UK COMMISSION FOR EMPLOYMENT AND SKILLS

Working Futures 2012-2022

Annexes
March 2014

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Working Futures 2012-2022: Annexes

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March 2014

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Introduction

Working Futures

Working Futures 2012-2022 is the latest in a series of quantitative assessments of the employment prospects in the labour market over a ten year horizon. It presents historical trends and future prospects by sector for the UK and its constituent nations and the English regions. The prime focus of *Working Futures* is on the demand for skills as measured by employment by occupation and qualification, although the supply side is also considered. The results are intended to provide a sound statistical foundation for the deliberations of all those with an interest in the demand for and supply of skills.

This document presents a set of Annexes which provide additional detail on both the results and methods to complement those presented in *Working Futures 2012-2022*. The main document[1] summarises the key findings, including the main employment trends, and the implications for the next 10 years if they continue. It covers macroeconomic and detailed employment prospects by industry, occupation, qualification, gender and employment status (full-time part-time and self-employment), providing a commentary explaining and interpreting the forecasts. It covers the whole of the UK and the constituent countries which make it up.

This set of Annexes comprises:

- Annex A, which provides a brief technical description of the sources and methods used to generate the sets of employment projections by industry and occupation presented in *Working Futures 2012-2022*.;
- Annex B, which presents a comparison with previous projections in *Working Futures 2010-2022*, covering sectoral employment and productivity, comparison with previous forecasts for occupations and qualifications and comparison with previous results by devolved country and English region;
- Annex C: presents a comparison with the latest results emerging from the Census of Population on overall estimates of occupational employment structure;
- Annex D: presents results for the devolved nations of Scotland, Northern Ireland and Wales and the 9 English Regions.

[1] See Wilson, R. A., R. Beaven, M. May-Gillings, G. Hay and J. Stevens (2014) . *Working Futures 2012-2022*. UK Commission for Employment and Skills: Wath on Dearne..

The main report and Annexes are also supported by a separate Technical Report which provides a much more detailed description of sources and methods used[2].

[2] Wilson, R. A., R. Beaven and M. May-Gillings (2014) . *Working Futures 2012-2022: Technical Report*. UK Commission for Employment and Skills: Wath on Dearne

Annex A: Sources and Methods

A.1 Introduction

Working Futures is focussed on developing quantitative projections of employment, concentrating on occupations and qualifications by industry and nation / region. Following best practice worldwide, these are 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 regional Multi-sectoral Dynamic Model (MDM-E3)[4] of the UK economy developed by CE and detailed occupational and qualification forecasting modules developed by IER. This approach has 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 confidentiality and other related issues regarding the release of such detailed information into the public domain.

In order to meet the remit specified for the previous *Working Futures* exercises, IER/CE have developed a detailed employment database covering all the main employment dimensions. Originally, this was based on the 41 (SIC 2003) based categories used in the CE multi-sectoral macroeconomic model MDM-E3. 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 to be as consistent as possible with all the official published sources upon which it is based.[5,6] For *Working Futures 5* this database was modified to cover 75 (roughly SIC 2-digit) categories based on SIC2007.

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[4] The E3 stands for Economy-Energy-Environment.

[5] 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.

[6] 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/BRES and LFS data available.

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 135,000 separate time series on employment alone (ignoring the qualifications dimension).7 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 MDM-E3 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.

The move to SIC2007 for *Working Futures 4* represented a more fundamental change in the classification of industries than some of the previous revisions. This has not been changed in the latest results which also use the SIC2007 system for classifying industries.

Working Futures adopts the SOC2010 occupational classification. This classification system replaced SOC2000 in 2011 (and has been used to classify occupations for the 2011 Census and other official data since that date). Full details on the UK SOC2010 can be obtained from the ONS at: http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/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.

The reworking of the database on to a SIC2007 and SOC2010 basis has been a substantial task that involved translating all the historical data on output, productivity and employment. The process results in set of data for 75 industries as set out in Tables A.1, A.2 and A.3 and 25 occupations as defined in Table A.5. These data are also cross classified by gender and

[7] That is: Sector (75) * occupation (25) * geographical area (12) * gender/status (6) = 135,000 separate time series.

status and for 12 spatial areas. Further disaggregation by 6 broad qualification levels is also made. This results in over 800,000 time series to be analysed and projected.[8]

For the sub-regional analysis a more aggregate set of industries is used as described in Table A.5.

8 That is 75 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/ons/guide-method/classifications/current-standard-classifications/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.[9] 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 135,000 in the core results for this latest update to *Working Futures,* and more than 800,000 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.

Working Futures 2012-2022 also includes a more limited set of projections for sub-regions (LEP areas in England and corresponding geographies in other countries of the UK). 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.[10]

It is also important to recognise the difficulties in putting such detailed information into the public domain. These include confidentiality problems, as well as concerns about statistical reliability. The terms of the 1947 Statistics of Trade Act (and subsequent legislation) prohibits publicly collected data being disseminated in such a manner as to enable the identification of individual enterprises or individuals. Following detailed discussions with ONS it was agreed that detailed data at the 75 industry level by region from BRES could be placed by ONS in the public domain without being disclosive. This information, in combination with other data from the LFS can then be used to generate estimates of employment in various categories of interest (e.g. by occupation and by highest qualification held).

In addition to the issue of confidentiality, presenting detailed historical and projected data in a ‘free access’ fashion also raises a number of important additional issues for the UK Commission. 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

9 These concerns are even greater at a sub-regional level such as ‘city regions’ or LEP areas.
10 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.

primarily inform (although as in the previous *Working Futures* results, steps have to be taken to ensure confidentiality constraints are not breached and that users are aware of the limitations of the data).

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. 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. This requires a multi-sectoral macroeconomic model.

The cornerstone of the projections is CE's regional Multi-sectoral Dynamic Model (MDM-E3) of the UK economy. MDM-E3 is used to generate estimates of output, productivity and employment for all the main industrial sectors in the UK and its nations and regions (from here on, forecasts for the nations (Scotland, Wales, Northern Ireland) and regions (nine former Government Office Regions of England) of the UK will be denoted 'regional'). The sectoral output and employment forecasts are based on an integrated, one-model approach in which the detailed industry and regional analysis is consistent with the macro analysis.

To develop a model that embodies for all of the nations and regions an accounting structure (including input-output coefficients) to parallel that of the UK would inevitably entail a substantial exercise in data construction and imputation.[11] Instead, the approach taken in MDM-E3 is to make best use of the regional data available to support detailed modelling of the key variables of interest – output, labour demand and labour supply. The approach has been to build up a regional econometric model and database as an integral part of the MDM-E3 model. The model has a clear economic structure, uses incomplete and partial data, and applies econometric techniques to those variables for which the data is judged sufficient robust to support econometric estimation. The forecasts and projections for the recent past are calibrated so as to reproduce the available data for employment and output. A sensible direction of economic causation for employment is an inherent feature of the model.

An important guiding principle is that that the regional variables and data are consistent with the UK variables and data. At the regional level, a less detailed (46) industry classification has been adopted for the industry variables in the regionalised MDM-E3 (such as GVA and employment) because the available regional data are not sufficient to disaggregate to 87 industries (as in the UK analysis).

In the model, key drivers (investment, productivity, prices, technical change, competitiveness, imports and exports) are modelled separately for each industry at the UK level. Sectoral

[11] Previous versions of MDM-E3 included a fuller accounting treatment for the regions, but the advantages that this provided were not considered sufficient to outweigh the limitations of the data and associated efforts to maintain that treatment.

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.

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.

Employment at the UK level is treated as a demand for labour, derived from the demand for goods and services. UK employment equations are estimated, relating industrial (headcount) employment in each industry to its gross output, wage rates and other drivers. Long-run cointegrating relationships are identified and estimated and dynamic error-correction equations estimated to allow for short-run effects. In general the equations are well determined and the parameters are of the expected sign and magnitude.

To determine employment by region, for each industry in the region, employment is set to grow at an assumed rate of productivity incorporated exogenously in the model. These productivity assumptions are derived from historical trends in regional productivity growth (by industry). Regional employment, by industry, is then scaled to match the UK employment.

MDM-E3 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 skills provision. They reflect, in a manner which more partial approaches cannot, how individual sector developments "fit together" into an 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.

Aggregate demand is modelled in a Keynesian manner, with a consumption function and investment equations at the UK level. However, the model also includes equations for average earnings by industry. Other aspects of the supply side come in through the export and import equations, in which capacity utilisation affects trade performance at the UK level.

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 46 industries used in MDM-E3, which are defined by reference to the availability of data on input-output flows. To meet the needs of sectoral users, the MDM-E3 46 sector regional results have been disaggregated to the 75 sectors listed in Table A.3.

Further information about data sources and methods is presented in the separate *Working Futures Technical Report*.

A.6 Regional and Sub-regional/Sub- national Projections

The UK Government's policies of 'localism', 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, although Scotland has retained its regional development agencies. With 'localism' there is increased emphasis on sub-regional geographies, encompassing both local neighbourhoods and 'natural economic geographies'. Development of Local Enterprise Partnerships (LEPs) highlights 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 LEPs (and analogous geographical areas in the devolved nations) *Working Futures* projections for 2012-2022 have also been developed for various sub-regional functional economic areas (see Table A.4), selected in agreement with the UK Commission.

The main emphasis at the spatial level as far as reporting is concerned remains 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. The sub-regional results are made available in Excel workbooks available through the UK Commission.

A.7 Occupational Projections including replacement demands

Occupational projections

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. As noted in the main text preliminary data from the 2011 Census have also been examined but these have not been used in the current set of projections. For further discussion see Annex C.

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). The IER database for *Working Futures 2012-2022* has now been extended and updated on a SOC2010 basis, using detailed converters developed by IER in collaboration with ONS.[13]

The database provides breakdowns to the sector level used within RMDM. This has been modified to cover the new detailed 75 industry categories based on SIC2007 agreed with UKCES and ONS. Using these data, it is feasible to generate industry by occupation employment matrices at a most detailed level (by the 75 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.[14]

Replacement demands

The occupational employment estimates also include replacement needs. These take into account the need to replace those who leave the employed workforce 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

[13] Professor Peter Elias of IER has played a leading role in the development of SOC2000 and SOC2010.

[14] 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.

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 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 the current and 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. However, while 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 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 provide in Excel workbooks 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.

Extension to 4-digit level of SOC2010

The aim is to expand the occupational results from 25 2 digit occupations by 75 industries to the 369 4 digit ones by 75 industries. In the *LMI for All* project, LFS data were used to compute shares of 4 digit occupations within 2 digit groups for All Industries, and then applied to all industries and for all years.

This runs into the problem that some 4 digit occupations are clearly industry specific. Applying the method above results in anomalous outcomes (e.g. the largest numbers of some textile operatives appearing in the industry food drink and tobacco rather than in the textiles industry). If industry specific shares can be used instead of the all industry ones the problem is (in principle) resolved. There are at least two problems with this:

First, using distinctive shares for (say) the 6 broad industry groups fails to resolve the problem since the differences above do not become apparent at this level (for example, applying shares based on the whole of the manufacturing instead of all industries will not make the differentiation between textiles and clothing and food drink and tobacco). To avoid that problem a much finer industry differentiation is needed (ideally at the 75 industry level).

But this raises a second problem, that the LFS sample size is inadequate to produce robust shares at the 75 industry level. The only way around this impasse is to generate a set of industry specific shares that is consistent (as far as possible) with the all the information available.

The "knowns" that the final estimates need to be consistent with are as follows:

1. The 75 industry employment totals
2. The 2 digit occupational totals

and within those:

3. The 75 industry x 2 digit occupational totals

1. - 3. are all available in the standard *Working Futures* database:

i. for all years

They are also available:

ii. by gender and status
iii. by region/country
iv. by qualification

Ideally, the expansion to the 4 digit level needs to cover all these dimensions.

Extension to ii. - iv poses more problems, not least in terms of the scale of the computations and programming required. Such extensions are however desirable since the detailed occupational patterns are likely to vary across these dimensions (see below).

The other "known" it is important (in principle) to take account of is information on the overall pattern of employment by 4 digit occupation (shares of 4 digit within 2 digit categories) when aggregated across all industries, all regions and all gender/status types.

This was the aggregate information used in the LMI for All project. In principle, this aggregate information could be extended to cover region and /or industry (for example the 6 broad sectors). Ideally, it can be further extended to differentiate the shares for each of the 75 industries. However this results in a very sparse data set with many "gaps" where the LFS has no entries (yet it is almost certain that there are people employed in those categories).

A compromise solution has been adopted which computes more detailed shares than was done in the LMI for All project, but without trying to impose the final aggregate 4-digit level constraint (which require a further RAS process).

The details of the algorithm developed to fill the gaps are summarised in Box A.2. The main steps are as follows:

- Step 1 - using the LFS data (combining years) generate a set of shares of 4 digit within 2 digit categories for each 75 industry category and covering dimensions ii - iv above for categories where data are available.

- Step 2 – where there are gaps use the nearest equivalent (more aggregate category) as set out in the Box.
- Step 3 – apply the final shares to the existing Working Futures employment data to generate a full data array of employment levels - 4 digit occupation by 75 industries. Step 3 effectively constrains this array to match the "knowns" in points 1. - 3. above.

The detailed occupational shares are extracted and applied as in the LMI for All project to the 2 digit occupational totals (but now differentiated for each of the 75 industries (as well as by region, gender/status and occupation).

Box A.2: Algorithm for developing the 4-digit occupational database

Expanding the 25 SMGs in Working Futures to 369 SOC Unit groups

WF data		LFS data	
1990-2022		10 quarters combined	
2	genders	2	genders
3	statuses	3	statuses
75	industries	75	industries
9	qualifications	6	qualifications
25	SMGs	369	SOC unit groups
12	regions		

From the LFS data, the shares for each unit group within each SMG is calculated.
The Working Futures employment level for that SMG is shared out to the Unit groups.
The share is applied to each nation/region and year

Where the LFS has is no value in a cell, aggregations are tried in order.

All statuses
Both genders
Both genders and all statuses
All industries (by gender and status)
Both genders and all statuses all industries

Shares are calculated separately within the six qualifications and applied to the appropriate 9 qualifications in the Working Futures data.

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 disaggregate these by the highest levels of qualification held using various modelling 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 MDM-E3. 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 MDM-E3.

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

- regional activity rates (by age-band/gender) are modelled as a function of unemployment and other variables, e.g. house prices relative to wages;
- the regional labour force is determined by activity rates multiplied by the population (by age-band/gender);
- workplace based employment jobs is determined using the existing MDM-E3 equations;
- the Labour Force Survey measure of employment (employed residents) is determined from workforce employment minus a labour market residual (note that one element of the residual is net commuting);
- some adjustments to the labour market residual are made in the projections to account for trend changes;
- regional labour force minus regional LFS employment determines regional unemployment (ILO).

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.

ONS projections of population by region, gender and age-band are taken as exogenous inputs to MDM-E3.

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[15] so also delivers projections disaggregated by age-band.

With regard to qualifications held by the workforce, the present approach is intentionally pragmatic and eclectic, making the most of the limited data available. It focuses on the highest level of qualification held.

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 for the UK Commission by Bosworth (2013a, b and c). It builds on the models developed in previous *Working Futures* exercises, covering both demand and supply.

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)), [16] using a **National time series model** as described in Bosworth (2013a, b and c). The results are then linked to the projections of the population and projections of the labour force by age and gender produced by RMDM, as set out above.

An important distinction between the qualification results presented here and those developed by Bosworth 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.

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. This ensures that the estimates (and projected shares) sum to 100 per cent. It covers the following main

15 The age-bands distinguished are 0-15, 16-24, 25-34, 35-44, 45-59, 60-64, 65+.
16 For details of the National Qualifications Framework see: http://ofqual.gov.uk/qualifications-and-assessments/qualification-frameworks/

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. 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 slightly different industry and occupational categories being used and the different treatment of qualifications.

New sheets providing an occupation by industry shift-share analysis have been added to most workbooks.

A new workbook containing 4 digit occupational data has been added.

The workbooks are available via UKCES. Please contact working.futures@ukces.org.uk

Table A.1: Broad Sectors (SIC2007)

Broad Sector	SIC2007 Section	SIC2007 Division	Industry full name	Ind 22	Ind 75
1. Primary sector and utilities	A	01-03	Agriculture, forestry and fishing	1,2,6,7	1,2,24-27
	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	3-23
3. Construction	F	41-43	Construction	8	28-30
4. Trade, accomod. & transport	G	45-47	Wholesale and retail trade; repair of motor vehicles	9-11	31-40
	H	49-53	Transport and storage		
	I	55-56	Accomodation and food activities		
5. Business & other services	J	58-63	Information and communication	12-17, 21-22	41-63,69-75
	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	64-68
	P	85	Education		
	Q	86-88	Human health and social work		

Table A.2: Industry Groups (SIC2007)

Ind 22	SIC2007 Section	SIC2007 Division	Industry full name	Ind 75
1. Agriculture	A	01-03	Agriculture, forestry and fishing	1
2. Mining & quarrying	B	05-09	Mining and quarrying	2
Manufacturing	C	10-33	Manufacturing	3-23
3. Food drink & tobacco		10-12	Food, drink and tobacco	3,4
4. Engineering		26-28	Engineering	16-18
5. Rest of manufacturing		13-25,29-33	Rest of manufacturing	5-15,19-23
6. Electricity & gas	D	35	Electricity, gas, steam and air conditioning	24
7. Water & sewerage	E	36-39	Water supply, sewerage, waste management	25-27
8. Construction	F	41-43	Construction	28-30
9 Whol. & retail trade	G	45-47	Wholesale and retail trade; repair of motor vehicles etc	31-33
10. Transport & storage	H	49-53	Transport and storage	34-38
11. Accommod. & food	I	55-56	Accomodation and food activities	39-40
Information & comm.	J	58-63	Information and communication	41-46
12. Media		58-60, 63	Media and communication	41-43
13. IT		61,62	Information technology	44-46
14. Finance & insurance	K	64-66	Financial and insurance activities	47-49
15. Real estate	L	68	Real estate activities	50
16. Professional services	M	69-75	Professional, scientific and technical activities	51-57
17. Support services	N	77-82	Administrative and support service activities	58-63
18. Public admin. & defence	O	84	Public administration and defence etc	64
19. Education	P	85	Education	65
20. Health & social work	Q	86-88	Human health and social work	66-68
21. Arts & entertainment	R	90-93	Arts, entertainment and recreation; other services	69-72
22. Other services	S	94-96	Other service activities	73-75

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

Ind 75	SIC2007 Section	SIC2007 Division	Industry full name	Ind22	Ind 6
1. Agriculture etc	A	01-03	Agriculture, forestry and fishing	1	1
2. Coal, oil & gas, mining & related	B	05-09	Coal, oil and gas, other mining and quarrying	2	1
3. Food products	C	10	Food products	3	2
4. Beverages & tobacco		11-12	Beverages and tobacco products	3	2
5. Textiles		13	Textiles	5	2
6. Wearing apparel; leather etc		14-15	Wearing apparel, leather and related procuts	5	2
7. Wood etc		16	Wood and cork products	5	2
8. Paper etc		17	Paper and paper products	5	2
9. Printing & recording		18	Printing and reproduction of recorded media	5	2
10. Coke & petroleum; chemicals etc		19-20	Coke and refined petroleum products, chemicals and chemical products	5	2
11. Pharmaceuticals		21	Pharmaceutical products	5	2
12. Rubber & plastic		22	Rubber and plastic products	5	2
13. Other non-metallic		23	Other non-metallic mineral products	5	2
14. Basic metals		24	Basic metals	5	2
15. Metal products		25	Metal products except machinery and equipment	5	2
16. Computers, etc		26	Computer, electronic and optical products	4	2
17. Electrical equipment		27	Electrical equipment	4	2
18. Machinery etc		28	Machinery and equipment n.e.c	4	2
19. Motor vehicles, etc		29	Motor vehicles, trailers and semi-trailers	5	2
20. Other trans. Equipment		30	Other transport equipment	5	2
21. Furniture		31	Furniture	5	2
22. Other manufacturing		32	Other manufacturing	5	2
23. Repair & installation		33	Repair and installation of machinery and equipment	5	2
24. Electricity, gas, etc	D	34	Electricity, gas, steam and air conditioning supply	6	1
25. Water	E	35	Water collection, treatment and supply,	7	1
26. Sewerage		36	Sewerage	7	1
27. Waste management		38-39	Waste and waste management services	7	1
28. Construction	F	41	Construction of buildings	8	3
29. Civil engineering		42	Civil engineering	8	3
30. Specialised construction		43	Specialised construction activities	8	3
31. Motor vehicle trade	G	45	Wholesale and retail trade or motorvehicles and motorcycles	9	4
32. Wholesale traide		46	Wholesale trade	9	4
33. Retail trade		47	Retail trade	9	4
34. Land transport, etc	H	49	Land transport and transport via pipelines	10	4
35. Water transport		50	Water transport	10	4
36. Air transport		51	Air transport	10	4
37. Warehousing, etc		52	Warehousing and support activities for transportation	10	4
38. Postal & courier		53	Postal and courier services	10	4
39. Accomodation	I	55	Accomodation	11	4
40. Food & beverage services		56	Food and beverage service activities	11	4
41. Publishing activities	J	58	Publishing activities	12	5
42. Film & music		59	Motion picture, video and music publishing	12	5
43. Broadcasting		60	Programming and broadcasting activities	12	5
44. Telecommunications		61	Telecommunications	13	5
45. Computer programming etc		62	Computer programming, consultancy and related activities	13	5
46. Information services		63	Information service activities	12	5
47. Financial services	K	64	Financial service activities	14	5
48. Insurance & pensions		65	Insurance and pension funding	14	5
49. Auxiliary financial services		66	Activities auxiliary to financial services and insurance	14	5
50. Real estate	L	68	Real estate activities	15	5
51. Legal & accounting	M	69	Legal and accounting activities	16	5
52. Head offices, etc		70	Activities of head offices; management consultancy activities	16	5
53. Architectural & related		71	Architectural and engineering activities	16	5
54. Scientific research		72	Scientific research and development	16	5
55. Advertising, etc		73	Advertising and market research	16	5
56. Other professional		74	Other professional, scientific and technical activities	16	5
57. Veterinary		75	Veterinary activities	16	5
58. Rental & leasing	N	77	Rental and leasing activities	17	5
59. Employment activities		78	Employment activities	17	5
60. Travel, etc		79	Travel agency and tour operator activites	17	5
61. Security, etc		80	Security and investigation activites	17	5
62. Services to buildings		81	Services to buildings and landscape activities	17	5
63. Office admin		82	Office administrative; office support activities	17	6
64. Public admin. & defence	O	84	Public administration and defence, compulsory social security	18	6
65. Education	P	85	Education	19	6
66. Health	Q	86	Human health activites	20	6
67. Residential care		87	Residential care activities	20	6
68. Social work		88	Social work activities without accommodation	20	6
69. Arts & entertainment	R	90	Creative, arts and entertainment activities	21	6
70. Libraries, etc		91	Library, archives, museums and other cultural activities	21	6
71. Gambling		92	Gambling and betting activities	21	6
72. Sport & recreation		93	Sport activities, amusement and recreational activities	21	6
73. Membership organisations	S	94	Activities of membership organisations	22	6
74. Repair of goods		95	Repair of computers and personal household goods	22	6
75. Other personal service		96	Other personal services activities	22	6

Table A.4: Sub-regional Geographies in Working Futures 5

WF 5 Sub-regional Geography	Local authorities included
England: Local Enterprise Partnerships (LEPS)	
Black Country	Dudley, Sandwell, Walsall, Wolverhampton
Buckinghamshire Thames Valley	Buckinghamshire
Cheshire and Warrington	Cheshire East (unitary), Cheshire West and Chester (unitary), Warrington (unitary)
Coast to Capital	Brighton and Hove (unitary), East Sussex: Lewes, Croydon, Epsom and Ewell, Mole Valley, Reigate and Banstead, Tandridge, West Sussex
Cornwall and Isles of Scilly	Cornwall (unitary), Isles of Scilly
Coventry and Warwickshire	Warwickshire , Coventry
Cumbria	Cumbria
Derby, Derbyshire, Nottingham and Nottinghamshire	Derby, Derbyshire, Nottingham (unitary), Nottinghamshire
Dorset	Bournemouth (unitary), Dorset, Poole (unitary)
Enterprise M3	Basingstoke and Deane, East Hampshire, Hart, New Forest, Rushmoor, Test Valley, Winchester, Elmbridge, Guildford, Runnymede, Spelthorne, Surrey Heath, Waverley, Woking
Gloucestershire	Gloucestershire
Greater Birmingham and Solihull	Cannock Chase, East Staffordshire, Lichfield, Tamworth, Birmingham, Solihull, Bromsgrove, Redditch, Wyre Forest
Greater Cambridge and Greater Peterborough	Cambridgeshire, Uttlesford, North Hertfordshire, King's Lynn and West Norfolk, Forest Heath, St Edmundsbury, Peterborough (unitary), Rutland (unitary)
Greater Lincolnshire	Lincolnshire, North Lincolnshire (unitary), North East Lincolnshire (unitary)
Greater Manchester	Greater Manchester
Heart of the South West	Devon, Somerset
Hertfordshire	Hertfordshire
Humber	East Riding of Yorkshire (unitary), Kingston upon Hull (unitary), North East Lincolnshire (unitary), North Lincolnshire (unitary)
Lancashire	Lancashire, Blackburn with Darwen (unitary), Blackpool (unitary)
Leeds City Region	Barnsley, Craven, Harrogate, Selby, West Yorkshire, York (unitary)
Leicester and Leicestershire	Leicester (unitary),Leicestershire
Liverpool City Region	Halton (unitary), Merseyside
London Enterprise Panel	Greater London
New Anglia	Norfolk, Suffolk
North Eastern	County Durham (unitary), Northumberland (unitary), Tyne and Wear
Northamptonshire	Northamptonshire
Oxfordshire	Oxfordshire
Sheffield City Region	Bolsover, Chesterfield, North East Derbyshire, Bassetlaw, South Yorkshire
Solent	East Hampshire, Eastleigh, Fareham, Gosport, Havant, New Forest, Test Valley, Winchester, Isle of Wight (unitary), Portsmouth (unitary), Southampton (unitary)
South East	East Sussex, Essex, Kent, Medway (unitary), Southend-on-Sea (unitary), Thurrock (unitary)
South East Midlands	Bedford (unitary), Aylesbury Vale, Central Bedfordshire (unitary), Luton (unitary), Milton Keynes (unitary), Corby, Daventry, Kettering, Northampton, South Northamptonshire, Cherwell
Stoke-on-Trent and Staffordshire	Staffordshire, Stoke-on-Trent (unitary)
Swindon and Wiltshire	Swindon (unitary), Wiltshire (unitary)
Tees Valley	Darlington (unitary), Hartlepool (unitary), Middlesbrough (unitary), Redcar and Cleveland (unitary), Stockton-on-Tees (unitary)
Thames Valley Berkshire	Bracknell Forest (unitary), Reading (unitary), Slough (unitary), West Berkshire (unitary), Windsor and Maidenhead (unitary), Wokingham (unitary)
The Marches	Herefordshire (unitary), Shropshire (unitary), Telford and Wrekin (unitary)
West of England	Bath and North East Somerset (unitary), Bristol (unitary), North Somerset (unitary), South Gloucestershire (unitary)
Worcestershire	Worcestershire
York North Yorkshire and East Riding	North Yorkshire, York (unitary), East Riding of Yorkshire (unitary)
Wales: Economic Areas	
North	Anglesey, Conwy, Denbighshire, Flintshire, Gwynedd, Wrexham
Mid	Ceredigion, Powys
South West	Carmarthenshire, Neath Port Talbot, Pembrokeshire, Swansea
South East	Bridgend, Blaenau Gwent, Caerphilly, Cardiff, Merthyr Tydfil, Monmouthshire, Newport, Rhondda, Cynon, Taff, Torfaen, Vale of Glamorgan
Scotland: Regional Skills Assessment Areas	
Aberdeen City and Shire	Aberdeen City, Aberdeenshire
Ayrshire	East Ayrshire, North Ayrshire, South Ayrshire
South of Scotland	Dumfries & Galloway, Scottish Borders
Edinburgh, Fife and the Lothian	East Lothian, Edinburgh (City of), Fife, Midlothian, West Lothian
Forth Valley	Clackmannanshire, Falkirk, Stirling
Highland and Islands SIP	Argyll & Bute, Eilean Siar, Highland, Moray, Orkney Islands, Shetland Islands
Tayside	Angus, Dundee City, Perthshire & Kinross
Glasgow and Clyde Valley	East Dunbartonshire, East Renfrewshire, Glasgow City, Inverclyde, North Lanarkshire, Renfrewshire, South Lanarkshire, West Dunbartonshire
Northern Ireland: Workforce Development Forum Areas	
Belfast	Belfast, Castlereagh
Northern	Coleraine, Ballymena, Ballymoney, Moyle, Antrim, Newtownabbey, Larne, Carrickfergus, Magherafelt
North West	Derry, Limavady, Strabane
Southern	Newry & Mourne, Armagh, Craigavon, Banbridge
South Eastern	Lisburn, North Down, Ards, Down
South West	Fermanagh, Omagh, Dungannon, Cookstown

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

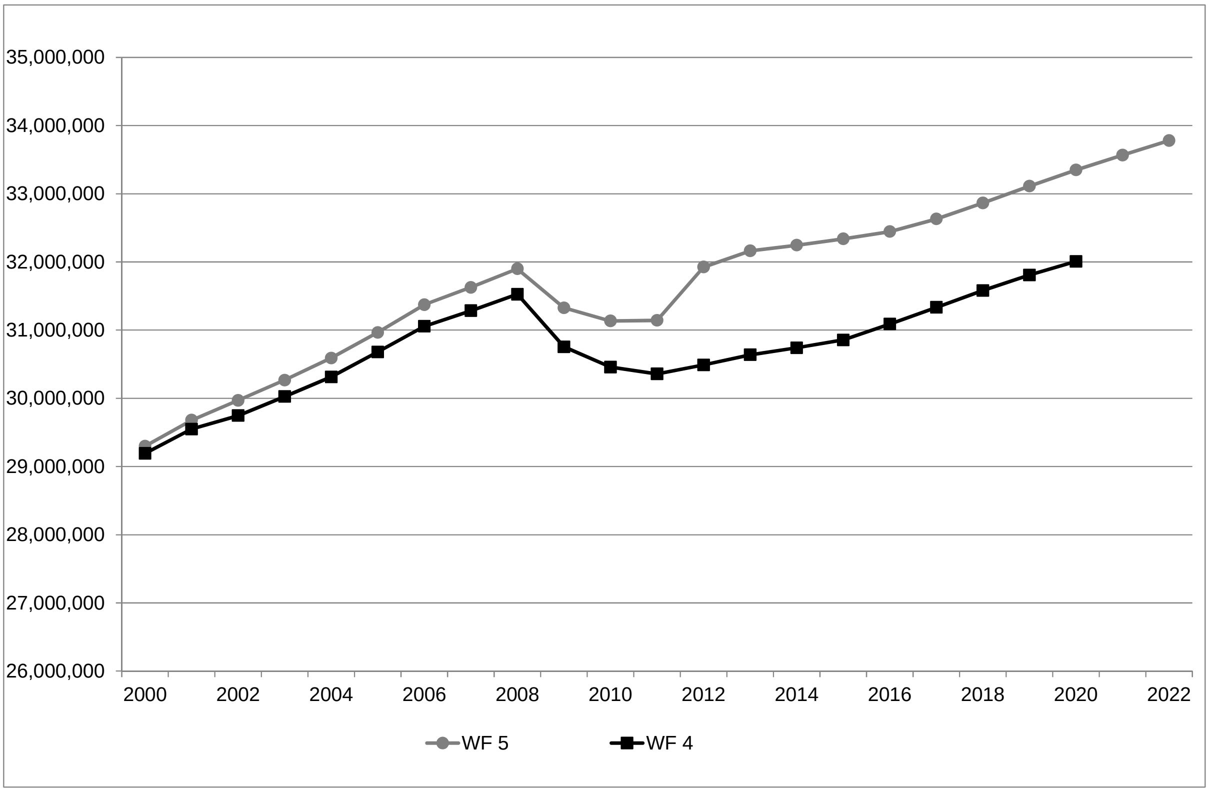
Annex B: Comparison with Previous Projections

B.1 Comparison with previous results for Sectoral Employment and Productivity

Figure B.1 and Tables B.1 – B.3 compare the employment forecasts from *Working Futures 2012-2022* (WF 5) with the forecasts from *Working Futures 2010-2020* (WF 4). Cambridge Econometrics' (CE) forecasts underpinning the WF 4 results were completed early in 2011, and the last year of official UK employment data available at the time was for 2010 (CE uses June workforce jobs figures for each year). Figure B.1 provides an overview of the difference in total UK employment (workforce jobs) in each forecast, and shows that there have been some revisions to the historical data since WF 4, due to newly available data and changes in ONS methodology.[17] The chart shows that even for periods for which we had official data (ie up to 2010), the revisions have been such that the fall in employment during the recession was not as sharp as indicated by the initial data. For example, the more recent workforce jobs data for (June) 2010, as used for WF 5, are around 700,000 jobs higher than indicated by the data for the same period that was available at the end of 2010. The new data show that the fall in workforce jobs between the peak (2008) before the recession and 2010 was around 750,000, whereas the official data we had for WF 4 indicated that the fall was more than 1m jobs.

