



UK COMMISSION FOR
EMPLOYMENT AND SKILLS

Working Futures

Report for Wales

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***Working Futures 2010-2020:* Summary report for Wales**

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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 Wales. 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.

Lesley Giles

Deputy Director

UK Commission for Employment and Skills

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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 Wales. 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:

- The rate of increase in gross value added (GVA) in Wales was slower than the UK average between 2000 and 2010 and is projected to continue to be slower for the period 2010 to 2020.
- Employment growth in Wales was stronger than the UK between 2000 and 2010, but is projected to increase at the same rate as the UK as a whole between 2010 and 2020.
- Population growth is projected to be slower in Wales than in the UK as a whole between 2010 and 2020.
- Workplace employment is projected to increase faster than the number of employed residents, with the implication that much of the projected employment growth may be filled by inward commuters into Wales.
- Male employment is projected to grow twice as fast as female employment, meaning that the male share of total employment is expected to increase slightly from 52.7 per cent in 2010 to 53.4 per cent in 2020.
- There is projected to be a small shift away from full-time towards part-time working between 2010 and 2020. The projected rate of growth of part-time working is faster for males than females.
- The projections indicate a higher rate of growth in output in the *Primary and utilities* and *Manufacturing* sectors in Wales than for the UK between 2010 and 2020. *Business and other services* is expected to see the fastest rate of output growth in Wales overall.
- *Primary and utilities*, *Construction* and *Trade, accommodation and transport* are expected to see employment growth that is ahead of the UK average rate between 2010 and 2020, whilst *Manufacturing* is expected to see a smaller decline in employment than the UK average over the same period.

- The relative shift of employment away from the *Manufacturing* sector towards the service sector is projected to continue. *Trade, accommodation and transport* is projected to be the largest industry sector in terms of employment in 2020.
- The shift in the occupational profile of employment away from lower-skilled occupations towards higher-skilled occupations is projected to continue. This is expected to benefit women in particular. The number of people in *Elementary occupations* is projected to decline (in contrast to the UK as a whole) because the loss of female jobs will outweigh the gain in male jobs in this occupational group.
- The qualification profile of employed people in Wales has improved and is projected to continue to improve. In 2000, around one third of jobs were held by people with no or low level qualifications but by 2020 this figure is projected to fall to just over one fifth. By 2020 more than two-fifths of jobs are expected to be held by people with higher level qualifications (level 4 and above).
- Job openings resulting from replacement demands are projected to be almost eight times greater than those arising from net growth in employment in Wales 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 Wales.

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 Wales 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.

A forthcoming report will present the impact of a “low growth scenario” on the *Working Futures* labour market projections, in order to assess their sensitivity to a deliberately pessimistic set of assumptions about the future development of the economy.

When reviewing the current document the reader should 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 changes which are likely to occur in the labour market 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. Comparing 2010-2020 with 2000-2010, there is forecast to be a relative improvement in economic growth relative to England in Wales, but a deterioration in Scotland, 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 and the UK's return to recession in 2012. 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 by the Office for National Statistics and other data providers. All of these factors could have an 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 by such revisions.

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 Report¹, available at www.ukces.org.uk/ourwork/working-futures

It should be noted that, unless otherwise stated, references to employment in the analysis relate to the number of jobs rather than a headcount of individuals.

¹ (Wilson, R. A., and K. Homenidou (2012). *Working Futures 2010-2020: Technical Report*. UK Commission for Employment and Skills: Wath on Dearne).

3 Headline employment and output changes

For the UK as a whole, output (measured by Gross Value Added²) 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 estimated annual average rate of 1.5 per cent for 2000 to 2010 (see 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 different for Wales. GVA grew more slowly than the other nations between 2000 and 2010. The projected annual average rate of GVA growth is more than twice as fast for 2010-2020, but is still slower than for England and Northern Ireland.

The annual average rate of growth of employment in Wales was nearly twice as fast as for the UK during 2000-2010, but employment (expansion demand) is projected to grow more slowly between 2010 and 2020, at the same rate as England and Northern Ireland, and faster than Scotland.

Table 1: Overall employment and output change in the UK and constituent nations (annual average percentage rates of change)³

	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

² The output data in the model are expressed in terms of chained volume measures, with reference year 2006.

³ At the time that these output (GVA) forecasts were produced in spring 2011 the most recent official data that were available related to 2009. Therefore, the GVA figures in the model for 2010 are forecast values. Since the forecasts were produced revisions have been made to official historic estimates of GVA, which if applied to the model may result in some differences to the results compared with those presented here.

4 Trends in labour supply and demand, 2010-2020

This section sets the projected employment changes for Wales within the context of projected changes in the population and labour force using a range of measures⁴.

The Welsh population is projected to be 2.9 per cent larger in 2020 than 2010 (an increase of 88,000), but projected UK population growth is more than twice as rapid, at 6.1 per cent over the decade.

The population aged 16 and over is projected to increase by 77,000 (3.1 per cent), but the working age population is only projected to increase by 46,000 (2.6 per cent), since much of the increase in the former is due to the increasing number of people of pensionable age.

