



Working Futures 2004-2014
National Report

Working Futures 2004-2014:

NATIONAL REPORT

R. Wilson, K. Homenidou and A. Dickerson
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Institute for Employment Research, University of Warwick, Coventry CV4 7AL
tel: 024 765 23283 fax: 024 765 24241 E-mail r.a.wilson@warwick.ac.uk

Preface and acknowledgements

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The projections are presented at a variety of different sectoral levels using two main types of definition:

- **broad sectoral definitions** based on groups of 6, 14 or 27 sectors, and defined by Standard Industrial Classification (SIC) codes. These preserve the traditional manufacturing, services and public sector groupings of the economy. They are hierarchically related, with the 6 broadest sectors being a more aggregated grouping of the 14 industries, and so on. The 14 and 27 groups have been adopted by the SSDA in their Sector Skills Matrix database and hence are referred to as the Sector Matrix Industries (SMI). These are not coterminous with the SSCs' footprints; and
- **Sector Skills Councils definitions** which employ SIC code groupings that most closely match the SSC footprints. These definitions are a 'best fit' of each SSC's core business sectors. These specify the *core* SIC codes that are undisputed and do not overlap with any other SSC. The extent to which this is an exact fit varies between SSCs. In some cases, the use of the core SIC codes excludes elements of the SSC footprint because they are included in other areas. SSCs can provide further depth analysis of skills and future employment within their sector (see their individual websites for details).

The results should be regarded as indicative of likely trends given a continuation of past patterns of behaviour and performance, rather than precise forecasts of what will inevitably happen. They should be regarded as a robust benchmark for debate and used in conjunction with a variety of other sources of LMI. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the SSDA, the LSC, DfES, RDAs nor individual SSCs.

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Summary

BACKGROUND

This document is the first of three volumes that present *Working Futures 2004-2014*. Together they represent the most detailed and comprehensive set of employment projections ever published for the UK. It focuses upon the future patterns of demand for skills as measured by occupation. This first volume focuses on the *National* (UK) picture. Other volumes deal with sectoral and spatial dimensions in greater detail. A separate technical report provides details of sources and methods.

The results are intended to provide a sound statistical foundation for the deliberations of all those with an interest in the supply of and demand for skills, including individuals, employers, education and training providers as well as the various agencies and departments of government. The latter include the Treasury, the Department for Education and Skills (DfES), the Sector Skills Councils (SSCs), Regional Development Agencies (RDAs) and Local Learning and Skills Councils (LLSCs), as well as the report's main sponsors the SSDA and LSC.

The projections are the latest in a long series, previously funded by DfES as well as the SSDA (*Working Futures 2002-2012*). The results are based on the use of a *multi-sectoral, regional macroeconomic model*, combined with *occupational, replacement demand* and *qualification* modules. The main projection period covered is *2004 to 2014*.

Because of the interest of the SSDA and the Sector Skills Councils (SSCs) in detailed sectoral prospects and the concern of the local arms of the LSC (LLSCs) with developments at a local level, a very detailed analysis is required. The present set of projections are the most detailed and extensive ever produced for the UK. Well over half a million time series have been consistently estimated and projected for employment alone.

The results take account of new data from the Census of Population 2001 and other sources including the Annual Business Inquiry 2003 and the Labour Force Survey (2004). Together these suggest a number of new features in the changing pattern of occupational employment in the British economy.

The present document provides an overview and summary for the UK. It also presents results for the SSDA Sector Matrix Industries (SMIs). This is complemented by a separate *Sectoral Report* which presents results specifically focused on the newly formed SSCs. This analysis provides for the first time a consistent set of results for these categories. These results can be used in conjunction with employment forecasts developed by the SSCs (details of how to find SSC forecasts are available in Annex C).

Finally there is a separate *Technical Report* that describes in some detail the data sources and methods used to generate all the results. As well as the innovations already mentioned this also covers the treatment of labour supply which is an addition to what was included in *Working Futures 2002-2012*.

MACROECONOMIC CONTEXT

Economic activity

Despite continuing uncertainties in the world economy and growing competitive pressures especially from the Far East, the prospects for the UK economy at a macro level are expected to remain sound. Although a slight downturn is expected in the short to medium term the scenario underlying the employment projections is expected to settle down to a pattern of modest growth, with only moderate rates of inflation. Measures of economic output such as *Gross Domestic Product (GDP)* and *Gross Value Added (GVA)* are projected to display long-term growth rates of just below 2½ per cent per annum.

Inflation, the sterling exchange rate and public expenditure

Continued low inflation among the major OECD countries is expected. A small depreciation for sterling against the euro and the US dollar is assumed. The outlook for domestic inflation is one of modest rates of increase in prices and wages. The projections are based on an assumption of slight slow down in the rate of growth of public current expenditure. Capital spending is projected to see a more rapid deceleration. The government is expected to be able to achieve this without any major increases in public borrowing.

General labour market prospects

A generally optimistic picture emerges for the labour market:

- employment is expected to continue to rise. The long-term rate of employment growth (jobs) is expected to be just under ½ a per cent per annum, resulting in over 1.3 million additional jobs over the decade;
- the majority of the additional jobs are expected to be taken by *women*; although males are now expected to take up an increasing share of employment in many parts of the economy previously dominated by female employment;
- the *working age population* and the *workforce* are expected to undergo significant growth. Labour market participation rates are defined as those economically active (i.e. those in employment or actively searching for work) expressed as a percentage of the population aged 16+. Overall labour market participation rates are projected to fall slightly. This reflects declining trends for males offset by some increases amongst females.
- the level of *claimant unemployment* is expected to remain stable, rising slightly and then falling back. The new results also present estimates of unemployment on an ILO basis (i.e. those actively searching for work). On this basis the unemployment rate is

around twice as high as the claimant measure but flowing a similar profile overtime to reach around 5 per cent by 2014. For most people unemployment will be a transitory experience, although a minority will continue to suffer long duration unemployment.

SECTORAL PROSPECTS

Projections of output by sector

The prospects for broad sectors to 2014 are as follows:

- *PRIMARY & UTILITIES* is projected to see only modest output growth. This obscures sharp declines expected for *mining & quarrying* offset by better prospects for *electricity, gas & water*, and in *Agriculture, etc.*;
- *MANUFACTURING* output growth is forecast to average just below 2 per cent per annum. There is faster growth in some technology and R&D-related industries such as parts of chemicals and engineering, but other sectors such as textiles, clothing and metals & metal goods, etc are expected to perform much less strongly, reflecting continuing intense international competition.
- *CONSTRUCTION* is also expected to show only modest growth, with average rates around 1 ½ per cent per annum.
- *DISTRIBUTION, TRANSPORT, ETC.* includes a diverse range of industries. *Transport & communications* output is forecast to grow by around 3½ per cent per annum, with communications displaying the strongest growth of any services apart from *computing services*. Output in *distribution, retailing*, and *hotels & restaurants* is forecast to grow by around 2 per cent per annum.
- *BUSINESS & OTHER SERVICES: Business services* (which includes *computing services*) are expected to grow by around 4 per cent per annum over the longer term but *financial services* are projected to grow at less than half this rate. *Other services* are also expected to see similar, slower, rates of growth in output.

- *NON-MARKETED SERVICES* comprise public administration and defence, as well as health and education services. Output in *Public admin & defence* is projected to increase by about 2 per cent per annum. *Education* services and *Health & social work* are also expected to see quite rapid growth at around 2 and 3 per cent per annum respectively.

Sectoral employment prospects

Employment prospects to 2014 depend upon the demand for the goods and services produced in the different sectors. It also depends on how rapidly productivity rises in each broad sector.

- In the *primary & utilities* sector (which includes *agriculture, etc* and *mining & quarrying; electricity, gas & water*) is expected to continue to experience significant job losses in the next decade of around 1 ½ - 2 per cent per annum (just under 100 thousand jobs in total);
- Long-term decline in employment in *manufacturing* is expected to continue, with a loss of just under 400 thousand jobs between 2004 and 2014 (around 1 per cent per annum). *Textiles & clothing* displays the largest job losses, losing around 75 thousand jobs but there are significant declines in many other sectors as well;
- *Construction* is projected to experience a slight fall in the total level of employment of just under 100 thousand between 2004 and 2014 (just under ½ a per cent per annum);
- Employment in *distribution, transport* etc, is expected to increase by around 500 thousand jobs between 2004 and 2014 (½ a per cent per annum) - with most of the growth accounted for by jobs in *distribution* and *retailing*;
- Employment in *business & other services* is forecast to increase by just under a million by 2014 (1.2 per cent per annum), with *other business services* (which includes *computing services*) showing the fastest growth;
- Employment in *non-marketed services*, is expected to increase by around 400 thousand between 2004 and 2014

(around a ½ per cent per annum). Within this broad grouping most of the projected employment growth is accounted for by *education* and *health & social work*; while *public administration & defence* are forecast to see a slight fall in employment.

CHANGES IN OCCUPATIONAL STRUCTURE

New Occupational Projections to 2014

The results take full account of information on changing patterns of occupational employment structure from the Census of Population 2001 as well as the latest LFS data.

The results suggest some significant changes in likely prospects for the next ten years. The main differences compared to the previous projections are as follows.

Compared with *Working Futures 2002-2012*, faster growth is now indicated for:

- managers, some professional and many associate professional occupations;
- protective service occupations and culture /media/ sports occupations;
- caring personal service and customer service occupations.

More rapid declines than previously measured in *Working Futures 2002-2012* have been observed for:

- administrative, clerical & secretarial occupations;
- skilled manual & electrical trades;
- other skilled trades.

It is also worth noting that a much slower pace of change in occupational employment structure is expected overall than has been the case over the previous decade.

The groups that are expected to show significant increases in employment over the next decade (2004-2014) are higher level occupations such as:

- managers & senior officials (+617 thousand, 1.3 per cent per annum);
- professional occupations (+697 thousand, 1.8 per cent per annum);
- associate professional & technical occupations (+238 thousand, 1 per cent per annum);

Sales & customer service occupations and personal service occupations are the other main beneficiaries of employment growth, (with projected increases of 424 (1.7 per cent per annum) and 375 thousand (1.5 per cent per annum) respectively) .

Administrative, clerical & secretarial occupations are expected to see further job losses of around 164 thousand jobs (-0.9 per cent per annum), although this category will continue to employ over 3½ million people.

Declining employment levels are projected for:

- skilled trades occupations (-150 thousand, -0.4 per cent per annum);
- machine & transport operatives (some -118 thousand, -0.5 per cent per annum); and especially
- elementary occupations (-675 thousand, -2.2 per cent per annum).

Amongst these declining groups, it is the elementary occupations which are expected to see by far the largest absolute reduction in numbers.

In general these patterns are similar to those in *Working Futures 2002-2012*.

Replacement Demand

These projections focus on the net growth (or decline) in occupational employment. Such estimates provide a useful indication of likely 'gainers' and 'losers' from employment change. This has traditionally been referred to as *expansion demand*, although for some occupations it can be negative.

However, employers will often need to replace those workers who leave - due to mortality, retirement, career moves, or related reasons. Such *replacement demand* can easily outweigh any losses resulting from structural changes.

For all occupations together, replacement demand is about 8 times larger than the net changes projected between 2004 and 2014. Over the decade there is expected to be a net requirement of about 12 million job openings. Retirements are the principal component in this estimate. This excludes job openings created by people transferring from one occupation to another (some of which will be filled by similar means) or other outflows.

Two broad groups of occupations with different patterns of expansion and replacement demand are identifiable. For some groups, positive replacement demand outweighs negative expansion demand. This applies, for example, to managers & proprietors in agriculture & service industries; administrative, clerical, secretarial & related occupations; skilled metal & electrical trades; process, plant and machine operatives; and elementary clerical occupations.

For many others, expected retirements will add to positive expansion demand to create even higher net requirements for new entrants. This applies, for example, to corporate managers; teaching & research professionals; health & social welfare associate professionals; business & public service associate professionals; caring personal services; and sales occupations.

1. Introduction

Key Messages

- This document presents ***Working Futures 2004-2014***, the second in a series of detailed and comprehensive employment projections, covering the whole of the UK, for the period from 2004 to 2014.
- These take into account the latest data from various official sources including the 2001 Census, the Labour Force Survey and the Annual Business Inquiry.
- The results now cover Sector Skills Councils (SSCs), as well as the broad SSDA Sector Skills Matrix Industries (SMIs), using 6, 14 and 27 industry groupings.
- This is the first of four volumes. It presents an overview of the UK picture and some detailed sectoral analyses by the SSDA SMIs.
- There are three companion volumes. The *Spatial Report* covers the individual countries and regions of the UK. The *Sectoral Report* presents detailed results for the SSCs. Finally, a *Technical Report* provides details of sources and methods used to produce the projections.

1.1 Background

This document is the first of four volumes that present ***Working Futures 2004-2014***. The latter is the second in a series of new projections of detailed employment. It covers the period from 2004 to 2014. It focuses upon employment by occupation, sector, and the regions and countries within the UK. The new set of forecasts updates the *Working Futures* work conducted in 2003.¹ It was commissioned by the Sector Skills Development Agency (SSDA) to provide a sound statistical foundation for the deliberations of a number of its key partners across the skills arena about the future demand for skills. These partners include the Sector Skills Councils (SSCs), the Learning and Skills Council (LSC) and its local arms (the Local Learning and Skills Councils (LLSCs)), The Department for Education and Skills (DfES), the Treasury, Regional Development Agencies (RDAs), as well as partners across the UK such as the Scottish Executive, Welsh Assembly Government and the Department for Employment and Lifelong Learning in Northern Ireland.

Working Futures provides the most comprehensive picture available for the UK about future patterns of demand for skills, focusing on occupations. This first volume focuses on the *National* (UK) picture. It provides an overview and summary for the UK. It also presents detailed results for the 27 broad SSDA Sector Matrix Industries (SMIs) in Chapter 6.

Analyses for each of the areas covered by the 9 English Regional Development Agencies (henceforth RDAs) and the other constituent countries within the UK are presented in a separate *Spatial Report*.²

This is complemented by a separate *Sectoral Report*. This presents results customised more closely to the newly formed SSCs.³ These represent a 'best fit' of each SSC's core business sectors.⁴

Finally, a detailed account of sources and methods is provided in the *Technical Report*.⁵

¹ See Wilson *et al.* (2004a and b). These results are henceforth referred to as *Working Futures 2002-2012*.

² Green, *et al.* (2006).

³ Dickerson *et al.* (2006)

⁴ For a more detailed discussion of the SSC footprint definitions please consult Annex A.

⁵ Wilson *et al.* (2006)

1.2 Rationale

There is on-going concern amongst those in Government working in the skills policy arena, to ensure that the UK has the appropriate skills base, now and in the future, to sustain economic growth and compete internationally. This means keeping abreast of changes in the economy and considering their implications for future skills demand and skills provision. Such information is of interest not just for policy makers but for all those having to make decisions about education and training, including individuals making careers choices, as well as education and training providers.

Nobody can predict the future with certainty. Most people can and do make plans and in doing so adopt assumptions about what the future might be like. The rationale behind *Working Futures* is that there are advantages in examining future skills demand using a single, multi-sectoral, economy-wide model, rather than relying on organisations and individuals to develop their own views independently. These advantages include the fact that this approach can provide a comprehensive, methodical, consistent and transparent set of results. It also benefits from economies of scale

The approach is based on the use of an input-output model, which means that the relationships between different parts of the economy are taken into account. The present results provide a consistent and systematic benchmark view for on-going debate and policy deliberations and the planning of future skills provision. They reflect, in a manner which more partial approaches cannot, how individual sector developments “fit together” into an overall economy wide picture.

The approach also includes analysis to consider changes in occupational employment and replacement demand. The latter takes into account those who leave employment due to retirement and the like, as well as the growth and decline in sectors. Different partners can use these results to form the basis of their

deliberations and agree what are the most appropriate policy actions.

This is not to say that the view developed here is the only one possible. Indeed, individual partners will still often find it useful to develop their own tailored forecasts, as several of the SSCs have done.⁶ The value of the *Working Futures* forecasts is that they provide a common economy wide basis and starting point for understanding skill needs and allow comparisons across sectors. This is based on a transparent, specific set of macroeconomic assumptions and economic relationships, affecting the whole economy and its structure. As such, the analysis is grounded in an understanding of the key drivers impinging upon the economy. It serves to act as an objective economy-wide, explanatory tool to facilitate the examination of the changing pattern of skills demand.

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, if past patterns of behaviour and performance are continued. It is not intended to be prescriptive. Particular sectors and groups may prefer alternative scenarios. However, the *Working Futures* results raise questions about what needs to be done to achieve such alternative scenarios. This is a fundamental objective of developing the projections presented here.

The results presented here should be regarded as indicative of general trends and orders of magnitude, given the assumptions set out below, rather than precise forecasts of what will necessarily

⁶ See for example the individual sector forecasts developed by Construction Skills, e-skills UK and SEMTA. Details of how to obtain these are included in Annex C.

happen.⁷ They are not intended to be prescriptive. Rather they indicate the most likely future, given a continuation of past patterns of behaviour and performance. If policies and patterns of behaviour are changed then alternative futures might be achieved. The present results are intended to provide a consistent and systematic benchmark view that can form the basis for an ongoing debate.

The focus on industrial and spatial detail pushes the available data to the limits for which it was originally collected.⁸ The results provide a useful benchmark for debate and policy deliberations about underlying employment trends. However they should not be regarded as more precise than the general statements in the text. Many years of international research have demonstrated that indicative manpower planning is not a practicable proposition.

It is important to appreciate that the purpose of the projections is not to make precise forecasts of employment **levels**. Rather, the aim is to provide policy analysts and other labour market participants with useful information about the general nature of **changing employment patterns** and their implications for skill requirements.

Such results can be both informative and thought provoking. However, it must be emphasised that, for a variety of reasons, the detailed projections, especially those at a local level, should not be regarded as inevitable fact. Rather they map out one possible future based on an extrapolation of past trends and patterns of behaviour. They should be seen as a starting point for debate rather than the end of the story. They should be used in conjunction with a variety of other sources of LMI.

⁷ See Wilson and Briscoe (2002) for further discussion.

⁸ For further details of the sources and methods used and the limitations of the data and estimates, see the *Technical Report* (Wilson *et al.*, 2006b).

The views expressed in this report are those of the authors. They do not necessarily reflect the views of the SSDA, the LSC, DfES, RDAs nor the individual SSCs.

1.3 General Approach

The demand for labour is a derived demand. It depends critically on developments in the markets for goods and services and the technologies used to produce them. Therefore, in order to assess the prospects for the changing pattern of demand for skills, it is essential to ground the analysis on a foundation and understanding of the key economic factors influencing the economy and its structure. To do this a multisectoral macroeconomic model is required.⁹

The projections are based on the use of the Cambridge Econometrics (CE) multi-sectoral, regional macroeconomic model (RMDM), which provides the general economic scenario. This is described in Chapter 2. This information is combined with occupational employment and replacement demand models developed by the Institute for Employment Research (IER) to generate the occupational projections.

RMDM solves as a single system in which macroeconomic results are built up from the more detailed results at sectoral and regional level.¹⁰ The long-term growth rate for the economy therefore reflects the expected performance of individual industries. This includes their rates of productivity growth and the demands for their output (including their international

⁹ This is regarded as standard practice in developing employment scenarios across the world. For further discussion see Wilson *et al.* (2004c), Wilson and Briscoe (2002) and Wilson (1994).

¹⁰ A comprehensive account of an earlier version of the model is given in Barker and Peterson (1987). This book, along with a series of updates in CE's *Industry and the British Economy*, remains the main reference on the workings of the CE macro-economic model. A full description of the current approach to developing the employment projections can be found in Wilson *et al.* (2006b).

trade performance).¹¹ The model is a combination of orthodox time-series econometric relationships and cross-sectional input-output relationships. Aggregate demand is modelled in a Keynesian manner, with a consumption function and investment equations. However the model also includes equations for average earnings by industry and region. Other aspects of the supply side come in through the export and import equations, in which capacity utilisation affects trade performance. The detailed set of industry employment equations allow relative wages 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 changes, that have been a feature 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. General industrial prospects are analysed in Chapter 3. Further information about the models is given in Annex A and, in more detail, in a separate *Technical Report*.¹²

In order to meet the needs of the SSDA and SSCs (as well as the LSC and its local arms), the present analysis is at a much more detailed level than hitherto. The equations within RMDM operate at the level of some 41 industries, which are defined by reference to the availability of data on input output flows. In order to generate results at a more detailed industry level, distinguishing some 67, 2 digit, SIC92 industries, a slightly different

approach is required, since many of the data required to estimate RMDM are not available. Details are given in Annex A and the accompanying *Technical Report*.¹³

At the industry level, all the two-digit categories of the 1992/2003 Standard Industrial Classification (SIC2003) have been distinguished, as well as some other, more detailed categories, resulting in 67 industries in total. In addition, results have been developed at an individual LLSC level. This results in the most detailed and extensive set of employment projections ever produced for the UK.

1.4 Occupational Employment Projections and Replacement Demands

The present report provides detailed projections of industrial and **occupational employment levels**. The occupational model is built around a series of employment matrices distinguishing 67 industries (SIC92/2003) and 25 sub-major occupational groups from the SOC 2000 occupational classification. Details of the methods used to generate these projections are given below. Further technical information on sources and methods can be found in the supporting annexes and in the separate *Technical Report*.¹⁴

The occupational projections are developed using largely extrapolative methods, based on data from the Census of Population and the Labour Force Survey (LFS). The occupational results are summarised in Chapter 4.

Changes in occupational employment levels between years are also analysed to show changes due to **replacement demand**. This takes into account the need to replace those who leave their jobs because of retirement or other reasons. These replacement demands need to be added to any structural change (or so

¹¹ This contrasts with a 'top down' approach, in which the long-term rate of growth in UK Gross Domestic Product (GDP) is made as an **assumption**, which then drives projections for sectoral output and employment growth, which in turn drive projections for regional performance.

¹² Wilson *et al.* (2006b).

¹³ Wilson *et al.* (2006b).

¹⁴ Wilson *et al.* (2006b).

called **expansion demand** or decline) that is projected, in order to obtain an estimate of the overall recruitment requirement. These estimates are based on quite limited data on age structures and flow rates from the LFS. They should again be regarded as indicative rather than precise indications of the likely scale of replacement demands. These results are presented in Chapter 5. The key message here is that replacement demands are likely to be much more significant in terms of education and training requirements than expansion demand, even where the latter is quite large.

1.5 Data Sources and Methods

The results incorporate the latest sectoral employment data from ONS, including the 2003 Annual Business Inquiry. They also

take account of information from the 2001 Census and subsequent revisions to the LFS (2004). These new data provide insights into recent trends in sectoral employment as well as other aspects of employment structure such as the gender status mix of employment and changing occupational shares.

These results reflect a number of new features:

- higher than previously estimated historical levels of employment;
- faster increases in the male share of employment than previously estimated;
- revised assessments of the prospects for many occupational categories in the light of the latest Census data.

Further information about sources and methods is presented in Annex A of the present document and in greater detail in the separate *Technical Report*.¹⁵

¹⁵ For further discussion see the *Technical Report* (Wilson *et al.*, 2006b).

2. Macroeconomic and General Labour Market Context

Key Messages

- Macroeconomic prospects generally remain optimistic. While there are some concerns about both the world economy and domestic demand, from both the private and public sectors, the medium term outlook remains strong.
- Official historical estimates of employment have been revised upwards quite significantly. These revisions are reflected in the new *Working Futures* database.
- The new *Working Futures* projections for the next decade are broadly similar to those presented in *Working Futures 2002-2012*. They suggest an increase in employment of around 1.3 million between 2004 and 2014.
- Patterns of change at the sectoral level are broadly similar to those in *Working Futures 2002-2012*, with continued employment decline in primary and manufacturing industries, offset by strong growth in services.
- In contrast to the previous set of projections, male full-time employment is now expected to increase over the next decade, reflecting recent trends which have shown a reversal of previous declines.
- The main uncertainties in the macroeconomic forecast relate to: the housing market (and related effects on the confidence of domestic consumers); the impact of high oil prices on worldwide levels of economic activity; and the impact of exchange rates (especially the strong pound) on trade performance.

2.1 Introduction

The macroeconomic prospects for the UK economy provide the context for the more detailed forecasts of employment by occupation that are the prime focus of attention. These include views about the fortunes of individual sectors, taking into account changing patterns of demand and international competition.

Section 2.2 begins with a brief overview of the key exogenous assumptions underlying the projections. The current situation is assessed in Section 2.3, drawing out general macroeconomic prospects for the UK over the next 5-10 years. The prospects for the labour market are then briefly summarised in Section 2.4. The sensitivity of the results to certain key assumptions is discussed in Section 2.5. Finally, Section 2.6 concludes with a brief comparison with previous forecasts.

2.2 Exogenous Assumptions

The main exogenous variables in the CE macroeconomic model are:

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

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

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

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

2.3 Macroeconomic Context

World Economy and Exchange Rates

Growth in the US slowed towards the end of 2004, due in part to an acceleration in imports of goods and a deceleration in personal consumption. Interest rates rose in 2004, but the scale of the external financial liabilities of the US led to a further weakening of the dollar. A combination of further interest rate rises and cutbacks in government spending is likely to depress growth in 2005, although the position is still strong, as consumer sentiment remains bullish, unemployment continues to fall and production indices across all types of activity show robust growth, particularly for investment goods.

Table 2.1: Macroeconomic Indicators for the UK

	Historical Trends		Recent Trends		Projections		
	1994-99	1999-2004	2001-2002	2002-03	2003-04	2004-09	2009-14
GDP at market prices (% p.a.)	3	2.5	1.8	2.2	3.1	2.3	2.4
GVA at basic prices (% p.a.)	3	2.5	1.5	1.9	3.1	2.2	2.3
exl. Extra-Regio (% p.a.)	2.9	2.7	1.5	2.1	3.2	2.4	2.3
Manufacturing output (% p.a.)	0.8	-0.4	-3.8	0.3	1.1	1.7	1.5
Household expenditure (% p.a.)	3.4	3.2	3.3	2.3	3.1	2.3	2.5
Employment (jobs, millions)	28.9	30.3	29.8	30.1	30.3	30.9	31.6
Unemployment (claimants, millions)	1.2	0.9	0.9	0.9	0.9	1.1	1.1
RPIX Inflation (% p.a.)	2.7	2.2	2.2	2.8	2	2.2	2.3
BP/GDP (%)	-2.7	-2.3	-1.7	-1.9	-2.3	-1.9	-1.6
PSNCR/GDP (%)	-0.1	3.2	1.8	3.6	3.2	1.7	1.8

Source: CE/IER estimates; CE projections MDM C51F8A Macrotables.xls, (Table 2.1).

