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Working Futures 2010-2020

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Working Futures 2010-2020: Main Report

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THURSDAY 15TH DECEMBER 2011: PUBLICATION OF MAIN REPORT OF WORKING FUTURES 2010-2020 STUDY

The UK Commission for Employment and Skills today publishes the main report of the *Working Futures* 2010-2020 study.

Working Futures is the most detailed and comprehensive set of UK labour market projections available; and is now in its fourth iteration. It focuses on a ten year horizon, providing a picture of the labour market for 2020. Its core purpose is to inform policy development and strategy around skills, careers and employment.

The results provide an insight into the prospects for:

- The sectoral pattern of output and employment
- The occupational structure of employment
- The magnitude and pattern of job openings across the economy, taking into account employment growth and replacement demands
- The demand and supply of qualifications
- The labour markets of the regions and nations of the UK.

The main report published today provides a detailed analysis against all of these key questions and shortly will be supplemented by a sectoral report and a full technical report.

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 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.

Key issues emerging from the report include:

Given the current economic climate, and allowing for some economic recovery over the longer term, it is expected that employment will rise slowly but steadily over the decade as a whole, driven by a significant increase in population levels. Private sector services are projected to be the greatest contributor to employment growth. The long-term rate of employment growth (jobs) is expected to be around ½ a per cent per annum, resulting in around 1½ million *additional jobs* by 2020.

Wider job openings created by people who leave the labour market through retirement and/or for family reasons (so called replacement demand) are projected to generate almost 8 times as many openings (i.e.12 million) over the period, equivalent to almost two-fifths of current employment. This dwarfs the level of anticipated new jobs. In industries and occupations in which the level of employment is expected to decline, such as the manufacturing sector and skilled manual occupations, there will still be job opportunities for appropriately skilled individuals created through this avenue.

***Manufacturing is projected to maintain its share of total output but to exhibit a falling share of employment between 2010 and 2020*.** It is important to note that manufacturing is expected to remain a critical sector in terms of its economic significance, retaining its share of UK output (around 11 per cent) and playing a critical role in terms of the UK's balance of trade. Employment will decline as a result of increasing productivity in the sector, as it responds to

global competitive pressures. Moreover, performance and competitiveness vary across the different industries in manufacturing and some parts of the sector are expected to outperform the sector average in output and employment terms. Finally, there will still be a significant level of job openings for new entrants to manufacturing due to replacement demands (see below).

There is expected to be a continued trend of employment growth in higher skilled, white collar occupations, including managers, professionals and associate professional roles, providing the most significant increases. The study projects around 2 million additional jobs in these occupations by 2020, which is expected to increase the share of this group to around 46 per cent over this period. This finding reinforces the importance of investment in higher level skills to meet the needs of the future labour market, focusing on the economically valuable skills that employers need.

Continuing sharp declines in employment are expected for skilled and semi-skilled manual roles including in skilled trade occupations and process, plant & machine operatives but these will be offset to a degree by replacement demand. 400,000 such manual jobs are expected to disappear between 2010 and 2020 in a slight acceleration of the existing trend, which means we expect the share of employment for this group to reduce to around 16 per cent. It is important to note that there will still be a large number of job openings due to replacement demands and a need in sectors like advanced manufacturing for technician workers who possess the ability to apply an in-depth understanding of a particular technical field in a practical setting.

Lower skilled jobs will remain a signifcant feature of the labour market. There is expected to be an increase of more than 300,000 jobs in caring, personal and other service occupations (+10 per cent) and 100,000 (+3 per cent) in low-skilled elementary jobs between 2010 and 2020, again mostly in service-based areas. Low-skilled jobs are expected to be a major source of job creation in sectors like hospitality and care of the young and elderly. Improving the quality of these jobs is important since they represent a key route for those seeking to move out of unemployment and progress through the labour market and for people looking to work part-time. These jobs also experience high labour turnover, requiring constant skills replenishment and in some cases up-skilling to meet heightened customer expectations and to meet product/service quality demands.

The projections indicate that the demand for skills as measured by formal qualifications will increase between 2010-2020, driven by the growth of jobs in higher level occupations. However, it is also projected that the supply of qualified people will increase significantly. These trends could lead to an increase in the deployment of well-qualified people in lower level jobs. This outcome is far from certain, though, not least because there is some evidence to suggest that the nature of jobs may be changing to make higher qualifications more necessary. Nonetheless, the questions of how demand for well-qualified individuals can be raised and how their skills can be best utilised in the workplace are important ones.

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 mission is to raise skill levels to help drive enterprise, create more and better jobs and promote economic growth. Our strategic objectives are to:

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

These strategic objectives are supported by a research programme that provides a robust evidence base for our insights and actions and which draws 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 study, *Working Futures* 2010-2020, is the most detailed and comprehensive set of UK labour market forecasts available. The results provide a picture of employment prospects by industry, occupation, qualification level, gender and employment status for the UK and for nations and English regions up to 2020. These projections form a core part of the base of labour market intelligence that is available to support policy development and strategy around careers, skills and employment. 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. At a time of great uncertainty about the short to medium term prospects for the economy, it is important to stress the value of *Working Futures* in aiding understanding of likely prospects for employment in the longer term (i.e. in 2020). 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.

Sharing the findings of our research and engaging with our audience is important to develop further the evidence on which we base our work. Evidence Reports are our chief means of reporting our detailed analytical work. Each Evidence Report is accompanied by an executive summary. 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 will be continually looking for mechanisms to share our findings, debate the issues they raise and extend their reach and impact.

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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Preface and Acknowledgements

The authors are grateful to the UK Commission for sponsoring this research. Special thanks are due to the project Steering Group, comprising Mark Spilsbury, Peter Glover and Debra Dhillon (UK Commission) for their comments. This report has been a team effort, involving a large number of people. Rachel Beaven, Graham Hay, Katy Long, and Yuee Zhao from Cambridge Econometrics, together with Andrew Holden, Peter Millar and Luke Bosworth from The Institute for Employment Research all made important contributions to the data analysis and processing. Derek Bosworth was responsible for developing key elements of the modelling of the supply of qualifications. Ilias Livanos also contributed to the work on qualification patterns at the spatial level. David Owen drafted the Spatial chapter. The responsibility for the views expressed and for any remaining errors lies with the authors.

The projections have been developed at a time of considerable uncertainty about prospects for the economy and the labour market. They should be regarded as indicative of likely developments given a gradual recovery from recession and re-establishment of longer term trends, rather than precise forecasts of what will inevitably happen. Many of these trends are very robust and are not likely to be affected by even the very turbulent conditions currently being experienced. They assume a broad continuation of past patterns of behaviour and performance. The dramatic events in financial markets in the autumn of 2008 had a significant impact on many trends in the short term, although others appear to have continued relatively undisturbed. The continuing uncertainties associated with the sovereign debt crises in Europe continue to cloud the picture. The report analyses changes pre and post these crises. It presents a view of medium to longer term trends (5-10 years ahead), reflecting the likely path of recovery from recession and a gradual reversion towards longer-term trends. These issues are elaborated in more detail in the main body of the report. The results should be regarded as a robust benchmark for debate and used in conjunction with a variety of other sources of Labour Market Information. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the UK Commission.

Table of Contents

List of Tables and Figures

Executive Summary

Key summary findings

Working Futures 2010-2020 is fourth in a series of labour market assessments that provide detailed projections for the UK labour market. It focuses on a ten year horizon, giving a picture of the labour market for 2020; including employment prospects for industries, occupations, qualification levels, gender and employment status for the UK and for nations and English regions. The core purpose of *Working Futures* is to inform policy development and strategy around skills, careers and employment.

The headline findings are as follows:

- The model projects that there will be a slow recovery from recession, with the UK economy generating around 1 ½ million additional jobs by 2020.
- The working age population and workforce are projected to rise significantly but labour market participation rates are expected to fall slightly, reflecting the aging of the population.
- Manufacturing is projected to maintain its share of total output (at around 11 per cent) up to 2020 but to see a small fall in its share of employment, from 8 to 7 per cent of the total, as a result of increased productivity.
- Private services are expected to be the main source of jobs growth, with employment in this part of the economy projected to rise by more than 1.5m (+9 per cent) during the full period of 2010-2020, increasing its share of total employment from 55 per cent to 58 per cent. Business and other services will be a particularly crucial component, with growth of more than 12 per cent, equivalent to more than 1 million additional jobs.
- The period is expected to see a shift in the balance of the economy away from public sector activities. The share of total employment accounted for by non-market services is projected to fall from 27 per cent in 2010 to 25 per cent in 2020.
- There is forecast to be a continued trend of employment growth in higher skilled, white collar occupations, including managers, professionals and associate professional roles. The study estimates 2 million additional jobs in these occupations by 2020. These three occupations are projected to increase their share of total employment from 42 per cent to 46 per cent over the 10 year period.

- Continuing sharp declines in employment are expected for skilled and semi-skilled manual roles, including in skilled trade occupations and process, plant & machine operatives. 400,000 such manual jobs are forecast to disappear between 2010 and 2020, reducing the combined employment share of these occupations from 18 per cent to 16 per cent.
- Administrative and secretarial occupations are projected to see a loss of almost 400,000 jobs, a fall of around 11 per cent, largely as a result of the continuing impact of technology in the workplace. There is still expected to be around 3 million jobs in this occupational area by 2020 but its share of employment will have fallen from 12 per cent to 10 per cent, according to the projections.
- Lower skilled jobs will remain a significant component of the labour market. There is expected to be an increase of more than 300,000 jobs in caring, personal and other service occupations (+10 per cent) and 100,000 (+3 per cent) in low-skilled elementary jobs between 2010 and 2020, again mostly in service-based areas.
- Job openings created by those who leave the labour market (i.e. replacement demands) are projected to generate around 12 million job openings between 2010 and 2020, many times more than the 1.5m openings from the creation of new jobs. Replacement demands will lead to job openings for all industries and occupations including those in which the net level of employment is expected to decline significantly. This has important implications for individuals who may be considering their future career and education and training options, since even those occupations where employment is projected to decline may still offer good career prospects.
- The demand for skills as measured by formal qualifications is projected to rise as is the supply of people holding higher level qualifications. The number of jobs in occupations typically requiring a degree is expected to continue to grow but perhaps more slowly than previously forecast.
- The southern part of England is expected to see more rapid employment growth than the devolved nations and the northern regions of England. Almost half of the growth in jobs in higher level occupations will occur in London, South East England and the East of England.

These points are explored in greater detail in the remainder of this summary and in the main report of *Working Futures*.

More detailed findings

Macroeconomic context

In developing any assessment of labour market prospects it is important to set things into a proper macroeconomic context.

The *Working Futures* projections were developed during a period of considerable turbulence in world financial markets. Concerns about the financial system now focus on problems of Sovereign debt, and in particular problems in Greece, Italy and the Eurozone generally. At the time of writing it remains unclear if these problems will trigger a further recession in Europe and the UK. The results presented here assume that such a crisis can be averted.

In such circumstances producing robust economic and labour market projections is particularly difficult. The baseline macroeconomic forecast underlying the results was developed in the first half of 2011. It assumes that a gradual recovery in confidence will bring about renewed growth in the UK economy, and that this will sustain employment growth in the longer-term (2010-2020). This forecast could underestimate the possible short term downturn that might affect the economy if the problems in Greece and the Eurozone more generally are not resolved.

Despite these uncertainties the economy is projected to continue its recovery, and to settle down in the medium term to a pattern of modest growth, with only moderate rates of inflation. Measures of economic output such as Gross Domestic Product (GDP) and Gross Value Added (GVA) are projected to display long-term growth rates of around 2½ per cent per annum.

The labour market prospects

Employment is projected to rise slowly but steadily over the decade as a whole, driven by a significant increase in population levels. The long-term rate of employment growth (jobs) is expected to be around ½ per cent per annum, resulting in around 1½ million additional jobs by 2020.

The working age population and the workforce are also projected to rise significantly. Labour market participation rates are defined as the proportion of the number of those economically active (i.e. those in employment or actively searching for work) expressed as a proportion of the working age population (those aged 16+). They are projected to fall slightly. This reflects the overall aging of the population. Declining trends for males, despite the efforts of government to postpone retirement ages, are offset by increases amongst some female age categories.

The rate of unemployment on the ILO basis (i.e. those actively searching for work as a percentage of the labour force) is expected to peak in the early part of the period, and then to fall slowly over time to reach around 6 per cent by 2020.

Sectoral prospects

Changing patterns of employment by sector are largely dominated by longer-term trends in the demand for goods and services. Increasing demand for a sector's output can be expected to result in increasing employment levels (and conversely) all else being equal. However rising output is not a sufficient condition to guarantee increasing employment levels. Employment prospects also depend upon how rapidly productivity rises in the sector. While productivity growth is a key element in maintaining competitiveness and reducing costs, it also has a direct impact on employment levels. All else being equal, increases in productivity imply fewer people employed.

The prospects for growth in output and employment over the decade to 2020 in the 6 broad sectors identified in the analysis can be summarised as follows:

- **The Primary & utilities sector** (which includes agriculture, etc, and mining & quarrying; electricity, gas & water) is projected to see only modest output growth over the decade. This obscures sharp declines for mining & quarrying, offset by somewhat better prospects for electricity, gas & water, and in agriculture, etc. Primary & utilities is expected to continue to experience significant job losses in the next decade of around ¼ per cent per annum (around 20 thousand jobs in total);

- **Manufacturing** output growth is projected to average around 2½ per cent per annum. There is faster growth in some technology and R&D-related industries, such as parts of chemicals and engineering, but other sectors such as textiles, clothing and metals & metal goods, etc. are expected to perform much less strongly, reflecting continuing intense international competition. Long-term decline in employment in manufacturing is expected to continue, with a loss of around 170 thousand jobs over the coming decade (a rate of change of around 3/4 per cent per annum). Textiles & clothing displays one of the largest job losses but there are significant declines in many other industries as well;
- **Construction** is projected to exhibit a similar rate of growth to the manufacturing sector in the medium to long-term. This is in spite of the immediate uncertainties in the housing market, because the sector is expected to benefit from strong demand for major infrastructure projects. Output growth is projected to average around 2 per cent per annum. The sector benefits from positive features such as the public expenditure on projects such as the Olympics, despite being hard hit by the immediate fallout from the credit crunch. Over the longer term, employment is projected to increase slightly by 240 thousand jobs over the coming decade (around 1 per cent per annum);
- **Trade, accommodation & transport** includes a diverse range of industries, including transport & communications, hotels and restaurants and distribution. Prospects in terms of output and employment growth are equally diverse. Communications is the sub-sector displaying the strongest growth. Output in the sector as a whole is projected to grow by 2.7 cent per annum. Employment is projected to increase by over 400 thousand jobs over the decade to 2020 (about ½ per cent per annum) with most of the growth accounted for by jobs in distribution, retailing and hotels and restaurants;
- **Business and other services** also incorporates a diverse range of industries, including computing services as well as business and finance. It was initially hard hit by the fallout from the credit crunch and subsequent recession, especially in the areas of banking finance and real estate. Despite this the sector as a whole is expected to stage a significant recovery, being projected to grow in output terms by almost 4 per cent per annum over the longer term. Employment in the whole sector is projected to increase by around 1.2 million by 2020 (a rate of growth of 1.3 per cent per annum). Other business services (which includes computing services) are expected to see the fastest growth;

- **Non-market services** comprise public administration and defence, as well as health and education services. Output in the sector as a whole is projected to grow by just 1 per cent per annum over the coming decade, much slower than in the previous decade. This disguises declines in most parts of the sector in the short-term, as public expenditure cuts bite. While the short-term prospects are bleak for public sector employment, things do pick up over the longer term as the economy recovers from the recession and the effects of the financial crises, especially in areas such as education and health services. Employment in Non-market services as a whole is expected to decline only slightly over the coming decade (by around 100 thousand in total, just over -0.1 per cent per annum). Within this broad grouping, most of the projected job losses are accounted for by public administration & defence.

Projected changes in occupational structure

Changing patterns of employment by occupation are largely dominated by longer-term trends rather than the cyclical position of the economy. Structural changes in the sectoral patterns of employment are a key driver (notably the shift towards a service economy). However, this has become less important in recent years than changing patterns of skill demands within each of the sectors. The latter has been driven by a combination of technological change and organisational change. Skill-biased technical change linked to information and communications technology has been a particularly significant factor, although this has been partially offset by factors leading to some polarisation in skill demands, with growth in some relatively less skilled jobs in services (such as in hotels and restaurants), as well as in high skilled ones.

The results take full account of the latest information on changing patterns of occupational employment structure from the LFS and other sources. This includes a reclassification of occupational categories using the new 2010 Standard Occupational classification (SOC2010). The change in SOC has resulted in some significant changes to the way some jobs are classified. Despite this, the latest evidence suggests that the changes in prospects for the next ten years are only slightly different compared to previous projections.

In general, there is expected to be a slightly faster pace of change in occupational employment structure expected than was the case in the previous projections, but the overall patterns remain very similar.

The groups that are expected to show the most significant increases in employment over the next decade (201-2020) are higher level occupations, namely:

- managers, directors & senior officials (+544 thousand, 18 per cent);
- professional occupations (+869 thousand, 15 per cent);
- associate professional & technical occupations (+551 thousand, 14 per cent).

Caring, leisure & other service occupations are the other main beneficiaries of employment growth, with projected increases of around 313 thousand jobs (12 per cent).

Administrative & secretarial occupations are projected to see significant further job losses of around 387 thousand jobs (-11 per cent per), although this category will still employ well over 3 million people in 2020.

Declining employment levels are also projected for:

- skilled trades occupations (-230 thousand, -7 per cent);
- process, plant & machine operatives (some -213 thousand, -11 per cent).

Elementary occupations are now projected to see a slight increase in employment, as the service sector in particular generates more such jobs. This polarisation of demand for skills, with growth at both top and bottom ends of the skills spectrum, appears to be an increasingly common feature across developed economies. On the other hand, the continued restructuring of the retail and distribution sectors appears to be leading to a much less optimistic picture for many lower level sales occupations.

Replacement demand

Employers also need to replace many of their workers who leave due to mortality, retirement, career moves, or other reasons. This so called replacement demand can easily outweigh any losses resulting from structural changes. In the present results replacement demand is almost 8 times larger than the net changes projected over the decade to 2020. The net requirement or total number of job openings, taking replacement demand into account is expected to be more than 13 million compared with the overall increase in employment levels of around 1½ million.

Retirements are the principal component in this estimate. It excludes job openings created by people transferring from one occupation to another or other outflows due to migration (some of which will be filled by similar means).

It is possible to identify two broad groups of occupations.

- In the first group positive replacement demand outweighs negative expansion demand. This applies, for example, to administrative & secretarial occupations; skilled trades; and process, plant and machine operatives.
- In the second group replacement needs simply serve to reinforce positive employment trends to create even higher net requirements for new job entrants. This applies, for example, to managers; professionals; associate professionals; and caring, leisure and other service occupations.

Implications for qualifications (demand, supply and mismatches)

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 recession reinforced this pattern as job opportunities for young people dried up.

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. How much this reflects demand as opposed to supply trends is open to debate.

Spatial variations

The projections of output for the regions and nations of the UK between 2010 and 2020 indicate a continuing pattern of the southern parts of England (particularly the south-east corner) being relatively advantaged, with the remainder (especially northern England and the devolved nations) falling further behind in relative terms.

The impact of the cut-backs in public spending upon the Non-market services sector will be greatest in the north and west of the UK.

However, the revival of employment in the primary sector and utilities and manufacturing industry will benefit these regions and nations.

Growth in employment in managers, directors and senior officials, professional and associate professional occupations will primarily benefit the south-eastern corner of the UK.

The *Working Futures* model

The prime focus of the model is on the demand for skills as measured by occupation and qualification, although the supply side is also considered. A detailed analysis of prospects by industry and spatial area is presented, including the historical context. As well as summary results for the UK, the report also covers the implications for the devolved nations and English regions.

Sectoral change is a key driver of the demand for skills. A separate Sectoral Report provides more detail about the prospects for 22 individual industries. This is based on categories defined using the new SOC2007 classification.

The results are based on the use of a multi-sectoral, regional macroeconomic model, combined with occupational, replacement demand and qualification modules. The results take account of the latest data from the Annual Business Inquiry (2010) and the Labour Force Survey (2010), as well as various other sources. Together, these provide an indication of the changing face of the UK economy and labour market. A separate Technical Report provides full details of sources and methods used to produce the results.

The 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 the various 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.

It is also important to emphasise that the views presented here are not the only possible future. They represent a benchmark for debate and reflection and to inform policy development. The detailed projections present a carefully considered view of what the future might look like, assuming that past patterns of behaviour and performance are continued over the longer term. The results should be regarded as indicative of general trends and orders of magnitude and are not intended to be prescriptive. If policies and patterns of behaviour are changed then alternative futures can result.

1 Introduction and Background

Key Messages

- *Working Futures 2010-2020* is the 4th in series of assessments of UK labour market prospects.
- It takes place against a context of continuing uncertainty about macroeconomic prospects both in the UK and more generally.
- The rationale for carrying out such work is now well established and includes informing not only policy makers but also all participants in the labour market about the world they may face over the next decade.
- The results provide the most detailed picture of employment prospects available in the UK, covering industries, occupations, qualifications, gender and employment status for the UK and its constituent parts.

1.1 Background

The fragility and uncertainty which still characterise the UK economy pose a number of challenges for forecasters. These are not entirely unprecedented. The projections produced by IER/CE between the 1970s and early 1990s were conducted against a backdrop which included: the aftermath of the 1973 oil shock; strong cyclical shifts in the economy; and structural change in the labour market, including three major recessions. To date the impact of the recent recession on the labour market has proved to be less severe than many had feared. However, prospects for the UK, European Union, and world economies remain uncertain, with events in the Eurozone a special concern.

The near collapse of financial intermediation in 2008 and the subsequent synchronous decline in output across nearly all major economies has made the recession of 2008-10 particularly severe. Despite the relatively strong growth rates posted by some countries such as Germany, UK economic recovery remains fragile, and is likely to remain so, at least over the immediate future. The unprecedented nature of the recession in terms of recent experience has been such that a quick return to long term trends as observed following the recessions of 1974/5, 1980/81, and 1990/92 is unlikely.

A quick return to previous long term trends was always unlikely. The recession which affected nearly every economy in the West was so severe by any historical comparison, that the economic recovery was likely to be a long-term process.

As Paul Krugman succinctly observed:

> "….it might be more accurate to say that it's like everything we've seen before, all at once: a bursting real estate bubble comparable to what happened in Japan at the end of the 1980s; a wave of bank runs comparable to those of the early 1930s (albeit mainly involving the shadow banking system rather than conventional banks); a liquidity trap in the United States, again reminiscent of Japan; and, most recently, a disruption of international capital flows and a wave of currency crises all too reminiscent of what happened to Asia in the late 1990s." (Krugman, 2008).

Policy makers face many uncertainties. The main one remains concerns about public finances in countries such as Greece, which continue to highlight the fragility of economic conditions across at least some parts of the EU. The measures currently being introduced by the UK Government to close the gap in public finances, including very substantial reductions in public expenditure, have led to concerns about prospects for employment over the short- to medium-term.

Whilst Krugman's observation emphasises the financial aspects of the current economic crisis, these financial events have had significant repercussions for the real economy of production, employment and unemployment. The danger is that events in Greece could yet trigger a similar crisis based around problems of sovereign rather than private debt.

From an employment, learning and skills perspective this report considers two critical questions:

i. Where will future jobs emerge from?

ii. What are the implications for both skills supply and demand?

Working Futures aims to shed light on these questions by providing projections of both the demand for and supply of skills.

Different sectors are likely to make very different contributions in generating growth in employment and value-added. Economic downturns tend to have conflicting outcomes on skills supply: employers reduce the amount of training they undertake, but individuals invest more heavily in their skills in order to tide them over the recession, and to give themselves a degree of advantage in a labour market with weak demand. These and other issues are considered in more detail in the report.

The projections indicate what is likely to happen to employment – disaggregated by sector, region, gender, occupation, etc. - highlighting the full impact of the recession, and indicating the likely path to recovery. They also provide new evidence on the impact of the recession on a range of other indicators, such as productivity and unemployment.

The projections utilise the latest official employment data, as well as factoring in the consequences of the Comprehensive Spending Review (CSR), and other economic policies introduced by the Government. The latter is especially important because, depending upon their consequences for further and higher education, there are likely to be important implications for skills supply. The projections are based on the Cambridge Econometric (CE) macroeconomic forecasts, produced in the spring of 2011.

1.2 Rationale for the *Working Futures* projections

The case for a regular and systematic assessment of future skills needs has been set out in the European Council's conclusions on "Anticipating and matching labour market needs". Comprehensive assessments of future skills requirements can make a key contribution to the identification of labour market trends and skills shortages, helping to contribute to a better matching between labour market needs and skills supply developments.

More effective anticipation and matching of labour market needs, it is argued, can contribute to the promotion of better labour utilisation and higher labour productivity, and therefore to growth and jobs, helping to reduce both frictional and structural unemployment. The *Working Futures* series is a key element in the UK's response to this request.

There is on-going interest amongst policy makers to ensure that the UK has the appropriate skills base to sustain economic growth and compete internationally. However such information is potentially of interest not just to policy makers but for all those having to make decisions about education and training, including individuals making careers choices, as well as education and training providers.

The main rationale for producing these kinds of projections is no longer that policy makers will engage in any kind of detailed, top down, planning (or anticipation) of the labour market. It is more about providing information to allow individual actors throughout the system (individuals making career choices, educational and training establishments and employers generally) to make better informed decisions.

Of course, nobody can predict the future with certainty. Most people can and do make plans and try to prepare for it. In doing so they adopt assumptions about what the future might be like, even if it is simply that the future will be the same as the past. There are also advantages of providing such projections centrally, as a public good, rather than relying on organisations and individuals to develop their own views independently. These advantages include the fact that this approach can provide a comprehensive, methodical, consistent and transparent set of results. It also benefits from economies of scale.

A key advantage of the *Working Futures* forecasts is that they provide a common and consistent economy wide overview, of skill needs, allowing detailed comparisons across sectors. This is based on a transparent, specific set of macroeconomic assumptions and economic relationships, affecting the whole economy and its structure. As such, the analysis is grounded in an understanding of the key drivers impinging upon the economy. It serves to act as an objective, economy-wide, explanatory tool to facilitate the examination of the changing pattern of skills demand.

This is not to say that there is not a role for individual sectors or other interest groups to develop their own tailored forecasts, as several of the Sector Skills Councils have done. However, the *Working Futures* results show how these fit into a broader macroeconomic context, covering all sectors in a consistent, systematic and comparable manner. This is a fundamental objective of developing the set of projections presented here.

The results presented here should be regarded as indicative of general trends and orders of magnitude, given the assumptions set out below, rather than precise forecasts of what will necessarily happen.[1] Rather, they indicate the most likely future, given a continuation of past patterns of behaviour and performance. If policies and patterns of behaviour are changed then alternative futures might be achieved. The present results are intended to provide a consistent and systematic benchmark view across the whole economy and labour market that can form the basis for an ongoing debate.

[1] See Wilson and Briscoe (2002) for further discussion on this point.

1.3 Aims and objectives

Recent developments in skills policy and implementation have placed increasing emphasis on the need for labour market information to be available at a more detailed spatial and sectoral level. The UK Commission - in conjunction with the Department for Business, Innovation and Skills (BIS), and the Devolved Administrations - require relevant, consistent and accessible data at a considerable level of detail to assist in their policy and provision planning. *Working Futures* 2010-2020 addresses these requirements, recognising the technical challenges that these requirements pose.

The projections focus on employment by occupation, cross-classified by sector and a spatial dimension down to individual countries within the UK, and regions within England. Results for employment are reported by:

- gender;
- employment status (full-time/part-time/self-employed);
- occupation (one and two digit occupational groups);
- expansion and replacement demand, as well as net requirements; and
- qualifications (6 broad QCF levels).

The analysis also considers the labour and skills supply. Consistent projections of labour supply have been generated by:

- gender; and
- age (7 broad age groups: 0-15, 16-24, 25-34, 34-44, 45-54,60-64, 65+).

Headline projections of the highest qualifications held by the working age population, those economically active, the unemployed and the employed, have been developed. The sensitivity of the results to variations in the underpinning assumptions on demography and migration, economic activity rates, rates of qualification achievement, and unemployment rates is also considered.

The study also compares the projected employment and productivity growth and levels pre- and post recession, comparing the results with those from *Working Futures 2007-17* (Wilson *et al*. 2008).

1.4 General methodological approach and data sources

There is no simple “one size fits all” solution to trying to anticipate changing skill needs. Reviews of best practice worldwide (see Wilson (2008) and Wilson *et al.* (2004)) suggest that various tools and models are needed, focussing on both quantitative and qualitative methods. Models are simplifications of reality, intended to highlight key drivers and relationships that can be used to gain some insights into what the future might look like. Where feasible, quantitative methods are highly recommended as they can provide a sound statistical foundation to any discussions which might otherwise be rather vague and woolly. However such approaches also have their limitations and not everything can be measured precisely. More qualitative approaches have advantages where there are difficulties in getting firm quantitative data. They also enable use to be made of expert insight and intuition.

Working Futures concentrates primarily on a quantitative, economic based approach. This focuses on sectoral and occupational employment structures, qualifications, and general workforce trends (including replacement demand). The approach adopted uses existing official data, following the same general methods and procedures adopted for the previous *Working Futures* projections. Significant innovations include the reclassification of the database to adopt categories based on the latest industrial and occupational classifications (SIC2007 and SOC2010).

Production of the projections requires detailed data on employment. As in the previous round of *Working Futures* projections, this raises important issues of confidentiality (Statistics of Trade Act, 1948 *et seq*.), as well as statistical reliability, in making such detailed data available in the public domain. Issues of the control of confidential information have become of even greater concern to the Government and others since the last *Working Futures* exercise was undertaken, so it is very important to address this issue explicitly in undertaking the dissemination (although these problems are less severe for results at the country/English regional level than for the sub regional areas for which exploratory results have also been produced).

These matters have been addressed carefully in order to provide the intended audiences with robust and useful information. Despite these technical and other problems it is possible to develop a range of projections that meet the needs of the UK Commission (and those of its partners) for detailed information and intelligence on likely sectoral developments and their implications for skill requirements.

The approach involves the detailed examination of sectoral as well as occupational change and their implications for skill requirements at both a micro and macro level. This is based upon the use of a variety of research methods, ranging from complex econometric modelling, to other more qualitative approaches, depending upon the objectives of the work and the nature of the basic data available.

The basic approach is to use the latest CE macroeconomic forecasts to update the *Working Futures* sectoral projections, for the period 2010-2020, producing detailed industry results for all the English regions and the devolved nations of the UK. The database has been reworked to reflect the new Standard Industrial classification (SIC2007).

Data from the Labour Force Survey and other sources are used to develop historical measures of the occupational and qualification structure of employment within industries. A combination of econometric methods and judgement is then used to generate projections of these patterns forward to 2020. This has been done using the new Standard Occupational Classification (SOC2010).

Analysis of labour supply by age and gender is carried out using econometric methods. These are then further disaggregated by formal qualifications held to obtain measures of the supply of skills using a stock flow model and other techniques. The sensitivity of the projections to variations in the underpinning assumptions on demography and migration, economic activity rates, rate of qualification achievement, and unemployment rates is explored.

Full details of the approach are set out in the separate *Working Futures Technical Report*. A brief summary is provided in Annex A to the present report. This covers information on the main data sources and methods, econometric analysis and model structure and content.

1.5 Outline and structure of the report

Chapter 2 sets out an overview of macroeconomic prospects for the global and UK economies, and the prospects for the UK labour market. Chapter 3 then goes on to assess the prospects for broad sectors in more detail. Chapter 4 provides an overview of the implications for occupations, including replacement demands. Chapter 5 moves on to consider the implications for qualifications demand and supply. Finally Chapter 6 presents the results for the devolved nations and regions of England that together make up the UK. More detailed results by industry are available in a separate Sectoral Report.

Annexes to the present report provide technical information about sources and methods, describing how the projections have been produced. A separate Technical Report goes into these aspects in much greater detail. This includes a detailed description of the macroeconomic and other models used to generate the projected demand for skills as well as the treatment of skills supply.

2 Macroeconomic and General Labour Market Context

Key Messages

- The UK economy is expected to continue a slow recovery from recession, but growth is projected to remain subdued and unemployment to fall only slowly.
- Overall, employment is projected to rise by around 1 ½ million over the next decade.
- The overall impact of the recession on employment has been substantial with the loss of around 2 million jobs compared with expectations prior to the crisis.
- The economy and labour market will continue to be subject to structural change in favour of services but there will be some rebalancing of jobs from the public to private sectors.
- Although the macroeconomic environment remains uncertain, the central forecast presented here provides a useful benchmark to assess ongoing trends at a more detailed level.

2.1 Introduction

This section provides an overview of macroeconomic prospects for the global and UK economies, and the prospects for the UK labour market. The macroeconomic prospects for the UK provide the context for the detailed forecasts of employment that will be examined in subsequent sections of this report. The analyses of the prospects for individual sectors which follow can be seen in the context of the general prospects for the UK economy as a whole outlined in this section. These macroeconomic projections are produced using a detailed multi-sectoral dynamic macroeconomic model (MDM).

Section 2.2 begins with a brief overview of the key exogenous assumptions underlying the projections. The current situation is assessed in Section 2.3, drawing out general macroeconomic prospects for the UK over the next 5-10 years. The prospects for the labour market are then briefly summarised in Section 2.4. The sensitivity of the results to certain key assumptions is discussed in Section 2.5.

2.2 Exogenous assumptions

The main exogenous variables in the RMDM are:

- world growth in GDP;
- world inflation (GDP deflators and prices of traded goods including oil);
- UK population and natural resources (including coal, oil and natural gas);
- current and capital spending of the UK government;
- UK tax rates and allowances;
- the sterling-dollar and other exchange rates;
- UK and US interest rates.

In many cases these assumptions are developed at a very detailed level, distinguishing different commodities and types of spending and many parts of the world. In combination, these assumptions drive the path of demand for the output of goods and services produced by the UK at a very disaggregated level.

The design of the model does not impose market-clearing in the labour market, rational or consistent expectations, or a policy reaction function in response to outcomes for target indicators. The model is therefore capable, in principle, of producing scenarios in which certain combinations of assumptions produce an unsustainable outcome (e.g. steadily increasing budget or trade deficits).

However, the case adopted as the basis for these projections represents a sustainable and plausible outcome on the basis of the experience of the recent past and longer term trends. It draws on the long-term forecasts prepared by CE as part of its regular commercial forecasting services. These projections have been presented to and discussed with subscribers to CE's forecasting services, who represent a broad range of private and public sector organisations.

2.3 Macroeconomic Context

World Economy and Exchange Rates

The recovery in the Eurozone generally remains weak, with GDP growth of just 0.3 per cent quarter-on-quarter in 2010Q4, unchanged from the rate seen in 2010Q3. While growth in household spending accelerated, growth in government spending and exports slowed. Investment continued to fall, at a faster pace than in 2010Q3. There are considerable disparities within the Eurozone, however. While Germany and France show some signs of economic growth and recovery, debt-laden Greece remains in recession. Growth prospects in other southern European countries such as Portugal remain weak.

According to the Purchasing Managers Index (PMI) survey data, the pace of expansion in private-sector activities in the Eurozone remained close to a four-and-a-half year high in March 2011. Manufacturing continued to lead the recovery but also services industry activity picked up in March to show the fastest growth since August 2007. Growth in both manufacturing and services new orders remained high, particularly in Germany and France. Consequently, job growth was amongst the strongest seen since the recession. However, there was a steep increase in input costs, resulting from high commodity prices and supply-chain disruption in Japan.

Despite the recent boost to job creation, the rate of unemployment in the Eurozone shows no sign of falling from the 10 per cent mark, where it has been since mid-2009. Again, there is a huge disparity between the member states: the unemployment rate was just under 6.5 per cent in Germany in 2011Q1, but it was over 20 per cent in Spain.

In Japan, growth in 2010-2011 was curbed primarily by weaker domestic demand; and the stronger yen which continued to hurt exports. The 2010 earthquake caused substantial economic damage (e.g. disruption to the supply chain), but government spending on rebuilding will boost output in the medium term. At the same time, the labour market remains relatively weak. The rate of unemployment has been falling from its high of 5.5 per cent in July 2009, but decline has been very slow and drawn out. The rate of unemployment in 2011Q1 was just under 5 per cent, which remains high compared to before the global recession, and continues to depress housing market activity.

Meanwhile, in the US, GDP growth accelerated slightly in 2010Q4, driven by stronger growth in private consumption and an upturn in residential fixed investment. The dollar weakened in 2010Q4 and exports continued to grow at a faster rate. Net trade made a positive contribution to GDP growth as the pace of import growth slowed sharply. Government spending decreased and there were signs of business destocking. Growth in non-residential investment slowed down. However, preliminary figures indicate that US GDP growth slowed to 0.5 per cent quarter-on-quarter in 2011Q1, reflecting a sharp upturn in imports, deceleration in private consumption and a larger decrease in government spending.

Elsewhere, conditions in the US labour market have been mixed. Between November 2010 and March 2011 the number of people unemployed fell by 1.5 million, and employment increased by nearly one million. But, on an annualised basis, GDP growth in 2011Q1 was equivalent to less than 2 per cent per annum, the rate required to keep up with population growth. Unsurprisingly, therefore, new claims for unemployment benefits picked up in April to average more than 400,000, the threshold consistent with sustainable job creation, and the rate of unemployment picked up to 9 per cent. Continuing problems in the US housing market will reinforce negative impacts on household spending, which is likely to be constrained in the short term and will temper the strength of the general US recovery.

Global GDP growth is expected to improve over 2011 and 2012 across almost all world areas, with China and India continuing to drive the global economy. In the short to medium term, Japan is expected to see weaker growth than both the US and the EU15 (the members before 2004), where the continuation of the strong recovery seen in Germany will encourage trade and promote growth in the other member states. However the EU15 will be dragged downwards by those countries facing the most severe sovereign debt crises: Greece, Ireland, Portugal and Spain. GDP growth in the EU12 (the twelve states that have acceded to the EU since May 2004) recovered to 2 per cent in 2010, and is expected to accelerate over 2010-20, but these countries account for only a small share of total EU output.

Over 2010-20, world GDP growth is expected to average 3.5-4 per cent per annum, with the emerging Asian economies, the EU12 and the economies of some other developing countries leading the way. The US will be just behind, on around 3 per cent per annum, with the EU15 a little further behind and Japan further back still.

Global inflation strengthened in 2010 after falling back in 2009, as economic activity increased. Inflation is expected to rise further in 2011 and 2012 as the recovery continues and boosts demand. The EU15 saw only a slight strengthening in inflation in 2010, but a steeper rise is expected in 2011 and 2012 as the recovery spreads from Germany to the other member states. In the EU12 inflation fell in 2010, but it is expected to increase to 2.5 per cent by 2012. The US is expected to see a sharp acceleration through 2011-12 to reach just under 2.5 per cent in 2012. In Japan, deflation will persist through 2011 before prices start to rise slightly from 2012 onwards. A tightening of monetary policy is expected in the US and the EU in the medium term, as the economies recover and inflation picks up. In Japan the authorities are expected to remain wary of further deflation and, as such, monetary policy is likely to be somewhat looser.

Over 2010-20, global inflation is assumed to average around 2 per cent per annum, with the EU and the US averaging 2 per cent per annum and Japan 1.5 per cent per annum. Inflation in the developing economies is assumed to be a little higher, at 2.5 per cent per annum.

UK Domestic Spending and Inflation

Household spending grew by just over 1 per cent in 2010 (see Table 2.1), following a sharp decline in 2009. Consumer confidence fell back over 2010 and by early 2011 consumer expectations for the economy in the short term had reached lows not seen since early 2009, when the recession was at its deepest. The prospects for household spending in the short to medium term are modest at best.

Sharp cuts in government consumption and other expenditures are planned for the remainder of this parliament. This is built in to the forecast. Government consumption spending is forecast to fall sharply in 2011 and 2012 as spending cuts are implemented from the 2011/12 fiscal year onwards.

Investment grew by around 3 per cent in 2010. Business investment grew in the first three quarters of 2010, having declined for six consecutive quarters previously, and was flat in 2010Q4. Investment by financial & business services is estimated to have recovered by around 7.3 per cent in 2010. In sharp contrast, investment by the public sector is estimated to have fallen by almost 8 per cent during the year, including a decrease in spending on public sector dwellings and existing buildings. These falls worked to offset the increases in the private sector. The housing market, meanwhile, is expected to remain weak through 2011 and 2012, with poor consumer confidence about the general economic situation outweighing any stimulus that might otherwise be expected from low interest rates. Along with much sharper falls in public sector investment, this will moderate the growth in investment in the short to medium term.

With regard to domestic inflationary pressures, the growth in manufacturers' input costs slowed in 2010H2 but accelerated sharply between 2010Q4 and 2011Q1, driven by rising energy and commodity prices. By April 2011, input-price inflation was approaching 20 per cent. Mirroring this trend, the growth in manufacturers' output prices slowed in 2010H2, before picking up in 2011Q1. Even so, the increase in output prices has not kept up with the increase in input prices, so some manufacturers have seen their margins come under pressure. Consumer price inflation fell back to 4 per cent in March 2011. It had picked up from 3.1 per cent in September 2010 to 4.4 per cent in February 2011, driven by rising world commodity prices and the rise in VAT to 20 per cent in 2011. CPI inflation remains well above the 2 per cent target. Despite this, the growth in average earnings remained largely unchanged over 2010Q4 and 2011Q1, at 2-2.25 per cent year-on-year.

Table 2.1: Macroeconomic Indicators for the UK

	Historical Trends		Recent Trends			Projections	
	2000-05	2005-10	2007-08	2008-09	2009-10	2010-15	2015-20
GDP at Market Prices (% pa)	2.5	0.5	-0.1	-5.0	2.2	1.8	2.5
GVA at Basic Prices (% pa)	2.4	0.5	-0.1	-4.8	1.8	1.9	2.7
excl. Extra-Regio (% pa)	2.7	0.6	0.1	-4.6	1.9	2.1	2.7
GVA per job (%pa)	1.4	0.6	-0.8	-2.4	2.7	1.7	1.9
Manufacturing Output (% pa)	-0.6	-1.6	-2.7	-11.2	4.3	3.1	2.0
Household Expenditure (% pa)	3.0	0.4	0.4	-3.3	1.1	1.8	2.4
Employment (jobs, millions)	30.9	30.7	31.7	31.0	30.7	31.0	32.2
Unemployment (claimants, millions)	0.9	1.5	0.9	1.5	1.5	1.7	1.3
CPI Inflation (% pa)	1.4	2.6	3.6	2.1	2.5	2.0	2.0
BP/GDP (%)	-2.6	-2.5	-1.6	-1.1	-2.5	-1.2	-1.3
PSNCR/GDP (%)	3.3	10.0	2.7	8.7	10.0	4.4	2.0

Source: Cambridge Econometrics, MDM revision 7146.
Notes:
(a) GDP = Gross Domestic Product
(b) GVA = Gross Value Added
(c) CPI = Consumer Price Index
(d) The balance of payments (BP) and the public sector net cash requirements (PSNCR) are expressed as a percentage of GDP at current prices.
(e) Employment, unemployment, CPI, BP/GDP and PSNCR/GDP refer to the last year of the period concerned.
(f) Employment is total workplace employment (jobs) and includes HM Forces.

Spare capacity and weak demand are expected to apply some downward pressure over the coming quarters; and it is assumed that sterling will not depreciate too sharply further. But upward pressure from the rise in VAT, higher commodity prices and import prices, and the rebuilding of profit margins mean that it is likely to be 2012 before CPI inflation falls back to target. Monetary policy is likely to remain loose in the short term, but a tightening of policy may start sooner if the current level of inflation persists. There is a risk that the Bank may nevertheless need to move more quickly than assumed to pre-empt another asset price bubble. This may take the form, initially, of reversing quantitative easing and selling securities. Over the long term, the rate of consumer price inflation is expected to fall back to 2 per cent per annum.

Employment and Output

Despite the improvement in the economy between 2009 and 2010, the UK recovery came to a halt in 2010Q4, with GDP falling by 0.5 per cent quarter-on-quarter. The main driver was net trade, as import growth accelerated between 2010Q3 and 2010Q4 while export growth remained largely unchanged. The impact was exacerbated by falls in household spending, as real incomes fell and saving held up, and investment declined, driven by falls in public and private investment in dwellings and buildings.

Early estimates suggest that the 0.5 per cent fall in GDP in 2010Q4 was reversed in 2011Q1. Across the broad sectors, the strong growth enjoyed by construction earlier in 2010 was brought to an end by the severe winter weather and a fall in investment in buildings; output fell by 2.25 per cent quarter-on-quarter in 2010Q4 and 4.7 per cent in 2011Q1. In manufacturing, output expanded by 1 per cent quarter-on-quarter in 2010Q4 and 2011Q1, boosted by the continued expansion of inventories. Activity in all the service sectors contracted in 2010Q4, as weaker leisure and investment spending hit demand for distribution, hotels and restaurants, and the bad weather and lower activity curbed demand for transport, storage and communications, the worst-affected sector. Activity in the public sector fell slightly and this hit demand for some parts of business services and finance, where output fell by 0.75 per cent quarter-on-quarter in 2010Q4. Nevertheless, the service sector rebounded in 2011Q1, driven by robust growth in transport, storage and communications, and business services and finance.

In the short term, stock building is likely to provide only modest support to growth while falling government spending is set to curb GDP growth in 2011 and 2012. Household spending looks set to remain positive but subdued in 2011 and not to accelerate much until 2012, as rising living costs, low wage growth and uncertainty about government spending cuts prevent a sharp recovery in consumer confidence.

The outlook for investment appears mixed. Markit/CIPS survey data for 2011Q1 suggest activity picked up in the services sector, but BCC and CBI survey data suggest that confidence among manufacturers is mixed: order books and output expectations remain healthy but there is concern about high prices and pressure on cash flow. The recovery in investment is expected to continue at a modest pace in 2011 and 2012. UK investment is forecast to rise by 4 per cent in 2011 and by 4.6 per cent in 2012, despite further falls in public sector investment. The short-term growth is expected to be driven by manufacturing investment, with some signs of recovery in 2010, boosted by the depreciation of the pound. Business investment is also expected to strengthen in 2011.

Bolstered by demand from developing economies, net trade is expected to support GDP growth in 2011 and 2012, but the sovereign debt crisis in the Eurozone, rising commodity prices and greater geopolitical uncertainty all pose risks in the short term. In the medium term GDP growth is expected to average around 1.8 per cent per annum and pick up to 2.5 per cent per annum over 2015-20 as the economy completes its recovery, bolstered by strengthening household spending.

The recovery in manufacturing output looks set to continue in 2011, supported by the recovery in investment and stronger export demand helped by a falling value of the pound on the international exchanges. Output in construction is expected to slow in 2011, as the cuts in public sector capital spending feed through and private sector demand remains weak.

Financial and business services are forecast to see stronger growth in 2011, but those most exposed to government spending cuts and the property market are likely to experience a weaker recovery. Wholesale & retail trade and accommodation & food are expected to experience a slight slowdown as households respond to falling real incomes and the impact of public spending cuts by curbing leisure spending and putting off major purchases. Output in transport, storage and communications should strengthen further as activity in the wider economy continues to recover, but activity in the public sector is expected to contract in 2011 as the spending cuts take effect.

In the long term, total GVA growth is expected to average 2 per cent per annum over 2010-15, a vast improvement on the 0.5 per cent per annum average over 2005-10. This will be supported by strong growth in manufacturing, where GVA growth is expected to average 3 per cent per annum. Beyond 2015, GVA growth is forecast to accelerate and average 2.7 per cent per annum over 2015-20. But in manufacturing, GVA growth is expected to slow over 2015-20, suggesting that some of the rebalancing seen over 2010-15 will be reversed over the later period.

Total employment in the UK is estimated to have fallen by almost 1 per cent in 2010. This represents some improvement on the large fall in employment of around 2.4 per cent in 2009. Whereas it was public sector employment that curbed the decline in total employment in the UK in 2009, it was a return to positive employment growth in some production industries that slowed the decline in total employment in 2010.

A return to positive employment growth in the production industries in 2010 was seen in just a few sectors. The strong employment growth in mining and quarrying and the utilities reflects a pickup in industrial demand for energy in the context of a wider recovery in the economy. Even though employment in manufacturing continued to decline in 2010, jobs were being lost at a slower pace and a return to growth is forecast for 2012, provided that global demand continues to recover. Business survey data, such as the Purchasing Managers Index for manufacturing, show a sustained increase in raw materials purchases over the course of 2010.

Accounting for approximately 7 per cent of UK employment, the construction industry is an important bellwether for the growth or decline in UK employment. The decline in employment in this industry is projected to continue in 2011, albeit at a slower pace, before employment growth resumes in 2012. Prospects in the construction industry will depend to a great extent on the availability of credit and the general appetite for investing in buildings. After making a partial recovery in 2009, the number of mortgage approvals reached a plateau in 2010, and remains less than half its pre-recession level, although this may reflect potential buyers' low confidence in the economy rather than credit constraints. Uncertainty also remains in the industry over the government's abolition of Regional Spatial Strategies, which specify regional housing targets for local planners. The constraints on public investment expenditure on education and health mean that long-term PFI projects are likely to be scarce. However, some new road and rail infrastructure projects offer some hope to employment growth in the construction industry. In particular, the value of building work on the rail network is set to double to more than £21bn over 2010-2015.

There is a mixed picture for employment in the various parts of the service sector. In 2010 employment fell steeply in wholesale & retail trade, accommodation & food and information & communication. This reflects the highly cyclical nature of these industries as consumers have cut back on their discretionary spending. It is likely that workers in low-skilled occupations, which predominate in these types of service industries, have borne the brunt of these sustained employment losses. In contrast other market services, such as professional and non-financial business services, experienced much smaller falls in employment in 2010 and employment is forecast to increase in the short to medium term.

In the public sector, heavy job losses are inevitable as a result of the government's deficit reduction programme. The Office for Budget Responsibility has predicted a reduction in the public-sector workforce of 330,000 between 2010/11 and 2014/15, an estimate considered optimistic by many analysts. There is already evidence of these cut backs feeding through into the hiring behaviour of the public sector. The full effects of the government's austerity measures, however, are not expected to be felt in the short term, since employment in the public sector is forecast to flatten off in 2011 and then decline in the medium term.

The implications of the reduction in the public-sector workforce for employment in the wider economy will depend on the extent to which jobs are permanently lost rather than transferred from the public to the private sector.

Total employment in the UK is expected to recover to 31 million in 2015 and just over 32 million in 2020. This compares to a high point of 31.7 million in 2008 and a low point of 31 million in 2010/2011. Overall, these results suggest that job creation in the private sector will eventually be sufficient to offset job losses in the public sector. However, the rate of generation of private sector jobs is insufficient to drive down unemployment to the kinds of levels seen before the crisis.

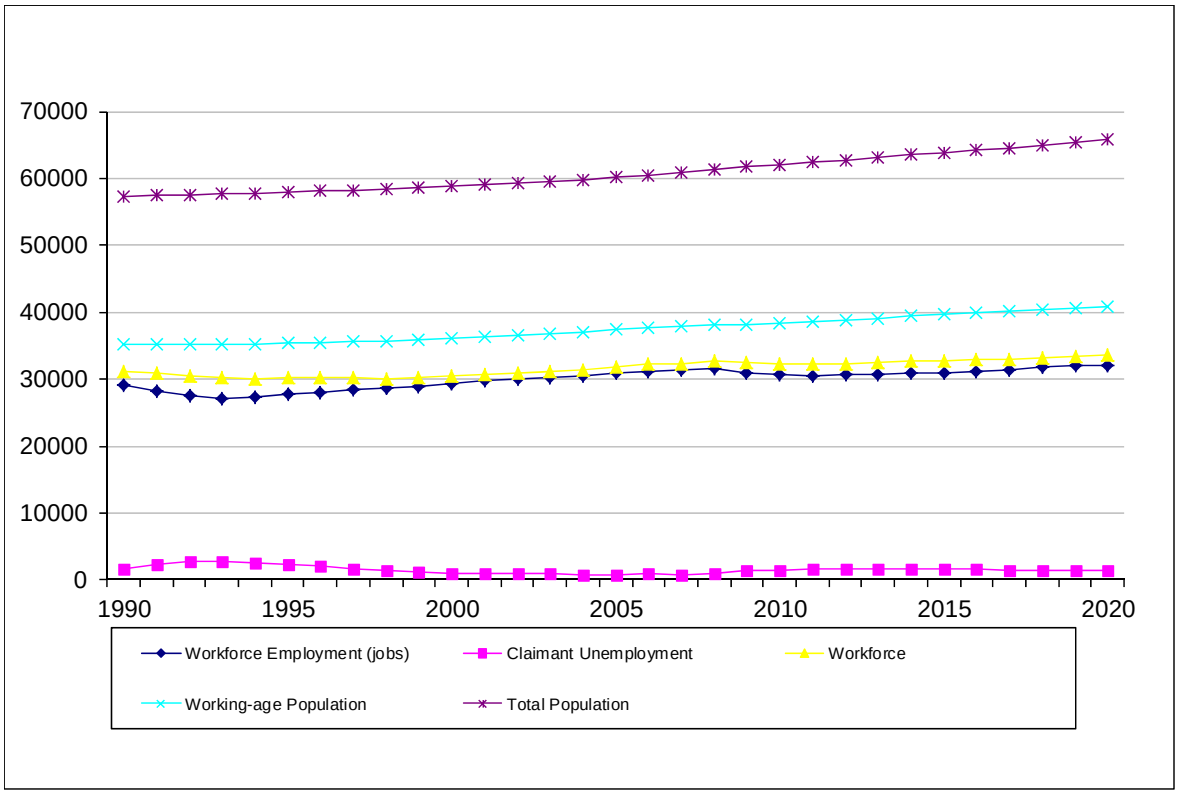
2.4 General labour market prospects

Population and the Labour Force

Over the period 2005-10, the UK total resident population increased by 1.8 million (3 per cent) to 62.1 million. A faster percentage increase occurred in the working-age population, with net inward migration contributing to this increase. This was reflected in a 4.3 per cent increase in the size of the labour force, which rose to 31.4 million by 2010.

Over 2010-20 UK population is expected to increase by a similar annual percentage rate as over 2005-10, but the population age over 16 will see a slower increase than in recent years. This reflects the ONS Official UK population projections (2008 based) and perhaps a lower net in-migration than in recent years. Both male population and male working age population are forecast to rise faster than for females, but the labour force for females, is expected to increase faster than the male labour force (continuing recent trends). This reflects the increasing participation of women in the labour force, and over the period 2012-20, the gradually increasing pension age for women from 59 to 64. Overall participation rates are expected to fall, especially over 2010-15, and this reflects the continued decline of male activity rates (see Table 2.2). This is associated with the slower increase in headcount employment for males than for females.

Figure 2.1: Population, Unemployment and Workforce Trends, 1990-2020, (000s)



Source: Cambridge Econometrics, MDM revision 7146

Figure 2.1 illustrates the long-term profile of key demographic and labour market variables, while Figure 2.2 illustrates the changes in these variables expected over 2010-20.

Over the period 2010-20, the population is expected to increase by 3.8 million, about 0.6 per cent per annum. The working-age population is forecast to increase by 2.6 million, but this represents a slightly faster rate of growth. The number of children is expected to increase over the forecast period, compared with a more than 2 per cent decline over the period 2000-2010. In contrast, the number of old-age pensioners is expected to exhibit much slower growth than historically.

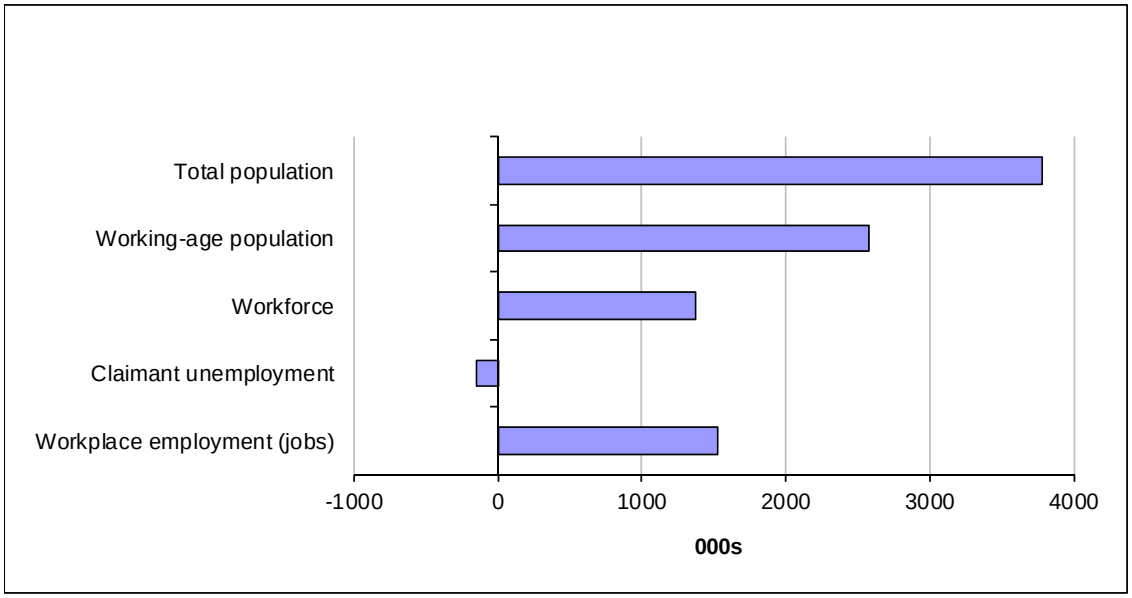
Overall, labour market participation or activity rates over the previous decade only increased slightly, but this was the result of a rising activity rate for women (by almost 1 percentage point) and a falling activity rate for men (by 0.5 percentage points). However, by 2010 the activity rate of women was still about 14 percentage points lower than the activity rate for men.

The economically active labour force depends on the size of the population and the labour market participation rate. The latter varies considerably by age and gender. Women are still not as likely to take part in the formal economy as much as males, although trends in participation rates for women are still rising. This trend is projected to continue.

Labour market participation rates for younger people have fallen steadily in recent years as educational participation beyond the age of compulsory schooling has risen. These trends are also expected to continue.

Activity rates for older workers, especially males, have fallen as people have chosen to take rising real incomes in the form of earlier retirement. Despite pressure from government to reverse this trend, due to concerns about pensions, overall participation rates for older men are expected to continue to fall.

Figure 2.2: Changes in Key Labour Market Indicators for the UK, 2010-20



Source: Cambridge Econometrics, MDM revision 7146

Box 2.1: 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, focussing 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 total number of workforce jobs 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.

Employment

Employment can be defined and measured in a variety of ways:

- numbers of jobs;
- numbers of people in employment (heads);
- by area of workplace; and
- by area of residence.

In most of *Working Futures* 2010-2020, the term employment is used to refer to the number of jobs located in a particular area (generally where the workplace is located). Box 2.1 provides the alternative definitions of employment and other labour market indicators. Unless indicated otherwise, data on employment in tables and charts show the number of workplace jobs rather than numbers of people or place of residence.

Employment by Gender and Status

In 2010 total employment in the UK stood at 28.9 million (head count measure) (see Table 2.2). Despite the economic crisis and recession, this was still up on the 2005 level. Of those in employment in 2010, around 53 per cent were male.

At just under 11 million, full-time employment (jobs) was the dominant status among males in 2010, accounting for 68 per cent of all jobs held by men (including the self-employed). Around 2.2 million jobs were held by men employed part-time and close to 3 million were self-employed (14 per cent and 19 per cent respectively). Among females, around 9 per cent of jobs were self-employed and roughly equal shares were in full-time (47 per cent) and part-time (44 per cent) jobs. The net effect of these distributions means that about 58 per cent (17.8 million) of all jobs in the UK in 2010 were full-time. Just under 28 per cent (8.5 million) were part-time; while close to 14 per cent (4.4 million) were self-employed (see Table 2.3).

Table 2.2: Population and Labour Force in the United Kingdom

						percentage change over period			
	2000	**2005**	**2010**	**2015**	**2020**	**2000-05**	**2005-10**	**2010-15**	**2015-20**
Male					000s				
Population	28,691	29,494	30,533	31,530	32,576	2.8	3.5	3.3	3.3
Population 16+	22,563	23,555	24,622	25,499	26,272	4.4	4.5	3.6	3.0
Labour Force	15,638	16,318	16,937	17,175	17,508	4.4	3.8	1.4	1.9
Activity Rate (%)	69	69	69	67	67	0.0	-0.5	-1.4	-0.8
ILO Unemployment	940	882	1,458	1,650	1,316	-6.2	65.4	13.2	-20.2
ILO Unemployment (%)	6	5	9	10	8	-0.6	3.2	1.0	-2.1
Employment (headcount)	14,698	15,436	15,479	15,524	16,192	5.0	0.3	0.3	4.3
Labour Market Residual	953	957	830	994	776				
Female									
Population	30,196	30,742	31,536	32,355	33,278	1.8	2.6	2.6	2.9
Population 16+	24,364	25,097	25,900	26,604	27,259	3.0	3.2	2.7	2.5
Labour Force	13,088	13,758	14,425	14,803	15,296	5.1	4.8	2.6	3.3
Activity Rate (%)	54	55	56	56	56	1.1	0.9	-0.1	0.5
ILO Unemployment	653	596	1,011	1,138	905	-8.7	69.6	12.6	-20.4
ILO Unemployment (%)	5	4	7	8	6	-0.7	2.7	0.7	-1.8
Employment (headcount)	12,435	13,162	13,414	13,666	14,390	5.8	1.9	1.9	5.3
Labour Market Residual	1,325	1,336	936	861	833				
Total									
Population	58,886	60,236	62,068	63,884	65,854	2.3	3.0	2.9	3.1
Population 16+	46,927	48,651	50,522	52,102	53,531	3.7	3.8	3.1	2.7
Labour Force	28,726	30,076	31,362	31,978	32,804	4.7	4.3	2.0	2.6
Activity Rate (%)	61	62	62	61	61	0.6	0.3	-0.7	-0.1
ILO Unemployment	1,593	1,478	2,469	2,788	2,222	-7.2	67.1	12.9	-20.3
ILO Unemployment (%)	6	5	8	9	7	-0.6	3.0	0.8	-1.9
Employment (headcount)	27,133	28,599	28,893	29,190	30,582	5.4	1.0	1.0	4.8
Labour Market Residual	2,278	2,293	1,766	1,855	1,608				

Source: CE estimates and projections, MDM C111 (revision 7146).