[17] See http://www.ons.gov.uk/ons/guide-method/method-quality/specific/labour-market/articles-and-reports/revisions-to-workforce-jobs-dec-2013.pdf and previous versions.

Figure B.1: UK Total Employment



For WF 4, the first year of CE's forecast was 2011; for WF 5 it is 2013. For the WF 5 forecast, we have official data for UK workforce jobs for 2011 and 2012 (and quarterly data up to March 2013, which were used to make an estimate for June 2013). The data show that, in 2012, workforce jobs bounced back much more sharply than CE had forecast for WF 4, and in fact the number of workforce jobs in 2012 was slightly higher than the peak before the recession.

After 2012 (which is a forecast in both sets of WF results), we now expect overall employment growth in the medium term (to around 2016/2017) to be slower than was previously forecast for WF 4. This is because the impacts on public sector employment of the government budget cuts are now expected to continue for longer than before (to 2016), to some extent countering growth in private sector jobs over a longer period.[18] In the longer term, the WF 5 forecast for growth in total UK employment is similar to that from WF 4.

Table B.1 compares the WF 5 and WF 4 forecasts by broad sector. The table shows how the bounceback in employment (data for WF 5 rather than forecast for WF 4) over 2010-12 was in two broad sectors: Trade, accommodation & transport services (4.9 per cent), in which a bounceback was not forecast (-0.8 per cent) in WF 4; and Business & other services (4.7 per cent), in which some bounceback (2.6 per cent) was forecast over this period in WF

[18] In Scotland, there has not been the same level of cuts to public sector employment.

4. There was also growth in manufacturing employment over this period (3.2 per cent), which was not forecast in WF 4 (-1.9 per cent).

Over 2012-20, the absolute change in employment in the WF 5 forecast (1.4m) is around 100,000 jobs fewer than the WF 4 forecast (1.5m), although the *level* of employment in 2012 in the WF 5 forecast is 1.4m higher than in the WF 4 forecast (in part due to revised data and in part due to the sharp increase in employment seen in 2012).

Although in broad terms, the two forecasts are quite similar over the long term (2012-20), with overall growth of 4.3 per cent forecast in WF 5 compared with 4.9 per cent in WF 4, the outcomes for absolute job numbers by broad sector can be quite different. The forecast for growth in non-market services (public administration, education, health and social work) is significantly different from WF 4, with growth of 1.6 per cent forecast over 2012-20 now compared with no overall growth forecast in WF 4. This is because although the government budget cuts are now expected to lead to falling employment for a longer period (out to 2016), the overall impact is not expected to be as strong. The forecast for an increase of 133,000 jobs in this sector over 2012-20 in WF 5 compares with a fall of 12,000 forecast in WF 4. Across the broad sectors, the difference in forecast employment change over this period is greatest for Trade, accommodation and transport services: an increase of around 290,000 jobs is forecast in WF 5, compared with an increase of around 450,000 jobs in WF 4.

Table B.2 compares the two forecasts by status of employment (full-time, part-time, self-employment, by gender). Over 2010-12, which is historical data for WF 5 compared with forecast for WF 4, the overall change in employment that took place is much larger than was forecast in WF 4, as already discussed. In terms of growth rates, the greatest differences are in female self-employment (the smallest employment status), which saw growth of 13 per cent over this period, and male self-employment, which saw growth of around 8 per cent – both likely to be a reflection of the impact of recession on finding conventional employment. All statuses of employment saw fairly strong growth over this period, whereas in the WF 4 forecast a decline was forecast in male full-time employment and in self-employment for both genders.

Over 2012-20, the pattern of growth across the statuses is expected to be broadly similar to the WF 4 forecast, as long term trends re-establish themselves. The only status which is now forecast to see (slightly) stronger growth than in the WF 4 forecast is female full-time, at 6.3 per cent rather than 5.7 per cent. The strongest growth over this period, as in WF 4, is expected to be seen in male part-time employment, as the long term trend continues. In absolute terms, however, the greatest increase in employment over 2012-20 is now forecast to be in female full-time employment (450,000). In WF 4 the greatest absolute increases were forecast to be in male and female part–time employment (395,000 in each), although female full-time wasn’t far behind (385,000).

Table B.1: Comparison of Working Futures 5 with Working Futures 4 - Employment by Broad Sector

Working Futures 4	2010	2012	2020	2022	2010-12	2012-20	2010-20
						Employment (000s)	
Primary sector & utilities	638	647	586	n.a.	9	-61	-52
Manufacturing	2,704	2,653	2,565	n.a.	-50	-88	-138
Construction	2,092	2,087	2,329	n.a.	-5	241	237
Trade, accomod. & transport	7,803	7,743	8,191	n.a.	-60	448	388
Business & other services	8,977	9,213	10,190	n.a.	236	977	1,213
Non-marketed services	8,444	8,341	8,329	n.a.	-103	-12	-115
Total	30,658	30,684	32,191	n.a.	26	1,506	1,532
		Shares (per cent)				growth (per cent)	
Primary sector & utilities	2.1	2.1	1.8	n.a.	1.4	-9.4	-8.1
Manufacturing	8.8	8.6	8.0	n.a.	-1.9	-3.3	-5.1
Construction	6.8	6.8	7.2	n.a.	-0.2	11.6	11.3
Trade, accomod. & transport	25.5	25.2	25.4	n.a.	-0.8	5.8	5.0
Business & other services	29.3	30.0	31.7	n.a.	2.6	10.6	13.5
Non-marketed services	27.5	27.2	25.9	n.a.	-1.2	-0.1	-1.4
Total	100.0	100.0	100.0	n.a.	0.1	4.9	5.0

Working Futures 5	2010	2012	2020	2022	2010-12	2012-20	2010-20	2012-22
							Employment (000s)	
Primary sector & utilities	787	819	770	773	32	-48	-16	-45
Manufacturing	2,562	2,646	2,467	2,417	83	-179	-96	-228
Construction	2,082	2,010	2,262	2,312	-72	253	180	302
Trade, accomod. & transport	8,174	8,572	8,865	8,986	398	292	690	414
Business & other services	9,227	9,665	10,605	10,788	438	941	1,378	1,123
Non-marketed services	8,498	8,401	8,535	8,657	-97	133	36	255
Total	31,331	32,112	33,504	33,933	781	1,392	2,173	1,821
		Shares (per cent)				growth (per cent)		
Primary sector & utilities	2.5	2.5	2.3	2.3	4.1	-5.9	-2.1	-5.5
Manufacturing	8.2	8.2	7.4	7.1	3.2	-6.8	-3.7	-8.6
Construction	6.6	6.3	6.8	6.8	-3.5	12.6	8.7	15.0
Trade, accomod. & transport	26.1	26.7	26.5	26.5	4.9	3.4	8.4	4.8
Business & other services	29.5	30.1	31.7	31.8	4.7	9.7	14.9	11.6
Non-marketed services	27.1	26.2	25.5	25.5	-1.1	1.6	0.4	3.0
Total	100.0	100.0	100.0	100.0	2.5	4.3	6.9	5.7

Source: Cambridge Econometrics, MDM revision 7146 and 12015

Note: Total employment and employment in non-market services includes H. M. Forces.

Table B.2: Comparison of Working Futures 5 with Working Futures 4 - Employment by Status

Working Futures 4					Employment (000s)		
	2010	2012	2020	2022	2010-12	2012-20	2010-20
Male FT	11,086	11,014	11,239	n.a.	-72	225	153
Female FT	6,729	6,761	7,146	n.a.	32	385	417
Male PT	2,227	2,300	2,694	n.a.	73	395	468
Female PT	6,262	6,290	6,685	n.a.	28	395	423
Male SE	2,995	2,966	3,034	n.a.	-29	68	38
Female SE	1,358	1,354	1,392	n.a.	-4	38	34
Total	30,658	30,684	32,191	n.a.	26	1,506	1,532
		Shares (per cent)				(per cent)	
Male FT	36.2	35.9	34.9	n.a.	-0.7	2.0	1.4
Female FT	21.9	22.0	22.2	n.a.	0.5	5.7	6.2
Male PT	7.3	7.5	8.4	n.a.	3.3	17.2	21.0
Female PT	20.4	20.5	20.8	n.a.	0.4	6.3	6.7
Male SE	9.8	9.7	9.4	n.a.	-1.0	2.3	1.3
Female SE	4.4	4.4	4.3	n.a.	-0.3	2.8	2.5
Total	100.0	100.0	100.0	n.a.	0.1	4.9	5.0

Working Futures 5						Employment (000s)		
	2010	2012	2020	2022	2010-12	2012-20	2010-20	2012-22
Male FT	11,604	11,755	11,988	12,054	150	233	384	300
Female FT	7,012	7,121	7,572	7,710	110	450	560	589
Male PT	2,307	2,412	2,786	2,889	105	374	479	478
Female PT	6,557	6,639	6,959	7,075	81	321	402	437
Male SE	2,663	2,842	2,841	2,839	180	-1	178	-4
Female SE	1,188	1,344	1,358	1,365	155	14	169	21
Total	31,331	32,112	33,504	33,933	781	1,392	2,173	1,821
		Shares (per cent)				(per cent)		
Male FT	37.0	36.6	35.8	35.5	1.3	2.0	3.3	2.6
Female FT	22.4	22.2	22.6	22.7	1.6	6.3	8.0	8.3
Male PT	7.4	7.5	8.3	8.5	4.6	15.5	20.8	19.8
Female PT	20.9	20.7	20.8	20.9	1.2	4.8	6.1	6.6
Male SE	8.5	8.9	8.5	8.4	6.7	-0.0	6.7	-0.1
Female SE	3.8	4.2	4.1	4.0	13.1	1.1	14.3	1.6
Total	100.0	100.0	100.0	100.0	2.5	4.3	6.9	5.7

Source: Cambridge Econometrics, MDM revision 7146 and 12015

Note: Includes H. M. Forces.

Table B.3: Comparison of Working Futures 5 with Working Futures 4 – Productivity (output per job)

Working Futures 4	change (per cent)		
	2010-12	2012-20	2010-20
Primary sector & utilities	-5.6	-0.7	-6.3
Manufacturing	8.1	25.3	35.5
Construction	2.6	10.5	13.4
Trade, accomod. & transport	5.7	19.7	26.6
Business & other services	4.1	22.1	27.1
Non-marketed services	0.4	10.3	10.8
Total	3.5	15.5	19.6

Working Futures 5	change (per cent)			
	2010-12	2012-20	2010-20	2012-22
Primary sector & utilities	-13.0	3.8	-9.7	3.3
Manufacturing	-2.0	19.6	17.2	26.2
Construction	-1.7	4.6	2.8	6.5
Trade, accomod. & transport	-3.9	9.7	5.5	11.5
Business & other services	-0.5	11.4	10.8	15.8
Non-marketed services	3.9	6.6	10.8	9.5
Total	-1.1	10.5	9.4	13.9

Source: Cambridge Econometrics, MDM revision 7146 and 12015

Table B.3 compares productivity growth in the two forecasts. The table shows that over 2010-12, rather than increasing by 3.5 per cent as forecast in WF 4, productivity actually fell by just over 1 per cent, as employment levels held up and in fact grew strongly (in 2012) despite weak growth in output. The greatest differences in actual productivity growth over 2010-12 compared to the WF 4 forecast were in the Primary sector & utilities (-7.4 percentage points), Manufacturing (-10.1 percentage points) and Trade, accommodation & transport services (-9.6 percentage points).

Over 2012-20, overall productivity growth (10.5 per cent) is now forecast to be a lot slower than in the WF 4 forecast (15.5 per cent). The greatest change in the forecast for productivity by broad sector is in Trade, accommodation & transport and Business and other services, which are now forecast to increase by around 10 per cent over this period, compared with around 20 per cent in WF 4. The strongest growth in productivity is still expected to be in manufacturing (19.6 percent) as employment declines over this period while output continues to grow.

B.2 Comparison with previous forecasts for occupations and qualifications

The comparison between the two models for occupations is shown in Table B.4. The switch from SOC2000 to SOC2010 resulted in significant changes in how jobs were classified between *Working Futures 3* and *Working Futures 4*. This is not an issue when comparing *Working Futures 4* with *Working Futures 5.*

Although here have been some changes with regard to trends in occupational structure, the main differences arise as a result of the somewhat more rapid recovery of employment levels overall now expected and differences in the pace of recovery between sectors.

The main factor which is different between the two sets of projections is the fact that total employment is now expected to rise more quickly between 2010 and 2020 (by around 2¼ million jobs as opposed to 1½ million). This benefits most occupations to some degree but the main beneficiaries are those that are already projected to be on a positive trend (managers, professionals, associate professionals and caring leisure and other service occupations (SOC Major Groups 1, 2, 3 and 6)).

If anything, the range of variation across occupations is rather more extreme in the latest results, with Administrative and secretarial occupations (SOC Major Group 4) in particular expected to show an even more rapid rate of job loss than previously expected. Job losses are also expected for skilled trades and process, plant and machine operatives (SOC Major Groups 5 and 8).

Sales and customer service occupations (SOC Major Group 7) are also now expected to see a modest decline compared with a small increase overall previously. This obscures a more general decline for less skilled general sales occupations (Sub-major Group 7.1), offset by smaller increases for the more skilled customer service occupations (Sub-major Group 7.2).

Employment amongst elementary occupations (SOC Major Group 9) is also now projected to decline slightly, although this average number hides some growth for more detailed occupations within this group and variations across industries where they are employed.

Overall at the Major Group level, the occupational trends projected remain very similar to those observed over the period since the early 1980s, as presented in previous *Working Futures* projections.

Table B.5 makes a similar comparison of the qualifications projections. There have been some revisions to the historic estimates of the patterns employed by highest level of qualifications held. These revisions raise the stated proportion of those in employment who are qualified at QCF levels 7-8 and 4.6 while reducing those qualified at QCF levels 1 or below. Taking these differences into account the patterns of change projected are broadly similar in *Working Futures 5* and *Working Futures 4*. The most notable difference relates to those qualified at QCF levels 4-6 which is now expected to rise more rapidly partly at the expense of those qualified at QCF level 7-8 and QCF level 3. The overall message of rapidly increasing shares and numbers at higher level (QCF level 4-8) and declines at QCF level 0-1 remains.

Table B.4: Comparison of Working Futures 5 with Working Futures 4 by Occupation

WF 4 (SOC 2010)	2005	2010	2015	2020	2005-10	2010-15	2015-20	2010-20
1. Managers, directors and senior officials	2,869	3,016	3,279	3,560	146	263	281	544
2. Professional occupations	5,489	5,843	6,189	6,712	355	346	523	869
3. Associate professional and technical	3,865	3,926	4,138	4,476	61	212	338	551
4. Administrative and secretarial	3,989	3,698	3,466	3,312	-291	-233	-154	-387
5. Skilled trades occupations	3,706	3,526	3,389	3,295	-181	-136	-94	-230
6. Caring, leisure and other service	2,488	2,719	2,801	3,032	231	82	231	313
7. Sales and customer service	2,601	2,608	2,555	2,610	7	-53	55	2
8. Process, plant and machine operatives	2,150	1,950	1,829	1,737	-200	-121	-91	-213
9. Elementary occupations	3,522	3,173	3,209	3,274	-349	37	64	101
All occupations	30,679	30,458	30,855	32,008	-221	397	1,153	1,550
		Share (per cent)				**Growth (per cent)**		
1. Managers, directors and senior officials	9.4	9.9	10.6	11.1	5.1	8.7	8.6	18.0
2. Professional occupations	17.9	19.2	20.1	21.0	6.5	5.9	8.5	14.9
3. Associate professional and technical	12.6	12.9	13.4	14.0	1.6	5.4	8.2	14.0
4. Administrative and secretarial	13.0	12.1	11.2	10.3	-7.3	-6.3	-4.4	-10.5
5. Skilled trades occupations	12.1	11.6	11.0	10.3	-4.9	-3.9	-2.8	-6.5
6. Caring, leisure and other service	8.1	8.9	9.1	9.5	9.3	3.0	8.3	11.5
7. Sales and customer service	8.5	8.6	8.3	8.2	0.3	-2.0	2.1	0.1
8. Process, plant and machine operatives	7.0	6.4	5.9	5.4	-9.3	-6.2	-5.0	-10.9
9. Elementary occupations	11.5	10.4	10.4	10.2	-9.9	1.2	2.0	3.2
All occupations	100.0	100.0	100.0	100.0	-0.7	1.3	3.7	5.1

WF 5	2005	2010	2015	2020	2005-10	2010-15	2015-20	2010-20
1. Managers, directors and senior officials	2,872	3,079	3,459	3,765	207	379	306	686
2. Professional occupations	5,462	5,984	6,757	7,208	522	773	452	1,225
3. Associate professional and technical	3,908	4,004	4,357	4,639	96	353	281	634
4. Administrative and secretarial	4,150	3,857	3,600	3,357	-293	-257	-243	-500
5. Skilled trades occupations	3,709	3,481	3,361	3,294	-228	-120	-66	-186
6. Caring, leisure and other service	2,469	2,779	3,113	3,371	310	334	258	592
7. Sales and customer service	2,643	2,704	2,609	2,651	61	-94	42	-53
8. Process, plant and machine operatives	2,130	1,962	1,890	1,822	-169	-71	-68	-140
9. Elementary occupations	3,624	3,284	3,193	3,242	-339	-91	49	-42
All occupations	30,966	31,134	32,338	33,349	168	1,204	1,011	2,215
		Share (per cent)				**Growth (per cent)**		
1. Managers, directors and senior officials	9.3	9.9	10.7	11.3	7.2	12.3	8.9	22.3
2. Professional occupations	17.6	19.2	20.9	21.6	9.6	12.9	6.7	20.5
3. Associate professional and technical	12.6	12.9	13.5	13.9	2.5	8.8	6.5	15.8
4. Administrative and secretarial	13.4	12.4	11.1	10.1	-7.1	-6.7	-6.7	-13.0
5. Skilled trades occupations	12.0	11.2	10.4	9.9	-6.1	-3.5	-2.0	-5.4
6. Caring, leisure and other service	8.0	8.9	9.6	10.1	12.6	12.0	8.3	21.3
7. Sales and customer service	8.5	8.7	8.1	7.9	2.3	-3.5	1.6	-2.0
8. Process, plant and machine operatives	6.9	6.3	5.8	5.5	-7.9	-3.6	-3.6	-7.1
9. Elementary occupations	11.7	10.5	9.9	9.7	-9.4	-2.8	1.5	-1.3
All occupations	100.0	100.0	100.0	100.0	0.5	3.9	3.1	7.1

Source: IER

Note: Excludes H. M. Forces.

Table B.5: Comparison of Working Futures 5 with Working Futures 4 by Qualification

WF 4	2005	2010	2015	2020	2005-10	2010-15	2015-20	2010-20
QCF 7-8	1,924	2,634	3,457	4,348	709	823	892	1,715
QCF 4-6	6,812	7,795	8,601	9,501	983	807	900	1,707
QCF 3	6,010	5,887	5,616	5,342	-123	-270	-275	-545
QCF 2	6,613	6,335	6,223	6,247	-278	-112	24	-88
QCF 1	5,575	4,995	4,744	4,744	-580	-251	-0	-252
No Qual	3,745	2,813	2,214	1,827	-933	-599	-387	-986
All Qualifications	30,679	30,458	30,855	32,008	-221	397	1,153	1,550
	Share (per cent)				**Growth (per cent)**			
QCF 7-8	6.3	8.6	11.2	13.6	36.9	31.2	25.8	39.4
QCF 4-6	22.2	25.6	27.9	29.7	14.4	10.3	10.5	18.0
QCF 3	19.6	19.3	18.2	16.7	-2.0	-4.6	-4.9	-10.2
QCF 2	21.6	20.8	20.2	19.5	-4.2	-1.8	0.4	-1.4
QCF 1	18.2	16.4	15.4	14.8	-10.4	-5.0	0.0	-5.3
No Qual	12.2	9.2	7.2	5.7	-24.9	-21.3	-17.5	-54.0
All Qualifications	100.0	100.0	100.0	100.0	-0.7	1.3	3.7	4.8

WF 5	2005	2010	2015	2020	2005-10	2010-15	2015-20	2010-20
QCF 7-8	2,164	2,886	3,654	4,496	722	768	842	1,610
QCF 4-6	7,535	8,872	10,672	12,189	1,337	1,800	1,517	3,317
QCF 3	6,033	6,111	6,088	5,794	78	-24	-294	-317
QCF 2	6,805	6,448	6,471	6,288	-357	23	-183	-160
QCF 1	5,493	4,700	3,965	3,413	-792	-736	-552	-1,288
No Qual	2,937	2,117	1,490	1,171	-819	-628	-319	-947
All Qualifications	30,966	31,134	32,338	33,349	168	1,204	1,011	2,215
	Share (per cent)				**Growth (per cent)**			
QCF 7-8	7.0	9.3	11.3	13.5	33.3	26.6	23.0	35.8
QCF 4-6	24.3	28.5	33.0	36.5	17.7	20.3	14.2	27.2
QCF 3	19.5	19.6	18.8	17.4	1.3	-0.4	-4.8	-5.5
QCF 2	22.0	20.7	20.0	18.9	-5.2	0.4	-2.8	-2.5
QCF 1	17.7	15.1	12.3	10.2	-14.4	-15.6	-13.9	-37.7
No Qual	9.5	6.8	4.6	3.5	-27.9	-29.6	-21.4	-80.9
All Qualifications	100.0	100.0	100.0	100.0	0.5	3.9	3.1	6.6

Source: IER

Note: Excludes H. M. Forces.

B.3 Comparison with Previous Results by Country and Region

Table B.6 shows the differences in the WF 4 and WF 5 forecasts by country and region. The table shows how the actual change in employment over 2010-12 in WF 5 compares with the forecast for that period from WF 4. Apart from Northern Ireland (where employment fell over 2010-12) and the North East where the actual fall was less severe than WF 4 predicted, the WF 4 forecasts under-predicted the growth of employment in each country and region over this period. The greatest difference between the WF 4 forecast for employment change and the outturn was for the South East, where the difference was 200,000 jobs. The next-largest differences over this period are in London, the East Midlands and Scotland, where the increase in employment was under-predicted by 125,000, 109,000 and 90,000 respectively.

Over 2012-20, total growth in employment across the regions is broadly similar between the two forecasts, although a narrower range of growth is forecast (3.1-6.4 percent) in WF 5 than was forecast in WF 4 (1.8-7.2 per cent). However, the ranking of growth prospects across the (twelve) different countries and regions is slightly different. Northern Ireland and Scotland are now ranked fourth (4.4 per cent) and sixth (3.8 per cent) respectively over this period, compared with seventh (4.5 per cent) and eleventh (2.6 per cent) respectively in WF 4. The greatest worsening of growth prospects over this period is for Wales, which was ranked fourth in WF 4 (5.7 per cent) but is ranked last (twelfth) (3.1 per cent) in WF 5.

WF 5 continues to forecast that the top three performing regions (London, East of England, South East, in growth order) will be in the south of England, although the South East was ranked sixth in WF 4, and the South West ranked second. The ranking of the other regions is broadly similar over this period.

Table B.6: Comparison of Working Futures 5 with Working Futures 4 - Employment by Country and Region

Working Futures 4	2010	2012	2020	2022	2010-12	2012-20	2010-20
					Employment (000s)		
London	4,683	4,734	5,037	n.a.	51	303	354
South East	4,263	4,272	4,507	n.a.	9	235	244
East of England	2,827	2,824	3,026	n.a.	-3	202	199
South West	2,616	2,637	2,808	n.a.	21	172	192
West Midlands	2,535	2,536	2,644	n.a.	1	108	109
East Midlands	2,095	2,076	2,195	n.a.	-18	118	100
Yorkshire & the Humber	2,474	2,474	2,552	n.a.	-0	78	78
North West	3,301	3,298	3,388	n.a.	-3	90	86
North East	1,154	1,138	1,158	n.a.	-17	21	4
Wales	1,333	1,328	1,404	n.a.	-5	76	71
Scotland	2,543	2,527	2,594	n.a.	-16	67	51
Northern Ireland	833	840	878	n.a.	7	38	44
UK	30,658	30,684	32,191	n.a.	26	1,506	1,532
		Shares (per cent)			growth (per cent)		
London	15.3	15.4	15.6	n.a.	1.1	6.4	7.6
South East	13.9	13.9	14.0	n.a.	0.2	5.5	5.7
East of England	9.2	9.2	9.4	n.a.	-0.1	7.2	7.0
South West	8.5	8.6	8.7	n.a.	0.8	6.5	7.3
West Midlands	8.3	8.3	8.2	n.a.	0.1	4.2	4.3
East Midlands	6.8	6.8	6.8	n.a.	-0.9	5.7	4.8
Yorkshire & the Humber	8.1	8.1	7.9	n.a.	-0.0	3.2	3.1
North West	10.8	10.7	10.5	n.a.	-0.1	2.7	2.6
North East	3.8	3.7	3.6	n.a.	-1.4	1.8	0.3
Wales	4.3	4.3	4.4	n.a.	-0.4	5.7	5.3
Scotland	8.3	8.2	8.1	n.a.	-0.6	2.6	2.0
Northern Ireland	2.7	2.7	2.7	n.a.	0.8	4.5	5.3
UK	100.0	100.0	100.0	n.a.	0.1	4.9	5.0

Working Futures 5	2010	2012	2020	2022	2010-12	2012-20	2010-20	2012-22
						Employment (000s)		
London	4,830	5,007	5,326	5,414	176	320	496	407
South East	4,404	4,615	4,837	4,902	212	222	433	286
East of England	2,810	2,855	3,014	3,061	45	159	205	206
South West	2,712	2,785	2,900	2,936	73	116	189	152
West Midlands	2,591	2,664	2,756	2,787	73	92	165	123
East Midlands	2,148	2,239	2,314	2,340	90	76	166	101
Yorkshire & the Humber	2,516	2,549	2,630	2,657	34	81	114	107
North West	3,379	3,400	3,513	3,548	22	113	134	148
North East	1,167	1,162	1,199	1,212	-4	36	32	50
Wales	1,351	1,366	1,408	1,424	15	42	57	57
Scotland	2,584	2,659	2,761	2,796	75	101	176	137
Northern Ireland	839	809	845	856	-30	35	6	46
UK	31,331	32,112	33,504	33,933	781	1,392	2,173	1,821
		Shares (per cent)				growth (per cent)		
London	15.4	15.6	15.9	16.0	3.7	6.4	10.3	8.1
South East	14.1	14.4	14.4	14.4	4.8	4.8	9.8	6.2
East of England	9.0	8.9	9.0	9.0	1.6	5.6	7.3	7.2
South West	8.7	8.7	8.7	8.7	2.7	4.1	7.0	5.4
West Midlands	8.3	8.3	8.2	8.2	2.8	3.4	6.4	4.6
East Midlands	6.9	7.0	6.9	6.9	4.2	3.4	7.7	4.5
Yorkshire & the Humber	8.0	7.9	7.8	7.8	1.3	3.2	4.6	4.2
North West	10.8	10.6	10.5	10.5	0.6	3.3	4.0	4.4
North East	3.7	3.6	3.6	3.6	-0.4	3.1	2.7	4.3
Wales	4.3	4.3	4.2	4.2	1.1	3.1	4.2	4.2
Scotland	8.2	8.3	8.2	8.2	2.9	3.8	6.8	5.1
Northern Ireland	2.7	2.5	2.5	2.5	-3.5	4.4	0.7	5.7
UK	100.0	100.0	100.0	100.0	2.5	4.3	6.9	5.7

Source: Cambridge Econometrics, MDM revision 7146 and 12015

Note: Includes H. M. Forces. Tables in Annex D exclude H.M. Forces.

As discussed above, the bounceback in UK employment over 2010-12 was in two broad sectors: Trade, accommodation & transport services, in which a bounceback was not forecast in WF 4; and Business & other services, in which some bounceback was forecast over this period in WF 4. There was also growth in manufacturing employment over this period, which was not forecast in WF 4. Across the regions, the majority of the bounceback (and difference between the two forecasts) in Trade, accommodation & transport services was seen in the South East and London. In Business & other services, the biggest bounceback (and difference between the two forecasts) was also seen in the South East. The increase in employment in this sector in London, while reasonably large, is smaller than was forecast in WF 4. For manufacturing, which was forecast to see a decline over 2010-12 in WF 4, but actually recorded an increase over the period, the greatest difference between the change in employment over this period in the two forecasts was made in the North West, Scotland, Wales and the East of England.