Notes:

(a) GDP = Gross Domestic Product

(b) GVA = Gross Value Added

(c) RPIX = Retail price index excluding mortgage interest payments

(d) The balance of payments (BP) and the public sector net cash requirements (PSNCR) are expressed as a percentage of GDP at current prices

(e) Employment, unemployment, RPIX, BP/GDP and PSNCR/GDP refer to the last year of the period concerned.

(f) Employment is total workplace employment (jobs) and includes HM Forces.

(g) Unemployment is the claimant measure. Some other tables use an ILO definition.

In Japan, growth has been mainly driven by manufacturing and trade, and the slowing of growth in the US, and to a lesser extent, China, is already affecting the prospects for 2005. Although growth in household expenditure accelerated in 2004, retail sales weakened towards the end of the year as the general view is that company profits, rather than employee wages, were the main beneficiaries. The present slowdown is similar to past experience, but a return to the near-zero growth of 2001-02 seems unlikely. With prices continuing to fall, interest rates remain ineffective as a policy tool.

Hopes of a recovery in the euro-zone, after external demand helped pull Germany and other key economies out of recession, have been dented after German output fell in the last quarter of 2004. The slowdown in the US and Japanese economies, the continued strength of the euro against the dollar, and the prospect of interest rate rises, put any recovery at risk. Domestic demand in the euro-zone remains weak as poor employment growth and high unemployment continue to undermine consumer confidence. Forecasters' expectations of growth in the major economies were generally revised downwards throughout 2004.

Overall, world growth is forecast to slow a little in 2005 led by the slowdown in the US. The US is expected to grow by 3¼ per cent and growth in Japan is expected to weaken to 2 per cent as a result of this and the slowdown in China. Growth in Germany and Italy is expected to weaken in 2005, but collectively, the original 15 EU countries are expected to experience faster growth than in 2004. The ten countries that joined the EU in 2004 are expected to see slightly slower growth. Beyond 2005 the world economy is assumed to settle down to a steady rate of growth of just under 3 per cent per annum.

Input prices for the manufacturing industry rose throughout 2004 and by January 2005 input price inflation stood at 7.2 per cent (excluding food, drink, tobacco and

petroleum). Oil prices, as well as fuel and imported metal prices, were the main contributors to the annual rise in input prices: each component rose by around 15 per cent in the year to December. Manufacturing output prices accelerated in the middle of 2004 but slipped back in the last quarter as oil prices fell; by January 2005 output price inflation was running at 2½ per cent. The upward pressure on output prices is likely to be sustained in the first half of 2005, as producers' profit margins are squeezed as payments on long-term contracts fail to cover the cost of oil and steel price rises.

World inflation rates are expected to pick up slightly compared to the past decade but to remain moderate at around 2 per cent per annum, although some commodity prices such as oil will see much faster growth.

The euro's appreciation against the dollar and sterling in 2004 continues to shift the balance of competitiveness away from euro-zone producers. Since the end of 2004 sterling has experienced a modest depreciation as it followed a middle path between the euro and the dollar. Like the dollar, sterling has depreciated against the euro despite the increase in the gap between UK and euro-zone short-term interest rates and the likelihood that this gap will increase further. The effective exchange rate for the £ sterling is expected to depreciate gradually from its recent high levels (by around 5 per cent against basket of all currencies between 2004 and 2014).

Export growth was held back by weak euro-zone demand and the weak dollar in 2004 but it picked up towards the end of 2004, driven by stronger demand from the euro-zone and a weaker pound. Import growth outpaced export growth in 2004 but slowed in the second half of 2004 as a result of weaker household spending and business investment. Despite this improvement in trade towards the end of 2004, it is estimated that net trade curbed GDP growth by almost 1 percentage point. The recent depreciation of sterling against the euro, the sustained (albeit

modest) growth in the euro-zone and the robust growth of the US economy expected in 2005 will help support UK export volumes in the short term. Over the longer term, much will depend upon UK companies' ability to compete with the increasing pressure from the Far East. On balance the present set of projections assumes that the UK manages to hold its current position, but with increasing exposure to international trade. Both exports and imports are forecast to grow by 6-6¼ per cent in real terms in 2005.

Domestic Spending and Inflation

In the UK, the continued growth of household spending and a recovery in business investment bolstered GDP growth in the first half of 2004. However, growth weakened and faltered in the second half of 2004 as interest rate and oil price rises began to have an effect. Export growth picked up in 2004 but there was no improvement in trade performance, due in part to the loss of competitiveness that resulted from the weak dollar, and the lack of demand from the euro-zone. GDP growth is forecast to slow in 2005 as household and government expenditure growth moderate.

The rate of growth in Government expenditure is assumed to slow over the next decade, averaging around 2-3 per cent for current expenditure over the longer term. Expenditure on Health and Education is projected to rise at 3-4 per cent per annum, while Defence sees a freeze in real terms. The pace of growth of government capital expenditure is projected to slow sharply following rapid growth over the past five years, although some continued growth at around 1-2 per cent per annum is assumed.

In the short to medium term, the issue of whether the chancellor, Gordon Brown, and the Treasury will break the 'Golden Rule' will attract attention. The general election in May 2005 was preceded by levels of government spending that now appear to have been excessive and which may force the Chancellor to borrow more than expected. Consequently, in order to

fund this shortfall and help the chancellor meet his 'Golden Rule', many commentators expect that taxes may need to rise. However the projections are based on the assumption that no major changes will be made in the main tax rates (VAT, Standard rate of Income tax, Corporation tax rate and NIC rates).

The housing market is now showing signs of having peaked, but consumer borrowing remains high and the labour market is relatively tight. The Bank of England may be under pressure to cut interest rates in 2006, as evidence of slower economic activity emerges. However, over the medium term, interest rates are assumed to remain unchanged.

Inflation, as measured by the Consumer Price Index (CPI), picked up towards the end of 2004, notably in November, as the impact of the higher oil price fed through to household energy bills and also to air fares. At the start of 2005, CPI inflation was just under 2 per cent per annum.

Although the headline measure of average earnings inflation suggests that pressure from labour costs has weakened, as the rate has fallen from the high rates seen at the beginning of 2004, this weakening entirely reflects the impact of bonus payments on the calculation; excluding bonuses, average earnings inflation has picked up a little since the beginning of 2004 (from about 3½ per cent in January to 4½ per cent in December). The main driver of earnings growth has been the public sector where pay excluding bonuses rose by 4.7 per cent in the year to December 2004; private sector earnings inflation remained unchanged through most of the second half of 2004 at 4¼ per cent. Another factor that contributed to the acceleration of average earnings at the end of 2004 was the 7¾ per cent increase in the minimum wage which took effect in October 2004. There is little sign yet that wage inflation will accelerate much further and, on the assumption that the crude oil price has peaked, the boost to inflation is likely to be a temporary effect. Over the longer term,

inflationary wage pressures are assumed to remain subdued

Household spending remained robust in 2004, supported by a strong housing market in the first half of 2004. It is estimated to have grown by around 3 per cent in 2004. As noted above, activity in the housing market appears to have peaked. House prices rose by only 2 per cent in the second half of 2004 compared to 12-13 per cent in the first half, as areas reported falling prices. This appears to have fed into consumer confidence with retail sales growth slowing over the last quarter of 2004. The volume of retail sales did not grow in the quarter to January 2005, while the annual rate for January 2005 was the lowest since December 2003. In the short term, with household income growth expected to moderate to 2½-2¾ per cent p.a. and households expected to start saving more, growth in household expenditure is expected to slow to more sustainable increases of 2½ per cent p.a.

Employment and Output

UK employment growth slowed in the year to June 2004 as productivity growth accelerated in manufacturing and services. Looking at trends in employment status, male employees increased by almost 1 per cent while female employees increased only marginally in the year to June 2004. Male self-employment rose by 2 per cent in the year to June 2004, perhaps reflecting slow growth in conventional employment. Female self-employment is also estimated to have increased in the year to June 2004, but by only 0.3 per cent. Overall, it is estimated that total employment increased by just under ¾ per cent in 2004, and unemployment fell to just under 855,000, bringing the rate of unemployment to a record low of 2¾ per cent.

In 2005 total employment is forecast to rise by almost ½ per cent. Employment in manufacturing is likely to continue to decline in 2005 as accelerating output

growth is outweighed by faster productivity growth. Over 2005-07, as UK and world GDP growth slow, productivity growth is expected to hold steady and average 2 per cent p.a.; consequently, employment growth is expected to slow to around ¼ per cent in 2007.

Overall GDP growth is estimated to have accelerated to 3¼ per cent in 2004 from around 2 per cent in 2003. Domestic demand is estimated to have grown by 3¾ per cent in 2004, a sharp pick-up compared to 2003.

GDP growth is expected to slow to 2¾ per cent in 2005. The growth is forecast to be more balanced, with some improvement in trade performance. Household spending growth is expected to moderate, as saving increases in response to higher interest rates and slower income growth. A slowdown in overall investment growth is forecast in 2005.

GDP growth is forecast to weaken to 2½ per cent in 2006 as world economic activity slows. Investment growth is expected to weaken, with the slower growth in government investment a major factor. As employment growth slows and households save more, household spending growth is forecast to weaken further; with weaker growth abroad also, trade growth is expected to slow. Export and import growth are forecast to fall back to 4-4½ per cent. Over the longer term the balance of payments as a percentage of GDP is projected to average 2¼ per cent.

2.4 General Labour Market Prospects

Employment (workplace based, number of jobs)

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

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

In most of *Working Futures 2004-2014*, the term employment is used to refer to the number of jobs located in a particular area (generally where the workplace is located). This corresponds to the definitions used in *Working Futures 2002-2012*. Box 2.1 provides more detailed definitions.

On this basis, in 2004, total employment in the UK economy (number of jobs) was around 30 million. Some 18 million of these jobs were for full-time employees, with part-timers accounting for almost 8½ million, (see Figure 2.1). Males still hold the majority of jobs. Females now hold about 46 per cent of all jobs (see Figure 2.2). Of the female workforce, 45 per cent is part-time; for males, the equivalent figure is less than 13 per cent.

Employment by Gender and Status

Between 2004 and 2014 the total level of employment (jobs) in the UK labour market (including H.M. Forces) is projected to rise from an estimated 30.3m to 31.6m, growing at an average rate of just under ½ per cent p.a. (see Figure 2.3). Figure 2.4 illustrates that the additional jobs are expected to be taken up equally by men and women. Among men, the extra jobs are expected to be split almost 50:50 between full-time and part-time. For women, about two-fifths of new jobs are expected to be full-time and three-fifths are expected to be part-time. Self-employment among both sexes is expected to decline; male self-employment is expected to fall by 6 per cent. For females the predicted fall is 11

per cent. Figure 2.5 illustrates the time series profiles of employment by gender and status over the full period 1981-2014.

Unemployment (claimant count)

With GDP growth expected to have peaked at 3¼ per cent in 2004, unemployment fell to a new low. By December 2004, the claimant count stood at 826,000, bringing the rate of unemployment down to 2.7 per cent. The downward trend in unemployment may have come to an end however, with the ILO rate of unemployment rising by 0.1 percentage points in the three months to January 2005, to 4.7 per cent. The employment rate at the end of 2004 was 74.9 per cent; the last time the rate was higher was August 1990. Again Box 2.1 provides more detailed definitions of the terms used.

The labour market is tight by historical standards but this has not led to an acceleration in wage inflation that would normally be associated with such conditions. Average earnings inflation is forecast to accelerate in 2005 and then weaken over 2006-07. Increases beyond then are projected to be in line with productivity growth.

One factor that may have contributed to the easing of pay pressures could be the increase in the number of migrant workers flowing into the UK. These now account for the largest proportion of net inflows of population. Another factor is the redesign of the tax and benefit system to put pressure on the unemployed to find work. These include the various New Deal initiatives, aimed at getting unemployed and inactive benefit claimants into work, as well as in-work benefits aimed at "making work pay".

Employment opportunities are expected to grow at a slightly slower pace than the workforce, and the projection is for a modest rise in the level of claimant unemployment (see Table 2.2 and Figure 2.3). The average rate of unemployment for the whole of the UK economy is projected to rise slightly by about ½ a

percentage point over 2004-14. Problems of long duration unemployment will remain concentrated in particular localities and in certain parts of the community (e.g. some ethnic minorities and older, less skilled, workers).

Figure 2.6 illustrates the time series profiles for key labour market indicators, including population, employment (jobs) and claimant unemployment.

Population and the Labour Force

Over the period 1999-2004, the UK total resident population increased by 1.1 million (1.9 per cent) to 59.8 million (see Figure 2.6). A proportionately larger increase occurred in the working-age population, attributable in part to net inward migration. This was reflected in a 3 per cent increase in the size of the labour force to 29.5 million in 2004. Overall labour market participation or activity rates over this period remained unchanged at around 61 per cent. Female activity rates rose slightly while those for males fell slightly. This was enough to offset the faster growth in the male working-age population. Consequently, while the male labour force increased by just over 2 per cent, the female labour force increased by 4¼ per cent (see Table 2.2). Government initiatives to make the workplace more family-friendly have probably played a part in raising the female participation rate. This has been reinforced by the greater attachment of successive cohorts to formal labour market activity.

Similar patterns are expected over the next decade. The labour force is projected to grow somewhat less rapidly than the working age population up to 2014, (see Figure 2.3). This reflects a slight fall in labour market participation (activity) rates. By the end of the decade the overall labour market participation rate is projected to be just over 60 per cent. This change obscures rising participation of women age 25-50 in the formal economy, offset by declines for most other groups.

Employed Residents (head count) and ILO Unemployment

Over the period 1999-2004, the number of residents in employment (head count) increased by 1.2 million (4½ per cent). This rise was more rapid than the growth in the labour force, and so the numbers unemployed (ILO definition) fell by around 340,000 to 1.4 million. Box 2.1 provides more detailed definitions of the terms.

For females, the number of employed residents (head count) increased from 12.3 million to about 13 million, over the same period, while the corresponding figure for males increased more slowly, from 14.5 million to 15.1 million. The fall in male (ILO) unemployment was greater in both magnitude and degree than the fall in female (ILO) unemployment. Again these patterns are expected to be broadly repeated over the next decade, although the level of ILO unemployment is expected to rise slightly, especially for males.

Box 2.1: Definitions of Employment and Related Labour Market Indicators

Alternative Definitions

There are various ways of looking at employment. For example, a distinction can be made between the number of people in employment (head count) and the number of jobs. These two concepts represent different things, as one person may hold more than one job. In addition, a further distinction can be made between area of residence and area of workplace. Similarly there are various different definitions of unemployment, the labour force, workforce and population. In *Working Futures 2004-2014* the following definitions are used:

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

Workplace basis: measured at place of work (as in the Annual Business Inquiry (ABI)).

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

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

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

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

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

Labour Force: employed residents plus ILO unemployment.

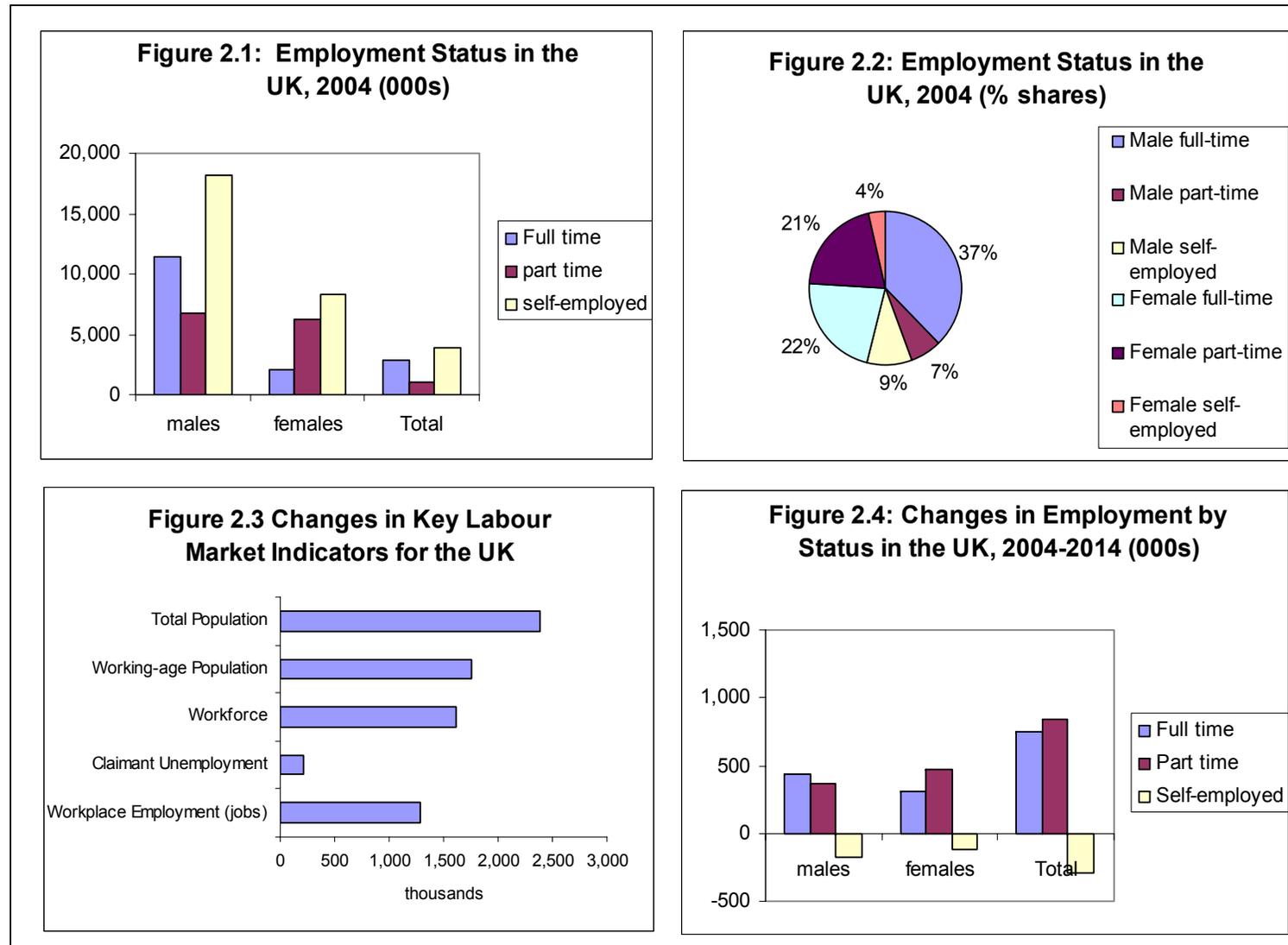
Labour market participation or Economic activity rate: the number of people who are in employment or (ILO) unemployed as a percentage of the total population aged 16 and over.

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

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

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

Working-age population: the total number of people aged 16-65 (males) or 16-60 (females), (residence basis).



Source: CE/IER estimates, MDM C51F8A Forecast, Macrotables.xls, (Figures 2.1 to 2.4).

Notes: Employment estimates are workplace (jobs). Unemployment is the claimants measure. For detailed definitions see Box 2.1.

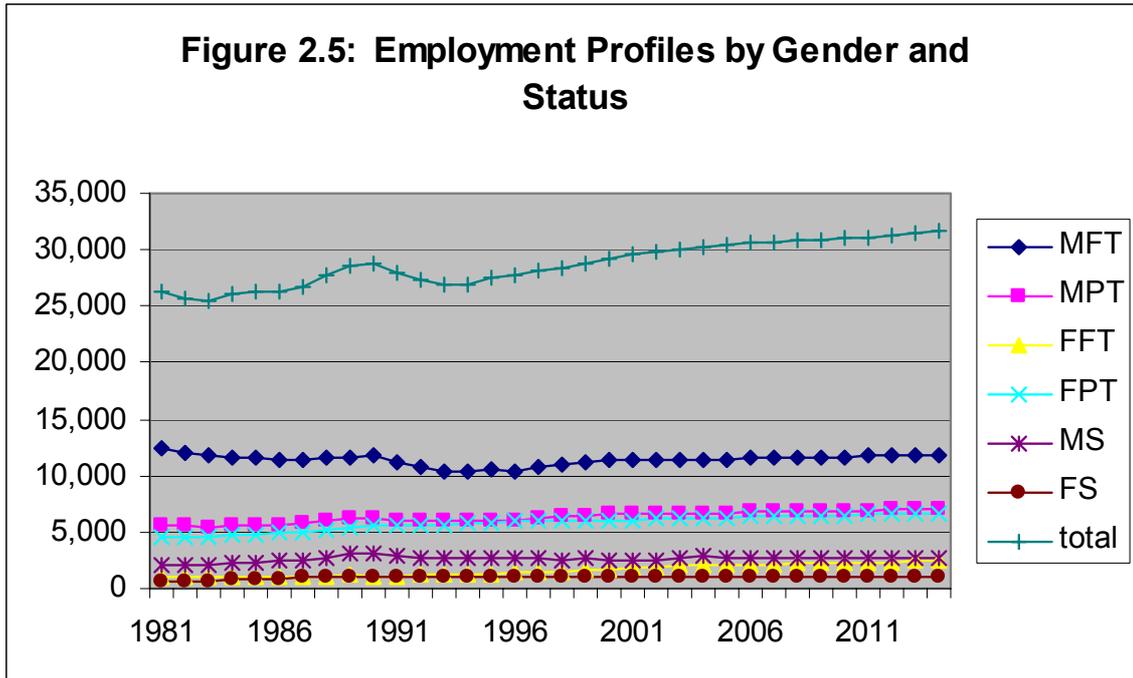
Table 2.2 Population and Labour Force in the UK

	000s				percentage change over period		
	1999	2004	2009	2014	1999-2004	2004-09	2009-14
Male							
Population	28,579	29,261	29,947	30,581	2.4	2.3	2.1
Population 16+	22,427	23,295	24,201	24,942	3.9	3.9	3.1
Labour Force	15,583	15,907	16,389	16,603	2.1	3.0	1.3
Activity Rate (%)	69.5	68.3	67.7	66.6	-1.2	-0.6	-1.1
ILO Unemployment	1,076	840	1,044	1,023	-21.9	24.3	-2.0
ILO Unemployment rate (%)	6.9	5.3	6.4	6.2	-1.6	1.1	-0.2
Employment (head count)	14,537	15,071	15,344	15,580	3.7	1.8	1.5
Labour Market Residual	906	1,235	1,260	1,353			
Female							
Population	30,106	30,562	31,107	31,613	1.5	1.8	1.6
Population 16+	24,247	24,879	25,610	26,218	2.6	2.9	2.4
Labour Force	12,999	13,543	14,078	14,294	4.2	3.9	1.5
Activity Rate (%)	53.6	54.4	55.0	54.5	0.8	0.6	-0.5
ILO Unemployment	693	589	733	717	-15.0	24.4	-2.2
ILO Unemployment rate (%)	5.3	4.3	5.2	5.0	-1.0	0.9	-0.2
Employment (head count)	12,276	12,950	13,345	13,577	5.5	3.1	1.7
Labour Market Residual	1,162	1,049	994	1,106			
Total							
Population	58,684	59,823	61,053	62,193	1.9	2.1	1.9
Population 16+	46,673	48,174	49,810	51,160	3.2	3.4	2.7
Labour Force	28,582	29,450	30,466	30,897	3.0	3.5	1.4
Activity Rate (%)	61.2	61.1	61.2	60.4	-0.1	0.1	-0.8
ILO Unemployment	1,769	1,429	1,777	1,740	-19.2	24.4	-2.1
ILO Unemployment rate (%)	6.2	4.9	5.8	5.6	-1.3	1.0	-0.2
Employment (head count)	26,813	28,021	28,689	29,157	4.5	2.4	1.6
Labour Market Residual	2,067	2,284	2,254	2,458			

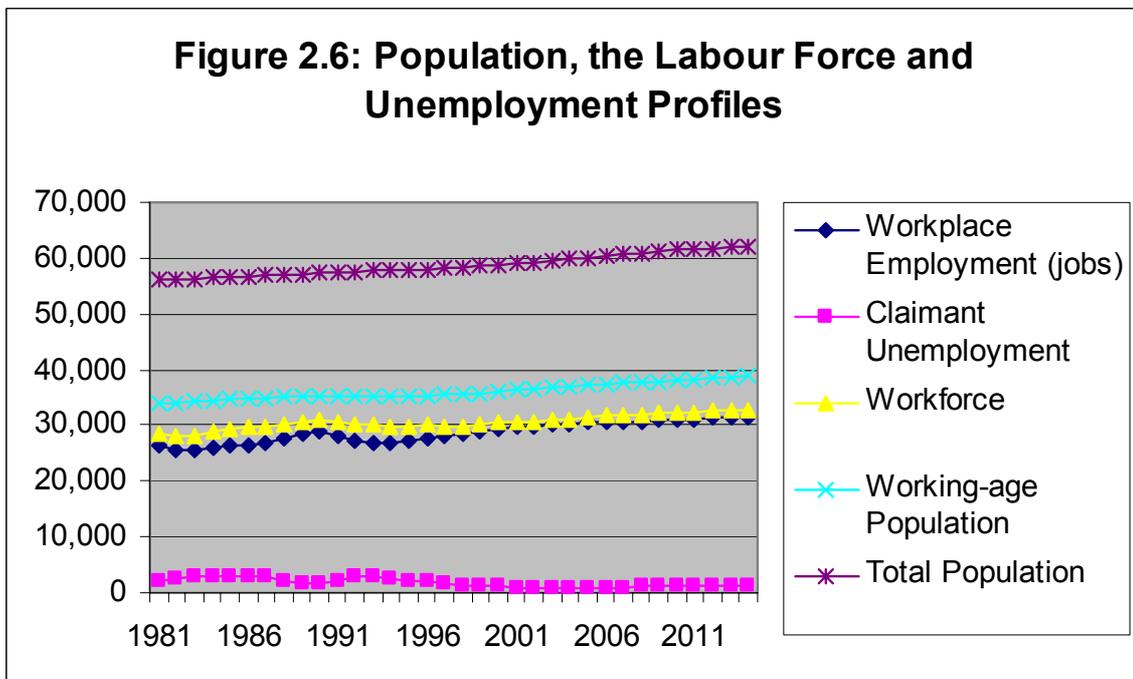
Source: CE/IER estimates; CE projections MDM C51F8A Macrotables.xls, (LF Table).

