	Financial and insurance activities		
	L	68	Real estate activities		
	M	69-75	Professional, scientific and technical activities		
	N	77-82	Administrative and support service activities		
	R	90-93	Arts, entertainment and recreation; other services		
	S	94-96	Other service activities		
6. Non-market services	O	84	Public administration and defence etc	18-20	68-72
	P	85	Education		
	Q	86-88	Human health and social work		

Table A.2: Industry Groups (SIC2007)

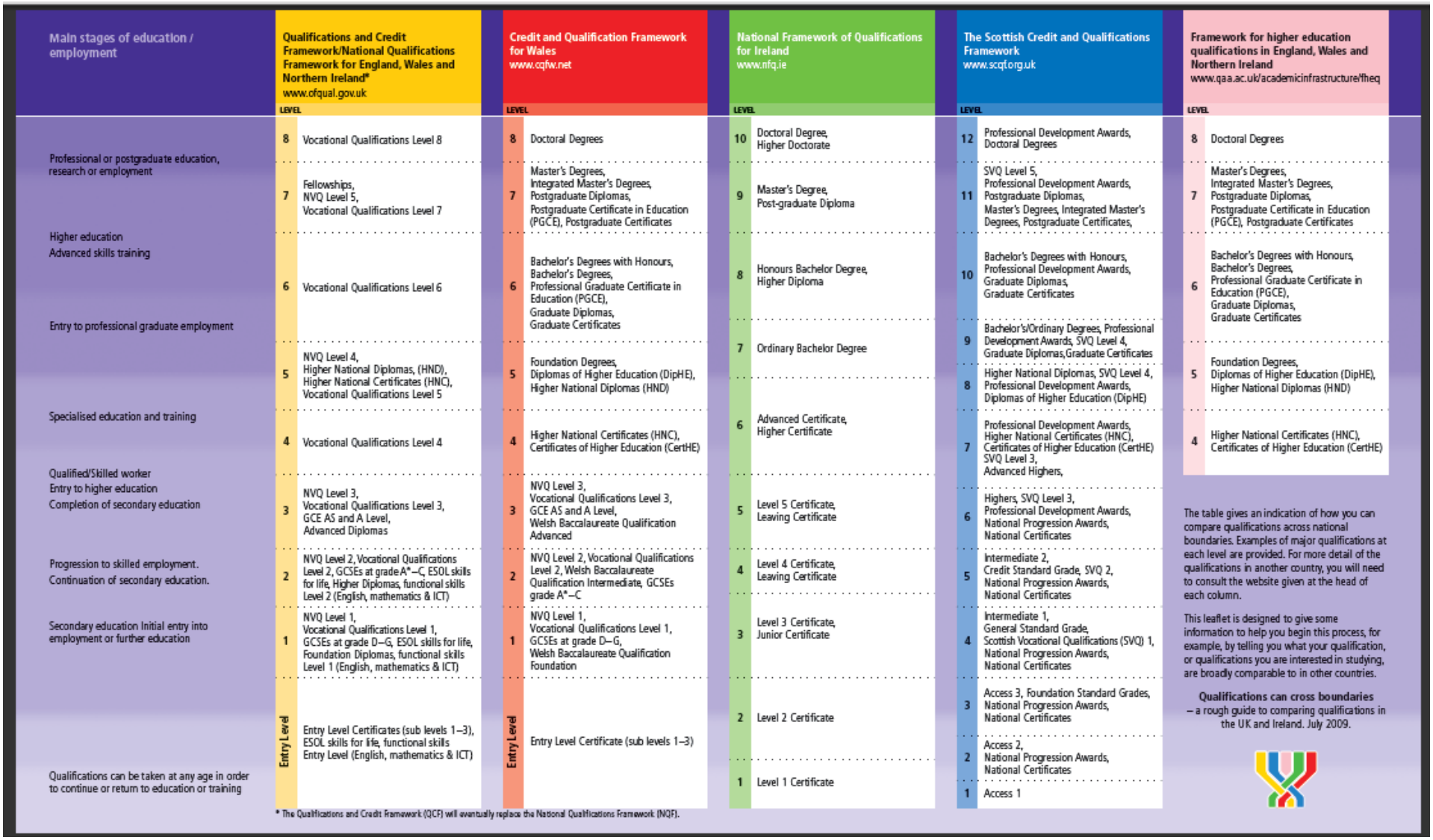
Ind22	Ind22 name	SIC2007 Section	SIC2007 Division	Industry full name	Industry 79
1	Agriculture	A	01-03	Agriculture, forestry and fishing	1
2	Mining & quarrying	B	05-09	Mining and quarrying	2-4
	Manufacturing	C	10-33	Manufacturing	5-27
3	Food drink & tobacco		10-12	Food drink and tobacco	5-6
4	Engineering		26-28	Engineering	20-22
5	Rest of manufacturing		13-25, 29-33	Rest of manufacturing	7-19
6	Electricity & gas	D	35	Electricity, gas, steam and air conditioning	28
7	Water & sewerage	E	36-39	Water supply; sewerage, waste management	29-31
8	Construction	F	41-43	Construction	32-34
9	Whol. & retail trade	G	45-47	Wholesale and retail trade; repair of motor vehicles etc	35-37
10	Transport & storage	H	49-53	Transport and storage	38-42
11	Accommod. & food	I	55-56	Accommodation and food activities	43-44
	Information & comm.	J	58-63	Information and communication	45-50
12	Media		58-60, 63	Media and communication	45-47, 50
13	IT		61, 62	Information technology	48-49
14	Finance & insurance	K	64-66	Finance and insurance activities	51-53
15	Real estate	L	68	Real estate activities	54
16	Professional services	M	69-75	Professional, scientific and technical activities	55-61
17	Support services	N	77-82	Administration and support service activities	62-67
18	Public admin. & defence	O	84	Public administration and defence etc	68
19	Education	P	85	Education	69
20	Health & social work	Q	86-88	Human health and social work	70-72
21	Arts & entertainment	R	90-93	Arts, entertainment and recreation; other services	73-76
22	Other services	S	94-96	Other service activities	77-79