Over 2012-20, there is some variation in the pattern of growth forecast for employment by broad sector in each of the countries and regions in the two forecasts. Differences in growth prospects for the broad sectors in each region do not simply reflect differences at the UK level, but the finer grain detailed industrial mix of each broad sector. For example, in Manufacturing, for which the overall UK employment growth forecast over 2012-20 is slower in WF 5 than WF 4, employment growth in the South West, Yorkshire & the Humber and Scotland is forecast to be better (albeit still declining) than forecast in WF 4. In non-market services, which is forecast to see growth of 1.6 per cent over this period in the UK as a whole over 2012-20, compared with no growth in WF 4, the biggest revisions in absolute employment change terms, are in London and Scotland.

The pattern of employment growth by gender and status across the regions reflect the pattern for the UK as a whole.

Comparison by occupation

At the devolved nation and English regional level the pattern of projected employment changes for SOC Major Groups 1 to 5 is broadly similar in *Working Futures 5* to those in *Working Futures 4*. 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 many high and some low-skilled occupations and a ‘hollowing out’ of employment in the middle range of skilled manual employment and more routine non-manual occupations.

Annex C: Census of Population Estimates of Occupational Employment Structure [19]

Table C.1 highlights some issues in comparing the latest results from the Census of Population with the LFS estimates upon which *Working Futures* is based. This illustrates some significant differences between the occupational profile of employment using initial data releases from the Census and those based on using the LFS.

In particular, the Census indicates that there are far fewer people employed as Sub-Major Group 21 (Science, Research, Engineering and Technology Professionals) than in the LFS. These comparisons are based on data for England and Wales only. Data currently available do not enable any analysis of how this might be linked to differences in industrial employment structure between the two sources.

Discussion with ONS statisticians highlight that the transition from the use of SOC2000 to SOC2010 when classifying occupations in the LFS which took place in in January 2011 might be part of the reason. This resulted in a significant increase in Major Group 2 compared to the SOC2000 equivalent. A large part of this increase can be attributed to the intended correction of the over-estimation of 'managers' in the previous classification(s). Broadly speaking, over half of the LFS respondents coded to major group 1 in the last quarter under SOC2000 were coded to the same major group in the first quarter under SOC2010. Of those 'recoded' from major group 1 almost a third moved into major group 2.[20]

In the specific case of SOC2010 sub major group 21 there is the additional factor that SOC2010 introduced a greater range of detailed IT-related occupation descriptions, e.g. IT analysts, web designers, programmers etc. It appears that these new IT-related descriptions captured respondents that were previously coded elsewhere: in 2011 Q1 around half of the cases coded to IT-related occupations in sub major group 21 were coded to occupations outside major group 2 in 2010 Q4.

For these reasons ONS expected to see an increase in major group 2 generally and in sub major group 21 in particular. This is reflected in the *Working Futures* results based on the new SOC2010 categories (both *Working Futures 4* and *5*).

However, if this kind of estimate is compared with the latest data from the Census, the same shift is not apparent. It is possible that differences in data collection and/or coding

[19] This annex is partly based on correspondence with Sean Milburn, Labour Force Survey, Social Survey Division, Office for National Statistics and Mandy Keen of the Census unit, Office for National Statistics.
[20] Based on a sub-sample of cases common to 2010 Q4 and 2011 Q1 with the same employer for three months or longer. conducted by ONS.

methodology could be minimising what ONS (LFS unit) thought were legitimate changes.

In the LFS an interviewer records a text description of the respondent's occupation and then submits this description to an electronic look-up which returns a SOC code. This method has been used since the introduction of SOC2000 in 2001. The interviewers are experienced in probing and recording the occupation description in such a way as to yield an accurate result.

The Census occupation coding process is based on the questions in “write-in boxes” asking 'what is your full and specific job title' and 'briefly describe what you do in your main job'. Industry and employment status were also asked for. The forms were then scanned and coded. The contractor Lockheed Martin had a processing centre in Manchester which coded the occupation to SOC2010 using ACTR automatically and then teams of coders for the ones not automatically assigned codes.

ONS Classification & Harmonisation Unit (CHU) have just received a 500,000 case sub-sample of the census specifically to check the accuracy of the coding. Hopefully that exercise will lead to a better understanding of any differences between the Census and the LFS.

Table C.1: Census/LFS Comparisons of occupational employment structure: England and Wales

SOC2010 Sub-Major Groups	Census*	% share	LFS#	% share	Diffs (%) LFS-
All industries			2011		
All occupations	26,681,568		24,792,321		
11 Corporate managers and directors	1,870,218	7	1,759,367	7.1	0.1
12 Other managers and proprietors	1,013,372	3.8	766,768	3.1	-0.7
21 Science, research, engineering and technology professionals	1,114,332	4.2	1,261,541	5.1	0.9
22 Health professionals	1,025,438	3.8	1,022,541	4.1	0.3
23 Teaching and educational professionals	1,161,176	4.4	1,252,642	5.1	0.7
24 Business, media and public service professionals	1,337,120	5	1,321,473	5.3	0.3
31 Science, engineering and technology associate professionals	426,959	1.6	448,516	1.8	0.2
32 Health and social care associate professionals	313,472	1.2	359,434	1.4	0.3
33 Protective service occupations	394,783	1.5	324,568	1.3	-0.2
34 Culture, media and sports occupations	554,414	2.1	522,633	2.1	0
35 Business and public service associate professionals	1,689,556	6.3	1,749,007	7.1	0.7
41 Administrative occupations	2,273,622	8.5	2,100,126	8.5	-0.1
42 Secretarial and related occupations	778,866	2.9	649,380	2.6	-0.3
51 Skilled agricultural and related trades	309,654	1.2	290,093	1.2	0
52 Skilled metal, electrical and electronic trades	1,056,013	4	967,514	3.9	-0.1
53 Skilled construction and building trades	1,040,897	3.9	910,979	3.7	-0.2
54 Textiles, printing and other skilled trades	662,483	2.5	521,206	2.1	-0.4
61 Caring personal service occupations	1,878,295	7	1,722,989	6.9	-0.1
62 Leisure, travel and related personal service occupations	623,961	2.3	518,568	2.1	-0.2
71 Sales occupations	1,827,765	6.9	1,547,927	6.2	-0.6
72 Customer service occupations	422,496	1.6	451,410	1.8	0.2
81 Process, plant and machine operatives	911,707	3.4	660,231	2.7	-0.8
82 Transport and mobile machine drivers and operatives	1,019,602	3.8	927,541	3.7	-0.1
91 Elementary trades and related occupations	456,344	1.7	414,449	1.7	0
92 Elementary administration and service occupations	2,519,023	9.4	2,321,420	9.4	-0.1
		100		100	0

** (from M:\IE\Projects\WorkingFutures\CensusDownloads\ct0058---occupation--4-digits-); economically active in employment*

 # From Public access version of the LFS as supplied to IER Warwick via the Survey Archive

Annex D: Spatial Perspectives

Key Messages

- The projections of output and employment for 2012 to 2022 for the regions and nations of the UK indicate that the southern parts of England (particularly the south-east corner) will continue to experience the most favourable trends relative to the remainder of England and the other nations of the UK.
- There is less variation between the nations and regions with regard to projected rates of employment change by industry sector and SOC major group during 2012 to 2022 than was estimated to have occurred between 2002 and 2012.
- Growth in employment in managers, directors and senior officials, professional and associate professional occupations is expected to be fastest in the south-eastern corner of the UK.
- In some occupations there is a marked contrast in projected employment prospects by gender, with men gaining jobs while women lose them quite quickly. The broad geographical contrast in rates of job loss is more pronounced for women in some SOC major groups.
- The demand for skills, as measured by the numbers employed holding higher level qualifications, is projected to rise significantly across all UK nations and English regions. Employment of the higher qualified is expected to be strongest in London, by a significant margin, followed by Scotland.

D.1 Introduction

Geographical differentials in the labour market performance of regional and local economies within the UK are extremely persistent. Since World War I, economic development has disproportionately benefited London and the south-eastern corner of England and the operation of factors such as greater rates of innovation and competitiveness and better accessibility to markets has intensified their relative advantage over time. It has been argued that a relative shift of economic activity from these congested areas to less developed parts of the UK would improve national economic efficiency and would be socially beneficial. Regional industrial policy in the second half of the twentieth century attempted to achieve this through attracting international direct investment and moving public sector employment, but has been weakened as the greater imperative became to achieve territorial economic cohesion at the EU scale and the ideology of governing parties shifted away from intervention. The deep economic recession which commenced in 2008 had a relatively greater impact on the more economically disadvantaged regions and nations, which had also become more dependent upon the public sector for employment as manufacturing continued its long-term decline. Since the private sector is relatively small in these regions and nations, their ability to create and sustain endogenous economic growth is much weaker than in the south and east of England and they are more vulnerable to the effects of public spending cuts designed to reduce the size of the state. 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 2012 to 2022.

The previous UK government devolved significant powers to the nations of the UK and the regions of England. In contrast, the Coalition government's 'localism agenda' aims for economic planning to be conducted at the "most appropriate" spatial scale. The primary geographical entities for the promotion of economic development in England are the 39 "Local Enterprise Partnerships" (LEPs) created to replace the Regional Development Agencies. These LEPs are intended to represent geographical areas with a broadly coherent functional economic identity. Wales, Northern Ireland and Scotland are each divided into a small number of economic regions, but economic development is primarily a national responsibility in the first two of these countries. Scotland retains enterprise bodies (Scottish Enterprise and Highlands and Islands Enterprise) to conduct regional policy.

Though English regions are no longer policy-relevant geographical areas, there are significant practical reasons why *Working Futures* 2012-2022 uses the spatial framework of regions in England to present sub-national output and productivity projections. First, there are a large number of LEPs in England, the boundaries of which often overlap and the use of this spatial framework would pose a challenge in terms of the amount of information presented and there would thus be a need to group areas together. Secondly, some LEPs have small populations and sample sizes may not be large enough to generate data for all of them. Thirdly, because of this, the level of industrial and occupational detail available at this scale is much reduced and hence the utility of analysing geographical trends is reduced.

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 annex. 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 Annex 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[49];

(e) projections of replacement demand

(f) projections of qualifications patterns.

The results are based on a multisectoral macroeconomic model, estimated from official historical data for the devolved nations and English Regions that together make up the UK. Details are set out in Annex A and in the separate Technical Report, Wilson *et al*. (2014). Projected output, productivity and employment are determined endogenously by this model (as described in Annex A and the *Technical Report*).

The present Annex follows the format of previous years and does not focus on the pre- and post-recession periods although some information is provided in the tables for interested readers.

Results are presented here at the level of six broad sectors (defined in Annex A) and nine SOC major occupational groups. The results described are all taken from the historical and projected database, which is available in much more detail in the

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

associated Excel Workbooks. The methodology adopted to create regional projections (including estimates of replacement demand and the changing qualifications profile of employment) is explained in Annex A (and in much more detail in the separate *Technical Report*.

Section D.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. Using the database of output and employment estimates created for the *Working Futures* projections, the pattern of output and employment change for 2002 to 2012 is contrasted with the projected change in output and employment for 2012 to 2022. Section D.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 2012-22, covering employment projections by industry sector in Section D.4. Employment change by gender and employment status (full-time, part-time and self-employment) is discussed in Section D.5. Occupational employment prospects are described in Section D.6. Section D.7 presents the complete picture of labour demand over the decade, outlining projections of replacement demand by occupation and region. Section D.8 focuses on implications for qualifications.

D.2 Aggregate trends by country and region

Table D.1 presents recent and projected trends in output (GVA) and employment across the UK. The historical period is divided into two parts to give some indication of patterns before and after the global financial crisis of 2007/2008.[50] The growth rates for GVA and employment were negative for a number of regions in the second half of the decade.

For the UK as a whole, the projections suggest that annual rate of economic growth will increase slightly in the coming decade, with the annual average rate of GVA growth between 2012 and 2022 0.4 percentage points higher than that for 2002 to 2012. This represents a slow recovery from the deep recession of 2008-9 and the subsequent stagnation which ended in late 2012. Past and projected GVA growth rates for England are the same as for the UK. Scotland and Northern Ireland experienced average growth rates similar to England during 2002 to 2012 but they are expected to see a slightly slower rate of growth relative to England between 2012 and 2022. In Wales, the annual rate of growth of GVA between 2002 and 2012 was much slower than in the rest of the UK, but the recovery in growth rates during 2012 to 2022 is projected to be much stronger, resulting in a growth rate comparable to those of Scotland and Northern Ireland.

Within England, the highest rates of annual GVA growth between 2002 and 2012 occurred in the regions of the south and east of England, with the highest rate overall in London and the lowest rates in the North West and Yorkshire and the Humber. The North East experienced a much higher rate of growth than other northern regions, for which slower growth rates reflect the impact of the 2008-9 recession. For the period 2012-2022, much less variation in regional growth rates is projected. London is projected to grow fastest, but the increase in regional growth rate relative to the earlier period is smaller than for any other region. Nonetheless, rates of growth are projected to be faster in the southern regions than in the devolved nations and the northern half of England.

The annual average rate of employment growth for 2012-2022 is projected to be the same as for 2002-12 in the UK as a whole (0.6 per cent) and to be slightly slower in England. During 2002-12, the estimated rate of employment growth in Wales was similar to England, whilst in Scotland and Northern Ireland it was slightly slower. For 2012-22, employment is projected to grow more quickly in Scotland and Northern

50 There is a case for choosing the low point of employment as the break year but 2007 represents the start of the crisis and has the advantage of splitting the decade into two periods of equal length.

Ireland than in the previous decade, narrowing the gap with England. The rate of employment growth is projected to be slightly slower in Wales than in 2012-2022. Projected rates of employment growth for the devolved nations are similar to those for the northern English regions.

Within England, the annual average rate of employment growth between 2002 and 2012 was fastest in the East Midlands, South West and London and slowest in the West Midlands and North West. The decade 2012-22 is projected to experience a continuing ‘north-south divide’ in annual average rates of employment growth, although the degree of variation in performance between regions is expected to decrease. The south and east of England (London, the East of England, the South East and South West) display the highest projected annual increases, with the West Midlands and North West performing slightly more strongly than the remaining regions.

Table D.1: Long-term Changes in Macroeconomic Indicators

	GVA				Employment			*% p.a.*
	2002-2007	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**
London	4.6	0.0	2.2	2.3	0.7	1.0	0.9	0.8
South East	3.3	0.2	1.7	2.0	0.6	0.9	0.7	0.6
East of England	3.7	-0.6	1.5	1.9	1.2	-0.1	0.6	0.7
South West	3.4	-0.2	1.6	1.9	1.0	0.7	0.9	0.6
West Midlands	2.5	-0.7	0.9	1.7	0.7	-0.2	0.3	0.5
East Midlands	3.3	-0.6	1.3	1.7	1.9	0.3	1.1	0.4
Yorks & the Humber	2.6	-1.0	0.8	1.6	1.5	-0.2	0.6	0.4
North West	2.3	-0.8	0.7	1.6	0.9	-0.2	0.4	0.5
North East	2.8	-0.5	1.2	1.5	1.6	-0.4	0.6	0.4
England	3.4	-0.3	*1.5*	*1.9*	1.0	0.3	*0.7*	*0.6*
Wales	2.6	-0.4	1.1	1.7	1.7	-0.5	0.6	0.4
Scotland	3.4	-0.5	1.4	1.6	1.3	-0.5	0.4	0.5
Northern Ireland	3.2	-0.2	1.5	1.7	1.8	-1.0	0.4	0.5
United Kingdom	3.4	-0.4	1.5	1.9	1.1	0.2	0.6	0.6

Source: CE/IER estimates, MDM revision 12015, 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. Figures exclude extra-regio element.

Employment is measured by workplace jobs (see Section D.3 for more details).

Table D.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 2012-2022 than for 2002-2012. During 2002-2012, the primary sector & utilities and construction sectors contracted by 0.3 and 0.4 per cent respectively per annum. The fastest growth was in business & other services, which grew by 3.1 per cent per annum on average. For the period 2012-2022, the construction and primary sector & utilities sectors are projected to grow at 2.1 and 0.5 per cent respectively per annum. The manufacturing sector is projected to return to growth (1.4 per cent per annum, following zero growth between 2002 and 2012), and growth in trade, accommodation and transport is projected to increase from by 0.6 to1.6 per cent per annum. Rates of growth of GVA are projected to slow from 3.1 to 2.6 per cent per annum in the business & other services[51] sector and projected to fall by a third, from 1.8 to 1.2 per cent per annum, for the non-market services sector (public administration, health and education) reflecting the impact of public sector spending cuts.

During **2002-2012**, output in the *primary sector & utilities* sector increased in the East Midlands, South East and South West of England. Elsewhere, the sector displayed a negative annual average rate of change, with decline being fastest in Northern Ireland and Wales, followed by the North West and London. The annual average rate of decline of 0.2 per cent in England was far slower than for any of the other countries.

The *manufacturing* sector declined in most regions of England between 2002 and 2012, most rapidly in London and the South East. GVA expanded most rapidly in the South West, North East and East of England. GVA in this sector grew in all three devolved nations, most strongly in Northern Ireland, followed by Wales. Output grew at a faster rate in Scotland than in most English regions.

Output in *construction* declined between 2002 and 2012 in most parts of the UK, growing slowly only in London and the South East. The rate of decline was fastest in Yorkshire and the Humber, the East Midlands and Northern Ireland. The rate of decline was faster in northern England than in Scotland and Wales.

The *trade, accommodation and transport* sector grew fastest in Northern Ireland, the East Midlands, and East of England, and faster than the UK average in London and Scotland. Growth was slower in England than in the other nations and markedly so in the case of Northern Ireland and Scotland.

[51] This includes the media, information technology, Finance and insurance, real estate, professional services, support services and arts and entertainment industries. For full definitions of all the broad sectors see Annex A.

Output in the *business & other services* sector grew quite strongly in all parts of the UK between 2002 and 2012. Northern Ireland displayed the highest growth rate, the rate of growth for Scotland was slightly faster than for England, whilst that for Wales was slightly slower. In England, the sector grew fastest in the South East and most slowly in the East of England, West Midlands and North West.

Output in the *non-market services s*ector grew faster in England than in the other three nations between 2002 and 2012. 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 **2012 to 2022**, these are based on a coherent and consistent picture of economic prospects for the whole of the UK set within a broad global context. This includes a view about government policy and general prospects for the world economy.

Output in the *primary sector & utilities* is projected to increase in all regions and nations of the UK except Scotland (where output growth had been static during 2002-2012). Output in Wales and Northern Ireland is projected to grow slightly more slowly than in England as a whole. Within England, output is projected to grow fastest in the South West, South East, East of England and North West. Regional differentials in projected growth rates are quite small.

There is also little inter-regional variation in projected output growth rates in *manufacturing*. The highest growth rates are projected to occur in the South West, Northern Ireland, West Midlands and Wales. The East of England and the North East of England are projected to grow most slowly.

Strong growth is projected for the *construction* sector, with the fastest growth expected for Northern Ireland, the East of England, London and the South East of England. Projected rates of growth are slower in northern England, the West Midlands, Wales and Scotland.

Turning to *trade, accommodation and transport*, there is projected to be much less variation in regional growth rates than in the preceding decade. The fastest rates of GVA growth are projected for London, the East of England and the East Midlands. Projected growth rates are slower in Scotland, Wales and the northern regions of England.

In the *business & other services* sector, annual average growth rates for 2012-2022 are projected to be faster than for any other sector, but slower than for the preceding decade. Projected growth rates are fairly similar but are slightly higher for Northern Ireland and

Wales, compared with Scotland and England as a whole. Within England, the projected rate of growth is highest in London, the South East and South West.

The rate of growth in the *non-market services sector* is projected to be a third slower than in the preceding decade. Output is projected to grow more slowly than the UK average in Northern Ireland, Scotland and Wales and faster than average in England. This is largely accounted for by the relatively high rate of growth projected for London. There is a north-south divide in England, with the southern regions and the midlands growing at close to the UK average, but output growth being projected to be slower than the average in the three northern regions. Regional growth rates are projected to be marginally higher in 2012 to 2022 than during 2002-2012 in Yorkshire and the Humber and Wales.

Table D.2: Long-term Changes in GVA by Broad Sector

% p.a.

	Primary sector and utilities				Manufacturing				Construction			
	2002-2007	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**
London	0.7	-3.4	-1.3	0.4	-1.5	-3.2	-2.4	1.5	2.6	-2.1	0.2	2.3
South East	2.8	-0.3	1.2	0.7	0.9	-3.5	-1.3	1.3	2.3	-1.4	0.4	2.3
East of England	-0.5	-1.6	-1.0	0.7	2.4	-0.7	0.8	1.3	1.2	-2.8	-0.8	2.5
South West	2.2	-1.5	0.3	0.8	2.5	0.0	1.2	1.7	1.9	-1.8	0.0	2.1
West Midlands	0.4	-1.2	-0.4	0.6	1.0	-1.4	-0.2	1.6	1.6	-3.3	-0.9	1.6
East Midlands	4.4	-1.7	1.3	0.5	1.4	-1.8	-0.2	1.4	1.7	-4.2	-1.3	2.2
Yorks & the Humber	-0.4	0.1	-0.1	0.4	2.3	-2.3	0.0	1.4	1.3	-5.0	-1.9	1.8
North West	-0.8	-2.7	-1.7	0.7	0.3	-1.4	-0.6	1.4	2.1	-3.5	-0.7	1.8
North East	-0.7	-1.0	-0.9	0.5	2.5	-0.9	0.8	1.3	1.6	-2.7	-0.6	1.6
England	1.1	-1.4	*-0.2*	*0.6*	1.2	-1.7	*-0.3*	*1.4*	1.9	-2.8	*-0.5*	*2.1*
Wales	-2.2	-2.7	-2.4	0.5	4.0	-1.1	1.4	1.6	1.4	-1.8	-0.2	1.6
Scotland	1.5	-1.4	0.0	-0.1	3.4	-1.5	0.9	1.5	2.9	-3.0	-0.1	1.6
Northern Ireland	-1.2	-5.3	-3.3	0.5	4.4	0.0	2.2	1.7	2.3	-4.8	-1.3	2.5
United Kingdom	1.0	-1.6	-0.3	0.5	1.6	-1.6	0.0	1.4	2.0	-2.8	-0.4	2.1

	Trade, accomod. and transport				Business and other services				Non-market services			
	2002-2007	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**
London	3.1	-1.3	0.9	1.8	6.2	0.3	3.2	2.7	3.3	2.2	2.8	1.7
South East	2.5	-1.5	0.4	1.6	5.1	1.9	3.5	2.7	3.1	1.4	2.3	1.3
East of England	3.7	-1.4	1.1	1.7	5.2	-0.4	2.4	2.5	4.4	1.1	2.7	1.3
South West	2.8	-1.3	0.7	1.6	5.9	0.4	3.1	2.7	2.2	0.9	1.6	1.2
West Midlands	2.3	-2.7	-0.2	1.5	5.0	0.0	2.5	2.4	1.6	2.0	1.8	1.2
East Midlands	3.5	-0.2	1.6	1.7	6.0	0.1	3.0	2.3	2.1	0.8	1.5	1.2
Yorks & the Humber	1.8	-2.1	-0.2	1.5	5.9	0.4	3.1	2.5	1.1	0.6	0.8	1.0
North West	1.7	-2.0	-0.2	1.4	5.5	-0.4	2.5	2.4	1.4	1.3	1.4	1.0
North East	2.4	-4.1	-0.9	1.4	6.5	-0.2	3.1	2.5	1.5	2.9	2.2	0.9
England	2.7	-1.6	*0.5*	*1.6*	5.7	0.4	*3.0*	*2.6*	2.4	1.5	*2.0*	*1.3*
Wales	2.4	-1.2	0.6	1.4	5.4	0.4	2.9	2.8	1.2	0.6	0.9	1.0
Scotland	2.4	-0.3	1.0	1.3	6.3	0.2	3.2	2.6	1.8	0.4	1.1	1.0
Northern Ireland	4.3	-0.8	1.7	1.6	7.1	0.5	3.7	2.9	0.5	2.0	1.2	0.9
United Kingdom	2.7	-1.5	0.6	1.6	5.8	0.4	3.1	2.6	2.3	1.4	1.8	1.2

Source: CE/IER estimates, CE projections MDM revision 12015, CrossRegional.xls (Table R.2)

Notes: GVA (output) is measured on a residence 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. Figures exclude extra-regio element.

D.2.2 Employment by broad sector

Table D.3 presents recent historical employment estimates (based on official data) and projected future trends in employment by broad sector. During 2002 to 2012, there was a rapid decline in *manufacturing* employment, slow employment growth in the *trade, accommodation and transport* and *construction* sectors and rapid growth of employment in the *primary sector and utilities*, *business and other services* and *non-market services* sectors. In the decade 2012 to 2022, the decline in *manufacturing* sector employment is projected to be much slower, while employment in the *primary sector & utilities* is also projected to fall. Employment in the *construction* sector is projected to increase quite strongly and the rate of employment growth in the *trade, accommodation and transport* sector is projected to increase slightly. The rate of employment growth in the *business & other services* sector is projected to slow, while a large reduction in the rate of employment growth in the *non-market services* sector is projected. The latter reflects continuing constraints upon expenditure in the public sector.

The period **2002 to 2012** will be considered first.

The *primary sector & utilities* gained employment at a fairly rapid rate (1.6 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 Northern Ireland lost jobs at a rapid rate and employment in Wales grew only half as fast as in England. There were more extreme contrasts within England, with London losing jobs at 1 per cent per annum but with rapid growth in the West Midlands (3.6 per cent). The rate of employment growth was also well above average in the South West, North West, Yorkshire and the Humber and East Midlands. Employment growth was slowest in the South East and North East.

In contrast, employment in the *manufacturing* sector declined in all regions and nations of the UK, but at a much faster rate in England than in Wales and Northern Ireland and slightly faster than in Scotland. Within England, the rate of employment loss was greatest in London and the West Midlands, and least in the South West and East Midlands.

Average rates of annual employment change in the *construction* sector displayed less variation. Employment increased in Scotland and England, but declined quite sharply in Northern Ireland and Wales. Within England, the rate of employment growth was highest by far in the East Midlands and North West, and was also relatively fast in London and the West Midlands. Employment contracted in the East of England, South East, North East and Yorkshire and the Humber.

Employment in *trade, accommodation and transport* grew very slowly at the UK level, but the rate of growth was fastest in Northern Ireland and England. Employment contracted in Scotland and growth was slower than the UK average in Wales. Within England, employment grew fastest in the East Midlands, with faster than average growth in the South East and East of England. In most other regions, the rate of increase was slow, but employment in the North West declined.

Employment in *business & other services* increased in all regions and nations. The annual average rate of employment increase was highest (at 2.5 per cent) in Northern Ireland and North East England. The growth of employment was faster in both Wales and Scotland than in England. Within England, employment grew most slowly in the East of England, South East and West Midlands and growth was above average outside the south-east corner: Yorkshire and the Humber, the East Midlands, South West and North West.

In the UK, employment in the *non-market services* sector grew at an annual average rate of 1.6 per cent. Employment grew in all regions and nations, faster in both England and Wales than in Scotland and Northern Ireland. Within England, the fastest rates of increase were in the south and east: the East Midlands, South West, South East, London and East of England. The slowest rates of employment growth occurred in northern England.

Turning to the pattern of employment change by sector for **2012-2022**, employment in the *primary sector & utilities* is projected to decline slowly, but more slowly than the UK average in Wales and more quickly than the average in Northern Ireland. Within England, the sector is only projected to gain employment in London. The projected rate of decline in employment is fastest in the South West, followed by the East Midlands. The North East and North West have the slowest projected rates of job loss.

Manufacturing employment is projected to decline at a slightly faster rate than *primary sector & utilities* and 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. Employment is projected to decline at around the same rate in all four nations of the UK. Within England, employment is projected to decline faster than the UK average rate in Yorkshire and the Humber, the South East and London. Elsewhere, the South West and West Midlands experience the slowest rate of job loss.

Employment is projected to increase fastest In the *construction* sector. The fastest rate of growth is projected for Northern Ireland, with England gaining jobs at the same rate as the UK and the rate of increase being somewhat slower in Wales and Scotland. Within England, the East of England and London are projected to experience employment growth faster than the national average, with the rate of increase slowest in the West Midlands and North East.

Employment in the *trade, accommodation and transport* sector is projected to increase slightly faster during 2012-2022 than in the preceding decade. Employment is projected to grow at a similar rate in all parts of the UK, but is expected to grow slightly slower in Scotland than the other nations[53]. In England, employment is projected to grow fastest in London, the East of England and the South East, and most slowly in the North East and North West.

The projected rate of employment growth in the *business & other services* sector for 2012-2022 is slower than for the previous decade. Employment growth is projected to be fastest in Northern Ireland, but to be similar to the UK average rate in the other three countries of the UK. In England, the projected rate of employment growth is slightly faster in the South East, East of England and North East, with little variation around the national average growth rate in the remaining regions.

In the *non-market services* sector, employment is projected to grow much more slowly than the other service sectors during 2012 to 2022 and much more slowly than during 2002 to 2012. The projected rate of growth is faster than the UK average in Scotland, and slightly slower in Wales and Northern Ireland. In England, the projected rate of employment growth is twice the national average in the East of England and South West and above average in Yorkshire and the Humber. Elsewhere, the projected rate of growth is at or slightly slower than the England (and UK) average.

D.2.3 Prospects for the nations of the UK and regions in England

The prospects for each devolved nation and English region depend upon its industrial structure and the performance of these industries in an international context. Details of the assumptions adopted and models used to generate the projections are summarised in Annex A and in more detail in the separate *Technical Report.*

London: The annual average rate of GVA growth was higher than for any other region or nation of the UK during 2002-2012 and is projected to continue to be highest during 2012-2022. The rate of employment growth was 50 per cent higher than that for the UK as a whole during 2002-2012. The region is projected to increase employment faster than elsewhere during 2012-2022, at a rate one-third faster than the UK average.

[53] The results for Scotland include the effects of short-term phenomena such as the 2014 Commonwealth Games.

- During 2002-2012, GVA growth was fastest in *business & other services*, *non-market services* and *trade, accommodation and transport.* GVA declined quite rapidly in the *manufacturing* and *primary sector & utilities* sectors. The latter two sectors also displayed rapid employment decline, but employment grew strongly in *non-market services* and, to a lesser extent, in *business & other services*.
- For 2012-2012, GVA is projected to grow in all sectors. It is projected to grow fastest in *business & other services* and *construction.* London's projected GVA growth is faster than the UK as a whole in all sectors, except *primary sector & utilities*. The projected rate of GVA growth is poorest relative to other regions for the *primary sector & utilities*, *manufacturing* and *business & other services* sectors.
- London lost employment in the *primary sector and utilities* and the *manufacturing* sector between 2002 and 2012. Employment grew in all other sectors. The rate of increase exceeded the UK average only in *construction* and *non-market services*.
- London is projected to gain employment in all sectors except *manufacturing* between 2012 and 2022. London's projected rate of employment loss in this sector is faster than all but two other regions or nations.
- Employment in the *primary & utilities* sector is projected to recover from the rapid decline of 2002-2012 to be the only region or nation in which employment is projected to increase between 2012 and 2022. Employment in the *construction* sector is projected to continue grow faster than the UK average during 2012-2022.
- London is projected to experience one of the fastest annual average rates of employment growth in the *trade, accommodation and transport* sector between 2012 and 2022. Employment in *business & other services* is projected to grow slightly slower than for the UK as a whole.