Table 2: Change in population, working age population, labour force, activity rate, unemployment and employment⁵

Indicator	Wales				UK	
	2010	2020	Change	%	Change	%
Total population (000s)	3,003	3,091	88	2.9	3,786	6.1
Aged 16+ (000s)	2,456	2,533	77	3.1	3,009	6.0
Working age population (000s)	1,797	1,843	46	2.6	2,581	6.7
Labour Force (000s)	1,423	1,429	6	0.4	1,442	4.6
Workforce (000s)	1,412	1,480	68	4.8	1,376	4.3
Economic activity rate 16+(%)	57.9	56.4	-1.5		-0.8	
Economic activity rate 16-64(%)	73.0	74.2	1.2		1.5	
ILO Unemployment (000s)	119	116	-3	-2.3	-247	-10.0
ILO unemployment rate (%)	8.4	8.1	-0.2		-1.1	
Claimant unemployment (000s) ⁶	73	71	-2	-2.6	-149	-10.0
Claimant unemployment rate (%)	5.2	4.8	-0.4		-0.6	
Employed residents (000s)	1,304	1,313	9	0.7	1,689	5.8
Workplace employment (000s)	1,333	1,404	71	5.3	1,533	5.0

Source: Working Futures

Note: Figure for workplace employment includes HM Forces

Workplace employment (the total number of jobs in Wales) is projected to increase at a slightly faster rate than the UK average for the 2010-20 period as a whole (by 71,000 or 5.3 per cent, compared with 5.0 per cent growth for the UK). Meanwhile growth in the number

⁴ Definitions of the terms used are contained in Box 1 of the Technical Appendix.

⁵ Figures relating to the workforce, workplace employment, ILO unemployment rate and claimant unemployment rate have been corrected since the publication of the original version of the main UK Working Futures report. A revised version of the main report was issued in August 2012 that takes account of these changes. This table contains data that are consistent with that revised report.

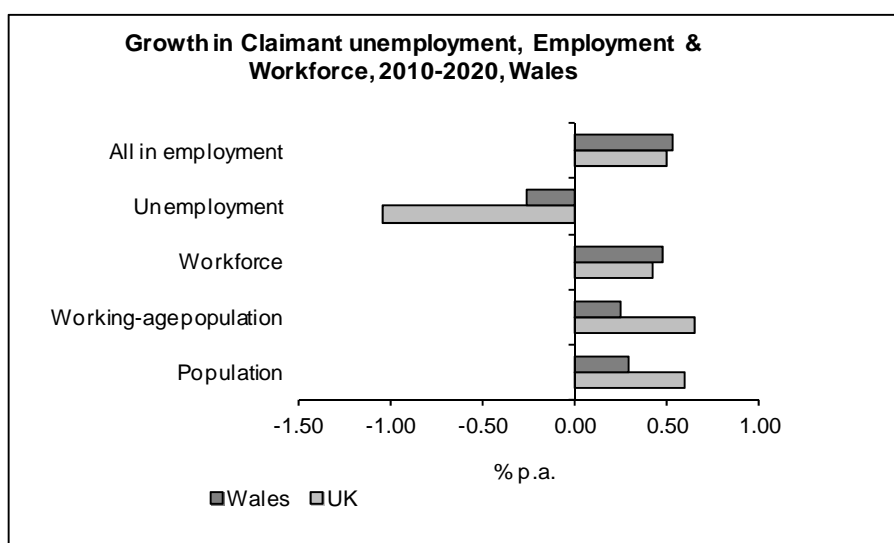
⁶ It should be noted that the introduction of Universal Credit and the replacement of Jobseekers Allowance will mean that claimant count statistics will no longer be available in their current form in future.

of employed residents is expected to be much slower than the rate of jobs growth at only 9,000 or 0.7 per cent. This suggests that there is the potential for inward commuters to take many of the new jobs created in Wales between 2010 and 2020.

This may be one reason why the number of unemployed people (on the ILO definition) is projected to decline much more slowly (by 3,000 or 2.3 per cent) in Wales than in the UK as a whole between 2010 and 2020, and the unemployment rate is projected to fall by only 0.2 percentage points (compared with 1.1 percentage points for the UK).

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 over⁷) is projected to fall by 1.5 percentage points, almost twice as rapidly as in the UK as a whole. However, the economic activity rate for those of working age (16-64 years) is projected to increase by 1.2 percentage points in Wales over the period, slightly lower than the projected UK increase of 1.5 per cent.

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



Source: Working Futures

⁷ The main indicator of economic activity used in *Working Futures* relates to people aged 16 and over, whereas the headline rate of economic activity used in official statistics relates to people of working age (16-64 years old.)

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

Males formed a small majority of all those in work in Wales in 2010 (52.7 per cent). The number of males in work is projected to increase twice as fast as the number of women in work between 2010 and 2020, and hence the male share of employment is projected to be 0.7 percentage points higher in 2020 (Table 3).

There is projected to be a shift away from full-time towards part-time work during this decade, with the proportion of jobs held by full-time employees falling from 55.2 per cent to 53.9 per cent between 2010 and 2020. Despite this fall in share, the number of male full-time employees is projected to increase by 2.6 per cent while female full-time employment is projected to increase by 3.4 per cent.

Part-time male employment accounts for nearly twice as many new jobs as male full-time employment between 2010 and 2020, with a projected growth rate for part-time jobs of 21.3 per cent. Female part-time employment is projected to grow at a rate that is only one third of that projected for men.

15 per cent of jobs were held on a self-employed basis in 2010, and while this percentage is projected to remain the same in 2020, there is a small projected shift from female to male self-employment.