Notes: 1. Levels are in thousands except for activity and unemployment rates (per cent). Changes are per cent per annum except for rates (percentage points).

2. The Labour Market Residual = workplace employment (number of jobs) minus employed residents (head count), see Box 2.1 for detailed definitions.



Source: CE/IER estimates, MDM C51F8A Forecast, Macrotables.xls, (Figures 2.1 to 2.4).
 Notes : Employment estimates are workplace (jobs), see Box 2.1 for detailed definitions.
 Key: MFT: males full-time employees; MPT: male part-time employees; MSE: males self-employed; FFT: female full-time employees; FPT: female part-time employees; FSE: females self-employed; FT: full-time employees; PT: part-time employees; SE: self-employed'.



Source: CE/IER estimates, MDM C51F8A Forecast, Macrotables.xls, (Figures 2.1 to 2.4).
 Notes : Employment estimates are Workplace (jobs), see Box 2.1 for detailed definitions.

2.5 Macroeconomic Uncertainties

There are a number of areas of uncertainty affecting the macro-economic forecast. These relate to the housing market, oil prices, the strength of the dollar and increasing competition from the newly developing economies. In addition, a number of other events arose after the main projections were completed which have a bearing on the outcomes, especially at a regional level.

The latter includes both the winning of the bid for the 2012 Olympic Games and the closure of Rover. These are examples of the more general impact of economic events on development in particular parts of the country. They are difficult to predict and may result in quite marked discontinuities at a very localised level. However, such events rarely, if ever, alter the underlying longer term trends at a broader level.

Sharper correction to the housing market

The housing market peaked in mid-2004 and house-price inflation has started to slow. The base forecast projects that, as unemployment increases in the short-term and as households become less willing to take on debt, there will be a gradual slowdown in the housing market. Neither interest rates nor unemployment are expected to rise substantially in the way that triggered the early 1990s housing market recession.

The market has so far proved quite resilient in the era of low nominal interest rates. If the loss of confidence is greater than anticipated, then the housing market could be vulnerable to a sharp correction. This would be felt most severely in areas where house-price inflation has been strongest and most sustained in recent few years - e.g. hot spots in the South of England.

Furthermore, this could have a knock-on effect on consumer spending. As some indices reported house-prices falling in the second half of 2004, retail data indicated a weakening of consumer spending.

Slower fall in oil prices and the prolonging of the dollar's weakness

In the base forecast it is assumed that real oil prices will weaken slightly in the short and medium term as the growth in global oil demand slows. Stronger world economic activity than expected or disruptions to supply may prevent this. Energy intensive sectors, such as manufacturing, would be worst affected by this.

The UK trade performance was held back in 2004 by the weakness of the dollar, with manufacturing especially hard hit. The dollar-sterling exchange rate is expected to remain largely unchanged in 2005 before trending downwards over 2006-07. Growth in affected industries is likely to be curbed therefore by the persistence of the exchange rate and any further strengthening of sterling against the dollar would be detrimental, as would be any delay to the dollar's appreciation.

Competition from the Far East

Many parts of the economy, both manufacturing and services, are open to competition from the fast developing economies of China, India and others in the Far East. This is affecting both exporters and domestic suppliers through import penetration. How UK companies respond to this threat will be a key issue over the next decade.

Competing solely in terms of price is unlikely to hold off the challenge. These countries are developing increasingly sophisticated and high quality products and services, so any strategies relying upon improving the specification and quality of products

will need to recognise the double edged nature of the threat. If UK companies fail to rise to this challenge the prospects for employment would look considerably less optimistic than presented here.

Winning the Olympics

Preparations are already in train for the hosting of the London 2012 Olympic and Paralympic Games. These range from the construction of the Olympic Park in the Lower Lea Valley, near Stratford, east London, to better transport links between east London and the west. Some, but by no means all of this will already be reflected in the present forecasts for London and for the UK as a whole.

Economic activity will be boosted by the infrastructure spending itself, (with effects principally on construction activity); by the spending associated with running the Games (partly financed by ticket sales and media rights); by the spending of athletes, officials, media staff and tourists (other than ticket sales) associated with the Games; by the stimulus given to tourism before and after the event thanks to the higher profile of London; and, in the longer term, by the attraction of activities and residents to occupy the facilities.

However, when attempting to estimate the scale of the economic impact of the Games, it is important to distinguish what should rightly be attributed to the Games as opposed to what would have happened anyway. It is also necessary to estimate the extent to which the identified spending will be displaced from elsewhere or brought forward in time.

Substantial sums are being spent on improving London's transport infrastructure, without which the Games could not be staged successfully (and without which the bid would probably not have succeeded). However, these are part of London's general transport development and

would probably, in large part, have gone ahead in any case. For example, the Thames Gateway had been earmarked for development under the Sustainable Communities Plan prior to the success of the Olympic bid. Such developments are already factored in to government expenditure and investment plans. Part of the spending on ticket sales, catering and accommodation will also come from UK residents, who might otherwise have spent their income in other ways. Their spending is therefore diverted from other products and localities, and does not increase UK GDP, although it may well increase economic activity in London at the expense of other areas, although some of the spending on both infrastructure and at the event will be outside London. Some £1.5bn of the £3.9bn estimated cost of building facilities and running the Games is expected to come from a special Olympic Lottery, and purchasers of Lottery tickets would otherwise have spent the money in other ways. With regard to the lottery funds generated, spending may also be diverted from the normal Lottery causes, as the Department of Culture, Media and Sport expects. A further £250m is due to come from the London Development Agency, whose budget for other activity is thereby reduced, and up to £550m is to come from an increase in Council Tax in London, again diverting spending from other activities.

For the UK as a whole, therefore, the net benefit of staging the Games is likely to be limited to the impact of the spending of the athletes and tourists (including the years before and after the Games) who would otherwise have gone elsewhere. Following the announcement that the bid had been successful, VisitBritain suggested that the bid could be worth more than £2bn in tourism revenue, but it is not clear how this calculation was made and how many years it covers. The British Hospitality Association suggested that

there could be an extra 500,000 foreign visitors to the UK in 2012. If each one spent £1000 this would generate £½bn. For comparison, the London bid assured the provision of 40,000 rooms for the period of the Games in hotels and universities.

For London, the net benefit will be larger, because some of the investment and consumption spending associated with staging the Games will be diverted from elsewhere in the UK. Following the same logic, the net benefit will be much larger for the Lea Valley, in which much of the infrastructure spending will take place.

The main elements here are: the £2.4bn to be spent on new facilities (the bulk of which, but not all, is at the Olympic Park in Stratford, including the athletes' village) and the estimated £0.8bn to be spent on redevelopment in the Lower Lea Valley outside of the Olympic budget. Assuming phasing over five years, with a peak in 2011, there could be 7,000 additional jobs (annual full-time equivalents) in construction in 2011 and a boost to value added in that sector of some £400m in that year. Spending on the inputs to construction will generate further jobs and value added, but much of this would flow outside of London, (some of this going outside the UK). For comparison, GVA in the whole construction industry in London was £6.6bn in 2002.

The potential effects are therefore large (perhaps as much as a 10 per cent boost to construction at certain times) but not sufficient to completely change long-term trends. Clearly, there are likely to be significant demand pressures for particular skills over this period. However, because the timing coincides with the running down of other major developments, including Heathrow Terminal 5, so the main impact may well be to alter the geographical focus of such pressures rather than their scale.

Rover

On a less positive note, soon after the main projections were completed, the closure of Rover as a going concern was announced. This will clearly have a significant impact on the local area and the West Midlands as a whole. Effects will not be confined to that region as some of Rover's component suppliers lie outside the West Midlands.

The immediate effect has been estimated as the loss of around 6,000 direct jobs, plus knock on effects for suppliers and other local industries and services. Given the historic importance of the motor industry in the West Midlands and the concentration of employment in a very localised area, this is of considerable significance to the area.

The *Working Futures 2004-2014* forecast already factors in job losses for the UK motor industry over the period 2004-14. So, to some degree, these events are already taken into account in the projections. However, the timing, speed of loss and geographical focus are now likely to be more intense than in the projections reported here.

On a more optimistic note, it appears that some continuation of car production at Longbridge is now likely, with the takeover of operations by a Chinese company, so the initial estimates of job losses may be exaggerated. The most recent figures available suggest that some 2,000 direct jobs may be saved in the longer term.

However, at the time of writing considerable uncertainty remains. A support package has been announced to ease the process of readjustment. The position is being monitored by the newly established MG Rover Task Force under the co-ordination of the RDA (Advantage West Midlands).

2.6 Comparison with previous forecasts

The present set of projections are broadly similar to those produced previously for the SSDA and Published as *Working Futures 2002-2012*. The previous forecasts were for an increase in employment of around 1.3 million between 2002 and 2012. The present projections suggest a similar increase between 2004 and 2014. However, the levels of employment now projected for 2012 are higher under the present forecast and this difference primarily reflects revision to the historical database. Projected change in the new forecast over the period 2002-2012 is 1.5 million. Patterns of change at the sectoral level are broadly similar in the two sets of projections.

In contrast to the previous set of projections, male full-time employment is now expected to increase over the next decade. Another difference is that female self-employment is expected to fall, when in the previous forecast it remained almost unchanged. These differences reflect revisions to the recent historical patterns of change in employment by gender and status.

They reflect changes at a detailed sectoral level. Finding jobs in the areas traditionally associated with male employment such as the primary and manufacturing sectors, is becoming increasingly difficult as these sectors shrink in employment terms. Many younger males are therefore moving into areas that, until recently, had been mainly the province of females. These trends are discussed in more detail in Chapter 3.

3. Sectoral Employment Prospects

Key Messages

- Sectoral prospects depend upon the changing patterns of demand for the goods and services that they provide. The factors underlying these developments are summarised in this chapter.
- The results suggest a continuing trend away from employment in primary and manufacturing industries and in favour of services.
- In contrast to the results in *Working Futures 2002-2012*, the prospects for male full-time employment are now expected to be rather more optimistic, reflecting recent trends in favour of this group in many sectors.
- New results are also presented for the first time for the Sector Skills Councils (SSCs). These highlight the very different prospects facing particular SSCs.

3.1 Introduction and context

This chapter presents an overview of sectoral employment change, highlighting the key drivers and the main features of these developments. The projections are presented at a variety of different sectoral levels using two main types of definition.

i. Broad sectoral definitions are based on groups of 6, 14 or 27 sectors, and defined by the 2003 (1992) Standard Industrial Classification (SIC 2003). These preserve the traditional manufacturing, services and public sector groupings of the economy. They are hierarchically related, with the 6 broadest sectors being a more aggregated grouping of the 14 sectors and so on. The 14 and 27 groups have been adopted by the SSDA in their Sector Skills Matrix database and are referred to as the Sector Matrix Industries (SMI).¹⁶

These are not coterminous with the “footprints” of the newly formed Sector Skills Councils (SSCs).

ii. Sector Skills Councils definitions use SIC code groupings that most closely match the SSC footprints. These definitions are a ‘best fit’ of each SSC’s core business sectors. These specify the *core* SIC codes that are undisputed and do not overlap with any other SSC. The extent to which this is an exact fit varies between SSCs. In some cases, the use of the core SIC codes excludes elements of the SSC footprint because they are included in other areas. SSCs can provide further depth analysis of skills and future employment within their sector (see their individual websites for details, Annex D provides addresses).

For the first time, therefore, a comprehensive set of results are presented for the SSCs. These are presented in a separate volume although some summary statistics are given here.¹⁷ These results can be used in conjunction with other available forecasts. For example, several of the SSCs have developed their own forecasts, details of which are provided in Annex C.

The present chapter focuses upon broad sectoral prospects. A more detailed analysis of industrial prospects can be found in Chapter 6, which explores occupational changes within industries, distinguishing categories identified by the SSDA and LSC as of key importance.

¹⁶ The SSDA and its partners have identified 27 sectors at national level referred to as the Sector Matrix Industries. Some of these are too small to enable a robust analysis. Mining & quarrying and Electricity, gas & water and Wood & paper and Printing & publishing have therefore been aggregated together here and in Chapter 6. However, where the data are sufficiently robust, detail for the sub-component categories is provided.

¹⁷ See Dickerson *et al.* (2006).

Section 3.2 begins with a brief review of the patterns of change for the 6 **broad sectors** over the past few years and their prospects for the next decade. A more detailed analysis of sectoral prospects for output is presented in Section 3.3. This presents results for 14 **sectors**. Section 3.4 focuses upon employment for the same 14 sectors. The discussion then goes on to draw out the prospects for the more detailed **industries** (although these are discussed in more detail in Chapter 6). Section 3.5 presents an overview of changing employment patterns by gender and status within the *broad sectors*. Finally, Section 3.6 presents a brief overview of the prospects for SSCs. The full detailed results for the SSC are presented in a separate volume.¹⁸

The reasons for the changing fortunes of different sectors are complex and inter-related. **Box 3.1** sets out some of the main drivers of sectoral changes over the past few decades and how these have affected different parts of the economy. Many of these factors are expected to continue to exert their influence over the coming decade. This is encapsulated in the projections from the multi-sectoral macroeconomic model.

¹⁸ See Dickerson *et al.* (2006).

Box 3.1: Key Drivers of Sectoral Change

Key Drivers: There have been major changes in the structure of employment across all developed economies over the past half-century. This has been the consequence of a complex mix of interdependent factors. These include: technological change; productivity growth; international competition; globalisation; specialisation and sub-contracting; economic growth and the large increases in real incomes; regulatory and legislative changes; and dramatic shifts in patterns of expenditure.

Technological change, and in particular the integration, and rapid and widespread use, of information and communication technologies (ICT) has heightened competition through effectively 'collapsing' time and space. It also transforms competitive advantage, speeds up the process of economic change, and changes the organisation of work and how goods and services are produced. It has led to the development of a huge range of new processes, products and services, including the internet, e-commerce and other advanced forms of telecommunication. This has had major implications for industrial employment structure, benefiting computing and other business services and to a lesser extent the manufacturing of electronic products. The impact of ICT in financial services is an example of a more negative impact, as ways of producing and delivering the services have changed dramatically, resulting in some sharp job losses as productivity levels have soared. ICT has also resulted in increased demands for IT skills across all sectors and occupations.

Productivity growth is the key to maintaining competitiveness and long-term sustainable economic growth, representing as it does, the growth in the value of the goods and services produced per person employed.

International competition has been a key feature of recent structural change, with many industries failing to keep pace with developments in other countries or to combat the cost advantages of low wage producers from overseas such as India and China. The decline of the UK textile industry is a good example of this phenomenon.

Globalisation has become a major factor in recent years, with many companies operating across international boundaries. The process of globalisation is increasingly opening up local and regional economies and integrating them into both the national the international economies. This integration takes the form of increasing connections and interdependency through: increased international trade (and inter-regional and inter-locality trade); increased international capital movements, including foreign direct investment (which also increases regional and local integration); and increased inter-firm collaboration in technology and product development. The development of global brands is one important aspect of this process. This increases both competitive pressures and opportunities, by progressively eliminating barriers to competition and widening the sphere within which market competition takes place. This then increases market opportunities but penalises those unable to compete effectively on this wider playing field. It makes it exceptionally difficult for relatively high wage economies to compete on costs and prices and has resulted in an increasing shift to higher value added, higher productivity goods and services in the more developed economies that have high information, knowledge, creativity and / or innovation components that are less easily replicated in lower wage economies. Globalisation homogenises the availability of factors of production over time, leaving the skills and capacities of the workforce as the key differentiating factor in competitiveness. It forces adaptation to changing market conditions and increases the importance of skills as a differentiating feature in competitive markets, especially if an area or nation is moving up the 'value added' chain in order to compete effectively.

Globalisation can both accentuate or moderate the forces of international competition, depending upon the locational choices made by such companies. The decisions of Toyota and Nissan to build factories in the UK (as well as the involvement of other international players such as Ford and BMW) was a key factor in stemming the downward trend in the motor vehicles industry, which was in imminent danger of collapse only a few years ago.

Specialisation and sub-contracting, including extension of supply chains, is also a key issue, with both international and domestic dimensions to it. Many functions such as cleaning and catering, as well as higher level activities such as research and development and design, have been hived off from the mainstream activities of many producers. This has at the same time accelerated the decline of employment in sectors such as manufacturing, while contributing to the growth of many parts of the service sector.

Economic growth and the associated increase in real disposable incomes have had a significant effect on patterns of expenditure. Many basic items now take up only a small part of consumers' budgets whereas there is more scope for spending on the outputs of producers of more luxurious goods (including leisure and tourist activity).

Regulatory and legislative changes, as well as other aspects of public policy, can also play an important role in changing the patterns of demand for goods and services and patterns of competitive advantage. Environmental legislation and rules, health and safety, as well as the more obvious rules and regulations under which international trade is conducted, can all play a significant role. More generally, much public policy, at least in the advanced economies, is aimed at supporting the rapid innovation and diffusion of technology and the process of globalisation. For example, the continuing development of the European Union, including the process of establishing free internal trade, the free flow of capital and for some countries at least, a single monetary policy, currency and exchange rate, are designed to strengthen and deepen the process of economic integration in Europe.

Changing patterns of expenditure have resulted from all the above factors. These include large shifts in the pattern of *international trade*, as low cost producers from the Far East have captured larger shares of domestic markets, as well as shifts in the patterns of *consumer demand*. The growth in real incomes has been a key driver of the latter but these patterns have also been influenced by technological changes, for example the dramatic growth in air travel, as well as the developments of new products and services linked to IT.

Together, these changes have resulted in the demise of many major areas of employment in the UK. In particular, there have been dramatic job losses in: agriculture, forestry and fishing; coal mining; and most parts of manufacturing. While these industries remain important in terms of output levels and in providing the foundation upon which much tertiary activity is based, they no longer employ large numbers of people. In contrast, there have been major increases in employment in many other areas. These include, especially, those sectors involved in processing and handling information, and those providing services to both consumers and businesses. Personal services, associated with tourism, leisure & the media, and health & education services have been particularly important for consumers, while for businesses, financial and accountancy services, as well as research design and development activities, have been key areas of growth.

The complex mix of phenomena that have resulted in these past patterns of structural change is reflected in the detailed multi-sectoral model used to project future trends. The model reflects the various sources of demand for goods and services. It also incorporates the various technical linkages between different sectors, including the impact of technological change on productivity levels, as well as the effects of changes in the way activities are classified as a result of the sub-contracting out of many functions. The model explains these phenomena by a complex set of behavioural equations. These relate the derived demand for labour to the prospects for output growth in each sector and the relative costs of labour and other inputs. For further details see Annex A.

3.2 General Prospects by Broad Sector

Tables 3.1 and 3.2 and Figures 3.1-3.3 summarise the long-term forecasts for six **broad sectors** within the economy, focusing on developments in aggregate output and employment.

The top panel of Table 3.1 shows how the structure of the economy has changed over the past two decades. The second two panels show the historical patterns of change in output and the expected future prospects. The middle panel presents annual growth rates, while the lower panel shows the total percentage change over the period covered. Figure 3.1 also shows the annual rates of growth over the three decades.

Over the medium term (5-10 years), growth in household expenditure and the recovery of key export markets, especially those in Europe, should see renewed manufacturing output growth but with continued loss of jobs. Marketed services are expected to continue to show strong growth. In manufacturing, the strongest growth is projected in high-tech industries such as *electronics and pharmaceuticals*. High-tech areas such as *communications* and *computing services* are also likely to exhibit above-average performance. Further changes in technology are likely to continue to be key drivers, with these trends continuing into the longer term.

The net outcome of this complex set of interdependent forces is summarised in the following section, which sets out the expected trends in sectoral output and employment for the UK economy.

Output

The latest estimates indicate that the *primary and utilities* sector now accounts for only just over 3 per cent of total output

and slightly more than 2 per cent of total employment. Output growth is expected to be weakest in mining, as UK oil and gas fields become exhausted and a larger share of demand is met by imports.

The estimates in Table 3.1 indicate that manufacturing accounted for around 16 per cent of total output in 2004. Compared to the 1994-2004 period, output growth in manufacturing is expected to improve over 2004-14. However, the share of manufacturing in total output is expected to continue to fall over the forecast period, albeit at a much slower pace than in the past.

Construction's share of total output is expected to continue its slow decline over 2004-14, as output growth is forecast to be around 1½ per cent p.a.

The share of *Non-Marketed Services* in total output broadly matched that of manufacturing over the past two decades, and it has declined at a similar rate. Although this broad sector is expected to maintain its share of total output over 2004-14, the trends for its sub-sectors (public administration, health & education) are expected to differ, as outlined below.

Over 2004-14 it is marketed services that are expected to drive output growth. Both *Distribution, transport, etc.* and *Business & other services* are expected to grow at almost twice the rate of *Manufacturing* and *Construction*, thereby increasing their already large shares of output. It is worth noting, however, that, over the forecast period, the output share of marketed services is not forecast to grow as rapidly as it did in the previous ten-year period. The fastest growth is expected to be in the *Communications* sub-sector, driven by strong industrial demand.

Table 3.1: Output by *Broad Sector*, 1984 – 2014

Shares (per cent)	1984	1994	2004	2009	2014
Primary & utilities	4.2	4.0	3.2	3.0	2.8
Manufacturing	22.4	20.7	16.0	15.5	14.9
Construction	6.8	6.5	6.1	5.7	5.6
Distribution, transport etc	22.8	24.3	25.2	25.5	25.8
Business & other services	20.1	23.0	28.2	29.0	29.9
Non-marketed services	22.4	19.5	17.8	18.1	18.1
Total	100.0	100.0	100.0	100.0	100.0
Growth (per cent p.a.)	1984-94	1994-04	2004-09	2009-14	2004-14
Primary & utilities	2.1	0.6	0.6	0.8	0.7
Manufacturing	1.9	0.2	1.7	1.5	1.6
Construction	2.2	2.2	1.1	1.7	1.4
Distribution, transport etc	3.3	3.2	2.6	2.6	2.6
Business & other services	4.0	4.9	3.0	2.9	2.9
Non-marketed services	1.3	1.9	2.7	2.3	2.5
Total	2.6	2.8	2.4	2.3	2.3
Growth (per cent total)	1984-94	1994-04	2004-09	2009-14	2004-14
Primary & utilities	23.5	5.7	3.2	4.0	7.4
Manufacturing	20.2	2.0	8.6	7.7	17.0
Construction	24.6	24.1	5.6	8.7	14.8
Distribution, transport etc	38.2	36.5	13.8	13.6	29.4
Business & other services	48.1	61.6	15.7	15.6	33.7
Non-marketed services	13.4	20.3	14.0	12.0	27.7
Total	29.7	31.8	12.3	12.2	26.0

Source: CE/IER estimates, MDM C51F8A, macrotables.xls (Table 3.1).

Notes: a. The Broad Sectoral groupings are defined in Annex, Table A.8.

b. Non-marketed services and the total include H.M Forces which are excluded from most other tables.

Employment

The key features of projected employment change across the broad sectors are summarised in Figures 3.2 and 3.3 and in Table 3.2. Figure 3.3 presents the net changes between selected years over the period 1984-2014. Figure 3.2 presents corresponding information in terms of annual percentage growth rates.

Employment is expected to continue to decline in the *Primary & utilities* sector, with the loss of a further 100 thousand jobs over the decade. Agriculture is expected to struggle to recover lost ground following the various health scares of recent years. Prospects in mining and quarrying will be dominated by the gradual running down of North Sea oil and gas. Utilities are expected to see further job losses, as pressures to reduce costs continue, albeit at a much slower rate than in recent years.

Manufacturing employment has continued to decline in recent years. This has affected almost all manufacturing industries, reflecting restructuring and pressures to improve productivity in the face of technological change and stiff international competition. In the long term, a decline in manufacturing employment overall of around 1½-2 per cent p.a. is expected as firms seek to maintain competitiveness. Some 400 thousand jobs are expected to be lost over the next ten years.

While these first two sectors will continue to play a crucial role in the economy, their role as a source of employment is likely to continue to diminish.

In *Construction*, government spending is expected to help boost employment in the short term. But the large planned increase in public spending could lead to severe bottlenecks in the industry. This is expected to help to drive up productivity.

As a consequence, a slight decline in employment in construction is projected of around 90 thousand jobs over the next decade.

In *Distribution, transport, etc.* the largest job gains in the short term are expected to be in retailing. Many of the jobs created are expected to be part-time. Employment in hotels & catering is also expected to pick up as international tourism begins to recover. For transport & communications, short-term difficulties mean that employment is likely to decline in the next year or two. In the longer term, some modest recovery is projected, with some 500 thousand additional jobs expected in the broad sector *Distribution, transport etc.*

In *Business and other services*, there is a mixed picture. For financial services the prospects are less good than in some other areas of business services. Following recent cuts in employment, prospects in banking are likely to improve slightly but employment increases are likely to be modest, due to increased investment in IT, etc. As for insurance, activity should recover quite strongly and lead to renewed employment growth. About a million extra jobs are projected in total between 2004 and 2014.

In *Non-marketed services*, prospects are also mixed, because there are pressures to reduce the number of people employed in public administration & defence. Government spending on central and local administration and related services is expected to continue to rise at a modest rate, but much slower than the average for the economy as a whole. As a result, a decline in employment is forecast to continue in the long term. However this is offset by growth in education and health services, both of which are expected to expand quite quickly. In total, around 400 thousand additional jobs are projected for this broad sector as a whole.