South-East England: GVA increased faster than the UK average during 2002-2012 and is projected to continue to grow slightly faster than the UK average between 2012 and 2022. Employment grew slightly faster than for the UK as a whole between 2002 and 2012 but is projected to grow more slowly (at the UK average rate) between 2012 and 2022. Only London is projected to experience higher rates of GVA growth.

- GVA grew in all sectors except *manufacturing* between 2002 and 2012. The rate of GVA growth was faster than the UK average in all sectors except *trade, accommodation and transport.* In most sectors, this region experienced one of the highest rates of output growth. GVA grew faster than in any other region or nation in the *construction* sector and was also particularly high for the *primary sector and utilities*.

- Over the period 2012 to 2022, GVA is projected to grow in all sectors. The projected rate of growth is above the UK average for all sectors except *trade, accommodation and transport* and *manufacturing*. In all sectors, the region is projected to experience one of the fastest rates of growth.
- Employment declined between 2002 and 2012 in the *manufacturing* and *construction* sectors. Employment grew more slowly than the UK average in the *primary sector and utilities* and in *business and other services*.
- Employment is projected to decline between 2012 and 2022 in the *primary sector and utilities* and the *manufacturing* sector, with the region performing markedly worse than the UK average in the latter. Employment growth is projected for all other sectors, but will only be faster than the UK average in the *trade, accommodation and transport* and *business and other services* sectors.

East of England: In the *East of England*, GVA increased at the UK average rate between 2002 and 2012, and is projected to continue to grow at the same rate as the UK between 2012 and 2022. Employment also grew at the same rate as the UK between 2002 and 2012, but it is projected to increase at a slightly faster rate than the UK average between 2012 and 2022.

- GVA declined in the *primary sector & utilities* and *construction* sectors between 2002 and 2012, in both cases at a much faster rate than the UK average. Over this period, GVA grew much faster than the UK average in the *manufacturing*, *trade, accommodation and transport* and *non-market services* sectors.
- GVA is projected to grow in all sectors between 2012 and 2022. The projected rate of growth exceeds the UK average in all sectors except *manufacturing* and *business and other services*. The region is projected to have the highest growth rate of any region or nation in the *construction* sector.
- Between 2002 and 2012, employment declined in the *manufacturing* and *construction* sectors (in the former at a slower rate than the UK average). Employment grew faster than the UK average in the *primary sector and utilities*, *trade, accommodation and transport*, and *non-market services* sectors. Employment in *business and other services* grew more slowly than in any other region or nation,

- The region is projected to continue to lose employment in the *primary sector and utilities* and *manufacturing* sectors between 2012 and 2022. Employment is projected to increase in all other sectors at a faster rate than the UK average. The rate of increase in the *construction* and *non-market services* sectors is joint fastest among all regions and nations of the UK.

South-West of England: The *South West* continues to perform more favourably than other regions and nations outside the south-eastern corner of England. Both GVA and employment grew faster than the UK average rate between 2002 and 2012 and both GVA and employment are projected to continue to grow at the UK average rate over the period 2012 to 2022.

- GVA increased in all sectors between 2002 and 2012. The regional growth rate exceeded the UK average in the *primary sector and utilities*, *manufacturing, construction* and *trade, accommodation and transport* sectors. Only in *non-market services* was the rate of growth slower than the UK average.
- GVA growth is projected for all sectors between 2012 and 2022. The rate of projected growth is equal to or faster than the UK average in each sector, and the fastest of all regions or nations for the *primary sector and utilities* and *manufacturing* sectors.
- Employment grew strongly between 2002 and 2012 in the *primary & utilities, business and other services* and *non-market services* sectors. The decline in *manufacturing* sector employment was slower than in any other region or nation. However, the employment performance of the *trade, accommodation and transport* sector was slightly poorer than average.
- For 2012 to 2022, employment in the *primary & utilities sector* is projected to contract twice as quickly as the UK average. However, employment is projected to increase twice as fast as the UK average in the *non-market services* sector. In other sectors, the rate of projected increase is similar to the UK average.

West Midlands of England: The *West Midlands* experienced the third slowest rate of GVA growth between 2002 and 2012 of any region or nation, and is projected to experience below average rates of GVA growth between 2012 and 2022. Employment grew at half the UK average rate between 2002 and 2012. The projected rate of employment growth for 2012 to 2022 is slightly slower than the UK average, similar to other regions and nations outside the south of England.

- During 2002-2012, GVA increased in only two sectors: business and other services and non-market services. In the former, the rate of increase was well below the UK average rate. Output in the *primary & utilities* and *manufacturing* sectors declined slightly faster than the UK average rate, but the decline in the *construction* sector was more than twice as fast as the average rate of decline for the UK.
- GVA is projected to increase in all sectors between 2012 and 2022. The projected rate of growth is faster than the UK average in the *manufacturing* sector, but much slower in the *construction* sector.
- Employment in *manufacturing* declined sharply between 2002 and 2012, must faster than the UK average, and more quickly than in any other region or nation except London. Employment grew in all other sectors, much faster than the UK average for the *primary & utilities* sector, but more slowly than average in the *business and other services* sector.
- Employment is projected to decline in the *primary & utilities* and *manufacturing* sectors, but to grow in all other sectors between 2012 and 2022. No sector experiences a projected rate of employment increase faster than the UK average.

East Midlands of England: GVA in the *East Midlands* grew slightly more slowly than the UK as a whole during 2002-12 and this relatively slow rate of growth is projected to continue between 2012 and 2022. Employment grew nearly twice as fast as the UK between 2002 and 2012, but employment in the region is projected to grow more slowly than the UK as a whole between 2012 and 2022.

- Between 2002 and 2012, GVA increased in all sectors except *manufacturing* and *construction*. In the latter, output declined faster than in any other region or nation except Northern Ireland and Yorkshire and the Humber. The East Midlands experienced the fastest rate of GVA growth of any region or nation for the *primary sector and utilities*. GVA in the *trade, accommodation and transport* sector grew more than twice as fast as in the UK, and only Northern Ireland recorded a faster growth rate.
- GVA is projected to grow in all sectors between 2012 and 2022, at close to the UK average rate in most sectors. The main exception is *business and other services,* in which GVA is projected to grow more slowly than for the UK as a whole.
- The only sector in which employment declined between 2002 and 2012 was the *manufacturing* sector. Employment increased much faster than the UK average rate in all other sectors. In the *construction*, *trade, accommodation and transport* and *non-market services* sectors, employment increased more rapidly than in any other region or nation.

- Employment is projected to decline between 2012 and 2022 in the *primary sector and utilities* and *manufacturing* sectors (in the former, more quickly than in any other region or nation except the South West). Employment in the construction sector is projected to grow much more rapidly than in the preceding decade. In the three service sector industries, employment growth is projected to be much slower than for 2002-12, at close to the UK average rate of increase.

Yorkshire and the Humber: During 2002-2012, GVA in *Yorkshire and the Humber* grew at half the average for the UK, one of the slowest rates of any region or nation. The projected annual average GVA growth rate for 2012 to 2022 is twice as fast, below the UK average but similar to neighbouring regions. Total employment grew at the UK average rate during 2002-2012, but is projected to be a third lower for 2012-22, this again being a similar growth rate to the other regions of northern England.

- GVA declined at a slightly slower rate than the UK average between 2002 and 2012 in the *primary sector & utilities,* while output in *construction* declined faster than any other region or nation. GVA also declined in the *trade, accommodation and transport* sector. GVA grew at the UK average rate in *business and other services*, but grew more slowly than any other nation or region in the *non-market services* sector.
- During the period from 2012 to 2022, GVA is projected to grow in all sectors. Projected rates of GVA growth are similar to the UK average in each case. There are large shifts from decline to growth between the two decades in the *construction* and *trade, accommodation and transport* sectors.
- Between 2002 and 2012, employment grew faster than the UK average in the *primary sector & utilities* and *business and other services* sectors and declined in the *manufacturing* and *construction* sectors. In other sectors, employment increased at around the UK average rate, but the rate of employment growth in *non-market services* was slower than average.
- Employment is projected to decline in the *primary sector and utilities* and *manufacturing* sectors between 2012 and 2022. The rate of employment decline in the latter is faster than for any other region or nation of the UK except the South East. Employment in other sectors is projected to increase slightly more slowly than the UK average, with the exception of the slightly faster than average rate of increase in the *non-market services* sector.

North West of England: In the *North West*, GVA grew more slowly than in any other UK region or nation between 2002 and 2012. The rate of GVA growth is projected to be more than twice as fast over the period 2012-2022, similar to neighbouring regions but still below the UK average growth rate. Employment grew at two-thirds of the UK average rate between 2002 and 2012, more slowly than neighbouring regions, but faster than the West Midlands.

- GVA declined in the *primary sector and utilities*, *manufacturing*, c*onstruction* and *trade, accommodation and transport* sectors between 2002 and 2012. The first of these experienced the most marked decline relative to the UK average. GVA grew in the *business and other services* and *non-market services* sectors.
- GVA is projected to grow in each sector between 2012 and 2022, more slowly than the UK average in all sectors except the *primary sector and utilities* and *manufacturing.* The *business and other services* and *non-market services* sectors are projected to grow more slowly than in the preceding decade, in contrast to other sectors.
- Employment grew above the UK average rate between 2002 and 2012 in the *primary sector and utilities*, *construction* and *business and other services* sectors. Employment in *non-market services* grew more slowly than the UK average, and employment in *trade, accommodation and transport* declined slightly, in contrast to all other regions and nations of the UK except Scotland. The rate of decline in *manufacturing* employment was slower than the UK average and slower than in other regions of northern England.
- Between 2012 and 2022, employment in the *primary sector and utilities* and *manufacturing* is projected to continue to decline but at below the UK average rate. Employment in other sectors is projected to perform at around the UK average rate. Projected rates of employment change are similar to those in neighbouring regions, in each sector.

North East of England: The annual average rate of GVA growth in the North East during 2002-2012 was a quarter 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 2012-22 is about a quarter higher, but slower than for Scotland and the rest of northern England. Employment grew at the UK average rate during 2002-2012 and is projected to grow at a slower than UK average rate between 2012 and 2022, which is similar to that projected for neighbouring regions and Scotland.

- GVA increased in manufacturing but declined sharply in the *primary sector and utilities, construction* and *trade, accommodation and transport* sectors between 2002 and 2012. In the last mentioned, the rate of decline was faster than in any other UK region or nation. GVA increased in the *business and other services* sector at the UK average rate, and much faster than the UK average in the *non-market services* sector.

- GVA is projected to grow in all sectors between 2012 and 2022. Output in the *construction*, *trade, accommodation and transport* and *non-market services* sectors is projected to increase much more slowly than the UK average.
- Employment performance was weaker than the UK average in the *manufacturing* and *construction* sectors between 2002 and 2012. Employment growth was particularly rapid in *business and other services* (and faster than in neighbouring regions), while *non-market services* grew more slowly than the UK average.
- During 2012-22, employment is projected to contract more slowly than the UK average rate in the *primary & utilities* and *manufacturing* sectors. Employment in the *construction*, *trade, accommodation and transport* and *non-market services* sectors is projected to be at a slower rate than the UK as a whole, and faster than the UK average in *business and other services*.

Wales: In Wales, GVA increased more slowly than the UK average between 2002 and 2012, but faster than the North West, Yorkshire and the Humber and the West Midlands. The projected annual average rate of GVA growth for 2012 to 2022 is over 50 per cent higher, closer to the UK average, equal to Northern Ireland and the midlands and slightly higher than those of Scotland and the three regions of northern England. Employment grew at the same annual average rate as the UK between 2002 and 2012, comparable with the East of England, Yorkshire and the Humber and the North East, but faster than the West Midlands, North West, Scotland and Northern Ireland. The rate of increase in employment is projected to be lower for 2012 to 2022, at a rate similar to other regions and nations of the north and west of the UK.

- Wales experienced the second fastest decline in GVA between 2002 and 2012 in the *primary sector and utilities* sector (after Northern Ireland), while output in the *construction* sector declined more slowly than the UK average. In contrast, GVA grew faster in the *manufacturing* sector than in any other UK region or nation except Northern Ireland. GVA grew at the UK average rate in the *trade, accommodation and transport* sector, but slightly slower than average in *business and other services* and at half the UK rate in *non-market services*.
- GVA is projected to grow in all sectors between 2012 and 2022. The projected rate of growth is faster than average in the *manufacturing* and *business and other services* sectors, at the UK average rate in *primary sector and utilities,* but markedly slower than average in the *construction* sector, and slightly slower than average in the *trade, accommodation and transport* and *non-market services* sectors.

- Between 2002 and 2012, employment contracted more slowly than the UK average in the *manufacturing* sector, but faster than in any other UK region or nation except Northern Ireland in the *construction* sector. Employment grew more slowly than the UK average in the *primary sector and utilities* and *trade, accommodation and transport* sectors. The rate of employment growth was faster than the UK average in the *business and other services* and *non-market services* sectors.
- Over the 2012 to 2022 period, employment is projected to decline at a slower than UK average rate in the *primary sector and utilities* and to decline at the UK average rate in the *manufacturing* sector. Employment is projected to grow more slowly than average in the *construction* sector and at around the UK average rate in the remaining sectors.

Scotland: In Scotland, GVA grew at a slightly slower rate than the UK average during 2002-2012 but faster than Wales and the regions of the midlands and northern England. The faster projected rate of growth for 2012 to 2022 remains slightly below the annual average growth rate for the UK, and similar to that for other regions and nations in the north and west of the UK. Employment grew more slowly than the UK average during 2002-2012 but the projected rate of growth in employment for 2012 to 2022 is closer to the UK average.

- Between 2002 and 2012, the only sector in which GVA declined was *construction*, but at a much slower rate than the UK average. Output in the *manufacturing* and *trade, accommodation and transport* sectors grew much faster than the UK average.
- Between 2012 and 2022, an increased rate of growth is predicted for the *manufacturing*, *construction* and *trade, accommodation and transport* sectors. In the *manufacturing* sector, the projected rate of growth exceeds the UK average, but in other two sectors it is lower. The rate of GVA growth for *business and other services* and *non-market services* is projected to be close to the UK average.
- During 2002 to 2012, employment declined at around the UK average rate in the *manufacturing* sector. In *trade, accommodation and transport* employment also fell, in contrast to the growth seen in most other parts of the UK. Employment grew more quickly than the UK average in *construction* but more slowly in the *non-market services* sectors.
- Employment is projected to decline at the UK average rate between 2012 and 2022 in the *primary sector and utilities* and *manufacturing* sectors. Employment growth at a slightly slower rate than the UK as a whole is projected for the *construction* and *trade, accommodation and transport* sectors. Employment in the *business and other services* sector is projected to grow at the same rate as for the UK as a whole.

- Employment in the *non-market services* sector is projected to grow more quickly than the UK average.

Northern Ireland: GVA grew at the UK average rate in Northern Ireland over the period 2002-2012. For 2012-2022, the rate of GVA growth is projected to be slightly higher, but below the UK average rate, in common with other regions and nations in the north and west of the UK. The rate of employment growth was two-thirds the rate for the UK as a whole during 2002-2012. The projected rate of employment growth is slightly higher for 2012 to 2022, but still slower than the UK average rate. The latter is higher because of the higher rates of employment growth in London and the East of England, with little variation in rates of increase across the other regions and nations of the UK.

- During 2002-2012, GVA contracted faster than in any other UK region or nation in the *primary sector and utilities* sector and much faster than the UK average in the *construction* sector. However, the *manufacturing* sector increased its GVA much faster than in any other region or nation of the UK. GVA also grew faster than in any other nation or region in *trade, accommodation and transport* and *business and other services* sectors. In contrast, GVA grew at well below the UK average rate in the *non-market services* sector.
- All sectors are projected to increase their GVA between 2012 and 2022. The annual average growth rate is the fastest or joint fastest of all regions and nations of the UK in the *manufacturing*, *construction and business and other services* sectors. In the *primary sector and utilities* and *trade, accommodation and transport sectors*, the rate of growth is equal to the UK average. In the *non-market services* sector, the projected growth rate is slower than the UK average.
- During 2002 to 2012, employment performed below the UK average in the *primary sector and utilities*, *construction* and *non-market services* sectors. However, Northern Ireland experienced the slowest rate of contraction of *manufacturing* sector employment of any UK region or nation except the South West. Employment grew above the UK average rate in the *trade, accommodation and transport* and *non-market services* sectors, and grew at the joint fastest rate for any UK region or nation in the *business and other services* sector.

- The *primary sector and utilities* and *manufacturing* sectors *are* projected to continue to lose employment at around the UK average rate between 2012 and 2022. The *construction* and *business and other services* sectors are projected to gain employment faster than any other UK region or nation. Employment in the *trade, accommodation and transport* sector is projected to grow at the UK average rate, while employment in the *non-market services* sector is projected to grow slightly more slowly than the UK average.

Summary over all countries and regions: Overall, the projections indicate that the spatial pattern of output and employment change between 2012 and 2022 (as presented in Tables D.1 to D.3) will be one of faster growth across the range of industries in the south and east of England relative to the rest of the UK. There is projected to be a recovery of output in all sectors, and employment is projected to grow slowly in most sectors. However, employment is projected to decline in all nations and all regions except London in the *primary sector and utilities*. For both output and employment, there is much greater variation in projected rates of change between sectors than between the regions and nations of the UK; and the level of variation, both between sectors and between nations / regions, in the period 2012 to 2022 is much less than is estimated for the 2002 to 2012 period.

Table D.3: Long-term Changes in Employment by Broad Sector

% p.a.

	Primary sector and utilities				Manufacturing				Construction			
	2002-2007	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**
London	-0.8	-1.1	-1.0	1.0	-4.1	-7.0	-5.6	-1.1	3.2	-2.0	0.5	1.6
South East	-3.2	4.4	0.5	-0.4	-4.8	-1.1	-3.0	-1.2	2.2	-2.8	-0.3	1.3
East of England	0.1	4.2	2.1	-0.6	-4.1	-1.5	-2.8	-0.9	1.7	-2.5	-0.4	1.9
South West	-1.9	7.7	2.8	-1.2	-3.8	-0.6	-2.2	-0.7	0.3	0.1	0.2	1.5
West Midlands	-0.5	7.8	3.6	-0.7	-5.6	-2.8	-4.2	-0.7	4.7	-3.7	0.5	1.1
East Midlands	2.1	2.7	2.4	-0.9	-3.3	-1.7	-2.5	-0.8	2.5	-0.4	1.0	1.5
Yorks & the Humber	-0.7	5.9	2.6	-0.7	-3.6	-2.4	-3.0	-1.2	4.9	-4.8	-0.1	1.3
North West	2.4	3.1	2.8	-0.3	-3.1	-2.7	-2.9	-0.8	1.8	-0.5	0.7	1.3
North East	-8.7	11.3	0.8	-0.3	-3.7	-3.7	-3.7	-0.8	6.9	-6.9	-0.2	1.2
England	*-0.9*	*5.0*	*2.0*	*-0.6*	*-4.1*	*-2.3*	*-3.2*	*-0.9*	*2.8*	*-2.4*	*0.2*	*1.4*
Wales	-0.4	2.5	1.0	-0.2	-2.0	-2.9	-2.4	-0.9	3.7	-5.2	-0.9	1.1
Scotland	2.6	0.1	1.4	-0.6	-3.6	-2.4	-3.0	-0.9	4.2	-3.2	0.4	1.2
Northern Ireland	0.3	-3.3	-1.5	-0.8	-2.1	-2.4	-2.3	-0.9	4.7	-6.9	-1.3	1.9
United Kingdom	-0.2	3.5	1.6	-0.6	-3.9	-2.3	-3.1	-0.9	3.0	-2.7	0.1	1.4

	Trade, accomod. and transport				Business and other services				Non-market services			
	2002-2007	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**	**2002-2007**	**2007-2012**	**2002-2012**	**2012-2022**
London	-0.2	0.6	0.2	0.7	1.4	1.3	1.3	1.0	1.0	2.9	1.9	0.3
South East	-0.1	1.4	0.6	0.6	0.9	1.2	1.0	1.3	3.0	1.1	2.0	0.2
East of England	0.7	0.5	0.6	0.7	2.0	-0.2	0.9	1.2	3.5	0.3	1.9	0.6
South West	0.2	0.2	0.2	0.4	2.6	0.7	1.7	1.1	3.1	1.1	2.1	0.6
West Midlands	0.6	0.1	0.3	0.4	2.7	-0.2	1.2	1.0	1.9	1.2	1.5	0.3
East Midlands	1.4	0.9	1.2	0.5	4.0	-0.4	1.8	1.0	3.6	1.2	2.4	0.2
Yorks & the Humber	1.6	-0.7	0.4	0.4	3.1	1.1	2.1	1.0	1.8	0.8	1.3	0.4
North West	0.5	-1.0	-0.2	0.3	2.3	0.8	1.6	1.1	1.7	0.5	1.1	0.2
North East	1.5	-0.9	0.3	0.2	3.8	1.3	2.5	1.2	2.0	0.6	1.3	0.2
England	*0.5*	*0.3*	*0.4*	*0.5*	*2.0*	*0.8*	*1.4*	*1.1*	*2.3*	*1.2*	*1.7*	*0.3*
Wales	1.6	-1.3	0.1	0.5	3.8	-0.2	1.8	1.1	1.8	1.6	1.7	0.2
Scotland	0.1	-0.4	-0.2	0.3	2.5	0.5	1.5	1.1	2.2	-0.5	0.9	0.5
Northern Ireland	1.3	-0.2	0.5	0.5	4.0	1.0	2.5	1.5	2.0	-0.6	0.7	0.2
United Kingdom	0.5	0.1	0.3	0.5	2.2	0.7	1.4	1.1	2.3	1.0	1.6	0.3

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Source: CE/IER estimates, MDM revision 12015, CrossRegional.xls (Table R.3)

D.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 D.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 (for example, the ILO unemployment rate is based on self-perception of unemployment, while the claimant count is based on an administrative count of those claiming unemployment benefit). 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 of the main report.

Total population is one of the drivers on economic growth. The UK *total population* was estimated to be 63.7 million in 2012, and is expected to grow by a further 5 million (7.9 per cent) between 2012 and 2022 to reach 68.7 million. The UK population is growing faster than at any time since the 1960s, driven by increasing life expectancy, increasing birth rates and high, and for many parts of the UK, increasing, levels of net international migration. The bulk (89.6 per cent) of this population increase will occur in England, the population of which is projected to grow from 53.5 to 58 million (by 8.4 per cent) during the decade. The projected rate of increase of population for the devolved nations is lower at 5.6 per cent for Wales, 5.7 per cent for Northern Ireland and 4.7 per cent for Scotland. London's population is projected to grow at a faster rate than the rest of the UK (by 13.7 per cent) to reach more than 9.4 million by 2022. The south-east corner of England is projected to increase in population, from 22.9 to 25.4 million (by 11 per cent). This slightly increases the share of England's population living in this region (to 44 per cent). In the rest of England, the East Midlands (8.6 per cent), South-West (8 per cent), West Midlands (6.8 per cent) and Yorkshire and the Humber (6.7 per cent) are projected to gain population most rapidly. The rate of population growth is expected to be slowest in the North West, North East and Scotland.

The *population aged 16+* is projected to grow by nearly 3.7 million, and the population of *working age* (aged 16-64) is projected to grow by 1.4 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 11.7 per cent between 2012 and 2022 in London and at more than double the UK average (7.1 compared to 3.3 per cent) in the south-east corner of England. The rate of increase is much slower in the rest of the UK. The working age population is projected to decline in the North West and North East of England, to remain constant in Scotland. Wales is projected to have the slowest rates of increase (0.3 per cent) and growth of 1.5 per cent is projected for Northern Ireland.

The labour force (measured as residents in work or unemployed on the ILO definition) is projected to grow by 7.1 per cent between 2012 and 2022, representing an increase of 2.2 million for the UK as a whole. The great bulk of this increase (88.3 per cent) is in England, with London's labour force growing by 639 thousand. The percentage increase in the labour force over the decade is also greatest in London (15.1 per cent), and in the south-east corner of England, the labour force is projected to increase by 10.1 per cent. Projected regional rates of increase are typically around 5 per cent elsewhere in the UK, in which the fastest rates are 6.6 per cent in the West Midlands, 6.5 per cent in Yorkshire and the Humber and 6.1 per cent in Wales. The slowest projected rate of increase is in North West England (3.8 per cent).

The *workforce* (defined as workplace employment plus claimant unemployment and those on government training schemes) is projected to increase by 4.5 per cent (1.5 million) to reach 35.2 million by 2022. While the workforce is projected to grow in all parts of the UK, it is projected to grow fastest (6.4 per cent) in the south-east corner of England, in which the increase of 826 thousand represents 54.6 per cent of the UK increase. Once again, the fastest growing region is London (6.9 per cent), while the workforces of Wales, Scotland and Northern Ireland as a whole are projected to increase by 2.7 per cent, 3.9 per cent and 3.2 per cent respectively. The projected rate of increase in the workforce is slowest in the North East and North West of England and in Wales.

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 remain the same in 2012 and 2022 (61.5 per cent). The large number of people born in the 'baby boom echo' years of the late 1950s and early 1960s will be approaching retirement and hence experiencing falling labour market participation rates over this period, but this is expected to be counterbalanced by the net international in-migration of economically active people and the entry of people born around the turn of the century into the workforce. Government policy is likely to continue to have the aim of 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. The highest economic activity rates in 2012 occur in the south-eastern regions, with a rate of 64.4 per cent in the East of England. The lowest rates are 57.2 per cent in Wales, 58.3 per cent in the West Midlands and 59.5 per cent in Northern Ireland. Economic activity rates in Yorkshire and the Humber (62.5 per cent) and the East Midlands (61.9 per cent) are projected to be higher than for regions in the rest of the midlands and northern England. The economic activity rate is projected to increase most quickly (1.4 percentage points higher in 2022 than 2012) in London (reflecting its rapid population growth due to net international migration and a youthful population structure), followed by Wales (0.7 per cent higher). It is projected to decrease most quickly in the East Midlands (1.5 percentage points lower in 2022) and the remaining regions of southern England (for example, the projected decline of 1.2 per cent in the South West). Elsewhere, the economic activity rate is projected to increase slightly over the decade in all regions and nations except Northern Ireland, where it is projected to fall slightly (0.2 per cent lower in 2022). In 2022, the economic activity rate is projected to be highest in London (65 per cent), the East of England, Yorkshire and the Humber and the South East. Wales is expected to display the lowest projected economic activity rate (57.9 per cent).

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 increase by just over a quarter of a million (10.6 per cent) between 2012 and 2022, with the largest increase (of 102 thousand) in London. The total is projected to be higher in 2022 than in 2012 in all regions and nations except South East and North West England, Scotland and Northern Ireland. The rate of increase in the projected unemployment total is fastest in the South West (28.9 per cent), London (26.9 per cent), Wales (22.7 per cent) and Yorkshire and the Humber (20.9 per cent). The projected unemployment total falls fastest in North West England (-10.9 per cent) and Scotland (-8.5 per cent).

The ILO unemployment rate (i.e. ILO unemployment as a percentage of the labour force) in 2022 is projected to be highest in Yorkshire and the Humber (10.7 per cent) followed by North East England (10.6 per cent), London (9.9 per cent) and Wales (9.6 per cent). With the exception of London, projected unemployment rates tend to be lower in southern England, but the unemployment rates for Scotland and Northern Ireland are similar to those experienced in southern England. The South East of England displays the lowest projected unemployment rate (5.5 per cent). The ILO unemployment rate is projected to fall fastest in North West England and Scotland (both of which are projected to experience a small increase in economic activity rate), but to increase fastest in South West England, Yorkshire and the Humber, Wales, the West Midlands and London.

In contrast, *claimant unemployment* is projected to decline by 302 thousand across the UK over the period from 2012 to 2022, when it will be nearly 1.6 million (and the difference between the ILO and claimant counts of unemployment is projected to increase by around 0.5 million over this period). This total is projected to decline in all regions and nations of the UK, most quickly in Northern Ireland (-28.2 per cent), North East England (-25 per cent) and North West England (-24.7 per cent). Wales, Scotland and Northern Ireland are projected to together account for a fifth of the decline in the claimant count, with a further 16.4 per cent of the decline occurring in North West England and 14.6 per cent in London. The *claimant unemployment rate* is projected to fall by 1.1 percentage points for the UK as a whole, from 4.7 per cent in 2012 to 3.6 per cent in 2022. The highest claimant count unemployment rate in 2022 is projected to occur in North East England (5.5 per cent), followed by Northern Ireland (5 per cent). Unemployment rates for Wales and Scotland are projected to remain higher than for England. The lowest rate is projected for South East England (2.6 per cent). The projected decline in this rate over the decade is largest in Northern Ireland (-2.2 per cent) and North East England (-2 per cent). With the exception of London (-1.1 per cent), projected declines in this rate are smallest in the southern regions of England.

The number of *employed residents* is projected to increase by nearly 2 million between 2012 and 2022 for the UK as a whole. London is projected to gain 537 thousand employed residents (or 27.1 of the total increase) to reach a total of 4.4 million employed residents in 2022. The number of employed residents is projected to increase in all regions and nations of the UK, but 54 per cent of the increase is concentrated into the south-eastern corner of England, an increase of 9.8 per cent over the period. The projected rate of increase in the number of employed residents is highest in the south east regions of England and lowest in South West England, northern England and Wales.

Workplace employment (the primary indicator used to assess the changing patterns of employment by sector, occupation, gender and status throughout *Working Futures* 2012-2022*)* measures the total number of jobs located within a region or nation. This is projected to increase slightly slower than the number of employed residents, with the total number of jobs increasing by 1.8 million (or 5.7 per cent) between 2012 and 2022. Just under half of this increase (49.3 per cent) is accounted for by the three south-eastern regions of England, in which workplace employment is projected to increase by 7.2 per cent. The projected rates of increase in workplace employment range from 8 per cent in London to 4.1 per cent in Wales (between 2012 and 2022). The projected rate of increase is higher in south eastern England, Scotland and Northern Ireland than in the midlands and north of England.

The final element in this table is the *labour market residual* (this is the difference between workforce employment and the number of employed residents). At the UK level, the main component of this quantity is “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 is projected to decline by 162 thousand, from 2.8 to 2.7 million (5.7 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 1 million in 2022, declining by 138 thousand (12 per cent) 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 each region or nation is projected to decline in all parts of the UK over the decade. This implies that the number of in-commuters will decline in all regions and nations of the UK.