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 Wales, 2010-2020

	2010		2020		2010-2020	
	000s	Percent	000s	Percent	Change (000s)	% change
Male	701	52.7	748	53.4	47	6.7
Male Full-Time	465	35.0	477	34.1	12	2.6
Male Part-Time	100	7.5	121	8.7	21	21.3
Male Self-Employed	136	10.2	150	10.7	14	10.3
Female	629	47.3	653	46.6	24	3.8
Female Full-Time	269	20.2	278	19.9	9	3.4
Female Part-Time	295	22.2	313	22.4	18	6.2
Female Self-Employed	65	4.9	61	4.4	-3	-5.1
Full-Time employees	735	55.2	756	53.9	21	2.9
Part-time employees	395	29.7	435	31.0	40	10.0
Employees	1,130	85.0	1,190	85.0	61	5.4
Self-employed	200	15.0	211	15.0	11	5.3
Total employment	1,330	100.0	1,401	100.0	71	5.4

Source: Working Futures

6 Employment and GVA change by industry

The annual average rate of increase in output (GVA) was somewhat slower than the UK average during 2000 to 2010 in Wales. Growth in output is projected to remain about 0.5 percentage points per annum slower than the UK average from 2010 to 2020. Table 4 presents a comparison of annual average rates of output change by broad industry sector for Wales and the UK. (The technical appendix provides details of the industry classification used in *Working Futures*.)

In Wales, GVA declined in the *Primary and utilities*, *Manufacturing* and *Construction* sectors between 2000 and 2010 and increased in the *Trade, accommodation and transport*, *Business and other services* and *Non-market services* sectors (Table 4). In the UK, the only sectors in which output declined were the *Primary and utilities* and *Manufacturing* sectors. The rate of decline of output was much faster in Wales than the UK in the *Primary and utilities* and *Construction* sectors. The fastest rates of GVA growth in Wales were recorded by the *Business and other services* and *Trade, accommodation and transport* sectors. The latter was the only sector to grow faster in Wales than across the UK as a whole.

The pattern of projected change in output for 2010 to 2020 for Wales is more similar to that for the UK, with growth projected for all sectors. The *Primary and utilities* and *Manufacturing* sectors, are projected to grow slightly faster than the UK average and the *Non-market services* sector is projected to grow at the UK average rate. The fastest rate of projected growth is for the *Business and other services* sector, which is expected to grow somewhat slower than the UK average for the sector.

Table 4: Average annual rate of change in GVA by industry sector, Wales and the UK 2000-2020⁸⁹

Industry sector	Wales		UK	
	2000-2010	2010-2020	2000-2010	2010-2020
Primary sector and utilities	-6.9	0.8	-1.9	0.5
Manufacturing	-1.3	2.6	-1.2	2.4
Construction	-0.5	2.2	1.4	2.4
Trade, accomod. and transport	2.2	2.5	1.6	3.0
Business and other services	2.5	3.4	2.9	3.8
Non-market services	1.5	0.7	1.6	0.7
All industries	0.9	2.2	1.5	2.7

Source: Working Futures

Between 2000 and 2010, employment in Wales declined fastest in the *Manufacturing* sector and also declined in the *Primary and utilities* sector (Table 5). The rate of employment decline in the *Manufacturing* sector was slightly slower in Wales than across the UK, whereas in the *Primary and utilities* sector employment increased at the UK level. Employment grew strongly relative to the UK in *Trade, accommodation and transport* and slightly faster than the UK average in *Construction* and *Business and other services*, but more slowly than the UK average in *Non-market services*.

For the 2010 to 2020 period, employment is projected to decline more slowly than in the UK as a whole in the *Manufacturing* sector in Wales and to grow slowly in the *Primary and utilities* sectors, whilst the UK is projected to see decline. Similar to the UK as a whole, employment is projected to decline slowly in the *Non-market services* sector. Employment is projected to grow faster than the UK average in the *Construction* and *Trade, accommodation and transport* sectors, but grow slower than the UK in the *Business and other services* sector.

⁸ Since the *Working Futures* main report was published in December 2011, a number of corrections have been made to the output (GVA) figures generated by the model. Estimates and projections of employment levels are unaffected by these changes. A revised version of the main report was issued in August 2012 that takes account of these changes to the output data. This table contains data that are consistent with that revised report.