Table 3.2: Employment by Broad Sector, 1984-2014

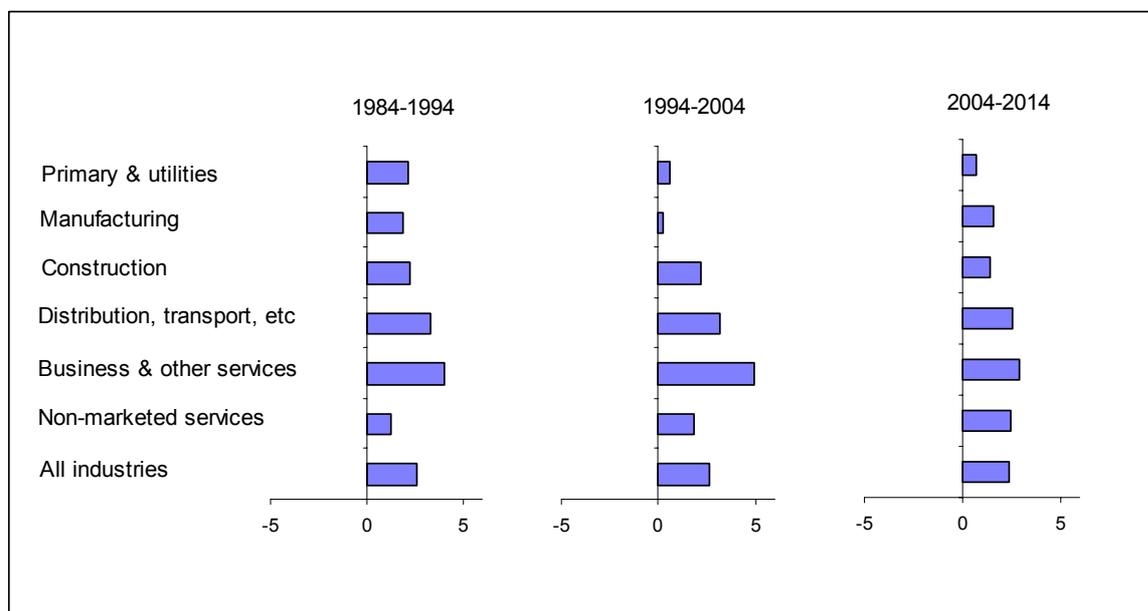
	1984	1994	2004	2009	2014
Levels (000s)					
Primary & utilities	1,241	840	610	564	514
Manufacturing	5,342	4,275	3,552	3,361	3,170
Construction	1,880	1,776	2,090	2,039	1,999
Distribution, transport, etc.	7,355	7,745	8,830	9,048	9,327
Business & other services	4,502	5,897	7,816	8,241	8,771
Non-marketed services	5,682	6,491	7,408	7,655	7,813
Total	26,002	27,025	30,305	30,907	31,594
Shares (per cent)					
Primary & utilities	4.8	3.1	2.0	1.8	1.6
Manufacturing	20.5	15.8	11.7	10.9	10.0
Construction	7.2	6.6	6.9	6.6	6.3
Distribution, transport, etc.	28.3	28.7	29.1	29.3	29.5
Business & other services	17.3	21.8	25.8	26.7	27.8
Non-marketed services	21.9	24.0	24.4	24.8	24.7
Total	100.0	100.0	100.0	100.0	100.0
Growth (per cent p.a.)					
Primary & utilities	1984-94	1994-2004	2004-09	2009-14	2004-14
Primary & utilities	-3.8	-3.2	-1.6	-1.8	-1.7
Manufacturing	-2.2	-1.8	-1.1	-1.2	-1.1
Construction	-0.6	1.6	-0.5	-0.4	-0.4
Distribution, transport, etc.	0.5	1.3	0.5	0.6	0.5
Business & other services	2.7	2.9	1.1	1.3	1.2
Non-marketed services	1.3	1.3	0.7	0.4	0.5
Total	0.4	1.2	0.4	0.4	0.4
Change (000s)					
Primary & utilities	1984-94	1994-2004	2004-09	2009-14	2004-14
Primary & utilities	-400	-231	-46	-49	-95
Manufacturing	-1,066	-723	-192	-191	-383
Construction	-104	314	-51	-41	-92
Distribution, transport, etc.	390	1,084	218	280	498
Business & other services	1,395	1,919	425	530	955
Non-marketed services	809	916	247	158	405
Total	1,023	3,280	602	686	1,289

Source: CE/IER estimates, MDM C51F8A, 6UK.xls (Table 3.2).

Notes: a. The Broad Sectoral groupings are defined in Annex, Table A.8.

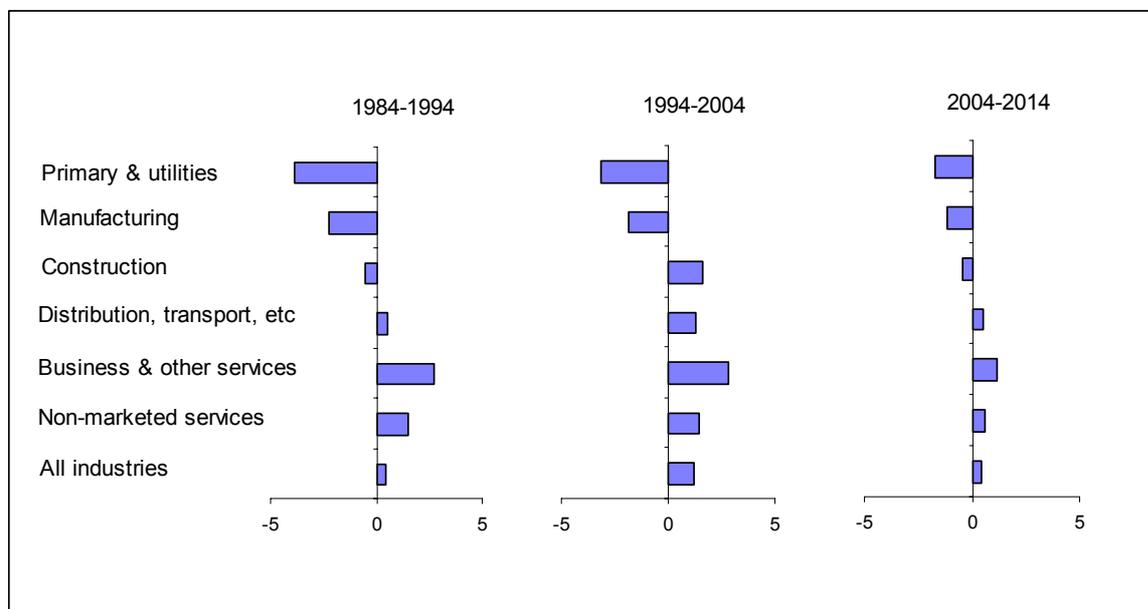
b. The totals here including those for non-marketed services include H.M Forces. These are excluded from most other tables.

Figure 3.1: Changes in Output by *Broad Sector*, 1984-2014 (per cent p.a.)

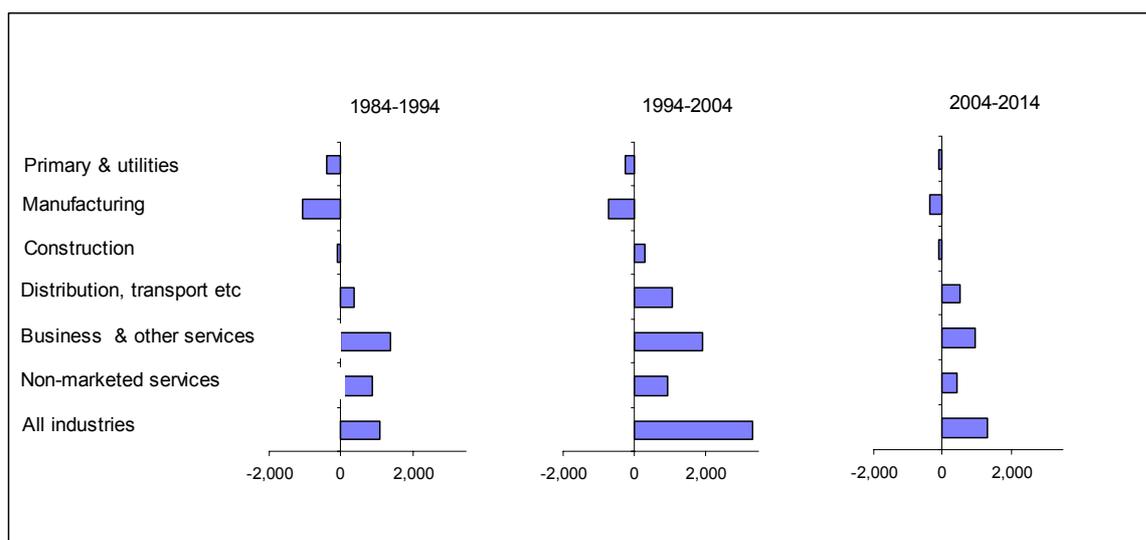


Source: CE/IER estimates, MDM9 C51F8A, 6725output.xls, (Figure 3.1).
 Note: The Broad Sectoral groupings are defined in Annex, Table A.8.

Figure 3.2: Change in Employment by *Broad Sector*, 1984-2014 (per cent p.a.)



Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.2).
 Note: The Broad Sectoral groupings are defined in Annex, Table A.8.

Figure 3.3: Change in Employment Structure by Broad Sector, 1984-2014 (000s)

Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.3).

Note: The Broad Sectoral groupings are defined in Annex, Table A.8.

3.3 Detailed Sectoral Output Prospects

This section explores sectoral prospects in more detail. In some cases, reference is made to the prospects for detailed categories distinguished in the macroeconomic model. In general, the focus is at a broader level, such as the 14 **sectors** used by ONS, and a more detailed breakdown of **industries** based on the SSDA's Sector Matrix Industries. The main results are presented in Table 3.3 -3.6 and in Figures 3.4 and 3.5. They are discussed in the order of the six **broad sectors** within which they fall. This section outlines output prospects. Section 3.4 focuses on employment prospects.

Primary & utilities

In *agriculture, etc* output is expected to grow slightly in 2005 after falling over 2003-04. In the long term, growth is expected to improve slightly but remain well below the rate for the rest of the economy.

In *Mining & quarrying* the decline of the UK coal industry is forecast to continue,

while the level of output in Other Mining is not expected to change at all.

The decline in UK oil and gas output that started around 2000 continued in 2004, when output fell by around 5½ per cent. This trend is not expected to change much over 2004-14, as increased output from fields west of Shetland and from the smaller deposits fails to offset the sharp decline in production from established UK North Sea fields. The volumes of oil and gas produced are expected to fall by about 47 per cent over the forecast period.

Output growth in electricity is expected to remain stable over 2004-14, as government policies to increase end-use energy efficiency are implemented. After falling over 1995-00 and stabilizing over 2000-2004, water supply output is expected to grow weakly until 2014. Stronger output growth is expected in gas supply, driven by power generation and household demand.

Manufacturing

Output growth in manufacturing is estimated to have picked up in 2004,

despite rising input costs and higher interest rates.

Despite the five interest rate rises between November 2003 and August 2004, sterling weakened against the euro in the last six months of 2004, giving some firms a competitive advantage over competitors based in the euro-zone. (Chemicals is one industry expected to benefit from this.) However, poor growth in the euro-zone continued to limit demand and it is estimated that manufacturing output grew by no more than 1¼ per cent in 2004.

Output growth is forecast to increase slightly in the medium term but euro-zone demand looks unlikely to accelerate in 2005, with, for example, Germany expected to suffer the effects of a strengthening euro and weaker global demand. Indeed, Germany (and Italy) recorded a fall in GDP output in 2004Q4. The US economy is also expected to slow in 2005, as a result of rising interest rates and government spending cuts. In the long term, manufacturing output is expected to grow by 1½-1¾ per cent p.a, with the rest of the economy outpacing it by around ¾ percentage points.

Basic metals and *Metal goods* returned to health in 2004, with growth of at least 2 per cent, but, despite accelerating export demand growth, activity in these industries is expected to slow in 2005 as UK industrial demand growth slows. In the long term, no or low growth is expected as the industries become increasingly internationalised.

In *Textiles, clothing & leather*, the quota system in the international textiles trade was abolished in January 2005. Some firms are surviving by focusing on high-value niche markets but this is not likely to be sufficient to prevent output in *Textiles, Clothing & Leather* falling by an estimated 7 per cent in 2005. In the long term, the industry will continue to suffer from the decline of commodity production, which is increasingly moving overseas to lower-cost countries, such as China.

In *Motor vehicles*, output growth slowed in 2004 to just over 1¼ per cent. This was a result of increased import penetration, weak demand from the euro-zone and a loss of competitiveness against dollar denominated competitors. Despite the demise of Rover, in the long term, the remainder of the UK based industry is expected to maintain its competitiveness and output growth is expected to average around 2 per cent p.a, with exports accounting for an increasing share of output.

The strongest growth in 2005 is forecast to be in *Pharmaceuticals* and *Electronics*. Pharmaceuticals is the UK's third most important export earner. Although the industry is coming under pressure from rising R&D costs and governments' desires to control drug prices, output in Pharmaceuticals is expected to grow by 6¼ per cent in 2005, driven by strong healthcare and consumer demand. Growth of 6½-7 per cent p.a. is expected over 2004-14, supported by demand from a wealthier, older population. After falling sharply in 2004, output in *Electronics* is expected to grow by 5-6 per cent p.a. over 2005-14, as industrial and export demand accelerate in response to new technologies, such as 3G telephony and digital broadcasting.

Construction

Output growth in *Construction* is estimated to have picked up slightly to 4 per cent in 2004, due mainly to a recovery in financial and business services that stimulated renewed demand for offices, the continued rise in public works and, despite the slowing of house-price inflation, the continued growth in the housing market. Growth in commercial and industrial demand is expected to slow during 2005, and the cooling of the housing market is likely to be reflected also in a slowdown in repair and refurbishments to housing. As a result output growth is expected to slow over 2005-07. In the long term construction output growth is expected to average around 2 per cent p.a, below the growth of the overall economy, on the

assumption that steep increases in government spending come to an end after 2007.

Distribution, transport, etc.

This broad sector enjoyed strong growth in 2004 and is expected to see strong output growth in the long term, with air transport and communications leading the way. Growth in real household disposable income is estimated to have accelerated in 2004 and this is reflected in household spending, which is estimated to have grown by around 3 per cent in 2004. This helped *Retailing* achieve output growth of around 6½ per cent in 2004. In the medium term, there is still concern about the strength of the relationship between consumer spending and the housing market. The Governor of the Bank of England played down its strength in November 2004, but retail sales growth in the three months to February 2005 was weak, as activity in the housing market slowed. In the long term, output in Retailing is expected to return to more sustainable rates of growth of around 2½ per cent p.a. in line with growth in the economy as a whole.

After recovering somewhat in 2003 and 2004, output growth in *Hotels & restaurants* is expected to weaken slightly in 2005. Although the current weakness of the dollar is likely to affect the industry, the relative strength of the euro makes the UK less expensive than the euro-zone and will help to mitigate the effect. The industry is expected to grow by 2½-2¾ per cent p.a. over 2004-14.

Output in *Air transport* is estimated to have risen by 5¼ per cent in 2004, the highest rate of growth since 2001. This performance reflects a strong recovery in scheduled intercontinental services following the Iraq crisis and SARS outbreak in 2003, and also strong growth on intra-EEA routes. Despite some upward pressure on fares as airlines passed on the rising cost of fuel to passengers, demand for travel to the US was boosted by the depreciation of the US dollar against sterling. The demand for

intra-EEA services may not be as strong in 2005 as household spending weakens and the housing market cools. Average fares on intra-EEA flights fell throughout 2004 as capacity grew strongly. Output growth in air transport is expected to slow to 4 per cent in 2005, settling at around 4 per cent p.a. over 2004-14.

After falling in 2003, output in *Land transport* grew by around 2¾ per cent in 2004, despite capacity constraints and the weakness of intermediaries such as travel agents. These difficulties are expected to keep output growth below the average growth rate of the whole economy in the medium term. The extension of the congestion charging zone within London and its possible adoption in other cities should stimulate growth in bus and light rail services, but not before the second half of the decade, while the effects on output of investment in the London underground will not be seen before the end of the decade. If the Government formulates an integrated policy for the development of port capacity in the UK, this is likely to help output growth in Land Transport, but only in the much longer term. Output growth in Land Transport is forecast to remain at around 2 per cent p.a. on average over the period 2004-14.

In *Water transport*, strong international trade meant demand for freight carriers exceeded capacity in 2004 and it is expected to do so again in 2005. Healthy world trade activity should support the industry in the long term, because continued economic growth in China and the rest of Asia outside Japan, alongside a revival in the economies of the euro-zone, are likely to ensure that demand for the UK trading fleet weakens only slightly.

In *Communications*, output growth is expected to accelerate to around 6 per cent p.a. over 2005-07, as industrial and consumer demand growth strengthens.

By the end of 2004 there were 5.3m broadband connections but this represents only one-third of all internet connections in the UK, and with 44 per cent of households not having internet access,

there is still a large market for broadband providers to capture.

3G telephony did not penetrate the market in 2004 as some expected. Provided operators can persuade users to pay premium rates for 3G services, 2005 and 2006 will be better years; most likely from the second half of 2005 onwards. 3G telephony should combine with broadband, along with VoIP (Voice over Internet Protocol) and Wi-Fi technologies, to help *Communications* outperform the economy over 2004-14, with output growth of roughly 6 per cent p.a.

Business and other services

Strong public sector and industrial demand boosted *Professional services*, and the whole business services sub-sector grew by over 6½ per cent in 2004. As the global economy slows, growth is expected to slow in *Business services*, but still outpace the rest of the economy.

Professional services has enjoyed strong growth recently, driven by an upturn in spending by companies as the wider economy strengthened, and strong growth in public-sector spending. Growth of 2¾-3 per cent p.a. is expected over 2004-14, driven in part by export demand, even though it accounts for a very small share of demand, as the rapidly expanding Asian economies require legal and consulting services.

Continued government expenditure on IT projects and a pick-up in business demand on the back of good operating results allowed *Computing services* to achieve output growth of almost 9 per cent in 2004. In the medium term, industrial and investment demand growth are likely to weaken as firms wait for the economic cycle to pick up and endeavour to avoid over-investing in IT. Unless the latest advances and new applications, such as third-generation mobile telephony, can deliver superior efficiency gains or cost-savings, their rapid take-up and diffusion is likely to be delayed until around 2007.

In the long term, industry output is forecast

to grow faster than GDP at just over 5¾ per cent p.a. over 2004-14, assuming the market for new advances such as third-generation telephony and new internet protocols develops.

Five of the top six UK banks reported improved returns on equity in the first half of 2004, compared to 2003. However, as GDP growth slows in 2005 and 2006, so too will output growth in *Financial services*. Investment banks may not be as badly affected, as IPO and M&A activity, and equities trading picked up in 2004. Output growth is forecast to follow the pattern of the general economy and grow at 2½-2¾ per cent p.a. over 2004-14. In the medium term, banks are busy preparing for the requirements of the Basel II agreement, which comes into effect in 2006. This is likely to lead to integration and consolidation in the industry across Europe.

Non-marketed services

Substantial real increases in government spending since 1997 have helped boost output growth in *Non-marketed services* in recent times, but growth in government spending is expected to be at its peak by 2005 and output growth is forecast to be largely unchanged over 2004-14. The focus of the additional spending will reinforce past spending priorities, with *Education, Health & social work* and *Transport* continuing to be major beneficiaries. In addition, public services are expected to benefit from the impact of rigorous efficiency improvements. The plan is that by the end of 2007/08 the drive for efficiencies will have released an additional £20bn annually, which can be spent on front-line services.

In the long term, government spending on *Public administration & defence* is expected to continue to rise at a modest rate of 1½ per cent p.a., and output is forecast to rise similarly. This will be in conjunction with around 80,000 job cuts over 2005-08 intended to free up funds for frontline services.

Stronger growth in government spending

is expected in *Education* in the long term, although it will slow to 2¾ per cent p.a. by 2008. The growth in output in *Education* is expected to slow in line with spending and average 2¼ per cent p.a. in the long term. Recent strategies set out an agenda for innovation in delivery mechanisms, assisted by technological solutions. While these may not be realised until the end of the current planning period, it would seem that the opportunities for employment growth in the long term will be modest.

Meanwhile, *Health & social work* is expected to see the strongest growth in government spending, averaging 3-3¼ per cent p.a. over 2004-14. The recent increases in spending have delivered real benefits with the number of people on hospital waiting lists continuing to fall. These have also come about as a result of increasing co-operation between the public and private sectors, with the former now allowed to buy services from the latter. This in turn has led to greater competition among private healthcare operators, with overseas providers increasing their presence in the UK and forcing domestic providers to lower their costs. Output in *Health & social work* is expected to grow by 3 per cent p.a. over 2004-14.

3.4 Detailed Employment Prospects by Sector and Industry

Prospects for employment in the various sectors depend upon the balance between, on the one hand, the demand for the goods and services produced in the sector (summarised in its prospects for output growth) and, on the other hand, the impact of productivity gains (allowing more output to be produced by fewer people). This balance is taken account of in the macroeconomic model by the estimated relationship between employment and output in each individual industry.

The key features of projected employment change across the 14 ONS *sectors* are summarised in Figure 3.4 and Tables 3.3-3.6. Figure 3.4 presents annual changes between selected years over the period 1984-2014. Table 3.3 presents further

details at the same broad level of aggregation. Table 3.4 gives projections for individual industrial groups for the key years 2009 and 2014. Tables 3.5 and 3.6 summarises results for the Sector Matrix Industries which are dealt with in detail in Chapter 6.

Primary & utilities

Employment is expected to continue to decline in the *Primary & utilities* sector. Employment in *Agriculture, etc* will continue to decline as smaller farms close and larger farms continue to substitute machines for labour. The main factor leading to employment decline in the medium term is the diversification from food producing to other activities in the rural economy. Many who used to work in farming may continue working in the same place, but in different activities. However, many in the industry believe that diversification cannot be a panacea for the continuing decline of agriculture. In the long term, productivity growth is expected to outpace output growth and so employment is expected to fall by 1-1¾ per cent p.a., while the UK economy is expected to register employment growth of around ½ per cent p.a.

The UK *Coal* industry is going through an uncomfortable period of retrenchment as the principal mining company, UK Coal, strives to boost efficiency in an effort to compete with the increasing penetration of the home market by imports. The rate of job loss in the industry is expected to ease in the medium term and remain steady in the long term at around 2¾ per cent pa. The sharp decline in *Oil & gas* production will come to a temporary halt over 2006-07 but the long term trend remains negative. Productivity will also fall in the long term, albeit at a slower rate. As a result of these trends, employment in *Oil & Gas* is expected to continue falling in the long term.

In *Electricity, gas & water*, the decline in employment is expected to continue in the long term, albeit at a much slower rate than in the early and mid-1990s. Most of

the job losses have reflected the very substantial productivity gains achieved following privatisation. The pace of such restructuring is expected to slow, following the high number of mergers and acquisitions in recent years. Productivity growth in Electricity, gas & water supply will remain healthy, but in Electricity & gas supply it will be well below the rates achieved in the 1990s.

Manufacturing

The *Manufacturing* sector is estimated to have expanded slightly in 2004 but strong productivity growth meant that employment continued to fall, by about 2¼ per cent. This rate of decline is less than in 2003 and it is expected that the decline will be even smaller in 2005. However, the contraction of the labour force is expected to accelerate again in 2006 and 2007. Employment in *Manufacturing* is forecast to fall in 2005 by about ¾ per cent. In *Electronics*, *Electrical engineering* and *Instruments*, however, strong productivity growth in 2005 is expected to result in an accelerated decline in employment, and no return to employment increases is expected before 2007, because global producers are continuing to relocate jobs to countries with lower labour costs, including new members of the EU in central and eastern Europe. *Chemicals* is also expected to see jobs relocated in 2006 and 2007.

Output growth in *Basic metals* accelerated in 2004, but employment fell by 2¼ per cent and it is forecast to fall by 1¾-2 per cent p.a. over 2004-14. In the short to medium term, the prospects for metal goods producers weakened in the third quarter of 2004 due to high raw material and energy costs, competitive trading conditions, and a weaker dollar.

In *Textiles, clothing & leather* the quota system in the international textiles trade was abolished in January 2005, and in response the European Commission has adopted a seven-point plan to minimise the impact on the textiles sub-sector. This is unlikely, however, to prevent the continued loss of jobs in the industry.

Over 2004-09, employment is expected to fall by 6 per cent p.a, while for manufacturing as a whole a fall of about 1¼ per cent p.a. is projected over the same period.

Employment in *Motor Vehicles* is set to continue to decline, as major plants in the UK are closed and manufacturers face increased pressure to cut costs to offset the impact of rising raw material prices. The closure of UK plants does not, on the whole, indicate more general industry-wide problems. It is expected that the UK *Motor Vehicles* industry will maintain its competitiveness, and higher levels of investment are forecast from 2006 onwards. Output growth in *Motor Vehicles* is forecast to remain at around 2 per cent p.a. on average over the period 2004-14, while productivity growth of about 3 per cent p.a. implies that employment will continue to decline.

In the face of technological change leading to higher productivity in some industries and the trend to relocate jobs overseas, employment in *Manufacturing* is projected to fall by 1-1¼ per cent p.a. over 2004-14.

Construction

Employment in *Construction* has been increasing strongly in recent years, by 4½ per cent in 2003 and 4¾ per cent in 2004. The new jobs are being taken partly by a net influx into the industry from other (mainly manufacturing) industries in which employment is declining, and partly by immigration. Employment growth is expected to be more subdued over the medium term, as lower sales volumes and increasing production costs increase the pressure on construction companies. Over 2004-14, the drive to boost productivity is expected to lead to a further increase in the use of factory-built (prefabricated) components and so employment in *Construction* is expected to decline by around ½-¾ per cent p.a. over the period.

Distribution, transport , etc.