Notes:(a) Levels are in thousands except for the activity and unemployment rates, which are in percentages.

(c) Changes are percentage difference over the period except for the activity and unemployment rates.

which are percentage points.

(b) The Labour Market Residual is the difference between employment (number of jobs) and head count employment.

Figure 2.3 shows that females accounted for around 47 per cent of all those employed in 2010, with females in full-time employment accounting for 22 per cent of total employment. Males in full-time employment accounted for 36 per cent of total employment, and so 58 per cent of all those employed were in full-time employment. Self-employment was also more common among male workers. While 15 per cent of all those employed were self-employed, self-employed males accounted for twice as many as self-employed females. Part-time employment accounted for 27 per cent of all employment, but while females in part-time employment made up 20 percentage points, males in part-time employment made up only 7 percentage points.

Between 2010 and 2020 total employment (headcount) in the UK labour market (including H.M. Forces) is expected to rise from 28.9 million to 30.6 million (an increase of 1.7 million, see Table 2.2). In terms of jobs, the net increase over 2010-20 is expected to be 1.5 million, which is less than the increase in headcount employment, indicating some reduction in "double jobbing" (mainly part-time work).

Table 2.3 Employment Status, 2010-2020

Table 3.5	Employment Status			000s
2010				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	10,905	2,227	2,995	16,127
Female employment	6,711	6,262	1,358	14,331
Total employment	17,616	8,489	4,353	30,458
2015				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	10,915	2,440	2,994	16,348
Female employment	6,800	6,352	1,354	14,507
Total employment	17,716	8,792	4,348	30,855
2020				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	11,078	2,694	3,033	16,806
Female employment	7,126	6,685	1,392	15,203
Total employment	18,203	9,380	4,425	32,008
				%
2010				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	35.8	7.3	9.8	52.9
Female employment	22.0	20.6	4.5	47.1
Total employment	57.8	27.9	14.3	100.0
2015				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	35.4	7.9	9.7	53.0
Female employment	22.0	20.6	4.4	47.0
Total employment	57.4	28.5	14.1	100.0
2020				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	34.6	8.4	9.5	52.5
Female employment	22.3	20.9	4.3	47.5
Total employment	56.9	29.3	13.8	100.0
				000's
2010-2015				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	10	213	-1	221
Female employment	90	90	-4	176
Total employment	100	303	-5	397
2015-2020				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	163	255	40	457
Female employment	325	333	38	696
Total employment	488	588	78	1,153
2010-2020				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	173	468	38	679
Female employment	415	423	34	872
Total employment	588	890	72	1,550

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Source: Cambridge Econometrics, MDM revision 7146

Figure 2.4 illustrates the net change in jobs by status over 2010-20, for males, females and the total. The majority (56 per cent) of the net increase of 1.55 million jobs over 2010-20 is expected to be taken up by women (men gain the remaining 44 per cent). In particular, there will be a large increase in both full-time and part-time employed women. The number of men in full-time employment is expected to take up 11 per cent of the net increase in jobs over 2010-20. Of the 588 thousand additional full-time jobs created between 2010 and 2020, 415 thousand will be occupied by women and only 173 thousand by men. Meanwhile, about 72 thousand additional self-employed jobs will be created over the period. These are projected to be shared equally between men and women.

Figure 2.5 illustrates the time series profiles of employment (jobs) by gender and status over the period 1990-2020. The figure shows that female employment has been rising faster than male employment, and both full-time and part-time female employment exhibit a clear upward trend. Among males, the increase has been mainly in part-time employment. However, male full-time employment fell sharply during the recession of the early 1990s, but between 1996 and the recent recession showed a good upward trend. Just before 2008, male full-time employment had returned to the peak which it had achieved just before the early 1990's recession. However, over 2010-20 male full-time employment is forecast to rise slowly, and even by 2020 is not expected to reach the previous peaks.

Claimant Count Unemployment, ILO Unemployment and Headcount Employment

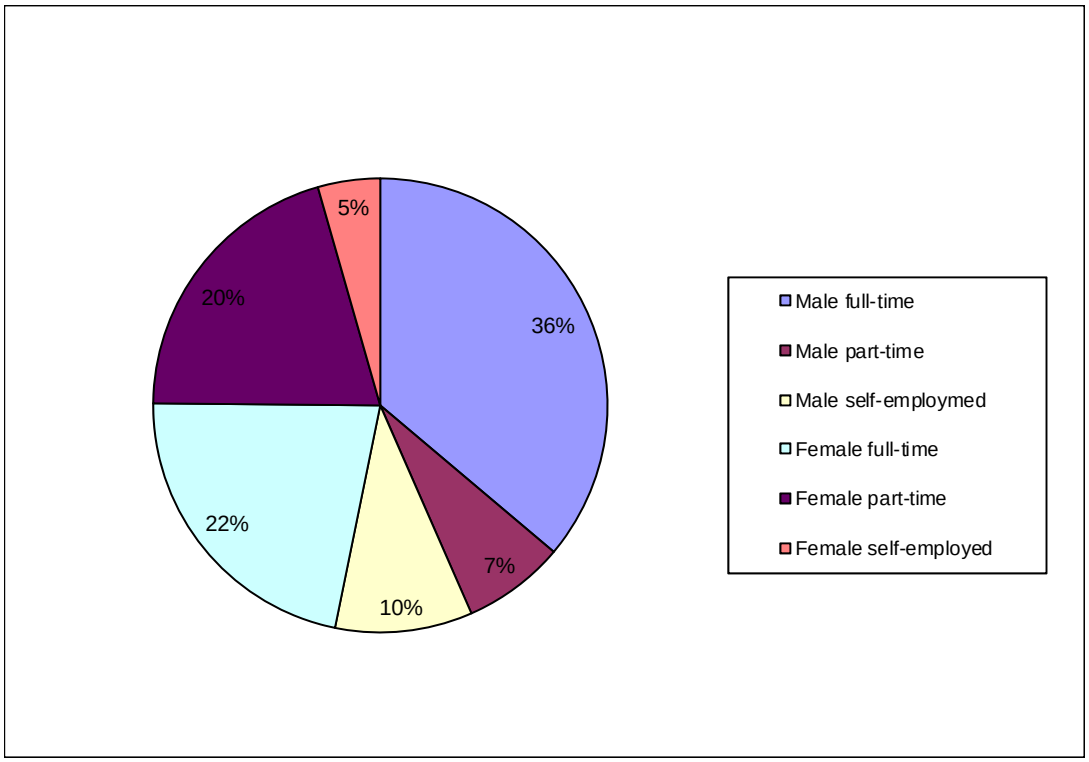
There are two commonly used measures of unemployment: the count of claimants and the ILO definition based on those actively searching for work. Box 2.1 above provides more detailed definitions of the terms.

Between May 2010 and April 2011, the claimant count was largely unchanged at 1.4-1.5 million, bringing the rate of claimant unemployment to 4.5-4.6 per cent. The ILO rate of unemployment also changed little. In May 2010 it stood at 7.8 per cent and, after the smallest of fluctuations over 2010, remained at 7.8 per cent in February 2011, meaning that the number of people unemployed according to this definition was about 2.5 million.

The labour market is not as tight as it has been in recent years, especially compared with conditions before the recession. In early 2011, the number of unemployed people per vacancy (LFS unemployed, and total UK vacancies) was around five, roughly double the level in early 2008, before the recession started. Similarly, the number of vacancies per 100 jobs stood at around 1.9 in early 2011, compared to 2.5 in early 2008, while the redundancy rate has fallen back to its lowest level since May 2008.

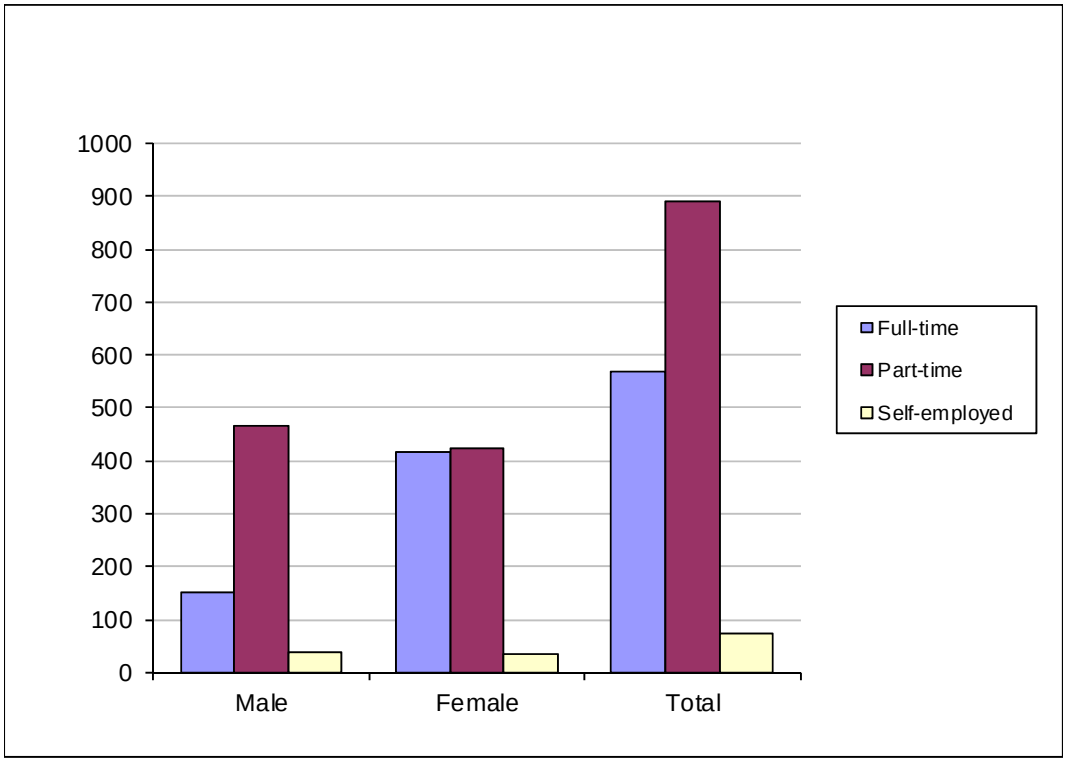
Claimant count unemployment is forecast to increase in 2011 to about 1.6 million (a rate of 5 per cent), and continue rising to peak at 1.7 million in 2015 (a rate of 5.2 per cent). Over 2015-2020 claimant count unemployment is expected to fall by about 340 thousand, and the unemployment rate on this basis is forecast to come down to 4 per cent by 2020.

Figure 2.3: Employment Status in the UK, 2010 (% shares)



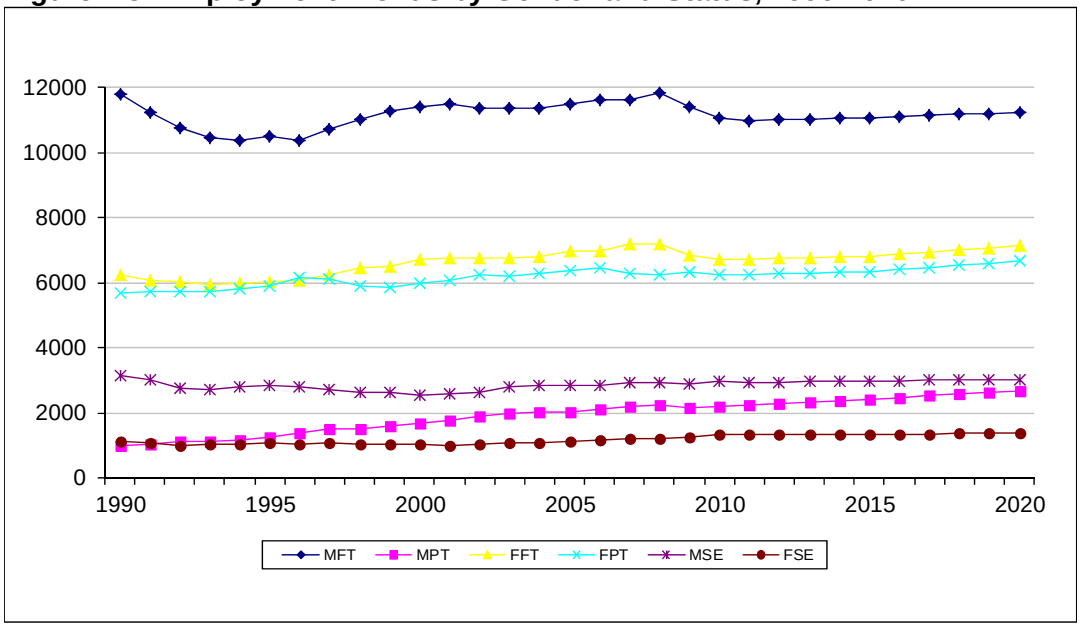
Source : Cambridge Econometrics, MDM revision 7146

Figure 2.4: Changes in Employment in the UK by Status, 2010-20 (000s)



Source: Cambridge Econometrics, MDM revision 7146

Figure 2.5: Employment Trends by Gender and Status, 1990-2020



Source: Cambridge Econometrics, MDM revision 7146
\\Sapphire\ier\ie\shared\Projects\Working Futures\MDM-data\CEdata\[Chapter2 Tables_Charts.xls]Figures 2.1-2.6

A similar movement is expected for the ILO unemployment rate. This is forecast to increase over the medium term to about 8.7 per cent of the labour force in 2015 before falling back to about 6.8 per cent in 2020. The male unemployment rate is expected to increase by 1 percentage point over 2010-15, while the female unemployment rate is expected to increase by just 0.7 percentage points. In the longer term both male and female unemployment is expected to fall. The male unemployment rate is expected to fall slightly faster than the female, reflecting the faster increase in the female labour force. Nevertheless, the male unemployment rate is expected to continue to be higher than the female over the next decade.

Over the period 2005-10, the number of residents in employment (headcount) increased by 294 thousand (1 per cent). At the same time the labour force increased by 1.3 million and this was reflected in a sharp increase in unemployment (ILO definition). Headcount employment increased faster for females (about 250 thousand); while for males the increase was only about 40 thousand. However, the male labour force increased at a slower rate than the female and as a result the increase in the male unemployment rate was only slightly faster than the increase in the female unemployment rate (see Table 2.2).

Over 2010-15 the increase in headcount employment is forecast to be slow at 1 per cent, with female employment rising faster than male employment. In the longer term similar patterns will continue, but for both male and female headcount employment is forecast to see an acceleration compared to 2010-2015.

2.5 Macroeconomic uncertainties

Risks and uncertainties

There are a number of risks and uncertainties surrounding the macroeconomic forecast presented in this section. On the global level these relate to: the general strength and sustainability of the recovery; the impact of rising commodity prices on the recovery; and the sovereign debt crisis in the Eurozone. At the UK level, the key uncertainties relate to: how inflation will develop in the short term; how the Bank of England will respond; and how household spending will respond to government spending cuts and tax changes.

The strength of the global recovery

In the US, rising living costs and the continued sluggishness of the housing and labour markets are likely to curb private consumption and weigh down on GDP growth in the short term. Meanwhile, appreciating currencies in the Eurozone and Japan are threatening their export competitiveness, while at the same time high levels of unemployment are constraining domestic demand. Furthermore, it is still not clear that the sovereign debt crisis in the Eurozone has been isolated and brought under control. The risk is that more shocks lie ahead. This could lead to a loss of confidence in the euro and see it weaken against other major currencies. While this would boost the competitiveness of euro-denominated exports, it would worsen the competitiveness of UK producers and hold back the rebalancing of the UK economy towards an improved trade balance.

At the same time, it remains to be seen if the recent rises in energy, food and commodities prices will persist and slow down the global recovery. Sustained high prices would hit consumer confidence and spending further, and retard the global recovery.

Inflation and household spending in the UK

In the UK, the key uncertainties are: inflation and how the Bank of England responds; and how household spending responds to government spending cuts and tax changes.

Inflation remains well above target and the Bank maintained rates on hold at 0.5 per cent well into 2011. Although the pressures that have pushed inflation up may be regarded as temporary, and therefore likely to subside over 2011-12, this is far from certain. Domestic factors, such as spare capacity and weak demand, are expected to apply downward pressure, but the upward pressure coming from global or external factors, such as higher commodity and import prices, brought about by increased geopolitical uncertainty, strong growth in developing economies and the disruption of some supply chains by the tsunami in Japan, remains strong. Should inflation persist over the summer the Bank could raise rates before the end of 2011 in a bid to prevent a ratchetting up of inflation expectations.

Despite the increase in VAT at the start of 2011 and weak consumer confidence, retail sales showed positive, if modest, growth at the beginning of 2011. However, it is possible that retail sales would have fallen, had it not been for the bad weather in December delaying many purchases until January. Sales volumes fell in February and barely grew in March. In addition, many retailers reported falling sales in early 2011, while in the bars and restaurants trade there was a sharp rise in firms suffering financial distress. At the same time, new car sales to private buyers were falling. Consumer expectations for the economy in the short term continued to fall at the start of 2011, reaching lows not seen since early 2009, when the recession was at its deepest, and confidence about making major purchases fell sharply alongside that. The risk, therefore, is that households are thriftier than expected in 2011 and slow down the recovery. The return to growth depends on faster creation of private sector job than shedding of public sector jobs, and any loss of confidence about the strength of household spending will delay this.

3 Sectoral Output and Employment Prospects

Key Messages

- The results presented here are the first using the new SIC2007 categories
- The broad patterns of change remain similar to those in previous *Working Futures* projections.
- Manufacturing is projected to maintain its share of output but to exhibit a falling share of employment.
- The main changes compared to the previous forecast are the much gloomier prospects for non-market services.
- Between 2010 and 2015 employment in the public sector (non marketed services) is projected to fall by over 400,000, and employment in the private sector (the rest of the economy) to increase by more than 800,000.
- Over the longer term, employment in public services recovers but not sufficiently to get back to pre recession levels.
- Employment in private services is projected to increase by well over 1 ½ million over the decade to 2020.

3.1 General prospects

Output

Table 3.1 and Figure 3.1 summarise the long-term prospects for six broad sectors in terms of developments in aggregate output. This chapter focuses on these 6 broad sectors, but a much more detailed sectoral analysis is available. A taste of this is provided here, but for more detailed results the reader is referred to the full sectoral report (Wilson, 2011).

The top two panels of Table 3.1 show how the structure of the economy has changed over the past two decades and what is implied from the forecast. The bottom two panels show historical and expected patterns of growth; the third panel presents annual growth rates, while the last panel shows the total percentage change over the period covered. Figure 3.1 presents the annual rates of growth over the three decades graphically.

The forecast is for modest GDP growth in 2011 supported by strengthening net trade and investment, as government spending falls and household spending remains subdued due to high inflation and uncertainty in the labour market. Growth in 2011 is expected to be led by manufacturing and financial and business services, as the public sector contracts and the recovery in construction lags behind that in other sectors.

In the medium term, the decline in non-market services output will hold back overall growth in the economy. Manufacturing and business & other services output will see strong growth. Output in water and air transport industries, will benefit from the increase in trade associated with the strengthening of the global economy in 2012 and 2013. Meanwhile, market services activities, which are most reliant on consumer and public-sector spending, will continue to face the greatest uncertainty.

The forecast suggests that there will not be much rebalancing of the UK economy by 2015. Manufacturing's share of value-added in 2015 is projected to be a little lower than it was in 2007, before the recession started, while business & other services are forecast to account for a larger share of total output in 2015.

Over the longer term, GVA growth is forecast to return to 2.5-3.0 per cent per annum, reflecting a recovery in growth in construction, financial & business services and trade, accommodation & transport. Although five of the six sectors broad sectors (the exception being the primary sector) achieve a return to pre-recession levels of output at least in nominal terms by the end of the period, there is a significant loss in real terms.

Over the period 2015-20, growth in business & other services will be higher than the rates seen over the 2000-05 period. However, GVA growth in trade, accommodation & transport is not expected to match the rates seen before the recession. It is not clear to what extent there will be some rebalancing of the economy towards manufacturing in the long run. Although robust, above-trend , growth in manufacturing is forecast over 2015-20, the rate of growth is forecast to slow towards the end of the forecast horizon, and will not be as strong as in other sectors such as financial and business services, information & communication and accommodation & food. As a result manufacturing's share of total output shows little change over the decade. This arrests the long term decline in its share, but at a very modest level of around 11 per cent. Although there is an ongoing political narrative about rebalancing the economy there seems little prospect of long term economic trends in this area being dramatically reversed.

Table 3.1: Output by Broad Sector, 1990-2020

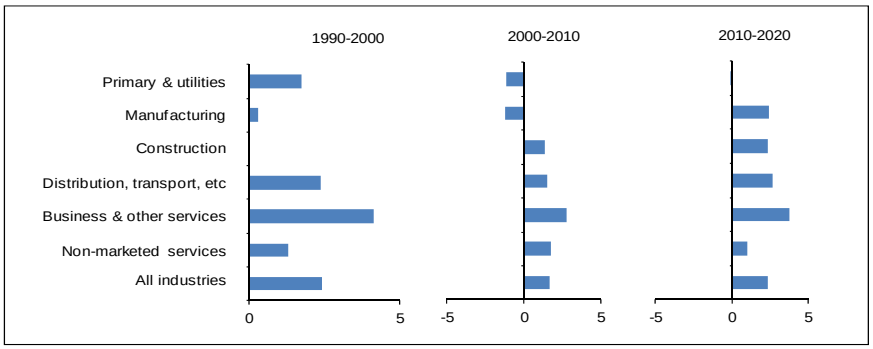
GVA levels (£2006 millions)						
	1990	**2000**	**2005**	**2010**	**2015**	**2020**
Primary sector & utilities	34,522	41,037	44,964	36,525	36,162	36,488
Manufacturing	139,554	144,234	138,586	127,458	147,597	162,111
Construction	63,277	63,277	73,873	72,384	79,820	91,343
Trade, accomod. & transport	149,757	189,259	221,289	219,360	248,380	285,098
Business & other services	200,602	300,496	357,620	395,109	473,020	575,523
Non-marketed services	163,121	185,618	206,527	220,280	215,672	244,653
Total	768,772	977,951	1,118,317	1,155,010	1,278,605	1,464,264
GVA share (per cent of total)						
	1990	**2000**	**2005**	**2010**	**2015**	**2020**
Primary sector & utilities	4.5	4.2	4.0	3.2	2.8	2.5
Manufacturing	18.2	14.7	12.4	11.0	11.5	11.1
Construction	8.2	6.5	6.6	6.3	6.2	6.2
Trade, accomod. & transport	19.5	19.4	19.8	19.0	19.4	19.5
Business & other services	26.1	30.7	32.0	34.2	37.0	39.3
Non-marketed services	21.2	19.0	18.5	19.1	16.9	16.7
Total	100	100	100	100	100	100
GVA growth (per cent per annum)						
	1990-00	**2000-05**	**2005-10**	**2010-15**	**2015-20**	**2010-20**
Primary sector & utilities	1.7	1.8	-4.1	-0.2	0.2	0.0
Manufacturing	0.3	-0.8	-1.7	3.0	1.9	2.4
Construction	0.0	3.1	-0.4	2.0	2.7	2.4
Trade, accomod. & transport	2.4	3.2	-0.2	2.5	2.8	2.7
Business & other services	4.1	3.5	2.0	3.7	4.0	3.8
Non-marketed services	1.3	2.2	1.3	-0.4	2.6	1.1
Total	2.4	2.7	0.6	2.1	2.7	2.4
GVA growth (per cent total)						
	1990-00	**2000-05**	**2005-10**	**2010-15**	**2015-20**	**2010-20**
Primary sector & utilities	18.9	9.6	-18.8	-1.0	0.9	-0.1
Manufacturing	3.4	-3.9	-8.0	15.8	9.8	27.2
Construction	0	16.7	-2.0	10.3	14.4	26.2
Trade, accomod. & transport	26.4	16.9	-0.9	13.2	14.8	30.0
Business & other services	49.8	19.0	10.5	19.7	21.7	45.7
Non-marketed services	13.8	11.3	6.7	-2.1	13.4	11.1
Total	27.2	14.4	3.3	10.7	14.5	26.8

Source: Cambridge Econometrics, MDM revision 7146.

\\Sapphire\ier\ie\shared\Projects\Working Futures\MDM-data\CEdata\[Chapter3-Tables_Charts.xls]Table 3.1

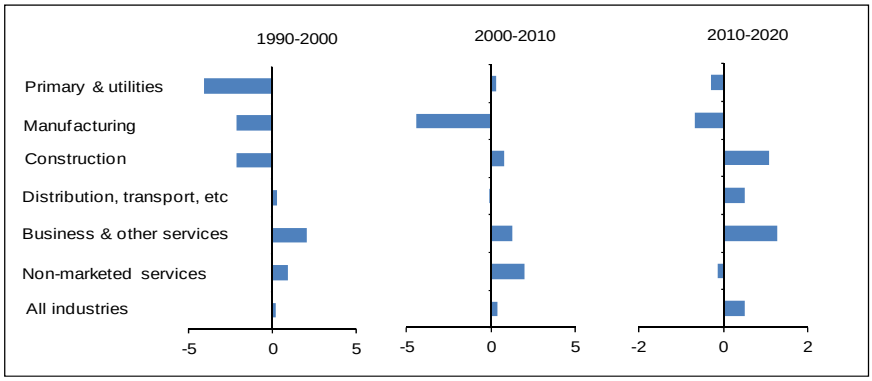
Notes: a. The six broad sectors are defined in the Technical Report.
b. Total output of the six broad sectors differs from total GVA; the latter includes ownership of dwellings.

Figure 3.1: Changes in Output by Broad Sector, 1990-2020 (per cent per annum)



\\Sapphire\ier\ie\shared\Projects\Working Futures\MDM-data\CEdata\[Chapter3 Tables_Charts.xls]Table 3.1
Source: Cambridge Econometrics, MDM Revision 7146.

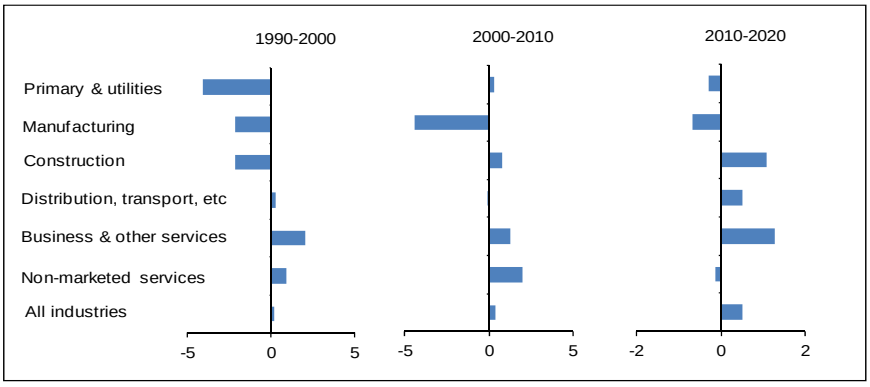
Figure 3.2: Changes in Employment Structure by Broad Sector, (per cent p.a.)



N:\Projects\Working Futures\workbooks\[6UK.xlsm]Figure 3.2

Source: Cambridge Econometrics, MDM Revision 7146.

Figure 3.3: Changes in Employment Structure by Broad Sector, (000s)



N:\Projects\Working Futures\workbooks\[6UK.xlsm]Figure 3.3

Source: Cambridge Econometrics, MDM Revision 7146.

In the longer term, the shares of most broad sectors in total output are expected to see a decline or remain unchanged, with only the share of business & other services expected to increase. The share of manufacturing output is expected to rise only briefly before exhibiting a decline over the period 2015-20. As a result, by 2020 the share of total output accounted for by manufacturing output will be similar to that in 2010 (see Table 3.1).

Employment

The key features of the employment forecast for the broad six sectors are summarised in Table 3.2 and Figures 3.2 and 3.3. The top two panels of Table 3.2 summarise the structure of the economy in terms of employment, while the bottom two panels summarise historical and forecast employment growth. Figure 3.2 presents annual rates of growth over the last two decades and the forecast period, while Figure 3.3 presents absolute changes in job levels.

A key hope of the government is that the private sector will lead the recovery and create enough new jobs to offset the job losses expected in the public sector over 2010-15. The forecast suggests that this will be achieved (at least in part). Between 2010 and 2015 employment in the public sector (non-marketed services is projected to fall by just over 423,000, and employment in the private sector (the rest of the economy) to increase by more than 800,000. In more detail, the increase in private-sector employment is expected to offset the fall in public-sector employment in each year between 2012 and 2015.

However, the immediate outlook for the labour market is bleak as both private and public-sector employment is expected to fall, making 2011 the toughest year for households in the whole period 2010-15. Overall, employment levels are likely to remain well below what was expected prior to the financial crisis (as set out in the previous *Working Futures* projections, for example).

Table 3.2: Employment by Broad Sector, 1990-2020

	1990	2000	2010	2015	2020
Levels (000s)					
Primary sector and utilities	1,125	741	767	770	745
Manufacturing	4,944	3,978	2,518	2,448	2,347
Construction	2,402	1,936	2,092	2,189	2,329
Trade, accomod. and trans	7,750	7,977	7,977	8,151	8,392
Business and other service	6,404	7,850	8,909	9,516	10,103
Non-market services	6,142	6,709	8,195	7,782	8,092
Total	28,768	29,192	30,458	30,855	32,008
Shares (%)	**1990**	**2000**	**2010**	**2015**	**2020**
Primary sector and utilities	3.9	2.5	2.5	2.5	2.3
Manufacturing	17.2	13.6	8.3	7.9	7.3
Construction	8.3	6.6	6.9	7.1	7.3
Trade, accomod. and trans	26.9	27.3	26.2	26.4	26.2
Business and other service	22.3	26.9	29.2	30.8	31.6
Non-market services	21.3	23.0	26.9	25.2	25.3
Total	100.0	100.0	100.0	100.0	100.0
Growth (% pa)	**1990-2000**	**2000-2010**	**2010-2015**	**2015-2020**	**2010-2020**
Primary sector and utilities	-4.1	0.3	0.1	-0.6	-0.3
Manufacturing	-2.2	-4.5	-0.6	-0.8	-0.7
Construction	-2.1	0.8	0.9	1.2	1.1
Trade, accomod. and trans	0.3	0.0	0.4	0.6	0.5
Business and other service	2.1	1.3	1.3	1.2	1.3
Non-market services	0.9	2.0	-1.0	0.8	-0.1
Total	0.1	0.4	0.3	0.7	0.5
Change (000s)	**1990-2000**	**2000-2010**	**2010-2015**	**2015-2020**	**2010-2020**
Primary sector and utilities	-384	26	2	-24	-22
Manufacturing	-967	-1,460	-70	-101	-170
Construction	-466	156	97	140	237
Trade, accomod. and trans	227	0	174	241	415
Business and other service	1,446	1,059	607	587	1,195
Non-market services	568	1,486	-413	310	-103
Total	425	1,266	397	1,153	1,550

Source: Cambridge Econometrics, MDM revision 7146.
N:\Projects\Working Futures\workbooks\\6UK.xlsm]Table 3.2
Notes: a. The six broad sectors are defined in the Technical Report.
b. Total employment and employment in non-market services includes H. M. Forces.

Over the period 2015-20, employment is forecast to grow by 0.7 per cent per annum. Most broad sectors will have employment rising, with the exception of manufacturing and primary sector & utilities, where employment will continue to decline.

Manufacturing employment continued to decline over the last decade in almost all industries, reflecting restructuring and pressures to improve productivity in the face of technological change and stiff international competition. Over the next ten years another 170 thousand jobs are expected to be lost, representing around a 7 per cent of the manufacturing jobs in 2010. The share of manufacturing in total jobs will fall by about 1 percentage point over 2010-20.

In construction the decline in government investment is expected to hold back employment in the short term. Over the period 2015-20 growth in construction jobs will accelerate to about 1.2 per cent per annum, but it is forecast to stay much lower than the rate of increase experienced over 2000-05.

In the trade, accommodation & transport sector employment is going to increase slowly over the next decade, but as this sector represents 26 per cent of total employment it will still create an additional 415 thousand jobs over this period.

Growth in business & other services employment will be 1.3 per cent per annum over 2010-20. This broad sector will generate about 80 per cent of the net increase in total jobs over the next decade, equivalent to 1.2 million jobs.

In the broad non-market services sector, employment in 2020 is expected to be less than in 2010, as the increase of jobs in the longer term will not be enough to compensate for the loss of jobs following the government's austerity plans. Within this broad sector employment changes are mixed; for example in health & social work, employment will continue to rise, although at rates lower than in the last decade. The modest recovery of employment in this broad sector of 300,000 jobs in the second half of the decade reflects a return towards trend growth in areas such as education and especially health services.

3.2 Prospects by broad sector

3.2.1 Primary Sector & Utilities

Output

The primary sector & utilities is a complex broad sector which consists of three distinctly different types of industry: agriculture, extraction and utility services. The sector accounts for less than 3.5 per cent of total GVA, with more than half of it accounted by agriculture. Total output in the primary sector & utilities fell by about 3.5 per cent in 2010 reflecting falls in all sub-sectors apart from electricity & gas. Over the period 2010-15 output is expected to decline further but at a much slower pace, while over the period 2015-20 a slight increase is forecast. This performance reflects rising output in agriculture and in electricity & gas, but falling output in mining & quarrying and water & sewerage.

High costs, especially for fuel and feed, have exacerbated the impact of the recession on agriculture and output is estimated to have fallen by around 1.5 per cent in 2010. In 2011, agriculture is expected to continue to face high costs, and output is expected to continue to fall.

In the medium and long term, cuts already made in spending at the Department for Environment, Food and Rural Affairs (DEFRA), and announced in October 2010 following the spending review, are likely to lead to less support for the industry. Together with the reduction in the Annual Investment Allowance from 2012, this is likely to lead to slower growth.

Debate about the next reforms to the EU Common Agricultural Policy (CAP) reform, to be introduced in the next seven-year 'Financial Perspective' period, from 2013/14, has begun. It is not yet clear what changes are likely to be made. There is speculation that the new round of CAP may introduce some form of payment equalisation, so that farmers in different member states will receive similar amounts per hectare. There could also be a greater emphasis on 'rural development' (which accounts for 20 per cent of the current EU CAP budget) and support for green growth.

Output in mining & quarrying continued to fall in 2010 and further falls are expected in 2011 and 2012. The declining viability of coal seams and of the UK Continental Shelf (UKCS) places a physical constraint on the long-term growth of the coal and oil & gas industries. As

it becomes more difficult (and expensive) to extract more fuel, the output of these sectors will continue to decline.

Economic factors that will influence the future output of these sectors include adequate economic demand and, because these two extraction industries produce commodities, global prices. From a demand point of view, environmental legislation and energy policies will continue to grow in importance.

UK demand for coal fell in 2009, by 16.3 per cent, as declining demand for fuel from power generation was felt disproportionately by coal. Demand from power generation, which now accounts for around four-fifths of total UK demand for coal, fell by almost 17 per cent in 2009, compared to a fall of 6.8 per cent from final users (industry, transport and households).

The decline in demand for coal in the UK became less steep in 2010 compared to 2009, and is expected to grow modestly in 2011. This trend is primarily driven by a modest growth in industrial demand for electricity as the economy slowly recovers from recession.

The long-term growth in demand for coal is expected to be subdued owing to increasing pressures on coal from alternative fuels, the promotion by government of the use of nuclear as well as renewables in electricity generation, and the EU Large Combustion Plant Directive which requires a number of, mainly coal power stations to close. There is not expected to be any major new investment in the UK coal industry, and its supply will decline in line with the depletion of the existing large mines from 2011 onwards.

The UK's production of oil and gas peaked in 1999 and 2000 respectively, and since then has been in long-term decline due to falling reserves on the UK Continental Shelf (UKCS). The pace of decline slowed somewhat in the years immediately before the recession, due to new investment from relatively small and new-entrant oil and gas firms and record oil prices. However, output fell sharply in 2009, mainly due to a fall in demand (imports fell by even more than domestic supply), but partly also due to the fall in oil and gas prices. In 2010, the growth in demand for oil and gas industry rebounded slightly from the slump of 2009. The declining trend in supply of oil and gas is expected to continue in 2011, but at a rate more in line with the early 2000s, buoyed mainly by seven new fields that started production in 2010Q1, a legacy of investment that took place before the recession, when oil prices were high.

The industry's prospects are determined mostly by supply-side factors. Given the lack of remaining reserves on the UKCS, there is no prospect of the industry returning to growth in the short or long term, and the major UK oil and gas firms are looking abroad for growth opportunities. UK demand already far outstrips domestic supply, with the gap being filled by growing imports. However, with sufficient investment there do remain profitable opportunities to produce oil on the UKCS, especially given a high oil price, which is expected to be sustained in the longer term.

In the rest of this broad sector, output is expected to continue to rise in electricity & gas but fall in water & sewerage. The decline in demand for electricity eased in 2010 as industrial demand picked up with the recovery. At the same time, UK demand for gas rose by 5 per cent in 2010 (in contrast to a steep fall in 2009). This was driven by an increase of 3 per cent in household demand, due largely to a very cold winter in 2009/10 at a time when gas prices had fallen and incomes were still rising. Meanwhile, industrial demand for water recovered slightly in 2010 from a sharp fall during the recession in 2009. Household demand increased at a much higher rate due, probably, to the long dry spell before August 2010.

Household expenditure on electricity is forecast to increase by 2 per cent in 2011, driven mainly by price rises rather than by increased consumption, before moderating in 2012. At the same time, household expenditure on gas is expected to grow less strongly in 2011, and to decline again in 2012 as austerity and rising unemployment encourage thrift. Household demand for water is forecast to continue growing modestly over the medium term, while industrial demand declines. Electricity demand from industry is forecast to grow at less than 0.5 per cent in 2011 and 2012 as slower growth in the wider economy succeeds the initial recovery from the trough of 2009. Meanwhile, in the short term, the expected increase in demand for gas by power generation owing to the new CCGT gas-fired power stations, and growth in manufacturing output are expected to counterbalance increased energy efficiency and so to keep industrial demand for gas largely flat.

Over 2015-20, the forecast is for utilities output to remain relatively flat; steady growth in electricity output to meet demand will be moderated by modest growth in gas supply, as imported gas displaces domestic production, and in water supply, as increasing resource efficiency in water consumption curbs the growth in demand

Employment

Employment in the primary sector & utilities increased by almost 10 per cent in 2010 owing to sharp increases in employment in agriculture and electricity & gas. Despite the fall in

agricultural output in 2010, ONS data show that employment in agriculture grew by more than 15 per cent in 2010 compared with a fall of around 1 per cent in the economy as a whole. Whether the ONS estimate will be revised downwards in the future remains to be seen. Employment in electricity & gas also increased by about 18 per cent, while in mining & quarrying and water & sewerage declined.

A further small increase is forecast for 2011, but after that employment in the primary sector & utilities is forecast to decline with about 38 thousand jobs lost between 2011 and 2020.

Continued pressure on prices from supermarkets, global demand conditions and reform of CAP are all expected to lead to further strong improvements in productivity, which will in turn mean that agricultural employment will continue to fall while output grows. Output growth in agriculture over 2015-20 is expected to be almost 1 per cent per annum, while employment is expected to continue falling, by 1 per cent per annum, over the same period.

In mining & quarrying employment is expected to fall but the decline is forecast to be slightly slower than the fall in GVA, while in utilities employment will increase by about 20 thousand over 2010-20. This is the net effect of a decline in electricity & gas, especially over 2015-20, reflecting continued rationalisation to improve efficiency in the face of increasing competition, and rising employment in water & sewerage.

3.2.2 Manufacturing

Output

Manufacturing output accounts for only 11 per cent of total GVA. The manufacturing share has been in a long-term decline, but in 2010 there was a break in the trend as manufacturing performed better than the economy as a whole. Manufacturing output is expected to continue to grow, but the rate of increase is forecast to slow to just above 2.5 per cent in 2011, compared with 4.5 per cent in 2010. Again the sector is expected to perform better than the economy as a whole. Metals, engineering and transport equipment industries are expected to provide the most support, underpinned by investment and export demand.

Buoyed by investment demand in 2010Q1 and pick-ups in consumer demand and exports in 2010Q2, manufacturing output growth averaged 1.5 per cent quarter-on-quarter in 2010H1. Output growth slowed slightly in 2010Q3 as consumer and export demand weakened, but remained brisk at just over 1 per cent quarter-on-quarter. Manufacturers benefited from stronger investment demand and the continued recovery in the stock cycle, and this appears

to have continued in 2010Q4, with the CBI reporting continued growth in production over 2010Q4 and the Markit/CIPS Purchasing Managers' Index reaching 58.3 in December, its highest level since September 1994.

Nevertheless, the CBI reported a fall in factory orders in January 2011, and with household spending on durables expected to slow sharply in 2011, driven by much weaker spending on new vehicles, much will depend on the strength of investment and export demand. The growth in investment is expected to strengthen in 2011 and 2012, and some of this will be reflected in increased demand for transport equipment, and machinery and equipment more generally. Meanwhile, exports of manufactured goods are unlikely to grow as fast as they did in 2010, but should still grow by over 9 per cent in 2011, buoyed by sterling's continued weakness against the dollar. With sterling expected to appreciate against the euro in 2011 and stern fiscal measures put in place to bring the Eurozone's fiscal problems under control, manufacturers must be less hopeful about demand from the Eurozone. Nevertheless, the growth in export and investment demand should still support further output growth in 2011.

In food, drink & tobacco, after strong growth of around 4.5 per cent in 2010, output is expected to see growth to slow to 0.7 per cent in 2011, before increasing to 1.1 per cent in 2012. This reflects producer caution in the short to medium term as public expenditure is cut, jobs are lost and the unemployment rate rises.

In the short-to-medium term, export demand for food drink & tobacco products is forecast to see strong, steady growth, growing by around 8 per cent in 2011 and 2012, owing to very low export price inflation at around 0.5 per cent and the weakness of sterling. At the same time, import supply will be increasing rapidly, growing by around 5 per cent in 2011, showing the UK's continuing dependence on other countries for food drink & tobacco products, as retailers seek to import from low cost sources. Although this is not beneficial for domestic producers, retailers and caterers will be able to continue with deals and promotions, to encourage consumer spending in the medium term when expenditure cuts start to take effect.

The metals, engineering and transport equipment industries should all enjoy robust growth in 2011 as demand for machinery and equipment picks up. However, growth in 2011 will be much lower than in 2010 when the car scrappage scheme was in place, VAT was 17.5 per cent and inventories were still being rapidly rebuilt. In engineering, after the present restocking and catching-up with the backlog of contracts is over, the other forces that drove growth in engineering from the energy industries, for special instruments and equipment and

for specialist electronics are expected to remain strong in 2011 and 2012. Engineering sectors producing domestic appliances, in contrast, face a period of, at best, weak growth in the UK. Their best prospects lie in emerging markets.

Meanwhile, the outlook for non-metallic mineral products and those parts of metal goods exposed to the construction industry in 2011 is less optimistic due to the continued weakness of the housing market and heavy falls in capital spending by the government. However, output in the pharmaceuticals industry is expected to recover to strong growth in 2011, as domestic production is boosted by the weak pound and the recovery in stock building continues.

After easing in 2011, output growth in manufacturing should quicken to 3.2-3.5 per cent in 2012 and 2013, as investment demand holds firm, supported by stronger growth in construction. Support from consumer spending on durables in 2012 is expected to be much the same as it was in 2011, before strengthening in 2013, while support from exports looks set to wane slightly as the appreciation of sterling reduces the competitiveness of some UK-produced goods in international markets.

The stronger output growth in 2012 and 2013 will be driven by higher growth rates in the following industries:

- *Basic metals*; where the international competitive pressure is such that continued restructuring will be necessary to match capacity against future likely demand and to contain operating costs in order to sustain international competitiveness.
- *Electronics*; where the key position of the leading UK companies as suppliers of components for the end-user products most in demand should ensure stronger growth in the medium term.
- *Motor vehicles and other transport equipment*; where prospects over 2011-13 depend critically on exports, given that Britain exports over 70 per cent of the cars and engines that it makes.

In the longer term, manufacturing output is expected to grow by 2 per cent per annum over 2015-20 as the growth in household spending on durables accelerates, while export growth slows throughout the period. Investment growth is not expected to be as strong as it is forecast to be over 2010-15.

Employment

Manufacturing employment has been declining over the last decade and the fall in manufacturing jobs accelerated over the recession. Employment fell by 9 per cent in 2009 and a further fall of 3.5 per cent occurred in 2010. Over the whole period 2000-10 there was a net loss of almost 1.5 million jobs in manufacturing. This has affected all the manufacturing industries and reflects restructuring and pressures to improve productivity in the face of technological change and stiff international competition.

The strong recovery of manufacturing in the short and medium term will be accompanied by strong increase in productivity and although the sharp decline in jobs is expected to be halted, manufacturing employment is not expected to increase. In fact over 2010-15 another 70 thousand jobs are expected to be lost. Productivity growth is expected to slow from the 3.6 per cent per annum forecast over 2010-15 to 2.8 per cent per annum over 2015-20. However, because output growth is also forecast to slow the fall in jobs is expected to accelerate again.

Among the manufacturing industries, employment is expected to increase in food, drink & tobacco over the next decade, but to decline in engineering and in the rest of manufacturing sector where the increase in productivity is expected to be faster. Within these broad sectors there are many niche areas where much faster growth is expected.

3.2.3 Construction

Output

Construction output rebounded sharply in 2010 and is estimated to have increased by 6.5 per cent. This rebound is, however, more a reflection of the scale of the collapse in 2009 than a pointer to continued strong growth. There were also some special factors: poor weather pushed a number of construction projects back from the last part of 2009 into 2010, for example. However activity fell in 2010Q4 due to more severe weather and this may result in stronger than expected growth in 2011. Nevertheless, construction purchases, an indicator of the underlying robustness of the sector, still remain fragile, as indicated by contractors surveyed by the Construction Products Association.

In the short term cuts in public sector capital programmes will drive further decline, while private sector work is not expected to pick up much. Following a fall of 11 per cent in 2009, construction output bounced back strongly in 2010, but because of public sector cuts only

marginal growth in output is expected in 2011 (0.3 per cent) before returning to modest growth in 2012 (2.1 per cent). There are a number of uncertainties around this forecast, not least the scale and timing of the austerity package announced in the emergency budget on private developments if the broader economic recovery is perceived to be at risk.

The Department for Communities and Local Government instruction to heads of planning to effectively abandon both regional spatial strategies and regional economic strategies could produce a hiatus in private sector spending. Consultation responses to the government's proposed 'New Homes Bonus Scheme' will give an indication as to whether this policy will stimulate the supply of new private sector housing, but even if successful, it will still take some time for the effects of this policy to feed through to the construction sector. Until the change in government, long-term growth in construction was expected to be underpinned by demand for new housing in order to meet housing targets across the UK. The abandonment of housing targets will reduce the pressure on local authorities to release land for housing development in the most popular areas.

Following the emergency budget, last autumn's Comprehensive Spending Review set out the new government spending plans in detail, which provided more certainty about the scale and timing of the cuts. For the most part these were as expected, with major cutbacks in capital spending across most departments.

In particular there will be severe cuts in the Department for Communities and Local Government's capital expenditure, from £6.8bn in 2010/11 to £3.3bn in 2011/12 and then £2.3bn in 2012/13. Equally, as the Building Schools for the Future (BSF) programme has been ended, the Department for Education will see its capital budget cut by £2.7bn in 2011/12. By contrast, the Department for Transport, the Department of Energy and Climate Change and the Ministry of Defence, will all see increases in their capital spending budgets, albeit modest ones.

Moreover, the risk-averse attitude of the banks continues to blight the short to medium term prospects of the industry by restricting private investment projects. Despite low interest rates and the quantitative easing asset-purchasing programme, commercial banks are still not lending to businesses at pre-crisis levels. However, at the turn of 2011, the Bank of England reported that credit availability was picking up for small and medium sized businesses, despite business demand for credit starting to slow. Mortgage markets are also still suffering from restricted liquidity, dampening demand for new housing.

Green investment remains one of the few positive areas for the construction industry: the new government has maintained nearly all of the green policies of the outgoing administration and the ambitious policy targets and associated policies could stimulate both industrial and household demand for construction. Major energy infrastructure projects are required to overhaul much of the UK's aging energy infrastructure if ambitious greenhouse gas emissions and renewables targets are to be met by 2020 and beyond. To support investment in green developments, the government announced in the budget the creation of a Green Investment Bank which should provide a stimulus to green infrastructure projects. Policies to stimulate retro-fitting (developing the existing housing stock to modern standards) are expected to stimulate household demand and due to the small average project scale, will likely provide opportunities for SMEs in the sector.

The forecast for the long term is for output growth to average around 2.7 per cent per annum over 2015-20 as public sector investment returns to supplement private sector investment (see Table 3.1).

Employment

The construction industry is an important employer in the UK. Before the recession approximately 2.3 million people were employed directly in construction, over 7 per cent of total employment. In 2009 construction employment fell sharply by 5.2 per cent and in 2010 by another 3.4 per cent. By 2011, it is forecast that employment levels will have fallen to close to 2 million, amounting to some 240 thousand job losses over the three years. The job cuts in 2009 and 2010, and those expected for 2011, are so substantial that, given the scale of the expected fiscal cuts over the next five years and the impact this will have on construction output, it might be almost 2020 before employment levels return to the 2.3-million peak in 2008.

3.2.4 Trade, Accommodation & Transport

Output

The broad industry trade, accommodation & transport accounts for about 20 per cent of the UK total GVA and output growth in this broad industry over the long term has been relatively close to the rate of growth in the whole economy. Following a sharp decline in output by more than 6 per cent in 2009, the sector saw output growth of 1.7 per cent in 2010 and similar growth is forecast in 2011. Growth will be mainly supported by growth in wholesale &

retail trade and accommodation & food, while transport & storage is forecast to see slower growth.

Output in the wholesale & retail trade and accommodation & food fell in 2010Q1, in part due to the return of the standard rate of VAT to 17.5 per cent in January 2010. Output picked up in 2010Q2 and the pace of growth was maintained in 2010Q3, as retail sales and leisure spending picked up. Transport experienced modest growth in 2010Q1, but disruption arising from the volcanic ash cloud led to a sharp fall in activity in 2010Q2. A sharp rebound followed in 2010Q3 as conditions returned to normal.

Consumer confidence continued to weaken in the second half of 2010 in response to rising concern about the impact of public-sector cuts, slowing house-price inflation and falling real incomes. At the same time, the labour market remains sluggish with no signs yet of a recovery in employment or sustained falls in unemployment. With real income growth expected to be weak at best in 2011, the forecast is for growth in retail sales and total household spending on services to remain weak by historical standards. This will be reflected in trade, with output growth slowing as consumers' appetites for major purchases or investments that characterise the industry's products and services shrink.

Growth in sales of motor vehicles is expected to slow in 2011 and 2012 but the vehicle repair sub-sector is one market that is likely to see a pick-up in activity as consumers delay renewing their cars. The slowdown in retail trade, meanwhile, is expected to be slight relatively to the sharper slowdown expected in wholesale trade, because the ability of consumers to substitute for cheaper alternatives will support sales volumes. In contrast, the leisure-based nature of accommodation & food makes this subsector more exposed to reductions in consumers' discretionary spending, but because eating out as part of a regular lifestyle is much more commonplace than it was 10 or 20 years ago, modest growth in consumer demand is still forecast, and this will support the continued recovery in accommodation & food in the short term. Further growth will also come from postal services where strong growth is expected.

In 2012 and 2013 recovery in leisure spending and the London Olympics, as well as the increase trade associated with the strengthening of the global economy, are expected to benefit accommodation & food and transport & storage.

All areas of transport are highly cyclical and heavily reliant on the economy as a whole. Their recovery is therefore closely linked to that of the wider economy. Demand in the air transport industry is set to recover from a turbulent 2010, disrupted by strikes and the eruption of the

volcano in Iceland. Over the course of the recession, all types of airline suffered a fall in demand, but the International Air Transport Association (IATA) reports that passenger numbers are back above pre-recession levels although they are still far from returning to previous rates of growth. The comparatively slow growth in passenger numbers is a result of the rapid recovery in business travel offset by a continued lack of consumer confidence. The decision not to build a second runway at Stansted or a third runway at Heathrow will act as an extra check on growth in the medium term.

In land transport output fell sharply during the recession, mainly due to a loss in commuter traffic, which accounts for some 30 per cent of the usage of public transport. Rail services are even more dependent upon commuter traffic, with 56 per cent of journeys being made by commuters. Since land transport is closely linked to the performance of the UK economy as a whole, a slow recovery is expected in output.

After the downturn in the recession, output in the water transport sector would have risen sharply in any case but the recovery over 2010-12 is expected to be even stronger because of strong economic growth in Asia. Thereafter, more normal and moderate rates of growth are expected

The new container port, London Gateway, near Thurrock in the Thames Estuary, will be crucial to the Water Transport industry. Construction was delayed, but finally began in the first quarter of 2010. The completion date is uncertain. However, this port could alter the whole pattern of freight distribution in the South East. At any rate, the new port is expected to double the container capacity of the South of England and may directly create more than 36 thousand new jobs.

In the long term, output in trade, accommodation & transport is forecast to strengthen to 2.8 per cent per annum over 2015-20, reflecting strong growth in trade and accommodation & food while transport & storage growth will lag behind the UK average for the whole economy.

Employment

The trade, accommodation & transport broad sector accounts for more than a quarter of total jobs in the UK (see Table 3.2). In 2010 almost 8 million people were employed by these industries. However, the sector's share of total jobs fell over the last decade by about 1 percentage point. This mainly reflects the impact of the recession, with job numbers in 2009

and 2010 having fallen faster than in the UK as a whole, while over 2000-05 employment had risen at a rate similar to the rate of increase in total jobs in the UK.

Within this broad sector employment fell sharply in wholesale & retail trade and in transport & storage over 2008-10, while in accommodation & food there was a smaller decline, but still above 5 per cent. Further job losses are expected in 2011 in all industries (a net loss of 46 thousand jobs) but a small increase of just 0.3 per cent is forecast for 2012. This reflects the recovery in output in transport & storage and accommodation & food expected in 2012. Over 2010-20 there will be a net increase of about 415 thousand jobs, representing a rate of increase similar to the rate of growth in total UK jobs. Therefore the share of this broad sector in total UK jobs will remain at 26 per cent.

Within the sector faster increase in the period is expected in accommodation & food and transport & storage over the longer term. In transport & storage the main increase comes from warehousing while in air transport, water transport and postal services increases in productivity will restrain job growth. In land and water transport employment is even expected to decline over 2015-20.

Productivity growth in air transport in particular is projected to be high. There is evidence that the recession has improved the efficiency of the air transport industry. Employment is expected to grow only slowly in the future, partly as a result of cost-cutting programmes (brought on by rising input costs and falling revenues) which included cutting the number of flights so that planes fly closer to maximum capacity. Output is expected to grow strongly as globalisation intensifies. Consequently, productivity is expected to improve substantially in the long term

Technological advances will play an important role in the future of transport employment and productivity. Firstly, with advances in technology such as video-conferencing, the need to travel to do business will be reduced. Meetings can be held with the use of web-cams and microphones or telephones and seminars can be recorded and then posted on the web. Transport industries may see a decrease in the number of passengers from the business sector as face-to-face meetings become less necessary. On the other hand, another contributing technological factor is that lighter materials and more efficient engines are being developed, thus increasing the efficiency of vehicles. This means less fuel is used which could allow for increases in capacity.

3.2.5 Business & Other Services

Output

Business & other services is the largest of the broad six sectors, accounting for more than one-third of total UK GVA (see Table 3.1). Over the last two decades this sector has been leading UK growth. Over the recession it was the best performing sector apart from government services. Output in this sector fell by 4.2 per cent in 2009, (compared with 11 per cent declines in manufacturing and construction and over 6 per cent in trade, accommodation & transport) but returned to slow growth in 2010.

The different parts of the business services sector rely on different sources of demand, and therefore recovery is unlikely to be uniform across the sector. Most aspects of the sector showed signs of a recovery in the first half of 2010, as private sector demand picked up, although the strength of any upturn varied. However, in the second half of the year the outlook began to weaken for those areas of professional services that rely on the housing market and construction sectors, such as property agents, architects and equipment hire companies. Furthermore, some areas of professional services, such as advertising agencies and R&D firms are dependent on a recovery in discretionary spending, and prospects here are still uncertain. Meanwhile, management consultancy and the legal sector, aspects of professional services that depend heavily on growth in the finance sector and other services sectors, fared much better in 2010. The prospects for these are more promising owing to the strong recovery in financial services. This broad group also includes the arts and entertainment, which, despite the impact of the recession on discretionary spending, are projected to exhibit strong growth rates as the economy picks up. Overall, the recovery in business & other services is expected to continue in 2011 and output growth is projected to accelerate to 3.5 per cent.

In information & communication, recent results from some of the largest computing services firms are promising, and show evidence of an increasing trend in big contracts, rather than smaller IT projects. The industry is forecast to see a good recovery in 2011, as relatively strong demand from the private sector is expected to more than offset the negative impact of the government spending cuts.

The recovery in business & other services is forecast to strengthen over 2012-13, led by finance & insurance, professional services and support services, with a more moderate pace of recovery expected in real estate.

The strong outturn for support services will be underpinned by the recovery in finance & insurance and professional services and the resulting increase in demand for these services. In terms of implications for employment this will be offset by continued pressure towards cost cutting and the trends towards specialisation in service provision, both of which facilitate outsourcing. Globalisation and completion from financial centres in the Far East in particular may limit these prospects.

Information & communication should enjoy output growth in excess of 5 per cent per annum in 2012 and 2013, as the recovery in finance and business services drives up demand, and super-fast broadband networks boost consumer demand. Even stronger rates of growth are expected in computing services in the medium term, as the recovery in business confidence leads firms across all industries to reinstate investment in computing upgrades or renewal into their budgets, creating strong demand for computing services.

The long-term prospects for business services are promising and demand is expected to continue to grow at a faster rate than the wider economy. Within the separate sub-sectors of business services demand is likely to increase in the mid to long term for slightly different reasons. However, an overarching factor of growth is the fact that business services provide key support to industries like financial services, which are expected to remain major players in the UK economy. Furthermore, the trend towards specialisation in service provision is a key driver of growth in both high value-added and low value-added business services, facilitating outsourcing and the development of innovative services and products that generate new demand.

Other sectors are likely to become ever more reliant on computing in the long term, to streamline production and provide solutions to business problems. Similarly, increases in outsourcing are also expected in the long term, as firms continue to improve efficiency, fostering growth in the professional and support services. Banking and financial services are particularly reliant on the professional services sector, which provides it with services such as law and accountancy. The increasing importance of finance & insurance industry will mean that professional services will see particularly strong growth in the long term.

Overall, long-term output growth rates in the business & other services broad sector are expected to remain above those in the wider economy, in the range of 3.7 – 4 per cent per annum over the period 2010-2020.

Employment

In terms of employment the business & other services sector accounts for 29 per cent of total UK jobs. This is lower than the share of the sector in terms of output, indicating the high productivity performance of several of the industries included in this broad sector.

Employment in business & other services fell by about 3 per cent in 2009 and by a further 0.8 per cent in 2010. In 2011, following the recovery in output, a pick-up in employment is also expected, but only at a very modest rate. However, this is the only broad sector that is expected to have rising employment in 2011.

Employment is likely to pick up in some areas of professional services in 2011 as output returns to higher growth. This is likely to be the case in areas such as management consultancy. However, there are still some downside risks to a recovery in employment in the sector, since many jobs depend on the robustness of the property markets, prospects in the construction sector and public sector spending. Employment growth is also forecast in support services in 2011, reflecting the expected strong output growth. As growth in sectors upon which support services is largely dependent, such as banking & finance, accelerates firms will increase recruitment in 2011. Employment growth is therefore forecast to reach 2.4 per cent in support services in 2011. By contrast, it is unlikely that employment will increase in computing services in 2011, as computing firms continue to streamline their businesses and increase productivity. In 2012 employment growth will strengthen reflecting improved prospects in all the industries in this broad sector.

Employment in the business & other services sector is expected to increase in the long term. Demand for the sectors included in business services is likely to increase, in most cases creating the need for greater employment. However, in some areas of business services, productivity improvements may outweigh the boost coming from output growth. For example, strong growth is expected in recruitment services (part of other business services), but much of this growth will come from demand for online services. An area of business services that is likely to face possible employment problems in the long term is computing services. There are concerns that certain skills gaps could be opening up in the sector, owing to large numbers of workers in certain fields reaching retirement age in the next ten years or so. At the same time, computing and IT subjects are falling in popularity among students.

Employment growth in the business & other services sector is forecast to be 1.3 per cent per annum over the period 2010-20 and the share of the sector in total UK jobs will rise to more than 31 per cent.

3.2.6 Non-market Services

The Comprehensive Spending Review has signalled a period of austerity in the public sector, leading to both output and job losses in the short and medium term. Investment spending is also set to suffer as capital spending budgets are slashed. Job losses are expected across central and local government as departmental budgets are cut. While current spending in the NHS and education has been protected, investment in these industries is also set to fall. GVA in non-market services is expected to fall by 0.4 per cent per annum over 2010-15 before returning to growth of more than 2.5 per cent per annum over 2015-20.

In its Comprehensive Spending Review, the government unveiled the full extent of its plans for fiscal consolidation. For those departments unprotected by ring-fencing pledges, this amounted to an average budget cut of 19 per cent over the period to 2015. This will have a considerable impact on both output and employment in public administration & defence. HM Revenue & Customs is required to find resource savings of 15 per cent. More effective utilisation of technology is expected to account for the bulk of this and is likely to come at the cost of jobs in the department.

Likewise the Department for Work & Pensions (DWP) is to reduce its core budget over the period to 2015 by 26 per cent. These savings are intended to be met partly through the use of digital services for processing benefits; a development which is bound to lead to job cuts. DWP will of course face rising costs which are recession-related (e.g. benefits payments). However the focus here is on the impact on public sector employment rather than budgets.