This chapter will now discuss in greater detail the regional distribution of *total employment* (including both employees and the self-employed) over the recent past (1992 to 2012) and projection (2012 to 2022) periods for nations and regions

Table D.5 presents the pattern of change in *total employment* by region and nation of the UK over the period from 1992 to 2022. Total UK employment increased in each of the ten year periods between 1992 and 2022, from 27.2 million in 1992 to a projected value of 33.8 million in 2022. The national distribution of employment within the UK is projected to change slowly between 2012 and 2022. Continuing the trend established between 1992 and 2012, England’s share of total employment is projected to continue to increase, to reach 85 per cent in 2022. The share of *total employment* in Northern Ireland increased slightly over the period 1992 to 2002 and is projected to remain constant from 2002 to 2022. Scotland’s share of UK employment declined sharply between 1992 and 2012, but is projected to fall only slightly by 2022. The percentage of total UK employment in Wales did not change between 1992 and 2012 and is projected to decline only slightly by 2022. London’s share of UK employment increases continuously from 1992 to 2022, as does that of the South East, East of England and South West. The East Midlands increased its share of UK employment between 2002 and 2012, but this is projected to decline slightly by 2022. The West Midland’s share of employment declined continuously between 1992 and 2012 and is projected to continue to decline slowly. Yorkshire and the Humber, the North East 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 1992 to 2012, and this shift is projected to continue until 2022.

The projected increase in *total employment* for 2012 to 2022 is slightly smaller than the actual employment increase between 2002 and 2012 for the UK and England, and the rate of increase is also projected to be slower. The fastest rates of employment growth between 2002 and 2012 occurred in London, the South West and the South East. Employment grew most slowly over this period in the West Midlands, North West, Scotland and Northern Ireland.

Total employment is projected to increase in all regions and nations of the UK between 2012 and 2022 at 0.6 per cent per annum on average, yielding an increase in employment of 1.9 million. It is projected to increase fastest in southern England, and to grow most slowly in the northern regions of England and in Wales. The projected rates of increase for Scotland and Northern Ireland are slightly lower than the UK average. The bulk of the increase in employment is also projected to occur in southern England, with the largest individual increase (401 thousand) being projected for London.

Table D.4: Changes in Population, Economic Activity Rates and Unemployment

	Population						Unemployment				Employment		
	Total	**16+**	**Working age**	**Labour Force**	**Workforce[1]**	**Economic activity rate**	**ILO level**	**ILO rate**	**Claimant level**	**Claimant rate**	**Employed residents**	**Workplace employment[2]**	**Labour Market Residual**
	000s	000s	000s	000s	000s	%	000s	%	000s	%	000s	000s	000s
Changes, 2012-2022													
London	1,135	836	669	639	363	1.4	102	0.9	-44	-1.1	537	399	-138
South East	781	582	212	306	277	-0.8	-3	-0.4	-9	-0.3	309	288	-20
East of England	597	433	179	248	186	-0.6	23	0.2	-20	-0.9	225	210	-15
South West	428	308	62	129	144	-1.2	46	1.4	-7	-0.4	84	148	65
West Midlands	383	265	76	175	86	0.4	47	1.1	-37	-1.4	129	123	-5
East Midlands	393	291	92	119	76	-1.5	15	0.2	-25	-1.2	104	98	-6
Yorks & the Humber	358	262	81	176	78	0.3	53	1.3	-29	-1.2	125	110	-15
North West	320	196	-24	129	98	0.2	-32	-1.2	-50	-1.5	161	156	-5
North East	121	84	-12	59	26	0.4	5	-0.1	-23	-2.0	55	50	-6
England	*4,516*	*3,257*	*1,334*	*1,980*	*1,336*	*-0.1*	*256*	*0.4*	*-243*	*-1.0*	*1,729*	*1,582*	*-145*
Wales	172	122	6	88	40	0.7	27	1.3	-17	-1.3	61	56	-5
Scotland	250	197	0	125	111	0.1	-18	-1.0	-25	-1.1	143	138	-6
Northern Ireland	104	87	18	49	28	-0.2	0	-0.4	-18	-2.2	49	44	-6
United Kingdom	5,043	3,663	1,358	2,242	1,515	0.0	265	0.3	-302	-1.1	1,982	1,820	-162
2012 levels													
London	8,308	6,641	5,704	4,218	5,234	63.5	379	9.0	227	4.3	3,839	5,007	1,168
South East	8,725	7,062	5,505	4,471	4,756	63.3	265	5.9	140	2.9	4,207	4,616	409
East of England	5,907	4,787	3,708	3,083	2,971	64.4	203	6.6	115	3.9	2,880	2,855	-25
South West	5,340	4,402	3,317	2,680	2,875	60.9	159	5.9	89	3.1	2,520	2,785	265
West Midlands	5,643	4,542	3,558	2,649	2,830	58.3	228	8.6	165	5.8	2,421	2,664	244
East Midlands	4,568	3,723	2,912	2,303	2,349	61.9	181	7.9	109	4.6	2,122	2,239	117
Yorks & the Humber	5,317	4,314	3,401	2,697	2,715	62.5	254	9.4	164	6.1	2,442	2,549	107
North West	7,084	5,754	4,532	3,430	3,602	59.6	293	8.5	201	5.6	3,137	3,400	263
North East	2,602	2,140	1,671	1,283	1,257	60.0	137	10.7	94	7.4	1,146	1,162	17
England	*53,494*	*43,365*	*34,307*	*26,814*	*28,590*	*61.8*	*2,099*	*7.8*	*1,304*	*4.6*	*24,714*	*27,277*	*2,565*
Wales	3,074	2,517	1,932	1,439	1,451	57.2	119	8.3	80	5.5	1,320	1,367	47
Scotland	5,286	4,371	3,449	2,681	2,807	61.3	213	7.9	142	5.1	2,468	2,659	192
Northern Ireland	1,824	1,442	1,169	858	874	59.5	63	7.3	63	7.2	795	809	14
United Kingdom	63,678	51,695	40,856	31,792	33,722	61.5	2,494	7.8	1,588	4.7	29,297	32,112	2,818

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

Table D.4: Changes in Population, Economic Activity Rates and Unemployment (continued)

	Population					2022	Unemployment				Employment		
	Total	**16+**	**Working age**	**Labour Force**	**Workforce(1)**	**Economic activity rate**	**ILO level**	**ILO rate**	**Claimant level**	**Claimant rate**	**Employed residents**	**Workplace employment(2)**	**Labour Market Residual**
	000s	000s	000s	000s	000s	%	000s	%	000s	%	000s	000s	000s
2022 levels													
London	9,443	7,477	6,373	4,857	5,597	65.0	481	9.9	183	3.3	4,376	5,406	1,030
South East	9,506	7,644	5,717	4,777	5,033	62.5	262	5.5	131	2.6	4,516	4,904	389
East of England	6,505	5,220	3,887	3,331	3,157	63.8	226	6.8	95	3.0	3,105	3,065	-40
South West	5,768	4,710	3,379	2,809	3,019	59.6	205	7.3	82	2.7	2,604	2,933	330
West Midlands	6,026	4,807	3,633	2,824	2,917	58.7	275	9.7	129	4.4	2,550	2,787	239
East Midlands	4,960	4,014	3,004	2,422	2,425	60.3	196	8.1	84	3.5	2,226	2,337	111
Yorks & the Humber	5,675	4,576	3,482	2,873	2,793	62.8	307	10.7	135	4.8	2,567	2,659	92
North West	7,404	5,950	4,507	3,559	3,700	59.8	261	7.3	151	4.1	3,298	3,556	258
North East	2,723	2,224	1,659	1,342	1,283	60.3	142	10.6	70	5.5	1,201	1,212	11
England	*58,010*	*46,622*	*35,641*	*28,794*	*29,926*	*61.8*	*2,355*	*8.2*	*1,061*	3.5	*26,443*	*28,859*	*2,420*
Wales	3,246	2,639	1,937	1,527	1,491	57.9	146	9.6	63	4.3	1,381	1,423	42
Scotland	5,536	4,568	3,450	2,806	2,918	61.4	195	6.9	117	4.0	2,611	2,797	186
Northern Ireland	1,928	1,529	1,187	907	903	59.3	63	6.9	45	5.0	844	853	8
United Kingdom	68,721	55,358	42,214	34,034	35,237	61.5	2,759	8.1	1,286	3.6	31,279	33,932	2,656
% Changes 2012-2022													
London	13.7	12.6	11.7	15.1	6.9	2.3	26.9	10.2	-19.5	-24.7	14.0	8.0	-11.8
South East	9.0	8.2	3.9	6.8	5.8	-1.3	-1.1	-7.5	-6.3	-11.5	7.3	6.2	-4.9
East of England	10.1	9.0	4.8	8.0	6.3	-0.9	11.3	3.0	-17.1	-22.0	7.8	7.4	60.0
South West	8.0	7.0	1.9	4.8	5.0	-2.0	28.9	23.0	-7.9	-12.3	3.3	5.3	24.5
West Midlands	6.8	5.8	2.1	6.6	3.0	0.7	20.6	13.1	-22.1	-24.4	5.3	4.6	-2.0
East Midlands	8.6	7.8	3.1	5.2	3.2	-2.5	8.3	3.0	-22.6	-25.0	4.9	4.4	-5.1
Yorks & the Humber	6.7	6.1	2.4	6.5	2.9	0.4	20.9	13.5	-17.6	-19.9	5.1	4.3	-14.0
North West	4.5	3.4	-0.5	3.8	2.7	0.3	-10.9	-14.2	-24.7	-26.7	5.1	4.6	-1.9
North East	4.7	3.9	-0.7	4.6	2.1	0.6	3.6	-0.9	-25.0	-26.5	4.8	4.3	-35.3
England	8.4	7.5	3.9	7.4	4.7	-0.1	12.2	4.5	-18.6	-22.3	7.0	5.8	-5.7
Wales	5.6	4.8	0.3	6.1	2.7	1.2	22.7	15.6	-20.7	-22.8	4.6	4.1	-10.6
Scotland	4.7	4.5	0.0	4.7	3.9	0.1	-8.5	-12.5	-17.7	-20.8	5.8	5.2	-3.1
Northern Ireland	5.7	6.0	1.5	5.7	3.2	-0.3	0.0	-5.4	-28.2	-30.4	6.2	5.4	-42.9
United Kingdom	7.9	7.1	3.3	7.1	4.5	0.0	10.6	3.3	-19.0	-22.5	6.8	5.7	-5.7

Source: CE/IER estimates, CE projections MDM revision 12015, CrossRegional.xls (Table R.4).

Notes: (1) Workforce is Workplace employment and Claimant Unemployment, above, plus government training schemes, not shown in this table.

(2) Workplace employment, in this table, includes HM Forces; elsewhere HMF are excluded.

Table D.5: Total Employment by Country and Region

	Total employment (000s)				% share of UK total				change 2002-2012			change 2012-2022		
	1992	2002	2012	2022	1992	2002	2012	2022	000s	%	% p.a.	000s	%	% p.a.
London	3,940	4,590	5,000	5,401	14.5	15.3	15.7	16.0	410	8.9	0.9	401	8.0	0.8
South East	3,696	4,248	4,564	4,861	13.6	14.2	14.3	14.4	316	7.4	0.7	297	6.5	0.6
East of England	2,336	2,675	2,835	3,049	8.6	8.9	8.9	9.0	159	6.0	0.6	214	7.6	0.7
South West	2,249	2,512	2,741	2,896	8.3	8.4	8.6	8.6	228	9.1	0.9	156	5.7	0.6
West Midlands	2,426	2,586	2,656	2,781	8.9	8.6	8.3	8.2	70	2.7	0.3	125	4.7	0.5
East Midlands	1,868	2,001	2,229	2,329	6.9	6.7	7.0	6.9	228	11.4	1.1	100	4.5	0.4
Yorks & the Humber	2,250	2,376	2,531	2,644	8.3	7.9	7.9	7.8	155	6.5	0.6	113	4.5	0.4
North West	3,081	3,275	3,398	3,554	11.3	10.9	10.6	10.5	122	3.7	0.4	157	4.6	0.5
North East	1,063	1,094	1,161	1,210	3.9	3.7	3.6	3.6	66	6.1	0.6	50	4.3	0.4
England	*22,909*	*25,358*	*27,113*	*28,726*	*84.4*	*84.6*	*84.9*	*85.0*	*1,756*	*6.9*	*0.7*	*1,613*	*5.9*	*0.6*
Wales	1,176	1,287	1,362	1,420	4.3	4.3	4.3	4.2	76	5.9	0.6	57	4.2	0.4
Scotland	2,419	2,550	2,646	2,786	8.9	8.5	8.3	8.2	96	3.8	0.4	140	5.3	0.5
Northern Ireland	654	774	804	849	2.4	2.6	2.5	2.5	30	3.9	0.4	44	5.5	0.5
United Kingdom	27,157	29,969	31,926	33,781	100.0	100.0	100.0	100.0	1,957	6.5	0.6	1,855	5.8	0.6

Source: CE/IER estimates. CE projections MDM revision 12015, CrossRegional.xls (Table R.5)

D.4 Sectoral Prospects by country and region

Information on projected employment change by broad sector over the period for 2012 to 2022 is presented in Table D.6. Employment change is broken down by gender in Table D.7 (for males) and Table D.8 (for females). The commentary will focus on the pattern of change for all persons, with particularly notable gendered features of employment change also highlighted.

The *primary sector & utilities* is projected to lose 45 thousand jobs or 5.5 per cent of its 2012 employment by 2022. There is a contrast in the projected employment prospects for men and women, with male employment projected to decline by 42 thousand (6.8 per cent) while female employment is projected to fall by 3 thousand (1.6 per cent). Male job losses are projected to be particularly large in the South West and Scotland, with the percentage decline in employment faster than in Scotland in Northern Ireland and the East Midlands.

Employment in the *manufacturing* sector is projected to decline by 228 thousand (8.6 per cent) in the UK as a whole between 2012 and 2022. Employment is projected to decline in all regions and countries. The number of males in employment is projected to decline by 10.5 per cent, but female employment is projected to be only 2.6 per cent lower in 2022 than in 2012. For males, the projected rate of job loss is much slower in the South West than in the other regions and nations of the UK. For females, the projected rate of job loss is fastest in London and Yorkshire and the Humber, while employment is projected to increase in the West Midlands.

The *construction* sector is projected to gain 302 thousand jobs over the period 2012 to 2022, an increase of 15 per cent. Employment is projected to grow in all parts of the UK. Projected rates of female employment change are much higher than for men, albeit from a low base, with UK employment increasing by 51 thousand or 20.3 per cent. The fastest rates of increase are projected for Northern Ireland and the East of England, with the slowest rates of increase projected for Scotland and the West Midlands.

The *trade, accommodation and transport* sector is projected to gain 416 thousand new jobs between 2012 and 2022, a rate of increase of 4.9 per cent. All regions and nations are projected to gain employment, with little regional variation in rates of increase. There is little pattern in the regional rates of male employment change, but female employment is projected to grow fastest in London and, the East of England The slowest projected rates of increase are in the North East and Scotland.

While the construction sector is projected to gain employment at a faster rate, the largest component of employment growth between 2012 and 2022 is in the *business and other services sector*, which is projected to grow by 1.1 million jobs or 11.6 per cent. Well over half of this growth (647 thousand jobs) is projected to be in male employment. Male employment is projected to increase by 12.1 percent and female employment by 11 per cent. All regions and nations are projected to gain both male and female employment, but projected employment growth in this sector is largely concentrated within southern England, with the largest increases in London, the South East, the North West and the East of England. There is little regional variation in rates of employment growth, but the fastest increases are projected for Northern Ireland and the South East. The slowest rate of increase (10.2 per cent) is projected for the East Midlands. The main difference in regional patterns of projected employment change between men and women is the slower rates of female employment growth in London, the East Midlands and Yorkshire and the Humber.

The *non-market services sector* is projected to gain 284 thousand jobs between 2012 and 2022, a rate of increase of 3.5 per cent. All regions and nations are projected to experience increases in total employment. The number of male jobs is projected to fall by 26 thousand or 1.1 per cent overall and to decline in all regions and nations except the East of England and South West. The projected rate of male job loss is greatest in Northern Ireland, the North East and North West. Female employment is projected to grow by 310 thousand or 8.3 per cent and to increase in all regions and nations. The fastest projected rates of increase in female employment are in the East of England, the South West and Scotland, with the slowest rates of increase in the North East, South East and East Midlands.

Table D.6: Projected Employment Growth by Broad Sector, 2012-2022

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	-12	43	85	249	33	401
South East	-4	-34	39	77	200	20	297
East of England	-4	-21	41	54	103	42	214
South West	-11	-16	29	30	83	41	156
West Midlands	-5	-20	19	31	76	24	125
East Midlands	-6	-20	26	34	54	11	100
Yorks & the Humber	-4	-29	22	26	69	30	113
North West	-2	-27	31	25	109	21	157
North East	-1	-9	9	7	38	6	50
England	*-34*	*-190*	*260*	*369*	*980*	*227*	*1,613*
Wales	-1	-13	10	16	35	11	57
Scotland	-7	-18	21	21	83	40	140
Northern Ireland	-3	-7	11	11	26	6	44
United Kingdom	-45	-228	302	416	1,124	284	1,855

b) per cent change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	10.9	-10.5	17.6	6.9	10.8	3.0	8.0
South East	-4.1	-11.3	14.3	6.0	13.4	1.8	6.5
East of England	-5.9	-8.7	20.2	6.7	12.3	6.2	7.6
South West	-11.6	-6.3	16.0	4.0	11.3	5.7	5.7
West Midlands	-6.5	-6.5	11.3	4.3	11.0	3.5	4.7
East Midlands	-8.8	-7.3	16.6	5.3	10.2	2.0	4.5
Yorks & the Humber	-7.0	-11.0	13.6	3.7	10.4	4.4	4.5
North West	-3.0	-8.1	13.5	2.7	11.5	2.3	4.6
North East	-3.0	-8.1	12.7	2.3	12.6	1.7	4.3
England	*-5.7*	*-8.6*	*15.3*	*5.0*	*11.6*	*3.3*	*5.9*
Wales	-2.1	-8.6	11.0	4.7	12.0	2.5	4.2
Scotland	-5.6	-8.9	12.5	3.0	11.5	5.5	5.3
Northern Ireland	-8.0	-9.1	20.2	5.3	15.7	2.4	5.5
United Kingdom	-5.5	-8.6	15.0	4.9	11.6	3.5	5.8

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	1.0	-1.1	1.6	0.7	1.0	0.3	0.8
South East	-0.4	-1.2	1.3	0.6	1.3	0.2	0.6
East of England	-0.6	-0.9	1.9	0.7	1.2	0.6	0.7
South West	-1.2	-0.7	1.5	0.4	1.1	0.6	0.6
West Midlands	-0.7	-0.7	1.1	0.4	1.0	0.3	0.5
East Midlands	-0.9	-0.8	1.5	0.5	1.0	0.2	0.4
Yorks & the Humber	-0.7	-1.2	1.3	0.4	1.0	0.4	0.4
North West	-0.3	-0.8	1.3	0.3	1.1	0.2	0.5
North East	-0.3	-0.8	1.2	0.2	1.2	0.2	0.4
England	*-0.6*	*-0.9*	*1.4*	*0.5*	*1.1*	*0.3*	*0.6*
Wales	-0.2	-0.9	1.1	0.5	1.1	0.2	0.4
Scotland	-0.6	-0.9	1.2	0.3	1.1	0.5	0.5
Northern Ireland	-0.8	-0.9	1.9	0.5	1.5	0.2	0.5
United Kingdom	-0.6	-0.9	1.4	0.5	1.1	0.3	0.6

Source: CE/IER estimates. CE projections MDM revision 12015, CrossRegional.xls (Table R.5)

Table D.7: Projected Male Employment Growth by Broad Sector, 2012-2022

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	-9	35	33	157	-5	214
South East	-4	-31	32	36	115	-3	144
East of England	-5	-20	35	28	54	4	96
South West	-9	-15	24	13	47	2	61
West Midlands	-4	-23	15	15	40	-3	41
East Midlands	-4	-18	22	14	32	-3	43
Yorks & the Humber	-4	-26	18	12	40	-1	40
North West	-2	-25	26	9	59	-7	60
North East	-1	-9	8	2	20	-4	16
England	*-30*	*-176*	*215*	*162*	*565*	*-20*	*716*
Wales	-2	-12	8	8	20	-2	20
Scotland	-7	-16	18	9	48	-1	52
Northern Ireland	-3	-7	10	7	15	-3	18
United Kingdom	-42	-211	251	187	647	-26	806

b) per cent change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	13.6	-11.7	16.6	4.5	12.2	-1.5	8.0
South East	-5.9	-13.5	13.5	5.1	13.8	-1.1	6.0
East of England	-8.7	-10.6	19.4	6.2	11.9	2.3	6.4
South West	-13.9	-7.9	15.1	3.2	11.6	1.1	4.3
West Midlands	-7.3	-9.7	10.5	3.6	10.9	-1.7	2.9
East Midlands	-9.4	-8.9	15.8	3.9	10.8	-1.9	3.6
Yorks & the Humber	-8.2	-12.5	13.0	2.9	11.1	-0.4	3.0
North West	-4.3	-9.7	12.8	1.8	11.7	-2.8	3.3
North East	-3.5	-10.2	12.3	1.5	12.1	-4.0	2.7
England	*-6.9*	*-10.5*	*14.5*	*3.9*	*12.1*	*-1.1*	*5.0*
Wales	-4.3	-10.8	10.3	4.5	11.9	-1.2	2.8
Scotland	-6.9	-10.4	12.0	2.4	11.8	-0.4	3.8
Northern Ireland	-9.3	-10.9	19.6	6.1	16.8	-5.1	4.3
United Kingdom	-6.8	-10.5	14.3	3.9	12.1	-1.1	4.8

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	1.3	-1.2	1.5	0.4	1.2	-0.2	0.8
South East	-0.6	-1.4	1.3	0.5	1.3	-0.1	0.6
East of England	-0.9	-1.1	1.8	0.6	1.1	0.2	0.6
South West	-1.5	-0.8	1.4	0.3	1.1	0.1	0.4
West Midlands	-0.8	-1.0	1.0	0.4	1.0	-0.2	0.3
East Midlands	-1.0	-0.9	1.5	0.4	1.0	-0.2	0.4
Yorks & the Humber	-0.9	-1.3	1.2	0.3	1.1	0.0	0.3
North West	-0.4	-1.0	1.2	0.2	1.1	-0.3	0.3
North East	-0.4	-1.1	1.2	0.2	1.2	-0.4	0.3
England	*-0.7*	*-1.1*	*1.4*	*0.4*	*1.1*	*-0.1*	*0.5*
Wales	-0.4	-1.1	1.0	0.4	1.1	-0.1	0.3
Scotland	-0.7	-1.1	1.1	0.2	1.1	0.0	0.4
Northern Ireland	-1.0	-1.1	1.8	0.6	1.6	-0.5	0.4
United Kingdom	-0.7	-1.1	1.3	0.4	1.2	-0.1	0.5

Source: CE/IER estimates. CE projections MDM revision 12015, CrossRegional.xls (Table R.5)

Table D.8: Projected Female Employment Growth by Broad Sector, 2012-2022

a) change in thousands

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	0	-4	8	53	91	38	186
South East	0	-3	7	41	85	23	153
East of England	0	-1	6	26	49	38	118
South West	-2	-1	5	17	36	39	95
West Midlands	-1	3	4	16	36	27	84
East Midlands	-1	-2	5	20	22	14	57
Yorks & the Humber	0	-4	4	14	28	31	73
North West	0	-2	5	16	50	28	97
North East	0	0	1	4	17	10	33
England	*-4*	*-13*	*45*	*206*	*415*	*247*	*897*
Wales	1	-1	2	7	16	12	37
Scotland	0	-2	3	12	35	41	88
Northern Ireland	0	0	1	4	12	9	26
United Kingdom	-3	-17	51	230	477	310	1,049

b) per cent change

	Primary sector and utilities	Manufacturing	Construction	Trade, accomod. and transport	Business and other services	Non-market services	All industries
London	2.6	-8.2	23.6	10.3	9.1	5.3	8.0
South East	0.7	-4.3	19.8	7.1	12.9	2.8	7.0
East of England	2.1	-2.3	26.0	7.4	12.8	7.7	8.9
South West	-6.4	-1.7	22.6	4.9	10.9	7.3	7.1
West Midlands	-4.8	4.3	16.3	5.2	11.0	5.2	6.7
East Midlands	-7.5	-2.6	22.6	7.3	9.4	3.4	5.6
Yorks & the Humber	-2.4	-6.0	18.4	4.9	9.5	6.2	6.2
North West	1.0	-2.6	18.1	4.0	11.3	4.2	6.0
North East	-1.2	1.5	16.3	3.1	13.3	4.1	6.1
England	*-2.4*	*-2.5*	*20.8*	*6.5*	*10.9*	*5.1*	*7.0*
Wales	2.9	-1.6	17.1	4.8	12.2	4.1	5.7
Scotland	-1.3	-4.6	16.2	3.7	11.1	7.8	7.0
Northern Ireland	7.3	-2.5	26.1	4.3	14.6	5.1	6.9
United Kingdom	-1.6	-2.6	20.3	6.1	11.0	5.3	7.0

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	0.3	-0.9	2.1	1.0	0.9	0.5	0.8
South East	0.1	-0.4	1.8	0.7	1.2	0.3	0.7
East of England	0.2	-0.2	2.3	0.7	1.2	0.7	0.9
South West	-0.7	-0.2	2.1	0.5	1.0	0.7	0.7
West Midlands	-0.5	0.4	1.5	0.5	1.1	0.5	0.7
East Midlands	-0.8	-0.3	2.1	0.7	0.9	0.3	0.5
Yorks & the Humber	-0.2	-0.6	1.7	0.5	0.9	0.6	0.6
North West	0.1	-0.3	1.7	0.4	1.1	0.4	0.6
North East	-0.1	0.1	1.5	0.3	1.3	0.4	0.6
England	*-0.2*	*-0.3*	*1.9*	*0.6*	*1.0*	*0.5*	*0.7*
Wales	0.3	-0.2	1.6	0.5	1.2	0.4	0.6
Scotland	-0.1	-0.5	1.5	0.4	1.1	0.8	0.7
Northern Ireland	0.7	-0.3	2.4	0.4	1.4	0.5	0.7
United Kingdom	-0.2	-0.3	1.9	0.6	1.1	0.5	0.7

Source: CE/IER estimates. CE projections MDM revision 12015, CrossRegional.xls (Table R.5)

D.5 Employment by Gender and Status by country and region

D.5.1 Gender

Tables D.9 and D.10 present employment totals and shares of total employment by gender and employment status over the period 1992 to 2022, distinguishing: males; females; full-time and part-time employees (also disaggregated by gender); and self-employment.

Female employment has risen steadily since 1992, by more than 3 million; women accounted for 47.4 per cent of all persons employed in 2012. Female employment is projected to continue to increase over the period 2012 to 2022 (by more than 1 million or 7 per cent), with females accounting for 47.8 per cent of all employment in 2022. The number of men in employment increased by nearly 1.5 million between 1992 and 2002, by over a million between 2002 and 2012 and is projected to increase by another 806 thousand (4.8 per cent) between 2012 and 2022. However, the male share of employment is projected to fall by 0.5 percentage points over this period.

Women's share of total employment was fairly similar in most regions and nations of the UK in 1992, but there was quite a large gap between the highest percentage (48.6 per cent in Wales and Yorkshire and the Humber) and the lowest percentage (44.4 per cent in Northern Ireland). The share of women in total employment was particularly low in London and the West Midlands. The female percentage of total employment fell in the South West and Yorkshire and the Humber, but increased strongly in Northern Ireland and Scotland during the following decade. In 2002, Scotland had the highest female employment share (49.9 per cent) and London the lowest (45.5 per cent).

During 2002-2012, the overall UK female share of total employment fell slightly, due to a decline in Wales, Scotland and the East Midlands and north of England, but it increased in southern England. In 2012, the highest female employment shares were experienced in the South West, Scotland and Wales. The lowest shares occurred in the East Midlands, London and Yorkshire and the Humber.

The female share of total employment is projected to be 0.5 percentage points higher in 2022 than in 2012. The female share of employment is projected to increase in all four nations of the UK, and to a slightly greater extent in Wales and Scotland. Within England, the percentage of employment represented by females is projected to increase most in the West Midlands, North East and Yorkshire and the Humber, and to hardly increase in London and the South East. The South West is projected to have the largest female share of employment in 2022, with London still having the lowest female share. Male employment is projected to grow in all regions and nations between 2012 and 2022. The largest increase is in London (214 thousand) and increases are largest in the southern regions of England, in both absolute and proportionate terms. Female employment is projected to increase at a similar rate in all four nations of the UK, but male employment growth is projected to be slower than the UK average in the North East, Wales, the West Midlands, Yorkshire and the Humber and the North West.

D.5.2 Full-time and part-time employees by gender

In 1992, 63 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 then, reaching 58.5 per cent in 2012 and being projected to fall further to 58.1 per cent by 2022. This decline occurred in all regions and nation of the UK between 1992 and 2012, the largest falls in this percentage occurring in the West Midlands, London and Scotland. The percentage of workers employed full-time in 2012 was highest by far in London, followed by the North East, North West and Scotland. In 2022, the largest percentages working full-time are projected to be in London, followed by the North East, Scotland and the North West. The lowest projected percentage is in the South West (52.4 per cent). The percentage working full-time is projected to decrease between 2012 and 2022 by 0.4 per cent in the UK as a whole, and to decline in all regions and nations. The largest declines in this percentage are projected for the East of England, South West and Wales.

In 1992, part-time employment represented 24.9 per cent of all employment, increasing to 28.3 per cent in 2012 and being projected to reach 29.5 per cent in 2022. The rate of increase in part-time employment was only 7.5 per cent for the UK during 2002-12 compared with 24.7 per cent between 1992 and 2002. The increase in part-time employment is projected to increase to 10.1 per cent over the period 2012-2022. The largest numbers of part-time workers are located in South East England and London throughout the period 1992 to 2022. The share of part-time workers in the total was highest in Yorkshire and the Humber, the South East and the South West and lowest in London in 1992. In 2012, the South West had the highest share, followed by Northern Irelan and Wales; and London had by far the lowest percentage of part-time workers. The number of part-time workers increased most rapidly in Northern Ireland and London between 1992 and 2002 and increased most quickly in the East of England and South West between 2002 and 2012. The rate of increase was slower in all regions and nations in the latter period and slowest in Scotland, the North West and North East. The largest increases in part-time working between 2012 and 2022 are projected to occur in the East of England and London, followed by the South West and Northern Ireland. The percentage of part-time workers in the total is projected to increase by at least one percentage point in nearly all regions and nations between 2012 and 2022. The share of part-time workers in the total is projected to increase fastest in the East of England and South West, and to grow most slowly in London.