In *Retailing* and *Distribution*, the largest job gains in the short and medium terms are expected to be in *Retailing*. Many of the jobs created are expected to be part-time. In *Distribution*, the downward trend in employment will come to an end in 2006 and long-term growth of ½ per cent p.a. is expected. Employment growth in *Retailing* is expected to weaken, by recent standards, over 2004-14, to ¾-1 per cent p.a. In *Hotels & restaurants* productivity growth peaked at 4 per cent in 2004 and is expected to fall back to 1 per cent p.a. over the long term. This will be matched by slower growth and skilled labour shortages in some sub-sectors with the net effect being slower employment growth in both the medium and long term.

In *Land transport*, employment has barely been growing in recent years and is expected to decline in 2005 and 2006. The pressures to control costs on the rail network, and the restructuring of travel intermediaries' activities, will act as a counterweight to any jobs growth in urban transport systems. Over the long term employment growth is expected to average less than ½ per cent p.a. Since world trade is being carried in ever larger ships, sea freight is not going to be a source of strong jobs growth in *Water transport*; nor are passenger services, because even in ocean cruisers costs have to be kept under control. Average job growth of less than ½ per cent p.a. is expected over 2004-09.

Employment in *Air transport* fell by about 2 per cent in 2004. Job cuts in the industry have been mostly in administration and support functions. Increasingly, traditional carriers such as BA are adopting the tactics of the budget airlines in making greater use of the internet for bookings and outsourcing administration and customer care functions. These pressures on employment are being offset, to some extent, by the increase in capacity on both intra-EEA and intercontinental services. In the short and medium term, employment growth is expected to be modest, peaking at 2 per cent in 2006 before settling at

around 1½ per cent p.a. over 2004-09.

In *Communications*, cost cutting contributed to the 4 per cent fall in employment in 2004. With productivity expected to grow at around 5¾ per cent p.a. on average in the short and medium term, employment is unlikely to change much over 2005-08. Indeed, employment is not forecast to grow by more than 6,000 over the next ten years, while output is expected to grow at just under 6 per cent p.a. between 2005-15, and as a result productivity growth will remain relatively high.

Business & other services

Output growth in *Business Services* was more than 6½ per cent in 2004, driven by an acceleration in industrial and investment demand growth.

Output growth in *Financial services* is expected to weaken in the medium term as the economy slows, but employment is expected to increase as company returns improve. In the long term, productivity growth is expected to be slightly weaker than it was over 1995-04 but still be strong enough to meet the growth in output. Hence, employment growth is expected to average no more than ½ per cent p.a. over 2004-09 and is expected to be negative over 2009-14.

The trend in offshoring jobs will have contributed to the 2½ per cent fall in employment in *Insurance* in 2004. However, overall employment is expected to remain little-changed over 2005-06. In the long term productivity growth is expected to average 1¼ per cent p.a, and employment is forecast to increase by around ½ per cent p.a.

In *Professional services* productivity growth peaked in the period 2000-04 and is expected to weaken over the next ten years. Output growth is expected to weaken also but remain above the rate for the rest of the economy. The industry will continue to be shaped by globalization and consolidation. As a result of all these trends, employment growth is expected to

slow in the short term but pick up to 1-1¼ per cent p.a. over 2004-14.

In *Computing services*, short-term employment prospects will be affected by conflicting forces. The off-shoring of services and the slowdown of the economy should mean weaker employment demand. With employers also reporting a shortage of IT professionals, one would expect falling levels of employment; but the proportion of firms in the industry planning to recruit is at its highest level in two years. The period of correction following the excesses of the dotcom boom is nearly at an end; and long-term employment growth should be strong.

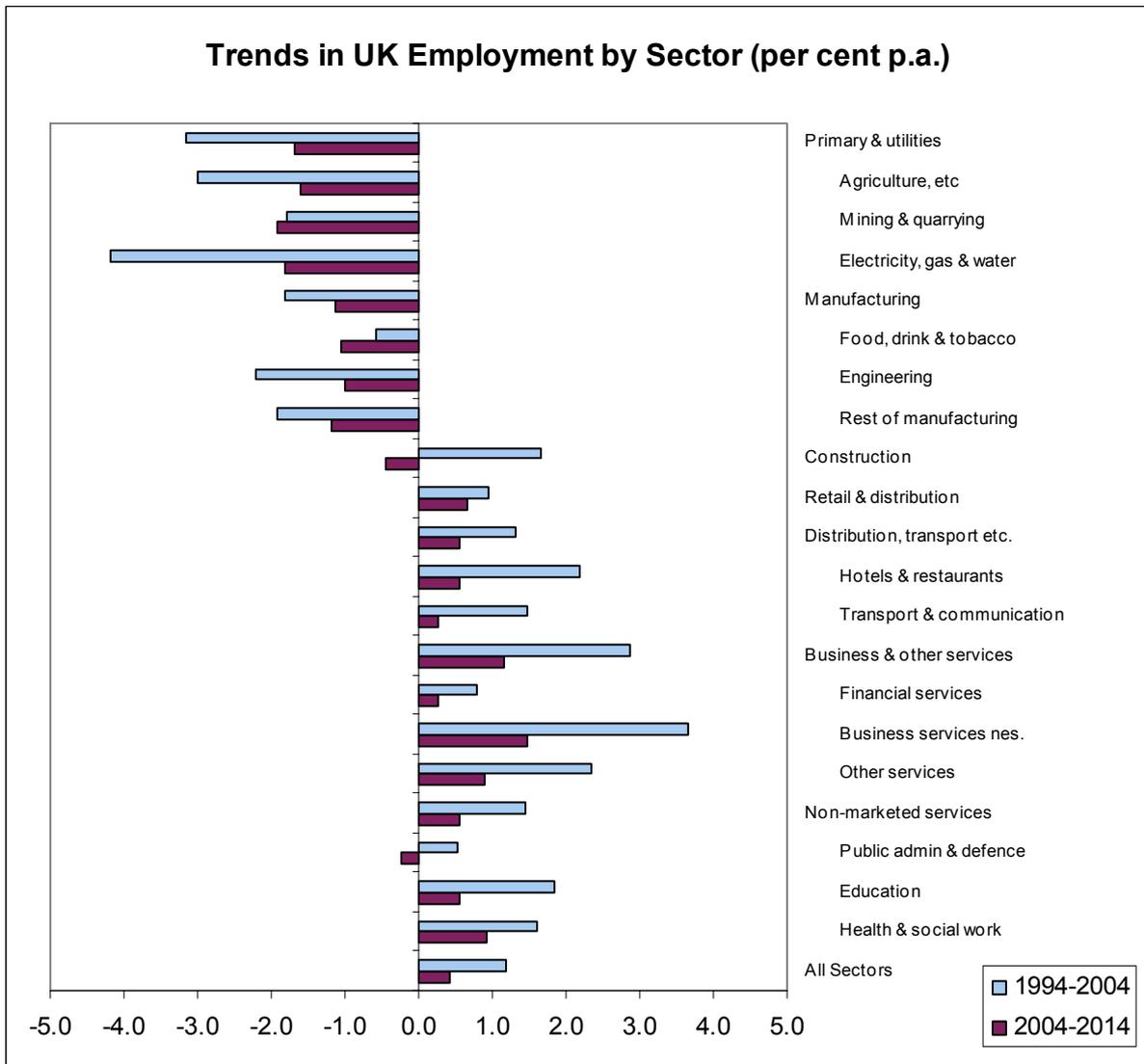
Non-Marketed Services

Employment in *Public administration & defence* is set to fall as the Government seeks to cut costs. The 2004 Spending Review and supporting documents highlighted the intended job cuts in civil service administration. It is unlikely that these plans will have much impact on overall employment levels in the short term, though the recent growth in employment is expected to come to an end. Employment is expected to remain

little-changed in 2005 and 2006. In the longer term there is expected to be a loss of jobs, continuing beyond the horizon of the latest Spending Review. The industry's labour force is expected to contract over the forecast period.

In *Education*, there has been a steady rise in the number of teachers in service since 1997, accompanied by a much sharper rise in the number of support staff, particularly teaching assistants and special needs support staff. Towards the end of the 1990s the number of people entering initial teacher training courses started an upward trend and is now 25-30 per cent higher than at the low point. There has been a corresponding decline in the number of teaching vacancies. Recent strategies set out an agenda for innovation in delivery mechanisms, assisted by technological solutions. While these may not be realised until the end of the current planning period, it would seem that the opportunities for employment growth in the long term will be modest, only around ½ per cent p.a.

Figure 3.4:



Source: CE/IER estimates, MDM C51F8A, 6725Output.xls, (Figures 3.4 and 3.5).

Notes: See notes to Table 3.3.

Table 3.3: Projections of Output and Productivity by Detailed Sector (per cent p.a.)

	Output				Productivity ^d			
	1994-1999	1999-2004	2004-2009	2009-2014	1994-1999	1999-2004	2004-2009	2009-2014
<i>Primary and utilities</i> ^b	0.7	0.4	0.6	0.8	3.5	4.2	2.2	2.7
1. Agriculture, etc	1.0	-0.5	1.3	1.0	3.0	3.7	2.8	2.8
2. Mining & quarrying	-4.7	-0.4	-2.7	-1.8	-5.4	4.1	-0.7	0.0
4. Electricity, gas & water	2.3	1.2	1.0	1.2	9.4	3.1	2.7	3.2
<i>3. Manufacturing</i> ^b	0.8	-0.4	1.7	1.5	0.5	3.6	2.8	2.7
Food, drink & tobacco ^c	0.1	0.2	1.1	0.5	-1.0	2.4	2.1	1.6
Engineering ^c	1.5	-1.3	2.6	2.0	0.3	4.6	3.4	3.2
Rest of manufacturing ^c	0.8	-0.3	1.5	1.6	0.9	3.5	2.8	2.8
<i>5. Construction</i> ^b	1.4	3.0	1.1	1.7	1.2	-0.1	1.6	2.1
<i>Distribution transport etc.</i> ^b	3.3	3.0	2.6	2.6	1.8	1.9	2.1	2.0
6. Retail & distribution	3.4	3.5	2.3	2.2	2.2	2.7	1.7	1.5
7. Hotels & restaurants	2.4	2.8	2.1	1.8	-0.1	0.9	1.4	1.3
8. Transport & communication	3.5	2.5	3.3	3.5	2.1	0.9	3.3	3.0
<i>Business & other services</i> ^b	5.3	4.5	3.0	2.9	1.7	2.3	1.9	1.7
9. Financial services	3.8	3.1	2.7	2.2	3.0	2.4	2.2	2.2
10. Business services nes.	6.2	5.6	3.4	3.5	1.4	2.9	2.1	1.8
14. Other services	4.2	2.3	1.6	1.6	1.4	0.3	0.7	0.7
<i>Non-marketed services</i> ^b	1.5	2.2	2.7	2.3	0.8	0.1	2.0	1.8
11. Public administration & defence	-0.4	1.9	2.1	2.0	0.7	-0.2	2.3	2.3
12. Education	1.5	0.6	2.2	2.0	-0.3	-1.3	1.5	1.5
13. Health & social work	3.2	3.9	3.4	2.7	2.4	1.5	2.3	1.9
All Sectors	3.1	2.9	2.4	2.4	1.7	1.9	2.0	1.9

Source: CE/IER estimates, MDM C51F8A, 6725output.xls, (Table 3.3).

Note: a) The *Sectors* are defined in Annex A, Table A.7. The 14 Sectors (numbered 1-14) are as used by ONS. These have been expanded to include some detail within manufacturing for comparison with the more detailed *Spatial Report*, which uses this set of extended Sectors.

b) *Broad sectors* are indicated by italics, The Broad Sectoral groupings are defined in Annex A, Table A.8.

c) The industry groups within manufacturing are those used in the companion *Spatial Report*.

d) Output per person.

Table 3.4: Projections of Employment by Detailed Sector

	% p.a.				000s			
	1994-1999	1999-2004	2004-2009	2009-2014	1994-1999	1999-2004	2004-2009	2009-2014
<i>Primary and utilities</i> ^b	-2.7	-3.6	-1.6	-1.8	-107	-124	-46	-49
1. Agriculture, etc	-2.0	-4.0	-1.4	-1.8	-56	-97	-30	-34
2. Mining & quarrying	0.7	-4.3	-2.0	-1.8	3	-15	-6	-5
4. Electricity, gas & water	-6.6	-1.8	-1.7	-1.9	-54	-12	-10	-10
<i>3. Manufacturing</i> ^b	0.3	-3.9	-1.1	-1.2	56	-779	-192	-191
Food, drink & tobacco ^c	1.0	-2.2	-1.0	-1.1	26	-53	-23	-23
Engineering ^c	1.2	-5.6	-0.8	-1.2	52	-229	-26	-39
Rest of manufacturing ^c	-0.1	-3.7	-1.2	-1.2	-22	-497	-143	-129
<i>5. Construction</i> ^b	0.2	3.1	-0.5	-0.4	18	297	-51	-41
<i>Distribution transport etc.</i> ^b	1.5	1.2	0.5	0.6	587	498	218	280
6. Retail & distribution	1.1	0.8	0.6	0.7	267	189	149	188
7. Hotels & restaurants	2.5	1.9	0.6	0.5	205	177	65	48
8. Transport & communication	1.4	1.5	0.1	0.5	115	132	5	44
<i>Business & other services</i> ^b	3.6	2.2	1.1	1.3	1,124	796	426	530
9. Financial services	0.8	0.7	0.5	0.1	46	42	29	3
10. Business services nes.	4.7	2.6	1.3	1.7	862	583	311	438
14. Other services	2.8	1.9	0.9	0.9	216	171	86	89
<i>Non-marketed services</i> ^b	0.7	2.2	0.7	0.4	221	739	250	166
11. Public administration & defence	-1.1	2.2	-0.1	-0.4	-81	156	-8	-27
12. Education	1.8	1.9	0.6	0.5	188	221	76	64
13. Health & social work	0.8	2.4	1.1	0.7	114	362	183	129
All Sectors	1.4	1.0	0.4	0.4	1,898	1,427	606	695

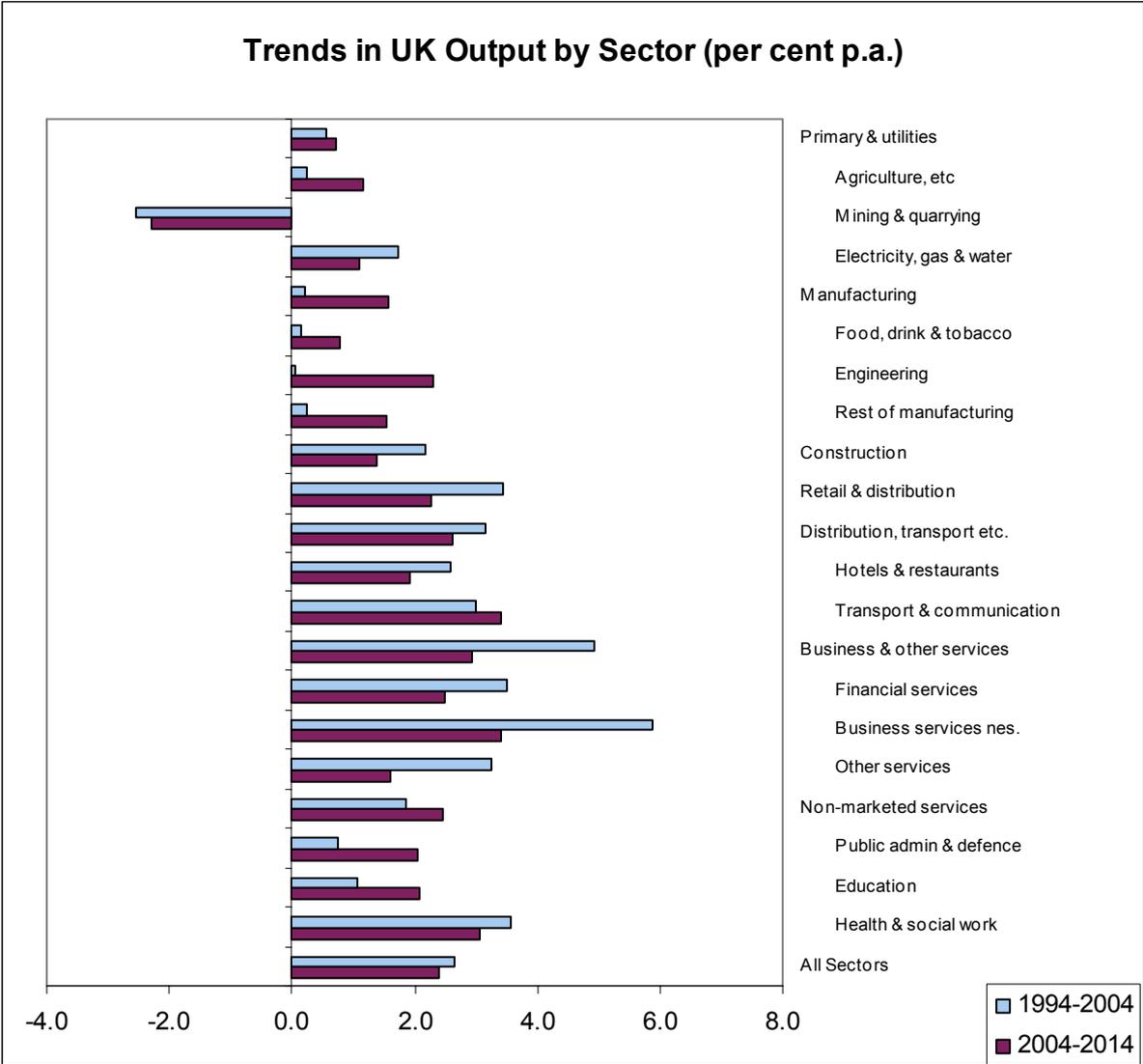
Source: CE/IER estimates, MDM C51F8A, 6725output.xls, (Table 3.3).

Note: a) The *Sectors* are defined in Annex A, Table A.7. The 14 Sectors (numbered 1-14) are as used by ONS. These have been expanded to include some detail within manufacturing for comparison with the more detailed *Spatial Report*, which uses this set of extended Sectors.

b) *Broad sectors* are indicated by italics, The Broad Sectoral groupings are defined in Annex A, Table A.8.

c) The industry groups within manufacturing are those used in the companion *Spatial Report*.

Figure 3.5:



Source: CE/IER estimates, MDM C51F8A, 6725Output.xls, (Figures 3.4 and 3.5).
 Notes: See notes to Table 3.3.

Table 3.5: Projections of Employment by Industry

Absolute levels and changes (000s)

	Levels		Changes			
	2004	2009	2014	2004-09	2009-14	2004-14
Agriculture, etc	426	396	362	-30	-34	-64
Mining & quarrying, Electricity, gas & water	183	167	152	-16	-15	-31
(of which:) <i>Mining & quarrying</i> ^a	61	55	51	-6	-5	-11
<i>Electricity, gas & water</i> ^a	122	112	102	-10	-10	-20
Food drink & tobacco	458	435	412	-23	-23	-46
Textiles & clothing	183	131	109	-53	-21	-74
Wood, pulp & paper; Printing & publishing	566	548	529	-18	-19	-37
(of which:) <i>Wood, pulp & paper</i> ^a	188	176	162	-13	-14	-27
<i>Printing & publishing</i> ^a	378	372	367	-5	-5	-10
Chemicals & non-metallic mineral products	599	569	527	-31	-42	-73
Metals & metal goods	470	443	418	-27	-25	-52
Machinery, electrical & optical equipment	681	655	617	-26	-39	-64
Transport equipment	362	341	317	-21	-24	-45
Other manufacturing & recycling	233	240	241	7	2	8
Construction	2,090	2,039	1,999	-51	-41	-92
Sale & maintenance of motor vehicles	671	663	689	-7	26	18
Wholesale distribution	1,240	1,278	1,307	39	29	68
Retailing	3,145	3,262	3,395	117	133	250
Hotels & restaurants	1,962	2,026	2,074	65	48	112
Transport	1,286	1,290	1,327	4	37	41
Communications	527	528	535	1	7	8
Financial services	1,162	1,190	1,194	29	3	32
Professional services	803	894	1,020	91	126	217
Computing services	550	605	711	55	106	161
Other business services	3,430	3,595	3,801	165	205	371
Public administration & defence	1,535	1,527	1,500	-8	-27	-35
Education	2,443	2,519	2,582	76	64	140
Health & social work	3,224	3,407	3,536	183	129	312
Other services	1,871	1,956	2,045	86	89	174
Total	30,099	30,705	31,399	605	695	1,300

Source: CE/IER estimates, MDM C51F8A, 25UK.xls, (Table 3.4a).

Notes: a) Because of their small size in terms of total employment, *Mining & quarrying* and *Utilities and Wood & paper* and *Printing & publishing* have been combined for most of the reporting. Separate results are presented where the data are sufficiently robust, as is the case here.

Table 3.6: Output, Productivity and Employment Changes for the 25 Industry Groups

	% changes in the periods shown								
	Output			Productivity			Employment		
	1999-2004	2004-2009	2009-2014	1999-2004	2004-2009	2009-2014	1999-2004	2004-2009	2009-2014
Agriculture, etc	-2.2	6.8	5.0	20.0	14.9	14.8	-18.5	-7.0	-8.6
Mining & quarrying, Electricity, gas & water	4.4	1.5	3.6	19.6	11.2	13.9	-12.7	-8.7	-9.1
Food, drink & tobacco	1.0	5.6	2.4	12.7	11.2	8.1	-10.4	-5.0	-5.3
Textiles & Clothing	-30.5	-30.7	-7.7	33.5	-2.8	10.3	-48.0	-28.7	-16.3
Wood, pulp & paper; Printing & publishing	-2.5	5.5	5.3	7.7	8.9	9.1	-9.4	-3.2	-3.5
Chemicals & non-metallic mineral products	7.2	13.4	12.4	23.9	19.5	21.4	-13.5	-5.1	-7.4
Metals & metal goods	-5.1	5.3	3.0	17.5	11.8	9.0	-19.2	-5.8	-5.6
Machinery, electrical & optical equipment	-6.5	13.8	10.2	25.0	18.2	17.1	-25.2	-3.8	-5.9
Transport equipment	2.0	11.2	9.5	15.8	18.2	17.7	-12.0	-5.9	-6.9
Other manufacturing & recycling	-3.2	14.0	10.5	2.9	10.9	9.7	-5.9	2.8	0.7
Construction	16.0	5.6	8.7	-0.4	8.2	11.0	16.5	-2.4	-2.0
Sale & maintenance of motor vehicles	6.1	8.7	7.6	10.3	9.3	7.4	-3.8	-0.6	0.2
Wholesale distribution	14.0	15.5	14.1	19.9	12.4	9.6	-4.9	2.8	4.1
Retailing	28.4	11.0	10.8	17.0	7.0	6.4	9.8	3.7	4.1
Hotels & restaurants	15.0	10.8	9.3	4.6	7.2	6.8	9.9	3.3	2.4
Transport	11.9	9.1	8.4	3.9	8.8	5.4	7.7	0.3	2.9
Communications	14.7	31.1	31.9	6.0	30.8	30.2	8.1	0.2	1.3
Financial services	16.7	14.5	11.7	12.5	11.7	11.3	3.8	2.5	0.3
Professional services	26.7	10.5	13.2	10.2	13.7	10.0	15.0	-2.8	2.9
Computing services	41.9	33.1	32.1	21.3	21.0	12.3	17.0	10.0	17.6
Other business services	32.2	19.1	17.1	16.8	10.3	8.1	13.1	8.0	8.3
Public administration & defence	10.0	11.2	10.3	-1.1	11.8	12.3	11.3	-0.5	-1.8
Education	3.2	11.3	10.5	-6.1	7.9	7.8	10.0	3.1	2.5
Health & social work	21.2	18.4	14.2	7.6	12.0	10.1	12.7	5.7	3.8
Other services	11.8	8.3	8.1	1.6	3.6	3.4	10.1	4.6	4.5
Total	15.5	12.7	12.4	10.0	10.4	9.9	5.0	2.0	2.3

Source: CE/IER estimates, MDM C51F8A, 6725output.xls, (Table 3.6).

In *Health & social work*, the substantial increases in employment seen over 2000-04 are not expected to be repeated, and job creation will return to pre-1997 levels. The demand for health and social care will be driven by a number of long-term factors, such as the aging population, rising expectations and average incomes. The demographic trends will stimulate demand from both government and individuals and this is expected to lead to long-term output growth in the industry of around 3 per cent p.a. Despite the considerable initiatives to raise productivity in the sector, the nature of the industry will limit results. As a result, employment is projected to rise by around ¾ per cent p.a. over 2004-14.

3.5 Changing Patterns of Employment by Status and Gender

The past few decades have seen dramatic shifts in the pattern of employment by status and gender. Women now account for almost half the workforce and there has been a huge shift in favour of part-time as opposed to full-time jobs. Many of these changes can be linked to changes in the industrial composition of employment. In particular, the decline of employment opportunities in the *primary & utilities* sector and in the *manufacturing* sector has resulted in the loss of many full-time jobs, traditionally held by men. The growth of jobs in the services sector, by contrast, has created many employment opportunities for women, particularly those wanting to work part-time. These demand side factors have been complemented by supply side changes which have reflected the increasing propensity of women to want to take an active role in the formal economy. More recently there have been some indications of a change in these trends, with males beginning to reverse the previous steady decline in their employment shares, showing increases in employment shares in some parts of the service sector, especially those that are continuing to grow rapidly.

In broad sectors such as *construction, distribution, transport, etc.* and in *business & other services*, there was also a

significant increase in the numbers of those classified as self-employed in the 1980s and early 1990s. This was attributed to a range of factors, including a response to high unemployment levels, increasing entrepreneurial activity and the effects of tax breaks. More recently this trend has reversed, especially in construction, as the Inland Revenue has tightened up regulations about self-employment status. In distribution, the decline of many small businesses, in the face of competition from large chains, has also been an important factor.

Table 3.7 summarises the present position with regard to the patterns of employment by status and gender for the total UK workforce. It also indicates how this is expected to change over the next decade. Table 3.8 presents the data in terms of the percentage shares of each gender status group, whilst the complementary Table 3.9 shows the same information in terms of changes in absolute numbers. Figure 3.6 summarises the main trends graphically.