The Home Office and Department for Communities and Local Government also face cuts of similar magnitudes to their resources budgets. In the latter case, this will be partly met by passing on the budget cuts to local government. Employment in public administration & defence led the fall in the non-market services sector in 2010Q1. The decline in total employment in the non-market services and public administration & defence in 2010 Q2 is also as a result of the civil service recruitment freeze announced by the government in May 2010. The results of the Comprehensive Spending Review are therefore expected to exert further downward pressure on employment in a sector which is already losing jobs.

The school education budget has emerged relatively unscathed by the Comprehensive Spending Review. Funding of schools' running costs is to increase, in real terms, by 0.1 per cent per annum over the period to 2015. However the Department of Education's capital budget is to be cut by over 55 per cent in the same period. This, along with the scrapping of

the Building Schools for the Future project, may make it difficult to meet the capacity required in the coming years by the expected surge in the numbers of children of Primary school age.

Pre-school education is also set to suffer as the Sure Start budget is to face a reduction in real terms of 9 per cent. In so far as this fall in investment leads to capacity constraints, and increasing class sizes in state schools, this may encourage some parents to move their children into the independent system.

The Further Education sector is expected to suffer as a result of the announcements made in the Comprehensive Spending Review. The Government's pledge to ring fence the education budget does not apply to post-16 education. Department for Education funding for the Further Education system is to be cut by a quarter over the period to 2015. Adult learning is expected to suffer the most, with programmes such as Train to Gain being abolished, and employers being expected to make an increasing contribution to the skills development of their employees.

The Comprehensive Spending Review outlined a fall in non-research higher education funding from £7.1bn to £4.2bn over the period to 2015. A substantial rise in tuition fees is expected in order to close this gap; however there are fears that some institutions which do not have the reputation to attract students at this level of tuition may face mergers or even financial collapse.

Poor employment prospects for school leavers are thought to have driven demand for university places in 2010. There are fears that there will be a further increase in demand in 2011 if there is a surge in applications from those wanting to avoid a possible tuition fee increase in 2012. This rising demand for higher education has served to attract for-profit education providers into the British Higher system. For example, US-owned business education provider BPP has recently been awarded university college status, making it the first private university college in the UK since the University of Buckingham.

Like education, the NHS is to receive a 0.1 per cent rise in real terms funding in each year to 2015. However this is accompanied by a 17 per cent reduction in capital spending for the NHS. The NHS is also likely to be heavily affected by the rise in VAT in January 2011, which has been estimated to add between £250m to £300m to its costs. Heavy job losses are expected as attempts are made to cut management costs by 45 per cent. In the short term, these will incur redundancy costs of up to £900m.

Given the large proportion of the health & social work industry that the NHS accounts for, modest output growth is forecast for this industry in the short term. Output growth in 2010 was estimated to be 2.8 per cent. This is forecast to come down to below 2 per cent in 2011 and remain low in 2012 and 2013 as the reduction in investment is likely to introduce capacity constraints in the NHS, thereby contributing to the stagnation in output in 2012 and 2013.

The aging of the UK population and increases in life expectancy will ensure long-term output growth is maintained in health & social work. However the limited rise in NHS spending will mean that the industry is forced to find productivity gains. Large-scale reform of the NHS, centred on a move towards GP's commissioning of healthcare services, could create scope for increased competition within the NHS and the efficiency gains this has to offer. Furthermore policy initiatives such as 'Choose and Book' suggest an increasing role for the involvement of private-sector health care providers. This would enable the health & social work output to continue growing over a period of possible low investment.

Demand for education is to increase due to a forthcoming surge in the number of children of primary school age. This, along with the government's plan to make education compulsory until the age of 18, means that output of education will grow over 2015-20. This growth may, however be limited by the reduction in investment over the short term. This could, in turn, hold back medium-to-long-term capacity. Reform to higher education funding may also act as a counterbalance on output if prospective students are put off from entering higher education due to any substantial rises in tuition fees. Long-term productivity gains may be made through the introduction of technology in the class room and the trend towards study through distance learning courses.

Employment

Non-market services account for 27 per cent of total jobs in the UK. Employment in this sector is expected to fall by 1 per cent per annum over 2010-15, but to return to growth after that. However over 2015-20 employment is expected to increase by only 0.8 per cent per annum, which represents low growth compared with the history of the sector. Overall, over 2010-20 the share of the sector in total jobs will fall by 2 percentage points, to around 25 per cent.

The budget cuts announced in the Comprehensive Spending Review are likely to lead to considerable reductions in employment in the next few years in the public administration & defence industry. The reductions to operational budgets are expected to cause job shedding

across central government departments as cost savings are sought in areas such as management and administration. HMRC and the Department for Work & Pensions, which are to face reductions in their resource budgets of 15 per cent and 26 per cent respectively, have already identified one major source of savings in the increased use of automated systems, but this is almost certain to lead to a reduction in administrative jobs.

The Ministry of Justice is to reduce staff numbers by 15,000 and reduce total administrative spending by a third. The introduction of payment by results schemes for probation and prisoner rehabilitation is likely to result in a transfer of jobs from the public to the private sector. The police are to receive a 14 per cent reduction in government funding and a reduction in officer numbers is likely to follow as a consequence. In defence, 42,000 jobs are scheduled to be lost in the armed forces and Ministry of Defence, as a consequence of the 8 per cent reduction in the budget over the period to 2015.

These scheduled job losses are reflected in the short-term forecast for employment in public administration & defence. A reduction of 46 thousand jobs is forecast in 2011. The number of job cuts is forecast to continue in 2012 and fall back to 39 thousand jobs lost in 2013.

The government's pledge to increase schools' funding by 0.1 per cent per annum in real terms should serve to limit job losses in the primary and secondary education sectors, which account for almost 60 per cent of the output of education. This is reflected in the short-term employment forecast for education in which the rate of employment loss in both 2012 and 2013 is forecast to be only 0.5 per cent per annum. This compares with 2.5 per cent per annum losses in public administration & defence.

There is some scope for productivity gains in education, for example through the increasing prevalence of distance learning courses in the higher-education sector.

Efforts to cut management costs by 45 per cent are very likely to lead to improvements in productivity in the NHS. In the short term, a decline of 0.7 per cent in employment forecast for 2012 in health & social implies an improvement of about 1.5 per cent in productivity in the same year.

Output and employment in the public sector are set to fall to levels not seen since the 1980s. This will result in a long-term redistribution of resources from the public to private sector, as the private sector replaces jobs lost in central and local government and also takes on a range of activities previously carried out by the state. The Third Sector in particular is likely

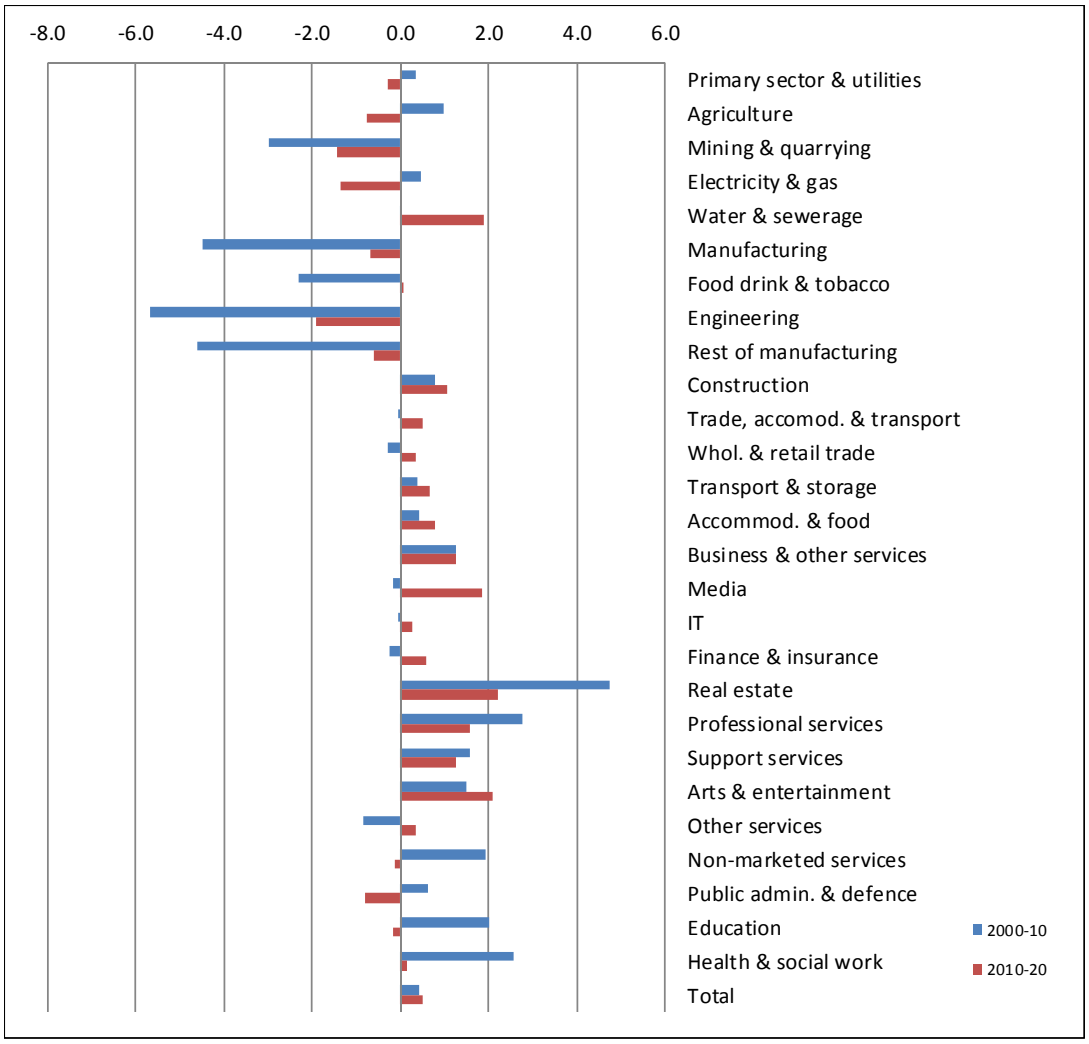
to take on an increased role in services provision in light of the government's 'Big Society' plans.

Public administration & defence is set to be the most heavily affected of the industries in the Public Sector. Reforms to simplify the tax and benefits system are to be brought in over the next two parliaments. Elsewhere in government productivity gains are being sought through the increased automation of processing systems and more efficient use of technology. A move towards technological resources to counter modern threats such as terrorism and cybercrime will change the capital- labour mix of the armed forces for the future. Long-term job losses are therefore forecast to be at a higher rate than the fall in output.

3.3 Detailed analysis by 22 Industries

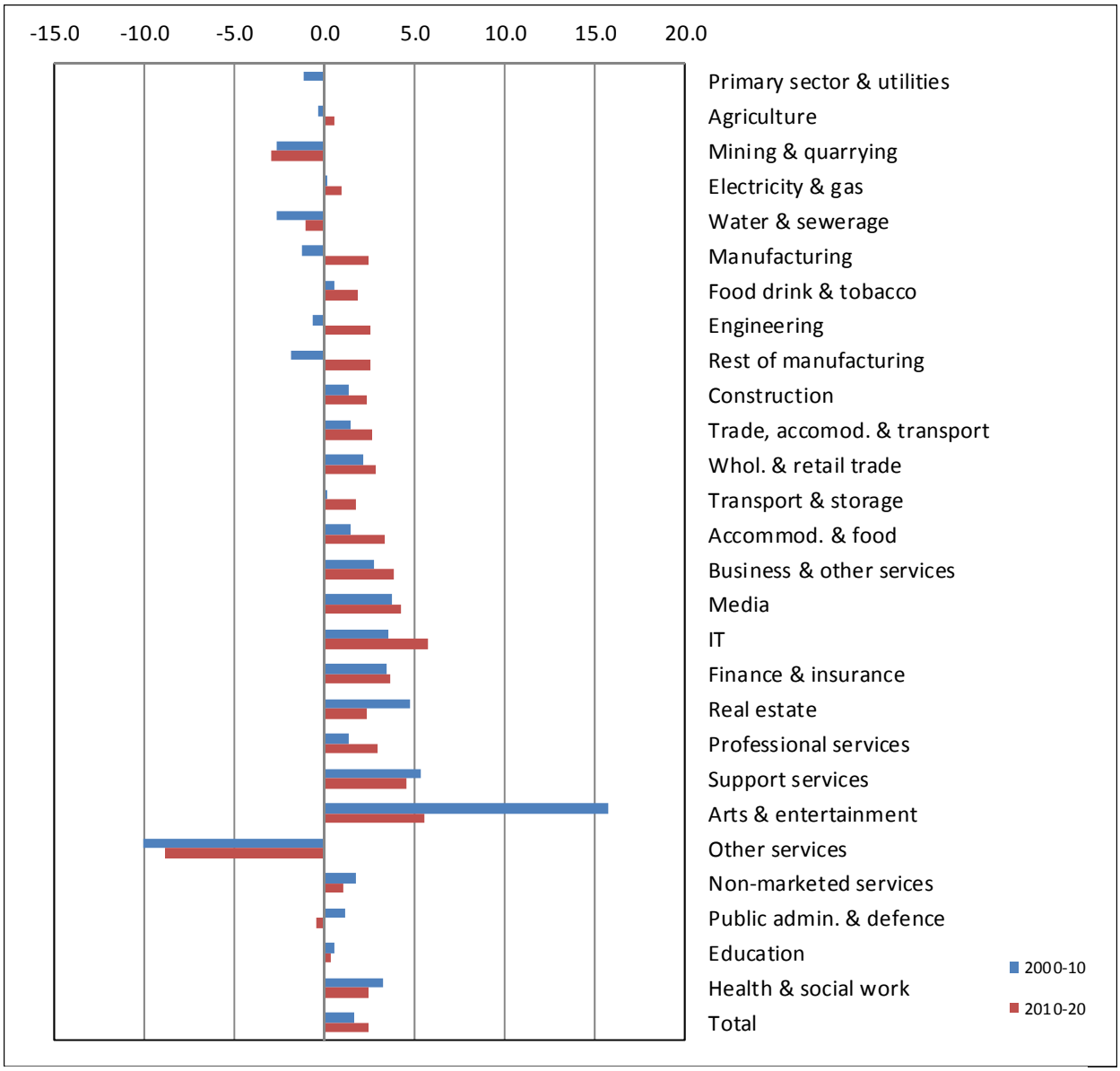
More detailed analysis by 22 industry categories can be found in the separate Sectoral Report. Figures 3.4 and 3.5 and Table 3.3 summarise these results in terms of percentage changes per annum in output and employment. Generally there is expected to be less variation changes in employment patterns over the coming decade than the previous one. This reflects the projected changes in output and productivity in the sectors. For more detailed discussion see the separate Sectoral Report.

Figure 3.4: Changes in UK Employment by Sector (per cent p.a.)



Source: Cambridge Econometrics, MDM Revision 7146.

Figure 3.5: Trends in UK Output by Sector (per cent p.a.)



Source: Cambridge Econometrics, MDM Revision 7146.

Table 3.3: Projections of Output and Productivity by Sector (per cent per annum)

	Output				Productivity			
	2000-05	2005-10	2010-15	2015-20	2000-05	2005-10	2010-15	2015-20
Primary sector & utilities	1.8	-4.1	-0.2	0.2	3.5	-6.2	-0.3	0.8
Agriculture	1.5	-2.2	0.2	0.9	2.1	-4.7	0.8	1.9
Mining & quarrying	-1.4	-3.8	-2.9	-2.9	4.1	-3.3	-2.0	-1.1
Electricity & gas	1.5	-1.3	0.8	1.1	7.0	-7.2	0.0	4.8
Water & sewerage	3.5	-8.6	-1.1	-1.1	3.9	-8.9	-2.8	-3.0
Manufacturing	-0.8	-1.7	3.0	1.9	4.2	2.6	3.6	2.8
Food drink & tobacco	1.0	0.0	2.1	1.6	3.8	2.0	2.0	1.5
Engineering	-2.2	0.9	3.4	1.8	4.1	6.6	5.5	3.7
Rest of manufacturing	-0.8	-2.8	3.1	2.0	4.3	1.6	3.5	2.9
Construction	3.1	-0.4	2.0	2.7	0.6	0.5	1.1	1.5
Trade, accomod. & transport	3.2	-0.2	2.5	2.8	2.1	0.9	2.1	2.2
Whol. & retail trade	3.9	0.4	2.7	3.0	3.2	1.6	2.5	2.5
Transport & storage	2.1	-2.0	1.6	1.8	0.6	-1.3	1.1	1.0
Accommod. & food	2.3	0.5	3.1	3.5	0.7	1.3	2.2	2.8
Business & other services	3.5	2.0	3.7	4.0	1.5	1.4	2.3	2.8
Media	2.2	5.2	4.6	3.9	2.2	5.6	2.9	1.8
IT	5.7	1.3	5.7	5.8	4.5	2.6	5.7	5.2
Finance & insurance	4.7	2.1	3.7	3.6	4.6	2.8	3.4	2.6
Real estate	4.5	5.1	1.7	2.9	-0.1	0.1	-0.8	1.0
Professional services	1.9	0.9	2.7	3.2	-1.3	-1.4	1.0	1.6
Support services	5.7	5.0	4.6	4.5	3.1	4.3	2.7	3.7
Arts & entertainment	15.3	16.2	7.0	4.2	12.1	16.1	4.9	2.0
Other services	-3.3	-16.4	-17.3	0.4	-3.7	-14.6	-17.2	-0.5
Non-marketed services	2.2	1.3	-0.4	2.6	-0.4	0.0	0.6	1.8
Public admin. & defence	2.1	0.1	-2.4	1.5	0.3	0.7	0.2	0.6
Education	0.8	0.2	-0.9	1.6	-1.5	-1.4	-0.3	1.3
Health & social work	3.5	3.1	1.2	3.7	0.4	1.0	1.9	2.7
All Sectors	2.7	0.6	2.1	2.7	1.7	0.8	1.8	2.0

Source: Cambridge Econometrics, MDM revision 7146.
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3.4 Productivity

Context: Productivity pre and post recession

Productivity is a key focus of the UK government. The Treasury, DTI and BIS have all undertaken analysis of the causes and consequences of productivity growth. Productivity developments in the long term are influenced by a range of factors, including technological change, enterprise and skills.

In the short term productivity is also affected by employers hiring and firing decisions. One characteristic of the experience of the recent recession in the UK and some other European countries has been the retention of labour, compared to the policy of more rapid firing, leading adopted in the USA. This can lead to very different profiles on productivity in the short term.

This section presents a comparison of productivity growth pre-recession with those estimated post-recession for the period 2010-20.

Productivity can be measured in various different ways. The most commonly used measures are output per head or per hour worked. For the purposes of this exercise the focus is on the ratio between value added and employment. Such measures of productivity by sector and region are readily available within the *Working Futures* database and modelling framework.

Economics provides a number of measures of recession, including the precise timing. For the purposes of the current exercise the operational definition is constrained by the annual data used in the modelling. The period 2010-20 is characterised by:

- First, a period of recession and cyclical adjustment to recession (i.e.. 2010-15); and
- Second, a period when underlying longer-term trends begin to reassert themselves (i.e. 2015-20).

Unemployment did not rise at the rate first feared when the recession began, and employment has so far held up better than many anticipated. Many employers have engaged in labour or skills hoarding (possibly wary of laying-off workers they feared would be difficult to recruit when the recovery commenced). This is reflected in changes in productivity levels and growth rates. How this develops over the forecast period is still subject to some uncertainty, given the long-term goal of boosting productivity, as well as the shorter-term plans for reform of public services (and in particular the impacts of public expenditure cuts).

Much of the difference between old and new results reflects the impact of the recession. However, because of the change in SIC used in this latest set of projections, direct comparison between the old and new results is also complicated by classification differences.

Productivity by Broad Sector

Figures 3.4 and 3.5 present the broad sector trends in employment (in terms of jobs and output growth, respectively), over the periods 2000-10 and 2010-20. The figures also present the same information for the detailed 22 industries.

Figure 3.4 illustrates the much smaller reduction in employment expected in manufacturing over the next decade compared with 2000-2010. Also it shows the forecast reduction in non-market services employment, which is in contrast to the 2 per cent growth which occurred over the previous decade. Total employment growth is expected to be slightly faster over the next decade compared with the last.

Total growth in GVA is also expected to be faster over 2010-20 than over 2000-10. Figure 3.5 illustrates that most broad sectors will see output rising faster over the next decade with the notable exception of the non-market services. In manufacturing output is expected to rise, while it fell over the last decade.

Table 3.3 combines the information in the Figures 3.4 and 3.5, and summarises the long-term prospects for productivity in the six broad sectors and the detailed industries. Taking the economy as a whole, growth in productivity, defined as output per job, will be higher on average over the period 2010-20 than in the previous decade. This is expected to be driven by strong productivity growth in business & other services, manufacturing, and trade, accommodation & transport. In comparison, the primary sector & utilities, construction and Non-market serviced are forecast to see more moderate productivity growth. All broad sectors are expected to see an improvement in productivity growth over 2010-20 compared with 2000-10.

The primary sector & utilities is the only broad sector which is expected to experience a fall in productivity between 2010 and 2015. Agriculture dominates the primary sector & utilities, in terms of its contribution to GVA and employment, and is therefore an important determinant of its productivity. Whilst recent high fuel and feed prices have contributed to a fall in output in this industry, employment in agriculture actually rose in 2010. Only moderate productivity growth is therefore expected for agriculture between 2010 & 2015. This will do little to mitigate the reductions in productivity expected in mining & quarrying and the utilities.

A key factor here is the gradual run down of output levels from North Sea oil and gas fields. A fall in productivity of 0.3 per cent per annum is therefore forecast for the sector as a whole, between 2010 & 2015. This fall, however, is much lower than that experienced between 2005 and 2010 and a return to productivity growth is forecast between 2015 and 2020, at a rate of 0.8 per cent.

Technological change and increasing global competition has driven long-term productivity growth in manufacturing between 2000 and 2010 and will continue to do so between 2010 and 2020, albeit at a slightly slower pace A rate of growth of 3.6 per cent per annum is expected between 2010 and 2015, making it the best performing of the six broad sectors in terms of productivity growth. Growth is forecast to remain positive between 2015 and 2020, although at the lower rate of 2.8 per cent per annum. The engineering industry is expected to be a key driver of this growth, as the long-term trend of falling employment continues, and output growth picks up (due to demand for plant and machinery derived from the output recovery in other manufacturing industries).

Moderate productivity growth is forecast in the construction sector between 2010 and 2020. This is a higher rate of growth than that experienced between 2000 and 2010, when sustained growth in construction employment saw its share of employment in the whole economy stand at over 7 per cent in 2008. Productivity growth of 1.1 per cent per annum is forecast between 2010 and 2015. This is expected to increase to 1.5 per cent per annum between 2015 and 2010, when it is hoped that uncertainty over local planning regulations in the wake of the abolishment of regional spatial strategies will have diminished and the availability of credit will have improved.

Productivity growth of 2.2 per cent per annum is forecast in the trade, accommodation & transport sector between 2010 and 2020. This is higher than the average rate of productivity growth in the previous decade. Accommodation & food is expected to be a key driver of this growth as the industry continues a period of market consolidation necessitated by the strength of competition and a squeeze on margins. The relatively high degree of casual workers in catering and hospitality affords the accommodation & food industry flexibility over the size of its workforce which will also aid productivity growth. The strong increase in productivity in wholesale & retail trade also underlies the productivity growth forecast for the trade, accommodation & transport sector. However it will be mitigated somewhat by the relatively weak productivity growth forecast in transport & storage. Still, productivity in this subsector is forecast to increase by 1 per cent per annum (while it fell by 0.7 per cent per annum over 2000-10).

Increased utilisation of new technologies will drive strong productivity growth in business & other services. Growth of 2.3 per cent per annum is forecast between 2010 and 2015. This is expected to increase to 2.8 per cent per annum between 2015 and 2020. This represents a significant increase on the productivity growth rates per annum experienced in the previous decade. Within the business & other services sector, however, there is considerable variation in productivity growth rates. In general, service activities which rely upon the discretionary spending of firms or the strength of the housing market, such as real estate and professional services, are expected to experience the weakest productivity growth, as demand remains muted and the inflexible nature of employment contracts for professionals limit the scope for adjustment of labour inputs. As in the previous decade, productivity is expected to see a further sharp decline in other services, which include activities such as libraries, gambling and sport & recreation.

Moderate growth is forecast for productivity in non-market services between 2010 and 2020. A growth rate of 0.6 per cent per annum is expected between 2010 and 2015, rising to 1.8 per cent per annum between 2015 and 2020. However, this is in stark contrast to the fall in productivity experienced, on average, in this sector in the previous decade, when employment growth surpassed output growth, especially in education. The productivity gains are expected to come about largely as a result of the austerity measures announced by the government in its comprehensive spending review. Whilst many of the measures will involve the transfer of activities to the private sector, cost saving measures such as the increased use of IT and automated systems in government departments such as DWP and HMRC will yield productivity gains. It is hoped that the government's planned reforms to the NHS, set to be the most extensive in generations, will lead to productivity gains in health & social work arising from the practice based commissioning of health services. Limits to the Department for Education's capital and current spending budgets, combined with an expected surge in school age children arising from the baby boom in 2001, will put upward pressure on class sizes. This will appear, statistically, as an increase in productivity.

Table 3.4: Historical Changes in Employment for 22 Industry Groups

Absolute levels and changes (000s)

	Levels			Changes		
	1990	2000	2010	1990-2000	2000-2010	1990-2010
Agriculture	589	411	453	-178	42	-137
Mining and quarrying	161	78	57	-83	-20	-103
Food drink and tobacco	546	507	401	-39	-106	-145
Engineering	871	712	397	-159	-315	-473
Rest of manufacturing	3,528	2,759	1,719	-769	-1,040	-1,809
Electricity and gas	188	95	99	-93	4	-89
Water and sewerage	187	158	158	-29	0	-29
Construction	2,402	1,936	2,092	-466	156	-310
Wholesale and retail trade	4,670	4,799	4,661	129	-138	-9
Transport and storage	1,369	1,367	1,424	-2	56	55
Accommodation and food	1,711	1,811	1,892	100	82	181
Media	255	328	323	73	-5	68
Information technology	444	776	773	332	-3	329
Finance and insurance	1,161	1,118	1,092	-43	-26	-69
Real estate	259	275	436	16	161	177
Professional services	1,706	1,734	2,280	28	546	574
Support services	1,292	2,015	2,353	723	339	1,061
Public admin. and defence	1,487	1,422	1,544	-65	122	57
Education	2,016	2,218	2,703	202	485	686
Health and social work	2,638	3,069	3,948	431	879	1,310
Arts and entertainment	564	739	856	176	117	293
Other services	724	865	796	141	-69	72
All industries	28,768	29,192	30,458	425	1,266	1,691

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Source: Cambridge Econometrics, MDM Revision 7146.

Table 3.5: Projections of Employment for 22 Industry Groups

Absolute levels and changes (000s)

	Levels			Changes		
	2010	2015	2020	2010-2015	2015-2020	2010-2020
Agriculture	453	439	419	-13	-21	-34
Mining and quarrying	57	55	50	-3	-5	-8
Food drink and tobacco	401	402	404	1	1	2
Engineering	397	359	328	-38	-31	-69
Rest of manufacturing	1,719	1,687	1,616	-32	-71	-103
Electricity and gas	99	104	87	4	-17	-13
Water and sewerage	158	172	190	14	18	33
Construction	2,092	2,189	2,329	97	140	237
Wholesale and retail trade	4,661	4,716	4,824	55	108	164
Transport and storage	1,424	1,460	1,519	36	59	95
Accommodation and food	1,892	1,975	2,049	83	74	156
Media	323	351	388	28	38	65
Information technology	773	774	795	2	21	22
Finance and insurance	1,092	1,106	1,159	14	53	67
Real estate	436	495	543	60	47	107
Professional services	2,280	2,475	2,668	195	194	389
Support services	2,353	2,579	2,671	226	92	318
Public admin. and defence	1,544	1,346	1,428	-198	82	-116
Education	2,703	2,623	2,663	-80	40	-39
Health and social work	3,948	3,813	4,000	-135	187	52
Arts and entertainment	856	948	1,055	91	107	198
Other services	796	789	825	-7	36	29
All industries	30,458	30,855	32,008	397	1,153	1,550

N:\Projects\Working Futures\w orkbooks\[22UK.xlsm]Table 3.4a, c111

Source: Cambridge Econometrics, MDM Revision 7146.

3.5 Changing patterns of employment by status and gender

Within these broad sectoral developments there are some interesting patterns and changes by gender and employment status (FT and PT employees and self employment). These are illustrated and 3.7. The 6 broad sectors have quite different patterns of employment in this regard. The differing fortunes of the sectors are one of the key drivers of change in overall gender / status employment patterns.

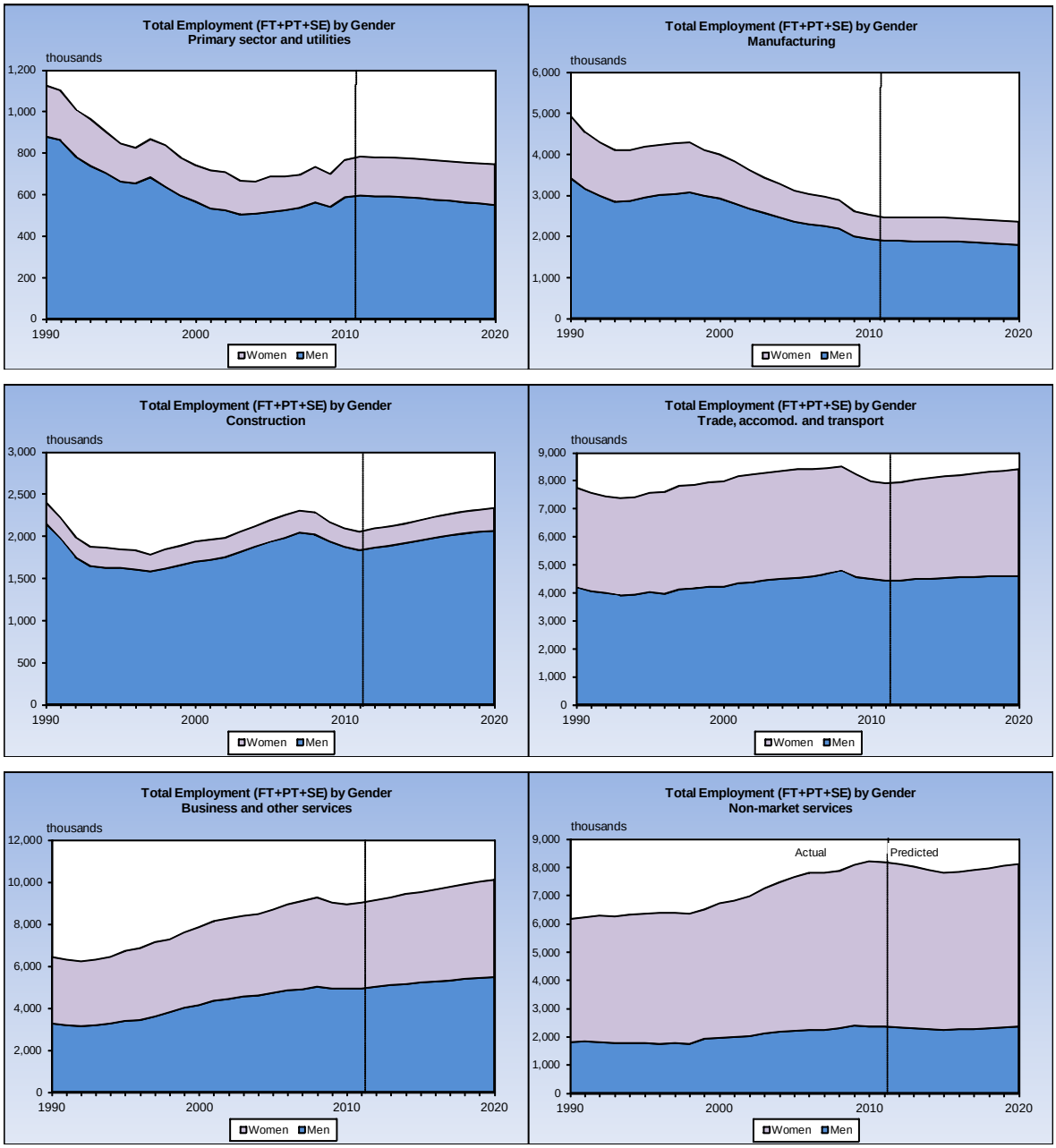
Table 3.6: Composition of Employment by Broad Industrial Sector

	Shares of total employment (%)				
	1990	**2000**	**2010**	**2015**	**2020**
Primary sector & utilities, of which:	3.9	2.5	2.5	2.5	2.3
Female employees	21.8	23.6	23.7	24.7	26.3
Self-employed	27.9	24.0	31.3	30.8	30.5
Part-time employees	6.6	9.7	10.6	10.8	11.8
Manufacturing, of which:	17.2	13.6	8.3	7.9	7.3
Female employees	30.8	26.7	23.7	23.7	23.9
Self-employed	6.3	6.0	7.7	7.7	8.0
Part-time employees	8.2	7.3	7.3	7.4	7.6
Construction, of which:	8.3	6.6	6.9	7.1	7.3
Female employees	10.4	12.5	10.8	11.0	11.4
Self-employed	44.7	35.1	41.7	41.5	41.3
Part-time employees	3.8	6.7	5.3	5.5	5.7
Distribution, transport etc, of which:	26.9	27.3	26.2	26.4	26.2
Female employees	46.0	47.4	43.7	44.5	45.3
Self-employed	15.3	10.2	10.6	9.9	9.2
Part-time employees	31.8	36.1	36.1	37.1	38.1
Business & other services, of which:	22.3	26.9	29.2	30.8	31.6
Female employees	49.5	47.4	45.0	45.4	45.8
Self-employed	17.6	16.4	17.9	17.2	16.7
Part-time employees	18.1	21.2	22.8	24.4	25.9
Non-marketed services services, of whic	21.3	23.0	26.9	25.2	25.3
Female employees	70.7	71.0	71.2	71.3	71.1
Self-employed	4.8	5.9	7.4	7.4	7.3
Part-time employees	41.1	39.3	39.2	39.3	39.1

\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\[6UK.xlsm]Table 3.8

Source: Cambridge Econometrics, MDM Revision 7146.

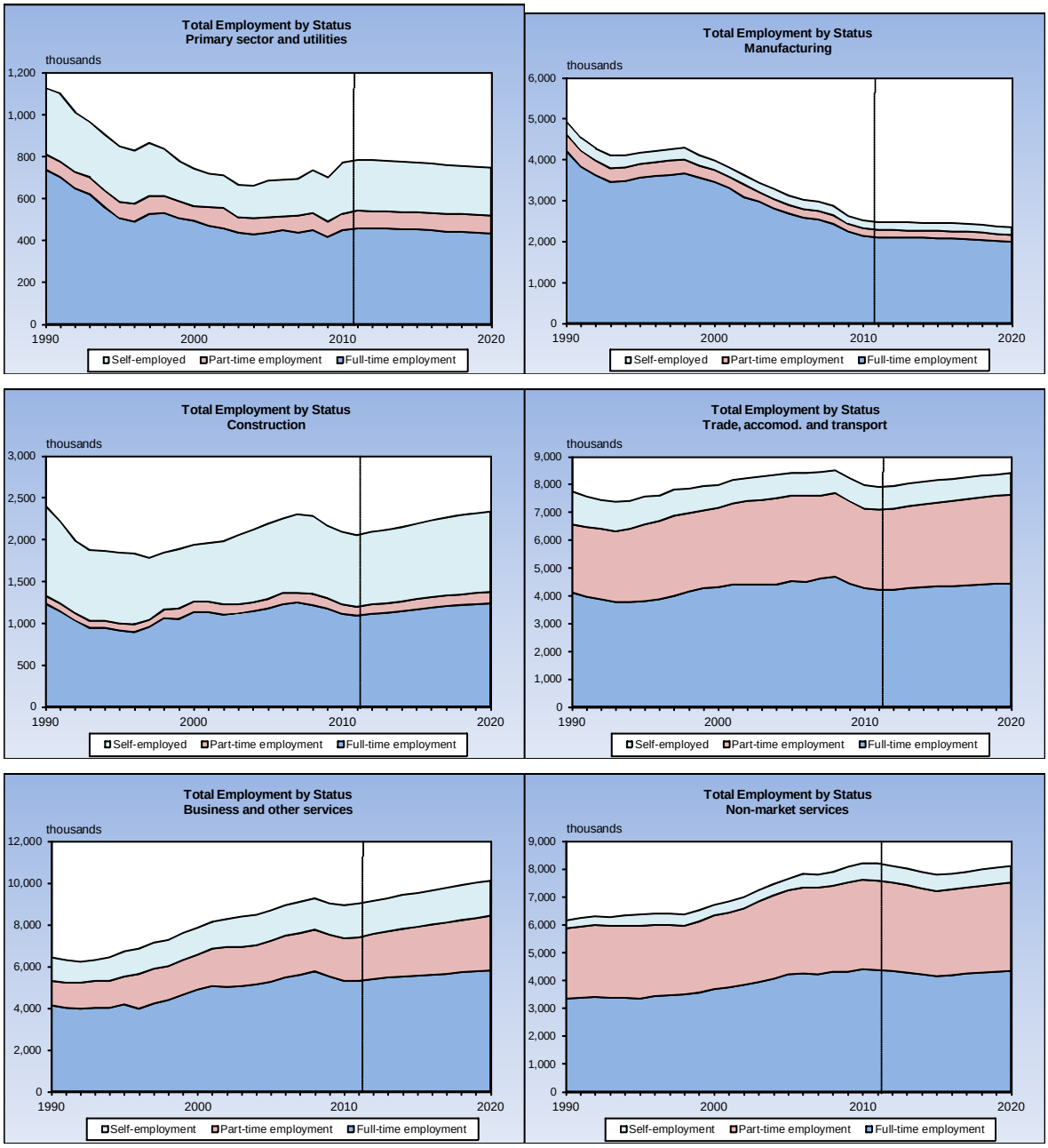
Figure 3.6: Changes in Employment patterns within Broad Sectors, (gender)



\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\[6UK.xlsm]Figure 3.6

Source: Cambridge Econometrics, MDM Revision 7146.

Figure 3.7: Changes in Employment patterns within Broad Sectors, (status)



\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\[6UK.xlsm]Figure 3.7

Source: Cambridge Econometrics, MDM Revision 7146.

4 Changing Occupational Structure and Replacement Demands

Key Messages

- This is the first set of projections published using the new SOC2010 classification and incorporating the latest Labour Force Survey (LFS) and other data.
- Although here are some differences as a result of the change in classification most of the underlying trends remain very similar to those observed in previous assessments.
- Changes in occupational employment structure are largely driven by longer term trends. Although the fallout from the "credit crunch" and subsequent recession has had some short-term impacts, the longer term trends remain robust.
- The latest evidence suggests that the occupational structure of employment is continuing to change in favour of white collar and more skilled occupations, although there will still be a large number of job opportunities for less skilled workers.
- The results suggest significant employment growth for managers, some professionals and many associate professional and technical roles.
- Other occupations expected to exhibit significant growth include caring, leisure and other service occupations.
- In contrast, sharp declines are projected for: administrative & secretarial occupations skilled trade occupations and process, plant & machine operatives.
- Elementary occupations are now projected to experience some job growth but sales occupations are expected to see little or no growth.
- There are some variations in the general patterns of occupational employment by gender and status. These reflect existing pattern of 'gender segregation' in the labour market.
- Replacement needs are crucial. Both policy analysts and other actors in the labour market need to recognise this and the important education and training requirements that arise for them. Typically they are equivalent to a third or more of current employment levels over a 10 year period and outweigh any projected employment declines in the industries or occupations concerned. As a result there are often quite good job opportunities for new entrants, in areas where initial impressions, based on projected changes in employment levels, look quite pessimistic.

4.1 Introduction and general approach

This section presents projections of occupational employment at a UK level, looking forward to 2020, and covering all industries and services.[20] The projections are based on categories defined using the new SOC2010 occupational classification.[21] These are described in more detail in Annex A.

In the occupational employment projections, the main focus is on the 25 sub-major occupation groups, but for presentational purposes much of the discussion here is at the broader major group level (the nine 1-digit level categories of SOC).[22] The results reflect the latest information available from the Labour Force Survey.

Such data provide a useful indicator of changing patterns of demand for skills. However, it is important to focus not just on projections of ***changing levels*** of employment by occupation, but also on ***replacement demands***. Projections of the structural change in employment levels provide only part of the picture of how the demand for skills is changing. Estimation of replacement demands recognises the need to replace those retiring from the existing workforce (or leaving for other reasons such as family formation). The results presented in this section show that, despite projected declines in employment for many occupations, there will be significant demand for the skills concerned to replace those leaving the current workforce because of retirement, etc.

The reasons for the changes in occupational employment structure are complex. Some of the most important factors are summarised in **Box 4.1**. A key driver is structural change in the economy, which affects sectoral patterns of employment. The changing fortunes of different sectors depend on a complex combination of economic and technological forces. These are taken into account by the multi-sectoral macroeconomic model, which projects those sectors likely to gain or lose jobs. The other main factors driving occupational employment, such as technological and organisational change, which affects the way work is done, are represented by changing occupational mix within sectors. This is analysed in detail using econometric and other methods, focussing on changes in occupational employment patterns within sectors

[20] More detailed results by sectors are available in the separate Sectoral Report.
[21] This requires an extensive reclassification of historical data. Details are given in the Annex and the accompanying *Technical Report* (Wilson *et al.,* 2011).
[22] Full detail of these classifications is provided in Annex A.

Section 4.2 provides a brief summary of recent historical developments in occupational employment structure, and then 4.3 presents the main projections, focussing on changes between 2010 and 2020. Some patterns vary significantly across gender and employment status. These are also highlighted in Section 4.3. Section 4.4 goes on to focus on replacement demands, as well as providing a more detailed discussion at the 2 digit level of SOC (the 25 sub-major groups). Section 4.5 presents an analysis of the main components of change using shift-share methods. Section 4.6 concludes with a summary of detailed occupational changes within industries.

Box 4.1: Factors Influencing Occupational Change

Drivers of change: Skill requirements are a derived demand. The focus in this section is on occupational employment patterns as opposed to qualifications or some other measure of skill. These demands are influenced by a range of factors, which vary over time and across sectors. The key factors can be broadly categorised into two groups: those which are **external** to the organisation and those which are primarily **internal**. These are reflected in the shift-share analysis used: industry effects can be regarded as primarily external; occupational effects are mainly driven by internal influences.

External skills drivers: influence the pattern of goods and services produced and therefore the Sectoral structure of employment. These drivers include: technological change; globalisation; other factors influencing the patterns of demand for goods and services; and public policy (including legislative and regulatory frameworks). These developments are taken into account by the multi-sectoral macroeconomic model and are summarised in Section 2. Those sectors that benefit from such changes will see employment grow. Conversely those that fail to keep pace will experience job losses. Occupations concentrated in the former sectors will gain employment in contrast to those concentrated in declining sectors (**industry effects)**.

Internal skills drivers: produce significant changes in the patterns of employment within particular industries, including major restructuring of the way work is organised (**occupational effects**). Skill requirements within organisations are driven by the business strategies they adopt. These reflect choices about what products or services to deliver and where and how to pitch that delivery. Some may focus on product differentiation in a high value added, premium markets while others may choose a low specification product or service, where the emphasis is keeping price and costs down. The former generally require higher skills, including the use of specialised and distinctive competencies, compared with strategies that focus on low level specifications. Organisations facing technological changes, or trying to move up-market, usually need to upgrade their skills. The introduction of new products and services, major changes in equipment and in working methods or workforce organisation often require the deployment of new skills.

Both internal and external drivers are influenced by technology (especially ICT) and other general factors. A number of commentators have focused on the biased nature of technical change, which has tended to favour higher skills and to displace lower skilled jobs. For example, ICT has led to the displacement of many clerical and secretarial jobs previously concerned with information processing using paper technology (internal effect), while increasing the demand for skilled professionals.

On the other hand, information technology has opened up many new product markets where information services can be provided which were previously not feasible (external effect). These new businesses often require jobs of a professional, associate professional and managerial nature. The application of IT in other areas such as such as robots in motor manufacturing has led to the loss of many jobs for skilled workers.

Other factors have also been important. These include the drive for efficiency in response to global competition, increased emphasis on customer service and product quality and related changes in production methods and the management of human resources. The income elasticity of demand for different products and services, together with changes in tastes and preferences is altering the patterns of demand towards an emphasis on high value added, higher quality, high specification goods and services.

Box 4.1 (continued): Factors Influencing Occupational Change

There is a major restructuring of production to meet these needs. Many of these products and services require expert knowledge as well as customer care, personal attention and face-to-face human interaction, (for example, leisure, hospitality, travel, personal care), increasing the need for such generic skills.

Changing patterns of industrial specialisation (industry effects) have had profound implications for the demand for different occupations as well as playing a key role in determining differences across spatial areas. The decline of employment in primary and manufacturing industries has resulted in a dramatic reduction in the need for many skills associated with the production of the output of these industries. For example: the agricultural sector now requires many fewer labourers; the coal industry now employs only a handful of skilled miners; the manufacturing sector no longer requires the same number of skilled engineering and other types of specific craft skills that were the foundation of its success in the past; utilities and transport now require far fewer workers than previously.

In contrast, the growth of the service sector has led to an increase in employment in many occupations. The growth of non-market, public service, employment, for example, has led to substantial additional jobs for: professional, managerial and clerical workers in public administration; for doctors and nurses in health services; and for teachers in education services. Similarly, growth in marketed, private sector, services has resulted in many new jobs for: leisure and other personal service occupations (in hotels and other services); sales occupations in distribution; and for professional, associate professional, clerical and secretarial in business and financial services.

Future Influences on Occupational Change

The combination of globalisation and technological change often increases skill requirements as work organisation and the nature of competitive advantage become more complex. Increasingly, the source of competitive edge in products and in processes is information and knowledge content. The increased emphasis on higher level skills and the associated decline in demand for unskilled workers has been attributed to the expansion of international trade (especially with developing economies) and the continuing process of technological change (particularly related to ICT). On balance, the evidence seems to suggest that the latter has become increasingly important, with changes within sectors being of most significance. This is reflected in the shift-share analysis presented here, which suggests that occupational shifts within sectors are growing in importance compared to previous decades (occupational effects). Nonetheless, it seems likely that both technology and growing trade will continue to raise the demand for higher level skills and drive down the demand for lower level skills.

The projected patterns of occupational change for the next decade are expected to mirror those of the recent past. The same basic forces are expected to operate. Changes in the industrial structure of employment in favour of the service sector (industry effects) will tend to favour white collar, non-manual occupations, while the continued loss of jobs in manufacturing and primary industries will result in yet further job losses for many manual blue collar jobs.

The impacts of information technology and other related organisational changes are likely to further reduce the demand for clerical and basic secretarial skills across all industries (occupational effects). Similarly, the introduction of new technologies in manufacturing will tend to displace many skilled workers. Conversely, the management and operation of the new technologies will require greater shares in employment for managerial, professional and associate professional occupations, including technicians of various kinds.

4.2 Changes for broad occupational groups: History and projections

Latest historical developments

Table 4.1 and Figure 4.1 present historical information on employment trends for the 9 SOC2010 major groups over the past two decades as well as projections to 2020. There are two distinctive factors at play here, when comparing these results with those produced previously. First, there are changes due to the technical modifications to the system of classifying occupations; and secondly, there are 'real' changes in the underlying employment patterns in the economy, including the impact of the crisis and recession.

The revision to SOC has altered the employment patterns across occupations. The definition of managerial jobs has been tightened up, and some categories such as Nurses have moved from one category to another (in this case from associate professional to professional). The historical data have all been reclassified onto the new basis using convertors provide by ONS.

The recession has also impacted severely on employment levels for all occupations. Despite this, the broad underlying trends in employment shares have continued more or less unabated.

The key features have been:

- rising employment levels and shares for higher level, white-collar groups such as:
    - managers, directors & senior officials;
    - professionals; and
    - associate professional & technical occupations;
- rapid increases for leisure related and other personal service occupations;
- decline in employment for administrative & secretarial occupations;
- declining employment levels and shares for most blue collar/manual occupations.

The latest LFS data confirms that these trends continue unabated.

Projections to 2020

Table 4.1 and Figures 4.1 and 4.2 also present employment projections for the 9 major occupations in the period from 2010-2020, comparing them with developments over the previous decade. A rather faster pace of change in occupational structure is now expected overall than was the case over the previous decade (see Figure 4.1). However, the broad pattern of change remains stable (see Figure 4.2).

The groups that are expected to show the most significant increases in employment over the next decade are managers, professional, and associate professional & technical occupations. There is also some growth for less skilled occupations, most notably in caring, leisure & other service occupations. This group has also exhibited strong growth since the early 1980s, and this is projected to continue over the next decade but at a slower rate. The sales & customer service occupation group has until recently also been the beneficiary of employment growth, but modest job losses are now projected, especially for the less skilled sales occupations sub-category.

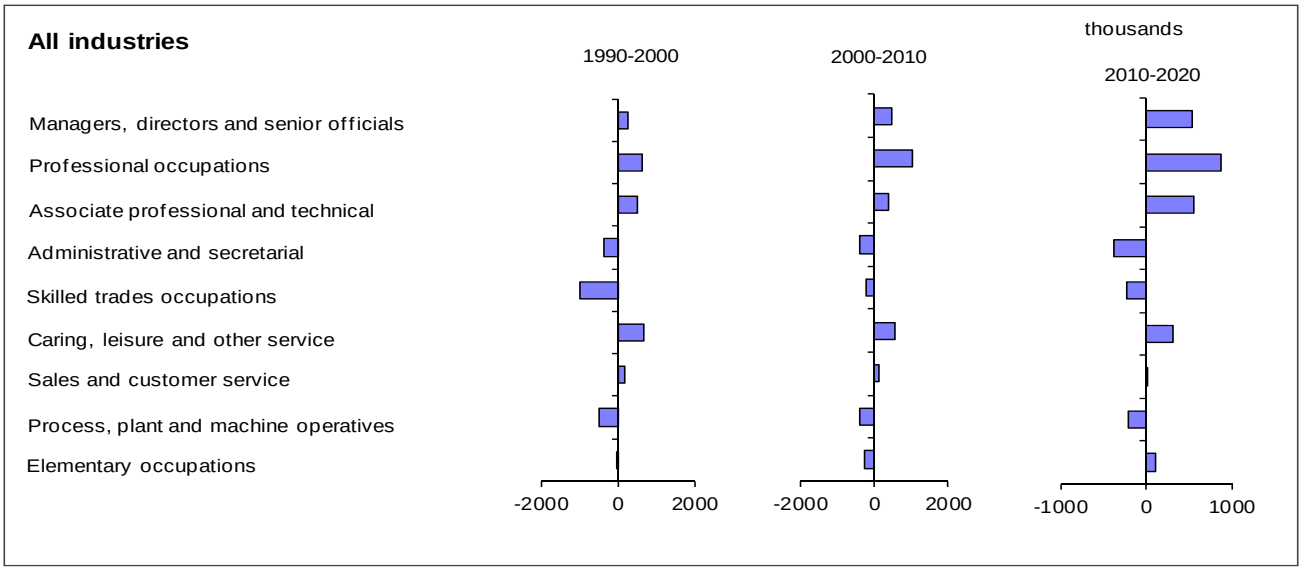
Administrative & secretarial occupations have seen significant job losses since the early 1990s, mainly as a consequence of the increasing use of computers and IT systems. This is projected to continue at an even faster pace over the next decade. Further job losses are projected, although this category will still employ 3 million people in 2020.

Declining employment levels are projected for skilled trades occupations and process, plant & machine operatives. Elementary occupations are also amongst the groups where employment has declined until recently. However, based on the latest evidence, these are now expected to see some modest growth, as many more industries, especially within the service sector, appear to be finding a need for such occupations. This is another example of some polarisation of the demand for skills, which has been attributed to the difficulties of automating some relatively low skill jobs that require a human response. This is especially important in some parts of the service sector.

These projections largely continue the historical trends highlighted earlier. As noted above, employment has been increasing most rapidly amongst non-manual occupations, especially those which derive employment opportunities from the services sector of the economy. For most manual / blue collar occupations (especially those tied to traditional manufacturing and the primary sector) there has been a steady decline in employment levels.

Tables 4.1 - 4.3 present the details of change, including how they vary by gender. Figures 4.2 - 4.6 also illustrate this, as well as differences by employment status.

Figure 4.1: Changes in Occupational Employment Structure, 1990-2020



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Source: IER estimates, MDM Revision 7146.

Table 4.1: Occupational Categories, SOC2010 – Major Groups

All Industry Sectors Employment Levels (000s)	1990	2000	2010	2015	2020
1. Managers, directors and senior officials	2,284	2,540	3,016	3,279	3,560
2. Professional occupations	4,181	4,820	5,843	6,189	6,712
3. Associate professional and technical	3,050	3,561	3,926	4,138	4,476
4. Administrative and secretarial	4,437	4,078	3,698	3,466	3,312
5. Skilled trades occupations	4,736	3,767	3,526	3,389	3,295
6. Caring, leisure and other service	1,446	2,142	2,719	2,801	3,032
7. Sales and customer service	2,309	2,479	2,608	2,555	2,610
8. Process, plant and machine operatives	2,819	2,349	1,950	1,829	1,737
9. Elementary occupations	3,504	3,454	3,173	3,209	3,274
Total	28,768	29,192	30,458	30,855	32,008

Percentage Shares	1990	2000	2010	2015	2020
1. Managers, directors and senior officials	7.9	8.7	9.9	10.6	11.1
2. Professional occupations	14.5	16.5	19.2	20.1	21.0
3. Associate professional and technical	10.6	12.2	12.9	13.4	14.0
4. Administrative and secretarial	15.4	14.0	12.1	11.2	10.3
5. Skilled trades occupations	16.5	12.9	11.6	11.0	10.3
6. Caring, leisure and other service	5.0	7.3	8.9	9.1	9.5
7. Sales and customer service	8.0	8.5	8.6	8.3	8.2
8. Process, plant and machine operatives	9.8	8.0	6.4	5.9	5.4
9. Elementary occupations	12.2	11.8	10.4	10.4	10.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Net Changes	1990-2000	2000-2010	2010-2015	2015-2020	2010-2020
1. Managers, directors and senior officials	256	476	263	281	544
2. Professional occupations	640	1,023	346	523	869
3. Associate professional and technical	511	364	212	338	551
4. Administrative and secretarial	-359	-380	-233	-154	-387
5. Skilled trades occupations	-969	-242	-136	-94	-230
6. Caring, leisure and other service	696	577	82	231	313
7. Sales and customer service	170	129	-53	55	2
8. Process, plant and machine operatives	-470	-399	-121	-91	-213
9. Elementary occupations	-50	-281	37	64	101
Total	425	1,266	397	1,153	1,550

\\Sapphire\ier\ie\shared\Projects\Working Futures\w orkbooks\[AllUK.xlsm]Table 4.1 T, c111

Source: IER estimates, MDM Revision 7146.

Table 4.2: Females. Occupational Categories, SOC2010 – Major Groups

All Industry Sectors Employment Levels (000s)	1990	2000	2010	2015	2020
1. Managers, directors and senior officials	533	731	1,001	1,157	1,321
2. Professional occupations	1,723	2,224	2,817	3,064	3,423
3. Associate professional and technical	962	1,352	1,632	1,791	2,026
4. Administrative and secretarial	3,638	3,302	2,934	2,713	2,549
5. Skilled trades occupations	704	526	444	399	367
6. Caring, leisure and other service	1,190	1,766	2,214	2,263	2,431
7. Sales and customer service	1,623	1,735	1,693	1,657	1,704
8. Process, plant and machine operatives	634	399	213	175	139
9. Elementary occupations	2,081	1,707	1,382	1,287	1,243
Total	13,087	13,743	14,331	14,507	15,203

Percentage Shares	1990	2000	2010	2015	2020
1. Managers, directors and senior officials	4.1	5.3	7.0	8.0	8.7
2. Professional occupations	13.2	16.2	19.7	21.1	22.5
3. Associate professional and technical	7.3	9.8	11.4	12.3	13.3
4. Administrative and secretarial	27.8	24.0	20.5	18.7	16.8
5. Skilled trades occupations	5.4	3.8	3.1	2.8	2.4
6. Caring, leisure and other service	9.1	12.9	15.5	15.6	16.0
7. Sales and customer service	12.4	12.6	11.8	11.4	11.2
8. Process, plant and machine operatives	4.8	2.9	1.5	1.2	0.9
9. Elementary occupations	15.9	12.4	9.6	8.9	8.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

\\Sapphire\ier\ie\shared\Projects\Working Futures\w orkbooks\[AllUK.xlsm]Table 4.1 F, c111

Source: IER estimates, MDM Revision 7146.

Table 4.3: Males, Occupational Categories, SOC2010 – Major Groups

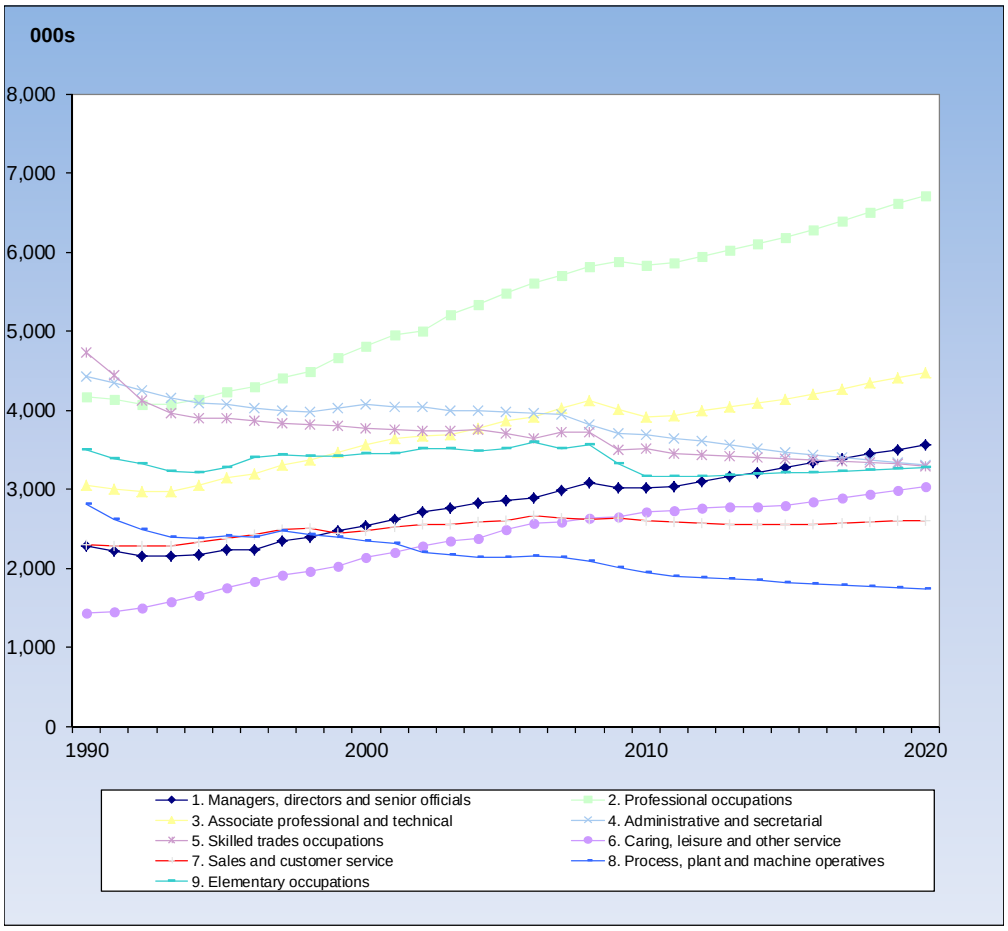
All Industry Sectors Employment Levels (000s)	1990	2000	2010	2015	2020
1. Managers, directors and senior officials	1,752	1,809	2,015	2,122	2,239
2. Professional occupations	2,458	2,596	3,026	3,125	3,289
3. Associate professional and technical	2,089	2,210	2,294	2,347	2,450
4. Administrative and secretarial	799	777	764	753	763
5. Skilled trades occupations	4,032	3,241	3,081	2,990	2,928
6. Caring, leisure and other service	257	376	505	538	600
7. Sales and customer service	686	744	915	898	906
8. Process, plant and machine operatives	2,185	1,950	1,737	1,654	1,599
9. Elementary occupations	1,424	1,747	1,791	1,922	2,031
Total	15,681	15,449	16,127	16,348	16,806

Percentage Shares	1990	2000	2010	2015	2020
1. Managers, directors and senior officials	11.2	11.7	12.5	13.0	13.3
2. Professional occupations	15.7	16.8	18.8	19.1	19.6
3. Associate professional and technical	13.3	14.3	14.2	14.4	14.6
4. Administrative and secretarial	5.1	5.0	4.7	4.6	4.5
5. Skilled trades occupations	25.7	21.0	19.1	18.3	17.4
6. Caring, leisure and other service	1.6	2.4	3.1	3.3	3.6
7. Sales and customer service	4.4	4.8	5.7	5.5	5.4
8. Process, plant and machine operatives	13.9	12.6	10.8	10.1	9.5
9. Elementary occupations	9.1	11.3	11.1	11.8	12.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

\\Sapphire\ier\ie\shared\Projects\Working Futures\w orkbooks\[AllUK.xlsm]Table 4.1 M, c111

Source: IER estimates, MDM Revision 7146.