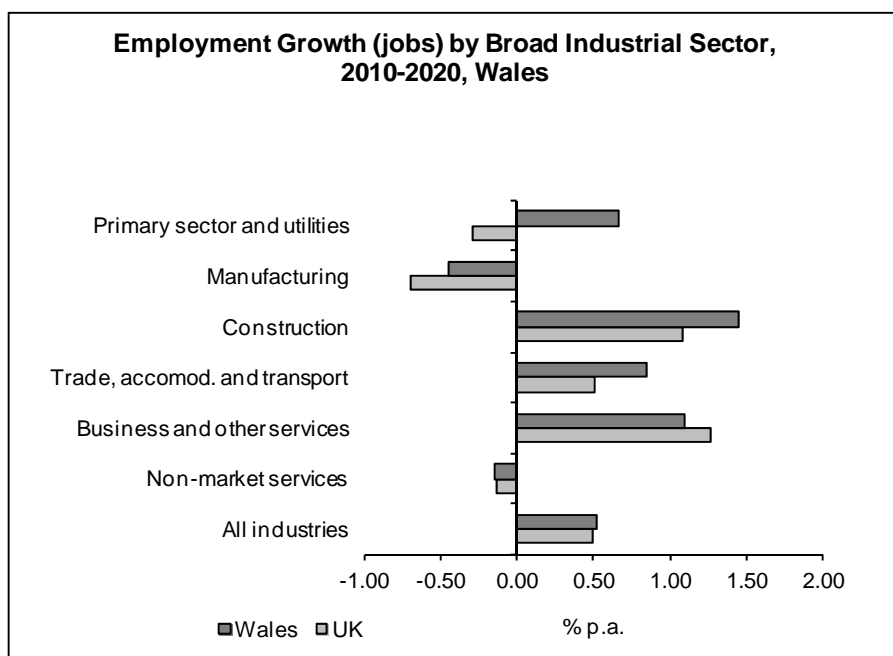
⁹ At the time that these output (GVA) forecasts were produced in spring 2011 the most recent official data that were available related to 2009. Therefore, the GVA figures in the model for 2010 are forecast values. Since the forecasts were produced revisions have been made to official historic estimates of GVA, which if applied to the model may result in some differences to the results compared with those presented here.

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

Industry sector	Wales		UK	
	2000-2010	2010-2020	2000-2010	2010-2020
Primary sector and utilities	-1.6	0.7	0.3	-0.3
Manufacturing	-4.3	-0.4	-4.5	-0.7
Construction	1.0	1.4	0.8	1.1
Trade, accomod. and transport	1.7	0.8	0.0	0.5
Business and other services	1.5	1.1	1.3	1.3
Non-market services	1.6	-0.1	2.0	-0.1
All industries	0.7	0.5	0.4	0.5

Source: Working Futures

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



Source: Working Futures

Table 6 shows how the industrial profile of Wales has changed from 1990 to 2010 and is expected to change between 2010 and 2020. The *Primary and utilities* and *Manufacturing* sectors together accounted for a quarter of employment in 1990, but by 2020 they are expected to account for about an eighth of employment. The decline in the combined employment share of these sectors is projected to slow down relative to recent decades, with *Primary and utilities* projected to retain a constant share of employment between 2010 and 2020.

The share of employment in the *Construction* sector declined between 1990 and 2000, but the sector is projected to grow its share between 2010 and 2020. The *Trade, accommodation and transport* sector had the largest share of employment in 1990, but was overtaken by *Non-market services* by 2000, and both expanded their share of employment between 2000 and 2010. The employment share of the former is projected to continue to grow between 2010 and 2020, while the share of *Non-market services* is projected to decline. The share of employment in the *Business and other services* sector is projected to continue to increase in Wales between 2010 and 2020, although it is expected to account for a smaller share of total employment in 2020 (22 per cent) than the UK average of 32 per cent.

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

Industry sector	Percentage share of total employment			
	1990	2000	2010	2020
Primary sector and utilities	6.5	4.1	3.3	3.3
Manufacturing	18.4	16.5	10.0	9.0
Construction	7.9	7.0	7.3	7.9
Trade, accomod. and transport	26.9	25.7	28.4	29.4
Business and other services	16.7	19.2	20.8	22.0
Non-market services	23.7	27.4	30.3	28.3
All industries (000s)	1,259	1,246	1,330	1,401

Source: *Working Futures*

7 Occupational employment change

The pattern of projected occupational¹⁰ employment change between 2010 and 2020 for males and females is presented in Table 7 and Figure 3. Occupational employment trends are projected to be broadly similar in Wales to the UK as a whole, with faster growth in higher skilled occupations and employment loss in less skilled occupations, but there are some notable differences.

The projected rate of increase in employment between 2010 and 2020 is fastest for *Managers* in Wales. Whilst the level of employment among *Professionals* is projected to grow slightly faster than the UK average rate, the rate of growth of employment in *Managers* and *Associate professional and technical* occupations is expected to be slower than the UK average.

Turning to employment in less skilled non-manual and manual occupations, the rate of employment loss for people in *Administrative and secretarial* occupations is projected to be similar to the UK as a whole. The number of people working in *Skilled trades* occupations is projected to grow, as a result of an increase in male employment in this occupation, in contrast to a projected decline for the UK as a whole. Employment in *Sales and customer service* occupations is projected to grow much faster than the UK average. This is entirely due to growth in female employment in this occupation. In contrast, the number of people working in *Caring, leisure and other service* occupations is projected to grow at a slower rate than for the UK as a whole. The projected rate of decline in employment in *Process, plant and machine operatives* is projected to be faster than in the UK as a whole and the number of people working in *Elementary occupations* is projected to decline slightly, in contrast with the projected increase for the UK as a whole.

¹⁰ The Standard Occupational Classification (SOC) is used, which provides a common classification system for occupational information for the United Kingdom. Within the context of the classification jobs are classified in terms of their skill level and skill content (skill specialisation). See Office for National Statistics (2010), *Standard Occupational Classification 2010: Volume 1: Structure and description of unit group*. Office for National Statistics: Newport.