Gender shares

In contrast to recent historical trends the female share of employment is now expected to increase only very slowly over the next decade. The number of females in employment is projected to rise by over just over 600 thousand, whilst the corresponding figure for males rises only slightly. By 2014 females are expected to account for just under 47 per cent of all jobs which is only marginally higher than in 2004.

The tables and charts also illustrate that these patterns vary significantly across sectors. However the underlying trends are common across nearly all industries. The main difference compared to previous assessments is that males are now finding employment in many more parts of the service sector than was previously the case and this has stopped the previously observed sharp decline in male employment shares.

Part-time/full-time working

Part-time employment is expected to continue to increase in relative importance for both men and women. The increases are more significant for women but the number of males in part-time jobs is now substantial in many sectors. A significant increase in the number of full-time jobs is now projected, benefiting both males and females (see Table 3.9).

Again, although the overall patterns vary across sectors, the underlying trend towards an increasing share for part-time working is common across most sectors (see Table 3.10).

Self-employment

The share of self-employment is projected to continue its recent decline over the next decade, particularly self-employment for males. This decline is expected to be less rapid than observed over the past few years. As noted below, the recent restructuring of employment status that has affected the construction sector, in particular, is assumed to have reached its limit. The share of self-employment amongst employed females is expected to decrease slightly over the forecast period.

Differences by broad sector

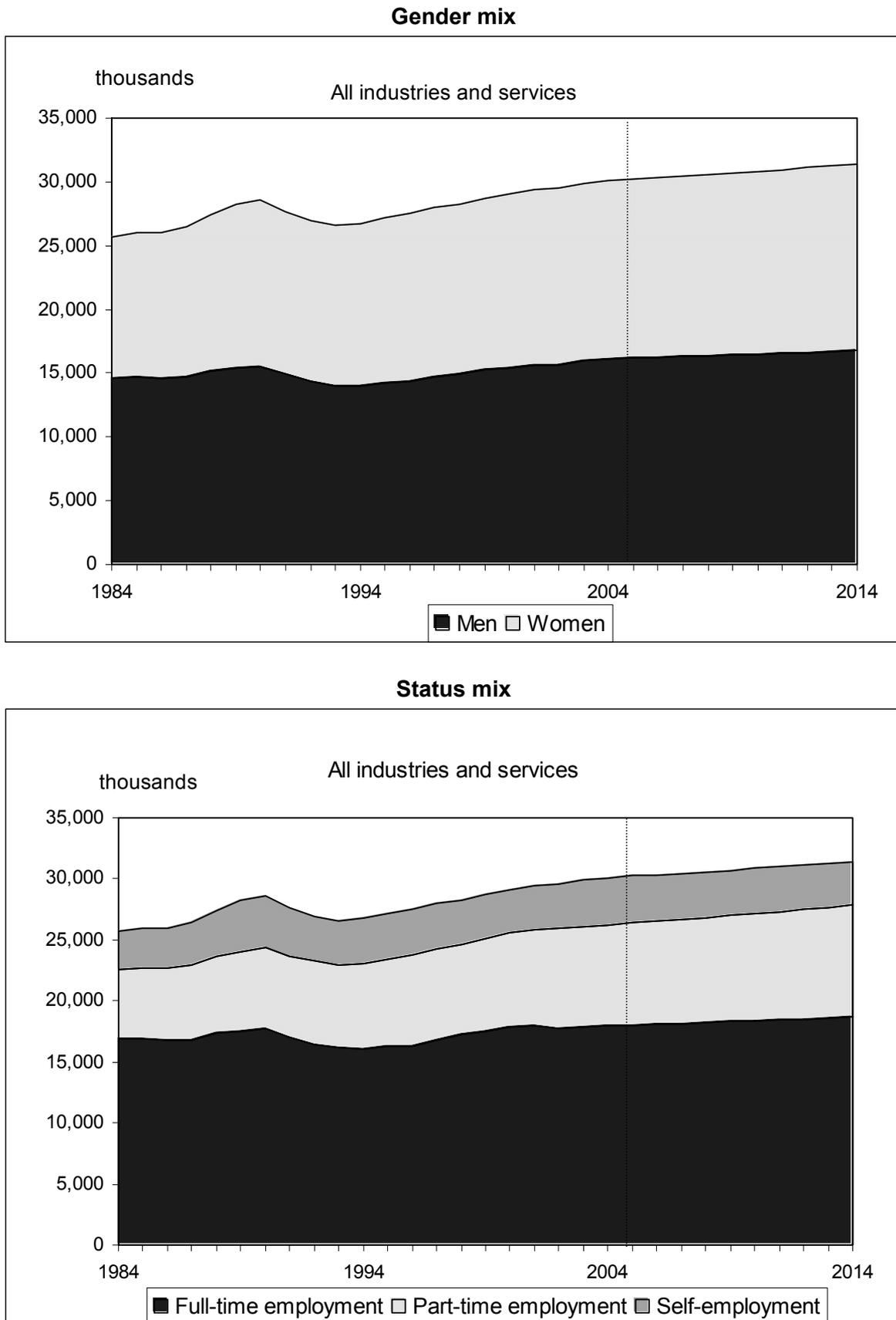
The patterns for six *broad sectors* are summarised in Table 3.10 and Figures 3.7 and 3.8. These highlight the marked difference between sectors in overall employment shares by gender and status

but also the common trends that apply in most industries.

Employment in the three service sectors is predominantly female (see the bottom half of Table 3.10 and the individual sector panels in Figure 3.6). These 3 broad sectors are forecast to show strong total employment growth over the next decade. The number of part-time jobs is also much higher in these sectors than in other parts of the economy (see Figure 3.7). Distribution, hotels and catering, miscellaneous services and health and education services are the industries with the highest concentration of part-time jobs and employment levels in these industries are projected to continue to grow strongly in the future.

The upward trend in self-employment over much of the 1980s and 1990s, especially for males, is illustrated in Figure 3.7. The widening area depicting self-employment is especially apparent in the figure for construction over this period. However, recent changes in rules and regulations in relation to self-employment status and the liability to pay income taxes and national insurance contributions have halted the strong growth trend in some of these industries (especially in construction). The projections show declining future trends in self-employment, especially within construction and the broad sector which includes distribution, hotels, catering, transport and communications.

Figure 3.6: Changing Patterns of Employment by Gender and Status, 1984-2014



Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.6 and Figure 3.7).

Table 3.7: Employment Status for the UK

				000s
2004				
Employment by Gender	FT	PT	SE	Total
Male employment	11,244	2,071	2,800	16,115
Female employment	6,680	6,232	1,073	13,985
Total employment	17,924	8,302	3,873	30,099
2009				
Employment by Gender	FT	PT	SE	Total
Male employment	11,461	2,232	2,710	16,404
Female employment	6,834	6,460	1,006	14,301
Total employment	18,296	8,692	3,717	30,705
2014				
Employment by Gender	FT	PT	SE	Total
Male employment	11,688	2,435	2,627	16,749
Female employment	6,993	6,707	950	14,650
Total employment	18,681	9,142	3,577	31,399

Source: CE/IER estimates, MDM C51F8A Forecast, AllUK.xls, (Table 3.5).

Table 3.8: Shares by Employment Status for the UK

				%
2004				
Employment by Gender	FT	PT	SE	Total
Male employment	37.4	6.9	9.3	53.5
Female employment	22.2	20.7	3.6	46.5
Total employment	59.6	27.6	12.9	100.0
2009				
Employment by Gender	FT	PT	SE	Total
Male employment	37.3	7.3	8.8	53.4
Female employment	22.3	21.0	3.3	46.6
Total employment	59.6	28.3	12.1	100.0
2014				
Employment by Gender	FT	PT	SE	Total
Male employment	37.2	7.8	8.4	53.3
Female employment	22.3	21.4	3.0	46.7
Total employment	59.5	29.1	11.4	100.0

Source: CE/IER estimates, MDM C51F8A Forecast, AllUK.xls, (Table 3.6).

Table 3.9: Changes in Employment Status for the UK

				000s
2004-2009				
Employment by Gender	FT	PT	SE	Total
Male employment	217	162	-90	289
Female employment	154	229	-66	316
Total employment	371	390	-156	605
2009-2014				
Employment by Gender	FT	PT	SE	Total
Male employment	226	202	-83	345
Female employment	159	247	-56	349
Total employment	385	449	-140	695
2004-2014				
Employment by Gender	FT	PT	SE	Total
Male employment	444	364	-173	635
Female employment	313	475	-123	665
Total employment	756	840	-296	1,300

Source: CE/IER estimates, MDM C51F8A Forecast, AllUK.xls, (Table 3.7).

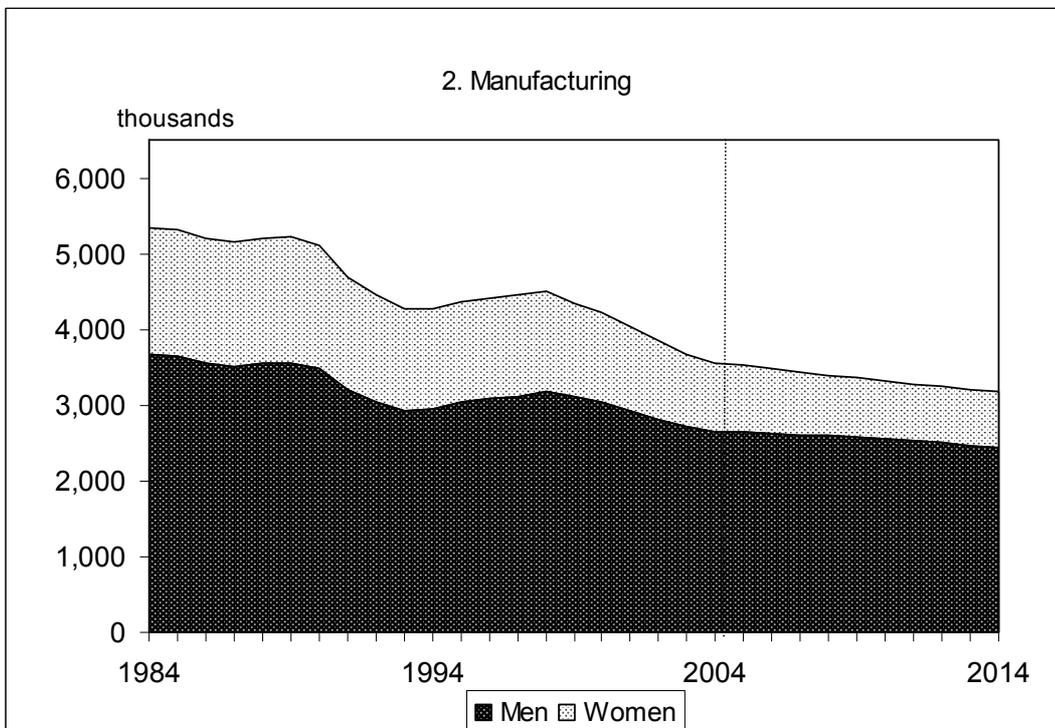
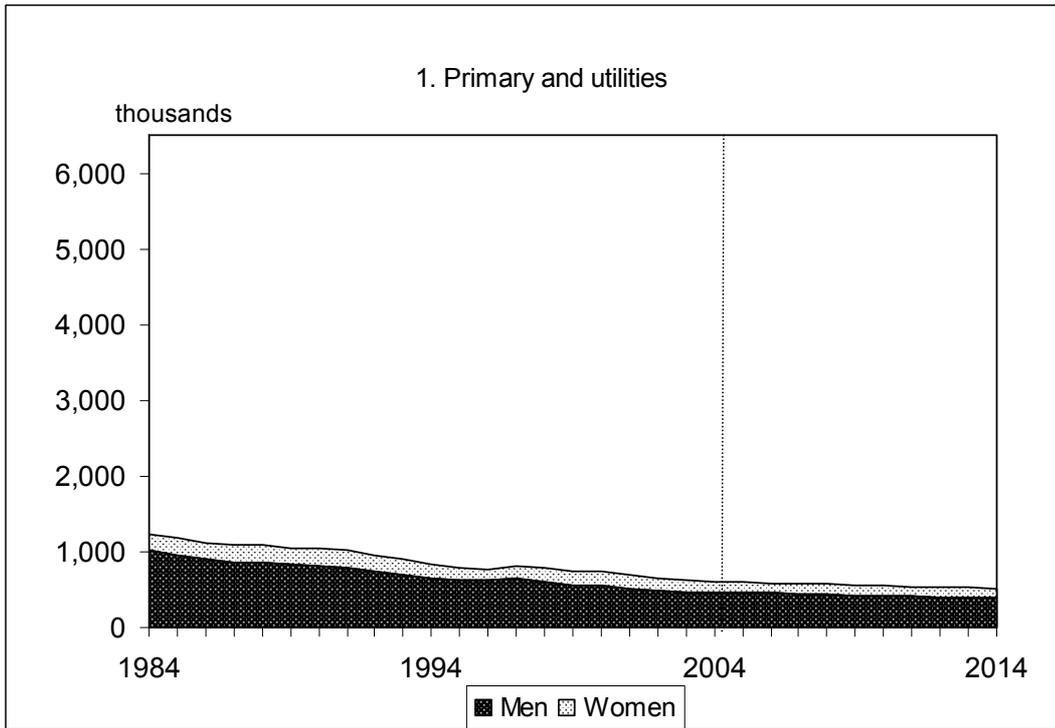
Table 3.10 Composition of Employment by Broad Industrial Sector^a, 1984-2014

	Share of total employment (per cent)				
	1984	1994	2004	2009	2014
<i>Primary & utilities,</i> ^b	4.8	3.1	2.0	1.8	1.6
of which:					
Female employees ^c	17.3	25.2	26.5	24.1	25.6
Self-employed ^c	26.0	36.4	32.0	35.8	36.8
Part-time employees ^c	6.9	10.0	13.5	11.8	12.8
<i>Manufacturing,</i> ^b	20.8	16.0	11.8	10.9	10.1
of which:					
Female employees ^c	32.3	32.8	29.7	24.6	23.5
Self-employed ^c	3.2	7.2	7.3	8.3	9.0
Part-time employees ^c	10.1	9.6	9.2	7.0	7.1
<i>Construction,</i> ^b	7.3	6.6	6.9	6.6	6.4
of which:					
Female employees ^c	8.9	11.3	9.2	10.6	10.7
Self-employed ^c	24.8	47.6	34.9	39.4	37.9
Part-time employees ^c	3.8	4.2	4.7	4.6	4.8
<i>Distribution, transport etc.,</i> ^b	28.6	28.9	29.3	29.5	29.7
of which:					
Female employees ^c	41.9	46.6	46.2	45.2	45.6
Self-employed ^c	12.7	13.6	9.9	8.8	7.3
Part-time employees ^c	28.5	33.0	35.5	36.9	38.3
<i>Business & other services,</i> ^b	17.5	22.0	26.0	26.8	27.9
of which:					
Female employees ^c	44.4	48.0	45.7	44.5	43.7
Self-employed ^c	13.1	14.5	14.8	15.4	14.6
Part-time employees ^c	18.3	20.0	24.0	22.2	21.4
<i>Non-marketed services,</i> ^b	20.9	23.3	23.9	24.3	24.3
of which:					
Female employees ^c	65.8	70.5	67.2	70.1	70.0
Self-employed ^c	3.9	4.7	5.3	5.7	5.6
Part-time employees ^c	35.4	40.4	37.2	39.7	41.0
<i>All industries,</i> ^b	100.0	100.0	100.0	100.0	100.0
of which:					
Female employees ^c					
Self-employed ^c					
Part-time employees ^c					

Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Table 3.8).

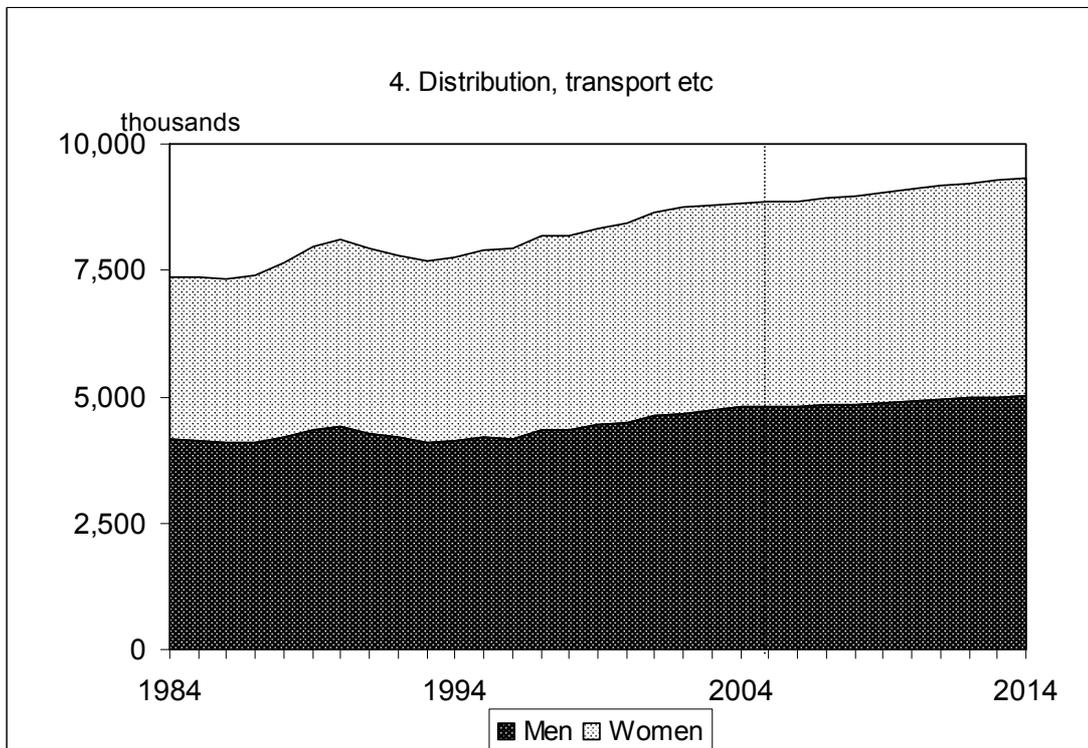
- Note: (a) The sectoral groupings are defined in Annex, Table A.2.
 (b) Percentages of total employment. The shares differ from those in Table 3.2 because the latter includes HM forces in non-marketed services.
 (c) Percentages of employment within the sector

Figure 3.7: Changing Patterns of Employment by Gender in *Broad Sectors*, 1984-2014



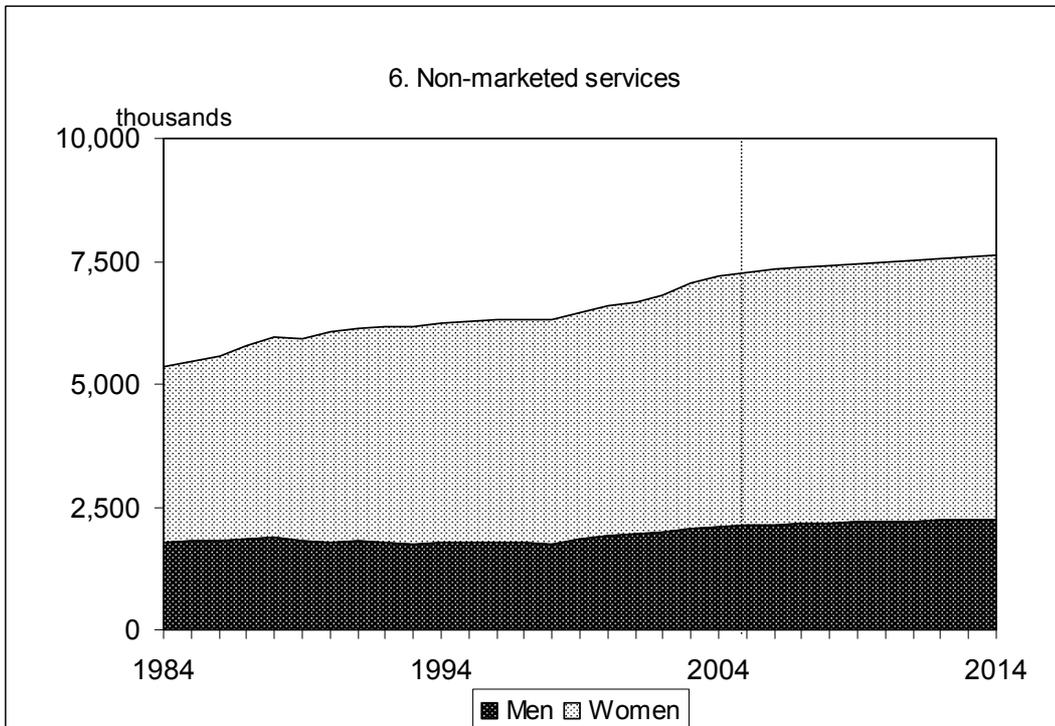
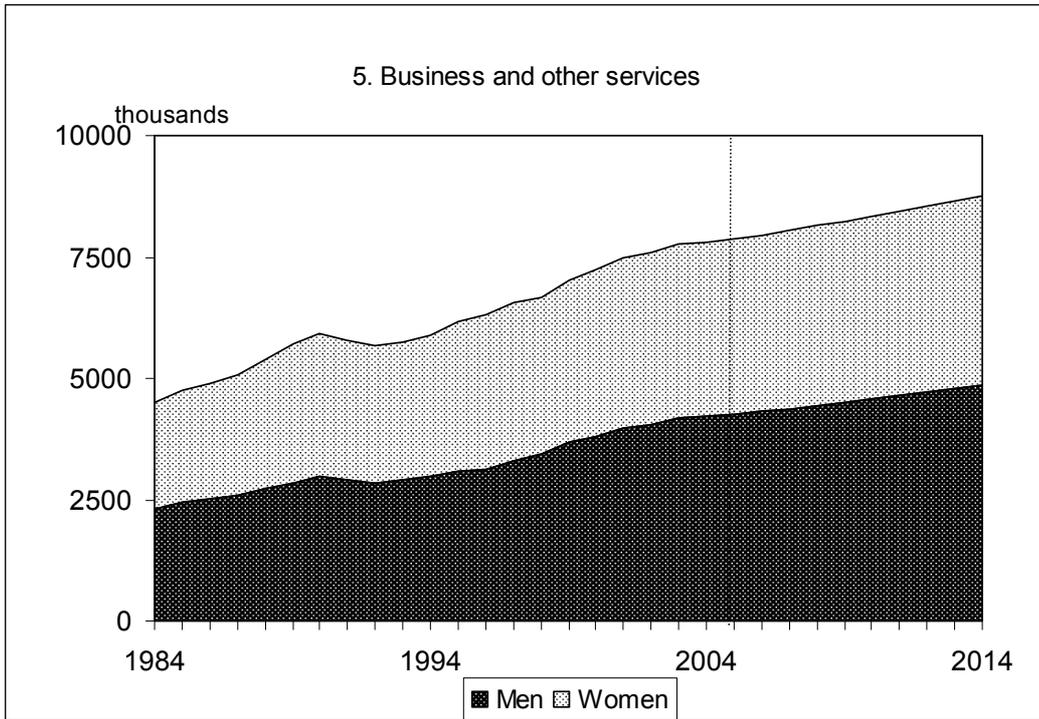
Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.6).
 Notes: Vertical scales differ between some panels.

Figure 3.7: Changing Patterns of Employment by Gender, 1984-2014 (continued)



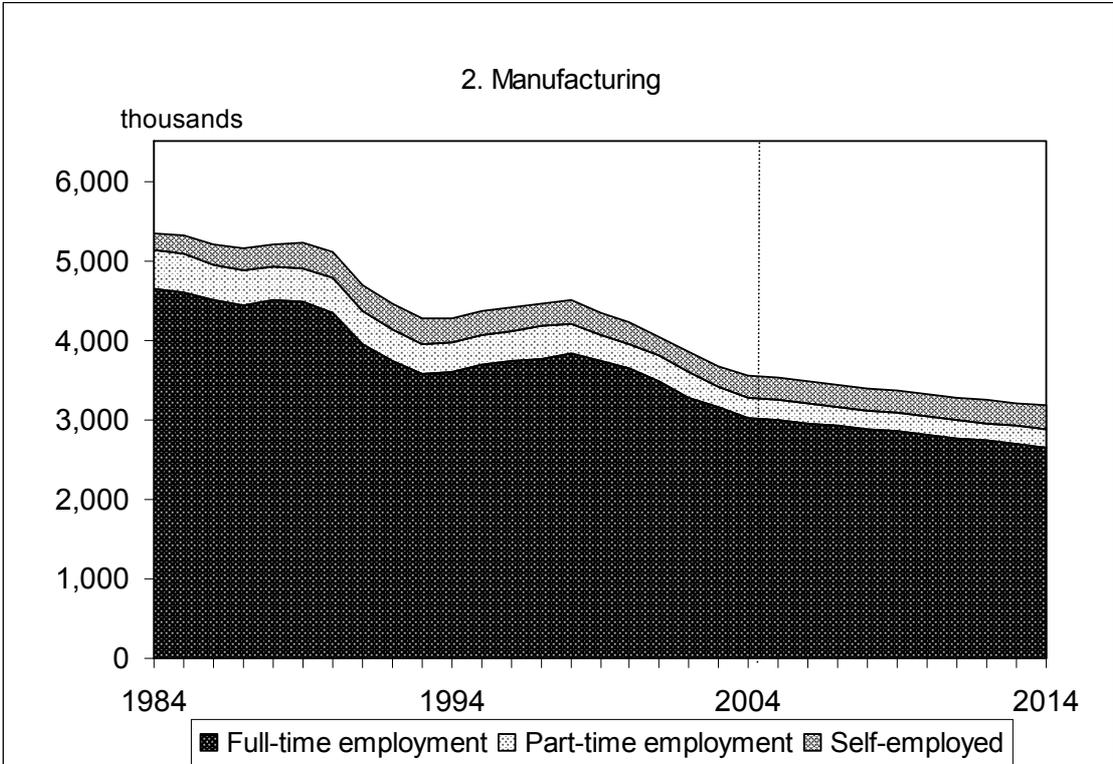
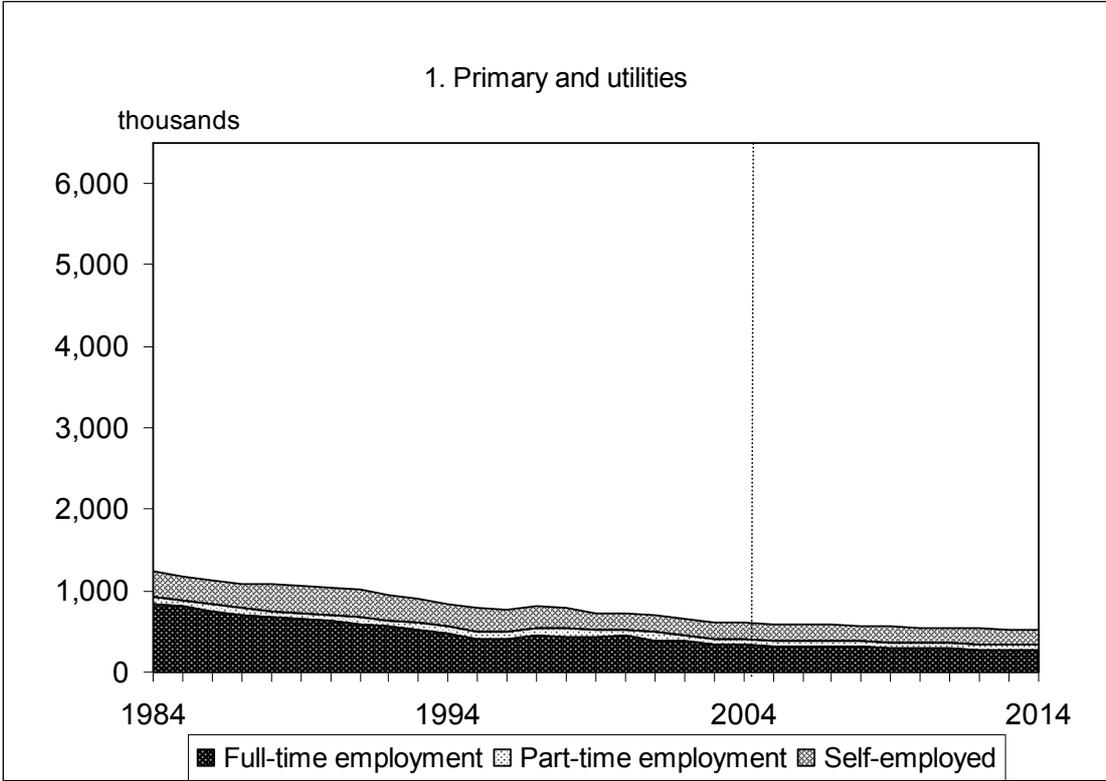
Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.6).
 Notes: Vertical scales differ between some panels.