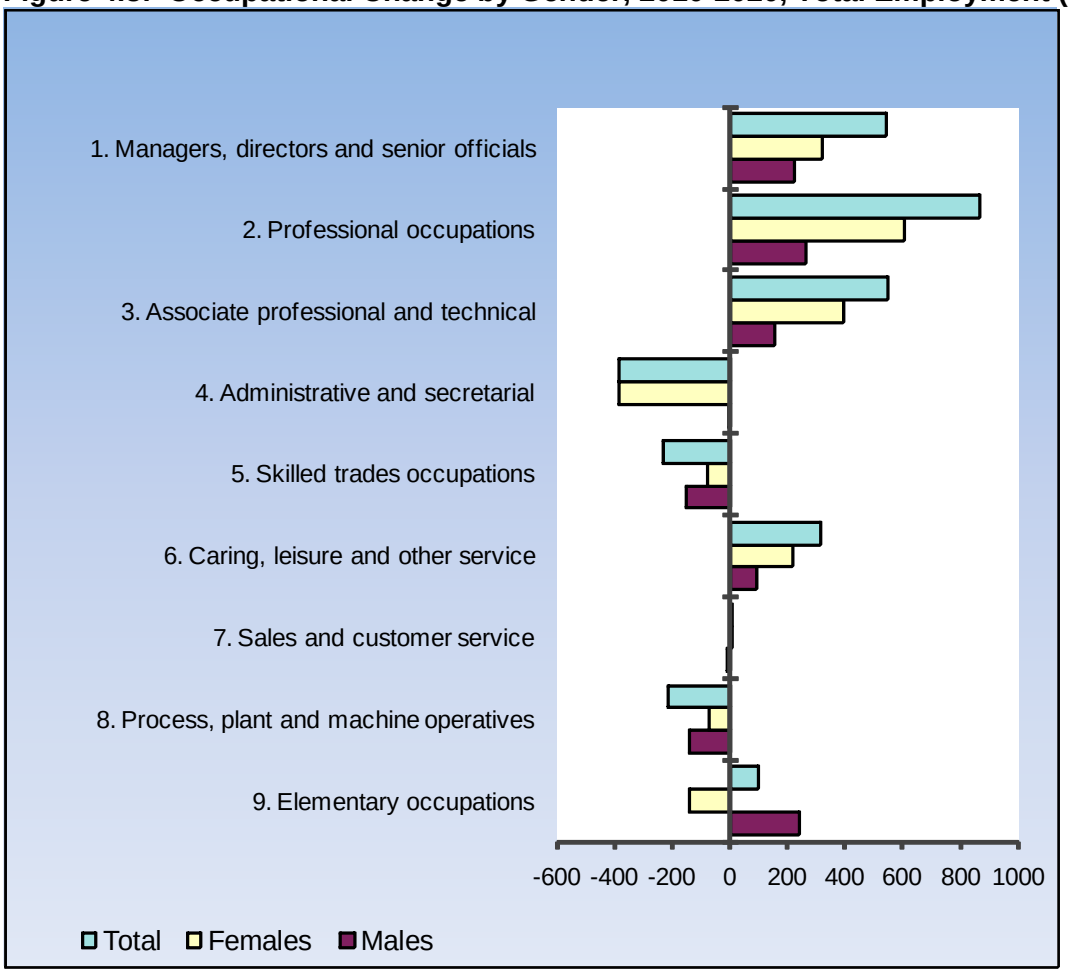
Figure 4.2: Occupational Trends, 1990-2020



\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\[AllUK.xlsm]Figure 4.1a, c111

Source: IER estimates, MDM Revision 7146.

Figure 4.3: Occupational Change by Gender, 2010-2020, Total Employment (000s)



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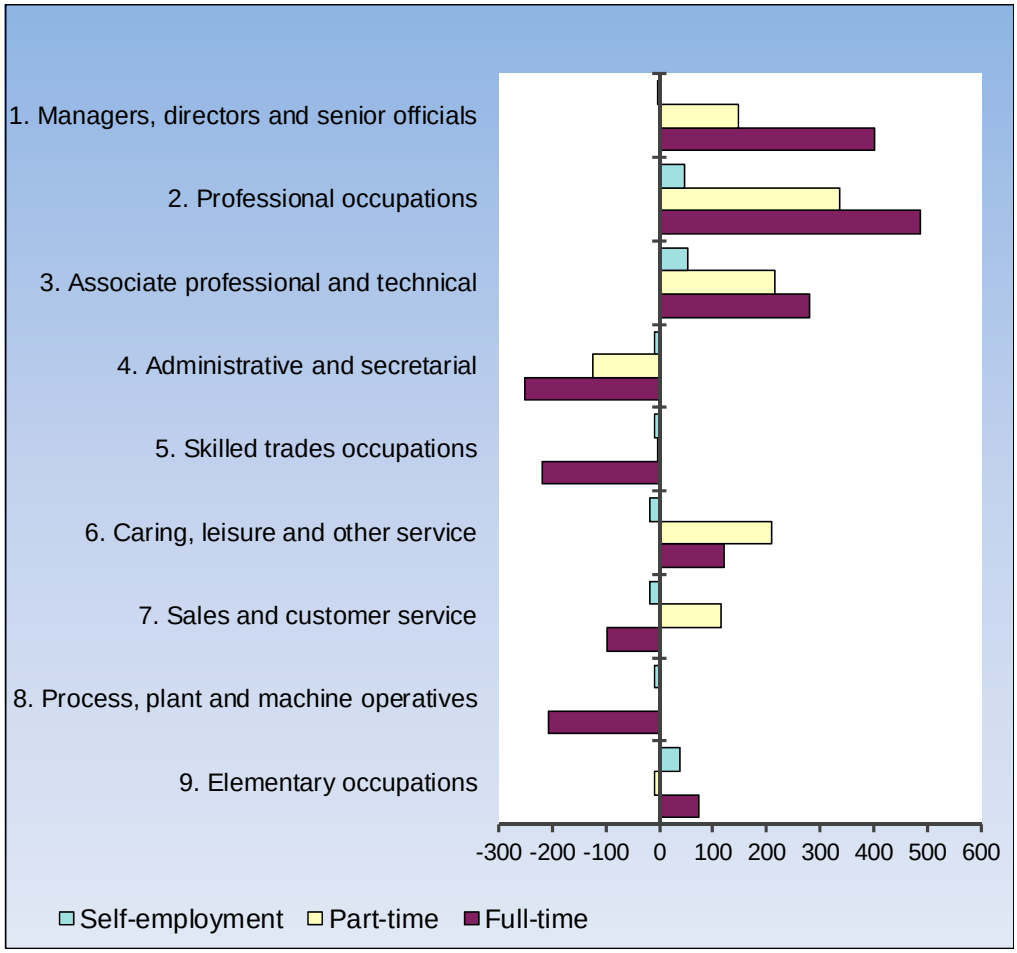
Source: IER estimates, MDM Revision 7146.

Figure 4.4: Occupational Change by Status, 2010-2020, Total Employment (000s)



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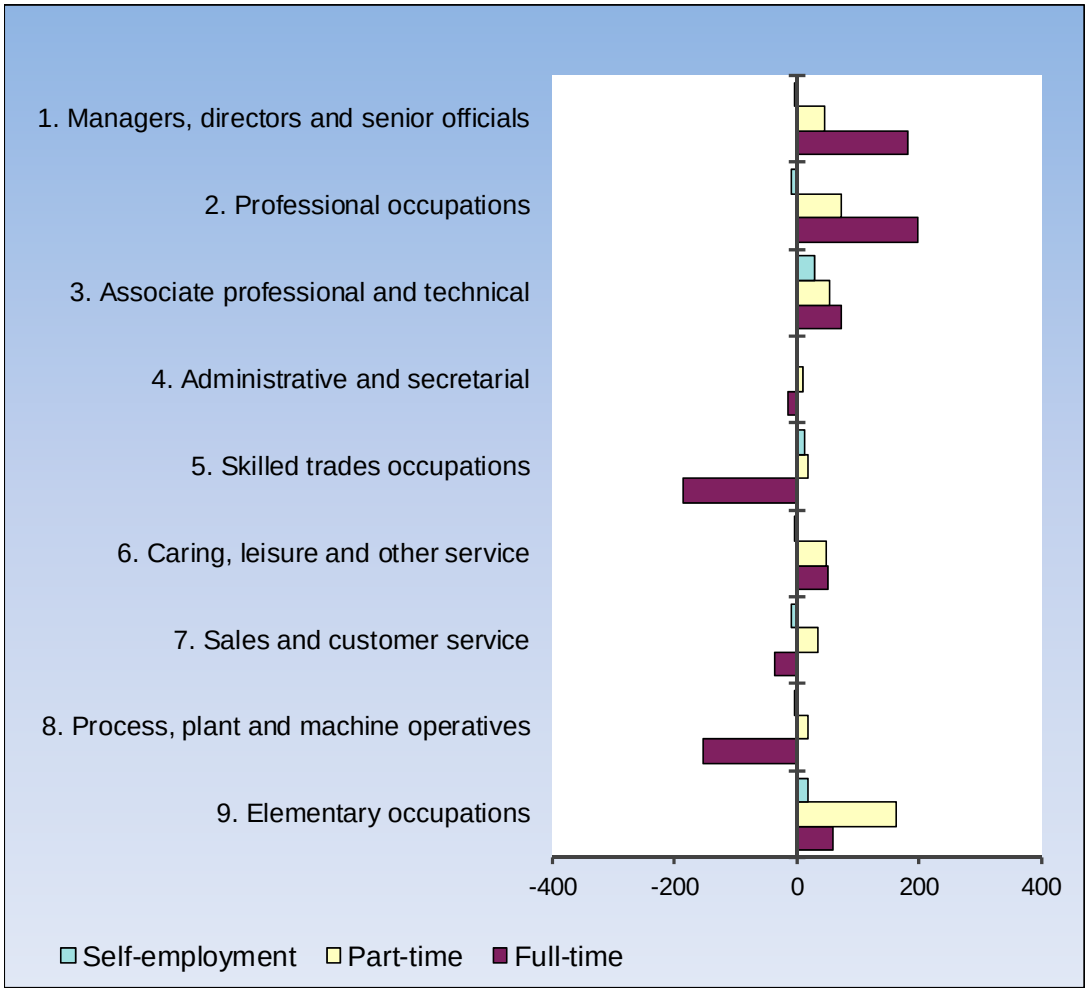
Source: IER estimates, MDM Revision 7146.

Figure 4.5: Occupational Change by Status, Males, 2010-2020 (000s)



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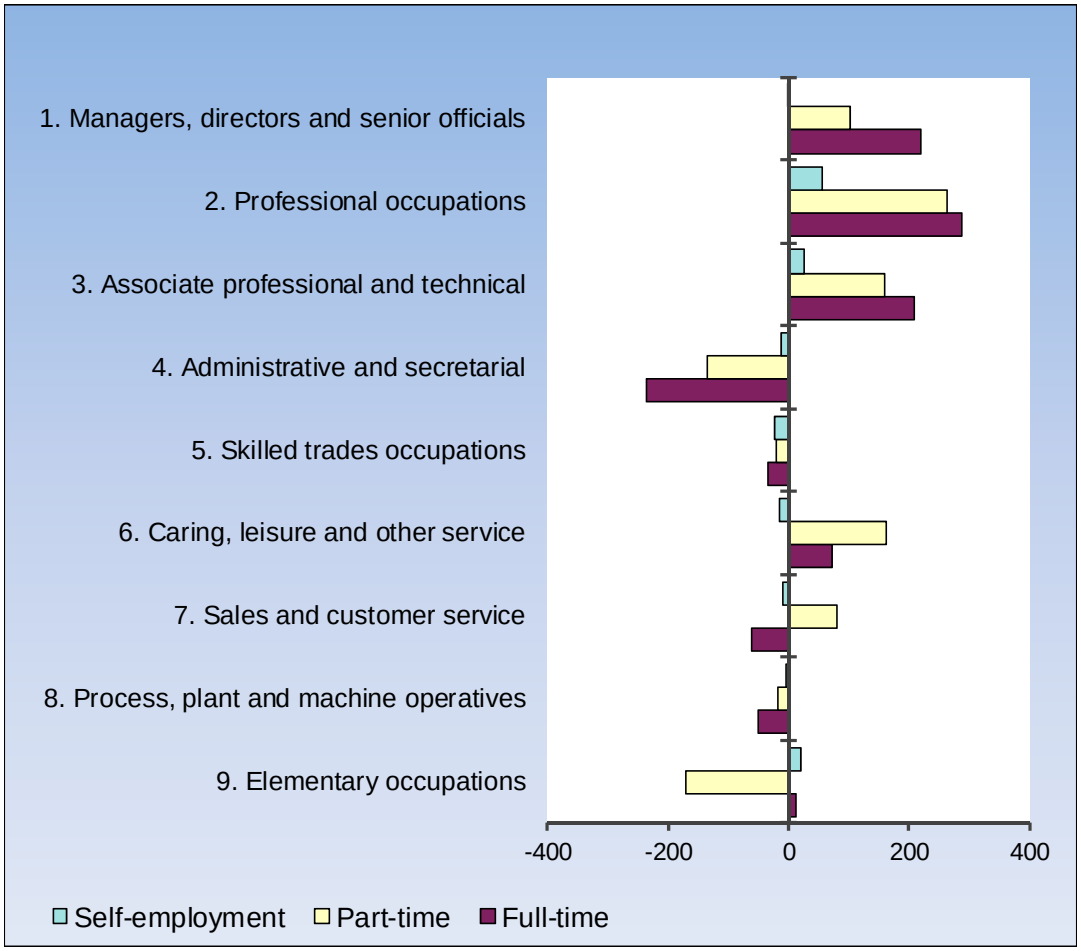
Source: IER estimates, MDM Revision 7146.

Figure 4.6: Occupational Change by Status, Females, 2010-2020 (000s)



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Source: IER estimates, MDM Revision 7146.

Table 4.4: Changing Composition of Employment by Occupation, 1990-2020

	Total					2010 - 2020		
SOC2010 Major Groups, United Kingdom						**Net Change**	**Replacement**	**Total**
Employment Levels (000s)	**1990**	**2000**	**2010**	**2015**	**2020**		**Demands**	**Requirement**
Managers, directors and senior officials	2,284	2,540	3,016	3,279	3,560	544	1,306	1,850
Professional occupations	4,181	4,820	5,843	6,189	6,712	869	2,315	3,184
Associate professional and technical	3,050	3,561	3,926	4,138	4,476	551	1,450	2,000
Administrative and secretarial	4,437	4,078	3,698	3,466	3,312	-387	1,695	1,309
Skilled trades occupations	4,736	3,767	3,526	3,389	3,295	-230	1,383	1,153
Caring, leisure and other service	1,446	2,142	2,719	2,801	3,032	313	1,144	1,457
Sales and customer service	2,309	2,479	2,608	2,555	2,610	2	938	939
Process, plant and machine operatives	2,819	2,349	1,950	1,829	1,737	-213	845	633
Elementary occupations	3,504	3,454	3,173	3,209	3,274	101	1,243	1,344
Total	28,768	29,192	30,458	30,855	32,008	1,550	12,319	13,869
						Percentage Changes		
Percentage Shares	**1990**	**2000**	**2010**	**2015**	**2020**			
Managers, directors and senior officials	8	9	10	11	11	18.0	43.3	61.4
Professional occupations	15	17	19	20	21	14.9	39.6	54.5
Associate professional and technical	11	12	13	13	14	14.0	36.9	51.0
Administrative and secretarial	15	14	12	11	10	-10.5	45.8	35.4
Skilled trades occupations	16	13	12	11	10	-6.5	39.2	32.7
Caring, leisure and other service	5	7	9	9	9	11.5	42.1	53.6
Sales and customer service	8	8	9	8	8	0.1	36.0	36.0
Process, plant and machine operatives	10	8	6	6	5	-10.9	43.3	32.4
Elementary occupations	12	12	10	10	10	3.2	39.2	42.4
Total	**100**	**100**	**100**	**100**	**100**	5.1	40.4	45.5

\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\[AllUK.xlsm]Table 6.x.3, c111

Source: IER estimates, MDM Revision 7146.

4.3 Occupational trends by gender /status

Gender

There are some significant differences in occupational employment prospects for males and females as shown in Figures 4.3 - 4.6.

For men the largest employment increases are expected in the managerial, professional and associate professional occupations, where between 200 and 300 thousand new jobs are projected between 2010 and 2020 for each occupational category. There is also growth projected for elementary occupations.

For women the occupations providing the largest number of new jobs are also concentrated in the top 3 occupational categories, plus caring, leisure and other service occupations.

Women are expected to bear the brunt of the significant job losses projected for administrative, clerical & secretarial occupations. Men suffer most from the job losses amongst skilled trades and process, plant & machine operatives.

Employment Status

Detailed projections have also been produced by full-time and part-time status and for self-employment. These are also summarised in Figures 4.3 - 4.6. They indicate significant differences in the pattern of change for different occupational and status categories. These reflect structural differences in terms of the demands for different sectors and different trends in the patterns of gender and employment status mix within sectors.

For managers, directors & senior officials (SOC major group 1), the main growth is for full-time workers.

Amongst professional occupations a substantial increase in part-time working is projected, although full-time work is also projected to rise. Self-employment numbers are not expected to change much for men, but more so for women. Again, these patterns vary significantly within different sectors, with business and other services presenting a much more optimistic prospect.

For associate professionals the main growth is expected to be for full-time workers. Smaller increases are expected for part-time workers and for self-employment.

Amongst administrative & secretarial occupations there are sharp declines, especially amongst full-time females.

For caring, leisure & other service occupations the main growth is for part-time jobs. This is also true for males in sales & customer service occupations.

For skilled trades occupations, and for process, plant & machine operatives, there is a marked decline in full-time jobs, especially for men.

The patterns by gender are generally similar for most of the status categories, but the occupational segregation of females and males into certain jobs results in some notable differences. For example, a much sharper growth in employment is expected for women than for men in caring, leisure & other service occupations, while men get the lion's share of jobs in the managers, directors & senior official category. They also suffer most in the job losses expected for skilled trades occupations. It is also notable that growth is expected for male employment in elementary occupations but the opposite is expected for females.

More detailed results by region are presented in Section 6. For sectors, the separate Sectoral Report provides results for each of the 22 industries.

4.4 Replacement demands and detailed occupational projections

Replacement Demands

The projections summarised in Tables 4.1 – 4.3 and Figure 4.1, focus on the total numbers of people that are expected to be employed in particular occupations in the future. Such estimates provide a useful indication of areas of change, highlighting the likely 'gainers' and 'losers'. However, this may give a misleading impression of job opportunities and related training requirements. Even those occupations where employment is projected to decline may still offer good career prospects, with a significant number of job openings. This is because, as long as significant numbers are employed in such jobs, employers will need to replace those workers who leave due to retirement, career moves, mortality or other reasons. This is referred to as 'replacement demand'. It is usually much more significant than any change which results from growth in employment in an occupational group. Such replacement demand can also easily outweigh any negative changes resulting from projected employment decline.

Traditionally net change in employment is referred to as “expansion demand” although where employment is declining this can be negative. A better term might be structural demand. The sum of expansion or structural demand and replacement demand is referred to as the net requirement. Further details of definitions and methods used to calculate the replacement demands and total requirements are given in Box 4.2.

Estimates of Replacement Demands

Table 4.4 provides a summary for the 9 major occupational groups. Further details on the 25 occupational major subgroups, is presented in Table 4.5 and Figure 4.8. In every occupational group, the net requirement for workers is positive, as replacement demand is substantial and easily outweighs any negative structural demand. For all occupations together, replacement demand over the period 2010-2020 is around 8 times larger than expansion demand, see Table 4.4.

Over the decade as a whole, there is expected to be a net requirement of almost 14 million new job openings. Replacement demand accounts for over 12 million of these. Retirements from the workforce are the principal component of the latter.

Box 4.2: Replacements Demands: Definitions and Methods

Methodology & Caveats

The projections described in this section define the so called "expansion" or structural demand arising from growth (or decline) in occupational employment levels. This estimate is the net change in employment between two periods. This is only part of the demand that needs to be met if employers are to maintain their operations. In order to do this they also need to replace those members of their staff who leave.

In principle, four components of replacement demands for occupations can be separately identified:

- losses due to retirement from the workforce, which require positive replacement;
- losses due to mortality;
- net occupational mobility, which, when outward, positively adds to replacement demand; if inward, it reduces such replacement demand;
- geographical mobility, which, when outward, adds to replacement demand.

Total replacement demand is defined as the sum of these four elements. Some of these are net flows. In some instances it may be appropriate to consider just gross outflows. The estimates here use net flows.

When total replacement demand as defined here is added to expansion demand, an estimate of expected net requirements for each occupation is obtained. This measure provides an indication of the number of newly qualified entrants likely to be required in each occupational group over a period of time.

The data used to estimate both the age structure of the workforce and the various flows are based upon very limited information, mostly taken from the Labour Force Survey (LFS). The replacement demand estimates should, therefore, be regarded as indicative rather than precise.

Data on net migration by occupation are not readily available, so this is set equal to zero by assumption in all the tables. Net occupational mobility measures based on turnover of those who change occupations within a 12 month period are available from the LFS. These exclude those who remain in the same occupation. They also exclude those who may change jobs more than once in a 12 month period. They are therefore a lower bound estimate of total turnover. These have been used in previous estimates of replacement demands (for example, see those in Wilson, 2001a). However it has proved impossible to develop a consistent set of such estimates for all the detailed specific sectors and geographical areas in the *Working Futures* database using data from the LFS. This is due to the latter's limited sample size. The estimates shown here and in the more detailed tables are therefore based just on estimated losses from retirements and mortality.

The methods for preparing estimates of replacement demands are described in more detail in the separate ***Technical Report***. There is a brief summary of this in Annex A of the present document.

In many occupations so called “expansion demand” is in fact negative (declining employment levels). These include broad occupational groups, such as:

- administrative & secretarial occupations;
- skilled trades;
- sales & customer service occupations; and
- process, plant & machine operatives

In these cases, negative structural (so called expansion) demand (projected employment decline in this case) is expected to be offset by positive replacement demand (mainly related to retirements from the workforce).

Expansion demand is positive in many other occupations, such as (at the more detailed, 2 digit level):

- corporate managers;
- teaching research professionals;
- science technology professionals;
- business public service associate professionals;
- skilled construction trades; and
- caring personal service occupations.

In such cases, expected retirements will add to positive expansion demand to create even higher net requirements for new entrants.

The results suggest that further substantial changes in occupational employment structure are likely over the next decade. In many cases this will result in job losses. Despite this, there will be a need to recruit and train new entrants into jobs to replace those retiring from the workforce or leaving for other reasons. Where employment is already projected to rise, such replacement demand elements will serve to reinforce this trend and lead to even greater requirements.

The estimates of outflows and replacement needs presented here are based on quite limited information, using data from the Labour Force Survey. They should therefore be treated with some care. Nevertheless, they provide a broad indication of the scale of such flows, compared to the structural changes projected in this section.

In principle, considerable variations in these patterns might be expected by sector and region, as well as by gender and status, reflecting in particular the different age structures of the different groups. In practice, the information available from the LFS does not make it easy to develop such customised estimates of age structures and flow rates. Nevertheless, an attempt has been made to indicate the potential variation in such flows across these various dimensions. These are considered in even more detail in the next sections.

The fundamental message to highlight is that policy analysts and other actors in the labour market need to focus not just on the projected changes in occupational employment levels but on replacement needs. As individuals retire from the workforce or leave jobs for other reasons, important education and training needs arise. Even in occupations where employment is forecast to decline such needs must be met in order to support existing operations. This also means that there may be good job opportunities for new entrants into many such areas, even where the initial outlook is quite uninviting.

More detailed analysis by 2 –digit categories

Table 4.5 and Figure 4.7 also present a more detailed analysis of occupational projections for the 25 sub-major occupation groups of SOC2010.

Managers, directors & senior officials: Within this group, the corporate managers category has been the main source of employment growth historically. This is expected to continue over the coming decade. This is despite the amendment to the occupational classification, which has aimed to tighten up the definition of what constitutes a managerial job. The other category within this group is other managers & proprietors. This category has also experienced steady growth in the past decade. This is expected to accelerate over the coming decade, possibly linked to the rebalancing of the economy towards the private sector.

Professional occupations: All the sub-major groups amongst professional occupations experienced employment growth between 2000 and 2010. This is projected to continue. The highest rate of growth is projected for business, media & public service professionals. All these professional groups are projected to increase their share of overall employment. The very rapid increases amongst health professional observed over the last few years are not expected to continue, as restraints on public expenditure bite. However, health professionals will still see an above average rate of growth over the period.

Associate professional & technical occupations: Substantial employment growth has been experienced for most of these sub-groups. Growth was slowest for science,

engineering & technology associate professionals. Employment has grown much faster for associate professionals engaged in the culture, media and sports occupations. These patterns are expected to change somewhat over the coming decade. Slower growth in public expenditure on health services will have an impact on the health & social care category, while the science, engineering & technology group benefits from the more buoyant prospects in business & other services.

Administrative & secretarial occupations: Amongst this group, the latest data suggest a continuation of the decline in employment for this group as a whole. Such job losses are projected to continue, especially amongst the secretarial & related occupations (secretaries, typists and word processing operators), who are increasingly being displaced by advances in computer technology.

Skilled trades occupations: The recession has accelerated the already significant loss of jobs in skilled metal & electrical trades, textile, printing & other skilled trades as well as construction & building trades. This pattern is generally expected to continue over the coming decade, although construction & building trades is expected to benefit from the gradual recovery in the construction sector.

Caring, leisure & other service occupations: Historical employment growth in these categories is expected to continue over the coming decade. The bulk of additional jobs have arisen in caring personal service occupations and this pattern is expected to continue, driven by the rising demand for services for an ageing population. The majority of these jobs are expected to be taken by women.

Sales & customer service occupations: This group is dominated numerically by occupations such as sales assistants and check-out operators in retail outlets. Females take up the greater part of employment in this occupational group, with many working part-time. Customer service occupations represent a much smaller but rapidly growing category. Both elements experienced employment growth over the past decade, but this is not projected to continue as pressures to reduce costs and other factors come into play for sales occupations. Customer service occupations are expected to face more optimistic prospects. Increasing concentration of businesses, competition from the Internet and technological developments such as automated checkout are expected to reduce the need for more traditional sales occupations, while at the same time the demand for more specialist sales and customer care occupations increases.

Process, plant & machine operatives: This group includes a variety of occupations. Employment declined quite rapidly for process, plant & machine operators over the last

decade, linked to the loss of jobs in manufacturing. However, there were modest job gains for the transport & mobile machine drivers category. Over the coming decade, further substantial job losses are expected amongst the plant & machine operators, who work in factories and on construction sites, and a slight decline for the transport & mobile machine drivers category.

Elementary occupations: The final occupational group contains elementary occupations which are not classifiable elsewhere. These are jobs that require little or no prior training. Employment levels across this group of occupations have been in long-term trend decline for many years, but there are now signs of this changing. The service sector, in particular, is beginning to generate a number of extra jobs in this area. The development of new opportunities in call centres, fast food outlets, etc, look set to reverse the long term trend decline in employment for such jobs, although some of these may fall within the more skilled customer service occupations category.

Table 4.5: Expansion and Replacement Demand by Occupation, 2010-2020

UK, All industries (Results in 000s)	Base employment level (2010)	Expansion demand	% of base	Replacement demands (retirements & mortality)	% of base	Net requirement (excluding occupational mobility)	% of base
11 Corporate managers and directors	2,015	391	19.4	834	41.4	1,226	60.8
12 Other managers and proprietors	1,000	153	15.3	472	47.2	625	62.5
21 Science, research, engineering and technology professionals	1,593	201	12.6	521	32.7	723	45.4
22 Health professionals	1,296	174	13.4	526	40.6	700	54.0
23 Teaching and educational professionals	1,364	205	15.0	597	43.7	801	58.7
24 Business, media and public service professionals	1,591	290	18.2	671	42.2	961	60.4
31 Science, engineering and technology associate professionals	501	25	4.9	169	33.8	194	38.7
32 Health and social care associate professionals	323	49	15.0	134	41.5	183	56.5
33 Protective service occupations	458	-10	-2.3	138	30.0	127	27.8
34 Culture, media and sports occupations	569	114	20.0	221	38.8	335	58.8
35 Business and public service associate professionals	2,074	374	18.0	788	38.0	1,162	56.0
41 Administrative occupations	2,738	-80	-2.9	1,204	44.0	1,125	41.1
42 Secretarial and related occupations	961	-307	-32.0	491	51.1	184	19.2
51 Skilled agricultural and related trades	399	8	1.9	205	51.5	213	53.4
52 Skilled metal, electrical and electronic trades	1,330	-140	-10.5	496	37.3	356	26.8
53 Skilled construction and building trades	1,152	77	6.7	434	37.7	511	44.3
54 Textiles, printing and other skilled trades	645	-175	-27.1	248	38.4	73	11.3
61 Caring personal service occupations	2,094	308	14.7	877	41.9	1,185	56.6
62 Leisure, travel and related personal service occupations	625	5	0.8	267	42.7	272	43.6
71 Sales occupations	1,991	-113	-5.7	735	36.9	622	31.2
72 Customer service occupations	617	115	18.6	202	32.8	317	51.4
81 Process, plant and machine operatives	822	-200	-24.3	311	37.8	111	13.5
82 Transport and mobile machine drivers and operatives	1,128	-12	-1.1	534	47.4	522	46.3
91 Elementary trades and related occupations	544	12	2.2	200	36.7	212	38.9
92 Elementary administration and service occupations	2,628	89	3.4	1,043	39.7	1,132	43.1
All Occupations	30,458	1,550	5.1	12,319	40.4	13,869	45.5

\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\[AllUK.xlsm]Table 5.1, c111

Source: IER estimates, MDM Revision 7146.

Notes: a) Numbers may not sum due to rounding.
b) Occupational and Geographical mobility are assumed to be zero for the purposes of these estimates.

4.5 Components of occupational change

The occupational projections and observed historical change can be analysed using shift-share techniques. This provides a description of how the changes can be broken down into three main components: a scale effect, an industrial mix effect and an occupational effect, (see box 4.3 for details).

Box 4.3: Shift-share analysis of occupational change

The ***scale effect*** measures the impact of the overall expansion (or decline) of employment levels in the economy, assuming this applies strictly proportionally to all industries, and occupations.

The ***industrial mix effect*** measures the impact of the changing patterns of final demands on the industrial structure of employment, whilst holding constant the occupational composition within the industries. It is measured as the difference between the growth or decline in employment the sector concerned and the scale effect.

The ***occupational effect*** measures the impact of organisational and technological changes on the occupational structure of employment within the industries. This is computed as the difference between the total change and the sum of the scale and industry effects.

The shift-share analysis is carried out at a detailed industry level (the 41 industries used in MDM), for the 25 SOC sub-major occupational groups, for males and females separately. The industry and occupational effects, by definition sum to zero when added up across all occupations.

In the Sectoral report a slightly different shift-share analysis is presented. This is based on the data presented there, which is for the 25 industries, 9 SOC major groups and for males and females combined. For an individual industry the occupational effects still sum to zero. But the industry effect does not. This shows the change in occupational employment that would have occurred in the industry had its occupational structure remained fixed. These changes can be positive or negative but they are the same percentage change for every occupation in the industry (= the % increase in employment for the industry, net of the increase for all industries). If all the industry effects are summed across the 25 industries they will sum to zero across all occupations, but for individual occupations they may be positive or negative. If this analysis were undertaken at the same level of gender, occupation and industry analysis as in Tables 4.6 and 4.7 the results would be identical to those presented there. Because they are not, minor discrepancies will arise. However, the basic patterns in terms of the industry effect becoming progressively less important, and differences across occupations, are the same in both sets of results.

During the 1970s and 1980s, industry effects, notably the rapid loss of jobs in the primary and manufacturing sectors and the rapid expansion of employment in services, played an even more significant role in explaining changes in occupational employment patterns. The analysis reported in previous labour market assessments showed large industry effects, both positive and negative. The former tended to benefit white collar, non-manual occupations, in the growing service sectors, while the latter was concentrated on manual, blue collar jobs in industries such as agriculture, mining and many parts of manufacturing.

Tables 4.6 and 4.7 present the results of the shift-share analysis for the historical period 2000-2010 and for the projection period 2010-2020. These tables show the projected net employment changes across each of the 25 sub-major occupations in terms of both absolute levels and percentages. These net changes are decomposed into the 3 component effects.

With a few notable exceptions, the dominant explanation of change for most occupations for the recent historical period is that attributable to occupational effects (see Table 4.6). However, the second most important explanation is the scale effect. All else being equal, this resulted in an increase of just over 4 per cent in each occupational employment level over the past decade. In many cases the occupational effect is of a much greater magnitude. This can of course be positive (as in the case of many white-collar, non-manual occupations) or negative (as is often the case for blue-collar, manual occupations). In recent years the industry mix effect has had only a relatively minor impact, although it has been important for a small number of occupations. These effects are negative for those occupations linked to the fortunes of declining sectors such as manufacturing or agriculture. They are positive for those occupations linked most closely to growing service sectors such as culture, media & sports occupations.

The effects rarely all point in the same direction. The scale effect is uniformly positive over both the periods 2000-2010 and 2010-2020. It reflects the overall employment increases projected across all categories. The other two effects exhibit differing signs across the various occupational groups, summing across all occupations to zero.

For the forecast period the scale and occupational effects are again dominant (see Table 4.7). The scale effect results in an increase of just over 5 per cent in employment levels for each occupation over the 2010-2020 period (all else being equal).

In absolute terms, the industry mix effect on occupational employment is fairly insignificant in the projections, except in a small number of occupations, such as teaching professionals and caring personal service occupations. These are mainly linked to the declining fortunes of the public sector in terms of employment over the next decade (especially in education and health sectors). The nature of the industry effects are generally consistent with the results for the previous decade, with the exception of the public sector where it has switched from being positive to negative. They are generally much less significant than observed in previous decades, when it was the decline of employment in the primary and manufacturing industries and the shift to services that was the key factor.

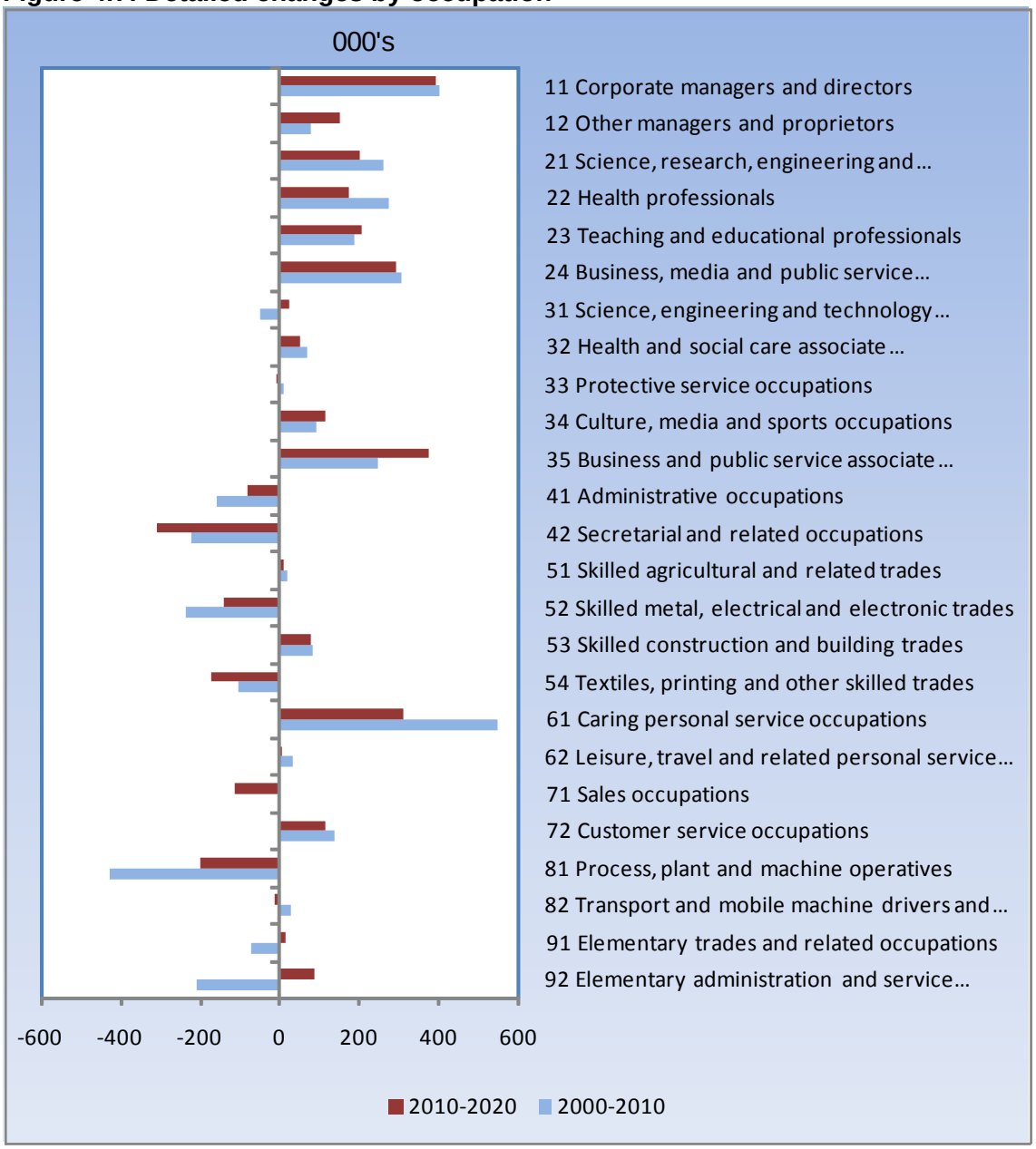
The industry mix effect is strongly significant in only a few occupations for the projected period. It makes a marginal contribution to many of the others. It impacts most significantly in positive fashion on some associate professional occupations.

Over the forecast period, the scale effect, which reflects the overall expansion (or decline) in employment levels, is important for all occupations. It is especially notable compared with the other effects for corporate managers, business associate professionals, administrative occupations caring personal service occupations and sales occupations.

The occupational effect is very strongly positive for most professional and associate professional groups and especially in the case of the caring personal service occupations. However, the occupational effect exercises a strong negative impact for administrative occupations, secretarial & related occupations, skilled metal & electrical trades, textile, printing and other skilled trades, and process, plant & machine operatives. In all of these sub-major groups, significant changes in organisation and technology within the employing industries are expected to have a marked negative impact on employment levels.

The key drivers of occupational employment change over the next decade are therefore expected to be related to changing ways of working within industries and the way in which technological change, especially IT, impacts on the need for different skills. This is in contrast to earlier decades when it has been the changing sectoral structure of employment that has been a prime driver.

Figure 4.7: Detailed changes by occupation



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Source: IER estimates, MDM Revision 7146.

Table 4.6: Total Occupational Employment, 2000-2010 United Kingdom: All Industry Sectors

SOC2010 Sub-Major Groups	Base year 2000		Target year 2010		Change 2000-2010		Components of change			
							Scale effect		Occupation effect	
	000s	% share	000s	% share	000s	%	000s	%	000s	%
11 Corporate managers and directors	1616	5.5	2015	6.6	399	24.7	70	4.3	413	25.6
12 Other managers and proprietors	924	3.2	1000	3.3	76	8.3	40	4.3	27	2.9
21 Science, research, engineering and technology professiona	1333	4.6	1593	5.2	260	19.5	58	4.3	264	19.8
22 Health professionals	1023	3.5	1296	4.3	272	26.6	44	4.3	51	5.0
23 Teaching and educational professionals	1178	4.0	1364	4.5	186	15.8	51	4.3	-40	-3.4
24 Business, media and public service professionals	1286	4.4	1591	5.2	304	23.7	56	4.3	137	10.7
31 Science, engineering and technology associate professiona	553	1.9	501	1.6	-52	-9.4	24	4.3	-46	-8.3
32 Health and social care associate professionals	254	0.9	323	1.1	70	27.6	11	4.3	14	5.4
33 Protective service occupations	449	1.5	458	1.5	9	2.1	19	4.3	-20	-4.4
34 Culture, media and sports occupations	476	1.6	569	1.9	93	19.5	21	4.3	60	12.5
35 Business and public service associate professionals	1829	6.3	2074	6.8	244	13.3	79	4.3	176	9.6
41 Administrative occupations	2896	9.9	2738	9.0	-158	-5.5	126	4.3	-331	-11.4
42 Secretarial and related occupations	1182	4.0	961	3.2	-221	-18.7	51	4.3	-383	-32.4
51 Skilled agricultural and related trades	380	1.3	399	1.3	19	4.9	16	4.3	0	-0.1
52 Skilled metal, electrical and electronic trades	1567	5.4	1330	4.4	-238	-15.2	68	4.3	-37	-2.3
53 Skilled construction and building trades	1070	3.7	1152	3.8	82	7.7	46	4.3	54	5.0
54 Textiles, printing and other skilled trades	749	2.6	645	2.1	-105	-14.0	33	4.3	-65	-8.7
61 Caring personal service occupations	1549	5.3	2094	6.9	545	35.2	67	4.3	184	11.9
62 Leisure, travel and related personal service occupations	593	2.0	625	2.1	32	5.4	26	4.3	6	1.0
71 Sales occupations	1997	6.8	1991	6.5	-6	-0.3	87	4.3	17	0.9
72 Customer service occupations	482	1.7	617	2.0	135	28.1	21	4.3	128	26.5
81 Process, plant and machine operatives	1251	4.3	822	2.7	-429	-34.3	54	4.3	-166	-13.2
82 Transport and mobile machine drivers and operatives	1098	3.8	1128	3.7	30	2.7	48	4.3	26	2.3
91 Elementary trades and related occupations	619	2.1	544	1.8	-74	-12.0	27	4.3	-48	-7.8
92 Elementary administration and service occupations	2835	9.7	2628	8.6	-207	-7.3	123	4.3	-420	-14.8
All occupations	29192	100.0	30458	100.0	1266	4.3				

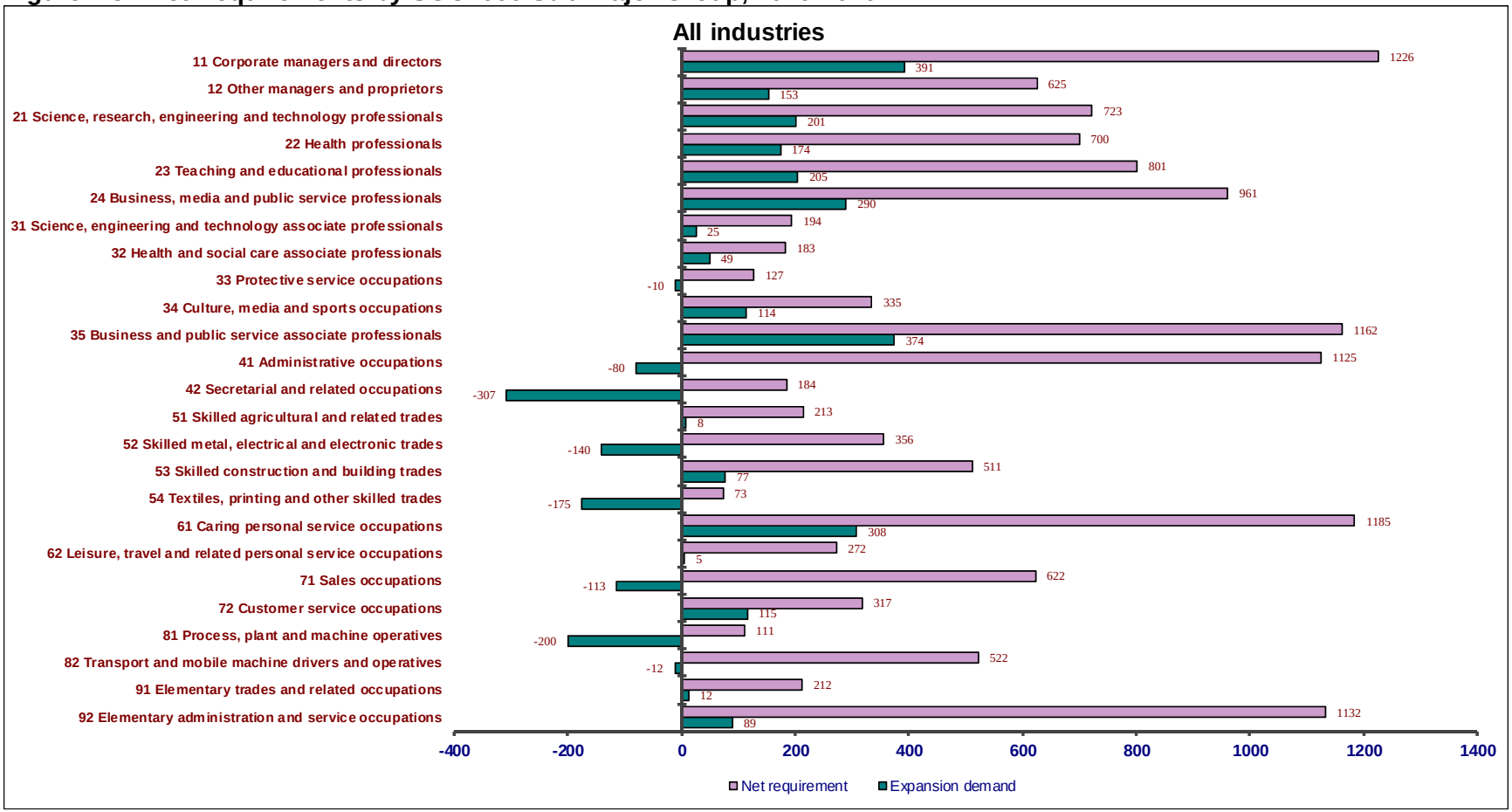
Source: IER estimates, MDM revision 7146., 22UK.xls, Shift-share.

Table 4.7: Total Occupational Employment, 2010-2020 United Kingdom: All Industry Sectors

SOC2010 Sub-Major Groups	Base year 000s	2010 % share	Target year 000s	2020 % share	Change 2010-2020 000s	Change 2010-2020 %	Components of change: Scale effect 000s	Scale effect %	Occupation effect 000s	Occupation effect %
11 Corporate managers and directors	2015	6.6	2407	7.5	391	19.4	103	5.1	282	14.0
12 Other managers and proprietors	1000	3.3	1153	3.6	153	15.3	51	5.1	70	7.0
21 Science, research, engineering and technology professiona	1593	5.2	1794	5.6	201	12.6	81	5.1	117	7.4
22 Health professionals	1296	4.3	1469	4.6	174	13.4	66	5.1	143	11.0
23 Teaching and educational professionals	1364	4.5	1569	4.9	205	15.0	69	5.1	206	15.1
24 Business, media and public service professionals	1591	5.2	1880	5.9	290	18.2	81	5.1	155	9.7
31 Science, engineering and technology associate professiona	501	1.6	526	1.6	25	4.9	26	5.1	1	0.2
32 Health and social care associate professionals	323	1.1	372	1.2	49	15.0	16	5.1	41	12.8
33 Protective service occupations	458	1.5	448	1.4	-10	-2.3	23	5.1	-3	-0.6
34 Culture, media and sports occupations	569	1.9	683	2.1	114	20.0	29	5.1	40	7.0
35 Business and public service associate professionals	2074	6.8	2448	7.6	374	18.0	106	5.1	244	11.8
41 Administrative occupations	2738	9.0	2658	8.3	-80	-2.9	139	5.1	-222	-8.1
42 Secretarial and related occupations	961	3.2	654	2.0	-307	-32.0	49	5.1	-367	-38.2
51 Skilled agricultural and related trades	399	1.3	407	1.3	8	1.9	20	5.1	11	2.7
52 Skilled metal, electrical and electronic trades	1330	4.4	1190	3.7	-140	-10.5	68	5.1	-177	-13.3
53 Skilled construction and building trades	1152	3.8	1229	3.8	77	6.7	59	5.1	-29	-2.5
54 Textiles, printing and other skilled trades	645	2.1	470	1.5	-175	-27.1	33	5.1	-210	-32.5
61 Caring personal service occupations	2094	6.9	2402	7.5	308	14.7	107	5.1	274	13.1
62 Leisure, travel and related personal service occupations	625	2.1	630	2.0	5	0.8	32	5.1	-38	-6.0
71 Sales occupations	1991	6.5	1878	5.9	-113	-5.7	101	5.1	-207	-10.4
72 Customer service occupations	617	2.0	732	2.3	115	18.6	31	5.1	75	12.2
81 Process, plant and machine operatives	822	2.7	622	1.9	-200	-24.3	42	5.1	-208	-25.3
82 Transport and mobile machine drivers and operatives	1128	3.7	1115	3.5	-12	-1.1	57	5.1	-76	-6.8
91 Elementary trades and related occupations	544	1.8	556	1.7	12	2.2	28	5.1	-9	-1.7
92 Elementary administration and service occupations	2628	8.6	2717	8.5	89	3.4	134	5.1	-114	-4.3
All occupations	30458	100.0	32008	100.0	1550	5.1				

Source: IER estimates, MDM revision 7146., 22UK.xls, Shift-share.

Figure 4.8: Net Requirements by SOC2000 Sub-major Group, 2010-2020



\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\[AllUK.xlsm]Replacement, c111

Source: IER estimates, MDM Revision 7146.

Notes: Figures for total requirements exclude replacement demands arising from occupational mobility

Figure 4.9: Occupational change 2010-2020, across the 22 Industries

	Sub-Major Groups																								
	11	12	21	22	23	24	31	32	33	34	35	41	42	51	52	53	54	61	62	71	72	81	82	91	92
Agriculture									-	+			-		-	-	-	+		-		-			
Mining and quarrying									-				-		-		-			-		-			
Food drink and tobacco	+	+	+	+	+	+		+	+	+	+			+			-	+			+	-			
Engineering					+								-		-		-					-			
Rest of manufacturing				+	+			+					-				-	+				-			
Electricity and gas									-			-	-		-	-	-			-		-		-	
Water and sewerage	+	+	+	+	+	+	+	+	+	+	+	+		+		+		+		+	+				
Construction	+	+	+	+	+	+	+	+	+	+	+		-	+				+	+		+		+		
Wholesale and retail trade	+			+	+	+		+	+	+	+		-	+			-	+			+	-			
Transport and storage	+	+	+	+	+	+	+	+		+	+			+			-	+	+		+				
Accommodation and food	+		+	+	+	+		+		+	+			+			-	+			+			+	
Media	+	+		+	+	+		+		+	+		-			+	-	+			+		+		+
Information technology					+								-		-		-	+				-			
Finance and insurance				+	+			+	+				-				-	+				-		+	
Real estate	+	+	+	+	+		+	+	+	+	+	+		+				+	+	+	+		+		
Professional services	+	+	+	+	+	+		+	+	+	+		-			+		+					+	+	+
Support services	+			+	+			+		+			-					+			+	-			
Public admin. and defence					+							-	-		-		-	+				-		-	
Education												-	-		-		-		-	-					-
Health and social work					+							-	-				-		-			-		-	-
Arts and entertainment	+	+	+		+	+	+	+			+	+					-	+			+				
Other services	+	+	+	+	+						+		-									-	-		

level of employment in 2010 and/or 2020 is 100000 or greater.
\+ growth in employment between 2010 and 2020 is forecast to be 20% or greater.
\- growth in employment between 2010 and 2020 is forecast to be -20% or less.
growth in employment in the sector or the occupation between 2010 and 2020 is forecast to be 15% or greater.
growth in employment in the sector or the occupation between 2010 and 2020 is forecast to be -15% or less.

\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\tablesCharts\[IOChart_22Output.xlsx]Diagram,
Source: IER estimates, MDM Revision 7146.

4.6 Detailed occupational changes within industries

The occupational structures and changes over time vary considerably within different industries. Figure 4.9 presents an overview of both history and projections to 2020. The figure illustrates a number of features, focussing on the 22 industries and the 2 digit SOC2010 sub-major groups.

Those industries and occupations that are expected to grow or decline most rapidly are highlighted by shading of the row and column headers. Thus dark red shading indicates that some industries such as Water and sewerage, the Media, Real estate, Professional services and Arts and entertainment are projected to grow by 15 per cent or more between 2010 and 2020.

The first of these only employs small numbers of people. This is indicated by the lack of shading in that row. Within the body of the figure, cells which include 100,000 or more people employed are shaded yellow. These will be areas where there are significant replacement demands.

Similarly particular occupational categories, such as SOC categories Corporate managers and directors; Business, media and public service professionals, Culture, media and sport and Customer service occupations are each projected to grow by 15 per cent or more.

In contrast, those industries and occupations that are expected to decline by 15 per cent or more are indicated by pale blue shading of row and column headers. These are concentrated in the Engineering part of the manufacturing sector and amongst blue collar occupations such as Textiles, printing and other skilled trades, Transport and mobile machine drivers and operatives, and in Secretarial and related occupations.

The cells with the most rapid changes (+ or – 20 per cent or more), are indicated by a + or – symbol. Where such symbols occur in a shaded cell, the changes are most significant in terms of numbers involved.

5 Implications for Qualifications

Key Messages

- Skill supply, as measured by highest formal qualification held, is rising rapidly as more young people in particular stay in education longer and acquire more higher level qualifications.
- The demand for skills as measured by the numbers employed in higher level occupations and the numbers employed holding higher level qualifications is also projected to rise.
- The average level of qualifications held is rising in all occupations.
- How much this is due to increases in demand as opposed to simply reflecting the supply side changes is a moot point.
- There is some evidence of continuing polarisation of skill demand, with some growth in the numbers of relatively low skilled jobs.

5.1 Introduction and general approach

Occupation is only one way of measuring skill. Formal qualifications provide a means of accrediting learning and skills acquired during education and training. They have been widely used in previous studies such as the Leitch Review (2008).[31] In some respects qualifications are better at measuring the supply of skills (numbers of people holding certain credentials) than the demand for skills. It is not so easy to measure the demand for qualifications by employers as there is typically a broad range of qualifications held by the workforce in any particular job.

Generally speaking, better qualified people have a higher probability of obtaining and retaining a job than someone less well qualified. They are also, therefore more likely to be active in the labour market than less qualified people, except when they are young and still acquiring qualifications, and possibly when they are approaching retirement.

[31] See Leitch, S (2006) Prosperity for all in the global economy - world class skills December 2006 =HMSO London (http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/leitch)

Demand is proxied in the present results by those in employment, although it is recognised that the observed patterns also reflect supply side changes. With the strong trends towards more people being better qualified, the tendency in recent years has been for the employment shares of those with higher level qualifications to rise and the share of those with no or few formal qualifications to fall.

The general approach adopted in analysing and modelling this aspect of the labour market is eclectic, involving a range of different data sets and models. Together the various inter-related models and modules cover various aspects of the supply of and demand for formal qualifications, at national and more detailed spatial levels. It builds upon earlier work, including the time series model developed in Bosworth, D.L. and G. Kik (2009).[32] Adding in a qualifications dimension to the analysis of employment trends raises a number of technical and conceptual issues (which are discussed in more detail in a separate Qualifications Technical Report (Bosworth and Wilson, 2011). These problems are addressed in a variety of ways, depending upon the availability of data and the prime objectives of each particular element.

The focus here is on numbers employed. The occupational employment structure of each industry, and how this is changing over time, is one of the key drivers for the numbers of formally qualified people employed. The key source of information on qualification patterns that is used is the Labour Force Survey (LFS), although various other data are also exploited. The LFS, while large, does not provide a sufficiently large sample to enable the full *Working Futures* database to be expanded to cover the qualification dimension using the original data. A full database has been created by assuming common patterns apply at more detailed levels and using RAS techniques to fill the gaps.[33]

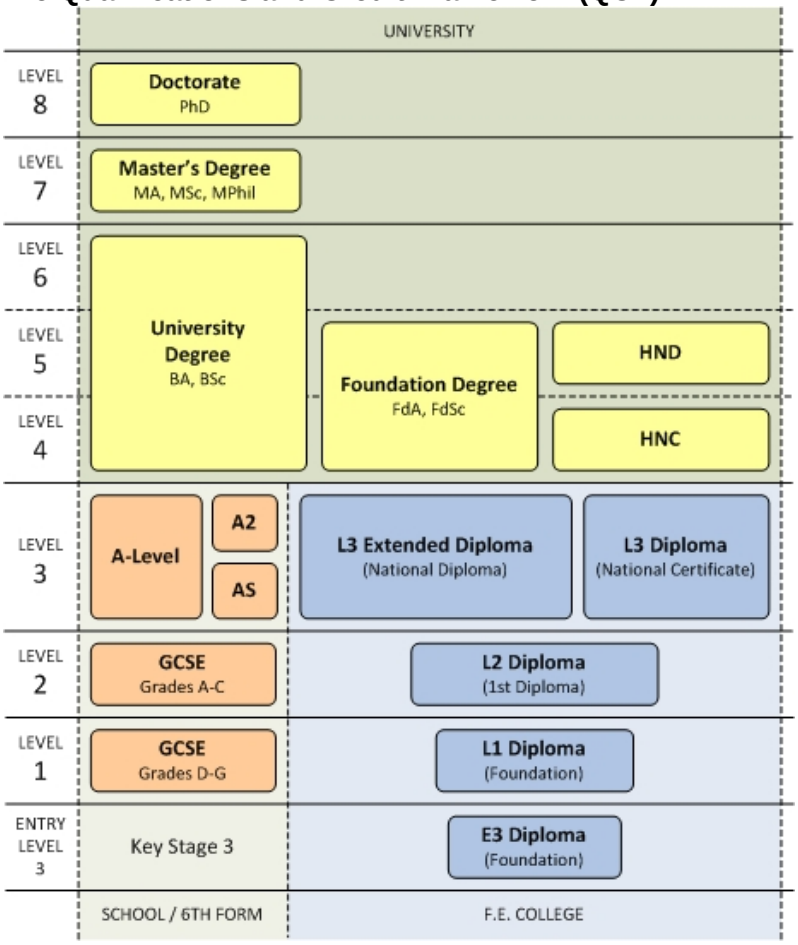
[32] See Ambition 2020: Technical Report. UK Commission for Employment and Skills. Wath-upon-Dearne. http://www.ukces.org.uk/tags/ambition-2020-technical-report

[33] RAS is an iterative technique used to fill gaps in a two dimensional data array given row and column totals. It is extended here to cover multidimensional arrays.

Qualifications are defined here with reference to the Qualifications and Credit Framework (QCF). This is the national credit transfer system for qualifications in England, Wales and Northern Ireland.[34] This framework defines formal qualifications by their level (i.e. level of difficulty) and credit value (how much time the average learner would take to complete the qualification). Level is the dimension of interest here. Figure 5.1 sets out the broad features. The framework has 8 main levels plus no formal qualifications. These are condensed here into 6:

- QCF 0 (Entry and none);
- QCF 1 (Foundation);
- QCF 2 (Intermediate);
- QCF 3 (Advanced);
- QCF 4,5&6 (Degree level or equivalent);
- QCF 7&8 (Postgraduate level).

Figure 5.1: The Qualifications and Credit Framework (QCF)



[34] QCF is the framework currently used for vocational qualifications. Scotland has its own qualification framework, the Scottish Credit and Qualifications Framework (SCQF), and its own system of levels. Correspondences between the levels used in QCF / NQF and the SCQF are mapped in *Qualifications can cross boundaries* (SCQF, 2011).

For most purposes, the focus is upon the highest qualification held. Further details of the qualifications included within each QCF category are given in the *Qualifications Technical Report*.[36]

A variety of different definitions of employment and related indicators are used (see Box 5.1). The starting point for the analysis is the total numbers of people in the population of working age in possession of different qualifications (residence basis, heads). Not all these people are economically active. Of these, at any point in time, some are unemployed. Subtracting these away from the economically active gives a measure of the number of employed residents (heads). Finally, of those who are employed, some have more than one job. Moreover they may be employed in a workplace in a geographical area different from where they are resident. This requires the use of an alternative measure - workplace jobs. It is this measure that is the focus of the main *Working Futures* model and results.

For each gender/QCF category, there are two accounting identities linking the various elements:

- Employment (residence/heads) plus (ILO) unemployment = total number economically active
- Economic activity rate = total number economically active/ total number in the population

The database used for the supply model (LFS/GAD) focuses on resident employment (heads). The main *Working Futures* (WF) database (ABI/ONS) focuses on workplace employment (jobs).

A ***National level model*** is used to produce projections of the total number of people qualified at broad QCF level, as well as the numbers of those economically active. This deals with the supply side. By making assumptions about unemployment patterns by qualification this is then translated into implications for employment. These results are then extended to cover the individual countries and English regions within the UK using a ***spatial qualification model.*** The country / regional results are presented in Section 6.

[36] Wilson and Bosworth (2011).

The supply side results are compared with a demand side analysis based on analysing trends in employment patterns within occupations. Detailed patterns by occupation, cross classified by sector and region are considered. The projections are based on extrapolating patterns of qualification by occupation for those employed within these various categories.

These more detailed results are then constrained to provide a picture consistent with the overall supply results from national model.[37] The estimates of employment by QCF level are constrained using RAS[38] iterative methods to:

- reconcile the aggregate sum of qualification requirements by qualification with the numbers available as indicated by the national model and related analysis of economic activity rates; and
- reconcile the separate industry or regional totals with the UK totals.

This provides consistency across the full set of *Working Futures* projections. The results from the spatial analysis are used to produce the initial estimates of qualification shares at individual country and English regional level. These are then constrained to match the overall UK totals using a RAS process. These values are then used as control totals to constrain a detailed analysis of changing qualification patterns within occupations. The same qualification patterns for resident (heads) are assumed to apply to the workplace jobs employment estimates.

More complete details of data sources and methods are given in the separate *Qualifications Technical Report*.[39]

Section 5.2 presents a brief overview of key historical and projected trends in the supply of people by highest qualification held. Section 5.3 presents the corresponding picture for the demand side (employment). Section 5.4 makes a comparison between the two. Section 5.5 concludes.

[37] When adding qualifications to all the other dimensions in the *Working Futures* database (gender, status, sector, occupation spatial area), it is impossible to ensure complete consistency across all dimensions. The data available from the LFS, which form the basis for most of the qualification estimates, are inadequate to fully populate such a database. In many cases no data are available. In even more cases the data that are available are based on insufficiently large sample numbers to produce robust estimates. The results presented here present, as far as is possible, a consistent picture across all the main dimensions. They should be regarded as indicative.
[38] RAS is an iterative procedure which is used to generate a data array constrained to match certain row and column targets.
[39] Bosworth and Wilson (2011).

Box 5.1: 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 2004-2014* 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)).