The number of males in full-time employment increased to the greatest extent in the regions of southern England between 1992 and 2002 and projected increases in the number of males working full-time during the period 2012 to 2022 are greatest in the three regions in the south-eastern corner of England. The share of male full-time employees in the total declined from 39.4 per cent in 1992 to 36.3 per cent in 2012, and is projected to decline to 35.3 per cent by 2022. In 1992, this share was highest in London, the West Midlands, the North East and Scotland and lowest in the South West, Northern Ireland and South East. By 2012, the highest percentages were in the North East, East Midlands and London, and the lowest in Northern Ireland, the South West, Wales, the South East and East of England. The share of male full-time employees in total employment is projected to decline in all regions and nations between 2012 and 2022, around the UK average decrease of 1 per cent. The largest projected declines are in the East of England and North East (1.3 per cent in each case) and the smallest declines are in London (-0.4 per cent) and the South East (-0.8 per cent).

Female full-time employees decreased from 23.5 per cent of all UK employees in 1992 to 23 per cent in 2002 and 22.3 per cent in 2012. A small increase in this percentage is projected, with females working full-time representing 22.8 per cent of all employees in 2022. The number of female full-time employees increased by 486 thousand between 1992 and 2002, 225 thousand in the next decade and is projected to grow by another 589 thousand between 2012 and 2022. In the UK, percentage of female full-time employees in the total declined between 1992 and 2012, but is projected to increase by 0.5 to 22.3 per cent between 2012 and 2022. London has a much larger than average highest percentage throughout this period, falling from 28.3 per cent in 1992 to 26.4 per cent in 2012 and projected to rise again to 26.7 per cent in 2022. The percentage of female full-time workers in total employment has been below the UK average in southern England and the midlands over the period 1992 to 2012, and while this percentage is projected to increase between 2012 and 2012, it will still be below the UK average in 2012. This percentage has been above the UK average since 1992 and is projected to remain above average in North East England, Scotland and Northern Ireland.

In the UK, male part-time employees formed only 4.4 per cent of all employees in 1992, but this percentage has steadily increased, to 7.6 per cent in 2012 and a projected share of 8.6 per cent in 2022. The number of males working part-time increased by 803 thousand between 1992 and 2002 (an increase of 67 per cent), 409 thousand between 2002 (20.4 per cent) and 2012 and is projected to increase by another 478 thousand between 2012 and 2022 (19.8 per cent). The spatial pattern of male part-time employment remains fairly stable over the period 1992 to 2022. The percentage share of this type of employment was greatest in Northern Ireland and the East of England and lowest in northern England and Scotland in 1992. By 2012 it had become much more common in all parts of the UK. Northern Ireland and the East of England still displayed the highest percentages, followed by Yorkshire and the Humber and the South East. The lowest percentages were displayed by London, the North West and Scotland. The share of male part-time employees in total employment is projected to increase in all regions and nations between 2012 and 2022, around the UK average increase of 1 per cent. The largest projected increase is in the East of England (1.2 per cent) and the smallest increases in London, the West Midlands and Scotland (0.9 per cent in each case). In 2022 the share of male part-time employment is projected to be largest in Northern Ireland, the East of England, Yorkshire and the Humber and to be smallest in London, Scotland and the North West.

Female part-time employment has been one of the fastest growing elements of employment since the 1960s. It has continued to grow in absolute numbers (by 863 thousand or 15.6 per cent between 1992 and 2002 and by 226 thousand or 3.5 per cent between 2002 and 2012) and is projected to increase by 438 thousand (6.6 per cent) between 2012 and 2022. In 1992, female part-time workers accounted for over a fifth of all employment. This share of employment increased slightly between 1992 and 2002, fell slightly by 2012, and is projected to increase very slightly by 2022, when it will account for 20.9 per cent of employment. In 1992, London stood out as having a much lower percentage of female part-time workers than the rest of the country. This differential was maintained over the period 1992 to 2012 and is projected to continue to 2022. There was little variation around the UK average percentage elsewhere, with the share of female part-time employment being highest in Yorkshire and the Humber and the North East and lowest in Northern Ireland and Scotland in 1992. In 2002, Yorkshire and the Humber and the North East still displayed the largest shares of female part-time employment in total employment, followed by Scotland. In 2012, there was very little difference in this percentage between regions and nations beyond London, but the South West displayed the highest percentage. Female part-time employment is projected to increase in all regions and nations of the UK between 2012 and 2022, and its share of total employment is also projected to increase outside London and the South East. This is projected to increase most in the South West, the West Midlands, North East and Wales. In 2022, the highest percentage is projected to be in the South West, with Wales, the West Midlands and Northern Ireland having the next highest percentages, and relatively little variation among the remaining regions and nations, with the exception of the very low percentage projected for London.

D.5.3 Self-employed

The share of self-employment in the UK fell from 12.2 per cent in 1992 to 10.9 per cent in 2002, but then increased to 13.1 per cent in 2012. It is projected to decline again to 12.4 per cent in 2022. In 1992, self-employment was largest relative to total employment in the South West and Northern Ireland and higher than the UK average in the South East, East of England and Wales. Self-employment was a smaller percentage of total employment in the northern regions of England and was smallest in the North East and Scotland. Between 1992 and 2002, self-employment increased in the south-east corner of England and (slightly) in Wales, Scotland and Northern Ireland; however, the share of self-employment in total employment declined everywhere. In the next decade, self-employment increased in all regions and nations of the UK (except Northern Ireland) but the number of new jobs created was greatest in the south-east corner of England. The rate of increase was fastest in North East England and Scotland. . In 2012, the share of self-employment in total employment was highest in the South West, the East of England and the South East, and lowest in the North-East, neighbouring parts of northern England and Scotland.

The industrial structure of employment change will influence the geographical pattern of change in self-employment over the period 2012 to 2022. The business and other services sector will be the largest source of employment growth over this period, while the primary and utilities sector, which has previously accounted for much self-employment, is projected to lose employment over this period. Self-employment is projected to increase by only 18 thousand (0.4 per cent) between 2012 and 2022, and its share of total employment is projected to decline by 0.7 percentage points. The number of people self-employed is only projected to increase in the four southern regions of England (London, the South-East, East of England and the South West) and to decline elsewhere. The share of self-employment in the total is projected to fall by 0.6 or 0.7 percentage points in all regions and nations of the UK over this period. The share of self-employment in total employment in 2022 is projected to be highest in the South West, East of England and South East and to be smallest in the North East and North West. With the exception of London, self-employment is projected to represent a larger proportion of total employment in southern England than in the midlands or north of England, or the other three countries of the UK.

Table D.10 summarises projected changes in full-time employees, part-time employees and the self-employed for the period 2012 to 2022 by gender across all the regions and nations of the UK. Overall, about half of employment change is accounted for by change in full-time employment. The contrasts in employment change will be discussed for men and women. In general, the spatial pattern of total full- and part-time employment and self-employment change is quite similar to the pattern for males.

Table D.9: Employment by Gender and Employment Status, 1992-2022

a) males	1992		2002		2012		2022	
	000s	%	000s	%	000s	%	000s	%
London	2,155	54.7	2,503	54.5	2,682	53.6	2,896	53.6
South East	1,925	52.1	2,237	52.7	2,388	52.3	2,533	52.1
East of England	1,252	53.6	1,428	53.4	1,512	53.3	1,608	52.7
South West	1,171	52.0	1,335	53.1	1,411	51.5	1,472	50.8
West Midlands	1,307	53.9	1,379	53.3	1,399	52.7	1,440	51.8
East Midlands	999	53.5	1,047	52.3	1,202	53.9	1,245	53.4
Yorks & the Humber	1,157	51.4	1,239	52.1	1,352	53.4	1,392	52.7
North West	1,596	51.8	1,698	51.9	1,778	52.3	1,837	51.7
North East	550	51.7	554	50.6	609	52.4	625	51.6
England	*12,112*	*52.9*	*13,421*	*52.9*	*14,332*	*52.9*	*15,048*	*52.4*
Wales	604	51.4	662	51.4	710	52.1	730	51.4
Scotland	1,260	52.1	1,277	50.1	1,377	52.0	1,429	51.3
Northern Ireland	364	55.6	415	53.5	421	52.3	439	51.7
United Kingdom	14,340	52.8	15,774	52.6	16,840	52.7	17,646	52.2

b) females	1992		2002		2012		2022	
	000s	%	000s	%	000s	%	000s	%
London	1,785	45.3	2,086	45.5	2,318	46.4	2,504	46.4
South East	1,771	47.9	2,010	47.3	2,176	47.7	2,329	47.9
East of England	1,084	46.4	1,247	46.6	1,323	46.7	1,441	47.3
South West	1,078	48.0	1,177	46.9	1,330	48.5	1,425	49.2
West Midlands	1,119	46.1	1,207	46.7	1,257	47.3	1,341	48.2
East Midlands	868	46.5	954	47.7	1,027	46.1	1,084	46.6
Yorks & the Humber	1,093	48.6	1,137	47.9	1,179	46.6	1,252	47.3
North West	1,485	48.2	1,577	48.1	1,620	47.7	1,717	48.3
North East	513	48.3	540	49.4	552	47.6	585	48.4
England	*10,797*	*47.1*	*11,937*	*47.1*	*12,781*	*47.1*	*13,678*	*47.6*
Wales	571	48.6	625	48.6	652	47.9	689	48.6
Scotland	1,159	47.9	1,273	49.9	1,269	48.0	1,357	48.7
Northern Ireland	290	44.4	360	46.5	384	47.7	410	48.3
United Kingdom	12,817	47.2	14,195	47.4	15,086	47.3	16,135	47.8

Source: CE/IER estimates. MDM revision 12015, CrossRegional.xls (Table R.5)

Table D.9: Employment by Gender and Employment Status, 1992- 2022 (continued)

c) total full time employees	1992 000s	%	2002 000s	%	2012 000s	%	2022 000s	%
London	2,777	70.5	3,056	66.6	3,207	64.1	3,458	64.0
South East	2,195	59.4	2,512	59.1	2,559	56.1	2,709	55.7
East of England	1,402	60.0	1,598	59.7	1,561	55.1	1,657	54.4
South West	1,261	56.1	1,397	55.6	1,456	53.1	1,517	52.4
West Midlands	1,576	65.0	1,624	62.8	1,551	58.4	1,607	57.8
East Midlands	1,154	61.8	1,187	59.3	1,303	58.5	1,349	57.9
Yorks & the Humber	1,381	61.4	1,420	59.8	1,488	58.8	1,540	58.2
North West	1,950	63.3	2,015	61.5	2,042	60.1	2,113	59.5
North East	691	65.0	690	63.1	713	61.4	736	60.8
England	*14,388*	*62.8*	*15,499*	*61.1*	*15,880*	*58.6*	*16,687*	*58.1*
Wales	713	60.7	760	59.1	770	56.5	792	55.8
Scotland	1,608	66.5	1,583	62.1	1,589	60.1	1,660	59.6
Northern Ireland	394	60.3	441	57.0	452	56.1	472	55.6
United Kingdom	17,104	63.0	18,283	61.0	18,690	58.5	19,610	58.1

d) male full time employees	1992 000s	%	2002 000s	%	2012 000s	%	2022 000s	%
London	1,663	42.2	1,848	40.3	1,885	37.7	2,015	37.3
South East	1,365	36.9	1,567	36.9	1,600	35.1	1,667	34.3
East of England	892	38.2	1,004	37.5	994	35.1	1,030	33.8
South West	792	35.2	898	35.8	923	33.7	940	32.5
West Midlands	1,019	42.0	1,047	40.5	975	36.7	985	35.4
East Midlands	745	39.9	747	37.3	843	37.8	855	36.7
Yorks & the Humber	887	39.4	910	38.3	939	37.1	948	35.9
North West	1,226	39.8	1,258	38.4	1,263	37.2	1,280	36.0
North East	442	41.5	428	39.1	438	37.8	441	36.5
England	*9,031*	*39.4*	*9,706*	*38.3*	*9,860*	*36.4*	*10,162*	*35.4*
Wales	444	37.8	469	36.5	476	35.0	479	33.7
Scotland	1,001	41.4	961	37.7	982	37.1	1,003	36.0
Northern Ireland	236	36.1	268	34.6	267	33.2	273	32.2
United Kingdom	10,711	39.4	11,405	38.1	11,586	36.3	11,917	35.3

e) female full time employees	1992 000s	%	2002 000s	%	2012 000s	%	2022 000s	%
London	1,115	28.3	1,208	26.3	1,322	26.4	1,444	26.7
South East	829	22.4	945	22.2	959	21.0	1,041	21.4
East of England	511	21.9	595	22.2	567	20.0	627	20.6
South West	470	20.9	498	19.8	533	19.4	577	19.9
West Midlands	558	23.0	577	22.3	577	21.7	623	22.4
East Midlands	409	21.9	440	22.0	460	20.7	494	21.2
Yorks & the Humber	494	21.9	510	21.5	549	21.7	592	22.4
North West	724	23.5	757	23.1	779	22.9	833	23.4
North East	249	23.4	262	23.9	274	23.6	295	24.3
England	*5,358*	*23.4*	*5,793*	*22.8*	*6,019*	*22.2*	*6,525*	*22.7*
Wales	269	22.9	291	22.6	293	21.5	313	22.0
Scotland	607	25.1	621	24.4	607	22.9	656	23.6
Northern Ireland	158	24.2	173	22.4	184	22.9	199	23.4
United Kingdom	6,392	23.5	6,879	23.0	7,104	22.3	7,693	22.8

Source: CE/IER estimates. MDM revision 12015, CrossRegional.xls (Table R.5)

Table D.9: Employment by Gender and Employment Status, 1992- 2022 (continued)

f) total part time employees

	1992 000s	1992 %	2002 000s	2002 %	2012 000s	2012 %	2022 000s	2022 %
London	741	18.8	1,059	23.1	1,152	23.0	1,290	23.9
South East	994	26.9	1,208	28.4	1,338	29.3	1,473	30.3
East of England	614	26.3	737	27.5	840	29.6	945	31.0
South West	601	26.7	760	30.3	857	31.3	948	32.7
West Midlands	588	24.2	716	27.7	784	29.5	857	30.8
East Midlands	480	25.7	601	30.0	642	28.8	699	30.0
Yorks & the Humber	612	27.2	726	30.5	744	29.4	810	30.6
North West	787	25.5	950	29.0	965	28.4	1,054	29.7
North East	283	26.6	325	29.7	331	28.5	360	29.8
England	*5,699*	*24.9*	*7,083*	*27.9*	*7,653*	*28.2*	*8,438*	*29.4*
Wales	308	26.2	368	28.6	407	29.9	445	31.3
Scotland	592	24.5	743	29.1	745	28.2	815	29.3
Northern Ireland	150	23.0	222	28.6	244	30.3	268	31.6
United Kingdom	6,749	24.9	8,416	28.1	9,050	28.3	9,966	29.5

g) male part time employees

	1992 000s	1992 %	2002 000s	2002 %	2012 000s	2012 %	2022 000s	2022 %
London	176	4.5	320	7.0	357	7.1	432	8.0
South East	181	4.9	296	7.0	358	7.8	428	8.8
East of England	120	5.2	175	6.5	231	8.2	286	9.4
South West	105	4.7	188	7.5	209	7.6	252	8.7
West Midlands	94	3.9	154	5.9	204	7.7	239	8.6
East Midlands	83	4.5	144	7.2	166	7.4	198	8.5
Yorks & the Humber	89	4.0	162	6.8	200	7.9	236	8.9
North West	122	4.0	210	6.4	240	7.1	289	8.1
North East	46	4.4	66	6.1	87	7.5	103	8.5
England	*1,018*	*4.4*	*1,714*	*6.8*	*2,052*	*7.6*	*2,463*	*8.6*
Wales	50	4.3	80	6.2	104	7.6	124	8.7
Scotland	93	3.8	154	6.0	189	7.1	223	8.0
Northern Ireland	38	5.9	56	7.2	67	8.3	80	9.4
United Kingdom	1,199	4.4	2,003	6.7	2,412	7.6	2,890	8.6

h) female part time employees

	1992 000s	1992 %	2002 000s	2002 %	2012 000s	2012 %	2022 000s	2022 %
London	565	14.3	740	16.1	795	15.9	858	15.9
South East	813	22.0	912	21.5	980	21.5	1,045	21.5
East of England	494	21.1	562	21.0	609	21.5	660	21.6
South West	496	22.0	572	22.8	648	23.6	695	24.0
West Midlands	494	20.4	563	21.8	580	21.8	618	22.2
East Midlands	397	21.2	458	22.9	476	21.3	501	21.5
Yorks & the Humber	522	23.2	564	23.7	544	21.5	574	21.7
North West	665	21.6	740	22.6	725	21.3	766	21.5
North East	237	22.3	259	23.7	244	21.0	258	21.3
England	*4,681*	*20.4*	*5,369*	*21.2*	*5,601*	*20.7*	*5,975*	*20.8*
Wales	257	21.9	289	22.5	303	22.3	320	22.6
Scotland	499	20.6	589	23.1	557	21.0	593	21.3
Northern Ireland	112	17.1	166	21.4	177	22.0	188	22.2
United Kingdom	5,550	20.4	6,413	21.4	6,639	20.8	7,076	20.9

Source: CE/IER estimates. MDM revision 12015, CrossRegional.xls (Table R.5)

Table D.9: Employment by Gender and Employment Status, 1992-2022 (continued)

i) total self employed	1992		2002		2012		2022	
	000s	%	000s	%	000s	%	000s	%
London	421	10.7	474	10.3	641	12.8	652	12.1
South East	508	13.7	527	12.4	667	14.6	679	14.0
East of England	319	13.7	340	12.7	434	15.3	446	14.6
South West	387	17.2	355	14.1	428	15.6	431	14.9
West Midlands	262	10.8	246	9.5	321	12.1	316	11.4
East Midlands	233	12.5	212	10.6	284	12.7	281	12.1
Yorks & the Humber	257	11.4	231	9.7	300	11.8	294	11.1
North West	344	11.2	310	9.5	390	11.5	387	10.9
North East	90	8.4	79	7.2	117	10.1	114	9.4
England	*2,821*	*12.3*	*2,776*	*10.9*	*3,580*	*13.2*	*3,601*	*12.5*
Wales	155	13.2	158	12.3	185	13.6	184	12.9
Scotland	219	9.1	224	8.8	312	11.8	311	11.2
Northern Ireland	109	16.7	112	14.4	109	13.5	109	12.8
United Kingdom	3,304	12.2	3,270	10.9	4,186	13.1	4,204	12.4

All employment	1992		2002		2012		2022	
	000s	%	000s	%	000s	%	000s	%
London	3,940	100.0	4,590	100.0	5,000	100.0	5,401	100.0
South East	3,696	100.0	4,248	100.0	4,564	100.0	4,861	100.0
East of England	2,336	100.0	2,675	100.0	2,835	100.0	3,049	100.0
South West	2,249	100.0	2,512	100.0	2,741	100.0	2,896	100.0
West Midlands	2,426	100.0	2,586	100.0	2,656	100.0	2,781	100.0
East Midlands	1,868	100.0	2,001	100.0	2,229	100.0	2,329	100.0
Yorks & the Humber	2,250	100.0	2,376	100.0	2,531	100.0	2,644	100.0
North West	3,081	100.0	3,275	100.0	3,398	100.0	3,554	100.0
North East	1,063	100.0	1,094	100.0	1,161	100.0	1,210	100.0
England	*22,909*	*100.0*	*25,358*	*100.0*	*27,113*	*100.0*	*28,726*	*100.0*
Wales	1,176	100.0	1,287	100.0	1,362	100.0	1,420	100.0
Scotland	2,419	100.0	2,550	100.0	2,646	100.0	2,786	100.0
Northern Ireland	654	100.0	774	100.0	804	100.0	849	100.0
United Kingdom	27,157	100.0	29,969	100.0	31,926	100.0	33,781	100.0

Source: CE/IER estimates. MDM revision 12015, CrossRegional.xls (Table R.5)

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 2.9 per cent, but part-time employment will increase by 13.7 per cent. All regions and nations are projected to experience an increase in male full-time employment. The increase in the number of full-time male employees will be greatest by far in London, followed by the South East and the East of England. The rate of increase in full-time jobs is also projected to be fastest in these three regions. The midlands and north of England will gain jobs more slowly than southern England, Northern Ireland or Scotland. Full-time male employment is projected to grow most slowly in Wales. The rate of part-time employment growth is projected to be fastest in the East of England, London, and the South West, slowest in the West Midlands, North East and Yorkshire and the Humber. Self-employment is projected to decline by 3 thousand (0.1 per cent) between 2012 and 2022. It is projected to increase quite strongly in London and the rest of southern England, but to decline elsewhere. The rate of decline is projected to be fastest in northern England and Wales.

The projected increase in full-time employment between 2012 and 2022 for *females* is much greater than that for males. In contrast to males, 56.2 per cent 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 of the UK, with the largest increases occurring in London, the South-East and the East of England. The fastest rates of increase are also projected for the East of England, London and the South-East, and projected rates of increase within England are faster in southern regions than in the midlands and north. Employment is projected to increase most slowly in Wales. The number of part-time jobs is also projected to increase in all regions and nations of the UK. The geographical pattern of increase is similar to full-time employment, with the increase in employment being greatest in the South East, followed by London and the East of England. The rate of increase is projected to be fastest in the East of England, London and the South West and slowest in the East Midlands, Wales and northern England. Self-employment for women is projected to increase by only 22 thousand or 0.3 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 and South East while the only decrease is projected for the East Midlands. The most rapid projected percentage increases are in the East of England, South East, South West and Northern Ireland.

Table D.10: Change in Employment Status by Gender, 2012-2022

a) change in thousands

	Males			Females			Total		
	FT	PT	SE	FT	PT	SE	FT	PT	SE
London	129	75	10	122	63	2	251	138	11
South East	68	70	7	82	66	6	149	136	12
East of England	36	55	6	61	51	7	97	105	13
South West	17	43	0	44	47	3	62	91	3
West Midlands	10	35	-5	46	38	0	56	73	-4
East Midlands	12	32	-1	33	26	-2	46	58	-3
Yorks & the Humber	9	36	-5	43	30	0	53	66	-5
North West	16	49	-6	54	40	2	71	89	-3
North East	3	16	-2	20	13	0	23	29	-3
England	*302*	*411*	*3*	*506*	*374*	*18*	*807*	*784*	*21*
Wales	3	20	-3	20	17	1	22	37	-2
Scotland	21	34	-3	50	36	2	71	70	-1
Northern Ireland	6	13	-1	14	11	1	20	24	0
United Kingdom	331	478	-3	589	438	22	920	916	18

b) per cent change

	Males			Females			Total		
	FT	PT	SE	FT	PT	SE	FT	PT	SE
London	6.9	21.1	2.2	9.2	7.9	0.2	7.8	12.0	1.8
South East	4.2	19.6	1.6	8.5	6.7	0.6	5.8	10.1	1.8
East of England	3.6	23.6	2.0	10.7	8.3	1.1	6.2	12.5	2.9
South West	1.9	20.8	0.2	8.3	7.3	0.5	4.2	10.6	0.8
West Midlands	1.0	17.4	-2.1	8.0	6.5	0.1	3.6	9.4	-1.3
East Midlands	1.5	19.3	-0.7	7.2	5.4	-0.3	3.5	9.0	-1.0
Yorks & the Humber	1.0	18.0	-2.5	7.9	5.5	0.0	3.5	8.8	-1.8
North West	1.3	20.3	-2.0	7.0	5.6	0.3	3.5	9.2	-0.8
North East	0.7	17.9	-2.9	7.4	5.5	-0.1	3.3	8.8	-2.4
England	*3.1*	*20.0*	*0.1*	*8.4*	*6.7*	*0.3*	*5.1*	*10.3*	*0.6*
Wales	0.6	19.4	-2.0	6.7	5.6	0.2	2.9	9.1	-1.0
Scotland	2.2	18.0	-1.5	8.2	6.5	0.4	4.5	9.4	-0.2
Northern Ireland	2.1	20.0	-1.1	7.9	6.2	0.5	4.5	10.0	-0.1
United Kingdom	2.9	19.8	-0.1	8.3	6.6	0.3	4.9	10.1	0.4

c) per cent per annum change

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

Source: CE/IER estimates. MDM revision 12015, CrossRegional.xls (Table R.5)

D.6 Occupational Prospects by country and region

D.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 2012 to 2022 is presented in Tables D.11 (total), D.12 (females) and D.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 E.7.

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 south and east of England, “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 (to a lesser extent) 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 relative concentration of skilled trades in the north and west reflects the greater 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 2012 and 2022 are in *professional occupations* (1175 thousand jobs), *caring, leisure and other service occupations* (649 thousand jobs), *managers, directors & senior officials* (586 thousand jobs) and *associate professional & technical occupations* (583 thousand jobs).

The greatest loss of jobs between 2012 and 2022 is projected for *administrative, clerical and secretarial occupations* (486 thousand jobs), followed by skilled trades occupations (306 thousand jobs) and *process, plant and machine operatives* (214 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 2012-2022.

The overall pattern is therefore of greatest increase in the most 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 2012 and 2022 in *skilled trades occupations* and for *process, plant and machine operatives*, together representing a loss of 372 thousand jobs. The largest increase in employment is for *professional occupations* (369 thousand or 11.5 per cent), followed by an increase of 239 thousand jobs in *managers, directors and senior officials* (11.0 per cent). The growth of employment in jobs not traditionally regarded as being 'male' is notable. Employment in *sales and customer service occupations* is projected to grow by 162 thousand (17.1 per cent), while employment in *caring, leisure and other service occupations* is projected to grow by 126 thousand (23.8 per cent). Employment in elementary occupations is projected to increase by 97 thousand (5 per cent).

The pattern for **female** employment is one of growth in higher status occupations (at a much faster rate than for males) and caring occupations and decline in the number of middle-ranking, semi-skilled and unskilled jobs. Employment in *professional occupations* is projected to increase by 806 thousand jobs (26.2 per cent), with the second largest projected increase being for *caring, leisure and other service occupations* (523 thousand or 22.5 per cent). The number of women in a*ssociate professional & technical occupations* is projected to grow by 403 thousand jobs (22.9 per cent) and the number of *managers & senior officials* is projected to increase by 348 thousand (30.6 per cent). The fastest rate of decline (-27.2 per cent, representing 57 thousand jobs) is projected for *process, plant and machine operatives*. In contrast to men, employment in *elementary occupations* is projected to decline relatively quickly, by 165 thousand (-11.9 per cent). The largest projected decline is in *administrative and secretarial occupations* (-492 thousand or -16.6 per cent). Employment loss is also projected for *skilled trades occupations* (-92 thousand or -19.5 per cent) and *sales and customer service occupations* (-226 thousand or -12.9 per cent).

D.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 2012, managers, directors & senior officials accounted for 10.3 per cent of total employment in the UK, but for 12.2 per cent in London and 11.9 per cent in the South East. This SOC Major Group is also over-represented relative to the UK average in the East of England. At the other extreme, this SOC major group accounted for only 8.1 per cent of total employment in Wales, 8.3 per cent in the North East and 8.5 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 (56.6 per cent) of the growth in employment for *managers, directors & senior officials* between 2012 and 2022 is projected to occur in southern England: London, the South East, the East of England and the South West. The rate of employment growth in this major group is projected to be well above the UK average (17.7 per cent) in the South East (20.5 per cent) and East of England (20.5 per cent) and slightly above average in the West Midlands and Wales (both 18 per cent). The projected rate of employment increase is slowest in the North East, North West and East Midlands. Hence the differential between southern England and the remainder of the UK is projected to increase, with the share of employment in this major group increasing to 13.4 per cent in the South East by 2022. Rates of employment growth are projected to be almost three time faster for females (30.5 per cent) than for males (11 per cent) and there is greater similarity in regional and national rates of growth, which range from 36.1 per cent in the East of England to 27.4 per cent in Scotland. The share of employment growth in this major group projected to be located in southern England is 60.3 per cent of the increase for men and 54.1 per cent for women.

Professional occupations: The share of total employment accounted for by professional occupations is highest by far in London (25.3 per cent in 2012, compared with the UK average of 19.6 per cent). The only other region with an above average percentage is the South-East (20.4 per cent). The East of England, South West, North East, Wales, Scotland and Northern Ireland have just below the UK average percentage of employment in this major group. The lowest percentages are 16.8 per cent in the East Midlands, 17 per cent in Yorkshire and the Humber and 17.1 per cent in the West Midlands. This pattern reflects the concentration of government departments, academic and research facilities etc in the south-eastern corner of the UK and may be a factor underlying regional and national differences in rates of innovation and productivity.

There is relatively little regional and national variation in the projected rate of increase in employment between 2012 and 2022. The largest percentage increases are in Scotland (20.8 per cent) and London (20.2 per cent) and the slowest increases in the North West (16.4 per cent) and East Midlands (16.5 per cent). Regional/national rates of increase are slightly faster in southern England, which is also projected to gain 53.5 per cent of the employment increase. Regional differentials will widen slightly over the decade. By 2022, this major group is projected to account for 28.2 per cent of employment in London, but only 18.8 per cent in the East Midlands. The south east/north west differential in regional and national rates of employment increase is more pronounced for males and smaller for females. For females, the rate of employment increase is fastest in Scotland (28.5 per cent), the East of England (28.4 per cent) and the North East (28.1 per cent) and slowest in the East Midlands (22.9 per cent).

Associate professional & technical occupations: Associate professional & technical occupations represented 18.9 per cent of total employment in London and 13.6 per cent in the South East compared with the UK average of 13.1 per cent for 2012. The percentage of employees from this SOC major group was lower than the UK average in the remaining nations and regions of the UK, but closest to the average in the East of England (12.8 per cent) and Scotland (12 per cent). This percentage fell in the range 10.8 to 11.8 per cent in the remaining regions and nations, being lowest (at 10.8 per cent) in Wales. The geographical distribution of this group is strongly influenced by the concentration of science-related economic activity in southern England (which contained 57.1 per cent of employment in 2012), 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 East of England (16.4 per cent), and faster than the UK average rate (13.9 per cent) in the West Midlands and Scotland (both 14.8 per cent), South East (14.5 per cent) and South West (14.4 per cent). The slowest projected rates of increase are in the North East (12 per cent), Northern Ireland and Wales (both 12.3 per cent). The four regions of southern England are projected to contain 55.8 per cent of the increase in employment between 2012 and 2022 (relative to an opening stock of for these regions of 53.8 per cent) and the largest increase in numbers employed is expected to be in London (129 thousand or 22.1 per cent of the total increase) while employment in the whole of the midlands and northern England will increase by 181 thousand (31.1 per cent of the total increase). Female employment is projected to grow fastest in Scotland (26.5 per cent), the East of England (25.9 per cent) and the West Midlands (25.5 per cent), and 51 per cent of new female jobs are projected to be located in southern England. For females (18.5 per cent), the rate of projected employment growth is slower than the UK average in London.