Figure 3.7: Changing Patterns of Employment by Gender in *Broad Sectors*, 1984-2014 (continued)



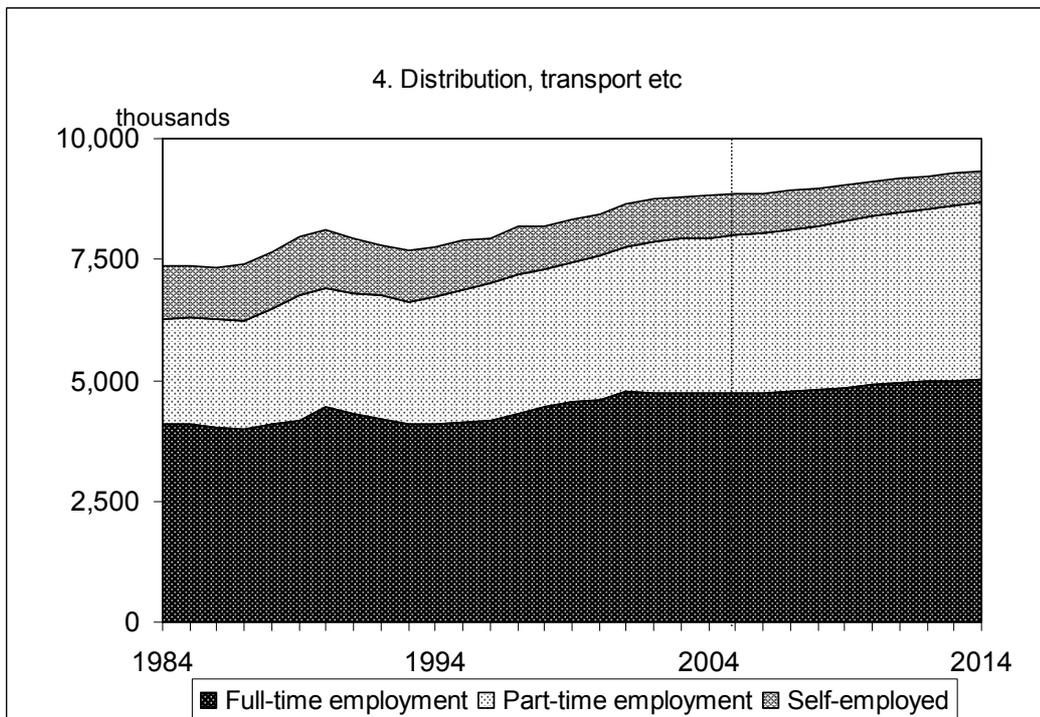
Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.6).
 Notes: Vertical scales differ between some panels.

Figure 3.8: Changing Patterns of Employment by Status in *Broad Sectors*, 1984-2014



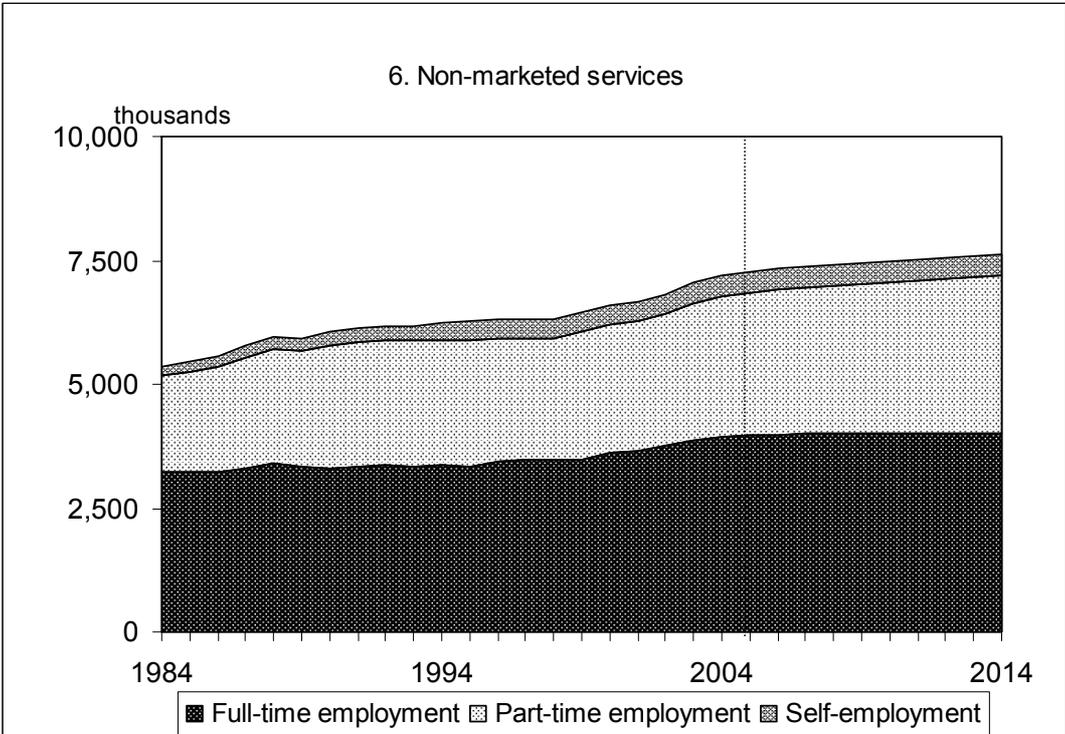
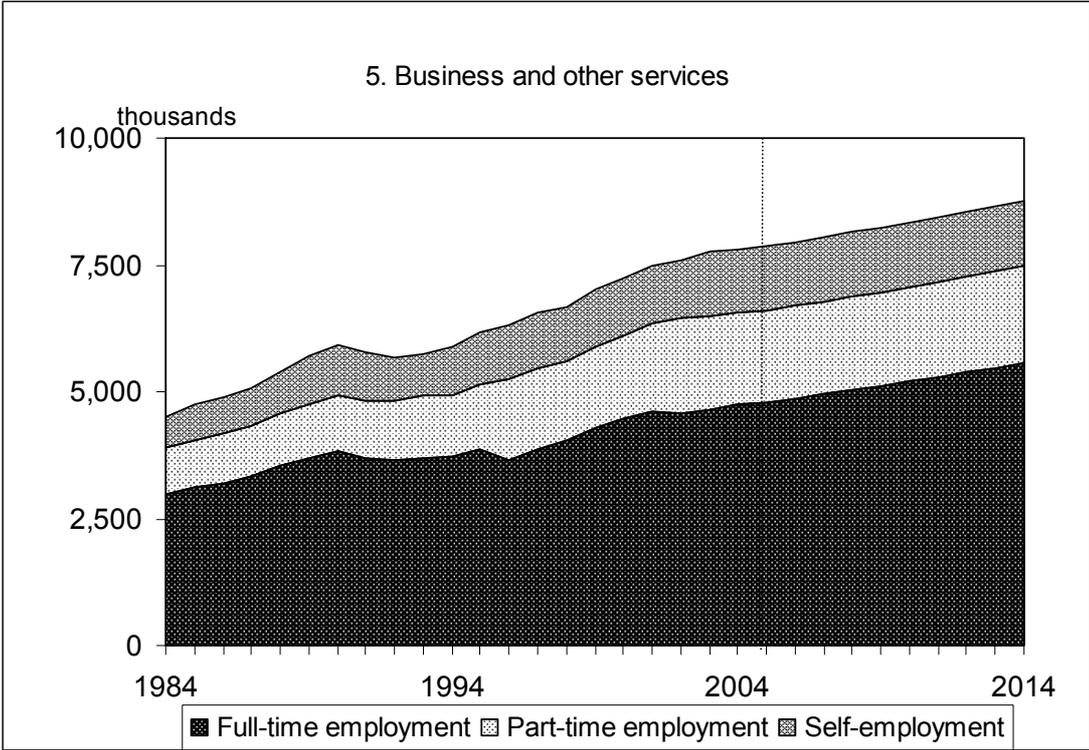
Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.7).
 Notes: Vertical scales differ between some panels.

Figure 3.8: Changing Patterns of Employment by Status in *Broad Sectors*, 1984-2014 (continued)



Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.7).
Notes: Vertical scales differ between some panels.

Figure 3.8: Changing Patterns of Employment by Status in Broad Sectors, 1984-2014 (continued)



Source: CE/IER estimates, MDM C51F8A Forecast, 6UK.xls, (Figure 3.7).
 Notes: Vertical scales differ between some panels.

3.6 Detailed Employment Prospects by SSC “Footprint”

The SfB network has involved the setting up of a number of new SSCs, supported and directed by the Sector Skills Development Agency (SSDA). The remit of the Skills for Business network includes the realisation of a much more powerful role for employers in the skills agenda across the UK. The SSCs, supported by the SSDA, are intended to identify current and future skill and workforce development needs, identify priorities, develop skill strategies and co-ordinate action around workforce development and employment practice to increase performance and productivity above current levels. *Working Futures* provides one potential, common, source of LMI that can feed into the SSCs skill needs assessments and deliberations with partners. Following discussions with the network, additional results have been developed which are customised more closely to the SSCs footprints. These have employed the official core definitions for the SSCs.¹⁹ The SIC codes used are a “best fit” of each SSC’s core business sectors. The extent to which this is an exact fit varies between SSCs. In some case the use of the core SIC codes excludes elements of the SSC footprint because they are included elsewhere.

Generally speaking, historical time series data do not exist for these categories. However the detailed results available from the *Working Futures* database enable an initial assessment to be made of both historical trends and future prospects for these categories. This is done by combining together the results from the 67 detailed industries which underlie the results presented above. These have the advantage of being based on a consistent assessment of the demand for the goods and services provided by these various industries, taking into account the situation across all

industries simultaneously.²⁰

A set of results based on a conversion from the 67 industries has been developed. These results are summarised here. These are based on applying a set of SIC to SSC convertors which differ for each gender status category.²¹ These convertors are based on data from the ABI (for employees) and the LFS (for self employment).

The *Working Futures* database is designed to match headline constraints at regional, sectoral and other levels but cannot replicate every nuance of the LFS. Point estimates based on the LFS for a particular SSCs employment structure will therefore inevitably differ from the detailed estimates presented here. These differences will reflect in part “noise in the data” (the LFS sample, although large in total, is often not adequate to guarantee very precise estimates at a detailed sectoral level, especially when cross-classified by other dimensions). The *Working Futures* results by SSC should however offer a useful guide to trends over time, especially for the future.

The key features of projected employment change across the SSCs are summarised in Figures 3.9 and 3.10 and Table 3.11. More detailed results, including an analysis of occupational changes within the SSCs, can be found in the Sectoral volume.²² Comparing these projections with those produced by the SSCs themselves is not a straightforward task. The results may differ for a whole host of reasons. These issues are discussed in more detail in the Sectoral report.²³ Annex C provides a summary here.

²⁰ These results can be used with other available forecasts developed by some of the SSCs for their sectors. See Annex C for details.

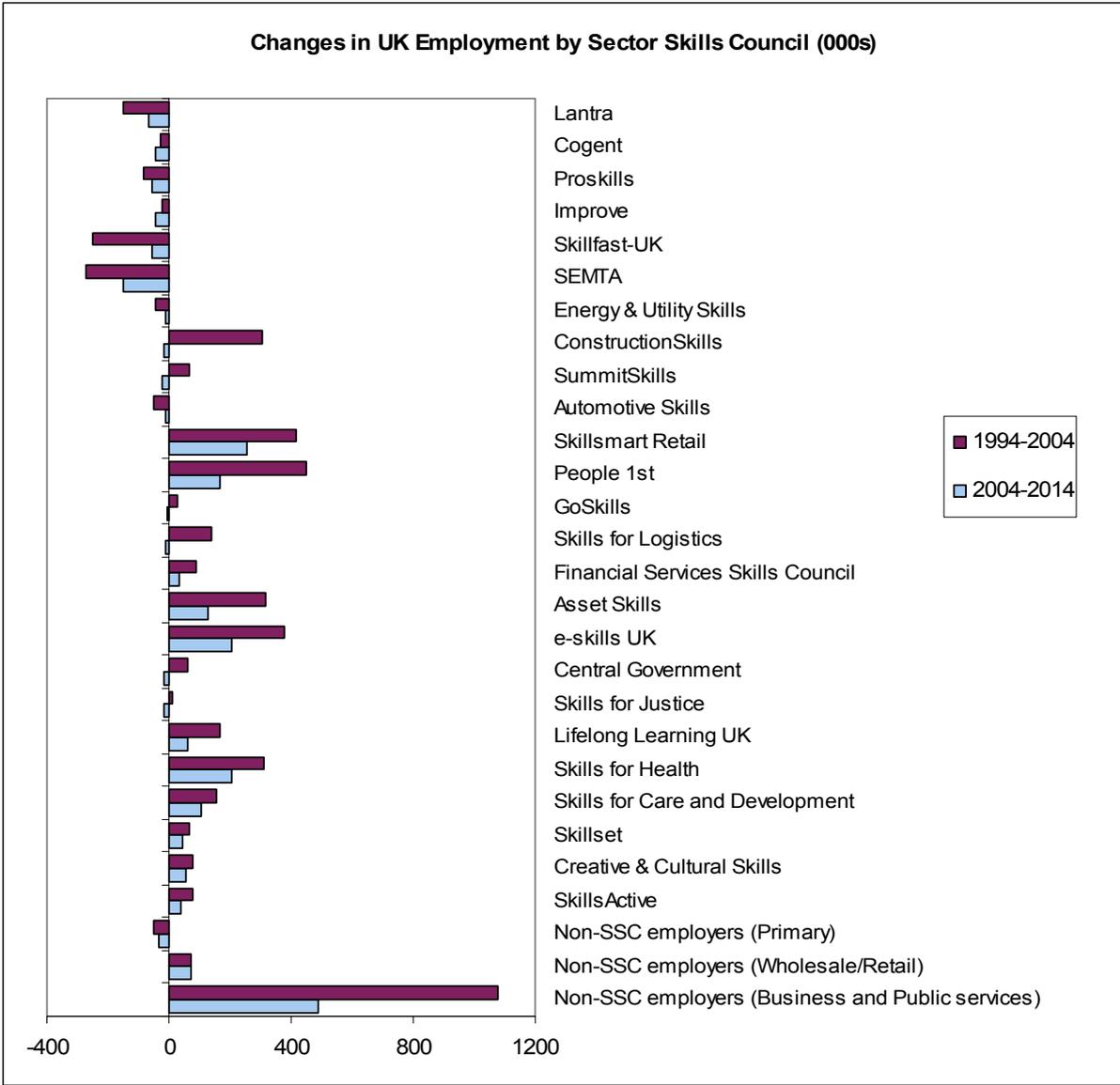
²¹ The results here are based on the SIC footprint as set out in Table A.4 in Annex A. Annex D provides further details of the full footprints.

²² See Dickerson *et al.* (2006).

²³ See Dickerson *et al.* (2006).

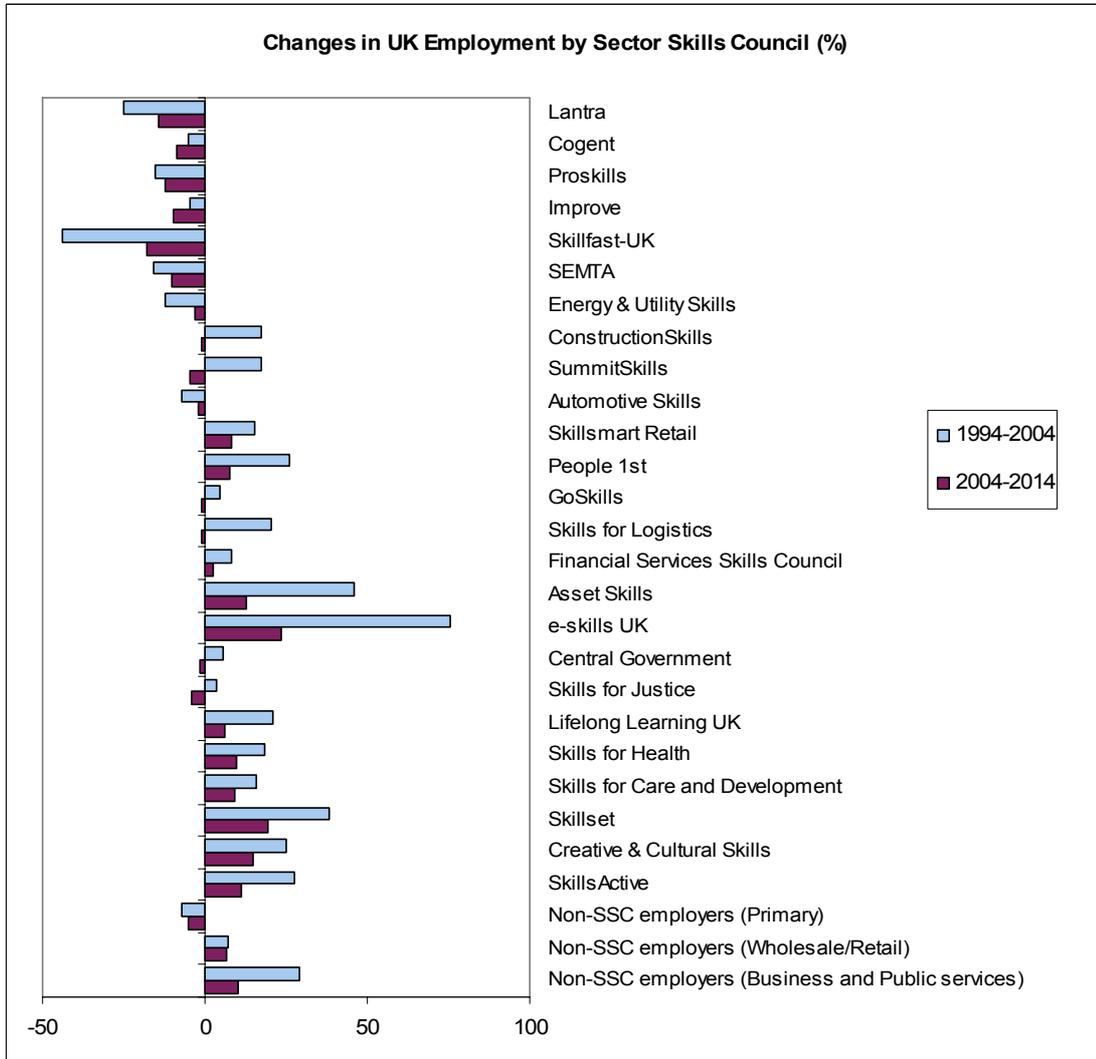
¹⁹ For details see Table A.4 in the Annex and Table D.1 in Annex D.

Figure 3.9:



Source: CE/IER estimates, MDM C51F8A, SSCuk.xls, (Figures 3.9 and 3.10).
 Notes: See notes to Table 3.10.

Figure 3.10:



Source: CE/IER estimates, MDM C51F8A, SSCuk.xls, (Figures 3.9 and 3.10).
 Notes: See notes to Table 3.10.

Table 3.11: Projections of Employment by SSC

Absolute levels and changes (000s)

	Levels		Changes			
	2004	2009	2014	2004-09	2009-14	2004-14
Lantra	451	421	387	-30	-34	-64
Cogent	517	498	471	-19	-27	-46
Proskills	445	418	390	-27	-28	-55
Improve	471	449	426	-22	-23	-45
Skillfast-UK	319	276	262	-43	-15	-57
SEMTA	1,443	1,374	1,293	-69	-81	-150
Energy & Utility Skills	324	319	314	-5	-5	-10
ConstructionSkills	2,073	2,057	2,056	-16	0	-17
SummitSkills	451	439	430	-11	-9	-21
Automotive Skills	619	609	607	-10	-3	-13
Skillsmart Retail	3,095	3,215	3,351	119	136	255
People 1st	2,186	2,272	2,351	86	78	164
GoSkills	674	665	668	-9	3	-6
Skills for Logistics	800	786	791	-13	5	-8
Financial Services Skills Council	1,162	1,190	1,194	29	3	32
Asset Skills	1,005	1,054	1,132	48	79	127
e-skills UK	875	950	1,080	76	130	205
Central Government	1,166	1,164	1,147	-3	-17	-19
Skills for Justice	369	363	353	-6	-10	-16
Lifelong Learning UK	965	997	1,025	31	28	59
Skills for Health	2,047	2,165	2,250	118	85	203
Skills for Care and Development	1,140	1,202	1,246	63	43	106
Skillset	240	262	287	22	24	46
Creative & Cultural Skills	389	420	448	31	27	58
SkillsActive	352	368	391	16	23	39
Non-SSC employers (Primary)	612	600	579	-12	-21	-33
Non-SSC employers (Wholesale/Retail)	1,121	1,150	1,194	29	45	73
Non-SSC employers (Business and Public services)	4,788	5,019	5,278	231	258	489
Total	30,099	30,705	31,399	605	695	1,300

Source: CE/IER estimates, MDM C51F8A, SSCuk, (Table 3.4a).

Notes: a) Based on a conversion from SIC categories using separate convertors for each gender status category.

b) The SIC "footprints" used are as defined in Table A..4 in Annex A.

4. Changing Occupational Structure

Key Messages

- The occupational structure of employment continues to change very substantially, generally favouring white collar and more skilled occupations.
- The latest Census and other data suggest even faster growth for managers, some professional and many associate professional occupations. Other occupations expected to do well include protective service occupations; culture /media/ sports occupations; caring personal service occupations and customer service occupations.
- In contrast, sharp declines are projected for: administrative, clerical & secretarial occupations; skilled manual & electrical trades; other skilled trades;
- Some variations in these patterns are anticipated by gender and status. These largely reflect the existing pattern of 'segregation' in the labour market.
- Males are expected to benefit most from the growth in job opportunities for professionals and associate professionals. An increasing proportion of such jobs will be part-time. Females are also expected to see significant growth amongst managerial and personal service occupations, as well as the professional/associate professional area. These will be both full-time and part-time jobs.
- Male, full-time workers are expected to bear the brunt of the job losses occurring in the skilled trades occupations. For women the main job losses are expected to be concentrated amongst administrative, clerical & secretarial occupations and in elementary occupations.

4.1 Introduction and General Approach

This chapter presents new projections of occupational employment at a UK level, across all industries. The projections are based on categories defined using the SOC 2000 occupational classification.²⁴ The main set of projections is for the 25 sub-major occupation groups, but for presentational purposes much of the discussion here is at a broader major group level (the 9 1-digit level categories of SOC).²⁵ The results now take full account of the latest data from the Census of Population, 2001.²⁶ The Census data have also been used by ONS to rebase many other statistical series including the Labour Force Survey.

Such data provide a useful indicator of changing patterns of demand for skills.

²⁴ This requires an extensive reclassification of historical data. Details are given in the Annex and the accompanying *Technical Report* (Wilson *et al.*, 2006b).

²⁵ Full detail of these classifications is provided in Annex A.

²⁶ For further details see the discussion in Annex A and the separate *Technical Report*.

However, it is important to focus not just on projections of changing levels of employment by occupation, but also on replacement demands. Projections of the structural change in employment levels provide only part of the picture of how the demand for skills is changing. Estimation of replacement demands recognises the need to replace those retiring from the existing workforce. This is discussed in Chapter 5. The discussion there indicates that, despite some projected employment declines in many occupations, there will be significant demand for many skills to replace those leaving the current workforce because of retirement, etc.

The reasons for the changes in occupational employment structure observed over the last two decades are complex. Some of the key factors are summarised in **Box 4.1**. A major factor emphasised there is structural change in the economy which affects the Sectoral structure of employment. The changing fortunes of different sectors, as represented by the macroeconomic model are a key driver of occupational change. The other main factors, such as

technological and organisational change, are represented by changing occupational mix within sectors.