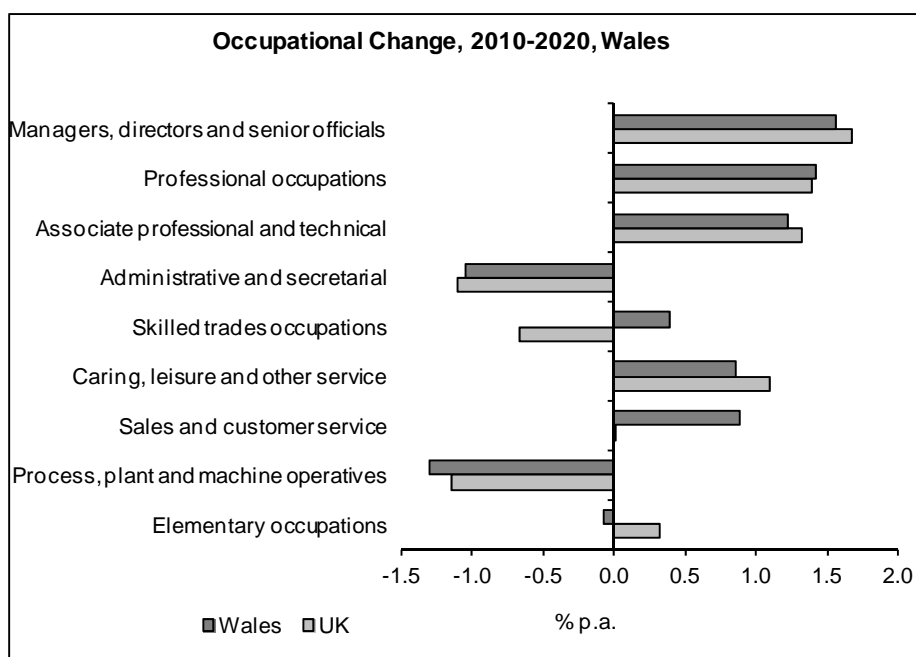
Table 7: Change in employment by occupation in Wales, 2010-2020

Standard Occupational Classification (SOC) 2010 Major group	Males		Females		% change in total employment 2010-2020	
	change 000s	% change	change 000s	% change	Wales	UK
Managers, directors and senior officials	10	12.8	8	25.7	16.8	18.0
Professional occupations	9	8.2	26	21.3	15.1	14.9
Associate professional and technical	8	9.7	10	17.3	12.9	14.0
Administrative and secretarial	4	10.1	-19	-16.1	-10.0	-10.5
Skilled trades occupations	10	6.3	-3	-13.9	4.0	-6.5
Caring, leisure and other service	4	16.6	8	7.3	8.9	11.5
Sales and customer service	0	0.0	11	13.4	9.1	0.1
Process, plant and machine operatives	-7	-7.9	-6	-40.1	-12.3	-10.9
Elementary occupations	11	12.5	-12	-16.8	-0.8	3.2
All occupations	47	6.7	24	3.8	5.4	5.1

Source: Working Futures

Within Wales, there are notable differences in projected employment changes by gender. Women are projected to experience much faster rates of employment increase in higher status occupations relative to growth rates for men. On the other hand, female employment in *Administrative and secretarial*, *Skilled trades* and *Elementary* occupations is projected to decline compared with projected growth for men. Women are also projected to experience much higher rates of job loss than men in *Process, plant and machine operatives* roles. For men, the highest projected rate of job increase is in *Caring, leisure and other service* occupations, albeit from a low base.

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



Source: Working Futures

Table 8: Employment shares by occupation in Wales, 1990 to 2020

Standard Occupational Classification (SOC) 2010 Major group	Percentage share of employment			
	1990	2000	2010	2020
Managers, directors and senior officials	6.9	6.7	8.1	9.0
Professional occupations	13.1	14.8	17.3	18.9
Associate professional and technical	8.7	9.9	10.5	11.2
Administrative and secretarial	13.3	13.0	11.6	9.9
Skilled trades occupations	18.3	14.8	13.9	13.7
Caring, leisure and other service	5.5	8.5	9.6	10.0
Sales and customer service	8.7	8.9	9.4	9.7
Process, plant and machine operatives	11.8	10.3	7.9	6.6
Elementary occupations	13.6	13.2	11.7	11.1
All occupations (000s)	1,259	1,246	1,330	1,401

Source: Working Futures

Table 8 shows how the occupational profile of employment in Wales has evolved and is projected to continue to change over the period 1990 to 2020.

The share of employment accounted for by higher level occupations has steadily increased, such that *Professional* occupations alone are projected to account for nearly a fifth of employment in 2020. While the growth of employment in *Associate professional and technical* occupations has been slower, the combined share of employment for *Managers, Professionals* and *Associate professional / technical* occupations is projected to increase from 28.7 per cent in 1990 to 39.1 per cent in 2020.

On the other hand, the share of employment in *Administrative and secretarial* occupations is projected to continue the decline experienced since 1990, accounting for less than 10 per cent of employment in 2020. The decline in the level of employment in *Skilled trades* jobs is projected to stop between 2010 and 2020 but its share of total employment will decline slightly over the period. Shares of employment in *Process, plant and machine operatives* and *Elementary occupations* are projected to continue to decline. The share of employment in *Caring, leisure and other service* occupations is projected to be close to twice as high in 2020 as in 1990, while the share of *Sales and customer service* occupations in total employment is projected to increase slightly between 2010 and 2020.

8 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 Wales for 2000, 2010 and 2020 by Qualifications and Credit Framework (QCF) level¹¹.