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 11.8 per cent in 2012. This major group was over-represented in the North West, Yorkshire and the Humber, West Midlands, Northern Ireland, Scotland and the

North East. 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 sharply between 2012 and 2022, by 486 thousand (-12.9 per cent) in the UK and employment declines are projected for all regions and nations but with south east England hit hardest. London is projected to lose 94 thousand jobs (19.3 per cent of its 2012 employment), the South East 90 thousand jobs (-16.8 per cent) and the South West is projected to lose 14.1 per cent of its 2012 employment. Overall, 55.1 per cent of the jobs lost will have been located in southern England, from an opening stock for these regions of 44 per cent. Elsewhere, the projected rate of job loss is highest in the East Midlands (-11.5 per cent) and Scotland (-10.8 per cent). The slowest projected rates of job loss are in Northern Ireland (-8.2 per cent), Yorkshire and the Humber (-9.8 per cent) and Wales (-9.9 per cent).

The impact of job loss in this SOC major group is strongly gendered. The number of males employed is projected to increase by 6 thousand in the UK as a whole, with increases of around 5 per cent in each of the northern English regions, 6.4 per cent in Wales and 10.4 per cent in Northern Ireland. Job loss is concentrated within the southern half of England and the East Midlands. London is projected to lose 9.8 per cent of its employment in this major group over the decade and the South East 4.5 per cent. Female employment is projected to decline by 492 thousand (-16.6 per cent) and all regions and nations are projected to lose around a sixth of female jobs over the period 2012 to 2022. London and the South East are projected to each lose around a fifth of their female jobs in the SOC major group.

Skilled trades occupations: The UK average share of employment in skilled trades occupations was 11 per cent in 2012. This major group displays the opposite pattern to higher-status white collar jobs, being under-represented in London (7.8 per cent) and the South East (10.1 per cent) and over-represented elsewhere. The largest percentages of skilled trades occupations in total employment were to be found in Northern Ireland (13.6 per cent), Wales (13.2 per cent), the South West and the West Midlands (12.5 per cent in each case. This reflects the continuing importance of the primary sector and utilities and manufacturing industry in these nations and regions.

Employment is projected to decline by 306 thousand overall between 2012 and 2022 (-8.7 per cent) and to decline in all nations and regions of the UK. Employment is projected to decline most rapidly in the East Midlands (-10.9 per cent), West Midlands (-10.8 per cent), Yorkshire and the Humber (-10.8 per cent) and Scotland (-9.8 per cent). London exhibits the lowest projected rate of job loss (-4.9 per cent), followed by Northern Ireland (-5.8 per cent). Overall, 45.5 per cent of projected UK job losses in this major group are projected to be experienced in the midlands and north of England, with a further 16.5 per cent in Wales, Scotland and Northern Ireland.

Job loss affects women to a greater extent than men in the SOC major group. Male employment is projected to decline by 215 thousand (-7 per cent), but the projected decline of 92 thousand in female employment represents a loss of a fifth (-19.5 per cent) of employment. Female employment is projected to decline in all regions and nations, the largest number of jobs lost being in London and the South East. The projected rate of job loss is much faster than for males, and is highest in the East Midlands (-23.9 per cent), the North East (-22 per cent) and Yorkshire and the Humber (-21.8 per cent) . The slowest projected rates of decline are for Wales (-14 per cent), Northern Ireland (-15.9 per cent) and the East of England (-16.4 per cent).

Caring, leisure and other service occupations: The percentage employed in caring, leisure and other service occupations was below the 2012 UK average (9 per cent) in London (6 per cent) Scotland (7.4 per cent) and the East of England (8.8 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 (10.8 per cent), the East Midlands (10.6 per cent) and Wales (10.3 per cent).

Employment is projected to increase by 649 thousand (22.7 per cent) between 2012 and 2022 and to increase in all regions and nations of the UK. The rate of projected employment growth is fastest in Scotland (27.9 per cent), the East of England (27.2 per cent), Yorkshire and the Humber (23.6 per cent), the South East (23.5 per cent) and South West (23.3 per cent). Employment growth is projected to be slowest in Northern Ireland (17.5 per cent), the North East (17.9 per cent) and Wales (18 per cent). The largest projected gains in employment are for the South East (97 thousand) and North West (75 thousand). A traditionally female occupation, 126 thousand of the employment increase is projected to be for males (an increase of 23.8 per cent) and 523 thousand for females (a rate of increase of 22.5 per cent). There is relatively little difference in the geographical pattern of projected change for males and females, but the rate of employment growth is slightly higher for males than females in most regions and nations of the UK.

Sales and customer service occupations: This SOC major group represented 8.4 per cent of total employment in the UK in 2012. This occupation is the most evenly distributed of the nine major groups. The highest percentages of employment in sales and customer service occupations were in the North East (10.1 per cent) and the North West (9.6 per cent).It was under-represented relative to the UK average in London (7.2 per cent) and the South East (7.7 per cent).

Total employment is projected to see a small decline of 64 thousand (-2.4 per cent) between 2012 and 2022, and to decline in all regions and nations of the UK except the North East (which is projected to gain employment by 1.6 per cent). Just over half (54.2 per cent) of the job loss is projected to occur in southern England. In contrast, Wales, Scotland and Northern Ireland taken together are projected to account for nearly a quarter (23.8 per cent) of the loss of employment. The fastest rates of projected job loss are for Wales (-5 per cent), the West Midlands (-3.8 per cent), the South East (-3.6 per cent) and Northern Ireland (-3.6 per cent). Once again, there is a strong contrast in the projected fortunes of the genders. Male employment is projected to increase by 162 thousand (17.1 per cent), while female employment is projected to decline by 226 thousand (-12.9 per cent). Male employment is projected to increase in all regions and nations of the UK. Male employment is projected to increase faster than average in the North East (22.7 per cent), East of England (19.8 per cent), Yorkshire and the Humber (19.1 per cent), Scotland (18.9 per cent), North West (18.7 per cent), South West (17.6 per cent) and South East (17.3 per cent). London (13.9 per cent) and Northern Ireland (14.6 per cent) are projected to experience the slowest rates of employment increase. Female employment is projected to decline in all regions and nations of the UK, with much of the employment loss projected for southern England. Female employment is projected to decline fastest in Northern Ireland (-16 per cent), the South East (-15.8 per cent), London (-15.5 per cent), West Midlands (-14.5 per cent) and Yorkshire and the Humber (-14.4 per cent). The projected rate of decline is least in the North East (-6.6 per cent), East Midlands (-8.9 per cent) and North West (-9.7 per cent).

Process, plant and machine operatives: This is the smallest SOC major group, representing only 6.2 per cent of total UK employment in 2012. There is a strong south-east / north-west contrast in the spatial distribution of process, plant and machine operatives. They comprised only 3.9 per cent of employment in London and 4.9 per cent in the South East in 2012. The percentage working in these types of semi-skilled manual job was above the UK average in the midlands, north of England and Wales, with the highest percentages being in the East Midlands (8.3 per cent), the West Midlands (8 per cent) and Wales (7.9 per cent).

Employment is projected to decline by 214 thousand (-10.8 per cent) between 2012 and 2022. Employment is projected to decline in all regions and nations, with over half of job losses (52.6 per cent) in the midlands and north of England. The smallest projected percentage declines are all in southern England: East of England (-7.2 per cent), South East (-7.3 per cent) and London (-7.8 per cent). The highest rates of decline are projected to occur in Scotland (-14.2 per cent), Yorkshire and the Humber (-13.5 per cent), the North West (-13.5 per cent), North East (-13 per cent) and Wales (-12.2 per cent).

Male employment is projected to decline by 157 thousand (-8.8 per cent), and while the projected female employment decline is much smaller (57 thousand), the projected percentage decline in female employment (-27.2 per cent) is much larger. For males, the geographical pattern of projected employment change is similar to the pattern of change in total employment. However, there is much greater variation in the rate of projected employment decline for females. Employment is projected to decline at a much faster than average rate in the midlands, northern England, Wales, Scotland and Northern Ireland than in southern England. The fastest rates of job loss are projected for the North West (-39.1 per cent), North East (-38.9 per cent), Northern Ireland (-36 per cent) and Yorkshire and the Humber (-34.7 per cent). The slowest rates of job loss are projected for London (-2.2 per cent), South East (-11.1 per cent) and East of England (-16 per cent).

Elementary Occupations: In 2012, jobs classed as being elementary occupations accounted for 10.5 per cent of all employment in the UK. There is little variation across regions and nations of the UK in the percentage of jobs accounted for by this SOC major group. The highest percentages of employment in elementary occupations in 2012 were in Scotland (12.7 per cent), East Midlands (11.1 per cent), West Midlands, Yorkshire and the Humber and North East (10.9 per cent in each case). These types of job are generally most common in areas of heavy industry or where warehousing and food processing are significant industries. The lowest percentages are in London (8.9 per cent), Northern Ireland (9.5 per cent) and the North West (9.9 per cent).

Employment in elementary occupations is projected to decline by 67 thousand (2 per cent) and to remain broadly constant or decline slowly in all regions and nations of the UK. There is little clear geographical pattern, with the fastest rates of decline projected to occur in Scotland (-3.4 per cent), the West Midlands (-3 per cent), South West (-2.8 per cent), Wales (-2.8 per cent) and London (-2.7 per cent). This pattern obscures opposing trends for male and female employment. Male employment is projected to increase by 97 thousand (5 per cent), while female employment is projected to decline by 165 thousand (-11.9 per cent). Male employment is projected to increase in all regions and nations of the UK, while female employment is projected to decline everywhere. The fastest rates of male employment increase are projected for the North West (7.1 per cent), the North East (6.5 per cent), and East of England (6.3 per cent). Male employment is projected to grow most slowly in the South West (2.9 per cent), Wales and West Midlands (3.6 per cent in each case) and London (4.2 per cent). Female employment is projected to decline fastest in the North East (-15.1 per cent), Yorkshire and the Humber (-14.4 per cent), North West (-14 per cent) and Northern Ireland (-13.8 per cent). Rates of employment loss tend to be lower in southern England than in northern England or the nations of the UK outside England, with the slowest rates of decline being projected for the East of England (-8.6 per cent), South East (-9.1 per cent) and South West (-10.4 per cent.

Table D.11: Projected Change in Total Employment by Occupation, 2012-2022

a) 2012 Shares

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	12.2	25.3	18.9	9.8	7.8	6.0	7.2	3.9	8.9	100
South East	11.9	20.4	13.6	11.7	10.1	9.0	7.7	4.9	10.7	100
East of England	11.2	18.8	12.8	11.6	11.2	8.8	8.9	6.3	10.4	100
South West	10.4	19.0	11.8	11.2	12.5	10.1	8.8	5.7	10.5	100
West Midlands	9.1	17.1	11.7	12.7	12.5	10.0	8.0	8.0	10.9	100
East Midlands	10.3	16.8	11.4	11.1	11.8	10.6	8.6	8.3	11.1	100
Yorks & the Humber	9.7	17.0	11.4	13.0	11.7	9.6	9.0	7.7	10.9	100
North West	9.4	18.1	11.5	13.3	11.0	10.1	9.6	7.0	9.9	100
North East	8.3	18.8	11.2	12.2	11.9	9.4	10.1	7.3	10.9	100
England	10.7	19.7	13.4	11.7	10.8	9.0	8.4	6.2	10.3	100
Wales	8.1	19.0	10.8	11.6	13.2	10.3	8.5	7.9	10.7	100
Scotland	8.9	19.4	12.0	12.6	12.0	7.4	8.7	6.3	12.7	100
Northern Ireland	8.5	18.7	11.7	12.7	13.6	10.8	9.0	5.5	9.5	100
United Kingdom	10.3	19.6	13.1	11.8	11.0	9.0	8.4	6.2	10.5	100

b) 2012 levels

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	610	1,267	945	488	392	301	358	196	443	5,000
South East	542	932	621	532	463	411	351	225	488	4,564
East of England	318	534	363	329	319	248	252	179	294	2,835
South West	285	520	323	306	342	278	241	157	288	2,741
West Midlands	241	454	310	338	332	266	212	212	291	2,656
East Midlands	229	375	254	246	262	237	192	184	248	2,229
Yorks & the Humber	246	430	289	330	297	244	227	195	275	2,531
North West	320	616	390	453	372	342	328	239	338	3,398
North East	97	218	130	141	138	109	117	84	127	1,161
England	*2,889*	*5,346*	*3,624*	*3,163*	*2,917*	*2,436*	*2,278*	*1,671*	*2,790*	27,113
Wales	110	259	147	158	180	140	116	107	145	1,362
Scotland	236	514	317	333	316	196	231	167	336	2,646
Northern Ireland	68	151	94	102	109	87	73	44	77	804
United Kingdom	3,303	6,270	4,182	3,756	3,522	2,859	2,698	1,989	3,348	31,926

c) 2022 levels

	SOC2010 Major Group									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**All**
London	719	1,524	1,073	394	373	359	347	181	431	5,401
South East	653	1,100	711	443	419	508	338	208	481	4,861
East of England	383	640	422	287	292	316	248	166	294	3,049
South West	332	619	370	263	316	342	234	141	280	2,896
West Midlands	285	539	355	303	296	327	204	190	282	2,781
East Midlands	266	437	286	218	234	291	190	164	245	2,329
Yorks & the Humber	285	508	328	297	265	301	222	168	270	2,644
North West	367	717	439	406	341	417	327	207	334	3,554
North East	111	256	146	126	127	129	119	73	124	1,210
England	3,401	6,340	4,130	2,737	2,662	2,990	2,229	1,497	2,739	28,726
Wales	130	305	165	142	167	165	111	94	141	1,420
Scotland	277	621	364	297	285	251	223	144	324	2,786
Northern Ireland	81	179	106	94	103	102	70	40	75	849
United Kingdom	3,889	7,444	4,764	3,270	3,216	3,508	2,633	1,775	3,280	33,781

Table D.11: Projected Change in Total Employment by Occupation, 2012-2022 (cont.)

d) change in thousands

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	109	256	129	-94	-19	59	-11	-15	-12	401
South East	111	168	90	-89	-43	97	-13	-17	-7	297
East of England	65	106	60	-41	-27	68	-3	-13	0	214
South West	46	99	47	-43	-27	65	-7	-16	-8	156
West Midlands	43	86	46	-35	-36	61	-8	-22	-9	125
East Midlands	36	62	32	-28	-29	54	-3	-21	-3	100
Yorks & the Humber	39	78	39	-32	-32	57	-5	-26	-5	113
North West	47	101	49	-47	-32	75	-1	-32	-4	157
North East	14	38	16	-15	-11	20	2	-11	-3	50
England	*512*	*994*	*506*	*-426*	*-256*	*554*	*-48*	*-173*	*-51*	*1,613*
Wales	20	46	18	-16	-13	25	-6	-13	-4	57
Scotland	41	107	47	-36	-31	55	-7	-24	-11	140
Northern Ireland	13	28	12	-8	-6	15	-3	-4	-2	44
United Kingdom	586	1,175	583	-486	-306	649	-64	-214	-67	1,855

e) per cent change

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	17.8	20.2	13.6	-19.3	-4.9	19.5	-3.1	-7.8	-2.7	8.0
South East	20.5	18.0	14.5	-16.8	-9.4	23.5	-3.6	-7.3	-1.4	6.5
East of England	20.5	19.8	16.4	-12.6	-8.4	27.2	-1.3	-7.2	0.1	7.6
South West	16.3	19.0	14.4	-14.1	-7.8	23.3	-2.9	-10.0	-2.8	5.7
West Midlands	18.0	18.9	14.8	-10.5	-10.8	22.7	-3.8	-10.6	-3.0	4.7
East Midlands	15.8	16.5	12.5	-11.5	-10.9	22.9	-1.4	-11.2	-1.3	4.5
Yorks & the Humber	15.9	18.0	13.6	-9.8	-10.8	23.6	-2.2	-13.5	-1.9	4.5
North West	14.8	16.5	12.5	-10.4	-8.5	21.9	-0.2	-13.5	-1.2	4.6
North East	14.5	17.6	12.0	-10.6	-8.0	17.9	1.6	-13.0	-2.3	4.3
England	*17.7*	*18.6*	*14.0*	*-13.5*	*-8.8*	*22.8*	*-2.1*	*-10.4*	*-1.8*	*5.9*
Wales	18.0	17.8	12.3	-9.9	-7.3	18.0	-5.0	-12.2	-2.8	4.2
Scotland	17.6	20.8	14.8	-10.8	-9.8	27.9	-3.2	-14.2	-3.4	5.3
Northern Ireland	18.4	18.7	12.3	-8.2	-5.8	17.5	-3.6	-9.7	-2.0	5.5
United Kingdom	17.7	18.7	13.9	-12.9	-8.7	22.7	-2.4	-10.8	-2.0	5.8

f) per cent per annum change

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	1.7	1.9	1.3	-2.1	-0.5	1.8	-0.3	-0.8	-0.3	0.8
South East	1.9	1.7	1.4	-1.8	-1.0	2.1	-0.4	-0.8	-0.1	0.6
East of England	1.9	1.8	1.5	-1.3	-0.9	2.4	-0.1	-0.7	0.0	0.7
South West	1.5	1.8	1.4	-1.5	-0.8	2.1	-0.3	-1.1	-0.3	0.6
West Midlands	1.7	1.7	1.4	-1.1	-1.1	2.1	-0.4	-1.1	-0.3	0.5
East Midlands	1.5	1.5	1.2	-1.2	-1.1	2.1	-0.1	-1.2	-0.1	0.4
Yorks & the Humber	1.5	1.7	1.3	-1.0	-1.1	2.1	-0.2	-1.4	-0.2	0.4
North West	1.4	1.5	1.2	-1.1	-0.9	2.0	0.0	-1.4	-0.1	0.5
North East	1.4	1.6	1.1	-1.1	-0.8	1.7	0.2	-1.4	-0.2	0.4
England	*1.6*	*1.7*	*1.3*	*-1.4*	*-0.9*	*2.1*	*-0.2*	*-1.1*	*-0.2*	*0.6*
Wales	1.7	1.7	1.2	-1.0	-0.8	1.7	-0.5	-1.3	-0.3	0.4
Scotland	1.6	1.9	1.4	-1.1	-1.0	2.5	-0.3	-1.5	-0.3	0.5
Northern Ireland	1.7	1.7	1.2	-0.9	-0.6	1.6	-0.4	-1.0	-0.2	0.5
United Kingdom	1.6	1.7	1.3	-1.4	-0.9	2.1	-0.2	-1.1	-0.2	0.6

Source: CE/IER estimates, CE projections MDM revision 12015, (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 D.12: Projected Change in Male Employment by Occupation, 2012-2022

a) 2012 Shares

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	14.8	23.9	20.4	3.5	12.5	2.9	5.6	6.8	9.6	100
South East	14.7	21.0	14.9	3.8	16.4	3.5	5.4	8.5	11.7	100
East of England	14.0	19.4	14.0	4.0	18.0	2.9	5.9	10.4	11.3	100
South West	13.7	18.8	13.1	3.9	20.9	2.6	5.5	9.7	11.7	100
West Midlands	11.1	16.4	12.9	5.1	20.9	2.6	5.5	13.5	12.1	100
East Midlands	13.1	17.1	13.0	3.7	18.8	3.4	5.2	13.4	12.4	100
Yorks & the Humber	11.7	16.0	12.5	6.3	19.1	3.1	6.1	12.7	12.5	100
North West	11.8	18.1	12.8	6.0	18.4	3.1	6.2	12.1	11.5	100
North East	10.3	18.1	12.4	5.1	20.3	3.3	5.4	12.7	12.4	100
England	13.2	19.4	14.7	4.5	17.6	3.0	5.7	10.4	11.5	100
Wales	10.7	16.5	12.0	5.2	21.8	3.6	4.8	13.0	12.5	100
Scotland	10.8	17.0	12.6	6.1	20.1	4.0	5.2	10.8	13.3	100
Northern Ireland	10.9	15.4	12.6	6.2	23.7	2.8	7.0	9.6	11.7	100
United Kingdom	12.9	19.0	14.4	4.7	18.1	3.1	5.6	10.6	11.7	100

b) 2012 levels

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	398	640	547	93	336	79	150	182	258	2,682
South East	351	501	356	92	391	83	129	204	280	2,388
East of England	212	293	212	60	273	44	89	158	171	1,512
South West	193	265	185	56	295	37	78	137	165	1,411
West Midlands	155	229	180	71	292	37	77	189	169	1,399
East Midlands	157	205	156	44	226	41	63	161	149	1,202
Yorks & the Humber	158	216	169	85	259	41	83	172	169	1,352
North West	209	322	228	106	328	55	110	216	205	1,778
North East	63	110	75	31	123	20	33	78	75	609
England	*1,897*	*2,782*	*2,108*	*638*	*2,521*	*437*	*812*	*1,496*	*1,642*	14,332
Wales	76	117	86	37	155	25	34	92	88	710
Scotland	149	234	174	84	277	55	71	149	183	1,377
Northern Ireland	46	65	53	26	100	12	29	40	49	421
United Kingdom	2,167	3,197	2,421	785	3,052	529	946	1,778	1,964	16,840

c) 2022 levels

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	450	732	602	84	327	96	171	167	268	2,896
South East	396	562	386	87	361	106	152	190	293	2,533
East of England	239	330	232	59	254	56	107	148	182	1,608
South West	212	297	199	53	277	45	91	126	170	1,472
West Midlands	172	253	193	75	264	45	89	174	175	1,440
East Midlands	173	228	166	43	206	51	71	149	157	1,245
Yorks & the Humber	171	236	178	90	235	51	98	154	179	1,392
North West	223	349	239	111	305	67	131	192	219	1,837
North East	67	118	78	33	116	24	40	69	80	625
England	2,105	3,105	2,272	637	2,344	543	951	1,368	1,725	15,048
Wales	84	127	90	39	145	30	39	84	92	730
Scotland	166	261	183	86	254	69	84	131	193	1,429
Northern Ireland	51	73	55	29	95	13	34	37	52	439
United Kingdom	2,406	3,566	2,600	791	2,838	655	1,108	1,621	2,061	17,646

Table D.12: Projected Change in Male Employment by Occupation, 2012-2022 (cont.)

d) change in thousands

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	52	92	55	-9	-9	17	21	-15	11	214
South East	45	61	30	-4	-30	23	22	-14	12	144
East of England	27	37	21	-1	-19	12	18	-9	11	96
South West	20	31	14	-2	-17	9	14	-11	5	61
West Midlands	17	23	13	4	-28	8	12	-15	6	41
East Midlands	16	23	10	-1	-20	11	9	-13	9	43
Yorks & the Humber	13	20	9	5	-24	10	16	-18	10	40
North West	14	28	11	5	-23	12	21	-23	15	60
North East	5	8	2	1	-8	4	7	-8	5	16
England	*208*	*323*	*164*	*-1*	*-177*	*105*	*139*	*-128*	*83*	*716*
Wales	8	10	4	2	-10	5	5	-8	3	20
Scotland	17	27	9	2	-23	14	13	-18	9	52
Northern Ireland	5	8	2	3	-5	1	4	-3	2	18
United Kingdom	239	369	179	6	-215	126	162	-157	97	806

e) per cent change

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	13.2	14.3	10.0	-9.8	-2.6	21.1	13.9	-8.2	4.2	8.0
South East	12.7	12.2	8.4	-4.5	-7.8	27.8	17.3	-7.0	4.4	6.0
East of England	12.8	12.8	9.7	-1.2	-7.0	27.8	19.8	-6.0	6.3	6.4
South West	10.3	11.8	7.6	-4.1	-5.8	23.2	17.6	-8.3	2.9	4.3
West Midlands	11.1	10.2	7.0	6.1	-9.5	22.9	15.1	-8.1	3.6	2.9
East Midlands	10.2	11.3	6.2	-2.7	-8.8	26.1	14.3	-7.9	5.7	3.6
Yorks & the Humber	8.0	9.2	5.3	5.7	-9.1	24.0	19.1	-10.7	5.9	3.0
North West	6.5	8.6	4.9	5.2	-6.9	22.0	18.7	-10.8	7.1	3.3
North East	7.3	7.2	3.0	4.5	-6.3	18.8	22.7	-10.8	6.5	2.7
England	*11.0*	*11.6*	*7.8*	*-0.2*	*-7.0*	*24.1*	*17.1*	*-8.6*	*5.0*	*5.0*
Wales	10.3	8.8	4.8	6.4	-6.2	20.0	14.8	-8.7	3.6	2.8
Scotland	11.7	11.6	5.3	2.4	-8.3	25.5	18.9	-11.9	5.1	3.8
Northern Ireland	11.6	12.6	3.7	10.3	-4.9	10.0	14.6	-7.4	4.5	4.3
United Kingdom	11.0	11.5	7.4	0.7	-7.0	23.8	17.1	-8.8	5.0	4.8

f) per cent per annum change

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	1.2	1.3	1.0	-1.0	-0.3	1.9	1.3	-0.9	0.4	0.8
South East	1.2	1.2	0.8	-0.5	-0.8	2.5	1.6	-0.7	0.4	0.6
East of England	1.2	1.2	0.9	-0.1	-0.7	2.5	1.8	-0.6	0.6	0.6
South West	1.0	1.1	0.7	-0.4	-0.6	2.1	1.6	-0.9	0.3	0.4
West Midlands	1.1	1.0	0.7	0.6	-1.0	2.1	1.4	-0.8	0.4	0.3
East Midlands	1.0	1.1	0.6	-0.3	-0.9	2.3	1.3	-0.8	0.6	0.4
Yorks & the Humber	0.8	0.9	0.5	0.6	-1.0	2.2	1.8	-1.1	0.6	0.3
North West	0.6	0.8	0.5	0.5	-0.7	2.0	1.7	-1.1	0.7	0.3
North East	0.7	0.7	0.3	0.4	-0.7	1.7	2.1	-1.1	0.6	0.3
England	*1.0*	*1.1*	*0.8*	*0.0*	*-0.7*	*2.2*	*1.6*	*-0.9*	*0.5*	*0.5*
Wales	1.0	0.8	0.5	0.6	-0.6	1.8	1.4	-0.9	0.4	0.3
Scotland	1.1	1.1	0.5	0.2	-0.9	2.3	1.7	-1.3	0.5	0.4
Northern Ireland	1.1	1.2	0.4	1.0	-0.5	1.0	1.4	-0.8	0.4	0.4
United Kingdom	1.0	1.1	0.7	0.1	-0.7	2.2	1.6	-0.9	0.5	0.5

Source: CE/IER estimates, CE projections MDM revision 12015, (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 D.13: Projected Change in Female Employment by Occupation, 2012-2022

a) 2012 Shares

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	9.2	27.1	17.2	17.0	2.4	9.6	9.0	0.6	8.0	100
South East	8.8	19.8	12.2	20.3	3.3	15.1	10.2	1.0	9.5	100
East of England	8.0	18.2	11.4	20.3	3.5	15.4	12.3	1.6	9.2	100
South West	7.0	19.1	10.4	18.8	3.6	18.1	12.3	1.5	9.2	100
West Midlands	6.9	17.8	10.3	21.2	3.2	18.3	10.8	1.8	9.6	100
East Midlands	7.0	16.6	9.6	19.7	3.6	19.1	12.6	2.2	9.7	100
Yorks & the Humber	7.4	18.2	10.2	20.7	3.2	17.2	12.2	1.9	8.9	100
North West	6.8	18.2	10.0	21.4	2.8	17.7	13.4	1.4	8.2	100
North East	6.1	19.5	10.0	19.9	2.7	16.1	15.3	1.2	9.3	100
England	7.8	20.1	11.9	19.8	3.1	15.6	11.5	1.4	9.0	100
Wales	5.3	21.8	9.4	18.6	3.8	17.6	12.6	2.3	8.7	100
Scotland	6.9	22.1	11.2	19.6	3.1	11.1	12.6	1.5	12.0	100
Northern Ireland	5.8	22.3	10.7	19.8	2.5	19.5	11.3	0.9	7.1	100
United Kingdom	7.5	20.4	11.7	19.7	3.1	15.4	11.6	1.4	9.2	100

b) 2012 levels

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	213	627	398	395	56	222	208	14	185	2,318
South East	190	431	265	441	72	328	221	21	207	2,176
East of England	106	241	151	269	46	204	162	21	122	1,323
South West	93	254	138	250	48	241	164	19	123	1,330
West Midlands	87	224	129	267	40	230	135	23	121	1,257
East Midlands	72	170	98	202	37	196	130	23	99	1,027
Yorks & the Humber	88	215	120	244	38	202	144	23	105	1,179
North West	111	294	162	347	45	287	218	23	133	1,620
North East	34	108	55	110	15	89	84	7	51	552
England	*992*	*2,565*	*1,516*	*2,525*	*396*	*1,999*	*1,466*	*174*	*1,148*	12,781
Wales	34	142	61	121	25	115	82	15	57	652
Scotland	87	280	143	248	40	141	160	18	152	1,269
Northern Ireland	22	86	41	76	9	75	43	4	27	384
United Kingdom	1,136	3,072	1,761	2,970	470	2,329	1,752	211	1,384	15,086

c) 2022 levels

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	269	792	472	310	46	264	175	14	163	2,504
South East	257	538	325	355	59	401	186	19	188	2,329
East of England	144	310	190	228	38	259	141	18	112	1,441
South West	119	322	170	210	38	297	143	15	110	1,425
West Midlands	113	287	162	227	32	282	116	16	106	1,341
East Midlands	92	209	120	175	28	239	118	15	87	1,084
Yorks & the Humber	114	272	150	207	29	250	123	15	90	1,252
North West	144	368	200	295	36	350	196	14	114	1,717
North East	43	138	68	94	11	105	79	4	43	585
England	1,296	3,235	1,858	2,100	318	2,448	1,279	129	1,015	13,678
Wales	46	178	75	103	21	135	71	10	50	689
Scotland	111	359	180	210	32	181	139	12	132	1,357
Northern Ireland	30	106	51	65	8	89	36	2	24	410
United Kingdom	1,484	3,878	2,164	2,479	379	2,853	1,526	154	1,219	16,135

Table D.13: Projected Change in Female Employment by Occupation, 2012-2022 (cont.)

d) change in thousands

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	57	164	74	-85	-11	42	-32	0	-23	186
South East	67	107	60	-85	-13	73	-35	-2	-19	153
East of England	38	69	39	-41	-8	55	-21	-3	-11	118
South West	27	67	32	-41	-10	56	-21	-4	-13	95
West Midlands	26	63	33	-40	-8	52	-20	-7	-15	84
East Midlands	20	39	22	-27	-9	44	-12	-8	-12	57
Yorks & the Humber	26	58	30	-37	-8	48	-21	-8	-15	73
North West	34	74	38	-53	-9	63	-21	-9	-19	97
North East	9	30	13	-16	-3	16	-6	-3	-8	33
England	*304*	*671*	*342*	*-425*	*-78*	*449*	*-187*	*-45*	*-133*	*897*
Wales	12	36	14	-18	-3	20	-11	-5	-7	37
Scotland	24	80	38	-38	-8	41	-21	-6	-21	88
Northern Ireland	7	20	10	-11	-2	14	-7	-1	-4	26
United Kingdom	348	806	403	-492	-92	523	-226	-57	-165	1,049

e) per cent change

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	26.6	26.2	18.5	-21.5	-18.7	19.0	-15.5	-2.2	-12.2	8.0
South East	35.0	24.8	22.8	-19.4	-18.1	22.4	-15.8	-11.1	-9.1	7.0
East of England	36.1	28.4	25.9	-15.1	-16.4	27.1	-12.9	-16.0	-8.6	8.9
South West	28.8	26.5	23.5	-16.3	-20.2	23.3	-12.6	-22.0	-10.4	7.1
West Midlands	30.3	27.9	25.5	-14.9	-20.6	22.7	-14.5	-30.9	-12.2	6.7
East Midlands	28.0	22.8	22.5	-13.4	-23.9	22.2	-8.9	-34.8	-11.9	5.6
Yorks & the Humber	30.2	27.0	25.2	-15.2	-21.8	23.5	-14.4	-34.7	-14.4	6.2
North West	30.5	25.0	23.2	-15.1	-20.5	21.9	-9.7	-39.1	-14.0	6.0
North East	28.0	28.1	24.4	-14.9	-22.0	17.7	-6.6	-38.9	-15.1	6.1
England	*30.7*	*26.1*	*22.6*	*-16.8*	*-19.8*	*22.5*	*-12.8*	*-25.8*	*-11.6*	*7.0*
Wales	34.9	25.2	22.8	-14.9	-14.0	17.5	-13.2	-33.8	-12.7	5.7
Scotland	27.7	28.5	26.5	-15.3	-20.5	28.8	-13.1	-33.2	-13.6	7.0
Northern Ireland	32.4	23.3	23.4	-14.6	-15.9	18.7	-16.0	-36.2	-13.8	6.9
United Kingdom	30.6	26.2	22.9	-16.6	-19.5	22.5	-12.9	-27.2	-11.9	7.0

f) per cent per annum change

	SOC2010 Major Group 1	2	3	4	5	6	7	8	9	All
London	2.4	2.4	1.7	-2.4	-2.0	1.8	-1.7	-0.2	-1.3	0.8
South East	3.0	2.2	2.1	-2.1	-2.0	2.0	-1.7	-1.2	-1.0	0.7
East of England	3.1	2.5	2.3	-1.6	-1.8	2.4	-1.4	-1.7	-0.9	0.9
South West	2.6	2.4	2.1	-1.8	-2.2	2.1	-1.3	-2.5	-1.1	0.7
West Midlands	2.7	2.5	2.3	-1.6	-2.3	2.1	-1.6	-3.6	-1.3	0.7
East Midlands	2.5	2.1	2.0	-1.4	-2.7	2.0	-0.9	-4.2	-1.3	0.5
Yorks & the Humber	2.7	2.4	2.3	-1.6	-2.4	2.1	-1.5	-4.2	-1.5	0.6
North West	2.7	2.3	2.1	-1.6	-2.3	2.0	-1.0	-4.8	-1.5	0.6
North East	2.5	2.5	2.2	-1.6	-2.5	1.6	-0.7	-4.8	-1.6	0.6
England	*2.7*	*2.3*	*2.1*	*-1.8*	*-2.2*	*2.0*	*-1.4*	*-2.9*	*-1.2*	*0.7*
Wales	3.0	2.3	2.1	-1.6	-1.5	1.6	-1.4	-4.0	-1.4	0.6
Scotland	2.5	2.5	2.4	-1.6	-2.3	2.6	-1.4	-4.0	-1.4	0.7
Northern Ireland	2.8	2.1	2.1	-1.6	-1.7	1.7	-1.7	-4.4	-1.5	0.7
United Kingdom	2.7	2.4	2.1	-1.8	-2.1	2.0	-1.4	-3.1	-1.3	0.7

Source: CE/IER estimates, CE projections MDM revision 12015, (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

D.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 focus primarily on retirements and other reasons for leaving the workforce semi permanently (such as family formation). Table D.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 2012 to 2022.