Workplace employment (number of jobs): these are typically estimated using surveys of employers, such as the ABI, 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 total number of workforce jobs 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 16-65 (males) or 16-60

5.2 Supply trends

There have been some remarkable changes in participation in education and training, in recent years. These have been reflected in the changing qualifications held by the population. Information from the LFS can be used to see how qualification profiles have been changing over time for both males and females. Figure 5.2 shows estimates of the proportions of those in the economically active workforce holding different levels of qualification. The data reported relate to the highest qualification held. Very similar trends can be observed for the total population (active and inactive) and for those in employment (Figure 5.6).

There are of course significant differences in the levels and trends by age and gender. In particular younger people tend to be much more likely to possess or acquire qualifications than older people. However, the main focus here is on totals for both genders and across all ages.

The numbers in the total population holding different levels of formal qualifications can be regarded primarily as a supply indicator (although in practice it will reflect both demand and supply influences). The key drivers in recent years have been demographic changes, combined with increases in educational participation. The results of these two factors have seen large increases in both numbers and shares of the population qualified at higher levels (QCF 4+) and reductions in the numbers and shares qualified to QCF level 1 or below. Over the last two decades the number and proportions qualified to QCF level 2 in the population have fallen slightly while those qualified to QCF level 3 have increased.

This has been driven by government policies to increase participation in higher and further education. It has resulted in a big increase in the numbers emerging on to the labour market with formal qualifications. The proportion of young people with formal qualifications is much higher than for older people. There is therefore a strong cohort effect. The overall rise in qualifications has been reinforced to some extent by increasing qualification rates (“upskilling”) for older people.

Table 5.1 presents the headline results from the national model. This shows the total numbers of people in the population aged 16+ in possession of different qualifications (residence basis, heads). It covers all individuals, both economically active and inactive. These results are based on trends in the existing stock of people by age and gender estimated using LFS data.

There is clear evidence of significant increases in the numbers of people acquiring higher level qualifications. In the benchmark projections, it is assumed that rates of acquisition of qualifications will continue at the same rate as that observed over the past decade or so. The time series based model always uses the last 10 years of data for the main projection, and 5 years for the one that lets more recent events have greater influence. The same is true of the pseudo cohort part of the stock flow model. The qualification mix is projected to shift significantly between 2009 and 2020 away from individuals with QCF1 and below and towards individuals with QCF4 and above. The largest percentage point reductions are amongst QCF0 and the largest increases in QCF 7&8, the latter is marginally higher than the increase in QCF4,5&6. If anything, the improvements suggested by the trends over the last five years (rather than the last decade) are even larger, particularly with regard to reductions in QCF0 and improvements in QCF4,5&6.

While the qualifications model explicitly deals with the role of migration, the results have to be treated with some caution.[40] The model allows the projected qualification mix to be made with and without the effects of migration. The results suggest that differences in the qualifications of immigrants and emigrants raise the proportion with QCF 1 or below by about 1.5 to 2 percentage points by 2020 through cumulative net immigration. Net migration reduces the proportion at QCF 2 and QCF 4,5&6, but mainly at level 3 (just over 2 percentage points). The effect at the highest qualification level is to marginally increase the proportion of QCF 7&8.

These projected effects are still based upon the ONS 2008-based population projections; the 2010-based projections were not available at the time of writing. They are based upon net immigration of 200 thousand in 2010, falling to 175 thousand by 2020. The sensitivity of the results to this assumption is relatively minor compared to the scale of the underlying trends; nevertheless, the assumed cumulative net immigration of around 2 million is important.

Table 5.2 shows the corresponding number of people who are economically active. This is also on a residence/heads basis. It is also derived from the national model and focuses on results for the whole of the UK, for those of working age.

In order to draw out the implications for total employment it is necessary to take a view about unemployment by level of qualification. Based on LFS data there is a clear

[40] There are important issues of: missing data; robustness of the observations; difficulties of coding Immigrant qualifications; and the absence of information about the qualifications of emigrants.

monotonic relationship between unemployment rates and qualifications held, with rates falling the better qualified people are. Up to 2008, the overall rate of unemployment (ILO basis) fell significantly but then rose sharply following the financial crisis in that year. Most groups benefited from the earlier decline, but the better qualified generally benefited the most. This was despite the large increase in their share of total employment. With the subsequent rise in unemployment rates, it has again been the less well qualified that have suffered most

However, as Table 5.3 shows, the shares of total unemployment amongst the various QCF categories have changed in a rather different fashion. The unqualified category accounted for over 27 per cent of total unemployment in 2000. By 2010 its share of the total had fallen to just below 20 per cent. This reflected the rapidly declining share of employment in the workforce as a whole for this group.

By contrast, the shares of both the workforce and unemployment for better qualified categories (all those qualified at QCF level 2 or above) rose, with the largest increases (in proportionate terms) falling to the best qualified. Those qualified at QCF level 7&8 accounted for just 1½ per cent of all unemployment in 2000. By 2010 this had more than doubled. The ILO unemployment rate for the best qualified group rose to 3½ per cent, compared to around 2 per cent in 2000. However this was still well below that for the less well qualified categories. There is still a clear hierarchy in terms of rates of unemployment.

In the main *Working Futures* scenario, unemployment as a whole is projected to fall slowly from around 8 per cent in 2010 to just below 7 per cent by 2020. The various QCF categories are assumed to be similarly affected. The results in terms of their shares of total unemployment and overall unemployment levels are summarised in Tables 5.4 and 5.5. Unemployment rates are projected to fall at about the same pace for graduates and the unqualified category. The latter group still exhibits a core of people, unwilling or unable to acquire formal qualifications.

In practice, the rising supply of better qualified workers could result in a more extreme change in the patterns of unemployment observed. One alternative scenario would be a continued rise in the proportion of the workforce that are better qualified with no matching increase in demand, resulting in an even larger increase in the share of better qualified people in total unemployment. However, sensitivity analysis suggests that this would affect the overall patterns of change in employment patterns only marginally compared with those presented here. A bigger change would occur if the

difficult labour market situation discouraged people from continuing on education and acquiring qualifications or if the changes to university tuition fees had a similar impact.

Table 5.6 presents estimates of employment (residence/heads basis) implied by these unemployment assumptions for 2020. They show the implied pattern of supply "in employment". This reflects the growth in shares of better qualified people compared with the less well qualified.

These patterns (shares of employment by QCF level) are then applied to the *Working Futures* estimates of employment on a workplace/jobs basis to get the final set of results presented in Table 5.7 below.[41] These figures are then used as the benchmark to which all the other employment figures in this report are constrained. In particular the projections of changing qualification profiles within occupations, in aggregate, and separately by sector and by region, are all constrained to match these overall totals.

[41] Analysis of the LFS suggest that double jobbing qualification patterns are not the exactly the same for heads and jobs , but Figure 4.8: Net Requirements by SOC2000 Sub-major Group, 2010-2020. The discrepancies would not make a huge difference here.

Table 5.1: Total numbers by qualification (total population 16+, 000s)

Supply	2000	2010	2020
QCF level			
QCF 0	9,438	6,523	3,470
QCF 1	9,079	8,760	8,940
QCF 2	10,032	10,521	10,520
QCF 3	8,132	9,273	8,900
QCF 4, 5 & 6	8,659	11,697	15,210
QCF 7 & 8	1,586	3,746	6,491
Total	46,926	50,520	53,531

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.

Table 5.2: Economically active population by qualification (000s)

	2000	2010	2020
QCF level			
QCF 0	4,271	3,174	2,057
QCF 1	5,709	5,338	5,095
QCF 2	6,304	6,661	6,581
QCF 3	5,461	6,003	5,467
QCF 4, 5 & 6	5,813	7,650	9,375
QCF 7 & 8	1,167	2,536	4,228
Total	28,725	31,362	32,803

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.
Note: Aged 16+ only.

Table 5.3: Shares of total unemployment by qualification

	2000	2010
QCF level	**Implied U/E shares (%)**	
QCF 0	27.3	20.2
QCF 1	23.8	24.1
QCF 2	22.1	24.7
QCF 3	14.3	15.1
QCF 4, 5 & 6	11.0	12.5
QCF 7 & 8	1.5	3.5
All quals.	100.0	100.0

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.

Table 5.4: Implied unemployment levels (000s)

	2000	2010	2020
QCF level			
QCF 0	435	498	308
QCF 1	379	595	542
QCF 2	352	610	567
QCF 3	228	372	316
QCF 4, 5 & 6	175	308	353
QCF 7 & 8	24	86	135
Total	1,593	2,469	2,221

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates

Table 5.5: Implied unemployment rates (%)

	2000	2010	2020
QCF level			
QCF 0	10.2	15.7	15.0
QCF 1	6.6	11.1	10.6
QCF 2	5.6	9.2	8.6
QCF 3	4.2	6.2	5.8
QCF 4, 5 & 6	3.0	4.0	3.8
QCF 7 & 8	2.0	3.4	3.2
All quals.	5.5	7.9	6.8

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates

Table 5.6 Employment (residence/heads, 000s)

	2000	2010	2020
QCF level			
QCF 0	3,835	2,676	1,749
QCF 1	5,330	4,743	4,553
QCF 2	5,952	6,051	6,014
QCF 3	5,233	5,631	5,151
QCF 4, 5 & 6	5,638	7,342	9,022
QCF 7 & 8	1,143	2,450	4,093
Total	27,132	28,893	30,582

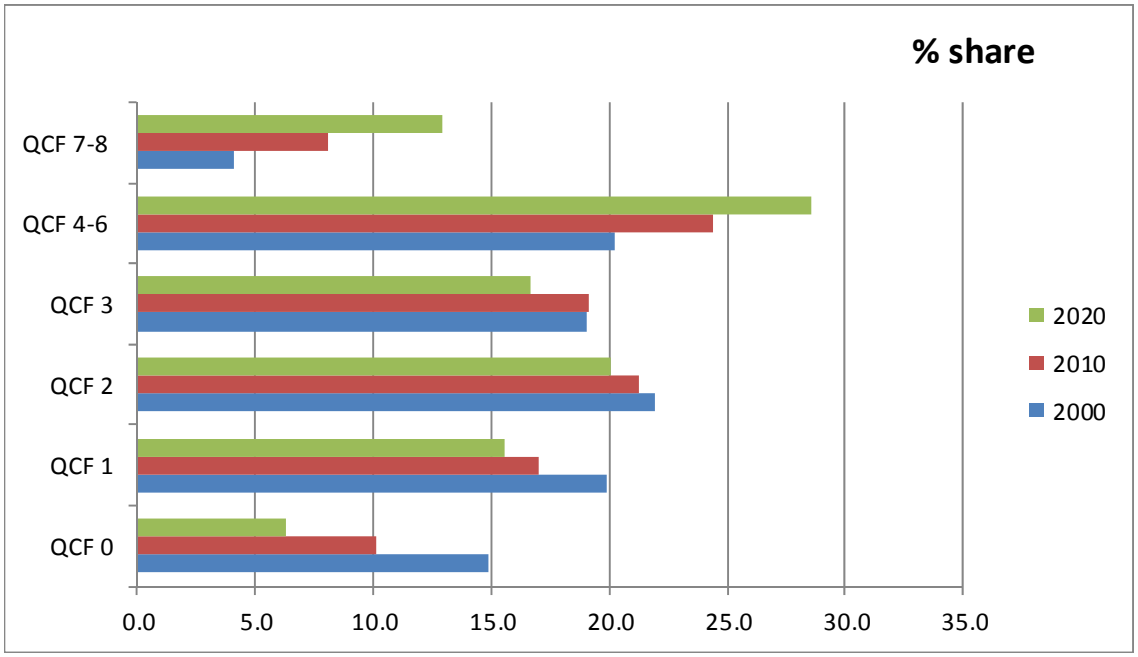
Source: IER estimates, LFS data, constrained to match *Working Futures* estimates, (heads)

Table 5.7: Employment (workplace/jobs, 000s)

	2000	2010	2020
QCF level			
QCF 0	4,165	2,839	1,840
QCF 1	5,798	5,034	4,789
QCF 2	6,455	6,423	6,331
QCF 3	5,647	5,970	5,422
QCF 4, 5 & 6	6,110	7,793	9,501
QCF 7 & 8	1,236	2,599	4,308
Total	29,411	30,658	32,190

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates
Notes: Includes HM Forces. Tables in Chapter 6 exclude HM Forces.

Figure 5.2: Changing patterns of Qualification within the Labour Force



Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.

5.3 Demand for formal qualifications

The patterns of employment by qualification observed are the result of a combination of both supply and demand factors. Separating them is not straightforward. Recent trends have seen a sharp rise in the formal qualifications held by those in employment. However it is obvious that, in part at least, this simply reflects the supply side changes described in the previous section.

Some have argued that supply has outpaced demand and that the increasing average qualification levels of those in employment just reflects increased supply rather than any real change in requirements (Brown and Hasketh, 2004). Others have argued that there is evidence that at least some of this change this reflects real increases in demand, with many jobs requiring more formal higher level qualifications than used to be the case (Purcell *et al.* 2005). There is evidence that the rates of return to obtaining higher level qualifications have held up quite well, suggesting that demand may have kept pace with the supply side (Elias and Purcell, 2011).[42]

Qualifications patterns vary considerably across occupations as Figure 5.4 illustrates. Higher level occupations, such as professionals and associate professionals, (and to a lesser extent managers), tend to be much better qualified than less skilled occupations. Shifts in occupational structure in favour of the former have been a key factor in increasing the numbers of graduates in employment, as discussed in greater detail in Chapter 5. Qualification profiles have changed in almost all occupations in favour of higher level qualifications (QCF4+) and with sharp reductions for the less well qualified (QCF1 and below). This shift in qualification patterns within occupations probably reflects supply as much as demand trends.

Qualifications profiles also vary very significantly across sectors (see Figure 5.5). To a large extent this reflects their occupational structure. Sectors such as health, education and public administration employ large numbers of people in higher level occupations and, as a consequence, large numbers of people qualified at QCF level 4+. In contrast some other sectors, such as some other parts of the service sector, employ large numbers in occupations which tend to be less well qualified.

[42] The results show that there is some divergence between those at the top and bottom of the income distribution however, with those returns for those in the bottom decile showing signs of decline.

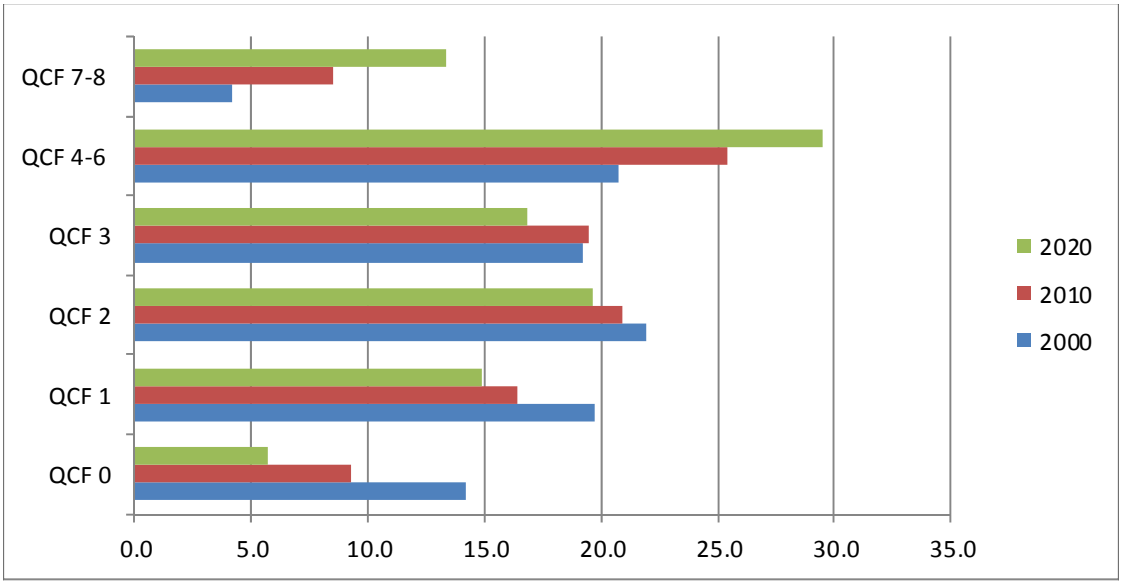
There are also variations across spatial areas, although these are less marked (see Figure 2.5). London (and to lesser extent Scotland and Wales) stands out, employing the largest proportion of those qualified at QCF level 4+. These differences reflect London's sectoral and occupational structure, with strong concentration of employment in education, public administration, banking and finance and head office functions. In the case of Scotland and Wales there are similar factors at work as well as the fact that Scotland has a rather different education system to the remainder of the UK.

Table 5.8: Changing Patterns of Qualification of those in Employment

	2000	2010	2020
QCF level			
QCF 0	14.2	9.3	5.7
QCF 1	19.7	16.4	14.9
QCF 2	21.9	20.9	19.7
QCF 3	19.2	19.5	16.8
QCF 4, 5 & 6	20.8	25.4	29.5
QCF 7 & 8	4.2	8.5	13.4
All quals.	100.0	100.0	100.0

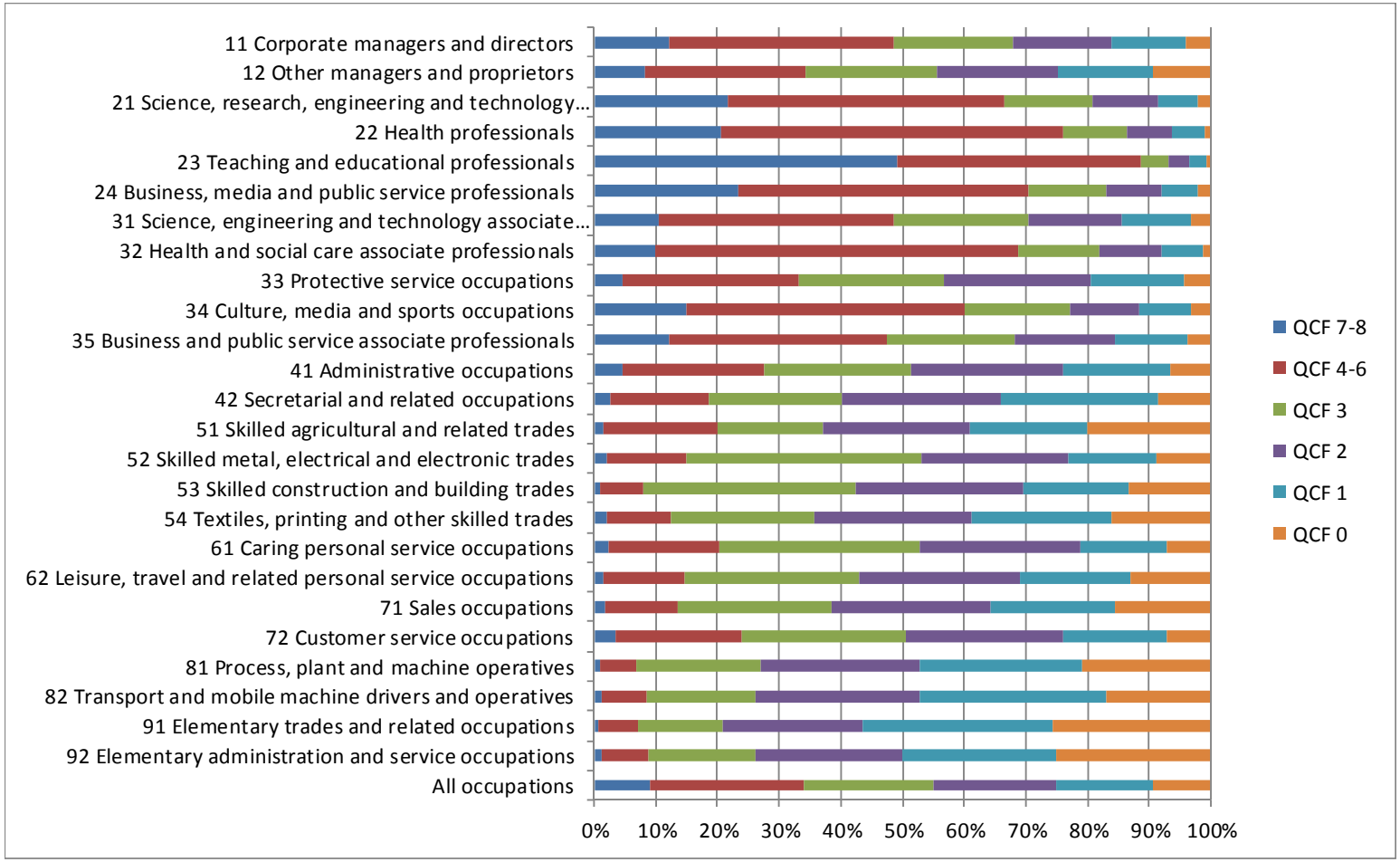
Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.

Figure 5.3: Changing Patterns of Qualification of those in Employment (% shares)



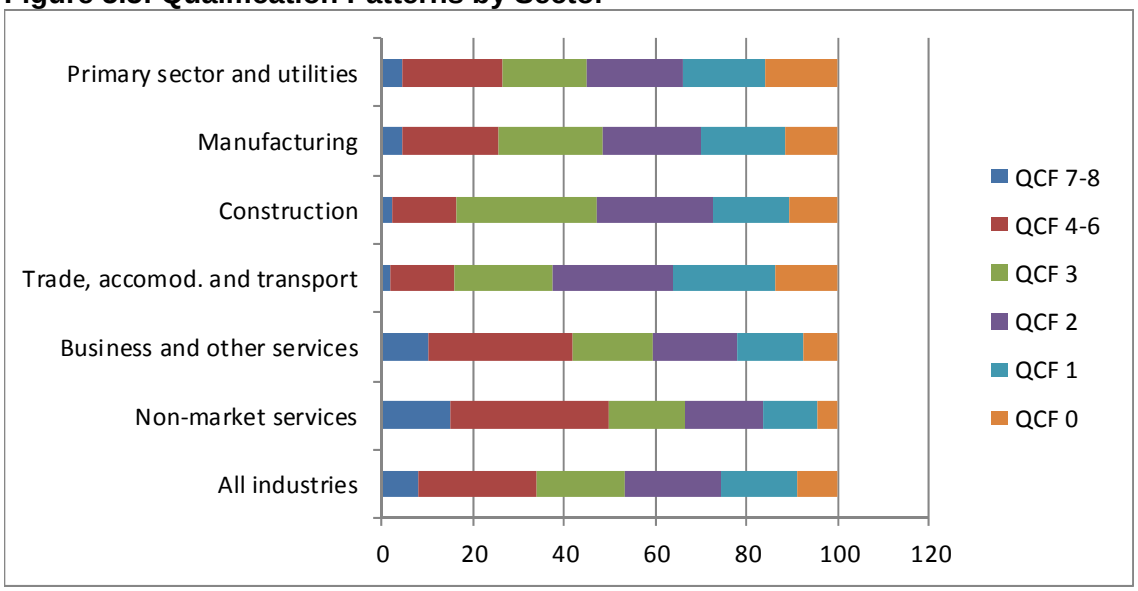
Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.
Notes: The estimates shown are based on LFS shares applied to *Working Futures* data on employment levels (jobs)

Figure 5.4: Qualification Patterns by Occupation, 2010



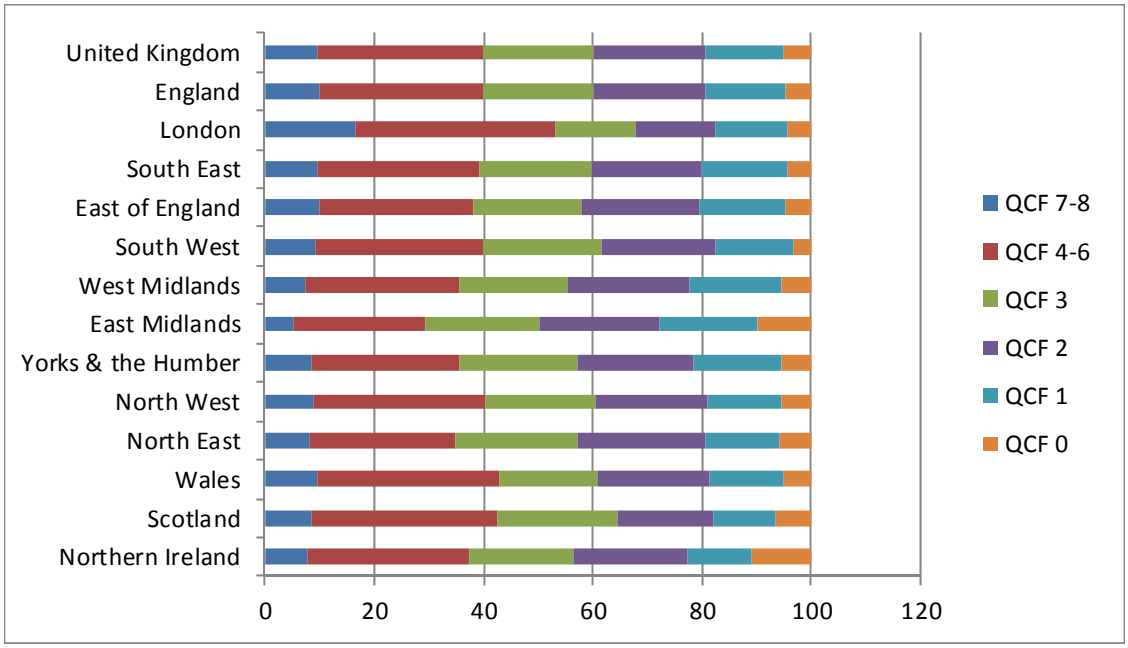
Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.

Figure 5.5: Qualification Patterns by Sector



Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.

Figure 5.6: Spatial Patterns



Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.

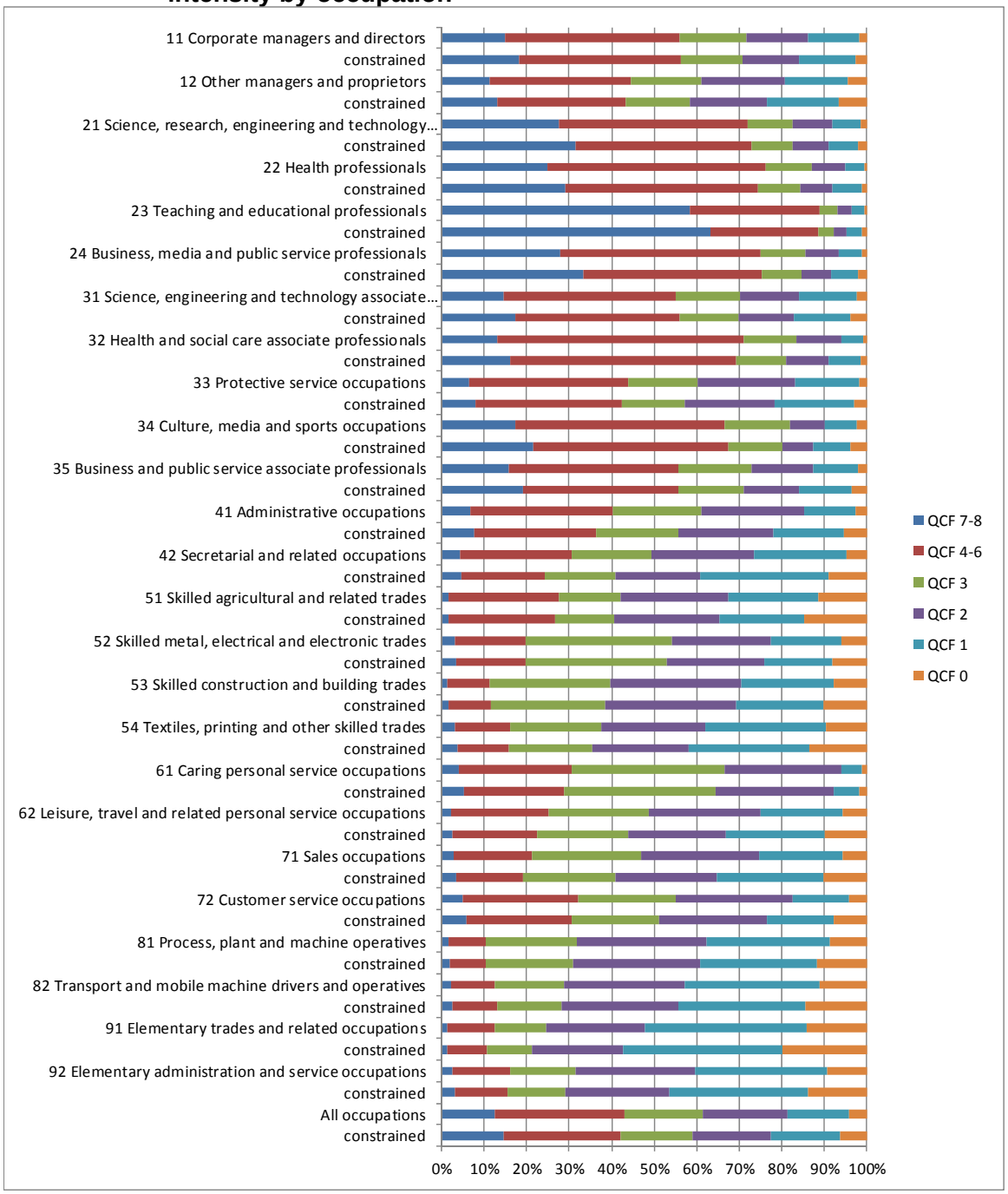
5.4 Reconciliation, imbalances and mismatches

Independent projections are made of the supply of people by highest qualification held and the patterns of employment within industries and occupations.

There is no guarantee these will match. A reconciliation is imposed by making certain assumptions about unemployment rates by highest qualifications held, and then reallocating people to jobs until all those available are employed. This involves raising the qualifications intensity of all jobs if initial supply exceeds demand and conversely. A RAS iterative process is used to achieve this, maintaining the original patterns of employment by industry occupation gender and status. The assumptions regarding unemployment are set out in Tables 5.3 –5.5 above.

The extent to which the patterns of qualification held within different occupations changes in 2020 is shown in Figure 5.7. This shows that for most occupations the qualification intensity (especially those holding qualifications at QCF 4+) has to be raised to bring demand into balance with supply. This is not necessarily indicative of excess supply of such qualifications. The nature of jobs may be changing to make higher qualifications more necessary. Education and health professions are good examples of where the entry requirements have seen a steady rise as the technical demands of jobs for teachers and nurses have risen. Similar changes may have taken place in other occupations. At the same time there may have also been some “qualifications inflation” or credentialism as employers have taken advantage of an increasingly well qualified workforce. As noted earlier, evidence from rates of return do not suggest a dramatic shift towards excess supply, while detailed case study evidence suggest that the nature of many jobs is changing in the direction of requiring more formal qualifications, especially in niche areas (Elias and Purcell, 2010).

Figure 5.7: Reconciling demand and supply in 2020– increasing qualification intensity by occupation



Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.

5.5 Concluding Remarks

A number of robust findings emerge from this analysis.

Changing patterns of educational participation mean that the overall qualification profile of the workforce will improve significantly over the next decade. The proportion and numbers of people qualified at higher levels will rise substantially. In contrast, the proportion and number of those in the workforce with qualifications at QCF level 1 or below will fall.

If the trends in qualification levels achieved over the past two decades continue then the results suggest that there will be a substantial improvement in the qualification profile of the population and the workforce. If there were to be a slowdown in the improvement in qualifications then rates of progress would be considerably less.

The results are also sensitive to the assumption made about net migration, since the qualifications patterns of inward migrants are significantly different to the domestic population.

Qualification levels amongst the employed workforce are likely to rise significantly. This will also reflect changing patterns of requirements in most jobs.

The balance between demand and supply influences is more difficult to predict. The most recent evidence available suggests that rates of return to higher qualifications have shown some signs of falling recently, although they still indicate significant positive benefits towards investing in such education and training, and have generally held up quite well.

The benchmark projections are based on the assumption that patterns of unemployment by QCF level maintain the same hierarchy in terms of unemployment rates, but that the better qualified take a bigger share of the total (reflecting their increasing share of the workforce). In practice, those qualified at higher levels may find it less easy to secure and retain employment compared with less well qualified people than they have done in the past. The results are not, however, very sensitive to this assumption.

There are some significant differences in qualification profiles across both sectors and spatial areas. These are primarily driven by differences in their employment patterns by occupation (and sector in the case of spatial areas).

Nearly all sectors and spatial areas are projected to see significant improvements in average qualification levels, with increased proportions and numbers employed at QCF level 4+ and reductions at levels 0 and 1.

There is considerable scope for refining both the demand and supply sides of the analysis, in particular focusing more attention on some of the key flows (migration, new entrants and retirements). There is also scope for exploring further the sensitivity of behaviour to prices (wages) and for refining the modelling approach, including applying it to a sub-UK level in combination with other methods of modelling spatial qualifications.

The research demonstrates the potential for this type of analysis, but it also highlights the limitations of the available data. While the LFS offers a very valuable insight into changing employment patterns, its sample size is inadequate to provide robust results at the level of detail that many users would like to see. The case for advocating further increases in the sample size remains very strong.

6 Spatial Perspectives

Key Messages

- The projections of GVA and output for 2010 to 2020 for the regions and nations of the UK indicate a continuing pattern of the southern parts of the country (particularly the south-east corner) being relatively advantaged, with the remainder (especially northern England and the countries outside England) falling further behind in relative terms.
- The impact of the cut-backs in public spending upon the output and employment of the non-market services sector will be greatest in the north and west of the UK.
- However, the revival of employment in the primary sector and utilities and manufacturing industry will benefit these regions and nations.
- Growth in employment in managers, directors and senior officials, professional and associate professional occupations will be fastest in the south-eastern corner of the UK.

6.1 Introduction

There are persistent differentials in the labour market performance of regional and local economies within the countries of the UK. One of the current government's priorities is for the 'rebalancing' of the economy. In spatial terms, the need for 'rebalancing' arises because economic development since World War I has disproportionately benefited London and South-East England. This spatial divide has become intensified by parallel variations in the level of innovation, competitiveness, and skills. Moreover, recent private sector employment growth has been even more strongly concentrated in these regions, leaving the north and west of England and the other nations of the UK excessively dependent upon public sector employment. With a relatively small private sector, the ability of these regions to create and sustain endogenous economic growth is much weaker than in the south and east of England. It is therefore important both for an understanding of how sub-national trends are likely to evolve and to indicate the likely scale of policy intervention necessary, to add to the detailed examination of trends in employment and productivity in the UK as a

whole with a review of projected trends in employment and productivity for the devolved nations and English regions over the period from 2010 to 2020.

A current emphasis of government is on the 'localism agenda', with the aim being for economic planning to be conducted at the most appropriate spatial scale. This has been reflected in the creation of "Local Enterprise Partnerships" (LEPs), replacing the Regional Development Agencies in England as the primary geographical entities for the promotion of economic development. These LEPs are intended to represent geographical areas with a broadly coherent functional economic identity, some of which are groups of local authority districts which can be seen to represent "city regions".

Though English regions are no longer policy-relevant geographical areas, there are significant practical reasons why *Working Futures* 2010-2010 uses the spatial framework of regions in England to present output and productivity projections. First, there are a large number of LEPs in England, the boundaries of which often overlap and the definition of some of these are not yet stable. Consequently, using this spatial framework would pose a challenge in terms of the amount of information presented and there is a risk that the report would quickly become out-of-date if LEP definitions changed. Secondly, some geographical sub-divisions have small populations and sample sizes may not be large enough to generate data for all of them. Thirdly, there would still be a need to group these local areas together in order to summarise trends.

For all these reasons, the nine regions in England (the former 'Government Office Regions'), together with the devolved nations of Wales, Scotland and Northern Ireland form the spatial framework for this chapter. An additional reason for this decision is that these are very familiar areal units for which a large volume of statistical data is available, and which are heavily used in reports by the Office for National Statistics and other data providers.

This chapter provides an overview of overall prospects for the devolved nations and English regions, focusing on long-term changes in output (GVA) and employment. It also covers:

(a) labour supply and demand: projected changes in the population, labour force, economic activity rates, unemployment and employment;

(b) prospects for employment change by sector;

(c) the changing composition of employment by gender and employment status;

(d) trends in occupational employment for nine SOC Major Groups[43];

(e) projections of replacement demand

(f) projections of qualifications patterns.

Section 6.2 provides a summary of overall prospects for GVA and employment in the nations and regions within the UK and goes on to discuss GVA and employment trends by broad industry sector. The pattern of output and employment change for 2000 to 2010 is contrasted with the projected change in output and employment for 2010 to 2020. Section 6.3 discusses regional and national aggregate labour supply and demand trends, including prospects for unemployment. The chapter then switches to discussing the projections of expansion demand in employment for 2010-20, covering employment projections by industry sector in section 6.4. Employment change by gender and employment status (full-time, part-time and self-employment) is discussed in Section 6.5. Occupational employment prospects are described in Section 6.6. Section 6.7 presents the complete picture of labour demand over the decade, outlining projections of replacement demand by occupation and region. Section 6.8 focuses on implications for qualifications.

6.2 Aggregate trends by country and region

6.2.1 Output by broad sector

Table 6.1 presents recent and projected trends in output (GVA) and employment across the UK.

For the UK as a whole, the projections suggest that economic growth will recover strongly in the current decade, with the annual average rate of GVA growth about 80 per cent higher than that for 2000 to 2010. This represents a fairly strong rebound from the deep recession of 2008-9. Past and projected GVA growth rates for England are the same as for the UK, but Wales, Scotland and Northern Ireland are projected to continue to experience lower rates of growth than England.

The projections for 2010 to 2020 suggest a return to the geographical pattern of higher growth in the south and east of England, apparent in the previous set of

[43] More detailed information at the 25 SOC Sub-Major Group level is also available.

Working Futures projections. The highest rates of annual GVA growth are projected to occur in the south and east of England, with the highest rate of growth in London. There is marked relative deterioration in economic growth relative to England in Scotland, but an improvement in Northern Ireland, while the relative position of Wales is projected to remain about the same during 2010-2020 as for 2000-2010.

Within England, the pattern of regional growth rates changes substantially. During 2000-2010, London displayed a much higher annual rate of GVA growth than the other regions. During 2010-2020, the other regions are projected have growth rates much closer to that of London. In the past decade there was not much differentiation within England beyond London, with the fastest rate of growth in the East Midlands and the slowest in the West Midlands. The slower growth rates for the West Midlands, North East and North West over the period 2000-2010 reflect the relatively greater impact of the 2008-9 recession upon these regions.

The annual average rate of employment growth is projected to be only marginally higher during 2010-20 than for 2000-10 for both the UK as a whole and England, but employment growth for each of the devolved nations is projected to be much slower than in the previous decade. During 2000-2010, employment grew fastest in Northern Ireland and the average rate of increase in Wales was similar to the fastest growing regions of England. During 2010-2020, the rate of employment growth in Wales and Northern Ireland is projected to be faster than that of the northern English regions, but slower than for southern England. The rate of employment growth in Northern Ireland (equal to that for England) is projected to be around half as fast as its growth rate for 2000-2010. In Scotland, employment grew relatively slowly during 2000-10. Its rate of employment growth is also projected to halve between 2010 and 2020 and to be slower than for any other nation or English region.

Within England, the annual average rate of employment growth between 2000 and 2010 was fastest in the East of England, South West and North East and slowest in the South East, East Midlands and Yorkshire and the Humber, while employment declined in the West Midlands (reflecting the impact of the severe recession of 2008-9). The decade 2010-20 is projected to see a return of the ‘north-south divide’ in annual average rates of employment growth apparent in the previous set of *Working Futures* projections. The south and east of England (the South East, South West, the East of England and London,) display the highest projected annual increases, followed by the Midlands, North West and Yorkshire and the Humber, with no increase at all projected for the North East.

Table 6.1: Long-term Changes in Macroeconomic Indicators

% p.a.

	GVA		Employment	
	2000-2010	**2010-2020**	**2000-2010**	**2010-2020**
London	2.6	3.0	0.4	0.7
South East	1.2	2.9	0.3	0.6
East of England	1.2	2.8	0.8	0.7
South West	1.5	2.7	0.7	0.7
West Midlands	0.7	2.5	-0.2	0.4
East Midlands	1.7	2.6	0.4	0.5
Yorks & the Humber	1.2	2.4	0.5	0.3
North West	1.1	2.6	0.4	0.3
North East	1.4	2.2	0.7	0.0
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

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Source: CE/IER estimates, MDM revision 7146, CrossRegional.xls (Table R.1).

Notes: GVA (output) is measured on a residence basis, employment is on an establishment (workplace /jobs) basis. Under the European System of Accounts 1995 (ESA95), the term GVA is used to denote estimates that were previously known as gross domestic product (GDP) at basic prices. Under ESA95 the term GDP denotes GVA plus taxes (less subsidies) on products, i.e. at market prices. The Regional Accounts are currently only published at basic prices, so the figures are referred to as GVA rather than GDP.

Table 6.2 presents recent and projected trends in output (GVA) by broad sector. Overall, the rate of output growth is projected to be higher in most sectors during 2010-2020 than for 2000-2010. During 2000-2010, the *primary sector & utilities* and *manufacturing* contracted by 1.2 per cent per annum. The fastest growth was in *business & other services*, which grew by 2.8 per cent per annum on average. During 2010-2020, *manufacturing* and *construction* are projected to grow at 2.4 per cent per annum, *trade, accommodation and transport* by 2.7 per cent per annum and *business & other services* by 3.8 per cent per annum. The only sector projected to grow more slowly is *non-market services*, for which the annual average rate of growth falls from 1.7 to 1.1 per cent.

During **2000-2010**, output in the *primary sector & utilities* increased in the East Midlands and South West. Elsewhere, the sector displayed a negative annual average rate of change, with the decline being fastest in Wales, followed by London. The annual average decline of 0.7 per cent in England was far slower than either the UK average or that for any of the other countries.

The *manufacturing* sector declined in all regions and nations of the UK between 2000 and 2010, and twice as fast in Wales (and England as a whole) than in Scotland and Northern Ireland. Within England, the rate of decline was fastest in London and the West Midlands.

Output in *construction* grew between 2000 and 2010 everywhere except Wales, where it declined at an average annual rate of 0.5 per cent. The rate of increase in output exceeded the UK average in London, the North West, the West Midlands, Scotland, the South East and North East England.

The *trade, accommodation and transport* sector grew fastest in Northern Ireland, the East Midlands, and Wales, and faster than the UK average in the South West, East of England and South East. Growth was slower in England than in the other three countries.

Output in the *business & other services* sector grew quite strongly in all parts of the UK between 2000 and 2010. Northern Ireland displayed the highest rate of growth, and those of Scotland and Wales were higher than England as a whole. In England, the sector grew fastest in London, followed by the North East and the East Midlands. The South East and the East of England both displayed very slow rates of growth.

Output in the *non-market services s*ector grew slightly faster in Scotland than England and Wales between 2000 and 2010, but growth was very much slower in Northern Ireland. Within England, growth was highest in the southern half of the country with London displaying the

highest annual rate of growth, followed by the East of England and South East. Growth was slower in the northern regions and the South West.

Turning to the projections for **2010 to 2020**, output in *primary sector & utilities* is projected to decline in London, the West Midlands, Scotland, Yorkshire and the Humber and the North West, and grow fastest in Northern Ireland, the South West and Wales. The spatial pattern of differentials is similar to the previous decade but annual average growth rates are higher.

There is less inter-regional variation in projected output growth rates in *manufacturing*, with highest growth projected in the North West, Wales, Northern Ireland, the South West and Scotland. However, London stands out with a much slower rate of growth, continuing the relatively poor performance of 2000-2010.

There is also little regional and national variation for projected output growth rates in the *construction* sector, with the South West, Northern Ireland, the South East and West Midlands projected to grow fastest and growth rates projected to be slowest in the northern regions of England and in Wales and Scotland. Wales displays the greatest increase in annual average growth rate (albeit from a very low base).

Turning to *trade, accommodation and transport*, the fastest projected rates of GVA growth occur in the East of England, Northern Ireland and the South West, with the slowest rates in Scotland, Wales and the North East. The regions with highest growth rates between 2000 and 2010 display the smallest improvements in growth in the next decade, and hence some convergence in regional growth rates is projected to occur.

In *business & other services*, projected annual average growth rates for 2010-2020 are higher in the English regions than in the other countries, with the exception of Northern Ireland. The latter is no longer projected to grow at the fastest rate. The highest rates are projected for the South West and East of England, with little variation in the remainder of England. In the fastest growing regions for 2000-2010, their projected growth rates are lower for 2010-2020.

Non-market services is the only sector in which projected growth rates are lower for 2010-2020 than for the preceding decade. Projected growth rates are lower in each region and nation, with little variation around the UK average, reflecting the expectation that the growth of the public sector will be severely constrained as the budget deficit is reduced. The East Midlands displays by far the highest projected annual average growth in GVA.

Table 6.2: Long-term Changes in GVA by Broad Sector

% p.a.

	Primary sector and utilities		Manufacturing		Construction	
	2000-2010	2010-2020	2000-2010	2010-2020	2000-2010	2010-2020
London	-3.6	-0.7	-3.2	1.2	2.2	2.3
South East	0.9	0.2	-1.5	2.7	1.5	2.6
East of England	-0.1	0.2	-0.8	2.6	0.9	2.5
South West	1.0	0.6	-0.9	2.5	1.1	2.8
West Midlands	-2.1	-0.7	-2.7	2.3	1.7	2.6
East Midlands	1.4	0.5	-0.6	2.2	1.1	2.2
Yorks & the Humber	-1.0	-0.3	-0.8	2.2	0.6	2.0
North West	-2.6	-0.1	-0.9	2.8	1.8	2.0
North East	-1.5	0.3	-0.2	2.6	1.6	2.1
England	-0.7	0.0	-1.3	2.4	1.4	2.4
Wales	-6.1	0.4	-1.3	2.7	-0.5	2.2
Scotland	-2.5	-0.6	-0.6	2.5	1.6	2.1
Northern Ireland	-1.9	0.8	-0.7	2.7	1.1	2.7
United Kingdom	-1.2	0.0	-1.2	2.4	1.4	2.4

	Trade, accomod. and transport		Business and other services		Non-market services	
	2000-2010	2010-2020	2000-2010	2010-2020	2000-2010	2010-2020
London	0.9	2.6	4.0	3.8	2.5	1.0
South East	1.6	2.6	1.5	4.1	1.9	1.2
East of England	1.8	3.1	1.1	4.0	2.2	0.9
South West	1.9	2.9	2.8	4.2	1.3	0.9
West Midlands	1.1	2.6	2.1	3.9	1.6	1.1
East Midlands	2.4	2.7	3.1	3.6	1.6	1.7
Yorks & the Humber	1.5	2.7	2.7	3.6	1.3	0.9
North West	1.1	2.5	2.5	3.8	1.3	1.1
North East	1.0	1.9	3.7	3.6	1.4	0.7
England	1.4	2.7	2.7	3.9	1.8	1.0
Wales	2.1	2.1	2.3	3.5	1.6	1.0
Scotland	1.5	2.4	3.2	3.1	1.9	1.2
Northern Ireland	2.5	3.0	4.8	3.7	0.3	1.0
United Kingdom	1.5	2.7	2.8	3.8	1.7	1.1

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Source: CE/IER estimates, CE projections MDM revision 7146, CrossRegional.xls (Table R.2)

6.2.2 Employment by broad sector

Table 6.3 shows recent historical and projected future trends in employment by broad sector. During 2000 to 2010, there was a substantial decline in manufacturing employment, slow employment growth in most other sectors and rapid growth of employment in *non-market services*. In the decade 2010 to 2020, the *primary sector & utilities* and *manufacturing* are projected to continue to lose employment, but at a much slower rate. This reflects continuing increases in productivity, since output is projected to increase as the competitiveness of these industries improves. *Construction* and *trade, accommodation and transport* are projected to gain employment at a faster rate, but the *non-market services* sector is projected to lose employment as a consequence of continuing constraints upon expenditure in the public sector. *Business & other services* are projected to gain employment at the same rate in both decades, but productivity improvements mean that employment will increase more slowly than output.

The period **2000 to 2010** will be considered first.

The *primary sector & utilities* gained employment at a rate of 0.3 per cent per annum on average, but this masked extremely large regional variations. England gained employment at a faster rate than the UK average, but Wales and Northern Ireland both lost jobs at a rapid rate. There were more extreme contrasts within England, with London losing jobs at 4.2 per cent per annum and the South East losing jobs at 1.9 per cent, but the South West gaining jobs at 4.1 per cent. The West Midlands, North West and East of England also gained jobs rapidly.

In contrast, employment in the *manufacturing* sector declined in all regions and countries of the UK, even faster in Scotland than in England, slightly slower in Wales, while Yorkshire and the Humber and Northern Ireland displayed the slowest annual average rates of employment decline. The annual average rate of loss of employment was highest in the south-east corner of England and the West Midlands, with the highest rate of decline (-6.4 per cent) in London. Elsewhere, the highest rate of job loss occurred in the North West.

Average rates of annual employment change in the *construction* sector displayed less regional and national variation. Employment increased in all regions and nations except Scotland, where it declined slowly. The rate of employment growth was highest by far in the South East, while the rate of increase was above the UK average in North West England and Wales. Most other regions displayed a slow increase in employment.

Employment in *trade, accommodation and transport* did not increase at the UK scale, but this masked large regional variations. Employment grew fastest in Wales, followed by Northern Ireland, and while employment grew slowly in Scotland, it declined slowly in England. Within England, employment declined in most regions, the fastest rate of decline occurring in London, followed by the North East. Employment increased fastest in the East of England, followed by Yorkshire and the Humber and the East Midlands.

Employment in *business & other services* increased in all regions and nations. The annual average rate of employment increase was highest (at 3.1 per cent) in Northern Ireland and higher in both Wales and Scotland than in England. Within England, employment grew fastest in the East Midlands, South West and North East, and most slowly in the South East.

In the UK, employment in the *non-market services* sector grew at an annual average rate of 2 per cent. Employment grew in all regions and nations, faster in England than in the other three countries. All regions of England gained employment at a faster annual rate than in Wales, Scotland and Northern Ireland. There was great similarity in regional growth rates, but the fastest increases occurred in the East of England, North East and London. The slowest rates of increase occurred in the South West and East Midlands.

Turning to the pattern of employment change by sector for **2010-2020**, employment in the *primary sector & utilities* is projected to decline slowly, but slightly more slowly in England than in the UK as a whole. Employment is projected to grow in Wales. But in Scotland and Northern Ireland it is expected to decline more rapidly than all other parts of the UK except North-East England (with the West Midlands losing jobs almost as fast). London, the East of England and the North West are all projected to see modest employment growth.

Manufacturing employment is projected to decline in all regions and nations. There is much less variation in regional and national average annual rates of employment change than during the previous decade. The highest rates of employment decline are projected to be in Scotland, Yorkshire and the Humber, the South West and London. The rate of employment loss is projected to be least in Northern Ireland, the West Midlands and the East of England. Each of these regions and nations experienced higher than average rates of job loss in the previous decade.

In the *construction* sector, employment is projected to increase at a slightly faster annual average rate during 2010-2020 than in the previous decade. Employment is projected to grow in all parts of the UK, more rapidly in Wales and Northern Ireland than in England. The

fastest projected increase in England is for the South West, while employment growth is projected to be sluggish in the three northern regions and London.

Employment in the *trade, accommodation and transport* sector is projected to increase slowly during 2010-2020, but this still represents a slight improvement over the previous decade. Employment is projected to grow in all parts of the UK except North East England (where it is projected to decline). The fastest projected growth rates are in Northern Ireland, Wales, the South West and the East of England, but no growth is projected for the North West, and very slow growth rates are projected for the West Midlands, East Midlands and Scotland.

The projected rate of employment growth in the *business & other services* sector for 2010-2020 is the same as for the previous decade. Employment growth is projected for all parts of the UK, but Scotland displays slower growth than the other nations. The fastest rates of employment growth are projected for the South West (continuing the good relative performance of 2000-2010), the East of England and Yorkshire and the Humber. There is relatively little difference in projected annual average rates of employment change among the other English regions, but the South East and North West display the lowest rates of increased.

In the *non-market services* sector, employment is projected to decline slowly in all countries of the UK between 2010 and 2020, representing a marked slowdown relative to the preceding decade. The projected rate of employment decline is slightly slower in England than in the other three countries, representing a continuation of the disadvantage of the latter group in terms of public sector employment. The projected rate of employment decline is fastest in North East England (which previously displayed the fastest rate of increase) and Yorkshire and the Humber. The South East of England and West Midlands stand out from the rest of the UK in displaying a slow projected annual average increase in employment in this sector.

6.2.3 Prospects for the nations of the UK and regions in England

London: The annual average rate of GVA growth was higher than for any other region or nation of the UK during 2000-2010 and is projected to continue to be highest during 2010-2020. However, employment growth was the same as for the UK as a whole during 2000-2010 and is projected to be only slightly above the UK average during 2010-2020; though this represents one of the fastest rates of employment growth.

- During 2000-2010, GVA growth was fastest in *business & other services*, *non-market services and construction*, but GVA declined quite rapidly in the *primary sector &*

utilities and *manufacturing* sectors. The latter two sectors also displayed rapid employment decline, but employment grew strongly in *business & other services* and *non-market services.*

- For 2010-2010, GVA is projected to grow in all sectors except *primary sector & utilities* and is projected to grow fastest in *business & other services* and *trade, accommodation and transport.* London's projected GVA growth is poorest relative to other regions for the *primary sector & utilities* and *manufacturing* sectors. For the other sectors, GVA growth is near the top of the range of regional performances.

- London is projected to gain employment in all sectors except *manufacturing* and *non-market services* between 2010 and 2020. London's projected rate of employment loss in the former is poorer than average, but far from the worst, while that in the latter sector is equal to the UK average.

- Employment in the *primary & utilities* sector is projected to recover from the rapid decline of 2000-2010 with a rate of employment increase exceeded only by Wales, while employment in the *construction* sector will grow more slowly than the UK average.

- London is projected to experience one of the fastest annual average rates of employment growth in the *trade, accommodation and transport* sector. Employment in business services is projected to grow slightly slower than for the UK as a whole, but only Scotland is projected to have a slower rate of employment growth in this sector.

South-East England: In the *South East,* GVA increased slower than the UK average during 2000-2010 but is projected to grow faster than for any other region or nation except London between 2010 and 2020. Employment grew more slowly than for the UK as a whole between 2000 and 2010 but is projected to grow faster than the UK average between 2010 and 2020 (but slightly more slowly than the other regions in the south and east of England).

GVA grew in all sectors except *manufacturing* between 2000 and 2010, at a faster rate than the UK average in all sectors except *business & other services* (in which the GVA growth rate was just over half the UK average) and slower than all other regions and nations of the UK except the East of England).

GVA grew more strongly in the *primary & utilities* sector than in any other region or nation except the East Midlands and South West, but growth in *construction* and *trade,*

accommodation and transport was relatively slow. GVA growth in *non-market services* was faster than the UK average and the decline in *manufacturing* GVA was slower than average.

Employment declined between 2000 and 2010 in the *primary & utilities, manufacturing* and *trade, accommodation and transport* sectors, and in each case the performance of the region was poorer than the UK average. However, the decline was not as great as in London. Employment increase was faster than average in construction and *non-market services*.

GVA is projected to grow in all sectors between 2010 and 2020, particularly quickly in *manufacturing, construction, trade, accommodation and transport* and *business and other services*. The performance of the region relative to other regions and nations is projected to improve slightly relative to the preceding decade.

Employment in the *primary & utilities* and *manufacturing* sectors is projected to decline between 2010 and 2020, but to grow in all other sectors. The projected annual average rate of employment growth is above average in *trade, accommodation and transport* and faster than for any other region or nation except the West Midlands in the case of *non-market services*. The rate of employment increase is projected to be higher during 2010-2020 than for 2000-2010 in all sectors.

East of England: In the *East of England*, GVA increased overall by a slower than average rate between 2000 and 2010, but is projected to grow faster than average (in common with its neighbouring regions) between 2010 and 2020. Employment grew relatively rapidly between 2000 and 2010 (twice the UK average) and though the rate of increase between 2010 and 2020 is projected to be slightly slower, this is still faster than the rate at which UK employment is projected to grow.

- GVA declined in the *primary & utilities and manufacturing* sectors between 2000 and 2010, in both cases at a slower rate than the UK average. GVA declined in the *primary & utilities* and *manufacturing* sectors between 2000 and 2010, but more slowly than the UK average.

- Between 2000 and 2010, the GVA growth rate for the *trade, accommodation and transport* sector was above the UK average and that for *non-market services* was higher than for any other region or nation.

- GVA is projected to grow in all sectors between 2010 and 2020 and at a rate higher than the UK average in all sectors except *non-market services*. The region displays the highest projected growth rate of any region or nation in the *primary & utilities,*

trade, accommodation and transport and its growth rates for *manufacturing* and *business and other services* are among the highest.

- Between 2000 and 2010, employment in the *primary & utilities, trade, accommodation and transport*, *business and other services* and *non-market services* sectors grew faster than the UK average, but the loss of employment in the *manufacturing* sector was faster than average.

- The region is projected to gain employment between 2010 and 2020 in all sectors except manufacturing and non-market services. The region's relative employment performance is projected to be particularly strong in the *primary & utilities sector,* and above average in the *trade, accommodation and transport* and *business and other services* sectors.

South-West of England: The *South West* continues to perform better than other regions and nations outside the south-east corner of England. Both GVA and employment grew at the UK average rate between 2000 and 2010 and GVA is projected to continue to grow at the UK average rate during 2010-2020, while employment will grow at a slightly slower rate than in the UK as a whole.

- The only sector in which GVA declined between 2000 and 2010 was *manufacturing*, but the rate of GVA growth was below the UK average in all except the *primary & utilities* and *trade, accommodation and transport* sector. The slightly better performance of these sectors probably reflected the strength of the rural economy in this region.

- GVA growth is projected for all sectors between 2010 and 2020, at a higher rate than the UK average in all sectors except *non-market services*. GVA is projected to grow faster than in any other region or nation in the *primary & utilities, construction* and *business and other services* sectors.

- Employment grew extremely rapidly between 2000 and 2010 in the *primary & utilities* and *business and other services* sectors, and the decline in *manufacturing* sector employment was slower than in most regions. However, the employment performance of the *construction*, *trade, accommodation and transport* and *non-market services* sectors was poorer than average.

- For 2010 to 2020, this pattern is projected to reverse, with manufacturing sector employment contracting faster than the UK average rate and employment growing at

a rate faster than the UK in the *construction*, *trade, accommodation and transport* and *business and other services sectors.*

West Midlands of England: The *West Midlands* experienced the slowest rate of GVA growth between 2000 and 2010 of any region or nation, but a substantial recovery in its annual average rate of GVA growth (which will still be less than the UK average growth rate) is projected for 2010-2020. It is the only region in which employment declined between 2000 and 2010 and the projected rate of employment growth for 2010-20 is below the UK average, but higher than for much of northern England, Wales, Scotland and Northern Ireland.

- During 2000-2010, GVA declined at twice the UK average rate in both the *primary & utilities* and *manufacturing* sectors and only construction grew faster than the UK average.

- GVA is projected to increase in all sectors except *primary & utilities* between 2010 and 2020, and will grow at a rate faster than the UK average in *construction* and *business and other services*.

- Employment in *manufacturing* declined sharply between 2000 and 2010, and employment also declined in *trade, accommodation and transport*. Employment increased in all other sectors, faster than the UK average for the *primary & utilities* and *business and other services* sectors, but slower than average in the *construction* sector.

- For 2010-20, employment is projected to decline in *primary & utilities* (much faster than the UK average) and manufacturing sectors, but to grow in all other sectors. The annual average rate of employment growth in the *trade, accommodation and transport* sector is projected to be much slower than the UK average.

East Midlands of England: GVA in the *East Midlands* grew at a slightly faster rate than the UK as a whole during 2000-10 and is projected to grow at slightly less than the UK average between 2010 and 2020. Employment grew at the same rate as the UK between 2000 and 2010 and is projected to grow at the same rate (which will be slightly below the UK average) between 2010 and 2020.

- Between 2000 and 2010, GVA increased in all sectors except *manufacturing*, which declined at half the UK average rate. GVA in the *primary & utilities* sector grew faster than in any other region or nation and only in Northern Ireland was growth in the *trade, accommodation and transport and business sector* faster.

- GVA is projected to grow in all sectors between 2010 and 2020, with the most rapid growth relative to the UK average in the *primary & utilities* and *non-market services* sectors. The relative output performances of *manufacturing* and *business and other services* are projected to be poorer for 2010-20 than for the preceding decade.

- The only sector in which employment declined between 2000 and 2010 was the *manufacturing* sector. Employment increased faster than the UK average rate in *business and other services*.

- Employment is projected to increase at around the UK average rate in four sectors between 2010 and 2020, but is projected to continue to decline slowly in *manufacturing* and to decline slightly faster than the UK average rate in *non-market services*.

Yorkshire and the Humber: During 2000-2010, GVA in *Yorkshire & the Humber* grew at well below the average for the UK, and at a slower rate than neighbouring regions. The projected annual average GVA growth rate is twice as fast for 2010-20, just below the UK average but still slower than for the North West and East Midlands (but faster than the North East). Total employment grew at a slightly faster rate than the UK average during 2000-2010, but is projected to be much lower for 2010-20, slower than the East Midlands but faster than the North East and North West.

- GVA declined at a slightly slower rate than the UK average between 2000 and 2010 in the *primary & utilities* and *manufacturing* sectors and grew more slowly than average in *construction* and *non-market* services.

- During the period from 2020 to 2020, GVA is projected to continue to decline in the *primary & utilities* sector, which is projected to perform more poorly than any other region or nation except the West Midlands and Scotland. GVA is projected to increase in all other sectors, but *manufacturing* and *construction* will grow most slowly relative to the UK average.

- Between 2000 and 2010, employment grew faster than the UK average in *construction*, *trade, accommodation and transport and non-market services* and declined more slowly than the UK average in *manufacturing*.

- Employment is projected to decline in the *primary & utilities* and *non-market* services sectors and to continue to decline (at around twice the UK average rate) between 2010 and 2020 in *manufacturing*. *Construction* employment is projected to increase

more slowly than the UK average, while employment in the other service sectors slightly faster than the UK average.