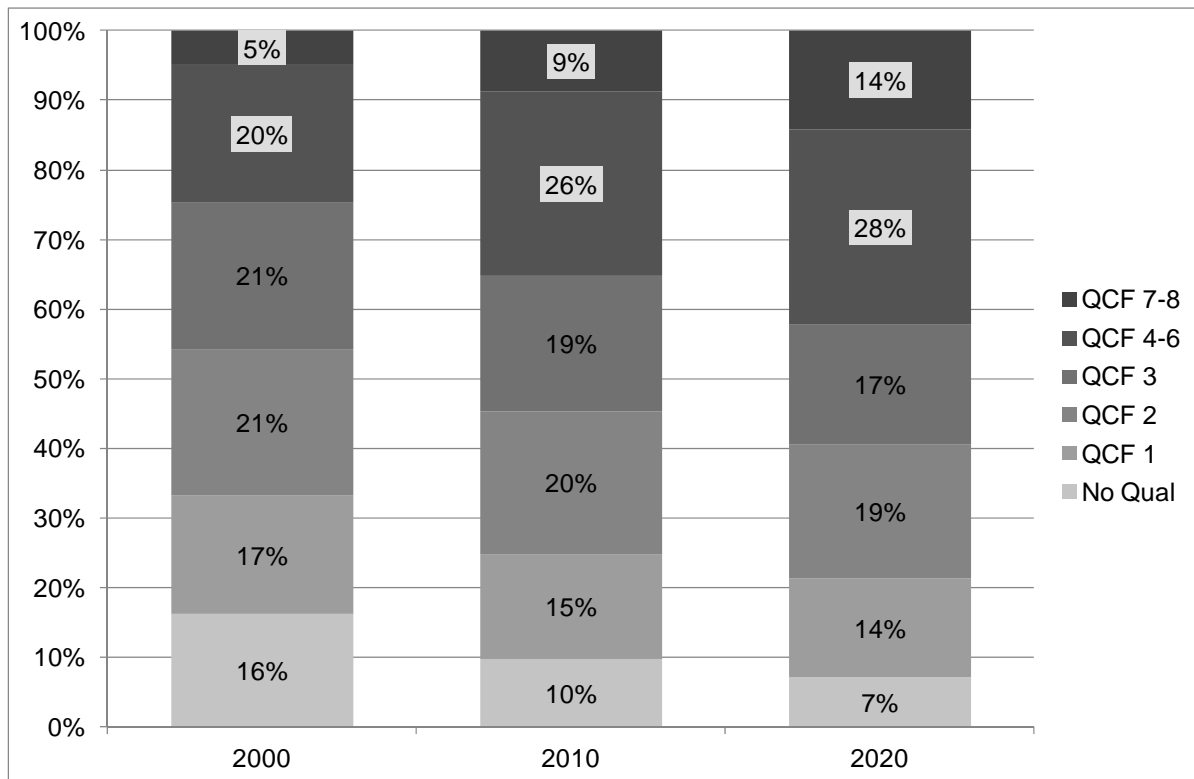
It is estimated that more than one third of jobs in Wales in 2010 were held by people qualified at a high level (QCF4 and above). This represents a substantial improvement on the figure of 25 per cent registered in 2000. It is projected that the proportion qualified at level 4 and above will continue to increase, reaching a point above 40 per cent of 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 just above one-fifth by 2020, compared with around one-third in 2000.

The proportion of jobs held by people qualified at intermediate level (QCF2 and QCF3) is expected to continue to be steadily squeezed between 2010 and 2020.

¹¹The 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.

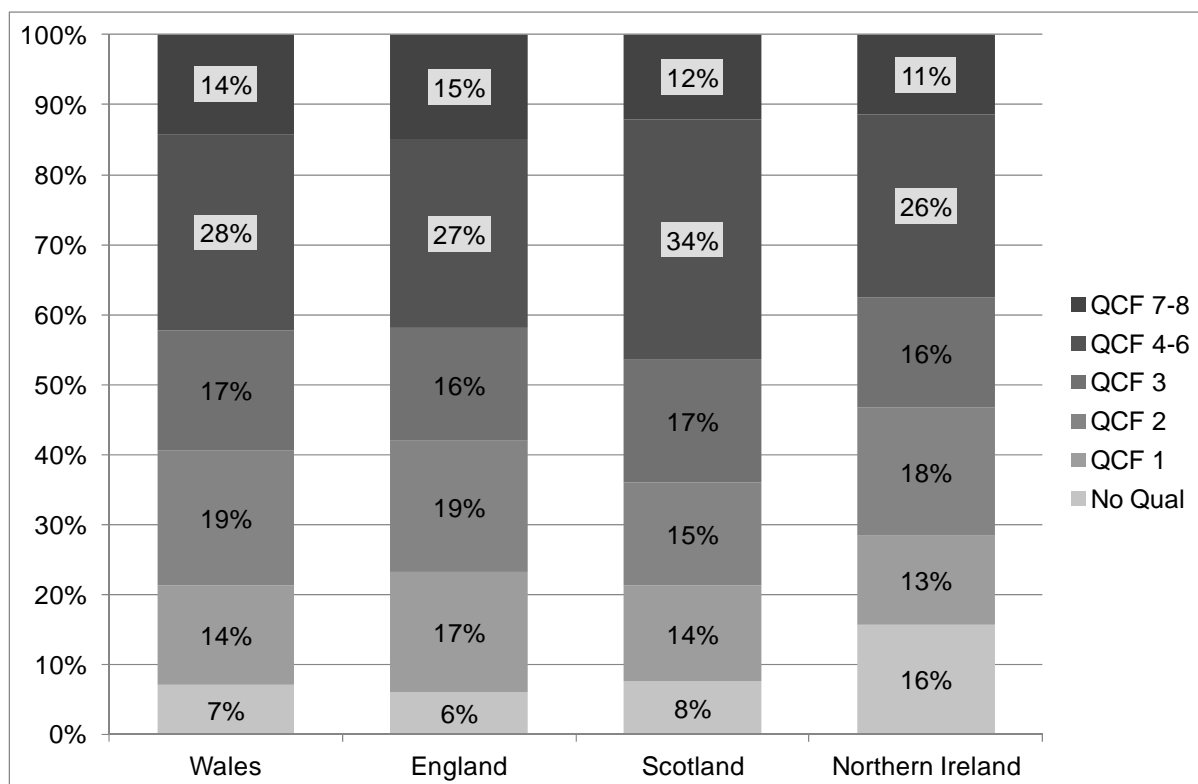
Figure 4: Profile of employment by level of highest qualification held, Wales, 2000 to 2020