The *Working Futures* results are based on 79 categories defined in terms of SIC2007 divisions. There are in fact 88 divisions in SIC2007 but the choice of 79 categories results from the limited availability of robust employment data and subsequent aggregation of some tiny categories. Agriculture is included, together with forestry and fishing.

Table A.3: Detailed industries used in Working Futures (2007 SIC)

Ind79	Ind79 name	SIC2007 Section	SIC2007 Division	Full industry name	22 industries	6 Industries
1	Agriculture, etc	A	01-03	01-03:Agriculture, forestry, fishing	1	1
2	Coal, oil & gas	B	05-06	05-06:Coal, oil and gas	2	1
3	Other mining		07-08	07-08:Other mining and quarrying	2	1
4	Mining support		09	09:Mining support service activities	2	1
5	Food products	C	10	10:Food products	3	2
6	Beverages & tobacco		11-12	11-12:Beverages and tobacco products	3	2
7	Textiles		13	13:Textiles	5	2
8	Wearing apparel		14	14:Wearing apparel	5	2
9	Leather, etc		15	15:Leather and related products	5	2
10	Wood etc		16	16:Wood and wood andcork products	5	2
11	Paper, etc		17	17:Paper and paper products	5	2
12	Printing & recording		18	18:Printing and reproduction of recorded media	5	2
13	Coke & petroleum		19	19:Coke and refined petroleum products	5	2
14	Chemicals, etc		20	20:Chemicals and chemical products	5	2
15	Pharmaceuticals		21	21:Pharmaceutical products	5	2
16	Rubber & plastic		22	22:Rubber and plastic products	5	2
17	Other non-metallic		23	23:Other non-metallic mineral products	5	2
18	Basic metals		24	24:Basic metals	5	2
19	Metal products		25	25:Metal products except machinery and equipment	5	2
20	Computers, etc		26	26:Computer, electronic and optical products	4	2
21	Electrical equipment		27	27:Electrical equipment	4	2
22	Machinery etc		28	28:Machinery and equipment n.e.c.	4	2
23	Motor vehicles, etc		29	29:Motor vehicles, trailers and semi-trailers	5	2
24	Other trans. equipment		30	30:Other transport equipment	5	2
25	Furniture		31	31:Furniture	5	2
26	Other manufacturing		32	32:Other manufacturing	5	2
27	Repair & installation		33	33:Repair and installation of machinery and equipmment	5	2
28	Electricity, gas, etc	D	35	35:Electricity, gas, steam and air conditioning supply	6	1
29	Water	E	36	36:Water collection, treatment and supply	7	1
30	Sewerage		37	37:Sewerage	7	1
31	Waste management		38-39	38-39:Waste and waste management services	7	1
32	Construction	F	41	41:Construction of buildings	8	3
33	Civil engineering		42	42:Civil engineering	8	3
34	Specialised construction		43	43:Specialised construction activities	8	3
35	Motor vehicle trade	G	45	45:Wholesale and retail trade of motor vehicles and motorcycles	9	4
36	Wholesale trade		46	46:Wholesale trade	9	4
37	Retail trade		47	47:Retail trade	9	4
38	Land transport, etc	H	49	49:Land transport and transport via pipelines	10	4
39	Water transport		50	50:Water transport	10	4
40	Air transport		51	51:Air transport	10	4
41	Warehousing, etc		52	52:Warehousing and support activities for transportation	10	4
42	Postal & courier		53	53:Postal and courier activities	10	4
43	Accommodation	I	55	55:Accommodation	11	4
44	Food & beverage services		56	56:Food and beverage service activities	11	4
45	Publishing activities	J	58	58:Publishing activities	12	5
46	Film & music		59	59:Motion picture, video and music publishing	12	5
47	Broadcasting		60	60:Programming and broadcasting activities	12	5
48	Telecommunications		61	61:Telecommunications	13	5
49	Computing programming etc		62	62:Computer programming, consultancy and related activities	13	5
50	Information services		63	63:Information service activities	12	5
51	Financial services	K	64	64:Financial service activities	14	5
52	Insurance & pensions		65	65:Insurance and pension funding	14	5
53	Auxiliary financial services		66	66:Activities auxiliary to financial services and insurance	14	5
54	Real estate	L	68	68:Real estate activities	15	5
55	Legal & accounting	M	69	69:Legal and accounting activities	16	5
56	Head offices, etc		70	70:Activities of head offices; management consultancy activities	16	5
57	Architectural & related		71	71:Architectural and engineering activities	16	5
58	Scientific research		72	72:Scientific research and development	16	5
59	Advertising, etc		73	73:Advertising and market research	16	5
60	Other professional		74	74:Other professional, scientific and technical activities	16	5
61	Veterinary		75	75:Veterinary activities	16	5
62	Rental & leasing	N	77	77:Rental and leasing activities	17	5
63	Employment activities		78	78:Employment activities	17	5
64	Travel, etc		79	79:Travel agency and tour operator activities	17	5
65	Security, etc		80	80:Security and investigation activities	17	5
66	Services to buildings		81	81:Services to buildings and landscape activities	17	5
67	Office admin.		82	82:Office administrative; office support activities	17	5
68	Public admin. & defence	O	84	84:Public administration and defence; compulsory social security	18	6
69	Education	P	85	85:Education	19	6
70	Health	Q	86	86:Human health activities	20	6
71	Residential care		87	87:Residential care activities	20	6
72	Social work		88	88:Social work activities without accommodation	20	6
73	Arts & entertainment	R	90	90:Creative, arts and entertainment activities	21	5
74	Libraries, etc		91	91:Library, archives, museums and other cultural activities	21	5
75	Gambling		92	92:Gambling and betting activities	21	5
76	Sport & recreation		93	93:Sport activities, amusement and recreational activities	21	5
77	Membership organisations	S	94	94:Activities of membership organisations	22	5
78	Repair of goods		95	95:Repair of computers and personal household goods	22	5
79	Other personal service		96	96:Other personal service activities	22	5