North West of England: In the *North West*, the rate of GVA growth was one of the slowest of all UK regions between 2000 and 2010. GVA is projected to grow more than twice as fast between 2010 and 2020, faster than in neighbouring regions but still just below the UK average growth rate. Employment grew at the UK average rate between 2000 and 2010, but is projected to grow at only half the annual average rate during 2010-20. This is faster than the North East but slower than for Yorkshire and the Humber.

- GVA declined most rapidly between 2000 and 2010 in *primary & utilities*, while the decline in *manufacturing* output was slower than the UK average but faster than in the rest of northern England. *Construction* increased its output faster than the UK average, but all other sectors grew more slowly.

- GVA is projected to grow more rapidly than the UK average between 2010 and 2020, but four of the other sectors are projected to grow more slowly than the UK as a whole and GVA for the *primary & utilities* sector is projected to continue to decline.

- Employment grew at or above the UK average rate between 2000 and 2010 in all sectors except *manufacturing,* which lost employment at a slightly faster rate than the UK as a whole. Employment growth was particularly strong in the *primary & utilities* sector.

- Between 2010 and 2020, employment in *manufacturing* is projected continued to decline (bit more slowly than in the preceding decade) and employment in *non-market services* is projected to contract at twice the UK average rate. In the other sectors, employment will grow more slowly than the UK average in all except the *primary & utilities* sector, in which growth will be relatively rapid.

North East of England: The annual average rate of GVA growth in the *North East* during 2000-2010 was just slower than the UK average, faster than in neighbouring regions of England but slightly slower than for Scotland. The projected rate of GVA growth for 2010-20 is about 50% higher, well below the UK average, equal to that of Scotland, but much slower than for the rest of northern England. Employment grew at a relatively rapid rate during 2000-2010 (faster than in the rest of northern England or Scotland) but no employment growth is projected for the 2010-2020 period (during which employment in neighbouring regions and Scotland is projected to grow slowly).

- GVA declined sharply in the *primary & utilities* sector between 2000 and 2010, but the decline in manufacturing output was less rapid than in any other region or nation. GVA in *business and other services* grew faster than in the rest of northern England and *construction* output grew faster than the UK average, but the other sectors grew more slowly than the UK average.

- GVA is projected to grow in all sectors between 2010 and 2020, with output increasing faster than the UK average in the in the *primary & utilities* and manufacturing sectors. The projected rate of increase in GVA is particularly slow for the *trade, accommodation and transport* sector.

- Employment contracted in both the *manufacturing* and *trade, accommodation and transport* sectors between 2000 and 2010. Employment growth was particularly rapid in *construction, business and other services* and *non-market services*.

- During 2010-20, employment is projected to contract rapidly in the *primary & utilities* sector and fall more slowly in the *manufacturing*, *trade, accommodation and transport* and *non-market services* sectors. Employment growth is projected to be slow in *construction* and faster than the UK average in *business and other services*.

Wales: In *Wales,* GVA grew more slowly than in any other region or nation except the West Midlands between 2000 and 2010. The projected annual average rate of GVA growth is more than twice as fast for 2010-2020, but is still the joint lowest rate of growth (equal to that of the North East and Scotland) among the regions and nations of the UK. The annual average rate of growth of employment was nearly twice that for the UK during 2000-2010, but is projected to decline during 2010-2020, matching the UK annual average rate of employment growth.

- Wales experienced the fastest decline in GVA between 2000 and 2010 in both the *primary & utilities* and *construction* sectors, and *manufacturing* output declined at a faster rate than the UK as a whole. GVA grew faster than average in the *trade, accommodation and transport* sector, but slower than average in *business and other services* and *non-market services*.

- GVA is projected to grow in all sectors between 2010 and 2020, more rapidly than the UK average in both the *primary & utilities* and *manufacturing sectors.*

- Between 2000 and 2010, employment declined rapidly in the *primary & utilities sector* and slightly slower than the UK average in *manufacturing.* Employment grew strongly

(faster than for any other nation or region) in *trade, accommodation and transport* and *business and other services, but more slowly in non-market services*.

- For the 2010 to 2020 period, employment is projected to decline at a slower than UK average rate in *manufacturing*, decline faster than the UK average in *non-market services* and increase at a faster than average rate in the *primary & utilities, construction,* and *trade, accommodation and transport* sectors.

Scotland: In Scotland, the annual average rate of GVA growth was equal to the UK average during 2000-2010, and while the projected rate of growth for 2010-2020 is about 50 per cent higher, this rate is well below the annual average growth rate for the UK. Employment also grew at the same rate as the UK during 2000-2010, but the projected annual average rate of employment growth for 2010-2020 is half that for the preceding decade, also well below the UK average.

- During 2000 to 2010, GVA in *primary & utilities* declined twice as fast as the UK average while *manufacturing* GVA declined half as fast as the UK average. GVA grew faster than the UK average in *construction*, *business and other services* and *non-market services*.
- Between 2010 and 2020, GVA is projected to continue to decline in the *primary & utilities* sector, to grow at just less than the UK average rate in *construction*, *trade, accommodation and transport* and *business and other services* sectors. GVA is projected to grow faster than the UK average in the *manufacturing* and *non-market services* sectors.
- During 2000 to 2010, employment declined faster than the UK average in the *manufacturing* and *construction* sectors, grew slower than average in the *primary & utilities* and *non-market services* sectors and grew faster than the UK average in *trade, accommodation and transport* and *business and other services*.
- Employment is projected to decline between 2010 and 2020 in the *primary & utilities*, *manufacturing* and *non-market services* sectors and grow more slowly than the UK average in *trade, accommodation and transport* and *business and other services*.

Northern Ireland: GVA grew at nearly the UK average rate in *Northern Ireland* during 2000-2010. The annual average rate of GVA growth is projected to be about two-thirds higher for 2010-2020, but will fall further behind the UK average. The rate of employment growth was more than twice as fast as for the UK as a whole during 2000-2010, and was faster than for any other region or nation. The projected annual rate of employment growth for 2010-2020 is

half that for the preceding decade, matching the UK average and the same as for Wales, but well below the rates projected for southern England.

- During 2000-2010, GVA declined faster than the UK average in *primary & utilities* sector, but the decline in *manufacturing* was far slower than average. GVA in the *business and other services* sector grew faster than in any other nation or region, but growth in the other sectors was slower than the UK average rate.

- All sectors are projected to increase their GVA between 2010 and 2020. The annual average growth rate is higher than the UK average in all except business and other services and *non-market services*, in which the projected growth rate is slightly higher than the UK average.

- During 2000 to 2010, employment contracted faster than the UK average in *primary & utilities* and slower than average in *manufacturing*. Employment grew more slowly than average in *construction* and *non-market services*, faster than average in *trade, accommodation and transport* and faster than for any other nation or region in *business and other services*.

- The *primary & utilities* sector is projected to continue to lose employment at a faster rate than the UK average between 2010 and 2020, while the projected decline in *manufacturing* employment is slower than the UK average rate. Employment in *non-market services* is projected to decline twice as fast as the UK average but employment in the *trade, accommodation and transport* sector is projected to grow twice as fast as the UK average.

Summary over all countries and regions: Overall, the projections indicate that the spatial pattern of economic activity (as presented in Tables 6.1 to 6.3) will return to the pattern of faster output and employment growth across the range of industries in the south and east of the UK with the remainder of the country lagging behind during the decade 2010 to 2020. The economic prospects of regions and nations which are most geographically remote from this London-dominated “mega-city-region” (London, the South East and East of England, which itself benefits from relative proximity to and good communications links with the geographical heartland of economic activity in the European Union) are projected to be poorest. There will be a recovery of output in all sectors, while employment will decline in the primary sector and utilities, manufacturing and non-market services. The geographical pattern of GVA and employment change in individual sectors is more variable, but northern England, Wales, Scotland and Northern Ireland are likely to experience poorer employment

prospects than the south and east of England as a consequence of the relatively greater impact of constraints on public sector expenditure.

Table 6.3: Long-term Changes in Employment by Broad Sector

% p.a.

	Primary sector and utilities		Manufacturing		Construction	
	2000-2010	2010-2020	2000-2010	2010-2020	2000-2010	2010-2020
London	-4.2	1.1	-6.4	-1.1	0.2	0.9
South East	-1.9	-0.3	-4.6	-0.5	1.8	1.1
East of England	1.2	0.5	-4.9	-0.3	0.8	1.1
South West	4.1	0.0	-3.2	-1.1	0.3	1.9
West Midlands	1.7	-1.4	-6.1	-0.3	0.5	1.3
East Midlands	0.1	0.3	-3.9	-0.5	0.5	1.3
Yorks & the Humber	0.0	0.0	-2.7	-1.5	0.9	0.6
North West	1.7	0.4	-4.8	-0.5	1.2	0.7
North East	0.7	-1.3	-3.5	-0.4	2.0	0.6
England	0.7	-0.1	-4.5	-0.7	0.9	1.1
Wales	-1.6	0.7	-4.3	-0.4	1.0	1.4
Scotland	0.2	-1.3	-5.2	-1.5	-0.4	1.0
Northern Ireland	-1.6	-1.5	-2.9	-0.2	0.6	1.4
United Kingdom	0.3	-0.3	-4.5	-0.7	0.8	1.1

	Trade, accomod. and transport		Business and other services		Non-market services	
	2000-2010	2010-2020	2000-2010	2010-2020	2000-2010	2010-2020
London	-1.0	0.6	1.0	1.2	2.4	-0.1
South East	-0.1	0.6	0.3	1.0	2.1	0.1
East of England	0.5	0.7	1.4	1.5	2.8	-0.1
South West	-0.2	0.8	2.1	1.9	1.6	-0.2
West Midlands	-0.6	0.1	1.6	1.2	2.0	0.1
East Midlands	0.2	0.5	2.4	1.4	1.6	-0.2
Yorks & the Humber	0.3	0.6	0.8	1.6	2.1	-0.4
North West	0.1	0.1	1.4	1.1	2.0	-0.2
North East	-0.6	-0.5	1.8	1.4	2.6	-0.5
England	-0.2	0.5	1.2	1.3	2.1	-0.1
Wales	1.7	0.8	1.5	1.1	1.6	-0.1
Scotland	0.5	0.4	1.6	0.8	1.6	-0.2
Northern Ireland	1.5	1.1	3.1	1.3	1.5	-0.2
United Kingdom	0.0	0.5	1.3	1.3	2.0	-0.1

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Source: CE/IER estimates, MDM revision 7146, CrossRegional.xls (Table R.3)

6.3 Labour Supply and Demand by country and region

This section sets the pattern of regional and national change in the demand for labour within the context of the changing labour force. Summary statistics on labour supply and demand are presented in *Table 6.4.* Some of the labour supply indicators presented in the table (e.g. economic activity rates) are residence-based, while others (e.g. workplace employment

[jobs]) relate to the place where people actually work. These indicators measure slightly different phenomena and are derived from different sources, which partly explains the differences between them. Another source of difference is commuting across regional boundaries. This factor is particularly significant in London and the neighbouring regions of the South East and East of England. Other sources of inconsistency include people holding more than one job and statistical and measurement error. The indicators and measures discussed here are defined in detail in Box 2.1 in Chapter 2 (page 15).

The UK *total population* is estimated to be 62.1 million in 2010, and is expected to grow by 3.8 million (6.1 per cent) between 2010 and 2020 to reach 65.9 million. The population is growing faster than at any time since the 1960s, driven by increasing life expectancy, increasing birth rates and high and increasing levels of net international migration. The bulk (89 per cent) of this population increase will occur in England, the population of which is projected to grow from 52 to 55.4 million (6.5 per cent) during the decade. The population of Scotland, Wales and Northern Ireland is projected to increase by 418 thousand (4.2 per cent) over the decade. The projected rate of increase of population is only 4 per cent for Scotland and 2.9 per cent for Wales. London's population is projected to grow faster than the rest of the country (by 8.6 per cent) to reach nearly 8.5 million by 2020. In 2010, 22.1 million people were estimated to live in the south-east corner of England, and this is projected to increase to 23.8 million in 2020, slightly increasing the share of England's population living in this region (to 43 per cent). Within England, the South-West, East Midlands and Yorkshire and the Humber are projected to gain population most rapidly, but the rate of population growth is expected to be much slower in the West Midlands, the North West and North East.

The *population aged 16+* is projected to grow by just over 3 million, and the population of *working age* (aged 16-64) is projected to grow by nearly 2.6 million. The geographical pattern of increase in both sections of the population largely mirrors the overall pattern of projected population change. The *working age* population is projected to increase by 10 per cent between 2010 and 2020 in London and at a faster rate than the UK average (6.7 per cent) in all regions of southern England. The rate of increase is much slower in the rest of the UK, with the exception of Yorkshire and the Humber. The slowest projected rates of increase are for Wales and the most northerly regions of England.

The labour force (measured as residents in work or unemployed on the ILO definition) is projected to grow by 4.6 per cent between 2010 and 2020, representing an increase of 1.4 million for the UK as a whole. The great bulk of this increase is in England, with London's labour force growing by a third of a million. The percentage increase in the labour force over the decade is greatest in London (8.1 per cent), just faster than for Northern Ireland (7.9 per

cent). It is also projected to grow rapidly in the East of England and Yorkshire and the Humber. It is projected not to increase in Wales and the North East and barely increase in the North West, Scotland and West Midlands.

The *workforce* (workplace employment plus claimant unemployment, plus those on government training schemes) is projected to increase by 5 per cent (nearly 1.4 million) to reach 32.2 million by 2020. While the workforce is projected to grow in all parts of the UK, it is projected to grow fastest in London, the South West and the East of England, and slightly slower in the South East, Northern Ireland and Wales. This pattern reflects the pattern of employment and population change, with the greatest projected gains occurring in the south-east corner of England and much slower growth in peripheral regions and nations.

The overall *economic activity rate* (defined as the labour force expressed as a percentage of the population aged 16 years and over) is projected to decline by 1.2 per cent over the period from 2010 to 2020, reaching 61.3 per cent in 2020. This is likely to reflect the ageing of the population over this period, with an increasing share of the population moving into retirement. Government policy will continue to aim at increasing the economic activity rate (especially for women and minority ethnic groups) in order to reduce the poverty faced by disadvantaged groups and reduce the economic dependency rate. However, there is some regional variation around this average. The effect of population ageing can be seen in the more rapid decreases in the North East, Wales, Scotland and the south of England outside London. The slowest decreases occur in the West Midlands and London, in which the population is younger on average and international migration is a major influence on population change. The highest projected economic activity rates in 2020 are in the south-east corner of England, with a fairly steady decline with distance north in England. Projected economic activity rates for 2020 in Wales, Scotland and Northern Ireland are slightly lower than the midlands and northern England. Wales displays the lowest and London the highest rate in both 2010 and 2020.

ILO unemployment measures the number of people who report that they are actively searching for work (regardless of whether or not they are registered as claimants). The total number of unemployed is projected to decline by a quarter of a million between 2010 and 2020, with the largest decline in London, where the number unemployed will be a quarter lower in 2020 than in 2010. The total declines everywhere except South East England, in which it increases by 10 thousand (a consequence of population increase, since the rate of unemployment is projected to fall very slightly). With this exception, the percentage decline in unemployment is greatest in London and the more populous regions of England, and least in Wales, Scotland and Northern Ireland. By 2020, ILO unemployment is projected to be 2.2

million, with the largest numbers unemployed being in London, the South East and the North West of England. The ILO unemployment **rate** (i.e. ILO unemployment as a percentage of the labour force) is projected to fall by 1.2 percentage points, with each region and nation having a lower unemployment rate in 2020 than in 2010. The largest fall (2.5 percentage points) is projected for London, the next largest being in the East of England and the East and West Midlands. With the exception of the South East, the projected decline in the unemployment rate is greater in the southern half of England than in northern England or the other nations of the UK.

Claimant unemployment is projected to decline by 149 thousand across the UK over the period to 2020, when it will be 1.35 million. The only region or nation in which an increase is projected is the South East. Elsewhere, declines are largely proportional to the size of the population and very similar to the pattern of change in ILO unemployment. The *claimant unemployment rate* is projected to fall by 0.6 percentage points for the UK as a whole, from 3.9 to 3.3 per cent over the decade. The projected decline is largest in London. On the whole, declines in this rate are larger in the southern regions of England.

The number of *employed residents* is projected to increase by 1.7 million between 2010 and 2020 for the UK as a whole. London is projected to account for a quarter of this increase, and most of the remainder is concentrated in the south and east of England, together with Yorkshire and the Humber and East Midlands. Increases are much slower in the rest of England and the other countries of the UK, with virtually no increase in Wales or North East England.

Workplace employment (the primary indicator used to assess the changing patterns of employment by sector, occupation, gender and status throughout *Working Futures* 2010-2020*)* measures the total number of jobs located within a region or nation. This is projected to increase slightly slower than to the number of employed residents, with the total number of jobs increasing by 1.4 million between 2010 and 2020. The bulk of this projected increase is concentrated into the southern regions of England, with the rate of increase being above average in these regions. Workplace employment increases at a faster rate in Wales, Scotland and Northern Ireland than in the north of England. There is projected to be no increase in the North East.

The final element in this table is the *labour market residual*. At the UK level, the main element of this is represented by “double jobbing” (people who have more than one job), with statistical errors and other inconsistencies in measurement between data from different sources accounting for the remainder. For the UK, this residual declines from 1.8 to 1.6

million (9 per cent) over the decade. For individual regions and nations, net commuting across geographical boundaries also influences the size of the residual. This is largest in London, where the projected number of jobs exceeds the projected number of working residents by around 0.9 million, declining slightly over the decade. The difference between the number of jobs located in a region or nation and the number of people in work living within it declined over the decade in all except the South East. This suggests that the number of in-commuters will decline over the decade in parts of the UK except the South East of England.

This chapter will now discuss in greater detail the regional distribution of *total employment* (including both employees and the self-employed) over the recent (1990 to 2010) and projection (2010 to 2020) periods for nations and regions

Table 6.5 presents the pattern of change in *total employment* by region and nation of the UK over the period from 1990 to 2020. Total UK employment increased in each of the ten year periods between 1990 and 2020, from 28.8 million in 1990 to a projected value of 32 million in 2020. England's share of total employment fell between 1990 and 2010, but is projected to increase slightly by 2020. The share of *total employment* in Northern Ireland increased slightly over the period 1990 to 2010 and is projected to remain the same by 2020, but Scotland's share of UK employment will decline slightly. London's share of UK employment increases continuously from 1990 to 2020, as does that of the East of England and South West. The South East's employment share declined slightly between 2000 and 2010, but is projected to be slightly higher in 2020 than 2010. The West Midland's share of employment declined continuously between 1990 and 2010 and is projected to continue to decline slowly. Yorkshire and the Humber and the North West are also projected to experience a slight decline in their share of employment. Overall, a relative shift of employment towards the south and east of the UK is demonstrated for 1990 to 2010, and this shift is projected to continue until 2020.

The projected increase in *total employment* for 2010 to 2020 exceeds the actual employment increase between 2000 and 2010 for the UK and England, and the rate of increase is also projected to accelerate (the rate of increase in the earlier period was reduced by the sharp recession of 2008-9). The fastest rates of employment growth between 2000 and 2010 occurred in Northern Ireland, the East of England, South West, North East and Wales. Employment declined over this period in the West Midlands.

Total employment is projected to increase in all regions and nations of the UK between 2010 and 2020 at 0.5 per cent per annum on average, yielding an increase in employment of 1.5

million. It is projected to increase fastest in southern England, and to grow most slowly in the midlands and northern regions of England as well as Scotland (with the slowest rates of growth of all in the North-East). The bulk of the increase in employment is also projected to be in southern England, with the largest individual increase being projected for London.

Table 6.4: Changes in Population, Economic Activity Rates and Unemployment

	Population						Unemployment				Employment		
	Total	**16+**	**Working age**	**Labour Force**	**Workforce**	**Economic activity rate**	**ILO level**	**ILO rate**	**Claimant level**	**Claimant rate**	**Employed residents**	**Workplace employment**	**Labour Market Residual**
	000s	000s	000s	000s	000s	%	000s	%	000s	%	000s	000s	000s
							Changes, 2010-2020						
London	671	571	523	334	354	-0.6	-98	-2.5	-56	-1.3	432	298	-79
South East	591	478	410	220	244	-1.2	10	-0.1	5	-0.1	210	248	34
East of England	487	393	316	199	199	-1.0	-36	-1.7	-20	-0.8	236	178	-35
South West	413	320	264	148	192	-1.1	-14	-0.9	-8	-0.4	163	184	28
West Midlands	195	134	107	68	109	-0.3	-26	-1.4	-17	-0.7	93	91	16
East Midlands	276	204	164	99	101	-0.8	-23	-1.4	-13	-0.7	122	86	-21
Yorks & the Humber	449	342	309	195	77	-0.3	-7	-0.6	-4	-0.5	201	73	-124
North West	198	139	148	49	86	-0.6	-29	-1.1	-18	-0.6	78	67	9
North East	88	63	59	0	4	-1.7	-7	-0.6	-4	-0.4	6	0	-2
England	*3,368*	*2,644*	*2,300*	*1,312*	*1,366*	*-0.8*	*-230*	*-1.2*	*-136*	*-0.7*	*1,541*	*1,293*	*-174*
Wales	88	77	46	6	71	-1.5	-3	-0.7	-2	-0.2	9	68	62
Scotland	208	182	149	60	51	-1.2	-13	-0.7	-9	-0.4	73	42	-21
Northern Ireland	122	106	86	65	45	0.2	-5	-0.9	-4	-0.7	69	40	-25
United Kingdom	3,786	3,009	2,581	1,443	1,533	-0.8	-251	-1.2	-149	-0.6	1,692	1,375	-158
							2010 levels						
London	7,792	6,305	5,224	4,119	4,683	65.3	379	8.1	217	4.2	3,740	4,907	944
South East	8,474	6,880	5,156	4,418	4,263	64.2	273	6.4	140	2.7	4,145	4,411	119
East of England	5,803	4,716	3,514	2,985	2,827	63.3	204	7.2	111	3.2	2,780	2,942	46
South West	5,259	4,338	3,122	2,687	2,616	61.9	165	6.3	84	2.7	2,522	2,705	94
West Midlands	5,439	4,389	3,293	2,646	2,535	60.3	243	9.6	164	5.0	2,404	2,706	132
East Midlands	4,475	3,655	2,748	2,294	2,094	62.8	177	8.5	102	3.7	2,118	2,201	-24
Yorks & the Humber	5,303	4,321	3,298	2,620	2,474	60.6	232	9.4	148	4.5	2,389	2,627	85
North West	6,917	5,615	4,251	3,399	3,301	60.5	287	8.7	184	4.3	3,112	3,491	189
North East	2,593	2,128	1,605	1,268	1,154	59.6	127	11.0	82	5.1	1,141	1,238	13
England	*52,055*	*42,347*	*32,211*	*26,436*	*25,947*	*62.4*	*2,087*	*8.0*	*1,306*	*4.1*	*24,351*	*28,640*	*1,598*
Wales	3,003	2,456	1,797	1,423	1,333	57.9	119	8.9	73	4.1	1,304	1,412	29
Scotland	5,209	4,301	3,259	2,677	2,542	62.2	208	8.2	136	4.2	2,469	2,685	73
Northern Ireland	1,800	1,418	1,110	826	833	58.3	58	7.0	57	5.1	768	893	65
United Kingdom	62,067	50,522	38,377	31,362	30,655	62.1	2,472	8.1	1,498	3.9	28,892	32,218	1,765

Source: CE/IER estimates, MDM01R1 C51F8A Forecast, CrossRegional.xls (Table R.4).

Table 6.4: Changes in Population, Economic Activity Rates and Unemployment (continued)

	Population						Unemployment				Employment		
	Total 000s	16+ 000s	Working age 000s	Labour Force 000s	Workforce 000s	Economic activity rate %	ILO level 000s	ILO rate %	Claimant level 000s	Claimant rate %	Employed residents 000s	Workplace employment 000s	Labour Market Residual 000s
London	8,463	6,876	5,747	4,453	5,037	64.8	281	5.6	162	2.8	4,172	5,205	865
South East	9,065	7,358	5,566	4,638	4,507	63.0	283	6.3	145	2.6	4,355	4,659	153
East of England	6,290	5,109	3,830	3,184	3,026	62.3	168	5.6	92	2.4	3,016	3,120	11
South West	5,672	4,658	3,386	2,835	2,808	60.9	151	5.4	77	2.3	2,685	2,889	122
West Midlands	5,634	4,523	3,400	2,714	2,644	60.0	217	8.2	146	4.3	2,497	2,797	148
East Midlands	4,751	3,859	2,912	2,393	2,195	62.0	154	7.0	89	3.0	2,240	2,287	-45
Yorks & the Humber	5,752	4,663	3,607	2,815	2,551	60.4	225	8.8	144	4.0	2,590	2,700	-39
North West	7,115	5,754	4,399	3,448	3,387	59.9	258	7.6	166	3.8	3,190	3,558	198
North East	2,681	2,191	1,664	1,268	1,158	57.9	120	10.4	78	4.7	1,147	1,238	11
England	*55,423*	*44,991*	*34,511*	*27,748*	*27,313*	*61.7*	*1,857*	*6.8*	*1,170*	*3.4*	*25,892*	*29,933*	*1,424*
Wales	3,091	2,533	1,843	1,429	1,404	56.4	116	8.3	71	3.9	1,313	1,480	91
Scotland	5,417	4,483	3,408	2,737	2,593	61.1	195	7.5	127	3.7	2,542	2,727	52
Northern Ireland	1,922	1,524	1,196	891	878	58.5	53	6.0	52	4.4	837	933	40
United Kingdom	65,853	53,531	40,958	32,805	32,188	61.3	2,221	6.9	1,349	3.3	30,584	33,593	1,607

Source: CE/IER estimates, CE projections MDM revision 7146, CrossRegional.xls (Table R.4).

Table 6.5: Total Employment by Country and Region

	Total employment (000s)				% share of UK total				change 2000-2010			change 2010-2020		
	1990	2000	2010	2020	1990	2000	2010	2020	000s	%	% p.a.	000s	%	% p.a.
London	4,270	4,504	4,676	5,031	14.8	15.4	15.4	15.7	172	3.8	0.4	355	7.6	0.7
South East	4,015	4,103	4,208	4,458	14.0	14.1	13.8	13.9	105	2.6	0.3	250	5.9	0.6
East of England	2,531	2,596	2,805	3,007	8.8	8.9	9.2	9.4	210	8.1	0.8	201	7.2	0.7
South West	2,384	2,392	2,568	2,765	8.3	8.2	8.4	8.6	176	7.4	0.7	197	7.7	0.7
West Midlands	2,649	2,568	2,527	2,636	9.2	8.8	8.3	8.2	-41	-1.6	-0.2	109	4.3	0.4
East Midlands	1,912	2,010	2,083	2,184	6.6	6.9	6.8	6.8	73	3.6	0.4	101	4.8	0.5
Yorks & the Humber	2,396	2,342	2,456	2,535	8.3	8.0	8.1	7.9	114	4.9	0.5	79	3.2	0.3
North West	3,213	3,184	3,299	3,385	11.2	10.9	10.8	10.6	114	3.6	0.4	87	2.6	0.3
North East	1,100	1,073	1,152	1,157	3.8	3.7	3.8	3.6	79	7.4	0.7	4	0.4	0.0
England	24,471	24,773	25,775	27,158	85.1	84.9	84.6	84.8	1,002	4.0	0.4	1,383	5.4	0.5
Wales	1,259	1,246	1,330	1,401	4.4	4.3	4.4	4.4	84	6.7	0.7	71	5.4	0.5
Scotland	2,388	2,424	2,528	2,579	8.3	8.3	8.3	8.1	104	4.3	0.4	51	2.0	0.2
Northern Ireland	650	749	826	870	2.3	2.6	2.7	2.7	77	10.3	1.0	44	5.4	0.5
United Kingdom	28,768	29,192	30,458	32,008	100.0	100.0	100.0	100.0	1,266	4.3	0.4	1,550	5.1	0.5

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Source: CE/IER estimates. CE projections MDM revision 7146, CrossRegional.xls (Table R.5)

6.4 Sectoral Prospects by country and region

Information on projected employment change by broad sector over the period for 2010 to 2020 is presented in *Table 6.6.* Employment change is broken down by gender in *Table 6.7* (for males) and *Table 6.8* (for females). The commentary will focus on the pattern of change for all persons, with particularly notable gendered features of employment change highlighted.

The *primary sector & utilities* sector is projected to lose 22 thousand jobs or 2.9 per cent of its 2010 employment by 2020. The bulk of this job loss is projected to occur in Scotland and the West Midlands, which are each projected to lose around 10 per cent of their 2010 total. Employment is projected to increase slightly in Wales, the North West, East Midlands and southern and eastern England. The largest percentage increase is projected for London, followed by Wales. There is a marked contrast in the projected employment prospects for men and women, with male employment projected to decline by 36 thousand (6.2 per cent) and female employment growing by 14 thousand (7.9 per cent). Male job losses are projected to be particularly large in Scotland, the West Midlands, Northern Ireland, London and the South East. There are high rates of projected increase in female employment in London, Wales, the North West and southern England. However, rapid decline is projected for in Northern Ireland, Yorkshire and the Humber and the West Midlands. Male employment is projected to grow slowly on the eastern side of England and in Wales.

Employment in the *manufacturing* sector is projected to decline by 170 thousand (6.8 per cent) in the UK as a whole between 2010 and 2020. Employment is projected to decline in all regions and countries, with the largest numbers of jobs being lost in Yorkshire and the Humber, Scotland and the South West. The rate of job loss is projected to be highest in Scotland, Yorkshire and the Humber, the South West and London. The pattern of projected job loss is similar for men and women, but the percentage job loss is greater for women. The East Midlands is also projected to lose female jobs at a relatively rapid rate.

The *construction* sector is projected to gain nearly a quarter of a million jobs over the period 2010 to 2020, an increase of nearly an eighth (11.3 per cent). Employment is projected to grow in all parts of the UK, with the increase greatest in South East and South West England. The percentage increase is highest (20.3 per cent) in the South West, followed by Northern Ireland and the East and West Midlands. Northern England is projected to experience the slowest rate of employment increase. Projected rates of female employment change are much higher than for men, with UK employment increasing by 40 thousand or 17.8 per cent. The regional pattern is similar, except that the largest increase is in South

West England and employment is projected to decline in North East England, Wales and Scotland.

The second largest increase in total employment (415 thousand, or 5.2 per cent) is projected for the *trade, accommodation and transport* sector. The North East is the only region in which employment is projected to decline between 2010 and 2020, at 5.1 per cent. The largest projected increases occur in the South East and London, with the largest increase outside southern England being in Yorkshire and the Humber. Employment in the sector is projected to increase fastest in Northern Ireland, followed by Wales and the South West. The slowest projected rates of increase are in the North West, West Midlands, Scotland and the East Midlands. Over three-quarters of the projected increase is in female employment, with quite rapid increases in most regions and nations except the North East (in which female employment is projected to decline), the North-West and Scotland. Male employment is projected to contract in the West Midlands and North East, to increase most in the South East and South West and to grow fastest in Northern Ireland, the South East and South West.

The largest component of employment growth between 2010 and 2020 is in the *business and other services sector*, which is projected to grow by 1.2 million jobs, or 13.4 per cent (the fastest growth rate for any sector). Just under half of this growth is projected to be in male employment. Male employment is projected to increase by 11.7 percent and female employment by 15.5 per cent. Projected employment growth in this sector is largely concentrated within southern England, with the largest increases in London, the South East, the South West and the East of England. The fastest increase (20.3 per cent) is projected for the South West, followed by Yorkshire and the Humber and the East of England. The slowest rate of increase (8.6 per cent) is projected for Scotland. There is relatively little variation around the UK average rate of increase among the remaining regions and nations. Projected female employment growth is greatest in London. The projected rate of growth in female employment is above the UK average (10.4 per cent) in the south of England, Yorkshire and the Humber, and the North East and well below the UK rate in Wales, Scotland and Northern Ireland. The fastest rates of projected increase are for the South West, West Midlands and East of England. Male employment is projected to grow fastest in the East Midlands and Wales.

The *non-market services sector* is projected to lose 103 thousand jobs between 2010 and 2020, a decline of 1.3 per cent. The South East and West Midlands are projected to have small increases in employment, but in all other nations and regions, employment will contract. The North-East, Yorkshire and the Humber and the South West are projected to

experience the largest percentage declines in employment in this sector. The projected loss of employment disproportionately affects women, who will lose 85 thousand jobs while men lose 19 thousand jobs. The projected rate of job loss is nearly twice as high for women as for men. The largest projected female job losses are in Scotland, Yorkshire and the Humber, the East of England and the North East. These four regions also experience the highest projected rates of job loss. Female employment will increase in South East England and Northern Ireland. Male employment in Northern Ireland is projected to decline by 11.7 per cent. However, male employment is projected to increase in Scotland, the South-East and the East of England.

Table 6.6: Projected Employment Growth by Broad Sector, 2010-2020

a) change in thousands

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	3	-13	21	73	279	-7	355
South East	-2	-13	37	73	141	14	250
East of England	4	-7	26	57	130	-8	201
South West	0	-23	34	56	146	-15	197
West Midlands	-10	-7	24	9	87	6	109
East Midlands	2	-14	20	28	75	-11	101
Yorks & the Humber	0	-41	11	41	93	-24	79
North West	3	-15	17	6	94	-18	87
North East	-3	-5	6	-13	38	-18	4
England	-5	-137	194	329	1,083	-80	1,383
Wales	3	-6	15	33	32	-6	71
Scotland	-14	-26	19	27	58	-13	51
Northern Ireland	-6	-2	9	25	22	-4	44
United Kingdom	-22	-170	237	415	1,195	-103	1,550

b) per cent change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	11.2	-10.0	8.9	6.6	13.2	-0.6	7.6
South East	-3.1	-4.5	11.4	6.4	10.7	1.3	5.9
East of England	4.9	-3.2	11.4	7.4	15.9	-1.2	7.2
South West	-0.4	-10.2	20.4	8.4	20.3	-2.2	7.7
West Midlands	-13.0	-2.5	13.3	1.4	13.1	0.9	4.3
East Midlands	3.4	-5.1	13.7	5.2	14.7	-2.0	4.8
Yorks & the Humber	-0.1	-14.0	6.1	6.1	16.7	-3.5	3.2
North West	4.3	-4.6	7.6	0.7	11.2	-1.9	2.6
North East	-12.7	-4.1	6.3	-5.1	14.6	-4.5	0.4
England	-0.9	-6.5	11.0	4.9	13.9	-1.2	5.4
Wales	6.8	-4.3	15.4	8.8	11.6	-1.5	5.4
Scotland	-12.1	-14.4	10.6	4.0	8.6	-1.9	2.0
Northern Ireland	-13.7	-2.1	15.0	11.2	13.8	-1.5	5.4
United Kingdom	-2.9	-6.8	11.3	5.2	13.4	-1.3	5.1

c) per cent per annum change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	1.1	-1.1	0.9	0.6	1.2	-0.1	0.7
South East	-0.3	-0.5	1.1	0.6	1.0	0.1	0.6
East of England	0.5	-0.3	1.1	0.7	1.5	-0.1	0.7
South West	0.0	-1.1	1.9	0.8	1.9	-0.2	0.7
West Midlands	-1.4	-0.3	1.3	0.1	1.2	0.1	0.4
East Midlands	0.3	-0.5	1.3	0.5	1.4	-0.2	0.5
Yorks & the Humber	0.0	-1.5	0.6	0.6	1.6	-0.4	0.3
North West	0.4	-0.5	0.7	0.1	1.1	-0.2	0.3
North East	-1.3	-0.4	0.6	-0.5	1.4	-0.5	0.0
England	-0.1	-0.7	1.1	0.5	1.3	-0.1	0.5
Wales	0.7	-0.4	1.4	0.8	1.1	-0.1	0.5
Scotland	-1.3	-1.5	1.0	0.4	0.8	-0.2	0.2
Northern Ireland	-1.5	-0.2	1.4	1.1	1.3	-0.2	0.5
United Kingdom	-0.3	-0.7	1.1	0.5	1.3	-0.1	0.5

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Source: CE/IER estimates. CE projections MDM revision 7146, CrossRegional.xls (Table R.5)

Table 6.7: Projected Male Employment Growth by Broad Sector, 2010-2020

a) change in thousands

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	-2	-12	20	14	101	-4	117
South East	-6	-14	22	32	67	8	109
East of England	1	-8	18	3	53	6	75
South West	-3	-18	24	18	65	-13	72
West Midlands	-8	-8	16	-22	19	13	11
East Midlands	1	-5	18	7	70	-5	85
Yorks & the Humber	2	-32	9	12	49	-4	36
North West	0	-14	13	5	59	-15	47
North East	-4	-4	9	0	17	-4	14
England	-19	-114	148	68	501	-18	566
Wales	1	-2	17	5	31	-4	47
Scotland	-14	-17	23	17	28	12	48
Northern Ireland	-4	-2	8	9	15	-8	17
United Kingdom	-36	-135	197	98	574	-19	679

b) per cent change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	-11.5	-12.4	9.6	2.2	8.4	-1.1	4.7
South East	-10.2	-6.8	7.8	5.1	9.0	2.7	4.9
East of England	2.7	-4.8	9.2	0.6	11.9	3.3	5.0
South West	-4.3	-10.3	16.3	5.1	17.7	-6.9	5.5
West Midlands	-14.6	-3.7	9.9	-5.8	5.3	7.0	0.8
East Midlands	1.9	-2.5	14.2	2.2	24.1	-3.5	7.6
Yorks & the Humber	3.4	-13.5	5.8	3.1	16.6	-1.9	2.7
North West	-0.7	-5.8	6.3	0.9	13.0	-5.8	2.7
North East	-17.1	-3.8	10.3	-0.1	11.4	-3.0	2.4
England	-4.5	-7.0	9.5	1.8	11.6	-0.9	4.1
Wales	3.6	-2.0	19.5	2.3	21.4	-3.5	6.7
Scotland	-15.7	-13.2	14.4	4.4	7.8	6.0	3.6
Northern Ireland	-11.2	-2.4	14.4	7.1	18.0	-11.7	4.0
United Kingdom	-6.2	-7.0	10.5	2.2	11.7	-0.8	4.2

c) per cent per annum change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	-1.2	-1.3	0.9	0.2	0.8	-0.1	0.5
South East	-1.1	-0.7	0.8	0.5	0.9	0.3	0.5
East of England	0.3	-0.5	0.9	0.1	1.1	0.3	0.5
South West	-0.4	-1.1	1.5	0.5	1.6	-0.7	0.5
West Midlands	-1.6	-0.4	0.9	-0.6	0.5	0.7	0.1
East Midlands	0.2	-0.2	1.3	0.2	2.2	-0.4	0.7
Yorks & the Humber	0.3	-1.4	0.6	0.3	1.6	-0.2	0.3
North West	-0.1	-0.6	0.6	0.1	1.2	-0.6	0.3
North East	-1.9	-0.4	1.0	0.0	1.1	-0.3	0.2
England	-0.5	-0.7	0.9	0.2	1.1	-0.1	0.4
Wales	0.4	-0.2	1.8	0.2	2.0	-0.4	0.7
Scotland	-1.7	-1.4	1.4	0.4	0.8	0.6	0.4
Northern Ireland	-1.2	-0.2	1.4	0.7	1.7	-1.2	0.4
United Kingdom	-0.6	-0.7	1.0	0.2	1.1	-0.1	0.4

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Source: CE/IER estimates. CE projections MDM revision 7146, CrossRegional.xls (Table R.5)

Table 6.8: Projected Female Employment Growth by Broad Sector, 2010-2020

a) change in thousands

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	5	-1	1	59	178	-3	238
South East	4	2	15	41	74	6	142
East of England	2	1	7	54	77	-15	127
South West	3	-5	9	38	81	-2	124
West Midlands	-2	1	8	31	67	-6	98
East Midlands	1	-9	2	22	5	-6	16
Yorks & the Humber	-2	-10	2	29	44	-20	43
North West	3	-1	4	2	34	-3	40
North East	0	-1	-3	-13	21	-14	-10
England	14	-23	45	262	582	-62	818
Wales	2	-4	-2	29	1	-2	24
Scotland	0	-8	-4	11	30	-25	3
Northern Ireland	-2	0	1	16	7	4	27
United Kingdom	14	-35	40	317	620	-85	872

b) per cent change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	86.4	-2.5	2.4	12.6	19.5	-0.4	11.0
South East	18.6	2.2	33.9	8.0	13.1	0.8	7.1
East of England	10.7	1.7	29.0	16.2	20.7	-2.8	9.6
South West	10.0	-9.8	58.4	12.3	23.0	-0.3	10.0
West Midlands	-9.3	1.3	41.2	11.4	22.7	-1.3	8.4
East Midlands	7.2	-12.7	10.3	9.6	2.4	-1.4	1.6
Yorks & the Humber	-19.6	-15.7	9.1	10.0	16.8	-4.1	3.8
North West	17.7	-0.7	22.5	0.4	9.0	-0.4	2.6
North East	4.8	-5.2	-34.0	-11.0	18.8	-5.2	-1.9
England	9.7	-4.6	23.5	9.0	16.7	-1.3	6.8
Wales	23.5	-12.4	-28.3	16.5	1.1	-0.6	3.8
Scotland	0.9	-17.6	-19.5	3.4	9.5	-5.1	0.2
Northern Ireland	-36.8	-0.8	22.2	16.2	9.3	2.3	6.9
United Kingdom	7.9	-5.9	17.8	9.1	15.5	-1.5	6.1

c) per cent per annum change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	6.4	-0.2	0.2	1.2	1.8	0.0	1.0
South East	1.7	0.2	3.0	0.8	1.2	0.1	0.7
East of England	1.0	0.2	2.6	1.5	1.9	-0.3	0.9
South West	1.0	-1.0	4.7	1.2	2.1	0.0	1.0
West Midlands	-1.0	0.1	3.5	1.1	2.1	-0.1	0.8
East Midlands	0.7	-1.4	1.0	0.9	0.2	-0.1	0.2
Yorks & the Humber	-2.2	-1.7	0.9	1.0	1.6	-0.4	0.4
North West	1.6	-0.1	2.0	0.0	0.9	0.0	0.3
North East	0.5	-0.5	-4.1	-1.2	1.7	-0.5	-0.2
England	0.9	-0.5	2.1	0.9	1.6	-0.1	0.7
Wales	2.1	-1.3	-3.3	1.5	0.1	-0.1	0.4
Scotland	0.1	-1.9	-2.2	0.3	0.9	-0.5	0.0
Northern Ireland	-4.5	-0.1	2.0	1.5	0.9	0.2	0.7
United Kingdom	0.8	-0.6	1.6	0.9	1.4	-0.1	0.6

Source: CE/IER estimates. CE projections MDM revision 7146, CrossRegional.xls (Table R.5)

6.5 Employment by Gender and Status by country and region

6.5.1 Gender

Tables 6.9 and 6.10 present employment totals and the shares of total employment accounted for by gender and employment status over the period 1990 to 2020, distinguishing: males; females; full-time and part-time employees (also disaggregated by gender); and self-employment.

In 1990, females comprised 45.5 per cent of those in employment in the UK. The number of females in employment has steadily increased since then, so that they accounted for 47.1 per cent of all employed in 2010. The increase in female employment is projected to continue over the period 2010 to 2020, reaching 47.5 per cent of the total in 2020. The number of men in employment declined slightly between 1990 and 2000, increased slightly more than the number of women employed between 2000 and 2010 and is projected to increase by 679 thousand (4.2 per cent) between 2010 and 2020. However, the male share of employment is projected to fall by 0.4 per cent.

Women's share of total employment was fairly similar in most regions and nations of the UK in 1990, but there was quite a large gap between the highest percentage (47 per cent in Scotland) and the lowest percentage (42.8 per cent in Northern Ireland). The share of women in total employment was notably low in London and the West Midlands. The female percentage of total employment increased everywhere during the following decade. By 2000, Wales displayed the highest female employment share and Northern Ireland the lowest, with regions such as London and the West Midlands still exhibiting very low percentages.

During 2000-2010, the overall UK female share of total employment did not change, but it increased in the regions of southern England, Scotland and Northern Ireland and declined in the East Midlands, Wales and northern England, and hence there was considerable convergence between regions and nations. Scotland displayed the highest percentage and London one of the lowest.

The female share of total employment is projected to be 0.4 percentage points higher in 2020 than in 2010. The female share of employment is projected to increase in England and Northern Ireland, but to decline in Wales and Scotland. Within England, the percentage of employment represented by females is projected to increase most in the West Midlands, London, the South West and the East of England and to hardly increase in most of the north. Male employment is projected to grow in all regions and nations between 2010 and 2020, but in Northern Ireland and the North East, the increase is under 20 thousand.

6.5.2 Full-time and part-time employees by gender

In 1990, 61.7 per cent of employees in the UK worked full-time, nearly two-thirds of whom were male. The share of full-time employees has steadily decreased since, reaching 57.8 per cent in 2010 and being projected to fall to 56.9 per cent by 2020. This decline occurred in all regions and nation of the UK between 1990 and 2010, the largest falls in this percentage occurring in London, the East of England, Wales and Northern Ireland. The percentage of workers employed full-time in 2010 was highest in London, North East England and Scotland. In 2020, the largest percentages working full-time are projected to be in the North East, London and Scotland, with the lowest projected to be in the East of England, South West and Wales. The percentage working full-time is projected to decrease between 2010 and 2020 everywhere with the exception of the North West and Northern Ireland. The largest declines in this percentage are projected for the East of England and London.

In 1990, part-time employment represented 23.4 per cent of all employment, increasing to 27.9 per cent in 2010 and being projected to reach 29.3 per cent in 2020. The rate of increase in part-time employment slowed during 2000-10 compared with 1990-2000, but is projected to be higher for 2010-2020. During 1990 to 2010, the largest numbers of part-time workers were located in South East England and London, and these two regions are projected to still contain the largest number in 2020. The share of part-time workers in the total was highest in Yorkshire and the Humber and the South West and lowest in London in 1990. By 2010, the East of England had the highest share and London still had the lowest percentage of part-time workers. The largest projected increases in part-time working between 2010 and 2020 will be in the south-eastern corner of England. The percentage of part-time workers in the total is projected to increase by at least one percentage point in most regions and nations between 2010 and 2020. The share of part-time workers in the total is projected to increase fastest in London and the East of England, and to grow most slowly in the North-East and Yorkshire and the Humber.

The share of male full-time employees in the total declined from 40 per cent in 1990 to 35.8 per cent in 2010, and is projected to decline to 34.6 per cent by 2020. In 1990, the share of male full-time workers in the total was greatest in the North East, London, the rest of northern England and Scotland and lowest in the South West and South East. By 2010, the highest percentages were in North East England, Scotland and the East Midlands, and the lowest in the East of England, South West and Northern Ireland. This percentage is projected to increase slightly in the East Midlands and Scotland, but to decline elsewhere between 2010 and 2020. The largest declines are projected to occur in the four southern regions of

England. The smallest declines are projected for the North West, Northern Ireland and the North East.

Female full-time employees increased from 21.6 per cent of all UK employees in 1990 to 23 per cent in 2000, but then declined to 22 per cent in 2010. A small increase is projected for the period 2010 to 2020, with 22.3 per cent of employees being females working full-time in 2020. The increase of half a million between 1990 and 2000 was followed by stagnation in the next decade but a projected increase of 400 thousand is expected by 2020. London displays the highest percentage of female full-time employees in the total throughout this period. This percentage declined between 2000 and 2010, but is projected to increase again between 2010 and 2020. The regions and nations which experienced some of the largest increases in the percentage of female full-time workers between 1990 and 2000 saw some of the largest decreases in the next decade. The exception to this is the North West, in which this percentage increased slowly between 2000 and 2010. The share of female full-time workers in total employment is projected to decrease quite markedly in the East Midlands and Scotland and to decrease slightly in the East of England and Wales. Projected increases are largest in Northern Ireland, the South West, the West Midlands the North West and the remainder of southern England, and slowest in the North East and Yorkshire and the Humber.

In the UK, male part-time employees formed only 3.5 per cent of all employees in 1990, but this has steadily increased, to 7.3 per cent in 2010 and a projected share of 8.4 per cent in 2020. The number of males working part-time increased by 662 thousand between 1990 and 2000, 549 thousand between 2000 and 2010 and is projected to increase by another 467 thousand by 2020, to form 8.4 per cent of employment in 2020. The percentage share of this type of employment was greatest in Northern Ireland and southern England in 1990, but by 2010 it had become much more common everywhere and Northern Ireland displayed one of the smallest percentages, together with Scotland and North East England. The percentage of all employment accounted for by part-time male employees was largest in the East of England. The share of male part-time employment in the total is projected to increase everywhere between 2010 and 2020, fastest in the North-West, followed by Wales and the East Midlands. The increase in this percentage is projected to be least in the West Midlands, South west and Northern Ireland. In 2020, the share of male part-time is projected to be largest in the East of England, London and the North West and smallest in Northern Ireland, the West Midlands and Scotland.

Female part-time employment has been one of the fastest growing elements of employment since the 1960s. In 1990, female part-time workers accounted for nearly a fifth of all

employment. This share of employment increased slightly between 1990 and 2000, but did not increase further by 2010. Female part-time employment is projected to grow by 423 thousand between 2010 and 2020, and to increase its share of total employment slightly. In 1990, London stood out as having a much lower percentage of female part-time workers than the rest of the country, and in the subsequent decades, this percentage increased then decreased. There was little variation around the UK average percentage elsewhere, but the share of female part-time employment was highest in the South West, Yorkshire and the Humber and the North East in 1990, highest in Wales in 2000 and highest in Yorkshire and the Humber, followed by Wales and Northern Ireland in 2010. The share of female part-time employment is projected to increase in southern England, the West Midlands, Wales and Northern Ireland. This share is projected to decline between 2010 and 2020 in the East Midlands, northern England and Scotland. The largest increases are projected for London, the West Midlands and the East of England and the largest falls in this percentage are projected for the North East and Yorkshire and the Humber. In 2020, the highest percentages are projected to be in the East of England, South West, Wales and Northern Ireland. There is relatively little where the share of female part-time employees in total employment is projected to be lowest in 2020.

6.5.3 Self-employed

The share of self-employment in the UK fell from 15 per cent in 1990 to 12.3 per cent in 2000, but then increased to 14.3 per cent in 2010. It is projected to decline to 13.8 per cent in 2020. In 1990, self-employment was largest relative to total employment in the south of England outside London and higher in the rural than the more urban regions of England, Northern Ireland and Wales. In most regions and nations of the UK, the increase in self-employment during the first decade of this century largely cancelled out the decline experienced during the 1990s. Self-employment did not recover to 1990 levels in the South East, South West and West Midlands of England, but there was rapid expansion in London, and Scotland. The share of self-employment in total employment in 2010 was highest in southern England, Northern Ireland and Wales and lowest in the North-East.

Growth in self-employment between 2010 and 2020 is more likely to occur in business and other services rather than the primary and utilities sector, which has previously accounted for much self-employment, and this will influence the spatial pattern of employment change. Self-employment is projected to increase by 72 thousand between 2010 and 2020, but its share of total employment declines by 0.5 per cent. The number of people self-employed is projected to increase very slightly or remain stable in most regions or nations of the UK. The largest increases in numbers self-employed are projected for the South-East, East of

England, Yorkshire and the Humber and South-West. The largest decline is projected for the North West. The share of self-employment in the total is projected to fall or remain static in most regions and nations. The largest increases in share are projected for Yorkshire and the Humber and the North East and the largest decreases are projected to occur in the North-West, Northern Ireland and London. The share of self-employment in total employment is projected to be highest in the East of England, slightly above the percentages for the South-West, South-East and Wales. Self-employment is projected to form the smallest percentage of employment in northern England, Scotland and the midlands.

Table 6.10 summarises projected changes in full-time employees, part-time employees and the self-employed for the period 2010 to 2020 by gender across all the regions and nations of the UK. The contrasts in employment change will be discussed for men and women. The spatial pattern of total full-time employment and self-employment is quite similar to the pattern for males, while that for total part-time employment is similar to the pattern for female part-time employment.

Table 6.9: Employment by Gender and Employment Status, 1990-2020

a) males	1990		2000		2010		2020	
	000s	%	000s	%	000s	%	000s	%
London	2,411	56.5	2,436	54.1	2,513	53.7	2,630	52.3
South East	2,169	54.0	2,178	53.1	2,215	52.6	2,323	52.1
East of England	1,402	55.4	1,404	54.1	1,481	52.8	1,556	51.7
South West	1,280	53.7	1,240	51.8	1,322	51.5	1,395	50.4
West Midlands	1,471	55.5	1,377	53.6	1,350	53.4	1,361	51.6
East Midlands	1,044	54.6	1,036	51.6	1,121	53.8	1,207	55.2
Yorks & the Humber	1,276	53.3	1,236	52.8	1,309	53.3	1,345	53.1
North West	1,722	53.6	1,684	52.9	1,751	53.1	1,798	53.1
North East	584	53.1	552	51.5	611	53.0	625	54.0
England	13,359	54.6	13,143	53.1	13,674	53.1	14,239	52.4
Wales	685	54.4	626	50.2	701	52.7	748	53.4
Scotland	1,265	53.0	1,274	52.5	1,320	52.2	1,368	53.0
Northern Ireland	372	57.2	407	54.4	433	52.4	450	51.7
United Kingdom	15,681	54.5	15,449	52.9	16,127	52.9	16,806	52.5

b) females	1990		2000		2010		2020	
	000s	%	000s	%	000s	%	000s	%
London	1,859	43.5	2,068	45.9	2,164	46.3	2,402	47.7
South East	1,847	46.0	1,925	46.9	1,993	47.4	2,134	47.9
East of England	1,129	44.6	1,192	45.9	1,324	47.2	1,451	48.3
South West	1,104	46.3	1,152	48.2	1,246	48.5	1,370	49.6
West Midlands	1,179	44.5	1,191	46.4	1,177	46.6	1,276	48.4
East Midlands	868	45.4	974	48.4	962	46.2	978	44.8
Yorks & the Humber	1,120	46.7	1,106	47.2	1,147	46.7	1,190	46.9
North West	1,490	46.4	1,500	47.1	1,547	46.9	1,587	46.9
North East	516	46.9	521	48.5	542	47.0	532	46.0
England	11,112	45.4	11,630	46.9	12,101	46.9	12,919	47.6
Wales	574	45.6	620	49.8	629	47.3	653	46.6
Scotland	1,123	47.0	1,151	47.5	1,208	47.8	1,211	47.0
Northern Ireland	278	42.8	342	45.6	393	47.6	420	48.3
United Kingdom	13,087	45.5	13,743	47.1	14,331	47.1	15,203	47.5

Source: CE/IER estimates. MDM revision 7146, CrossRegional.xls (Table R.5)

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Table 6.9: Employment by Gender and Employment Status, 1990- 2020 (continued)

c) total full time employees

	1990		2000		2010		2020	
	000s	%	000s	%	000s	%	000s	%
London	2,945	69.0	2,991	66.4	2,907	62.2	3,056	60.7
South East	2,277	56.7	2,440	59.5	2,365	56.2	2,449	54.9
East of England	1,490	58.9	1,556	59.9	1,487	53.0	1,530	50.9
South West	1,324	55.5	1,306	54.6	1,375	53.5	1,453	52.5
West Midlands	1,664	62.8	1,624	63.2	1,467	58.1	1,510	57.3
East Midlands	1,169	61.1	1,226	61.0	1,218	58.5	1,262	57.8
Yorks & the Humber	1,445	60.3	1,406	60.0	1,385	56.4	1,407	55.5
North West	1,992	62.0	1,998	62.7	1,964	59.5	2,027	59.9
North East	721	65.6	675	62.9	707	61.3	702	60.7
England	15,027	61.4	15,221	61.4	14,875	57.7	15,396	56.7
Wales	760	60.3	708	56.8	735	55.2	756	53.9
Scotland	1,560	65.3	1,554	64.1	1,548	61.2	1,563	60.6
Northern Ireland	393	60.5	442	59.0	458	55.5	489	56.2
United Kingdom	17,740	61.7	17,925	61.4	17,616	57.8	18,203	56.9

d) male full time employees

	1990		2000		2010		2020	
	000s	%	000s	%	000s	%	000s	%
London	1,834	43.0	1,802	40.0	1,709	36.6	1,736	34.5
South East	1,466	36.5	1,537	37.5	1,470	34.9	1,477	33.1
East of England	980	38.7	994	38.3	924	32.9	934	31.1
South West	858	36.0	823	34.4	858	33.4	874	31.6
West Midlands	1,110	41.9	1,044	40.6	927	36.7	927	35.2
East Midlands	770	40.3	764	38.0	784	37.6	828	37.9
Yorks & the Humber	965	40.3	908	38.8	891	36.3	894	35.3
North West	1,314	40.9	1,262	39.6	1,200	36.4	1,221	36.1
North East	477	43.4	422	39.3	445	38.6	439	38.0
England	9,775	39.9	9,555	38.6	9,208	35.7	9,331	34.4
Wales	498	39.6	428	34.3	465	35.0	477	34.1
Scotland	993	41.6	962	39.7	956	37.8	982	38.1
Northern Ireland	247	38.0	276	36.8	276	33.4	287	33.0
United Kingdom	11,513	40.0	11,220	38.4	10,905	35.8	11,078	34.6

e) female full time employees

	1990		2000		2010		2020	
	000s	%	000s	%	000s	%	000s	%
London	1,111	26.0	1,189	26.4	1,198	25.6	1,319	26.2
South East	812	20.2	902	22.0	894	21.3	972	21.8
East of England	510	20.1	562	21.6	563	20.1	596	19.8
South West	466	19.5	483	20.2	517	20.1	578	20.9
West Midlands	553	20.9	581	22.6	540	21.4	583	22.1
East Midlands	399	20.9	463	23.0	434	20.8	434	19.9
Yorks & the Humber	480	20.0	497	21.2	495	20.1	513	20.2
North West	679	21.1	736	23.1	764	23.2	806	23.8
North East	244	22.2	253	23.6	262	22.7	263	22.7
England	5,252	21.5	5,666	22.9	5,668	22.0	6,065	22.3
Wales	262	20.8	281	22.5	269	20.2	278	19.9
Scotland	567	23.8	592	24.4	592	23.4	580	22.5
Northern Ireland	146	22.5	166	22.1	182	22.0	202	23.2
United Kingdom	6,227	21.6	6,705	23.0	6,711	22.0	7,126	22.3

Source: CE/IER estimates. MDM revision 7146, CrossRegional.xls (Table R.5)

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Table 6.9: Employment by Gender and Employment Status, 1990- 2020 (continued)

f) total part time employees

	1990		2000		2010		2020	
	000s	%	000s	%	000s	%	000s	%
London	781	18.3	1,001	22.2	1,101	23.5	1,313	26.1
South East	981	24.4	1,096	26.7	1,171	27.8	1,298	29.1
East of England	586	23.1	675	26.0	870	31.0	995	33.1
South West	598	25.1	704	29.4	766	29.8	864	31.3
West Midlands	601	22.7	662	25.8	724	28.6	788	29.9
East Midlands	466	24.4	547	27.2	587	28.2	639	29.3
Yorks & the Humber	618	25.8	669	28.6	732	29.8	766	30.2
North West	795	24.7	837	26.3	907	27.5	984	29.1
North East	273	24.8	289	26.9	319	27.7	321	27.8
England	5,699	23.3	6,482	26.2	7,178	27.8	7,969	29.3
Wales	302	24.0	365	29.3	395	29.7	435	31.0
Scotland	576	24.1	631	26.0	678	26.8	717	27.8
Northern Ireland	143	22.1	199	26.6	239	28.9	259	29.8
United Kingdom	6,719	23.4	7,677	26.3	8,489	27.9	9,380	29.3

g) male part time employees

	1990		2000		2010		2020	
	000s	%	000s	%	000s	%	000s	%
London	152	3.6	271	6.0	363	7.8	458	9.1
South East	155	3.9	254	6.2	291	6.9	347	7.8
East of England	95	3.7	152	5.8	239	8.5	294	9.8
South West	92	3.8	156	6.5	190	7.4	228	8.2
West Midlands	85	3.2	134	5.2	187	7.4	200	7.6
East Midlands	68	3.6	108	5.4	150	7.2	188	8.6
Yorks & the Humber	76	3.2	133	5.7	177	7.2	208	8.2
North West	104	3.2	167	5.2	235	7.1	297	8.8
North East	34	3.1	53	4.9	77	6.7	91	7.9
England	860	3.5	1,427	5.8	1,909	7.4	2,310	8.5
Wales	42	3.3	77	6.2	100	7.5	121	8.7
Scotland	82	3.4	132	5.4	162	6.4	199	7.7
Northern Ireland	31	4.7	41	5.5	55	6.7	64	7.4
United Kingdom	1,015	3.5	1,678	5.7	2,227	7.3	2,694	8.4

h) female part time employees

	1990		2000		2010		2020	
	000s	%	000s	%	000s	%	000s	%
London	629	14.7	731	16.2	738	15.8	855	17.0
South East	826	20.6	842	20.5	880	20.9	951	21.3
East of England	491	19.4	524	20.2	631	22.5	701	23.3
South West	506	21.2	549	22.9	576	22.4	636	23.0
West Midlands	516	19.5	528	20.5	537	21.2	588	22.3
East Midlands	398	20.8	440	21.9	437	21.0	451	20.7
Yorks & the Humber	542	22.6	536	22.9	555	22.6	558	22.0
North West	691	21.5	671	21.1	671	20.4	688	20.3
North East	239	21.7	236	22.0	242	21.0	230	19.9
England	4,838	19.8	5,055	20.4	5,268	20.4	5,659	20.8
Wales	260	20.6	288	23.1	295	22.2	313	22.4
Scotland	493	20.7	499	20.6	516	20.4	518	20.1
Northern Ireland	113	17.3	158	21.0	183	22.2	195	22.4
United Kingdom	5,704	19.8	5,999	20.6	6,262	20.6	6,685	20.9

Source: CE/IER estimates. MDM revision 7146, CrossRegional.xls (Table R.5)
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Table 6.9: Employment by Gender and Employment Status, 1990- 2020 (continued)

i) total self employed								
	1990		**2000**		**2010**		**2020**	
	000s	**%**	**000s**	**%**	**000s**	**%**	**000s**	**%**
London	544	12.7	512	11.4	668	14.3	663	13.2
South East	757	18.9	567	13.8	672	16.0	711	15.9
East of England	456	18.0	365	14.1	448	16.0	482	16.0
South West	462	19.4	381	15.9	427	16.6	448	16.2
West Midlands	385	14.5	282	11.0	337	13.3	338	12.8
East Midlands	277	14.5	236	11.8	278	13.4	282	12.9
Yorks & the Humber	332	13.9	267	11.4	339	13.8	362	14.3
North West	426	13.3	349	11.0	428	13.0	374	11.1
North East	106	9.6	109	10.1	126	11.0	133	11.5
England	3,745	15.3	3,069	12.4	3,722	14.4	3,793	14.0
Wales	198	15.7	173	13.9	200	15.0	211	15.0
Scotland	252	10.6	240	9.9	302	11.9	300	11.6
Northern Ireland	113	17.5	108	14.5	129	15.7	122	14.0
United Kingdom	4,308	15.0	3,590	12.3	4,353	14.3	4,425	13.8

All employment								
	1990		**2000**		**2010**		**2020**	
	000s	**%**	**000s**	**%**	**000s**	**%**	**000s**	**%**
London	4,270	100.0	4,504	100.0	4,676	100.0	5,031	100.0
South East	4,015	100.0	4,103	100.0	4,208	100.0	4,458	100.0
East of England	2,531	100.0	2,596	100.0	2,805	100.0	3,007	100.0
South West	2,384	100.0	2,392	100.0	2,568	100.0	2,765	100.0
West Midlands	2,649	100.0	2,568	100.0	2,527	100.0	2,636	100.0
East Midlands	1,912	100.0	2,010	100.0	2,083	100.0	2,184	100.0
Yorks & the Humber	2,396	100.0	2,342	100.0	2,456	100.0	2,535	100.0
North West	3,213	100.0	3,184	100.0	3,299	100.0	3,385	100.0
North East	1,100	100.0	1,073	100.0	1,152	100.0	1,157	100.0
England	24,471	100.0	24,773	100.0	25,775	100.0	27,158	100.0
Wales	1,259	100.0	1,246	100.0	1,330	100.0	1,401	100.0
Scotland	2,388	100.0	2,424	100.0	2,528	100.0	2,579	100.0
Northern Ireland	650	100.0	749	100.0	826	100.0	870	100.0
United Kingdom	28,768	100.0	29,192	100.0	30,458	100.0	32,008	100.0

Source: CE/IER estimates. MDM revision 7146, CrossRegional.xls (Table R.5)

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For *males*, the projected increase in the number of employees is dominated by the increase in part-time workers, representing a marked relative shift from full to part-time working for men. Full-time employment is projected to increase by 1.6 per cent, but part-time employment will increase by 7.8 per cent. The increase in the number of full-time male employees will be greatest in the East Midlands, followed by London, Scotland and the North-West. The rate of increase in full-time jobs is projected to be fastest in the East Midlands, Northern Ireland, Scotland and Wales, while the North-East is projected to lose full-time male jobs. The increase in the number of part-time jobs will be greatest in London and the North West and least in Northern Ireland and the West Midlands. Part-time employment will grow fastest in London, the North West and the East Midlands and most slowly in and the West Midlands. Self-employment is projected to increase by only 38 thousand employees, or 0.5 per cent between 2010 and 2020. It is projected to increase most in the South-East, but to decline in Scotland, London and the West Midlands. The rate of increase is projected to be highest in Wales and the South-East, with the decline in self-employment fastest in the North West and Scotland.