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 2012 to 2022, 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), but the age structure of the population means that the full impact of change to pensions and retirement upon labour market participation is likely to be felt more strongly after 2022. 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 1.9 million between 2012 and 2022, replacement demand is expected to be nearly 7 times larger at 12.5 million, accounting for 87 per cent of the overall labour requirement. 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 even declining occupations will still provide job opportunities for younger people. The level of replacement demand over the period 2012-2022 is large for those SOC major groups in which expansion demand is greatest: for example, professional occupations (2.5 million), associate professionals (1.5 million) and managers, directors and senior officials (1.4 million). However, there are also large replacement demands in occupations in which demand for labour is projected to contract: for example administrative and secretarial (1.6 million) and elementary occupations (1.2 million).

Replacement demand accounts for well over 80 per cent of the projected overall labour requirement over the decade 2012 to 2022 in all regions and nations of the UK. This percentage is highest in Wales (90.2 per cent), the North East (90.1 per cent), Yorkshire and the Humber (89.7 per cent), East Midlands (89.6 per cent), North West (89.4 per cent) and West Midlands (89.2 per cent) and lowest in London (83.1 per cent), East of England (83.9 per cent) and South East (85.8 per cent). The paradox is that the regions and nations where projected replacement demand is highest are, other things being equal, 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. The Scottish and Welsh Governments have recognised the need to attract migrants to address employment or skills and have pressed the UK Government to adopt an approach to migration that recognises the positive contribution that migrants can make to the economy, whilst at the same time recognising the need to develop the skills and capabilities of people from the UK.

The regional distribution of total projected replacement demand broadly reflects the population distribution of the UK, with 85 per cent located in England. However, replacement demands 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. In the five declining SOC major groups (administrative and secretarial, skilled trades, sales and customer service, process, plant and machine operatives and elementary occupations), replacement demand exceeds expansion demand in all nations and regions of the UK.

Table D.14: Replacement Demand by Occupation and region, 2012-2022

a) expansion demand (000s)										
Region	Occupational Group									
	1	2	3	4	5	6	7	8	9	all occs.
London	109	256	129	-94	-19	58	-11	-15	-12	401
South East	111	168	90	-90	-43	97	-13	-17	-7	297
East of England	65	106	60	-41	-26	68	-4	-13	0	214
South West	46	99	47	-43	-27	65	-7	-16	-8	156
West Midlands	44	86	46	-35	-36	61	-8	-22	-9	125
East Midlands	36	62	32	-28	-29	54	-3	-21	-3	100
Yorks & the Humber	39	78	39	-32	-32	58	-5	-26	-5	113
North West	47	101	49	-47	-32	75	0	-32	-4	157
North East	14	38	16	-15	-11	20	2	-11	-3	50
England	512	994	507	-426	-255	555	-49	-173	-51	1,613
Wales	20	46	18	-16	-13	25	-6	-13	-4	57
Scotland	41	107	47	-36	-31	55	-7	-24	-11	140
Northern Ireland	13	28	12	-8	-6	15	-2	-4	-2	44
United Kingdom	586	1,175	583	-486	-306	649	-65	-214	-68	1,855
b) replacement demand (000s)										
Region	Occupational Group									
	1	2	3	4	5	6	7	8	9	all occs.
London	252	525	355	203	131	135	121	78	163	1,964
South East	229	371	230	227	157	191	122	86	182	1,795
East of England	134	214	136	143	109	117	89	67	110	1,120
South West	118	211	121	131	118	130	87	57	107	1,080
West Midlands	101	182	114	146	110	124	73	77	107	1,034
East Midlands	94	147	91	107	89	110	70	66	91	866
Yorks & the Humber	103	174	105	141	100	113	79	70	100	985
North West	133	246	141	195	125	158	118	87	124	1,327
North East	40	87	46	61	46	49	44	30	46	450
England	1,204	2,157	1,339	1,353	985	1,129	804	618	1,030	10,620
Wales	46	107	53	68	63	63	42	36	53	531
Scotland	99	210	116	142	109	92	83	59	127	1,036
Northern Ireland	28	62	34	44	38	40	25	16	28	314
United Kingdom	1,378	2,536	1,541	1,607	1,195	1,324	953	730	1,237	12,501
c) overall requirement (000s)										
Region	Occupational Group									
	1	2	3	4	5	6	7	8	9	all occs.
London	361	781	484	109	112	194	110	63	151	2,365
South East	340	539	321	137	114	288	109	69	175	2,092
East of England	199	320	196	101	83	185	86	54	110	1,334
South West	165	310	167	88	91	195	80	42	98	1,236
West Midlands	144	269	160	111	74	185	65	54	98	1,159
East Midlands	130	209	123	79	60	164	67	46	88	966
Yorks & the Humber	142	252	144	109	68	171	74	43	95	1,098
North West	180	347	190	148	93	233	118	55	120	1,483
North East	54	125	62	46	35	69	46	19	44	499
England	1,715	3,151	1,846	928	731	1,684	755	445	979	12,233
Wales	66	153	71	52	49	89	36	23	48	588
Scotland	140	317	162	106	78	147	75	35	116	1,176
Northern Ireland	41	90	45	36	32	55	22	11	26	358
United Kingdom	1,963	3,711	2,124	1,121	889	1,974	889	515	1,169	14,356

Source: CE/IER estimates, CE projections MDM revision 12015, (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

D.8 Qualification Patterns within Countries and Regions of the UK

Producing Projections by Country and English Region

This section summarises the results of qualifications projections produced for each constituent country and English Regions 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.

Jobs are categorised based on the highest qualification held, classified using National Qualifications Framework (NQF) / Qualifications and Curriculum Framework (QCF categories). Qualification data for Scotland is converted to this framework. These results are described in more detail in Chapter 5 of the main report, in Annex A and in Bosworth (2013a, b and c).

Demand is proxied in the present results by those in employment, although it is recognised that observed employment levels are the consequence of both demand and supply influences.

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 D.15 and D.16 summarise the results for workplace/jobs, comparing all the nations and regions of the UK. The general pattern is of a reduction in the demand for lower level qualifications over the period 2012 to 2022 in all parts of the UK. The share of employment in lesser skilled occupations continues to be higher in the northern and western nations and regions of England than in the south and east of the UK.

Considerable growth in demand for higher level qualifications is projected, with 37.6 per cent of jobs requiring NQF 4 to 6 and 14.3 per cent requiring NQF 7 or 8 (postgraduate qualifications) by 2022. The demand for higher level qualifications is projected to be strongest in London, with 43.3 percent of jobs in London being held by individuals qualified at NQF 4 to 6 and a further 22.4 per cent at NQF 7 or 8. Scotland had a much higher than average demand for NQF 4 to 6 skills in 2012 and it is projected to have the highest share of employment at this qualification level in 2022, giving it a projected ranking of second with regard to overall higher qualified employment (levels 4-8). The demand for higher level qualifications was generally lower in the northern and western regions and nations of the UK in 2012, and this is projected to continue in 2022, although some of these regions are projected to increase their higher level qualifications at a slightly faster rate over the intervening period. The proportion of jobs in Wales held by the higher qualified (level 4 and above) is projected to exceed the UK average by 2022.

These patterns are in part determined by available supply in different parts of the country.

Table D.15: Projections of Qualifications by Region and Country - Employment (Workplace Jobs, 000s)

		QCF 0	QCF 1	QCF 2	QCF 3	QCF 4-6	QCF 7-8	total
UK	2012	1,868	4,225	6,582	6,226	9,936	3,089	31,926
	2022	1,129	3,234	6,216	5,665	12,691	4,846	33,781
% shares	2012	5.9	13.2	20.6	19.5	31.1	9.7	100.0
	2022	3.3	9.6	18.4	16.8	37.6	14.3	100.0
London	2012	277	624	774	672	1,861	791	5,000
	2022	181	477	662	535	2,338	1,207	5,401
% shares	2012	5.5	12.5	15.5	13.4	37.2	15.8	100.0
	2022	3.3	8.8	12.3	9.9	43.3	22.4	100.0
South East	2012	208	629	945	906	1,431	445	4,564
	2022	121	491	904	850	1,810	686	4,861
% shares	2012	4.6	13.8	20.7	19.9	31.4	9.7	100.0
	2022	2.5	10.1	18.6	17.5	37.2	14.1	100.0
East of England	2012	173	431	626	565	783	257	2,835
	2022	106	343	606	537	1,010	446	3,049
% shares	2012	6.1	15.2	22.1	19.9	27.6	9.1	100.0
	2022	3.5	11.3	19.9	17.6	33.1	14.6	100.0
South West	2012	111	383	611	594	810	231	2,741
	2022	56	288	594	574	1,010	373	2,896
% shares	2012	4.0	14.0	22.3	21.7	29.6	8.4	100.0
	2022	1.9	9.9	20.5	19.8	34.9	12.9	100.0
West Midlands	2012	191	375	601	541	748	200	2,656
	2022	111	291	585	505	974	315	2,781
% shares	2012	7.2	14.1	22.6	20.4	28.2	7.5	100.0
	2022	4.0	10.5	21.0	18.2	35.0	11.3	100.0
East Midlands	2012	135	326	496	484	630	157	2,229
	2022	74	254	483	454	826	238	2,329
% shares	2012	6.1	14.6	22.2	21.7	28.3	7.1	100.0
	2022	3.2	10.9	20.7	19.5	35.5	10.2	100.0
Yorkshire & the Humber	2012	140	369	580	530	694	218	2,531
	2022	77	285	578	486	875	343	2,644
% shares	2012	5.5	14.6	22.9	20.9	27.4	8.6	100.0
	2022	2.9	10.8	21.8	18.4	33.1	13.0	100.0
North West	2012	217	434	757	702	1,009	279	3,398
	2022	138	317	722	624	1,289	464	3,554
% shares	2012	6.4	12.8	22.3	20.7	29.7	8.2	100.0
	2022	3.9	8.9	20.3	17.6	36.3	13.1	100.0
North East	2012	63	146	276	255	326	95	1,161
	2022	33	102	268	237	413	157	1,210
% shares	2012	5.4	12.6	23.8	22.0	28.1	8.2	100.0
	2022	2.7	8.4	22.1	19.6	34.2	13.0	100.0
England	2012	1,514	3,718	5,666	5,250	8,293	2,673	27,113
	2022	898	2,848	5,401	4,802	10,546	4,230	28,726
% shares	2012	5.6	13.7	20.9	19.4	30.6	9.9	100.0
	2022	3.1	9.9	18.8	16.7	36.7	14.7	100.0
Wales	2012	89	162	293	266	422	131	1,362
	2022	52	115	263	241	546	203	1,420
% shares	2012	6.5	11.9	21.5	19.5	31.0	9.6	100.0
	2022	3.7	8.1	18.5	17.0	38.5	14.3	100.0
Scotland	2012	167	270	452	554	984	218	2,646
	2022	106	209	393	478	1,283	316	2,786
% shares	2012	6.3	10.2	17.1	21.0	37.2	8.3	100.0
	2022	3.8	7.5	14.1	17.2	46.0	11.3	100.0
Northern Ireland	2012	99	75	171	156	238	66	804
	2022	73	62	159	143	315	97	849
% shares	2012	12.3	9.4	21.2	19.4	29.6	8.2	100.0
	2022	8.6	7.3	18.7	16.9	37.1	11.4	100.0

Source: IER estimates based on LFS data, constrained to match Working Futures estimates. MDM revision 12015, (TablesforDocuments.xlsx).

Notes: Numbers will not match raw LFS data. They exclude HM Forces and therefore differ slightly from Table 5.7 in the main report.

Table D.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	2012	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	2022	100.0	100.0	100.0	100.0	100.0	100.0	100.0
London	2012	14.8	14.8	11.8	10.8	18.7	25.6	15.7
	2022	16.0	14.7	10.6	9.4	18.4	24.9	16.0
South East	2012	11.1	14.9	14.4	14.6	14.4	14.4	14.3
	2022	10.7	15.2	14.5	15.0	14.3	14.2	14.4
East of England	2012	9.2	10.2	9.5	9.1	7.9	8.3	8.9
	2022	9.4	10.6	9.7	9.5	8.0	9.2	9.0
South West	2012	5.9	9.1	9.3	9.5	8.2	7.5	8.6
	2022	5.0	8.9	9.6	10.1	8.0	7.7	8.6
West Midlands	2012	10.2	8.9	9.1	8.7	7.5	6.5	8.3
	2022	9.8	9.0	9.4	8.9	7.7	6.5	8.2
East Midlands	2012	7.2	7.7	7.5	7.8	6.3	5.1	7.0
	2022	4.0	6.0	7.3	7.3	8.3	7.7	7.3
Yorkshire & the Humber	2012	7.5	8.7	8.8	8.5	7.0	7.1	7.9
	2022	6.9	8.8	9.3	8.6	6.9	7.1	7.8
North West	2012	11.6	10.3	11.5	11.3	10.2	9.0	10.6
	2022	12.2	9.8	11.6	11.0	10.2	9.6	10.5
North East	2012	3.4	3.5	4.2	4.1	3.3	3.1	3.6
	2022	2.9	3.2	4.3	4.2	3.3	3.2	3.6
England	2012	81.0	88.0	86.1	84.3	83.5	86.5	84.9
	2022	79.5	88.1	86.9	84.8	83.1	87.3	85.0
Wales	2012	4.7	3.8	4.5	4.3	4.2	4.2	4.3
	2022	4.6	3.5	4.2	4.3	4.3	4.2	4.2
Scotland	2012	8.9	6.4	6.9	8.9	9.9	7.1	8.3
	2022	9.4	6.5	6.3	8.4	10.1	6.5	8.2
Northern Ireland	2012	5.3	1.8	2.6	2.5	2.4	2.1	2.5
	2022	6.5	1.9	2.6	2.5	2.5	2.0	2.5

Source: IER estimates based on LFS data, constrained to match Working Futures estimates. MDM revision 12015, (TablesforDocuments.xlsx).

Note: Numbers will not match raw LFS data.

Benchmark Employment Projections by Country and English Region

Table D.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 Chapters 3-5, except that they exclude HM forces. 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.[28]

The results are then repeated for each of the nations and regions of the UK 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 which in large part determine the numbers of jobs available for people with different levels of qualification. The employed workforce in London stands out as being rather better qualified at NQF levels 4+ than all other parts of the country (especially at NQF levels 7-8). Scotland is also above average in this respect, especially at NQF level 4-6. The South West and Northern Ireland have the highest proportions with no formal qualifications in 2012. 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 NQF levels 4+ and declines for those with no, or low (NQF level 1), qualifications. The position for those qualified at NQF levels 2 and 3 is more ambiguous, not least because the focus here is on **highest qualification held**. Although increasing numbers and proportions of people are acquiring formal qualifications at

[28] Expansion demands is somewhat of a misnomer since these can sometimes be negative when overall employment levels are falling.

NQF levels 2 and 3, many go on to obtain even higher qualifications. Hence, the number of people whose highest qualification held is at levels 2-3 is projected to decline.

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 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). The largest component of replacement demand in all regions and nations of the UK is for people qualified to NQF levels 4 to 6. However, there is replacement demand for all levels of qualification in all areas of the UK. Northern Ireland stands out as having has a particularly high share of replacement demand for people with no qualifications.

Table D.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region

United Kingdom

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	3,089	1,757	4,846	1,210	2,966
QCF 4-6	9,936	2,754	12,691	3,891	6,645
QCF 3	6,226	-560	5,665	2,438	1,877
QCF 2	6,582	-367	6,216	2,577	2,211
QCF 1	4,225	-990	3,234	1,654	664
No Qual	1,868	-739	1,129	731	-7
Total	31,926	1,855	33,781	12,501	14,356
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.7	56.9	14.3	9.7	96.0
QCF 4-6	31.1	27.7	37.6	31.1	66.9
QCF 3	19.5	-9.0	16.8	19.5	30.2
QCF 2	20.6	-5.6	18.4	20.6	33.6
QCF 1	13.2	-23.4	9.6	13.2	15.7
No Qual	5.9	-39.5	3.3	5.9	-0.4
Total	100.0	5.8	100.0	100.0	45.0

London

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	791	416	1,207	311	727
QCF 4-6	1,861	478	2,338	731	1,208
QCF 3	672	-137	535	264	127
QCF 2	774	-113	662	304	192
QCF 1	624	-147	477	245	98
No Qual	277	-96	181	109	13
Total	5,000	401	5,401	1,964	2,365
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	15.8	52.6	22.4	15.8	91.9
QCF 4-6	37.2	25.7	43.3	37.2	64.9
QCF 3	13.4	-20.4	9.9	13.4	18.9
QCF 2	15.5	-14.5	12.3	15.5	24.7
QCF 1	12.5	-23.6	8.8	12.5	15.7
No Qual	5.5	-34.7	3.3	5.5	4.6
Total	100.0	8.0	100.0	100.0	47.3

Source: IER estimates based on LFS data, constrained to match Working Futures estimates.MDM revision 12015, (Allxx.xls Table Q)

Notes: Numbers will not match raw LFS data.

Table D.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

South East

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	445	241	686	175	416
QCF 4-6	1,431	379	1,810	563	942
QCF 3	906	-56	850	356	300
QCF 2	945	-41	904	372	330
QCF 1	629	-138	491	247	109
No Qual	208	-87	121	82	-5
Total	4,564	297	4,861	1,795	2,092
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.7	54.2	14.1	9.7	93.5
QCF 4-6	31.4	26.5	37.2	31.4	65.8
QCF 3	19.9	-6.2	17.5	19.9	33.1
QCF 2	20.7	-4.4	18.6	20.7	35.0
QCF 1	13.8	-21.9	10.1	13.8	17.4
No Qual	4.6	-41.9	2.5	4.6	-2.5
Total	100.0	6.5	100.0	100.0	45.8

East of England

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	257	189	446	102	291
QCF 4-6	783	227	1,010	309	537
QCF 3	565	-28	537	223	195
QCF 2	626	-21	606	247	227
QCF 1	431	-88	343	170	83
No Qual	173	-66	106	68	2
Total	2,835	214	3,049	1,119	1,334
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.1	73.6	14.6	9.1	113.1
QCF 4-6	27.6	29.1	33.1	27.6	68.6
QCF 3	19.9	-5.0	17.6	19.9	34.5
QCF 2	22.1	-3.3	19.9	22.1	36.2
QCF 1	15.2	-20.3	11.3	15.2	19.2
No Qual	6.1	-38.4	3.5	6.1	1.1
Total	100.0	7.6	100.0	100.0	47.1

Source: IER estimates based on LFS data, constrained to match Working Futures estimates.MDM revision 12015, (Allxx.xls Table Q)

Notes: Numbers will not match raw LFS data.

Table D.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

South West

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	231	142	373	91	233
QCF 4-6	810	200	1,010	319	519
QCF 3	594	-20	574	234	214
QCF 2	611	-17	594	241	224
QCF 1	383	-95	288	151	56
No Qual	111	-55	56	44	-11
Total	2,741	156	2,896	1,080	1,236
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.4	61.5	12.9	8.4	100.9
QCF 4-6	29.6	24.7	34.9	29.6	64.1
QCF 3	21.7	-3.4	19.8	21.7	36.0
QCF 2	22.3	-2.7	20.5	22.3	36.7
QCF 1	14.0	-24.8	9.9	14.0	14.6
No Qual	4.0	-49.2	1.9	4.0	-9.8
Total	100.0	5.7	100.0	100.0	45.1

West Midlands

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	200	115	315	78	193
QCF 4-6	748	226	974	291	517
QCF 3	541	-36	505	211	175
QCF 2	601	-16	585	234	218
QCF 1	375	-84	291	146	62
No Qual	191	-80	111	74	-5
Total	2,656	125	2,781	1,035	1,160
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	7.5	57.3	11.3	7.5	96.3
QCF 4-6	28.2	30.2	35.0	28.2	69.1
QCF 3	20.4	-6.6	18.2	20.4	32.3
QCF 2	22.6	-2.7	21.0	22.6	36.2
QCF 1	14.1	-22.4	10.5	14.1	16.6
No Qual	7.2	-41.8	4.0	7.2	-2.8
Total	100.0	4.7	100.0	100.0	43.7

Source: IER estimates based on LFS data, constrained to match Working Futures estimates. MDM revision 12015, (Allxx.xls Table Q)

Notes: Numbers will not match raw LFS data.

Table D.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

East Midlands

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	157	80	238	61	142
QCF 4-6	630	196	826	245	441
QCF 3	484	-30	454	188	158
QCF 2	496	-13	483	193	180
QCF 1	326	-72	254	127	54
No Qual	135	-60	74	52	-8
Total	2,229	100	2,329	866	966
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	7.1	51.1	10.2	7.1	89.9
QCF 4-6	28.3	31.1	35.5	28.3	69.9
QCF 3	21.7	-6.2	19.5	21.7	32.6
QCF 2	22.2	-2.6	20.7	22.2	36.3
QCF 1	14.6	-22.2	10.9	14.6	16.7
No Qual	6.1	-44.8	3.2	6.1	-5.9
Total	100.0	4.5	100.0	100.0	43.4

Yorkshire & the Humber

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	218	125	343	85	210
QCF 4-6	694	181	875	270	451
QCF 3	530	-43	486	206	163
QCF 2	580	-2	578	226	223
QCF 1	369	-84	285	144	60
No Qual	140	-63	77	55	-8
Total	2,531	113	2,644	985	1,098
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.6	57.3	13.0	8.6	96.2
QCF 4-6	27.4	26.0	33.1	27.4	64.9
QCF 3	20.9	-8.2	18.4	20.9	30.7
QCF 2	22.9	-0.4	21.8	22.9	38.5
QCF 1	14.6	-22.7	10.8	14.6	16.2
No Qual	5.5	-44.8	2.9	5.5	-5.9
Total	100.0	4.5	100.0	100.0	43.4

Source: IER estimates based on LFS data, constrained to match Working Futures estimates.MDM revision 12015, (Allxx.xls Table Q)

Notes: Numbers will not match raw LFS data.

Table D.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

North West

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	279	186	464	109	294
QCF 4-6	1,009	280	1,289	394	674
QCF 3	702	-78	624	274	196
QCF 2	757	-35	722	295	261
QCF 1	434	-117	317	170	52
No Qual	217	-79	138	85	6
Total	3,398	157	3,554	1,327	1,483
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.2	66.6	13.1	8.2	105.7
QCF 4-6	29.7	27.7	36.3	29.7	66.8
QCF 3	20.7	-11.1	17.6	20.7	27.9
QCF 2	22.3	-4.6	20.3	22.3	34.5
QCF 1	12.8	-27.0	8.9	12.8	12.0
No Qual	6.4	-36.4	3.9	6.4	2.7
Total	100.0	4.6	100.0	100.0	43.7

North East

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	95	62	157	37	99
QCF 4-6	326	87	413	126	214
QCF 3	255	-18	237	99	81
QCF 2	276	-8	268	107	99
QCF 1	146	-44	102	57	13
No Qual	63	-30	33	24	-5
Total	1,161	50	1,210	450	499
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.2	65.4	13.0	8.2	104.1
QCF 4-6	28.1	26.8	34.2	28.1	65.6
QCF 3	22.0	-7.1	19.6	22.0	31.7
QCF 2	23.8	-3.0	22.1	23.8	35.7
QCF 1	12.6	-30.0	8.4	12.6	8.7
No Qual	5.4	-47.4	2.7	5.4	-8.6
Total	100.0	4.3	100.0	100.0	43.0

Source: IER estimates based on LFS data, constrained to match Working Futures estimates. MDM revision 12015, (Allxx.xls Table Q)

Notes: Numbers will not match raw LFS data.

Table D.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

England

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	2,673	1,556	4,230	1,047	2,603
QCF 4-6	8,293	2,254	10,546	3,248	5,502
QCF 3	5,250	-447	4,802	2,056	1,609
QCF 2	5,666	-265	5,401	2,219	1,954
QCF 1	3,718	-869	2,848	1,456	587
No Qual	1,514	-616	898	593	-23
Total	27,113	1,613	28,726	10,620	12,233
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.9	58.2	14.7	9.9	97.4
QCF 4-6	30.6	27.2	36.7	30.6	66.3
QCF 3	19.4	-8.5	16.7	19.4	30.7
QCF 2	20.9	-4.7	18.8	20.9	34.5
QCF 1	13.7	-23.4	9.9	13.7	15.8
No Qual	5.6	-40.7	3.1	5.6	-1.5
Total	100.0	5.9	100.0	100.0	45.1

Wales

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	131	72	203	51	123
QCF 4-6	422	124	546	164	289
QCF 3	266	-25	241	104	79
QCF 2	293	-30	263	114	84
QCF 1	162	-47	115	63	16
No Qual	89	-37	52	35	-2
Total	1,362	57	1,420	531	588
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	9.6	54.8	14.3	9.6	93.7
QCF 4-6	31.0	29.5	38.5	31.0	68.5
QCF 3	19.5	-9.4	17.0	19.5	29.6
QCF 2	21.5	-10.3	18.5	21.5	28.7
QCF 1	11.9	-29.1	8.1	11.9	9.8
No Qual	6.5	-41.5	3.7	6.5	-2.5
Total	100.0	4.2	100.0	100.0	43.2

Source: IER estimates based on LFS data, constrained to match Working Futures estimates.MDM revision 12015, (Allxx.xls Table Q)

Notes: Numbers will not match raw LFS data.

Table D.17: Projections of Workplace Employment (Jobs) and Replacement Demands by Country and Region (continued)

Scotland

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	218	98	316	86	183
QCF 4-6	984	299	1,283	385	684
QCF 3	554	-76	478	217	141
QCF 2	452	-60	393	177	118
QCF 1	270	-60	209	106	45
No Qual	167	-60	106	65	5
Total	2,646	140	2,786	1,036	1,176
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.3	44.7	11.3	8.3	83.9
QCF 4-6	37.2	30.4	46.0	37.2	69.5
QCF 3	21.0	-13.7	17.2	21.0	25.5
QCF 2	17.1	-13.2	14.1	17.1	26.0
QCF 1	10.2	-22.4	7.5	10.2	16.7
No Qual	6.3	-36.3	3.8	6.3	2.9
Total	100.0	5.3	100.0	100.0	44.5

Northern Ireland

Total QCF group	Base year level 2012	Change 2012 - 2022	Projected level 2022	Replacement Demand	Total requirement 2012 - 2022
QCF 7-8	66	31	97	26	56
QCF 4-6	238	77	315	93	170
QCF 3	156	-12	143	61	48
QCF 2	171	-12	159	67	55
QCF 1	75	-13	62	29	16
No Qual	99	-26	73	38	13
Total	804	44	849	314	358
	% share	**% change**	**% share**	**% share**	**% of base year level**
QCF 7-8	8.2	46.2	11.4	8.2	85.2
QCF 4-6	29.6	32.4	37.1	29.6	71.4
QCF 3	19.4	-7.9	16.9	19.4	31.1
QCF 2	21.2	-6.8	18.7	21.2	32.2
QCF 1	9.4	-17.7	7.3	9.4	21.3
No Qual	12.3	-26.1	8.6	12.3	12.9
Total	100.0	5.5	100.0	100.0	44.5

Source: IER estimates based on LFS data, constrained to match Working Futures estimates.MDM revision 12015, (Allxx.xls Table Q)

Notes: Numbers will not match raw LFS data.

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