Annex A: Qualification levels



Main stages of education / employment	Qualifications and Credit Framework/National Qualifications Framework for England, Wales and Northern Ireland* www.ofqual.gov.uk	Credit and Qualification Framework for Wales www.cqfw.net	National Framework of Qualifications for Ireland www.nfq.ie	The Scottish Credit and Qualifications Framework www.scqf.org.uk	Framework for higher education qualifications in England, Wales and Northern Ireland www.qaa.ac.uk/academicinfrastructure/fheq
	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL
Professional or postgraduate education, research or employment	8 Vocational Qualifications Level 8	8 Doctoral Degrees	10 Doctoral Degree, Higher Doctorate	12 Professional Development Awards, Doctoral Degrees	8 Doctoral Degrees
	7 Fellowships, NVQ Level 5, Vocational Qualifications Level 7	7 Master's Degrees, Integrated Master's Degrees, Postgraduate Diplomas, Postgraduate Certificate in Education (PGCE), Postgraduate Certificates	9 Master's Degree, Post-graduate Diploma	11 SVQ Level 5, Professional Development Awards, Postgraduate Diplomas, Master's Degrees, Integrated Master's Degrees, Postgraduate Certificates,	7 Master's Degrees, Integrated Master's Degrees, Postgraduate Diplomas, Postgraduate Certificate in Education (PGCE), Postgraduate Certificates
Higher education Advanced skills training	6 Vocational Qualifications Level 6	6 Bachelor's Degrees with Honours, Bachelor's Degrees, Professional Graduate Certificate in Education (PGCE), Graduate Diplomas, Graduate Certificates	8 Honours Bachelor Degree, Higher Diploma	10 Bachelor's Degrees with Honours, Professional Development Awards, Graduate Diplomas, Graduate Certificates	6 Bachelor's Degrees with Honours, Bachelor's Degrees, Professional Graduate Certificate in Education (PGCE), Graduate Diplomas, Graduate Certificates
Entry to professional graduate employment			7 Ordinary Bachelor Degree	9 Bachelor's/Ordinary Degrees, Professional Development Awards, SVQ Level 4, Graduate Diplomas, Graduate Certificates	
	5 NVQ Level 4, Higher National Diplomas, (HND), Higher National Certificates (HNC), Vocational Qualifications Level 5	5 Foundation Degrees, Diplomas of Higher Education (DipHE), Higher National Diplomas (HND)		8 Higher National Diplomas, SVQ Level 4, Professional Development Awards, Diplomas of Higher Education (DipHE)	5 Foundation Degrees, Diplomas of Higher Education (DipHE), Higher National Diplomas (HND)
Specialised education and training	4 Vocational Qualifications Level 4	4 Higher National Certificates (HNC), Certificates of Higher Education (CertHE)	6 Advanced Certificate, Higher Certificate	7 Professional Development Awards, Higher National Certificates (HNC), Certificates of Higher Education (CertHE) SVQ Level 3, Advanced Highers,	4 Higher National Certificates (HNC), Certificates of Higher Education (CertHE)
Qualified/Skilled worker Entry to higher education Completion of secondary education	3 NVQ Level 3, Vocational Qualifications Level 3, GCE AS and A Level, Advanced Diplomas	3 NVQ Level 3, Vocational Qualifications Level 3, GCE AS and A Level, Welsh Baccalaureate Qualification Advanced	5 Level 5 Certificate, Leaving Certificate	6 Highers, SVQ Level 3, Professional Development Awards, National Progression Awards, National Certificates	
Progression to skilled employment. Continuation of secondary education.	2 NVQ Level 2, Vocational Qualifications Level 2, GCSEs at grade A*–C, ESOL skills for life, Higher Diplomas, functional skills Level 2 (English, mathematics & ICT)	2 NVQ Level 2, Vocational Qualifications Level 2, Welsh Baccalaureate Qualification Intermediate, GCSEs grade A*–C	4 Level 4 Certificate, Leaving Certificate	5 Intermediate 2, Credit Standard Grade, SVQ 2, National Progression Awards, National Certificates	
Secondary education Initial entry into employment or further education	1 NVQ Level 1, Vocational Qualifications Level 1, GCSEs at grade D–G, ESOL skills for life, Foundation Diplomas, functional skills Level 1 (English, mathematics & ICT)	1 NVQ Level 1, Vocational Qualifications Level 1, GCSEs at grade D–G, Welsh Baccalaureate Qualification Foundation	3 Level 3 Certificate, Junior Certificate	4 Intermediate 1, General Standard Grade, Scottish Vocational Qualifications (SVQ) 1, National Progression Awards, National Certificates	
	Entry Level Entry Level Certificates (sub levels 1–3), ESOL skills for life, functional skills Entry Level (English, mathematics & ICT)	Entry Level Entry Level Certificate (sub levels 1–3)	2 Level 2 Certificate	3 Access 3, Foundation Standard Grades, National Progression Awards, National Certificates	
Qualifications can be taken at any age in order to continue or return to education or training			1 Level 1 Certificate	2 Access 2, National Progression Awards, National Certificates 1 Access 1	

* The Qualifications and Credit Framework (QCF) will eventually replace the National Qualifications Framework (NQF).

The table gives an indication of how you can compare qualifications across national boundaries. Examples of major qualifications at each level are provided. For more detail of the qualifications in another country, you will need to consult the website given at the head of each column.

This leaflet is designed to give some information to help you begin this process, for example, by telling you what your qualification, or qualifications you are interested in studying, are broadly comparable to in other countries.

Qualifications can cross boundaries
– a rough guide to comparing qualifications in the UK and Ireland. July 2009.

Source: Qualifications can cross boundaries – a rough guide to comparing qualifications in the UK and Ireland

Evidence Reports present detailed findings of the research produced by the UK Commission for Employment and Skills. The reports contribute to the accumulation of knowledge and intelligence on skills and employment issues through the review of existing evidence or through primary research. All of the outputs of the UK Commission can be accessed on our website at www.ukces.org.uk

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