The projected increase in full-time employment between 2010 and 2020 for *females* is much greater than that for males. In contrast to males, nearly half of the UK increase in female employment is projected to be in full-time jobs. Full-time employment is projected to increase in all regions and nations except Scotland, with the largest increases occurring in London, the South-East and the South-West. The fastest increases are projected for the South-West, Northern Ireland and London, and the projected rate of increase within England is much faster in the south than in the midlands and north. The number of part-time jobs is projected to increase in all regions and nations except the North East. The geographical pattern of increase is similar to full-time employment, with the increase in employment being greatest in London, followed by the southern regions of England. The rate of increase is projected to be fastest in London, the East of England, the South West and West Midlands and slowest in Scotland, the North West and the East Midlands.

Self-employment for women is projected to increase by only 34 thousand or 0.5 per cent in the UK as a whole, and hence regional changes in female self-employment are mostly quite small. The projected increase in self-employment is greatest in the East of England, Yorkshire and the Humber and Scotland while the largest decrease is projected for the North West. The most rapid projected percentage increases are in Yorkshire and the Humber, the East of England and Scotland.

Table 6.10: Change in Employment Status by Gender, 2010-2020

a) change in thousands

	Males			Females			Total		
	FT	PT	SE	FT	PT	SE	FT	PT	SE
London	27	95	-5	121	117	0	148	211	-5
South East	7	56	46	77	71	-6	84	127	39
East of England	9	55	10	33	71	23	42	126	34
South West	16	38	18	61	60	3	78	98	21
West Midlands	0	13	-2	43	51	4	43	64	2
East Midlands	44	38	3	0	14	1	45	52	4
Yorks & the Humber	3	31	2	18	3	21	22	34	23
North West	22	61	-36	41	16	-18	63	78	-54
North East	-5	14	5	1	-12	1	-4	2	6
England	*124*	*401*	*41*	*397*	*390*	*30*	*521*	*791*	*71*
Wales	12	21	14	9	18	-3	21	40	11
Scotland	26	36	-14	-12	2	12	14	39	-2
Northern Ireland	11	9	-2	20	12	-5	31	21	-7
United Kingdom	*173*	*468*	*38*	*415*	*423*	*34*	*588*	*890*	*72*

b) per cent change

	Males			Females			Total		
	FT	PT	SE	FT	PT	SE	FT	PT	SE
London	1.6	26.1	-1.1	10.1	15.8	0.0	5.1	19.2	-0.7
South East	0.5	19.3	10.1	8.7	8.0	-0.7	3.6	10.8	5.9
East of England	1.0	22.9	3.3	5.8	11.2	3.7	2.8	14.4	7.5
South West	1.9	20.0	6.6	11.8	10.4	0.6	5.6	12.8	5.0
West Midlands	0.0	6.8	-1.0	8.0	9.6	0.8	3.0	8.9	0.5
East Midlands	5.6	25.6	1.5	0.1	3.1	0.3	3.7	8.9	1.5
Yorks & the Humber	0.4	17.4	0.6	3.7	0.6	3.9	1.6	4.7	6.8
North West	1.8	26.0	-11.4	5.4	2.4	-2.7	3.2	8.5	-12.6
North East	-1.2	18.4	6.1	0.4	-5.0	0.4	-0.6	0.6	5.0
England	1.3	21.0	1.6	7.0	7.4	0.6	3.5	11.0	1.9
Wales	2.6	21.3	10.3	3.4	6.2	-1.1	2.9	10.0	5.3
Scotland	2.7	22.3	-7.1	-2.0	0.4	2.4	0.9	5.7	-0.7
Northern Ireland	3.9	16.0	-2.3	11.2	6.4	-2.7	6.8	8.6	-5.6
United Kingdom	1.6	7.8	1.3	6.2	6.7	0.5	3.3	10.5	1.7

c) per cent per annum change

	Males			Females			Total		
	FT	PT	SE	FT	PT	SE	FT	PT	SE
London	0.2	2.3	-0.1	1.0	1.5	0.0	0.5	1.8	-0.1
South East	0.0	1.8	1.0	0.8	0.8	-0.3	0.4	1.0	0.6
East of England	0.1	2.1	0.3	0.6	1.1	1.6	0.3	1.4	0.7
South West	0.2	1.8	0.6	1.1	1.0	0.2	0.6	1.2	0.5
West Midlands	0.0	0.7	-0.1	0.8	0.9	0.4	0.3	0.9	0.1
East Midlands	0.5	2.3	0.2	0.0	0.3	0.2	0.4	0.9	0.2
Yorks & the Humber	0.0	1.6	0.1	0.4	0.1	2.0	0.2	0.5	0.7
North West	0.2	2.3	-1.2	0.5	0.2	-1.7	0.3	0.8	-1.3
North East	-0.1	1.7	0.6	0.0	-0.5	0.2	-0.1	0.1	0.5
England	0.1	1.9	0.2	0.7	0.7	0.3	0.3	1.1	0.2
Wales	0.3	2.0	1.0	0.3	0.6	-0.5	0.3	1.0	0.5
Scotland	0.3	2.0	-0.7	-0.2	0.0	1.2	0.1	0.6	-0.1
Northern Ireland	0.4	1.5	-0.2	1.1	0.6	-1.9	0.7	0.8	-0.6
United Kingdom	0.2	1.9	0.1	0.6	0.7	0.2	0.3	1.0	0.2

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Source: CE/IER estimates. MDM revision 7146, CrossRegional.xls (Table R.5)

6.6 Occupational Prospects by country and region

6.6.1 Overview

The projected change in employment by occupation (in terms of the numerical change, percentage change and average annual rate of change) over the period 2010 to 2020 is presented in Tables 6.11 (total), 6.12 (females) and 6.13 (females). These tables present the pattern of *structural* demand (i.e. 'expansion demand') for labour, and do not include the effect of *replacement* demand, which is considered in section 5.6.

The occupational structure of regions and nations within the UK are all different, but there is a broad divide between the regions of the south and east of England and the rest of the country. In the former, "white-collar" occupations are over-represented relative to the UK average, while elsewhere, manual occupations and less skilled non-manual occupations are over-represented. Managers, directors and senior officials, professionals and associate professionals are particularly over-represented in London and the South-East of England while SOC major groups 4 to 8 are over-represented in the West Midlands, northern England, Wales, Northern Ireland and Scotland. These differences in occupational specialisation reflect differences in industrial employment structures. For example, the concentration of skilled trades in the north and west reflects the importance of manufacturing in these regions. Likewise, the concentration of business services in London and the South East is a key reason for their above average employment shares in managerial, professional and associate professional occupations. Despite such differences, the main changes in occupational structure within industries are common across all regions.

The largest projected increases in employment at the level of SOC Major Groups across the UK between 2010 and 2020 are in *professional occupations* (869 thousand jobs), *associate professional & technical occupations* (551 thousand jobs) and *managers & senior officials* (544 thousand jobs). Other SOC Major Groups in which employment is projected to increase are *caring, leisure and other service occupations* (313 thousand jobs) and *elementary occupations* (101 thousand jobs).

The greatest loss of jobs between 2010 and 2020 is projected for *administrative, clerical and secretarial occupations* (387 thousand jobs), followed by skilled trades occupations (230 thousand jobs) and *process, plant and machine operatives* (213 thousand jobs). The preceding sections have demonstrated that the southern and eastern regions of the UK are projected to gain employment faster than the north and west, and it can be seen that given the expected pattern of employment change by occupation, the regional occupational

specialisation discussed above will strongly influence the changing geography of employment over the period 2010-2020.

The overall pattern is therefore of growth in both the most and least skilled occupations and decline in skilled manual and semi-skilled occupations. This pattern is shared by **males**, for whom employment is projected to decline between 2010 and 2020 in *skilled trades occupations* and for *process, plant and machine operatives*, together representing a loss of 291 thousand jobs. The largest increase in employment is for *professional occupations* (263 thousand or 10.8 per cent), just exceeding the growth of 240 thousand jobs in *elementary occupations* (13.4 per cent) and the increase of 224 thousand in managers, directors and senior officials (11.1 per cent).

The pattern for **female** employment is one of growth in higher status occupations and decline in middle-ranking, semi-skilled and unskilled jobs. In contrast to men, employment in *elementary occupations* is projected to decline by 139 thousand (-10.1 per cent). The largest projected decline is in *administrative and secretarial occupations* (-385 thousand or -13.1 per cent). The largest percentage projected declines are in two smaller SOC major groups, *skilled trades occupations* (-17.4 per cent, but only 77 thousand jobs) and *process, plant and machine* operatives (-34.9 per cent, or 74 thousand jobs). These losses are largely compensated for by strong growth in *managers & senior officials* (320 thousand jobs or 32 per cent), *professional occupations* (606 thousand jobs or 21.5 per cent) and a*ssociate professional & technical occupations* (394 thousand jobs or 24.1 per cent) and a slower increase in *caring, leisure and other service occupations* (217 thousand or 9.8 per cent).

6.6.2 Change by occupation

The main implications of employment change by **region** in each Major Group are explored further in the remainder of this section.

Managers, directors & senior officials: In 2010, managers, directors & senior officials accounted for 10.2 per cent of total employment in the UK, but for 12.1 per cent in London and 11.8 per cent in the South East. This SOC Major Group is also over-represented relative to the UK average in the East of England, South West and East Midlands. At the other extreme, this SOC major group accounted for only 8 per cent of total employment in the North East, 8.3 per cent in Wales and 8.8 per cent in Northern Ireland. The geographical distribution of this occupational category illustrates the concentration of decision-making in the south-eastern corner of the country and a possible deficit in entrepreneurship in northern England and the

other nations of the UK. The higher incomes of these workers also contribute to the differential in regional GVA between the south and east and the remainder of the UK.

Over half of the growth in employment for *managers, directors & senior officials* between 2010 and 2020 is projected to occur in London, the South East, the East of England and the South West. The rate of employment growth is projected to be above average in the South West (22.9 per cent), East of England (21 per cent), South East (20.9 per cent), and Yorkshire and the Humber (20 per cent). The projected rate of employment increase is slowest in the North East, North West and Scotland. Hence the differential between southern England and the remainder of the UK is projected to increase. This is the case for females as well as males, with female employment in this SOC major group growing by 35 per cent or more in the East of England, South East, South West, Yorkshire and the Humber and the West Midlands. The slowest growth is projected for the North East and Scotland.

Professional occupations: The share of total employment accounted for by professional occupations is highest by far in London (23 per cent in 2010, compared with the UK average of 17.8 per cent). The only other region with an above average percentage is the South-East (18.7 per cent). In most other regions and nations of the UK, between 16 and 17 per cent of all employees had jobs in this SOC major group in 2010. The lowest percentage is 15.1 per cent in Yorkshire and the Humber, while the highest percentage below the average is in Scotland (17.5 per cent). This pattern reflects the concentration of government departments, academic and research facilities in the south-eastern corner of the UK and may be a factor underlying differences in rates of innovation and productivity.

There is relatively little regional and national variation in the projected rate of increase in employment between 2010 and 2020. The fastest increase is in the South West (18.9 per cent) and the slowest in the North West (10.3 per cent) and North East (12.1 per cent). In general, rates of increase are highest in southern England, which is also projected to gain more than half of the employment increase. However, the increase for the West Midlands (17.4 per cent) is higher than that for London (17.2 per cent). Regional and national differentials in the rate of employment increase are smaller for females, for whom the rate of employment increase is fastest in the South West (27.3 per cent) and slowest in the East Midlands (15.2 per cent) and Scotland (16.4 per cent).

Associate professional & technical occupations: Associate professional & technical occupations represented 17.9 per cent of total employment in London and 12.7 per cent in the South East compared with the UK average of 12.1 per cent for 2010. The percentage of employees from this SOC major group was less than the UK average in the remaining

countries and regions of the UK, but closest to the average in the East of England, South West and West Midlands. This percentage was just over 10 per cent in most other regions and nations, but lowest (at 9.7 per cent) in Wales. The geographical distribution of this group is strongly influenced by the concentration of science-related economic activity in the south and east of the UK, but this occupational group is also strongly represented in the National Health Service and therefore regional percentages are fairly similar in the remainder of the UK.

Employment is projected to increase most rapidly in the South West (18.8 per cent), followed by London (16 per cent) and the East of England (15.3 per cent). The four regions of southern England will receive 60 per cent of the projected increase in employment and the largest increase in numbers employed will be in London (139 thousand, not far short of the 153 thousand employment gain in the whole of the midlands and northern England). Female employment is projected to grow fastest in the South West (32.5 per cent), London (28.4 per cent) and West Midlands (27.9 per cent), and 60 per cent of new jobs will be located in southern England. With the exception of Northern Ireland (25.4 per cent) and Yorkshire and the Humber (23.6 per cent), rates of increase are projected to be lower in northern England, Wales and Scotland.

Administrative, clerical & secretarial occupations: There is less regional and national variation in the proportion of total employment accounted for by administrative, clerical & secretarial occupations than for higher level non-manual occupations. The UK average share of total employment was 12.3 per cent in 2010. This major group was over-represented in the North West, West Midlands, Yorkshire and the Humber, the North East, Scotland and Northern Ireland. This reflects the presence of devolved administrations, the decentralisation of central government departments and the establishment of private sector 'back office' functions in locations with lower operating costs. The long-term trend is for decline in this occupational group, exacerbated by cost-savings in private sector organisations and cut-backs in public sector administration.

Employment in administrative, clerical & secretarial occupations is projected to decline between 2010 and 2020 in all regions and nations. London is projected to lose 84 thousand jobs (16.9 per cent of its 2010 employment) and the South East will lose 65 thousand jobs (-12.6 per cent). However, only 44.7 per cent of job losses will occur in southern England. Elsewhere, the projected rate of job loss is highest in the East Midlands (-12.7 per cent), the North East (-11.9 per cent) and Scotland (-11.7 per cent). The slowest projected rates of job loss are in Northern Ireland (-5.5 per cent), the South West (-5.6 per cent), and the West

Midlands (-5.7 per cent). The spatial pattern of projected female employment change is very similar.

Skilled trades occupations: The UK average share of employment in skilled trades occupations was 10.6 per cent in 2010. This major group displays the opposite pattern to higher-status white collar jobs, being under-represented in London (7.4 per cent) and the South East (9.7 per cent) and over-represented elsewhere. The largest percentages of skilled trades occupations in total employment were to be found in Northern Ireland (13.4 per cent), Wales (12.8 per cent) and the North East (12 per cent). This reflects the continuing importance of manufacturing industry in these nations and regions.

Employment is projected to decline in all regions and nations of the UK except Wales (where there is a projected increase of 4 per cent or 7 thousand). Employment is projected to decline most rapidly in the South East (-10 per cent), North West (-9.4 per cent) and Yorkshire and the Humber (9 per cent). London exhibits the lowest rate of job loss (-3.7 per cent). Female employment is projected to decline in all regions and nations, the largest number of jobs lost being in the North West, Scotland and the South East. The rate of job loss for females is far higher than that of males in each region and nation, the smallest rate of decline being in Wales (-14 per cent) and the highest in Northern Ireland (-33.4 per cent).

Caring, leisure and other service occupations: The percentage employed in caring, leisure and other service occupations was below the 2010 UK average (9 per cent) in London (6.6 per cent), but at or above average in all other regions and nations of the UK. The highest percentages of employment accounted for by this SOC major group were in Northern Ireland (11 per cent) and the North West (10.2 per cent).

Employment is projected to increase between 2010 and 2020 in all regions and nations. The rate of increase is projected to be fastest in the south and midlands of England. The South East (15.2 per cent), East Midlands (14.7 per cent), London (14.1 per cent), East of England (13.7 per cent) and West Midlands (13.4 per cent) are projected to gain employment fastest. Employment growth is projected to be slowest in the North East (4.1 per cent), Northern Ireland (6.2 per cent), and Scotland (6.7 per cent). The largest projected gains in employment are for the South East (57 thousand) and London (43 thousand). For females, the geographical pattern of projected employment change is similar, but percentage increases are smaller.

Sales and customer service occupations: This SOC major group represented 8.8 per cent of total employment in the UK in 2010. It was under-represented relative to the UK average in London (7.3 per cent), the South East (8 per cent) and the West Midlands (8.5 per cent). The

highest percentages of employment in sales and customer service occupations were in the North East (10.9 per cent) and Yorkshire and the Humber (10 per cent).

Employment is projected to decline most in South-East England (by 14 thousand jobs or -4.2 per cent), and London (by 10 thousand jobs, or -3 per cent). Smaller declines are also projected for the North West (5 thousand), North East (5 thousand), Scotland and the West Midlands (3 thousand in each case). The fastest projected rates of increase are in Wales (9.1 per cent, representing 11 thousand jobs) and the East Midlands (6.4 per cent, representing 11 thousand jobs). Female employment is projected to increase overall by 10 thousand, with decline in the South East (11 thousand, or 5.3 per cent), North West (10 thousand or 4.8 per cent), the North East (7 thousand or 8.2 per cent) and London (5 thousand or 2.3 per cent). The fastest increase is projected for Wales (13.3 per cent or 11 thousand jobs). Male employment is projected to decline by a few thousand in most regions of southern England and the midlands and to grow slowly in Scotland and northern England.

Process, plant and machine operatives: This is the smallest SOC major group, representing only 6.7 per cent of total UK employment in 2010. There is a strong south-east / north-west contrast in the spatial distribution of process, plant and machine operatives. They comprised only 4.1 per cent of employment in London and 5.3 per cent of all employment in the South East in 2010. The percentage working in these types of semi-skilled manual job was above the UK average in the midlands, north of England, Wales and Scotland, with the highest percentages being in Yorkshire and the Humber (8.8 per cent) and the East Midlands (8.5 per cent).

Employment is projected to decline in all regions and nations. The smallest declines are projected for southern England, and the highest rates of decline are projected to occur in the North East (-15.2 per cent or 13 thousand jobs), West Midlands (-14.9 per cent or 28 thousand jobs), Scotland (-14.6 per cent or 26 thousand jobs), Yorkshire and the Humber (-13.8 per cent or 29 thousand jobs) and Wales (-12.2 per cent or 13 thousand jobs). The percentage rate of job loss is projected to be much higher for female than for male employment. Employment is projected to decline at a much faster rate in the midlands, northern England, Wales, Scotland and Northern Ireland than in southern England. The fastest rate of job loss is projected for the North East (-47.7 per cent, or 4 thousand jobs) and the slowest rate of decline is projected to occur in London (-11 per cent, or 1 thousand jobs).

Elementary Occupations: In 2010, jobs classed as being elementary occupations accounted for 12.6 per cent of all employment in the UK. In most regions and nations, the percentage of jobs accounted for by this SOC major group is just below the UK average. The lowest percentage is in London (10.7 per cent). The highest percentages of employment in

elementary occupations in 2010 were in Scotland (15.5 per cent), Wales (14.1 per cent) and the East of England (13.8 per cent). These types of job are most common in areas of heavy industry or where warehousing and food processing are significant industries.

Employment in elementary occupations is projected to increase in all regions and nations except the West Midlands (-7 thousand or -2.9 per cent), North East (-3 thousand or -1.9 per cent), Yorkshire and the Humber (-1 thousand or -0.4 per cent) and Wales (-1 thousand or -0.8 per cent). Projected employment increases are largest in the East of England (32 thousand or 9.9 per cent), South East England (27 thousand or 6.2 per cent), the North West (21 thousand or 6.3 per cent), the South West (12 thousand or 4.5 per cent), Northern Ireland (5 thousand or 6 per cent) and London (7 thousand or 1.8 per cent). This pattern obscures broadly opposite trends for male and female employment. Male employment in elementary occupations is projected to increase or remain stable in all parts of the UK. The, fastest rates of increase occur in the North West (43 thousand jobs or 22.4 per cent) and the East Midlands (27 thousand jobs or 21.4 per cent). Other large projected increases in male employment are projected for the South East (27 thousand) and East of England (31 thousand). Female employment is projected to decline everywhere except the South East and East of England, where employment is expected to remain stable. With the exception of the South West (-12 thousand or -10.9 per cent), rates of employment loss are lower in the south than in northern England or the other countries of the UK. The most rapid declines in female employment are projected for the North East (-28.5 per cent or 14 thousand) and East Midlands (-21.7 per cent or 20 thousand).

Table 6.11: Projected Change in Total Employment by Occupation, 2010-2020

a) change in thousands

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	92	199	139	-84	-14	43	-10	-18	8	355
South East	100	124	82	-66	-45	56	-14	-14	28	250
East of England	61	74	52	-36	-22	34	10	-5	32	201
South West	60	89	57	-17	-14	23	3	-17	12	197
West Midlands	38	78	45	-19	-27	33	-2	-28	-7	109
East Midlands	36	49	27	-31	-14	32	11	-17	7	101
Yorks & the Humber	45	55	37	-25	-28	21	4	-28	-1	79
North West	39	60	34	-35	-36	37	-5	-29	21	87
North East	11	25	9	-17	-7	4	-5	-13	-3	4
England	*482*	*752*	*484*	*-329*	*-206*	*283*	*-8*	*-170*	*95*	*1,383*
Wales	18	35	18	-15	7	11	11	-13	-1	71
Scotland	31	58	35	-37	-24	13	-3	-26	3	51
Northern Ireland	13	24	13	-6	-8	6	1	-4	5	44
United Kingdom	*544*	*869*	*551*	*-387*	*-230*	*313*	*2*	*-213*	*101*	*1,550*

b) per cent change

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	17.0	17.2	16.0	-16.8	-3.7	14.1	-2.9	-9.9	1.8	7.6
South East	20.9	14.6	14.4	-12.7	-10.1	15.0	-4.3	-6.9	6.4	5.9
East of England	21.0	14.6	15.3	-10.4	-6.5	13.7	4.1	-2.8	9.8	7.2
South West	22.9	18.9	18.8	-5.6	-4.2	9.1	1.5	-11.6	4.4	7.7
West Midlands	16.8	17.4	14.9	-5.7	-8.2	13.4	-1.2	-14.9	-2.9	4.3
East Midlands	17.1	13.5	11.4	-12.7	-5.7	14.7	6.4	-10.1	3.3	4.8
Yorks & the Humber	20.0	13.5	13.6	-7.9	-9.0	9.0	1.8	-13.8	-0.4	3.2
North West	13.4	10.2	9.3	-8.1	-9.4	11.1	-1.6	-11.3	6.3	2.6
North East	11.9	12.1	7.0	-11.9	-4.7	4.2	-4.3	-15.2	-2.5	0.4
England	*18.4*	*15.1*	*14.2*	*-10.5*	*-7.1*	*12.3*	*-0.3*	*-10.5*	*3.6*	*5.4*
Wales	16.8	15.1	12.9	-10.0	4.0	8.9	9.1	-12.3	-0.8	5.4
Scotland	13.9	12.2	12.2	-11.7	-7.4	6.8	-1.4	-14.6	0.8	2.0
Northern Ireland	19.1	16.3	14.3	-5.4	-6.6	6.2	1.1	-7.8	6.0	5.4
United Kingdom	*18.0*	*14.9*	*14.0*	*-10.5*	*-6.5*	*11.5*	*0.1*	*-10.9*	*3.2*	*5.1*

c) per cent per annum change

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	1.6	1.6	1.5	-1.8	-0.4	1.3	-0.3	-1.0	0.2	0.7
South East	1.9	1.4	1.4	-1.3	-1.1	1.4	-0.4	-0.7	0.6	0.6
East of England	1.9	1.4	1.4	-1.1	-0.7	1.3	0.4	-0.3	0.9	0.7
South West	2.1	1.7	1.7	-0.6	-0.4	0.9	0.1	-1.2	0.4	0.7
West Midlands	1.6	1.6	1.4	-0.6	-0.9	1.3	-0.1	-1.6	-0.3	0.4
East Midlands	1.6	1.3	1.1	-1.4	-0.6	1.4	0.6	-1.1	0.3	0.5
Yorks & the Humber	1.8	1.3	1.3	-0.8	-0.9	0.9	0.2	-1.5	0.0	0.3
North West	1.3	1.0	0.9	-0.8	-1.0	1.1	-0.2	-1.2	0.6	0.3
North East	1.1	1.1	0.7	-1.3	-0.5	0.4	-0.4	-1.6	-0.3	0.0
England	*1.7*	*1.4*	*1.3*	*-1.1*	*-0.7*	*1.2*	*0.0*	*-1.1*	*0.4*	*0.5*
Wales	1.6	1.4	1.2	-1.0	0.4	0.9	0.9	-1.3	-0.1	0.5
Scotland	1.3	1.2	1.2	-1.2	-0.8	0.7	-0.1	-1.6	0.1	0.2
Northern Ireland	1.8	1.5	1.3	-0.6	-0.7	0.6	0.1	-0.8	0.6	0.5
United Kingdom	*1.7*	*1.4*	*1.3*	*-1.1*	*-0.7*	*1.1*	*0.0*	*-1.1*	*0.3*	*0.5*

\\Sapphire\ier\ie\shared\Projects\Working Futures\workbooks\[OverviewTablesCharts.xlsm]TableR.11, forecast c111

Source: CE/IER estimates, CE projections MDM revision 7146, (Regional Summary)

Occupational groups:

1 Managers, directors and senior officials
2 Professional occupations
3 Associate professional and technical
4 Administrative and secretarial
5 Skilled trades occupations
6 Caring, leisure and other service
7 Sales and customer service
8 Process, plant and machine operatives
9 Elementary occupations

Table 6.12: Projected Change in Male Employment by Occupation, 2010-2020

a) change in thousands

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	37	56	37	-17	-7	15	-5	-17	18	117
South East	41	45	28	-5	-36	20	-3	-9	27	109
East of England	18	27	14	-3	-17	9	-4	0	31	75
South West	28	27	15	-3	-7	2	-3	-11	24	72
West Midlands	11	28	12	4	-21	5	-7	-21	1	11
East Midlands	21	24	14	-1	-7	11	4	-8	27	85
Yorks & the Humber	17	14	10	7	-22	7	1	-19	21	36
North West	12	8	7	7	-26	8	5	-19	43	47
North East	6	5	0	0	-3	3	2	-9	11	14
England	192	233	137	-12	-145	80	-11	-111	202	566
Wales	10	9	8	4	10	4	0	-7	11	47
Scotland	17	16	9	5	-15	12	3	-18	19	48
Northern Ireland	6	4	3	2	-4	0	0	-2	8	17
United Kingdom	224	263	157	-1	-153	96	-8	-138	240	679

b) per cent change

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	10.3	9.4	7.3	-17.0	-2.1	19.4	-3.9	-9.8	7.5	4.7
South East	12.8	9.7	8.5	-6.2	-9.3	26.7	-2.2	-4.5	11.3	4.9
East of England	9.1	9.6	7.0	-5.5	-5.8	20.3	-4.7	0.0	16.7	5.0
South West	16.2	11.0	8.6	-5.4	-2.5	6.6	-3.7	-8.6	15.8	5.5
West Midlands	7.5	11.8	6.3	5.8	-7.3	13.8	-9.4	-12.3	0.5	0.8
East Midlands	14.1	12.2	9.4	-1.7	-3.3	31.2	5.9	-5.3	21.3	7.6
Yorks & the Humber	11.5	6.7	6.4	8.7	-7.8	17.3	1.0	-10.5	14.8	2.7
North West	6.4	2.7	3.3	6.7	-7.6	14.3	4.5	-8.2	22.4	2.7
North East	9.8	4.4	-0.4	0.2	-2.2	14.2	5.8	-11.3	15.8	2.4
England	10.9	8.9	6.8	-1.9	-5.7	19.2	-1.4	-7.7	13.6	4.1
Wales	12.8	8.2	9.7	10.1	6.3	16.6	0.0	-7.9	12.5	6.7
Scotland	11.9	7.4	5.8	6.3	-5.3	22.9	3.9	-11.6	11.3	3.6
Northern Ireland	12.7	6.4	6.1	9.1	-3.8	1.1	-1.2	-4.0	16.6	4.0
United Kingdom	11.1	8.7	6.8	-0.2	-5.0	19.0	-0.9	-8.0	13.4	4.2

c) per cent per annum change

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	1.0	0.9	0.7	-1.8	-0.2	1.8	-0.4	-1.0	0.7	0.5
South East	1.2	0.9	0.8	-0.6	-1.0	2.4	-0.2	-0.5	1.1	0.5
East of England	0.9	0.9	0.7	-0.6	-0.6	1.9	-0.5	0.0	1.6	0.5
South West	1.5	1.1	0.8	-0.6	-0.3	0.6	-0.4	-0.9	1.5	0.5
West Midlands	0.7	1.1	0.6	0.6	-0.8	1.3	-1.0	-1.3	0.0	0.1
East Midlands	1.3	1.2	0.9	-0.2	-0.3	2.8	0.6	-0.5	2.0	0.7
Yorks & the Humber	1.1	0.7	0.6	0.8	-0.8	1.6	0.1	-1.1	1.4	0.3
North West	0.6	0.3	0.3	0.6	-0.8	1.3	0.4	-0.8	2.0	0.3
North East	0.9	0.4	0.0	0.0	-0.2	1.3	0.6	-1.2	1.5	0.2
England	1.0	0.9	0.7	-0.2	-0.6	1.8	-0.1	-0.8	1.3	0.4
Wales	1.2	0.8	0.9	1.0	0.6	1.5	0.0	-0.8	1.2	0.7
Scotland	1.1	0.7	0.6	0.6	-0.5	2.1	0.4	-1.2	1.1	0.4
Northern Ireland	1.2	0.6	0.6	0.9	-0.4	0.1	-0.1	-0.4	1.5	0.4
United Kingdom	1.1	0.8	0.7	0.0	-0.5	1.8	-0.1	-0.8	1.3	0.4

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Source: CE/IER estimates, CE projections MDM revision 7146, (Regional Summary)

Occupational groups:

1 Managers, directors and senior officials
2 Professional occupations
3 Associate professional and technical
4 Administrative and secretarial
5 Skilled trades occupations
6 Caring, leisure and other service
7 Sales and customer service
8 Process, plant and machine operatives
9 Elementary occupations

Table 6.13: Projected Change in Female Employment by Occupation, 2010-2020

a) change in thousands

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	55	143	102	-66	-7	27	-4	-1	-10	238
South East	58	79	54	-60	-9	36	-11	-6	1	142
East of England	43	48	39	-32	-5	25	14	-5	1	127
South West	32	62	42	-14	-7	21	6	-6	-12	124
West Midlands	27	50	33	-23	-6	28	5	-8	-8	98
East Midlands	15	24	14	-30	-7	21	8	-9	-20	16
Yorks & the Humber	28	41	27	-32	-6	14	3	-9	-22	43
North West	27	51	27	-42	-10	29	-10	-10	-22	40
North East	5	20	10	-17	-4	2	-7	-4	-14	-10
England	290	519	347	-317	-62	203	3	-59	-107	818
Wales	8	26	10	-19	-3	8	11	-6	-12	24
Scotland	14	42	26	-42	-9	1	-6	-7	-17	3
Northern Ireland	7	20	10	-8	-4	5	1	-2	-3	27
United Kingdom	320	606	394	-385	-77	217	10	-74	-139	872

b) per cent change

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	30.0	25.4	28.3	-16.8	-14.0	12.2	-2.3	-11.0	-5.7	11.0
South East	37.4	20.4	22.7	-14.0	-14.9	12.2	-5.4	-29.8	0.5	7.1
East of England	45.4	20.5	26.6	-11.4	-10.3	12.3	8.8	-24.2	0.5	9.6
South West	35.8	27.3	32.5	-5.7	-15.2	9.6	4.0	-31.7	-11.0	10.0
West Midlands	35.0	23.7	27.9	-8.8	-14.6	13.3	3.6	-34.5	-7.4	8.4
East Midlands	24.2	15.2	14.5	-15.1	-21.7	11.4	6.6	-41.9	-21.7	1.6
Yorks & the Humber	36.8	20.4	23.6	-13.4	-18.4	7.3	2.2	-38.6	-19.8	3.8
North West	27.6	18.6	18.1	-12.6	-23.6	10.5	-4.8	-39.3	-15.8	2.6
North East	16.1	20.6	17.4	-15.2	-28.1	2.0	-8.2	-47.7	-28.8	-1.9
England	33.5	22.0	24.7	-12.7	-16.7	10.7	0.2	-33.6	-9.5	6.8
Wales	25.7	21.3	17.3	-16.1	-13.9	7.3	13.4	-40.1	-16.8	3.8
Scotland	17.6	16.4	20.2	-17.3	-21.2	0.7	-3.8	-39.5	-10.9	0.2
Northern Ireland	33.1	23.9	25.4	-10.4	-33.3	7.0	2.6	-46.5	-10.0	6.9
United Kingdom	32.0	21.5	24.1	-13.1	-17.4	9.8	0.6	-34.9	-10.1	6.1

c) per cent per annum change

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	2.7	2.3	2.5	-1.8	-1.5	1.2	-0.2	-1.2	-0.6	1.0
South East	3.2	1.9	2.1	-1.5	-1.6	1.2	-0.6	-3.5	0.0	0.7
East of England	3.8	1.9	2.4	-1.2	-1.1	1.2	0.8	-2.7	0.0	0.9
South West	3.1	2.4	2.9	-0.6	-1.6	0.9	0.4	-3.7	-1.2	1.0
West Midlands	3.0	2.2	2.5	-0.9	-1.6	1.3	0.4	-4.1	-0.8	0.8
East Midlands	2.2	1.4	1.4	-1.6	-2.4	1.1	0.6	-5.3	-2.4	0.2
Yorks & the Humber	3.2	1.9	2.1	-1.4	-2.0	0.7	0.2	-4.8	-2.2	0.4
North West	2.5	1.7	1.7	-1.3	-2.7	1.0	-0.5	-4.9	-1.7	0.3
North East	1.5	1.9	1.6	-1.6	-3.3	0.2	-0.9	-6.3	-3.3	-0.2
England	2.9	2.0	2.2	-1.3	-1.8	1.0	0.0	-4.0	-1.0	0.7
Wales	2.3	2.0	1.6	-1.7	-1.5	0.7	1.3	-5.0	-1.8	0.4
Scotland	1.6	1.5	1.9	-1.9	-2.4	0.1	-0.4	-4.9	-1.1	0.0
Northern Ireland	2.9	2.2	2.3	-1.1	-4.0	0.7	0.3	-6.1	-1.1	0.7
United Kingdom	2.8	2.0	2.2	-1.4	-1.9	0.9	0.1	-4.2	-1.1	0.6

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Source: CE/IER estimates, CE projections MDM revision 7146, (Regional Summary)

Occupational groups:

1 Managers, directors and senior officials
2 Professional occupations
3 Associate professional and technical
4 Administrative and secretarial
5 Skilled trades occupations
6 Caring, leisure and other service
7 Sales and customer service
8 Process, plant and machine operatives
9 Elementary occupations

6.7 Replacement Demands by country and region

In order to obtain a complete picture of the changing demand for labour by occupations it is necessary to take into account the effect of retirements, mobility between occupations and other factors, as measured by estimates of *replacement demand*. The *overall requirement* for labour in each occupation and region is the sum of expansion demand and replacement demand. Since there is little reliable data on occupational and geographical mobility, the estimates presented here are derived only from the projected pattern of retirements. Table 6.14 presents the pattern of projected expansion demands, replacement demands and overall requirements by occupation for the regions and nations of the UK over the period from 2010 to 2020.

With people born in the post-war “baby boom” (from the mid-1940s to the early 1950s) reaching retirement age and those born in the “baby boom echo” (from the late 1950s to the mid 1960s) approaching retirement age during the decade 2010 to 2020, the effect of people retiring from the workforce is the dominant factor in the overall requirement for labour. The size of these age cohorts and their increasing life expectancy is placing increasing financial pressure on pension provision by the state and private sector, which has led the UK government to increase the state pension age (more quickly for women than men, due to gender equality legislation), which will delay the retirement of some members of these cohorts. The abolition of the default retirement age of 65 may also lead some individuals (especially those whose pensions may be inadequate) to delay their retirement (although this will not be possible in more physically or emotionally demanding occupations). All these factors will mean that there will be some uncertainty around the estimates of replacement demand presented here.

While expansion demand is projected to increase by 1.6 million, replacement demand is expected to be nearly 8 times larger at 12.3 million, accounting for 89 per cent of the overall labour requirement between 2010 and 2020. Because of the need to replace workers who are retiring, there will be replacement demands in all SOC major groups, including those whose expansion demand is negative (i.e. where employment decline is projected), indicating that these occupations will still provide job opportunities for younger people. The pattern of replacement demands has strong similarities to that of expansion demand, and the large replacement demands for SOC major groups 1 to 3, 6 and 9 reflect the pattern of projected expansion demand. However, the age structure of employment will be an important influence, so that the highest replacement demands are for professionals, administrative and secretarial occupations and elementary occupations.

Replacement demand accounts for well over 80 per cent of the projected overall labour requirement over the decade 2010 to 2020 in all regions and nations of the UK. In London and the South West, replacement demand represents 84 per cent of the projected regional labour requirement, in the midlands it is around 90 per cent and it is above 90 per cent in northern England, reaching a maximum of 99 per cent in the North East. For Wales and Northern Ireland, the percentage is not as high, but for Scotland it is 95 per cent. The paradox is that the regions and nations where projected replacement demand is highest are those least likely to satisfy it because their older age structures mean there are relatively fewer young people in the working age population and they are less attractive to international migrants than the regions of southern England (though the Scottish Government has recognised the need to attract migrants and has pressed for a more relaxed approach to migration control than the UK policy in order to meet the labour needs of the Scottish economy).

The regional distribution of total projected replacement demand broadly reflects the population distribution of the UK. However, replacement demand for professional occupations and associate professional and technical occupations (and to a lesser extent managers, directors and senior officials) are disproportionately concentrated in London, indicating that the capital will continue to be a magnet for migrants from elsewhere in the UK and outside the UK seeking work in high-status occupations.

Table 6.14: Replacement Demand by Occupation and region, 2010-2020

a) expansion demand (000s)

Region	Occupational Group									
	1	2	3	4	5	6	7	8	9	all occs.
London	92	199	139	-84	-14	43	-10	-18	7	355
South East	100	123	82	-65	-45	57	-14	-14	27	250
East of England	61	74	52	-36	-22	34	10	-5	32	201
South West	60	89	57	-17	-14	23	3	-17	12	197
West Midlands	38	78	45	-19	-27	33	-3	-28	-7	109
East Midlands	36	49	27	-31	-14	32	11	-17	7	101
Yorks & the Humber	45	55	37	-25	-28	21	4	-29	-1	79
North West	39	60	35	-35	-36	37	-5	-29	21	87
North East	11	25	9	-17	-7	4	-5	-13	-3	4
England	482	752	484	-329	-206	283	-7	-170	95	1,383
Wales	18	35	18	-15	7	11	11	-13	-1	71
Scotland	31	58	35	-37	-24	13	-3	-26	3	51
Northern Ireland	13	24	13	-6	-8	6	1	-4	5	44
United Kingdom	544	869	551	-387	-230	313	2	-213	101	1,550

b) replacement demand (000s)

Region	Occupational Group									
	1	2	3	4	5	6	7	8	9	all occs.
London	235	464	324	226	145	126	116	83	162	1,882
South East	206	333	211	240	174	157	116	93	171	1,701
East of England	125	201	127	159	132	105	87	76	126	1,138
South West	116	186	113	141	133	108	84	63	103	1,046
West Midlands	96	177	111	151	129	103	73	81	100	1,021
East Midlands	91	141	87	111	97	92	65	73	85	842
Yorks & the Humber	98	161	100	145	121	98	86	89	99	995
North West	126	230	136	197	149	141	113	112	131	1,336
North East	38	82	48	66	58	43	46	36	46	462
England	1,132	1,974	1,258	1,435	1,136	972	786	705	1,022	10,422
Wales	47	93	51	70	73	54	46	43	61	539
Scotland	96	189	106	144	126	79	79	76	129	1,024
Northern Ireland	31	59	34	47	48	38	27	21	30	334
United Kingdom	1,306	2,315	1,450	1,695	1,383	1,144	938	845	1,243	12,319

c) overall requirement (000s)

Region	Occupational Group									
	1	2	3	4	5	6	7	8	9	all occs.
London	327	663	464	143	131	169	106	65	170	2,237
South East	306	456	293	175	129	214	103	78	197	1,951
East of England	186	275	180	123	110	140	97	71	158	1,339
South West	176	275	170	123	119	131	87	46	115	1,243
West Midlands	134	255	156	132	102	136	71	53	92	1,130
East Midlands	127	190	115	80	83	123	77	56	92	943
Yorks & the Humber	143	216	137	119	93	118	90	60	98	1,073
North West	165	290	171	162	113	178	108	83	152	1,422
North East	49	107	58	48	51	47	41	23	43	466
England	1,614	2,726	1,742	1,106	930	1,256	779	535	1,117	11,805
Wales	65	128	69	55	80	65	57	31	60	610
Scotland	127	247	142	107	102	92	76	50	132	1,075
Northern Ireland	44	83	47	41	40	44	28	17	35	379
United Kingdom	1,850	3,184	2,000	1,309	1,153	1,457	939	633	1,344	13,869

Source: CE/IER estimates, CE projections MDM revision 7146, (Regional Summary)

Occupational groups:

1 Managers, directors and senior officials
2 Professional occupations
3 Associate professional and technical
4 Administrative and secretarial
5 Skilled trades occupations
6 Caring, leisure and other service
7 Sales and customer service
8 Process, plant and machine operatives
9 Elementary occupations

6.8 Qualification Patterns within Countries and Regions of the UK

This section summarises the results of qualifications projections produced for each constituent country and English Region within the UK consistent with main *Working Futures* results. Details of how these estimates were produced can be found in Annex A, which summarises the approach used to develop projections of qualifications for those in employment.

The basic sources and methods used to produce the detailed spatial results for employment (workplace jobs) are as follows. LFS data are used to analyse the changing patterns of qualification profiles for each occupation within the relevant country or English region, separately by gender. Where no robust data are available the nearest equivalent is substituted.

These patterns are extrapolated forward and applied to the detailed occupational employment projections from *Working Futures.* The resulting numbers are then constrained to match the spatial qualification model for each country and region. It is these results which then provide the benchmark projections for the main *Working Futures* results.

Tables 6.15 and 6.16 summarise the results for workplace/jobs, comparing all the constituent countries and English regions within the UK.

Table 6.15: Projections of Qualifications by Region and Country - Employment (Workplace Jobs, 000s)

Cross-regional comparison of qualification structure (000s & % shares)

		QCF 0	QCF 1	QCF 2	QCF 3	QCF 4-6	QCF 7-8	total
UK	2010	2,762	4,822	6,010	6,446	7,583	2,835	30,458
	2020	2,078	5,315	5,888	5,204	8,858	4,664	32,008
% shares	2010	9.1	15.8	19.7	21.2	24.9	9.3	100.0
	2020	6.5	16.6	18.4	16.3	27.7	14.6	100.0
London	2010	392	705	698	755	1,397	729	4,676
	2020	332	773	635	503	1,650	1,139	5,031
% shares	2010	8.4	15.1	14.9	16.1	29.9	15.6	100.0
	2020	6.6	15.4	12.6	10.0	32.8	22.6	100.0
South East	2010	286	680	848	916	1,080	398	4,208
	2020	215	787	824	755	1,234	644	4,458
% shares	2010	6.8	16.2	20.2	21.8	25.7	9.4	100.0
	2020	4.8	17.7	18.5	16.9	27.7	14.4	100.0
East of England	2010	242	485	610	587	620	261	2,805
	2020	203	586	588	493	707	429	3,007
% shares	2010	8.6	17.3	21.8	20.9	22.1	9.3	100.0
	2020	6.8	19.5	19.6	16.4	23.5	14.3	100.0
South West	2010	166	405	548	597	635	218	2,568
	2020	105	486	560	523	719	371	2,765
% shares	2010	6.5	15.8	21.3	23.2	24.7	8.5	100.0
	2020	3.8	17.6	20.3	18.9	26.0	13.4	100.0
West Midlands	2010	258	463	548	536	553	169	2,527
	2020	198	462	543	456	665	311	2,636
% shares	2010	10.2	18.3	21.7	21.2	21.9	6.7	100.0
	2020	7.5	17.5	20.6	17.3	25.2	11.8	100.0
East Midlands	2010	199	344	457	477	457	148	2,083
	2020	133	396	440	402	581	232	2,184
% shares	2010	9.6	16.5	22.0	22.9	21.9	7.1	100.0
	2020	6.1	18.1	20.1	18.4	26.6	10.6	100.0
Yorkshire & the Humber	2010	243	437	512	559	521	186	2,456
	2020	144	464	549	453	603	322	2,535
% shares	2010	9.9	17.8	20.8	22.7	21.2	7.6	100.0
	2020	5.7	18.3	21.7	17.9	23.8	12.7	100.0
North West	2010	323	506	667	715	819	269	3,299
	2020	252	526	677	569	901	460	3,385
% shares	2010	9.8	15.3	20.2	21.7	24.8	8.2	100.0
	2020	7.4	15.5	20.0	16.8	26.6	13.6	100.0
North East	2010	120	170	268	272	238	84	1,152
	2020	66	170	261	223	289	147	1,157
% shares	2010	10.4	14.8	23.2	23.6	20.7	7.3	100.0
	2020	5.7	14.7	22.6	19.3	25.0	12.7	100.0
England	2010	2,229	4,196	5,156	5,413	6,320	2,461	25,775
	2020	1,649	4,650	5,078	4,378	7,349	4,055	27,158
% shares	2010	8.6	16.3	20.0	21.0	24.5	9.5	100.0
	2020	6.1	17.1	18.7	16.1	27.1	14.9	100.0
Wales	2010	130	200	272	258	352	117	1,330
	2020	99	200	270	240	393	199	1,401
% shares	2010	9.8	15.0	20.5	19.4	26.5	8.8	100.0
	2020	7.1	14.2	19.3	17.2	28.1	14.2	100.0
Scotland	2010	244	324	417	613	727	202	2,528
	2020	194	355	382	449	889	311	2,579
% shares	2010	9.6	12.8	16.5	24.3	28.8	8.0	100.0
	2020	7.5	13.8	14.8	17.4	34.5	12.1	100.0
Northern Ireland	2010	159	102	164	162	184	55	826
	2020	137	111	158	138	228	99	870
% shares	2010	19.2	12.4	19.9	19.6	22.3	6.7	100.0
	2020	15.7	12.7	18.2	15.8	26.2	11.4	100.0

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (TablesforDocuments.xlsx).
Notes: Numbers will not match raw LFS data. They exclude HM Forces and therefore differ slightly from Table 5.7.

Table 6.16: Projections of Qualifications Shares within Regions and Countries - Employment (Workplace Jobs)

		QCF 0	QCF 1	QCF 2	QCF 3	QCF 4-6	QCF 7-8	total
UK	2010	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	2020	100.0	100.0	100.0	100.0	100.0	100.0	100.0
London	2010	14.2	14.6	11.6	11.7	18.4	25.7	15.4
	2020	16.0	14.5	10.8	9.7	18.6	24.4	15.7
South East	2010	10.4	14.1	14.1	14.2	14.2	14.0	13.8
	2020	10.3	14.8	14.0	14.5	13.9	13.8	13.9
East of England	2010	8.8	10.1	10.2	9.1	8.2	9.2	9.2
	2020	9.8	11.0	10.0	9.5	8.0	9.2	9.4
South West	2010	6.0	8.4	9.1	9.3	8.4	7.7	8.4
	2020	5.1	9.1	9.5	10.1	8.1	8.0	8.6
West Midlands	2010	9.3	9.6	9.1	8.3	7.3	5.9	8.3
	2020	9.5	8.7	9.2	8.8	7.5	6.7	8.2
East Midlands	2010	7.2	7.1	7.6	7.4	6.0	5.2	6.8
	2020	4.8	8.2	7.3	6.2	7.7	8.2	7.2
Yorkshire & the Humber	2010	8.8	9.1	8.5	8.7	6.9	6.6	8.1
	2020	7.0	8.7	9.3	8.7	6.8	6.9	7.9
North West	2010	11.7	10.5	11.1	11.1	10.8	9.5	10.8
	2020	12.1	9.9	11.5	10.9	10.2	9.9	10.6
North East	2010	4.3	3.5	4.5	4.2	3.1	3.0	3.8
	2020	3.2	3.2	4.4	4.3	3.3	3.2	3.6
England	2010	80.7	87.0	85.8	84.0	83.3	86.8	84.6
	2020	79.3	87.5	86.2	84.1	83.0	86.9	84.8
Wales	2010	4.7	4.1	4.5	4.0	4.6	4.1	4.4
	2020	4.8	3.8	4.6	4.6	4.4	4.3	4.4
Scotland	2010	8.8	6.7	6.9	9.5	9.6	7.1	8.3
	2020	9.3	6.7	6.5	8.6	10.0	6.7	8.1
Northern Ireland	2010	5.7	2.1	2.7	2.5	2.4	1.9	2.7
	2020	6.6	2.1	2.7	2.6	2.6	2.1	2.7

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (TablesforDocuments.xlsx).
Note: Numbers will not match raw LFS data.

6.8.1 Benchmark Employment Projections by Country and English Region

Table 6.17 provides an overview of the qualification patterns in terms of **workplace jobs** within each of the countries and regions distinguished. The first sub-table shows corresponding results for the UK. These match the workplace jobs discussed in Chapter 3. The first section of each sub-table focuses upon numbers employed and the second section presents percentage shares and changes. As well as employment levels, the results also include replacement needs in the final column where these are added in to the projected change in levels to give so called expansion demands.[18]

The results are then repeated for each of the countries and regions in turn, beginning with the English regions. The results provide important insights into how both the structure of employment varies across the different spatial areas and how these patterns are expected to change over the next decade.

Patterns of employment by qualification vary considerably across the different parts of the UK. This is primarily driven by differences in their industrial and occupational employment structures. The employed workforce in London stands out as being rather better qualified at QCF levels 4+ than all other parts of the country. Scotland is also above average in this respect. London also has one of the lowest proportions with no formal qualifications. The results presented here are based on the assumption that qualification patterns are similar for those resident and those working in a geographical area. For most parts of the country the difference between the two is probably not very significant but this may be a more significant issue for London and its immediate neighbours. This is a topic for further research.

These patterns have been changing rapidly and are projected to continue to do so over the next decade. Without exception the countries and regions of the UK are expected to see rising shares of employment for those qualified at QCF levels 4+ and declines for those with no, or low (QCF level 1), qualifications. The position for those qualified at QCF levels 2 and 3 is less clear, not least because the focus here is on **highest qualification held**. Although increasing numbers and proportions of people are acquiring formal qualifications at QCF levels 2 and 3, many go on to obtain even higher qualifications. The net effect for the highest qualification held can in some cases fall as a consequence.

The replacement demand and total requirement estimates are based on the module and data used for the main *Working Futures* results. The LFS data, upon which the occupation specific qualification profiles for each industry or spatial area are based, can

[18] Expansion demands is somewhat of a misnomer since these can sometimes be negative when overall employment levels are falling.

be inadequate in certain respects. In particular, the sample sizes were not large enough to provide customised data for every occupation. When the qualification by occupation profiles used to generate the numbers contains a zero entry for a particular occupation, this is replaced by the nearest equivalent (e.g. the all industry or all region equivalent).

6.8.2 Concluding remarks on qualifications patterns by spatial area

There are some significant differences in qualification profiles across spatial areas. These are primarily driven by differences in their employment patterns by occupation and sector.

Nearly all spatial areas are projected to see significant improvements in average qualification levels, with increased proportions and numbers employed at QCF levels 4+ and reductions at levels 0 and 1.

Table 6.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region

United Kingdom					**000s**
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	2,835	1,828	4,664	1,147	2,975
QCF 4-6	7,583	1,275	8,858	3,067	4,342
QCF 3	6,446	-1,242	5,204	2,607	1,365
QCF 2	6,010	-122	5,888	2,431	2,309
QCF 1	4,822	493	5,315	1,950	2,444
No Qual	2,762	-683	2,078	1,117	433
Total	30,458	1,550	32,008	12,319	13,869
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.3	64.5	14.6	9.3	104.9
QCF 4-6	24.9	16.8	27.7	24.9	57.3
QCF 3	21.2	-19.3	16.3	21.2	21.2
QCF 2	19.7	-2.0	18.4	19.7	38.4
QCF 1	15.8	10.2	16.6	15.8	50.7
No Qual	9.1	-24.7	6.5	9.1	15.7
Total	100.0	5.1	100.0	100.0	45.5
N:\Projects\Working Futures\w orkbooks\[AllUK.xlsm]TableQ, c111					
London					**000s**
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	729	410	1,139	293	703
QCF 4-6	1,397	253	1,650	562	815
QCF 3	755	-252	503	304	52
QCF 2	698	-63	635	281	218
QCF 1	705	68	773	284	352
No Qual	392	-61	332	158	97
Total	4,676	355	5,031	1,882	2,237
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	15.6	56.3	22.6	15.6	96.5
QCF 4-6	29.9	18.1	32.8	29.9	58.3
QCF 3	16.1	-33.3	10.0	16.1	6.9
QCF 2	14.9	-9.1	12.6	14.9	31.2
QCF 1	15.1	9.6	15.4	15.1	49.9
No Qual	8.4	-15.4	6.6	8.4	24.8
Total	100.0	7.6	100.0	100.0	47.8
N:\Projects\Working Futures\w orkbooks\[AllLO.xlsm]TableQ, c111					

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (Allxx.xls Table Q)
Notes: Numbers will not match raw LFS data.

Table 6.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

South East					000s
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	398	246	644	161	407
QCF 4-6	1,080	154	1,234	437	590
QCF 3	916	-161	755	370	209
QCF 2	848	-24	824	343	318
QCF 1	680	107	787	275	382
No Qual	286	-71	215	116	44
Total	4,208	250	4,458	1,701	1,951
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.4	61.9	14.4	9.4	102.4
QCF 4-6	25.7	14.2	27.7	25.7	54.6
QCF 3	21.8	-17.6	16.9	21.8	22.8
QCF 2	20.2	-2.9	18.5	20.2	37.5
QCF 1	16.2	15.8	17.7	16.2	56.2
No Qual	6.8	-24.9	4.8	6.8	15.5
Total	100.0	5.9	100.0	100.0	46.4
N:\Projects\Working Futures\w orkbooks\[AllSE.xlsm]TableQ, c111					

East of England					000s
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	261	169	429	106	274
QCF 4-6	620	88	707	251	339
QCF 3	587	-94	493	238	144
QCF 2	610	-22	588	248	225
QCF 1	485	100	586	197	297
No Qual	242	-39	203	98	59
Total	2,805	201	3,007	1,138	1,339
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.3	64.7	14.3	9.3	105.2
QCF 4-6	22.1	14.1	23.5	22.1	54.7
QCF 3	20.9	-16.1	16.4	20.9	24.5
QCF 2	21.8	-3.6	19.6	21.8	36.9
QCF 1	17.3	20.6	19.5	17.3	61.2
No Qual	8.6	-16.0	6.8	8.6	24.6
Total	100.0	7.2	100.0	100.0	47.7
N:\Projects\Working Futures\w orkbooks\[AllEE.xlsm]TableQ, c111					

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (Allxx.xls Table Q)
Notes: Numbers will not match raw LFS data.

Table 6.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

South West					000s
Total QCF group	Base year level 2010	Change 2010 - 2020	Projected level 2020	Replacement Demand	Total requirement 2010 - 2020
QCF 7-8	218	153	371	89	242
QCF 4-6	635	84	719	259	342
QCF 3	597	-73	523	243	170
QCF 2	548	12	560	223	235
QCF 1	405	81	486	165	246
No Qual	166	-60	105	67	7
Total	2,568	197	2,765	1,046	1,243
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.5	70.1	13.4	8.5	110.8
QCF 4-6	24.7	13.2	26.0	24.7	53.9
QCF 3	23.2	-12.2	18.9	23.2	28.5
QCF 2	21.3	2.2	20.3	21.3	42.9
QCF 1	15.8	20.0	17.6	15.8	60.8
No Qual	6.5	-36.3	3.8	6.5	4.4
Total	100.0	7.7	100.0	100.0	48.4
N:\Projects\Working Futures\workbooks\[AllSW.xlsm]TableQ, c111					

West Midlands					000s
Total QCF group	Base year level 2010	Change 2010 - 2020	Projected level 2020	Replacement Demand	Total requirement 2010 - 2020
QCF 7-8	169	143	311	68	211
QCF 4-6	553	113	665	223	336
QCF 3	536	-80	456	217	136
QCF 2	548	-5	543	222	217
QCF 1	463	-2	462	187	186
No Qual	258	-59	198	104	45
Total	2,527	109	2,636	1,021	1,130
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	6.7	84.7	11.8	6.7	125.1
QCF 4-6	21.9	20.4	25.2	21.9	60.8
QCF 3	21.2	-15.0	17.3	21.2	25.4
QCF 2	21.7	-0.9	20.6	21.7	39.5
QCF 1	18.3	-0.4	17.5	18.3	40.0
No Qual	10.2	-23.0	7.5	10.2	17.4
Total	100.0	4.3	100.0	100.0	44.7
N:\Projects\Working Futures\workbooks\[AllWM.xlsm]TableQ, c111					

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (Allxx.xls Table Q)
Notes: Numbers will not match raw LFS data.

Table 6.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

East Midlands					000s
Total QCF group	Base year level 2010	Change 2010 - 2020	Projected level 2020	Replacement Demand	Total requirement 2010 - 2020
QCF 7-8	148	83	232	60	143
QCF 4-6	457	124	581	185	309
QCF 3	477	-75	402	193	118
QCF 2	457	-17	440	185	167
QCF 1	344	52	396	139	191
No Qual	199	-66	133	80	15
Total	2,083	101	2,184	842	943
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	7.1	56.3	10.6	7.1	96.7
QCF 4-6	21.9	27.2	26.6	21.9	67.6
QCF 3	22.9	-15.7	18.4	22.9	24.7
QCF 2	22.0	-3.8	20.1	22.0	36.6
QCF 1	16.5	15.0	18.1	16.5	55.4
No Qual	9.6	-33.1	6.1	9.6	7.4
Total	100.0	4.8	100.0	100.0	45.3
N:\Projects\Working Futures\workbooks\[AllEM.xlsm]TableQ, c111					
Yorkshire & Humberside					**000s**
Total QCF group	Base year level 2010	Change 2010 - 2020	Projected level 2020	Replacement Demand	Total requirement 2010 - 2020
QCF 7-8	186	136	322	75	211
QCF 4-6	521	82	603	211	293
QCF 3	559	-106	453	226	121
QCF 2	512	38	549	207	245
QCF 1	437	27	464	177	204
No Qual	243	-98	144	98	0
Total	2,456	79	2,535	995	1,073
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	7.6	73.0	12.7	7.6	113.5
QCF 4-6	21.2	15.8	23.8	21.2	56.2
QCF 3	22.7	-18.9	17.9	22.7	21.6
QCF 2	20.8	7.4	21.7	20.8	47.9
QCF 1	17.8	6.2	18.3	17.8	46.7
No Qual	9.9	-40.5	5.7	9.9	0.0
Total	100.0	3.2	100.0	100.0	43.7
N:\Projects\Working Futures\workbooks\[AllYH.xlsm]TableQ, c111					

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (Allxx.xls Table Q)
Notes: Numbers will not match raw LFS data.