Source: Working Futures

Figure 5 compares the projected qualification profile of Wales with that of the other nations of the UK in 2020. The proportion of those employed at a high level (QCF4 and above) in Wales is projected to be similar to England, above Northern Ireland and lower than Scotland. However, the proportion of employment at postgraduate level (QCF levels 7 and 8) is projected to be higher in Wales than Scotland and Northern Ireland. At the other end of the spectrum, the percentage with no or low qualifications in Wales (QCF1 and below) is projected to be similar to England and Scotland but lower than in Northern Ireland.

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



Source: Working Futures

9 Replacement demand

The *Working Futures* projections also include estimates of employers' need to replace workers due to mortality, retirement 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 Wales, total projected replacement demand for the period 2010 to 2020, at 539,000 job openings, is equivalent to 40 per cent of the opening stock of employment in 2010 (1.33 million) (see Table 9). As with the UK average, replacement demand in Wales is projected to be around eight times the size of net employment growth ("expansion demand") for the period (around 71,000)¹².

Table 9: Changing composition of employment by occupation, Wales

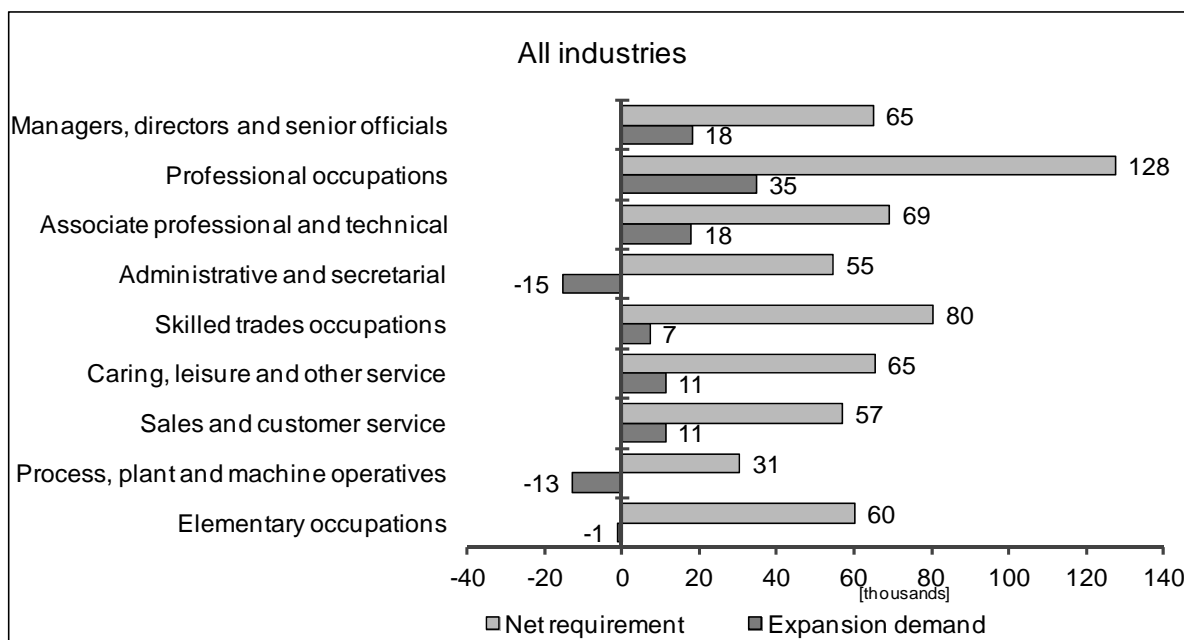
Standard Occupational Classification (SOC) 2010 Major group	Employment levels (000s)		Net change (000s)	Replacement demands (000s)	Total requirement (000s)
	2010	2020	2010-2020	2010-2020	2010-2020
Managers, directors and senior officials	108	126	18	47	65
Professional occupations	230	265	35	93	128
Associate professional and technical	139	157	18	51	69
Administrative and secretarial	154	138	-15	70	55
Skilled trades occupations	185	192	7	73	80
Caring, leisure and other service	128	140	11	54	65
Sales and customer service	124	136	11	46	57
Process, plant and machine operatives	105	92	-13	43	31
Elementary occupations	156	155	-1	61	60
Total	1,330	1,401	71	539	610

Source: *Working Futures*

For *Administrative & secretarial* occupations and *Process, plant and machine operatives*, positive replacement demand outweighs significant 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.