Table 6.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

North West					000s
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	269	191	460	109	300
QCF 4-6	819	81	901	332	413
QCF 3	715	-146	569	289	143
QCF 2	667	11	677	270	281
QCF 1	506	21	526	205	225
No Qual	323	-71	252	131	59
Total	3,299	87	3,385	1,336	1,422
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.2	71.2	13.6	8.2	111.7
QCF 4-6	24.8	9.9	26.6	24.8	50.4
QCF 3	21.7	-20.4	16.8	21.7	20.1
QCF 2	20.2	1.6	20.0	20.2	42.1
QCF 1	15.3	4.1	15.5	15.3	44.6
No Qual	9.8	-22.1	7.4	9.8	18.4
Total	100.0	2.6	100.0	100.0	43.1
N:\Projects\Working Futures\workbooks\[AllNW.xlsm]TableQ, c111					

North East					000s
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	84,079	63,100	147,179	33,731	96,831
QCF 4-6	238,397	50,788	289,185	95,641	146,429
QCF 3	271,749	-48,473	223,275	109,021	60,548
QCF 2	267,886	-6,884	261,002	107,472	100,588
QCF 1	170,245	161	170,406	68,299	68,461
No Qual	120,101	-54,554	65,547	48,183	-6,371
Total	1,152,457	4,138	1,156,595	462,347	466,485
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	7.3	75.0	12.7	7.3	115.2
QCF 4-6	20.7	21.3	25.0	20.7	61.4
QCF 3	23.6	-17.8	19.3	23.6	22.3
QCF 2	23.2	-2.6	22.6	23.2	37.5
QCF 1	14.8	0.1	14.7	14.8	40.2
No Qual	10.4	-45.4	5.7	10.4	-5.3
Total	100.0	0.4	100.0	100.0	40.5
N:\Projects\Working Futures\workbooks\[AllNE.xlsm]TableQ, c111					

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (Allxx.xls Table Q)
Notes: Numbers will not match raw LFS data.

Table 6.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

England					000s
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	2,461	1,594	4,055	995	2,589
QCF 4-6	6,320	1,029	7,349	2,555	3,584
QCF 3	5,413	-1,035	4,378	2,189	1,153
QCF 2	5,156	-78	5,078	2,085	2,007
QCF 1	4,196	454	4,650	1,696	2,151
No Qual	2,229	-580	1,649	901	321
Total	25,775	1,383	27,158	10,422	11,805
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.5	64.8	14.9	9.5	105.2
QCF 4-6	24.5	16.3	27.1	24.5	56.7
QCF 3	21.0	-19.1	16.1	21.0	21.3
QCF 2	20.0	-1.5	18.7	20.0	38.9
QCF 1	16.3	10.8	17.1	16.3	51.3
No Qual	8.6	-26.0	6.1	8.6	14.4
Total	100.0	5.4	100.0	100.0	45.8
N:\Projects\Working Futures\w orkbooks\[AllEN.xlsm]TableQ, c111					
Wales					**000s**
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	117	82	199	47	129
QCF 4-6	352	41	393	143	184
QCF 3	258	-18	240	105	87
QCF 2	272	-2	270	110	108
QCF 1	200	-1	200	81	81
No Qual	130	-31	99	53	22
Total	1,330	71	1,401	539	610
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.8	70.0	14.2	8.8	110.5
QCF 4-6	26.5	11.7	28.1	26.5	52.2
QCF 3	19.4	-6.9	17.2	19.4	33.6
QCF 2	20.5	-0.7	19.3	20.5	39.8
QCF 1	15.0	-0.3	14.2	15.0	40.2
No Qual	9.8	-23.9	7.1	9.8	16.6
Total	100.0	5.4	100.0	100.0	45.9
N:\Projects\Working Futures\w orkbooks\[AllWA.xlsm]TableQ, c111					

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (Allxx.xls Table Q)
Notes: Numbers will not match raw LFS data.

Table 6.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

Scotland					000s
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	202	109	311	82	191
QCF 4-6	727	162	889	295	456
QCF 3	613	-165	449	248	84
QCF 2	417	-35	382	169	134
QCF 1	324	31	355	131	162
No Qual	244	-50	194	99	49
Total	2,528	51	2,579	1,024	1,075
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.0	53.6	12.1	8.0	94.1
QCF 4-6	28.8	22.2	34.5	28.8	62.7
QCF 3	24.3	-26.8	17.4	24.3	13.7
QCF 2	16.5	-8.5	14.8	16.5	32.0
QCF 1	12.8	9.5	13.8	12.8	50.0
No Qual	9.6	-20.5	7.5	9.6	20.0
Total	100.0	2.0	100.0	100.0	42.5
N:\Projects\Working Futures\w orkbooks\[AllSC.xlsm]TableQ, c111					
Northern Ireland					**000s**
Total QCF group	**Base year level 2010**	**Change 2010 - 2020**	**Projected level 2020**	**Replacement Demand**	**Total requirement 2010 - 2020**
QCF 7-8	55	44	99	22	66
QCF 4-6	184	44	228	74	118
QCF 3	162	-24	138	65	41
QCF 2	164	-6	158	67	61
QCF 1	102	9	111	41	50
No Qual	159	-22	137	64	42
Total	826	44	870	334	379
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	6.7	79.8	11.4	6.7	120.3
QCF 4-6	22.3	23.7	26.2	22.3	64.2
QCF 3	19.6	-14.8	15.8	19.6	25.7
QCF 2	19.9	-3.6	18.2	19.9	36.9
QCF 1	12.4	8.4	12.7	12.4	48.9
No Qual	19.2	-13.9	15.7	19.2	26.6
Total	100.0	5.4	100.0	100.0	45.9
N:\Projects\Working Futures\w orkbooks\[AllNI.xlsm]TableQ, c111					

Source: IER estimates based on LFS data, constrained to match *Working Futures* estimates.MDM revision 7146, (Allxx.xls Table Q)
Notes: Numbers will not match raw LFS data.

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Annex A: Sources and Methods

A.1 Introduction

The prime focus of the project is to develop quantitative projections, concentrating on anticipating changing skill needs, in the context of changes in general economic conditions. World-wide experience in these matters suggests that quantitative occupational projections should be based on the results from a detailed multi-sectoral macroeconomic model (for a review see Wilson *et al.* (2004b)). 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.

A.2 Providing the sectoral and spatial detail required

As in the previous *Working Futures* projections, the UK Commission and its partners are interested in obtaining results at a detailed sectoral and geographical level. There are various technical and methodological issues that constrain what can be done. The methods used here build on those developed in previous exercises. These include some important confidentiality issues regarding the release of such information into the public domain, which also need to be carefully considered.

In order to meet the remit specified for previous *Working Futures*, IER/CE developed a detailed employment database covering all the main employment dimensions. This was based on the 41 SIC (2003) based categories used in the CE multi-sectoral macroeconomic model RMDM. These were cross-classified by the 25 sub-major occupational groups of SOC2000, and by the 12 nations and regions of the UK, plus gender and status. This database has been developed over many years and is as consistent as possible with all the official published sources upon which it is based.[19,20] This database was extended to cover 67 SIC2-digit categories in order to meet the requirements specified in the *Working Futures* 2004-2014.

There are considerable technical problems and constraints in building a database to cover such a detailed breakdown of sectors and local areas. Taking all these dimensions in combination implies that the database required for *Working Futures* needs to cover over

[19] Complete consistency is not possible since the various official sources are themselves inconsistent, not least because some (but not all) are subsequently revised and updated by ONS.

[20] ONS have not, until very recently, published consistent time series information, cross-classified by region at the level of detail required for this exercise. However, it is possible to generate estimates by using the information ONS/BIS are prepared to publish. While not strictly precise in a statistical sense, such estimates can provide useful information and intelligence to users about detailed employment trends. The current employment estimates reflect the latest ABI and LFS data available.

120,000 separate time series on employment alone.[21] This poses problems of validation and quality assurance as discussed below.

A.3 Using the latest SIC and SOC categories

It is important that models and results are structured around classifications which are both commonly used and appropriate in characterising the economy. It is also necessary that the models are founded on sound data, which in the context of economic models such as RMDM means the availability of robust time-series data on which to estimate model parameters. These two factors are often in tension, especially when classifications change. This problem has been faced many times by the CE/IER team over the past 30 years and has been dealt with successfully. However, the move to SIC2007 represents a more fundamental change in the classification of industries than some of the previous revisions.

Employment data for the regions have now been published on SIC2007, and consistent historical data are now available. However, economic data for the UK and the regions published in the UK National and Regional Accounts were not expected to become available in SIC2007 until autumn 2011.

This posed two issues:

- how to incorporate the latest employment data which is on SIC2007;
- whether, or not, to reconfigure the results to SIC2007 definitions.

Following detailed discussion with UKCES it was agreed to utilise the latest employment estimates (classified using SIC2007) and to extend and convert the old SIC2003 based time series, including projections of employment and associated output on this basis. In order to "future proof" the results as far as possible, they have been therefore been reworked and presented using the latest classifications for Industries (SIC2007)

The reworking of the database was a substantial task that involved translating all the historical data on output, productivity and employment on to that basis. This makes comparisons with any future *Working Futures* results more straightforward, since these will be based upon such data. However, it complicates comparisons with previous *Working Futures* results which were based on SIC1992/2003 categories.

As with SIC, the UK Commission also required that the occupational data be translated on to the latest SOC2010 classification. IER have been working with ONS on developing the new SOC2010 classification which is to be used for all official data from 2011. This brings the UK system of classification more into line with that in other countries, including reclassifying many middle order managers into other occupations. IER have access to historical data reclassified on to the new system which has been used to translate both historical and projected series on to the new classification.

This process results in set of data for 79 industries as set out in Tables A.1, A.2 and A.3 and 25 occupations as defined in Table A.4. These data are also cross classified by gender and

[21] That is: Sector (67) * occupation (25) * geographical area (12) * gender/status (6) = 120,600 separate time series.

status and for 12 spatial areas. Further disaggregation by 6 broad qualification levels is also made. This results in over 850,000 time series to be analysed and projected.[22]

Working Futures adopts the new SOC2010 occupational classification. This classification system has recently replaced SOC2000 (and will be used to classify occupations for the 2011 Census and other official data).Full details on the UK SOC2010 can be obtained from the ONS at: http://www.ons.gov.uk/about-statistics/classifications/current/soc2010/index.html

The structure of UK-SOC2010 comprises nine major groups, 25 sub-major groups, 90 minor groups and 369 unit groups. The major and sub-major groups, and associated skill level specialisations are presented in Table A.4. As can be seen, the skill specialisation criterion is used to distinguish groups of occupations within each skill level.

[22] That is 79 industries*25 occupations*6 gender /status categories*6 qualification levels* 12 spatial areas.

Box A.1: UK-SOC2010 Classification

Jobs are classified into groups according to the concept of 'skill level' and 'skill specialisation'. As in SOC2000 and its predecessor SOC90, skill level is defined with respect to the duration of training and/or work experience recognised in the field of employment concerned as being normally required in order to perform the activities related to a job in a competent and efficient manner.

Skill specialisation is defined as the field of knowledge required for competent, thorough and efficient conduct of the tasks. In some areas of the classification it refers also to the type of work performed (for example materials worked with, tools used).

Skill levels are approximated by the length of time deemed necessary for a person to become fully competent in the performance of the tasks associated with a job. This, in turn, is a function of the time taken to gain necessary formal qualifications or the required amount of work-based training. Apart from formal training and qualifications, some tasks require varying types of experience, possibly in other tasks, for competence to be acquired. Within the broad structure of the classification major groups and sub-major groups reference can be made to these four skill levels:

- The first skill level equates with the competence associated with a general education, usually acquired by the time a person completes his/her compulsory education and signalled via a satisfactory set of school-leaving examination grades. Competent performance of jobs classified at this level will also involve knowledge of appropriate health and safety regulations and may require short periods of work-related training. Examples of occupations defined at this skill level within the SOC2010 include postal workers, hotel porters, cleaners and catering assistants
- The second skill level covers a large group of occupations, all of which require the knowledge provided via a good general education as for occupations at the first skill level, but which typically have a longer period of work-related training or work experience. Occupations classified at this level include machine operation, driving, caring occupations, retailing, and clerical and secretarial occupations.
- The third skill level applies to occupations that normally require a body of knowledge associated with a period of post-compulsory education but not normally to degree level. A number of technical occupations fall into this category, as do a variety of trades occupations and proprietors of small businesses. In the latter case, educational qualifications at sub-degree level or a lengthy period of vocational training may not be a necessary prerequisite for competent performance of tasks, but a significant period of work experience is typical.
- The fourth skill level relates to what are termed 'professional' occupations and high level managerial positions in corporate enterprises or national/local government. Occupations at this level normally require a degree or equivalent period of relevant work experience.

Source: *http://www.ons.gov.uk/about-statistics/classifications/current/soc2010/soc2010-volume-1-structure-and-descriptions-of-unit-groups/index.html*

A.4 Limitations of the database, statistical reliability and confidentiality

Having established a very detailed employment database it is important to appreciate its limitations.[23] 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 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 series.

IER/CE have also provided a limited set of projections for a small number of sub-regions. The aim in constructing the data series at this level is to provide a useful benchmark for consideration at a more disaggregated level rather than a fully thought out, local level forecast for each local area and detailed sector.[24]

It is also essential to recognise that it is not possible to put all of this information into the public domain because of confidentiality problems. Doing so could fall foul of the terms of the 1948 Statistics of Trade Act, which prohibits publicly collected data being disseminated in such a manner as to enable the identification of individual enterprises or individuals.

Presenting detailed historical and projected data in a 'free access' fashion also raise a number of important additional issues for the UK Commission, in addition to the confidentiality ones. The reliability of historical and projected data inevitably declines with greater sectoral and spatial disaggregation, and is certainly even less reliable in terms of levels for output data than for employment data.

This need not inhibit the presentation of the most detailed information, complete with the appropriate caveats, to the target group of users that the UK Commission is concerned to primarily inform (although as in the previous *Working Futures* results, steps have to be taken to ensure confidentiality constraints are not breached). These steps involve ensuring that all users are fully aware of their responsibilities and, in particular sign up for an appropriate Chancellor of the Exchequers' Notice. This has been organised as for previous *Working Futures*, with users registering first with IER, and then block applications being submitted to ONS. Users interested in access these data should contact UKCES.

[23] These concerns are of even greater concern at a sub-regional level such as 'city regions' or LEP areas.

[24] Local users and commentators may be in a position to develop more customised projections, taking into account local circumstances and focussing on issues such as sustainable communities, local growth hot spots and major public sector interventions. It is possible to facilitate this by providing software packages that enable users to develop their own locally customised scenarios. Such software, based on the well established Local Economy Forecast Model, can be supplied at additional cost if required. A number of the former LLSCs and others took up this option based on the previous *Working Futures* results.

A.5 The multi-sectoral macroeconomic model

The demand for labour is a derived demand. It depends critically on developments in the markets for goods and services and the technologies used to produce them. Therefore, in order to assess the prospects for the changing pattern of demand for skills, it is essential to ground the analysis on a foundation and understanding of the key economic factors influencing the economy and its structure. To do this a multi-sectoral macroeconomic model is required.

The cornerstone of the projections is CE's Multi-regional Multi-sectoral Dynamic Model (RMDM) of the UK economy. RMDM is used to generate estimates of output, productivity and employment for all the main industrial sectors in the UK and its regions. The sectoral output forecasts are based on an integrated, one-model approach in which the detailed industry and 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 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 regional demand for goods and services. 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 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.

The use of RMDM ensures that, by industry and region, productivity over the forecast period reflects changes in the economy that are not based simply on past trends. Productivity is determined by a complex set of behavioural and technical relationships. These are captured in the model by a set of econometric relationships between 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 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 is built around an input-output model, which means that the relationships between different parts of the economy are taken into account. The present results provide a consistent and systematic benchmark view for on-going debate and policy deliberations and the planning of future skills provision. They reflect, in a manner which more partial approaches cannot, how individual sector developments “fit together” into an overall economy wide picture.

As well as macroeconomic factors, the model also deals with other important issues, such as sub-contracting and technological changes, that have been important features of much recent structural change. *Working Futures* therefore sets out a carefully considered view of what the future might look like. It is not intended to be prescriptive.

RMDM solves as a single system in which macroeconomic results are built up from the more detailed results at sectoral and 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 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 use of the macroeconomic model, which is built around a full input-output matrix, provides a sound foundation for assessing industrial employment prospects. In particular, it deals explicitly with such important issues as sub-contracting and technological change which have been features of much recent structural change. These phenomena are dealt with in the model by changes in the pattern of purchases by one industry from another, as reflected in the input-output matrix and by the technical relationship between sectoral employment and output.

In order to meet the needs of all users, the present analysis is at a very detailed level, exploiting the 41 industries used in RMDM, which are defined by reference to the availability of data on input-output flows. To meet the needs of sectoral users all the two-digit categories of the 2003 Standard Industrial Classification (SIC2003) have been distinguished, as well as some other, more detailed categories, resulting in 67 industries in total. The results on output and employment have then been translated on to a SIC2007 basis for reporting.

Further information about data sources and methods is presented in Annex A of the present document and in greater detail in the separate Technical Report.

A.6 Regional and Sub-regional Projections

The Government's policies of 'localism' and the 'Big Society', and the announcement of the abolition of Regional Development Agencies and the Government Offices for the Regions in England, mean that there is less explicit policy focus on the regional level than was the case formerly. With 'localism' there is increased emphasis on sub-regional geographies, encompassing both local neighbourhoods and 'natural economic geographies'. The July 2010 invitation from BIS and CLG to local authority leaders and business leaders in England to submit proposals for Local Enterprise Partnerships (LEPs) highlighted a preference for 'functional economic areas', rather than 'artificial' boundaries.

In recognition of the importance of provision of economic and labour market intelligence to the nascent LEPs, which the Government sees as playing a crucial role in rebalancing the economy towards the private sector, *Working Futures* projections for 2010-2020 have also been developed for five sub-regional functional economic areas (selected in conjunction with the UK Commission). These include city-region scale units which are mainly metropolitan in nature, as well as some more rural sub-regions. The purpose of this is not only to provide projections for these sub-regional areas, but also to demonstrate the scope for production of projections at a flexible sub-regional scale across the board.

The main emphasis at the spatial level is on the regions and devolved nations of the UK. Despite a renewed focus on sub-regional geographies there is recognition of a continuing need for overarching regional level information. Moreover, as stated above, regions still have a fundamental position in the sub-national statistical architecture.

A.7 Occupational Projections including replacement demands

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. The estimates also include replacement needs. These take into account the need to replace those who leave their jobs because of retirement or other reasons. Replacement demands need to be added to any structural change (or so called expansion demand or decline) that is projected, in order to obtain an estimate of the overall requirement. The Replacement Demand estimates are based on quite limited data on age structures and flow rates from the LFS. They should be regarded as indicative rather than precise indications of the likely scale of replacement demands.

Estimates of occupational employment within industries are produced by linking the sectoral employment results to the IER's occupational and regional models. These models are based on research about the factors expected to influence occupational structure at sectoral level (Briscoe and Wilson, 2003). IER had already developed a database for *Working Futures 2007-2017*. This database comprised a consistent set of SOC2000 categories and reflects a substantial investment in time and effort to convert data from previous Censuses and

surveys on to the SOC2000 classification. As outlined above, this has now been extended on to a SOC2010 basis using detailed converters developed by IER in collaboration with ONS.[25]

The database provides breakdowns to the sector level used within RMDM. This has been extended to cover the more detailed 79 industry categories based on SIC2007. Using these data, it is feasible to generate industry by occupation employment matrices at the most detailed level (by the 79 sectors, 25 SOC2010 sub major groups, gender, status and region / country). These estimates are constrained to match published totals using a complex RAS iterative procedure to ensure that everything still adds up to the target totals by sector, occupation, region, *etc.*[26]

Estimates of replacement demands have been a key feature of IER occupational projections for many years. The projected net change in employment (expansion demand) tells only a part of the story in terms of future skill requirements. It is crucial to recognise that there will be job openings and important education and training requirements for many occupations where employment levels are expected to fall. These arise because of the need to 'replace' the existing skills that will be 'lost' as a result of retirements and other aspects of the normal process of labour turnover. The scale of replacement demand typically outstrips the scale of expansion demand by a considerable margin (in both the previous *Working Futures* projections by an order of magnitude). This varies across occupations and sectors but even where substantial job losses are projected the replacement demand elements are usually more than sufficient to offset this. It is essential, therefore, for employers, education and training providers, and public agencies to recognise the different characteristics and requirements of these two different components of future skill needs.

The various elements of replacement demand depend upon the rates of flows from employment due to factors such as retirement and occupational and geographical mobility. The main source of information that has been used to generate replacement demand estimates is the LFS. This includes estimates of the various flows in and out of the labour market, as well as information on age structure. While, however, this can provide useful information across all sectors and regions combined, its sample size is inadequate to provide specific data for particular sectors and regions at a detailed level. There are real problems in obtaining estimates differentiated by all the various dimensions that UK Commission and its partners are interested in, 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.

Replacement demand (RD) estimates are sensitive to the precise assumptions made about the age structure of the workforce concerned and the rates of flows. These are likely to vary considerably across the various key dimensions but in a manner that is not very robustly

[25] Professor Peter Elias of IER has played a leading role in the development of SOC2000 and SOC2010.

[26] RAS is an iterative technique designed to ensure that the row and column sums of a two-dimensional array match some target totals. It has been extended by IER to deal with multi-dimensional arrays. This is not a trivial problem. The present software used by IER to generate a consistent database runs to thousands of lines of complex computer code. This was substantially extended to meet the new requirements of *Working Futures* 3.

measured in available statistics. In order to recognise this, as in the previous *Working Futures*, a set of benchmark projections are developed which recognise the importance of RD issues, and which set out clearly and transparently the assumptions upon which they are based, combined with the facility for interested users to develop their own alternative views (if they so wish).

Such numbers are provided to users on a *caveat emptor* basis. Further customisation is possible if users have specific information for that particular case. This is facilitated by providing users of the results with a module that generates RD estimates using a standard set of assumptions but which allows the user to substitute their own alternatives.

Separate estimates of the key assumptions have been made available by sector or by spatial area. Using such information users can assess the sensitivity of outcomes to variations in such assumptions. This will be at the expense of such estimates no longer summing to the published benchmark aggregate figures.

A.8 Labour and Skill Supply Projections

There are many conceptual difficulties in modelling labour supply by level of skill. Most occupations are undertaken by people with a bewildering range of formal qualifications. This is partly a function of age, with older workers generally relying more upon experience than formal qualifications. Even allowing for the age factor, there are enormous differences. This makes defining the supply of people into an occupation almost impossible. It is possible to identify some key elements, focussing on the flows of people through the education and training system, but boundaries are too blurred and transitory to enable quantitative modelling. Much the same is true for the concept of supply of labour to a sector.

For these reasons, the development of supply estimates and projections by occupation and/or sector are not regarded as a practicable proposition. As in previous *Working Futures* exercises, the approach adopted is to focus on general projections of population and overall labour supply (those economically active) by gender for each geographical area, and to then disaggregated these by the highest levels of qualification held using stock flow modelling and other techniques.

The project updates the previous projections using the methodologies developed in previous *Working Futures* exercises. The first step was to produce projections of economic activity rates, labour supply and unemployment, for each of the countries and English regions within the UK. The projections provided focus upon total labour supply by gender and broad age group. These reflect the move to 16-64 as the new official working age definition.

Labour supply projections are developed for the geographical areas detailed above and include:

i. total population;
ii. population aged 16 and over;
iii. working age population;
iv. labour force;
v. workforce;
vi. ILO unemployment;
vii. claimant unemployment;
viii. employed residents;
ix. workplace employment;
x. labour market residual.

A set of stochastic behavioural equations to forecast economic activity rates by region and age-band/gender has been incorporated into RMDM. These include a number of explanatory variables including unemployment. These are generally 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 region is incorporated (notably, how tight the labour market is, and how expensive it is to live there). The equations are estimated across regions, since that is where the variation is largest.

The specification of the equations draws upon earlier econometric work that IER undertook on behalf of DfEE (which underlies the systems currently used to construct the official projections of economic activity rates). The remainder of 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. regional labour force is determined by activity rates multiplied by working-age population;
iii. 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. regional unemployment (ILO) = is determined from regional unemployment (claimant count);
v. the Labour Force Survey measure of employment is determined from regional labour force minus 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 net commuting which results from people travelling from their place of residence, across regional boundaries to their place of work.

In RMDM, total working-age population for each region is determined by the natural increase in working-age population plus net working-age migration. 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 region to the outside world and vice versa. The explanatory variables used include a measure of 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.

The analysis described above provides projections of labour supply, for each of the countries and regions of the UK, by gender. The modelling work is undertaken by detailed age-band[27] so also delivers projections disaggregated by age-band.

With regard to qualifications held by the workforce, IER has built up considerable experience of working with the qualification data available in the LFS, including work for Dearing, Leitch and the UK Commission. While a number of different approaches can be adopted to modelling qualifications, the present approach is intentionally pragmatic and eclectic, making the most of the limited data available.

The results are internally consistent at the different levels of aggregation, and the modelling of the supply side, in particular, is complementary to the qualifications modelling previously carried out by the UK Commission. It builds on the models already developed for *Working Futures 2004-2014* and for other work, focussing upon both demand and supply. The present exercise focuses on the highest level of qualification held, as defined in previous work for the Treasury and in the modelling undertaken for the UK Commission.

The "supply of qualifications" focuses on the future flows of individuals in the population with different qualification levels (based upon the new Qualifications Credit Framework (which replaces the old National Qualifications Framework), [28] using a stock flow / pseudo cohort modelling approach. An important distinction between the qualification results presented here and those developed previously for the UK Commission as part of its annual assessment of employment and skills (e.g. *Ambition 2020: the 2010 Report*) is that the present work also considers the "demand side". This generates estimates and projections of employment, unemployment and inactivity rates by level of qualification, as well as the distribution of employment by sector, occupation and region.

This distinction between supply and demand is somewhat artificial, as the observed outcomes are the result of a combination of both demand and supply influences. The flow of individuals through qualification levels depends upon perceptions of current and future employment opportunities and wage rates. Likewise, employment by qualification is the outcome of the interaction between supply and demand.

Modelling was attempted using both a stock flow model (STOCKFLOW), and a more simplistic approach based on extrapolation of trends in stocks (**National model**). The former

[27] The age-bands distinguished are 0-15, 16-24, 25-34, 35-44, 45-59, 60-64, 65+.
[28] For details of the National Qualifications Framework see: www.qcda.gov.uk/resources/assets/qca-06-2298-nqf-web.pdf.

distinguishes year of age, incorporating information inflows of newly qualified people and losses due to mortality retirement, *etc*, as reflected in LFS data, Inflows by qualification level are modelled using pseudo-cohort data from the LFS at the level of the UK. The results are then linked to the latest ONS (GAD) projections of the population and projections of the labour force by age and gender, as set out above.

Comparisons were made between the results of this analysis and those based on the **National model** – a time series extrapolative approach (similar to models developed in earlier work by the authors for the Treasury (as part of the Leitch Review) and for the UK Commission). On balance the **National model** is preferred as giving more robust results. The STOCKFLOW model although conceptually superior, appears to underestimate to possibilities for qualification acquisition for older people.

While the **National model** assumes that the net effects of migration are neutral in terms of skills, this is an important issue which is explored in some detail. Separate results are produced for men and women, as well as all individuals combined (the latter can be useful where the cell sizes are small by gender).

Given that the data for Northern Ireland and, to a slightly lesser extent, Wales are subject to small sample size problems, results for the four nation states have been produced by disaggregation of the UK projections at broader age groups than for the UK as a whole. Further disaggregation of the results is made to regional level, for example, apportioning the results for England to the *regions of residence*.[29] This is done by broad age group (rather than individual year of age), but small sample sizes for some regions pose problems for many of these more detailed results.

A **regional qualification model,** produces equivalent regional results for employment (including results all for the individual countries and regions within the UK). This model focuses upon the shares of the employed population who are qualified to various levels. It uses a probabilistic approach (mprobit or mlogit) to modelling these shares which ensures that the estimates (and projected shares) sum to 100 per cent. It covers the following main dimensions: country/region (12); gender (2); qualification level (6). The results are constrained to sum to the UK total from the national model.

The **demand side** results are generated through the macro model, which gives benchmark information on future employment prospects by occupation. Occupation is one of the main drivers of changing patterns of employment by qualification, as different occupations tend to have very different requirements (e.g. most professional occupations require higher level qualifications as a matter of course, etc). In addition there are often significant trends in these patterns within each occupational category which can be modelled and exploited to generate projections. The aggregate employment projections are then further disaggregated by a series of sub-models.

The **occupational/qualification shares model**, (QUALSHARE) develops projections of qualification shares within occupations.

[29] Note that the regional breakdown of the supply side is potentially more disaggregated than on the demand side.

In order to reconcile the supply and demand sides, a **sorting algorithm *(SORT)*** then sorts people into occupations such that the various results from the different parts of the modelling exercise are made consistent. In particular, this model is designed to reconcile the projections from the **National** model with those from QUALSHARE. The former can be regarded as essentially a view of supply side developments (the overall numbers of people acquiring qualifications), while the latter is more concerned with which occupations they end up in. The SORT model uses an iterative RAS procedure to reconcile the two sets of estimates, constraining the overall qualification shares from QUALSHARE to match those from STOCKFLOW, while maintaining the patterns of occupational deployment in QUALSHARE. The constraint is imposed at the 2- digit occupational level. The key dimensions are: occupations (25); gender (2); qualification levels (6). SORT operates at a UK level.

Finally, there is an extended **replacement demand module,** which generates estimates of qualification numbers for detailed industries and geographical areas. This final module provides the mechanism whereby the implications for individual sectors and regions are developed, focussing on replacement needs. The overall results from this module are calibrated to match the main results from the benchmark projections for the UK and its constituent countries and regions which emerge from SORT and REGQUAL. Data and parameters are provided for individual sectors and regions which enable customised projections for these categories to be developed. These include aggregate qualification and age profiles for individual sectors and regions (but not cross-classified). While data limitations mean that it is not possible to ensure that these results are consistent in every respect with those from the national results, they provide reasonably robust and consistent implications at the more detailed regional and sectoral level. The key dimensions covered are: occupations (25); gender (2); qualification levels (6); regions (25); sectors (22).

A.9 Workbooks and access to detailed results

A set of detailed Workbooks have been prepared consistent with those produced for previous *Working Futures* exercises. The detailed format of the Workbooks is broadly similar to that used previously, the main changes reflecting the different industry and occupational categories being used.

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

Table A.4: Sector Skills Councils (SSA sectors)

SSA industry [SIC]	SIC2007 2-digit industry
1 Agriculture, forestry and fishing [01-03,75]	01 Crop and animal production, hunting and related service activities
	02 Forestry and logging
	03 Fishing and aquaculture
	75 Veterinary activities
2 Energy production and utilities [05-09,35-39]	05 Mining of coal and lignite
	06 Extraction of crude petroleum and natural gas
	07 Mining of metal ores
	08 Other mining and quarrying
	09 Mining support service activities
	35 Electricity, gas, steam and air conditioning supply
	36 Water collection, treatment and supply
	37 Sewerage
	38 Waste collection, treatment and disposal activities; materials recovery
	39 Remediation activities and other waste management services
3 Manufacturing [10-33,72]	10 Manufacture of food products
	11 Manufacture of beverages
	12 Manufacture of tobacco products
	13 Manufacture of textiles
	14 Manufacture of wearing apparel
	15 Manufacture of leather and related products
	16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
	17 Manufacture of paper and paper products
	18 Printing and reproduction of recorded media
	19 Manufacture of coke and refined petroleum products
	20 Manufacture of chemicals and chemical products
	21 Manufacture of basic pharmaceutical products and pharmaceutical preparations
	22 Manufacture of rubber and plastic products
	23 Manufacture of other non-metallic mineral products
	24 Manufacture of basic metals
	25 Manufacture of fabricated metal products, except machinery and equipment
	26 Manufacture of computer, electronic and optical products
	27 Manufacture of electrical equipment
	28 Manufacture of machinery and equipment n.e.c.
	29 Manufacture of motor vehicles, trailers and semi-trailers
	30 Manufacture of other transport equipment
	31 Manufacture of furniture
	32 Other manufacturing
	33 Repair and installation of machinery and equipment
	72 Scientific research and development

Table A.4: Sector Skills Councils (SSA sectors) (continued)

SSA industry [SIC]	SIC2007 2-digit industry
4 Construction [41-43,71]	41 Construction of buildings
	42 Civil engineering
	43 Specialised construction activities
	71 Architectural and engineering activities; technical testing and analysis
5 Wholesale and retail trade [45-47,77]	45 Wholesale and retail trade and repair of motor vehicles and motorcycles
	46 Wholesale trade, except of motor vehicles and motorcycles
	47 Retail trade, except of motor vehicles and motorcycles
	77 Rental and leasing activities
6 Transportation and storage [49-53]	49 Land transport and transport via pipelines
	50 Water transport
	51 Air transport
	52 Warehousing and support activities for transportation
	53 Postal and courier activities
7 Accommodation, food and tourism activities [55,56,79,92,93]	55 Accommodation
	56 Food and beverage service activities
	79 Travel agency, tour operator and other reservation service and related activities
	92 Gambling and betting activities
	93 Sports activities and amusement and recreation activities
8 Information and communication [61-63,95]	61 Telecommunications
	62 Computer programming, consultancy and related activities
	63 Information service activities
	95 Repair of computers and personal and household goods
9 Creative media and entertainment [58-60,73,74,90,91]	58 Publishing activities
	59 Motion picture, video and television programme production, sound recording and music publishing activities
	60 Programming and broadcasting activities
	73 Advertising and market research
	74 Other professional, scientific and technical activities
	90 Creative, arts and entertainment activities
	91 Libraries, archives, museums and other cultural activities
10 10 Financial, insurance & other professional services [64-66,69,70]	64 Financial service activities, except insurance and pension funding
	65 Insurance, reinsurance and pension funding, except compulsory social security
	66 Activities auxiliary to financial services and insurance activities
	69 Legal and accounting activities
	70 Activities of head offices; management consultancy activities
11 11 Real estate and facilities management [68,80,81]	68 Real estate activities
	80 Security and investigation activities
	81 Services to buildings and landscape activities
12 12 Government [84,94,99]	84 Public administration and defence; compulsory social security
	94 Activities of membership organisations
	99 Activities of extraterritorial organisations and bodies
13 13 Education [85]	85 Education
14 14 Health [86]	86 Human health activities
15 15 Care [87,88]	87 Residential care activities
	88 Social work activities without accommodation
16 16 Not within scope of SSA [78,82,96-98]	78 Employment activities
	82 Office administrative, office support and other business support activities
	96 Other personal service activities
	97 Activities of households as employers of domestic personnel
	98 Undifferentiated goods- and services-producing activities of private households for own use

Table A.5: SOC2010 Major Groups and Sub-major Groups

Major group	Sub-Major Groups	Skill level
1 Managers, directors and senior officials	11 Corporate managers and directors	4
	12 Other managers and proprietors	3
2 Professional occupations	21 Science, research, engineering and technology professionals	4
	22 Health professionals	4
	23 Teaching and educational professionals	4
	24 Business, media and public service professionals	4
3 Associate professional and technical occupations	31 Science, engineering and technology associate professionals	3
	32 Health and social care associate professionals	3
	33 Protective service occupations	3
	34 Culture, media and sports occupations	3
	35 Business and public service associate professionals	3
4 Administrative and secretarial occupations	41 Administrative occupations	2
	42 Secretarial and related occupations	2
5 Skilled trades occupations	51 Skilled agricultural and related trades	3
	52 Skilled metal, electrical and electronic trades	3
	53 Skilled construction and building trades	3
	54 Textiles, printing and other skilled trades	3
6 Caring, leisure and other service occupations	61 Caring personal service occupations	2
	62 Leisure, travel and related personal service occupations	2
7 Sales and customer service occupations	71 Sales occupations	2
	72 Customer service occupations	2
8 Process, plant and machine operatives	81 Process, plant and machine operatives	2
	82 Transport and mobile machine drivers and operatives	2
9 Elementary occupations	91 Elementary trades and related occupations	1
	92 Elementary administration and service occupations	1

Source: *SOC2010: Volume 1: Structure and Description of Unit Groups*

Annex B: Comparison with Previous Projections

B.1 Comparison with previous results Sectoral Employment and Productivity

Figure B.1 and Tables B.1 – B4 compare the employment forecasts from *Working Futures 2010-2020* (WF IV) with the forecasts from *Working Futures 2007-2017* (WF III). Figure B.1 provides an overview of the difference in total employment and clearly illustrates the impact of the global financial crisis (GFC) and subsequent worldwide recession. Employment in total is probably around 2 million less than might have been the case if the GFC could have been averted. This clearly had a major impact on employment levels across the board. However the impact on employment patterns (shares) by sector and occupation have been less dramatically affected.

Table B.1 presents data and forecasts for the broad industries as defined in WF III i.e. in SIC2003 definitions. WF III presented forecasts over the period 2007-17. However, in WF IV the change of employment over 2007-10 is based on official published data. These have been translated back to SIC 2003 definitions in order to make comparisons with the WF III estimates. Comparisons are presented for two periods, 2007-10 and 2010-17.

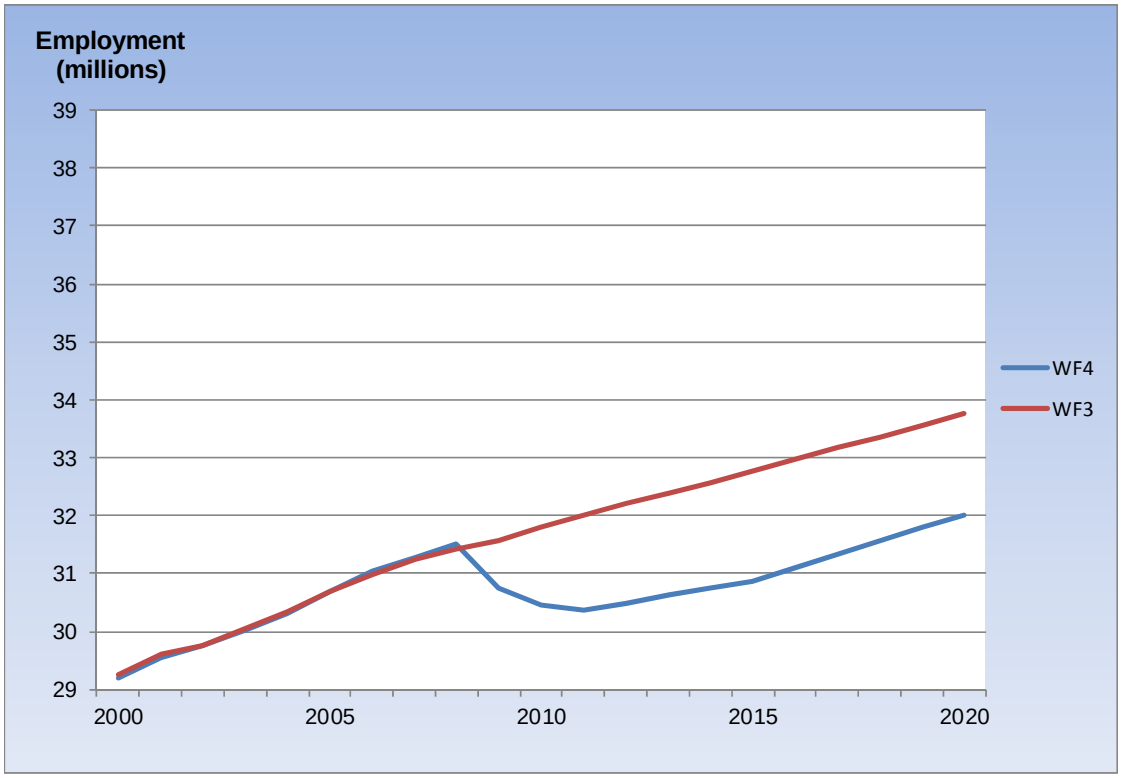
These show a decline of 2½ per cent in employment reflecting the impact of the 2008-09 recession. This is equivalent to a loss of about 827 thousand jobs and it is in sharp contrast with the forecast from the WF III where an increase of just under 2 per cent (around 568 thousand jobs) was predicted prior to the crisis. For most broad sectors the outturn is worse than the forecast from WF III. There are two exceptions: primary & utilities, partly reflecting a doubtful (but officially reported) very sharp increase in agricultural jobs, and in non-market services as the government boosted employment in the public sector trying to counterbalance the effect of the recession on jobs in the private sector.

Comparing employment by type and the relative performances over 2007-10, perhaps the most distinctive feature in the WF IV data is the sharper decline in full-time jobs for females rather than for males over the recession (-6½ per cent). However, female self-employment seems to have performed better than was forecast in WF III (see Table B.2).

Over the period 2010-17, there is a forecast increase in jobs by 862 thousand in WF IV, equivalent to just under 3 per cent. This is substantially less than the 1.4 million (4¼ per cent) forecast in WF III. The most important difference between the two forecasts comes from the decline in the jobs in government services now expected in WF IV (around -314 thousand) compared with an increase of equal size expected in WF III. This reflects the policies now being carried out to reduce the deficit public sector finances. The other significant difference is the much milder decline expected in manufacturing jobs in WF IV compared with WF III.

Comparing employment by type, perhaps the important difference is in the increase in male full-time jobs. While the increase in female full-time jobs is similar in the two forecasts, the increase in full-time male in the WF IV is about one-quarter of the corresponding increase in WF III. The smaller increase in jobs forecast in WF IV mainly reflects fewer jobs for males in full-time jobs.

Figure B.1: Impact of the recession on UK Total Employment



Source: Cambridge Econometrics, MDM revision 7146.

Comparing the employment forecast over the decade (i.e. WF IV 2010-20, WF III 2007-17) the main differences are:

- the increase in jobs in WF IV is lower over the decade than in WF III;
- government sector jobs fall in WF IV while they were projected to increase rapidly in WF III;
- growth in jobs in marketed services is slower in WF IV;
- growth in jobs in primary & utilities, manufacturing and construction performs better in WF IV, although in primary & utilities and manufacturing employment is still declining.

Table B.1: Comparison of Working Futures IV with Working Futures III by Broad Sector

Working Futures III								
	2007	2010	2017	2020	2007-10	2010-17	2007-17	
						Employment ('000s)		
Primary & utilities	633	590	503	n.a.	-43	-87	-130	
Manufacturing	3,181	3,040	2,750	n.a.	-141	-290	-432	
Construction	2,187	2,256	2,361	n.a.	70	105	175	
Distribution, transport etc	8,881	9,024	9,418	n.a.	143	394	537	
Business & other services	8,573	8,949	9,879	n.a.	376	929	1,306	
Non-marketed services	7,977	8,140	8,454	n.a.	163	314	477	
Total	31,432	32,000	33,365	n.a.	568	1,365	1,933	
		Shares (per cent)			growth (per cent)			
Primary & utilities	2.0	1.8	1.5	n.a.	-6.8	-14.7	-20.5	
Manufacturing	10.1	9.5	8.2	n.a.	-4.4	-9.5	-13.6	
Construction	7.0	7.1	7.1	n.a.	3.2	4.6	8.0	
Distribution, transport etc	28.3	28.2	28.2	n.a.	1.6	4.4	6.0	
Business & other services	27.3	28.0	29.6	n.a.	4.4	10.4	15.2	
Non-marketed services	25.4	25.4	25.3	n.a.	2.0	3.9	6.0	
Total	100.0	100.0	100.0	n.a.	1.8	4.3	6.1	
Working Futures IV								
	2007	2010	2017	2020	2007-10	2010-17	2007-17	2010-20
							Employment ('000s)	
Primary & utilities	693	767	759	745	74	-8	66	-22
Manufacturing	2,966	2,518	2,421	2,347	-448	-97	-545	-170
Construction	2,302	2,092	2,259	2,329	-210	167	-43	237
Distribution, transport etc	8,431	7,977	8,257	8,392	-454	280	-174	415
Business & other services	9,103	8,909	9,745	10,103	-194	836	642	1,195
Non-marketed services	7,790	8,195	7,893	8,092	405	-302	103	-103
Total	31,285	30,458	31,333	32,008	-827	875	48	1,550
		Shares (per cent)				growth (per cent)		
Primary & utilities	2.2	2.5	2.4	2.3	10.7	-1.1	9.5	-2.9
Manufacturing	9.5	8.3	7.7	7.3	-15.1	-3.8	-18.4	-6.8
Construction	7.4	6.9	7.2	7.3	-9.1	8.0	-1.9	11.3
Distribution, transport etc	26.9	26.2	26.4	26.2	-5.4	3.5	-2.1	5.2
Business & other services	29.1	29.2	31.1	31.6	-2.1	9.4	7.1	13.4
Non-marketed services	24.9	26.9	25.2	25.3	5.2	-3.7	1.3	-1.3
Total	100.0	100.0	100.0	100.0	-2.6	2.9	0.2	5.1

Source: Cambridge Econometrics, MDM revision 7146.

Table B.2: Comparison of Working Futures IV with Working Futures III: Employment by Status

Working Futures III						Employment ('000s)		
	2007	2010	2017	2020	2007-10	2010-17	2007-17	
Male FT	11,563	11,702	12,035	n.a.	139	333	472	
Female FT	7,036	7,126	7,323	n.a.	89	198	287	
Male PT	2,163	2,349	2,834	n.a.	186	485	671	
Female PT	6,465	6,559	6,775	n.a.	94	216	310	
Male SE	2,973	2,991	3,010	n.a.	17	20	37	
Female SE	1,231	1,274	1,387	n.a.	43	113	156	
Total	31,432	32,000	33,365	n.a.	568	1,365	1,933	
			Shares (per cent)				(per cent)	
Male FT	36.8	36.6	36.1	n.a.	1.2	2.8	4.1	
Female FT	22.4	22.3	21.9	n.a.	1.3	2.8	4.1	
Male PT	6.9	7.3	8.5	n.a.	8.6	20.7	31.0	
Female PT	20.6	20.5	20.3	n.a.	1.5	3.3	4.8	
Male SE	9.5	9.3	9.0	n.a.	0.6	0.7	1.2	
Female SE	3.9	4.0	4.2	n.a.	3.5	8.9	12.6	
Total	100.0	100.0	100.0	n.a.	1.8	4.3	6.1	
Working Futures IV						Employment ('000s)		
	2007	2010	2017	2020	2007-10	2010-17	2007-17	2010-20
Male FT	11,463	10,905	10,999	11,078	-558	94	-464	173
Female FT	7,172	6,711	6,930	7,126	-462	219	-242	415
Male PT	2,211	2,227	2,540	2,694	16	313	328	468
Female PT	6,284	6,262	6,482	6,685	-22	219	198	423
Male SE	2,940	2,995	3,014	3,033	55	19	75	38
Female SE	1,215	1,358	1,369	1,392	143	11	154	34
Total	31,285	30,458	31,333	32,008	-827	875	48	1,550
			Shares (per cent)				(per cent)	
Male FT	36.6	35.8	35.1	34.6	-4.9	0.9	-4.0	1.6
Female FT	22.9	22.0	22.1	22.3	-6.4	3.3	-3.4	6.2
Male PT	7.1	7.3	8.1	8.4	0.7	14.0	14.8	21.0
Female PT	20.1	20.6	20.7	20.9	-0.3	3.5	3.1	6.7
Male SE	9.4	9.8	9.6	9.5	1.9	0.6	2.5	1.3
Female SE	3.9	4.5	4.4	4.3	11.8	0.8	12.6	2.5
Total	100.0	100.0	100.0	100.0	-2.6	2.9	0.2	5.1

Source: Cambridge Econometrics, MDM revision 7146.

Table B.3: Comparison of Working Futures IV with Working Futures III: Productivity

Working Futures III			change (per cent)	
	2007-10	2010-17	2007-17	
Primary & utilities	9.9	25.6	38.0	
Manufacturing	9.2	21.9	33.1	
Construction	2.6	11.3	14.2	
Distribution, transport etc.	7.0	16.6	24.7	
Business & other services	5.4	13.4	19.5	
Non-marketed services	4.9	11.9	17.4	
Total	6.0	14.9	21.9	

Working Futures IV			change (per cent)	
	2007-10	2010-17	2007-17	2010-20
Primary & utilities	-16.6	6.7	-11.0	13.2
Manufacturing	5.7	26.2	33.4	35.5
Construction	3.5	7.9	11.7	13.4
Distribution, transport etc.	0.7	20.9	21.7	31.1
Business & other services	-0.6	15.4	14.7	24.5
Non-marketed services	-1.9	5.2	3.2	10.9
Total	-0.6	15.8	15.1	24.1

Source: Cambridge Econometrics, MDM revision 7146.

Table B.4: Comparison of Working Futures IV with Working Futures III by Occupation

Working Futures III								
	2007	2010	2017	2020	2007-10	2010-17	2007-17	
(SOC 2000)						Employment ('000s)		
Managers and Senior officials etc	4,858	5,111	5,731	n.a.	253	620	873	
Professional occupations	4,117	4,304	4,759	n.a.	187	456	643	
Associate professional & technical	4,500	4,691	5,154	n.a.	190	463	654	
Administrative & secretarial	3,739	3,624	3,337	n.a.	-115	-287	-401	
Skilled trades occupations	3,426	3,361	3,196	n.a.	-65	-165	-230	
Personal service occupations	2,498	2,627	2,941	n.a.	129	314	444	
Sales & customer care occupations	2,433	2,463	2,536	n.a.	30	72	103	
machine and transport operatives	2,304	2,270	2,184	n.a.	-34	-86	-120	
Elementary occupations	3,558	3,549	3,526	n.a.	-8	-23	-32	
Total	31,432	32,000	33,365	n.a.	568	1,365	1,933	
		Shares (per cent)			growth (per cent)			
Managers and Senior officials etc	15.5	16.0	17.2	n.a.	5.2	12.1	18.0	
Professional occupations	13.1	13.4	14.3	n.a.	4.5	10.6	15.6	
Associate professional & technical	14.3	14.7	15.4	n.a.	4.2	9.9	14.5	
Administrative & secretarial	11.9	11.3	10.0	n.a.	-3.1	-7.9	-10.7	
Skilled trades occupations	10.9	10.5	9.6	n.a.	-1.9	-4.9	-6.7	
Personal service occupations	7.9	8.2	8.8	n.a.	5.2	12.0	17.8	
Sales & customer care occupations	7.7	7.7	7.6	n.a.	1.3	2.9	4.2	
machine and transport operatives	7.3	7.1	6.5	n.a.	-1.5	-3.8	-5.2	
Elementary occupations	11.3	11.1	10.6	n.a.	-0.2	-0.7	-0.9	
Total	100.0	100.0	100.0	n.a.	1.8	4.3	6.1	
Working Futures IV								
	2007	2010	2017	2020	2007-10	2010-17	2007-17	2010-20
(SOC 2010)							Employment ('000s)	
Managers, directors and senior officials	2,992	3,016	3,393	3,560	23	-27	401	544
Professional occupations	5,703	5,843	6,398	6,712	140	-26	694	869
Associate professional and technical	4,030	3,926	4,274	4,476	-104	-25	245	551
Administrative and secretarial	3,947	3,698	3,407	3,312	-249	-24	-541	-387
Skilled trades occupations	3,729	3,526	3,359	3,295	-203	-23	-369	-230
Caring, leisure and other service	2,585	2,719	2,893	3,032	134	-22	309	313
Sales and customer service	2,635	2,608	2,577	2,610	-27	-21	-58	2
Process, plant and machine operatives	2,139	1,950	1,797	1,737	-189	-20	-342	-213
Elementary occupations	3,525	3,173	3,235	3,274	-353	-19	-291	101
Total	31,285	30,458	31,333	32,008	-827	-18	48	1,550
		Shares (per cent)				growth (per cent)		
Managers, directors and senior officials	9.6	9.9	10.8	11.1	0.8	-0.9	13.4	18.0
Professional occupations	18.2	19.2	20.4	21.0	2.5	-0.4	12.2	14.9
Associate professional and technical	12.9	12.9	13.6	14.0	-2.6	-0.6	6.1	14.0
Administrative and secretarial	12.6	12.1	10.9	10.3	-6.3	-0.6	-13.7	-10.5
Skilled trades occupations	11.9	11.6	10.7	10.3	-5.5	-0.7	-9.9	-6.5
Caring, leisure and other service	8.3	8.9	9.2	9.5	5.2	-0.8	12.0	11.5
Sales and customer service	8.4	8.6	8.2	8.2	-1.0	-0.8	-2.2	0.1
Process, plant and machine operatives	6.8	6.4	5.7	5.4	-8.8	-1.0	-16.0	-10.9
Elementary occupations	11.3	10.4	10.3	10.2	-10.0	-0.6	-8.2	3.2
Total	100.0	100.0	100.0	100.0	-2.6	-0.1	0.2	5.1

Source: IER estimates, MDM revision 7146.

Table B.3 compares productivity by broad sector. Official data show now that output per job fell by 0.6 per cent over 2007-10. In WF III the forecast was for an increase of 6 per cent over the same period. Part of this difference is explained by the change in productivity in the non-marketed services. While in WF IV productivity fell by almost 2 per cent, reflecting the faster increase in employment than in output, in WF III the forecast was for an increase in productivity of about 5 per cent. Productivity in market services also performed worse in WF IV, as business retained employment but reduced working hours in the recession.

Over 2010-17 UK productivity as a whole is expected to rise slightly faster in WF IV than was forecast in WF III. However, manufacturing and private services productivity is expected to show the best gains. Productivity in primary & utilities, construction and non-market services is expected to grow somewhat less rapidly than in WF III.

Comparing the productivity forecast over the decade (i.e. WF IV 2010-20, WF III 2007-17) the main differences are:

- productivity in the UK is expected to increase by 24 per cent in WF IV, which is 2 percentage points faster than the forecast from WF III;
- growth in manufacturing productivity is slightly faster (2 percentage points) in WF IV;
- growth in productivity in distribution & transport is strong at 31 per cent in WF IV, 6 percentage points faster than in WF III;
- productivity in non-market services and primary & utilities is much lower in WF IV than in WF III.

B.2 Comparison with Previous Forecasts (occupations)

The analogous comparison for occupations is shown in Table B.4. The comparison of the occupational projections is also complicated by changes in classification. The switch from SOC2000 to SOC2010 resulted in significant changes in how jobs were classified. The main changes affect the shares employed in managerial occupations (the much tighter definitions in SOC2010 reducing the share) and nursing being largely reclassified as professional (as opposed to associate professionals).

The new estimate of the total number of managers in 2007 is now around 2 million lower than in the previous *Working Futures* projections. Professional occupations are the main area where such jobs have been reallocated in the new SOC. The associate professional group also benefits to some degree, but this is more than offset by the switch of nurses to the professional group. The employment shares of the other occupational groups are broadly similar in the old and new results (although note that these are based on two different occupational classifications, SOC2000 and SOC2010).

The other key factor which is different between the two sets of projections is of course the impact of the recession. In WF III an increase of employment of over half a million was expected between 2007 and 2010. The latest results show a decline of more than ¾ of a million jobs. All occupations have shared in the job losses, although for those such a managers and professional sit has been in the form of less than expected growth while for many other occupations job losses have been greater than expected.

Experience suggests that occupational patterns do recover from such 'shocks' and that longer term trends are generally re-established relatively quickly. Sharp recessions often hasten the structural changes going on the economy, resulting in the more rapid decline of struggling sectors and declining occupations and the birth of new ones. The increasingly inter-connected nature of the global economy may help to hasten this process. Analysis of previous recessions suggest that, while the impact on employment levels can be quite severe as the downturn accelerates, the effect on patterns of labour demand by sector and skill are much less marked, and that the underlying trends in such shares are quite robust.

This is the case here. Despite the changes in classification, at the major group level, the occupational trends over the period since the early 1980s are indeed very similar to those presented in previous *Working Futures* projections.

Compared with earlier projections, much slower growth over the period 2007-2017 is now indicated for: managers; associate professional occupations; and sales occupations. Somewhat more rapid declines than previously expected are now projected for: administrative, clerical & secretarial occupations; skilled trades; sales occupations; process, plant and machine operatives; and elementary occupations.

Comparing the changes expected over the decade 2010-2020 with those projected previously for 2007-2017, the overall shifts in occupational employment structure are fairly similar. Employment growth is expected to favour managers, professional and associate professionals, plus a few generally less skilled occupations such as caring, leisure and other service occupations. Job losses hit hardest for: administrative and secretarial; skilled trades; and process, plant and machine operatives. Sales occupations are expected to see some job losses now, while there is a modest growth in some elementary occupations (linked to the expansion of some parts of the service sector).

B.3 Comparison with Previous Results by country and region

Background

This section compares the current set of projections with the *Working Futures* projections for the period 2007 to 2017, focussing on the regions and nations of the UK. The actual values change between projections for a whole host of reasons, including: choice of different periods; revisions to historical data and models; and the changing economic circumstances between the times at which the projections were made. However, it is possible to compare the broad patterns of projected change between the two sets of projections.

The projections for 2010 to 2020 are for a slightly faster annual average rate of growth in GVA and a slightly slower rate of growth in employment than was projected for 2007 to 2017. This is mainly accounted for by the fact that the latest projections encompass the recovery from the deep recession of 2008-9. The broad trends of employment change across industries, regions and time demonstrate considerable similarity for the two projections. The key similarities and differences in the projected regional trends are discussed below.

Comparison of overall prospects by region and nation

The spatial pattern of annual average rates of change in GVA is very similar in both sets of projections. In each case, GVA is projected to increase in all regions and nations, with the highest rate of increase being projected for London. Rates of growth are much lower in the midlands and northern England than in southern England. The growth rate of Wales is slightly lower and that of Scotland slightly higher in the latest projections than was projected for *Working Futures* 3. Wales is the only nation or region in which GVA is projected to grow more slowly.

In both sets of projections, employment growth is projected to be fastest in southern England. Total employment is projected to grow at the same or at a slightly slower rate in nearly all regions and nations. However, no employment growth is projected for 2010-20 in the North East, compared with an annual average rate of employment change of 0.3 per cent in the previous set of projections.

The labour market residuals for the *Working Futures* 4 projections are only about half as large as those for the previous set of projections. The very large residuals in the North West, West Midlands and Scotland in the projections for 2007-17 are not present in the current set of results.

Comparison by broad sector

The 2010-20 projections by broad sector exhibit marked differences to the projections of *Working Futures 2007-17.* GVA was projected to increase in all sectors between 2007 and 2017. However, the projections for 2010-20 are for no growth in the primary sector and utilities, faster growth in manufacturing, construction and business and other services and much slower growth in non-market services. *Working Futures 2007-17* projected rapid declines in employment in the primary sector and utilities and in manufacturing and relatively slow growth in construction and the service sector industries, with business and other services gaining employment most quickly. The projected rate of decline in employment between 2010 and 2020 in the primary sector and utilities is slower and the growth of employment in trade, accommodation and transport and business and other services is slower. The largest differences are in the higher predicted rate of employment growth in construction and the decline in employment in non-market services.

Regional differences in rates of employment change between the projections for 2007-17 and 2010-20 are clearly influenced by the effect of the 2008/9 recession and the recovery from it. Thus, the rate of decline of manufacturing employment in the midlands and Wales is projected to be much slower for 2010-20 than for 2007-17. There is a rates of employment growth to be faster in the southern and eastern regions than in the northern and western regions and nations in both sets of projections and this is strongest in the projected pattern of employment change between 2010 and 2020 in non-market services, with the periphery experiencing the greatest negative effects from the contraction of the public sector.

Comparison by occupation

The pattern of projected employment changes for SOC Major Groups 1 to 5 is broadly similar for both 2007-17 and 2010 to 2020. However, the largest differences for 2010-20 relative to

2007-17 are in the much slower projected growth of caring, leisure and other service occupations, the switch of sales and customer service occupations from growth to decline, the much faster decline of process, plant and machine operative occupations. Overall, the difference in occupational employment projections can be summarised as an acceleration of the trend towards the polarisation of employment into growing employment in high and low-skilled occupations and a 'hollowing out' of employment in the middle range of skilled manual employment and more routine non-manual occupations.

There is less regional and national variation in rates of employment change by occupation projected for 2010-20 than was projected for 2007-17. The key spatial differences in the pattern of occupational employment change are the faster rates of loss of associate professional and process, plant and machine operative occupations in northern England and the nations beyond England.

Comparison by gender and employment status

The most striking differences between the two sets of projections are in the much slower rates of female employment growth projected for 2010-20 than for 2007-17. The largest difference is in the rate of growth of female self-employment. Male part-time employment is also projected to grow more slowly than in the 2007-17 set of projections. However, there is little difference in the spatial pattern of employment change by gender or full-time / part-time status. Self-employment is projected to grow more slowly during 2010-20 than for 2007-17 in southern England, but more quickly in northern England and the non-English nations.

List of previous publications

Executive summaries and full versions of all these reports are available from www.ukces.org.uk

Evidence Report 1
Skills for the Workplace: Employer Perspectives

Evidence Report 2
Working Futures 2007-2017

Evidence Report 3
Employee Demand for Skills: A Review of Evidence & Policy

Evidence Report 4
High Performance Working: A Synthesis of Key Literature

Evidence Report 5
High Performance Working: Developing a Survey Tool

Evidence Report 6
Review of Employer Collective Measures: A Conceptual Review from a Public Policy Perspective

Evidence Report 7
Review of Employer Collective Measures: Empirical Review

Evidence Report 8
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Review of Employer Collective Measures: Policy Prioritisation

Evidence Report 10
Review of Employer Collective Measures: Final Report

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Evidence Report 41
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