¹² See *Working Futures* main report for more detail on UK position (Wilson, R. A., and K. Homenidou (2011). *Working Futures 2010-2020: Main Report*. UK Commission for Employment and Skills: Wath on Dearne)

Figure 6: Expansion demand and net requirement by Standard Occupational Classification (SOC) 2010 Major group, Wales 2010-2020



Note: Net requirement = expansion demand + replacement demand

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. The largest net requirement is in *Professional* occupations, and the lowest is for *Process, plant and machine operatives*. The chart demonstrates that all occupational groups are projected to see a positive net requirement, including those in which net employment is expected to decline.

10 Conclusion

Wales is forecast to see slower output growth than the UK for the period 2010 to 2020 but a rate of employment growth that is on a par with the UK average.

A number of broad sectors in Wales are projected to see employment performance that is ahead of the UK average between 2010 and 2020, including *Primary and utilities, Manufacturing, Construction and Trade, accommodation and transport*. Employment is projected to grow fastest in the *Construction and Business and other services* sectors.

There is projected to be a substantial shift in employment from less-skilled to more skilled occupations, and this coincides with a marked increase in the educational qualification level of the workforce. However, *Skilled trades and Elementary occupations* are projected to be a major source of new jobs for men over the period 2010 to 2020, whilst *Sales and customer service and Caring, leisure and other service occupations* are projected to see a notable level of growth in female jobs.

The population of Wales is projected to grow at a slower rate than the UK as a whole, and the labour supply will grow slowly. There is potential for much of the projected increase in jobs in Wales to be filled by inward commuters. 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 replacement demand in all occupations. 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 in all occupations.

Technical Appendix

The following appendix provides a brief summary of the technical background to the Working Futures study. For full details please see the Technical Report¹³.

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.

¹³ (Wilson, R. A., and K. Homenidou (2012). *Working Futures 2010-2020: Technical Report*. UK Commission for Employment and Skills: Wath on Dearne).

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 Standard Occupational Classification 2010¹⁴ 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:

¹⁴ The Standard Occupational Classification (SOC) provides a common classification system for occupational information for the United Kingdom. Within the context of the classification jobs are classified in terms of their skill level and skill content (skill specialisation). It was last revised in 2010. See Office for National Statistics (2010), *Standard Occupational Classification 2010: Volume 1: Structure and description of unit group*. Office for National Statistics: Newport.

- 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.¹⁵ 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 Standard Industrial Classification (SIC) 2007¹⁶ and Standard Occupational Classification (SOC) 2010¹⁷;

¹⁵ 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.

¹⁶ The Standard Industrial Classification (SIC) is used to classify business establishments and other statistical units by the type of economic activity in which they are engaged. The classification was last revised in 2007. See Office for National Statistics (2009), *UK Standard Industrial Classification of Economic Activities 2007 (SIC 2007): Volume 1: structure and explanatory notes*. Office for National Statistics: Newport. Also see Table A.1 for details of how industry sectors are classified in *Working Futures*.

¹⁷ See footnote 14.

- 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).

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 used¹⁸:

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 (employee jobs plus self-employment 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.

¹⁸ See the remainder of this technical appendix and the full *Working Futures* Technical Report for details of how each of these definitions are applied in terms of official labour market data and the operation of the model.

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.¹⁹

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.

¹⁹ The headline rate of economic activity used in official statistics relates to people of working age (16-64 years old.)

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		
6. Non-market services	S	94-96	Other service activities	18-20	68-72
	O	84	Public administration and defence etc		
	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 Standard Industrial Classification (SIC) 2007 divisions.


The Standard Industrial Classification (SIC) is used to classify business establishments and other statistical units by the type of economic activity in which they are engaged. The classification was last revised in 2007.

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 and cork 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 equipment	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.cqf.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.scf.org.uk	Framework for higher education qualifications in England, Wales and Northern Ireland www.qaa.ac.uk/academicinfrastructure/theq
	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
Higher education	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
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	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)	7 Ordinary Bachelor Degree	9 Bachelor's/Ordinary Degrees, Professional Development Awards, SVQ Level 4, Graduate Diplomas, Graduate Certificates	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	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	<p>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.</p> <p>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.</p> <p>Qualifications can cross boundaries – a rough guide to comparing qualifications in the UK and Ireland. July 2009.</p> 
Entry to higher 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	
Completion of secondary 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	
Progression to skilled employment.	Entry Level	Entry Level	2 Level 2 Certificate	3 Access 3, Foundation Standard Grades, National Progression Awards, National Certificates	
Continuation of secondary education.	Entry Level Certificates (sub levels 1-3), ESOL skills for life, functional skills Entry Level (English, mathematics & ICT)	Entry Level Certificate (sub levels 1-3)	1 Level 1 Certificate	2 Access 2, National Progression Awards, National Certificates	
Secondary education Initial entry into employment or further education				1 Access 1	

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

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

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