Section 4.2 provides a brief summary of recent developments while Section 4.3 presents the main projections. Some patterns vary significantly across gender and employment status. These are

highlighted in Sections 4.4 and 4.5. Section 4.6 presents a more detailed discussion at the 2 digit level of SOC. Section 4.7 presents an analysis of the main components of change using shift share methods. The chapter concludes with a summary of detailed occupational changes within industries.

Box 4.1: Factors Influencing Occupational Change

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

External Skills Drivers influence the pattern of goods and services produced and therefore the Sectoral structure of employment. They include: technological change, globalisation, changing patterns of demand, and public policy (including legislative and regulatory frameworks). These are discussed in greater detail in Chapter 3. These developments are taken into account by the multi-sectoral macroeconomic model and are summarised in Chapters 2 and 3. Those sectors that benefit from such changes will see employment grow. Conversely those that fail to keep pace will experience job losses. Occupations concentrated in the former sectors will gain employment in contrast to those concentrated in declining sectors (**industry effects**).

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

Both internal and external drivers are influenced by technology (especially ICT) and other general factors. For example, ICT has led to the displacement of many clerical and secretarial jobs previously concerned with information processing using paper technology (internal effect). On the other hand, information technology has opened up many new product markets where information services can be provided which were previously not feasible (external effect). These new businesses often require jobs of a professional, associate professional and managerial nature. The application of IT in other areas such as such as robots in motor manufacturing has led to the loss of many jobs for skilled workers.

Other factors have also been important. These include the drive for efficiency in response to global competition, increased emphasis on customer service and product quality and related changes in production methods and the management of human resources. The income elasticity of demand for different products and services, together with changes in tastes and preferences is changing the pattern of demands towards an emphasis on high value added, higher quality, high specification goods and services. There is a major restructuring of production to meet these needs. Many of these products and services require expert knowledge as well as customer care, personal attention and face-to-face human interaction, (for example, leisure, hospitality, travel, personal care), increasing the need for such generic skills.

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

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

Future Influences on Occupational Change

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

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

The impacts of information technology and other related organisational changes are likely to further reduce the demand for clerical and basic secretarial skills across all industries (occupational effects). Similarly, the introduction of new technologies in manufacturing will tend to displace many skilled workers. Conversely, the management and operation of the new technologies will require greater shares in employment for managerial, professional and associate professional occupations, including technicians of various kinds. In some factories there will be an increased need for machine operatives of various types who need some training but not the long apprenticeship required of traditional apprentice-based craft skills.

4.2 Changes for Broad Occupational Groups: Historical Perspective

The estimates presented here reflect the latest data available, including those from the 2001 Census and subsequent revisions to the Labour Force Survey. At the major group level, the trends over the period since 1982 are very similar to those presented in *Working Futures 1 (WF I)* as well as with estimates presented in previous analysis conducted on behalf of the DfES in *Projections of Occupations and Qualifications (POQ)*.²⁷

Table 4.1 presents historical information on past trends for the 9 SOC 2000 major groups.

The key features are:

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

The full results from the Census have resulted in a further reassessment of changes the pattern of occupational employment over the past decade. This also has important implications for likely prospects for the next ten years. The main differences compared to the previous projections are as follows.

Compared with both WF I and POQ, faster growth is now indicated for:

- managers, some professional and many associate professional occupations;
- protective service occupations and culture /media/ sports occupations;

- caring personal service and customer service occupations.

More rapid declines than previously measured have been observed for:

- administrative, clerical & secretarial occupations;
- skilled manual & electrical trades;
- other skilled trades.

The reclassification of many jobs in SOC 2000 from managerial to other categories served to moderate somewhat estimates of growth for managers using SOC 1990 categories, especially in the early 1990s. However the latest Census data confirm that, despite this, managerial occupations continue to be one of the most rapidly growing areas of employment (see Figure 4.1).

4.3 Projections to 2014

Table 4.1 and Figure 4.1 present the employment projections for the 9 major occupations in the period to 2014. The first point to note is that a much slower pace of change is expected overall than has been the case over the previous decade.

The groups that are expected to show significant increases in employment over the next decade are managers & senior officials, professional occupations, associate professional & technical occupations and also personal service occupations. The personal service occupations have had especially strong growth since the early 1980s and this is projected to continue over the next decade.

The sales & customer service occupation group are the other main beneficiaries of employment growth.

Administrative, clerical & secretarial occupations are expected to see further job losses, although this category will continue to employ over 3½ million people.

Declining employment levels are projected for skilled trades occupations; machine &

²⁷ See, for example, Wilson (2001a).

transport operatives; and elementary occupations. Amongst these declining groups, it is the elementary occupations which are expected to see the largest absolute reduction in numbers, with projected job losses over the decade of almost 700 thousand.

These projections continue trends which, for the most part, have been apparent for the previous two decades. As noted above, employment has been increasing amongst the non-manual occupations and those which derive employment opportunities from the services sector of the economy, whilst manual occupations and those tied to manufacturing and the primary sector have seen declining employment levels. A major exception to this rule of continuation of trends is administrative, clerical & secretarial occupations, in which employment had grown rapidly for many years. The use of computers and IT systems has more recently resulted in a marked reduction in employment for this group, as well as for the routine clerical jobs included within the elementary occupations group. This new trend is expected to continue over the next decade.

4.4 Differences by Gender

Figure 4.2 shows some significant differences in occupational employment prospects for males and females.

For men the largest employment increases are expected in the professional and associate professional occupations, where around 300-400 thousand new jobs are projected between 2004 and 2014.

For women the occupations providing the largest number of new jobs are managers & senior officials and personal service occupations (both projected to rise by around 500 thousand).

Professional occupations and associate professional & technical occupations (each with a projected increase of around 200-300 thousand jobs) are also expected

to provide a large number of new employment opportunities for women. For men a significant number of job losses, (around 300 thousand) are forecast for elementary occupations.

For women significant job losses are expected for administrative, clerical & secretarial occupations, machine & transport operatives, and for elementary occupations. The latter group of occupations, which contains mainly unskilled workers, is forecast to decline by almost half a million.

4.5 Variation by Employment Status

In addition to separate analyses by gender, detailed projections by full-time and part-time status and for self-employment have also been produced. These are summarised in Figures 4.3-4.5. They indicate significant differences in the pattern of change for different occupational and status categories. There are also some notable differences in the patterns for males and females.

For managers & senior officials (SOC major group 1), the main growth is for full-time workers. Self-employment is expected to decline (reflecting trends in construction and the distribution and related sectors).

Amongst professional occupations a substantial increase in part-time working is projected, although full-time work is also projected to rise. Self-employment numbers are projected to decline very slightly.

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

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

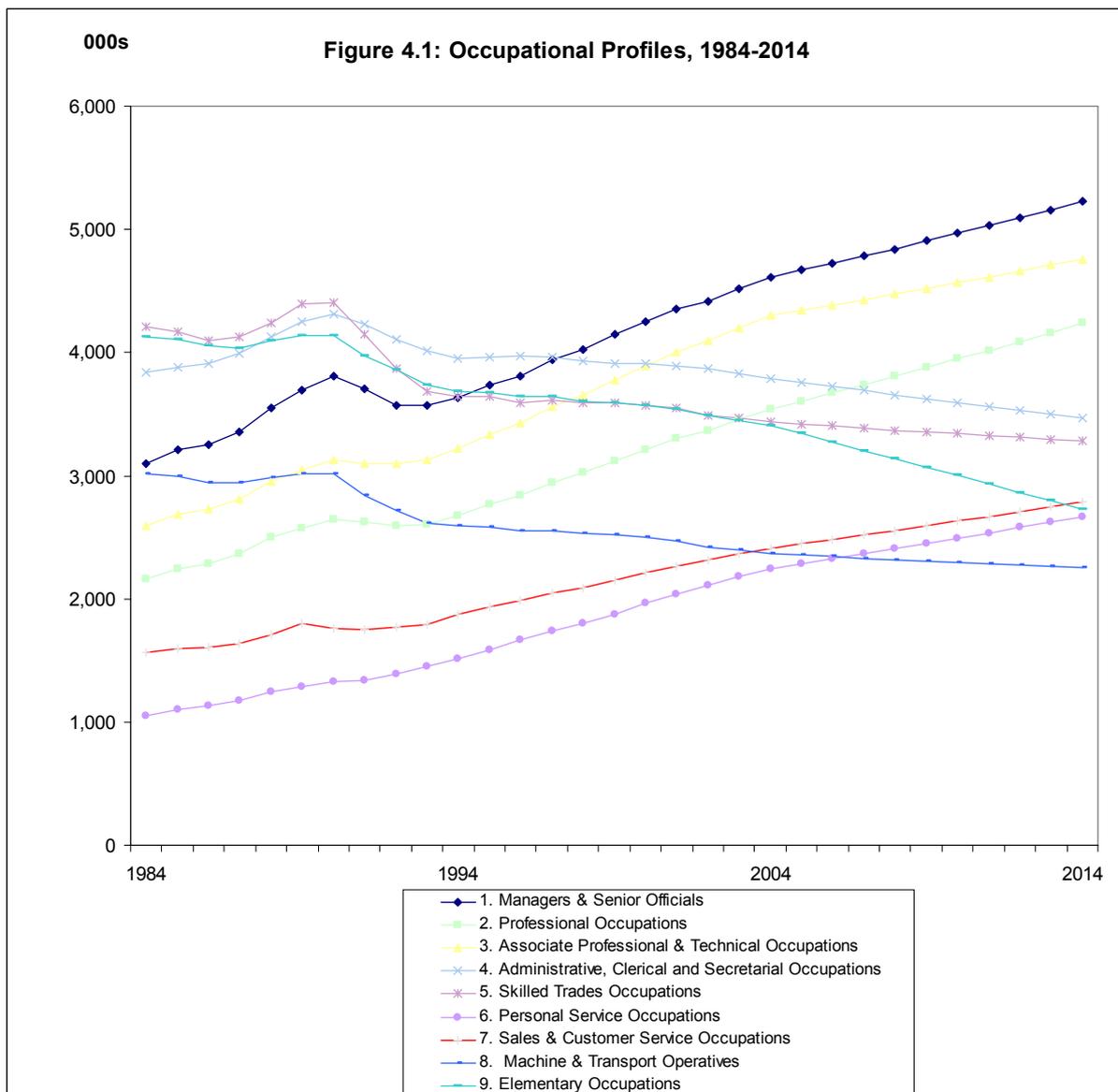
For personal service occupations and for sales & customer service occupations, the main growth is for part-time jobs.

For skilled trades occupations, part-time employment is expected to increase slightly but there is a sharp decline in self-employment and especially full-time jobs.

The patterns by gender are generally similar but the occupational segregation of females and males into certain jobs results in some

notable differences, such as the much sharper growth in employment that is expected for women in personal service occupations. There are similar patterns also for elementary occupations. Here there is a now sharp decline in part-time jobs for women.

More detailed results by sector and region are presented in Chapter 6 of the present volume and in the separate *Spatial Report* (Green *et al*, 2006).



Source: CE/IER estimates, MDM01R1 C51F8A Forecast, AllUK.xls, (Figure 4.1a).

Table 4.1 Occupational Categories SOC 2000 – Major Groups**United Kingdom: All Industry Sectors**

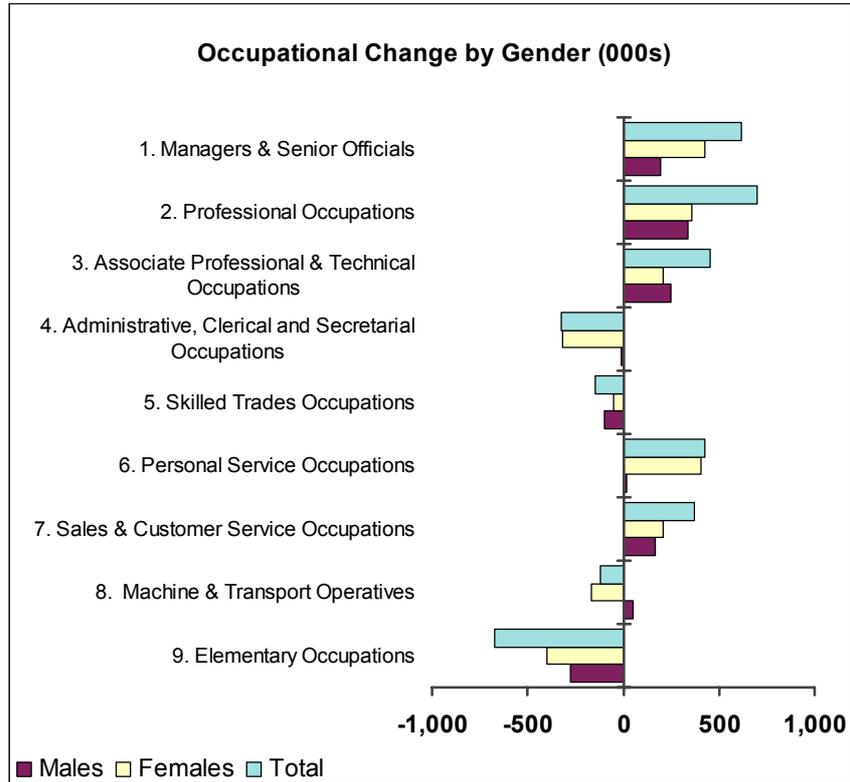
Employment Levels (000s)	1984	1994	2004	2009	2014
1. Managers & senior officials	3,096	3,629	4,609	4,906	5,227
2. Professional occupations	2,165	2,674	3,539	3,876	4,236
3. Associate professional & technical occupations	2,593	3,218	4,302	4,521	4,758
4. Administrative, clerical & secretarial occupations	3,843	3,955	3,790	3,627	3,463
5. Skilled trades occupations	4,211	3,642	3,433	3,355	3,283
6. Personal service occupations	1,054	1,509	2,244	2,449	2,668
7. Sales & customer service occupations	1,565	1,872	2,412	2,594	2,788
8. Machine & transport operatives	3,018	2,596	2,367	2,307	2,249
9. Elementary occupations	4,131	3,680	3,403	3,070	2,728
Total	25,676	26,775	30,099	30,705	31,399

Percentage Shares	1984	1994	2004	2009	2014
1. Managers & senior officials	12.1	13.6	15.3	16.0	16.6
2. Professional occupations	8.4	10.0	11.8	12.6	13.5
3. Associate professional & technical occupations	10.1	12.0	14.3	14.7	15.2
4. Administrative, clerical & secretarial occupations	15.0	14.8	12.6	11.8	11.0
5. Skilled trades occupations	16.4	13.6	11.4	10.9	10.5
6. Personal service occupations	4.1	5.6	7.5	8.0	8.5
7. Sales & customer service occupations	6.1	7.0	8.0	8.4	8.9
8. Machine & transport operatives	11.8	9.7	7.9	7.5	7.2
9. Elementary occupations	16.1	13.7	11.3	10.0	8.7
Total	100.0	100.0	100.0	100.0	100.0

Net Changes (000s)	1984- 1994	1994- 2004	2004- 2009	2009- 2014	2004- 2014
1. Managers & senior officials	533	981	297	321	617
2. Professional occupations	509	865	337	360	697
3. Associate professional & technical occupations	627	625	1,083	219	238
4. Administrative, clerical & secretarial occupations	115	112	-165	-162	-164
5. Skilled trades occupations	-569	-210	-78	-72	-150
6. Personal service occupations	455	735	205	219	424
7. Sales & customer service occupations	307	540	181	194	375
8. Machine & transport operatives	-421	-229	-60	-58	-118
9. Elementary occupations	-451	-277	-333	-342	-675
Total	1,099	3,324	605	695	1,300

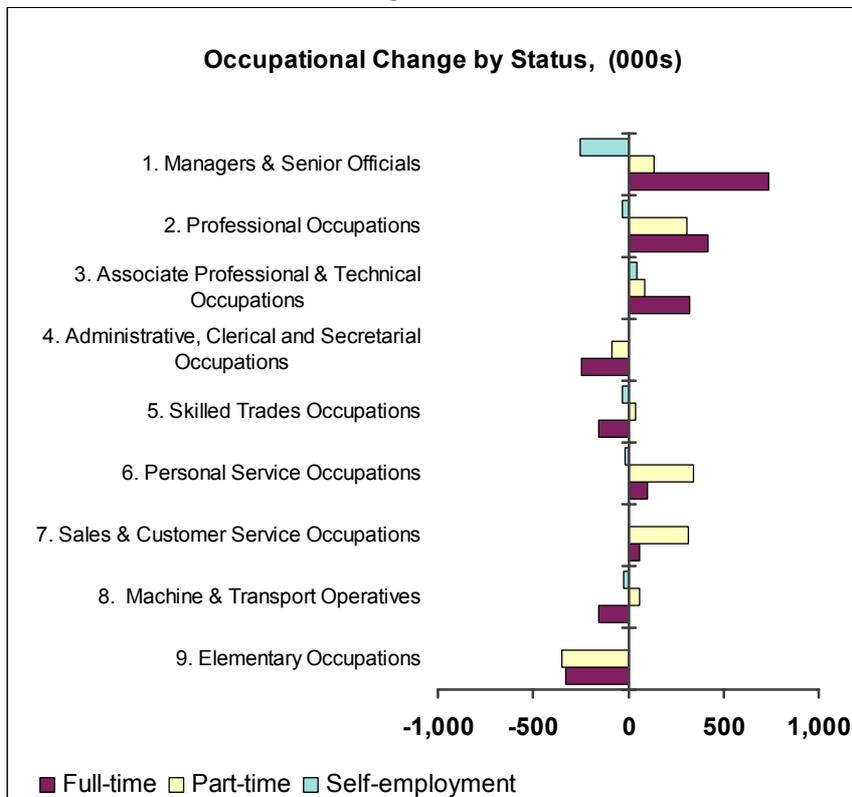
Source: CE/IER estimates, MDM01R1 C51F8A Forecast, AllUK.xls, (Table 4.1T).

Figure 4.2:



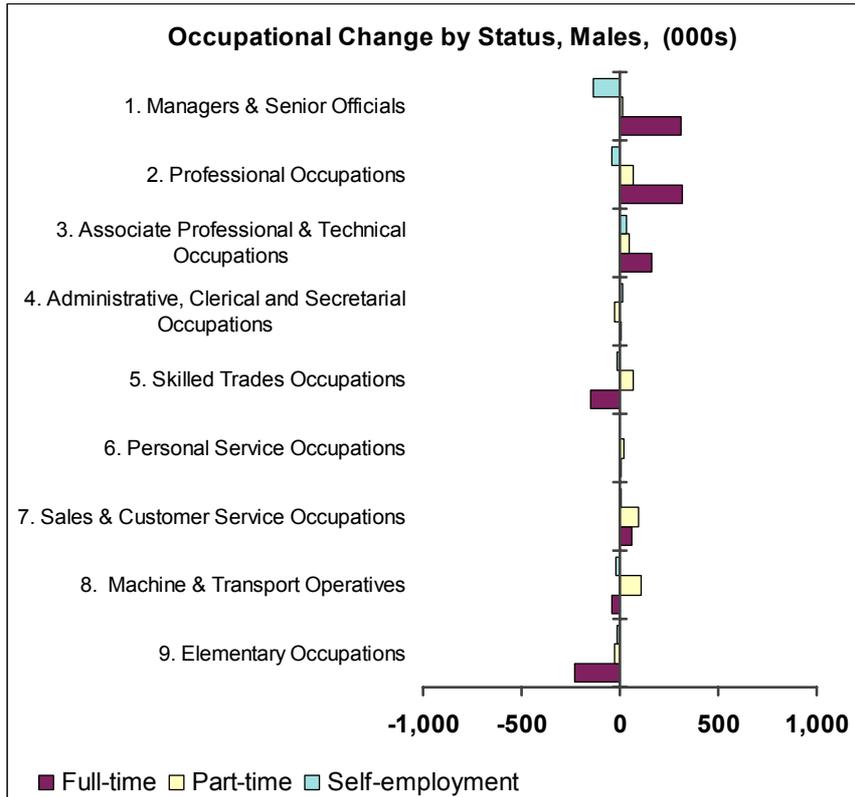
Source: CE/IER estimates, MDM01R1 C51F8A Forecast, Alluk.xls, (Figures 4.1 to 4.4).

Figure 4.3:



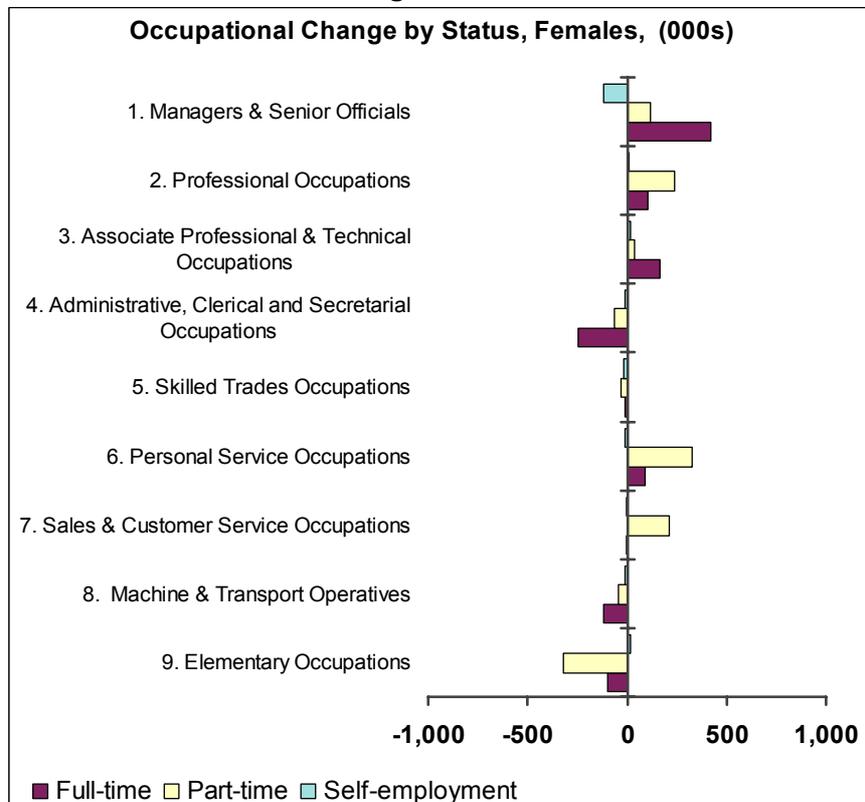
Source: CE/IER estimates, MDM01R1 C51F8A Forecast, Alluk.xls, (Figures 4.1 to 4.4).

Figure 4.4:



Source: CE/IER estimates, MDM01R1 C51F8A Forecast, Alluk.xls, (Figures 4.1 to 4.4).

Figure 4.5:



Source: CE/IER estimates, MDM01R1 C51F8A Forecast, Alluk.xls, (Figures 4.1 to 4.4)

4.6 Occupational Trends for Sub-Major Groups

Tables 4.2 and 4.3 present a more detailed analysis of occupational projections for the 25 sub-major occupation groups of SOC 2000. These enable identification of prospects for specific occupations which are contained within the broader groups analysed above.

Managers & senior officials

Within the managers and senior officials group, employment for corporate managers has been the source of growth. This is expected to continue in the period to 2014. The latest information suggests that the pace of growth will be faster than previously anticipated.

Professional occupations

Amongst professional occupations, all sub-major groups have experienced growth. This is projected to continue. The highest rate of growth is projected for teaching and research professionals and health professionals. Growth is also projected for business and public service professionals and for science and technology professionals (which includes engineers). All these professional groups will increase their share of overall employment between 2004 and 2014.

Associate professional & technical occupations

Most of the sub-groups that comprise the associate professional and technical occupations have also seen significant employment growth over the decade. The slowest rate of growth has been for health associate professionals. Much higher rates of job increase have occurred for associate professionals engaged in the culture, media and sports occupations and for protective service occupations. Strong growth, in terms of job numbers, has also been recorded for business and public service associate professionals (which includes those working in computers and in business and finance). This group is now estimated to have posted an increase

of 200 thousand jobs between 1994 and 2004. Essentially, these patterns are projected to continue, albeit at a more modest pace. The fastest rates of growth over the period 2004 to 2014 are expected for the culture, media & sports and business & public service occupational groups.

Administrative, clerical & secretarial occupations

Amongst the administrative, clerical and secretarial occupations, the latest Census data now suggest a decline in employment for the group as a whole over the past decade. Such job declines are projected to continue, most intensively amongst secretarial and related occupations (secretaries, typists and word processing operators), who are increasingly being displaced by advances in computer technology.

Skilled trades occupations

In the skilled trades group, skilled metal & electrical trades are now estimated to have experienced the loss of around a ¼ of a million jobs over the past decade. Over the next 10 years, the highest job losses are again expected to be in the skilled metal & electrical trades. These are most closely associated with the engineering industry. Significant losses over the next 10 years are also forecast for the group other skilled trades.

Personal service occupations

Caring personal service occupations have been one of the main areas of employment increase over the past decade with an increase in employment of almost ¾ of a million jobs over the last decade. Over the next 10 years, almost all of the relatively high growth that is projected for the personal services group is again focused on the caring personal services occupations. The majority of these jobs are expected to be taken by women.

Sales & customer service occupations

Sales occupations comprise primarily occupations such as sales assistants and check-out operators in retail outlets. Employment in this occupation group is mostly taken up by females, many of whom work only part-time. Customer service occupations represent a much smaller but rapidly growing group. Both saw employment increase over the 1990s by around a ¼ of a million jobs. The former is projected to grow by around 12 per cent between 2004 and 2014. Customer service occupations are expected to grow much more rapidly. In both cases, a higher concentration of businesses and wider use of the Internet and other mechanisms for placing orders is expected to moderate growth in more traditional occupations.

Machine & transport operatives

There is a wide diversity of different occupations within the machine & transport operatives group. Many of these jobs are related to manufacturing, construction and transport activity. Employment declined quite rapidly for process & plant machine operators over the last decade, with the loss of around a third of a million jobs between 1994 and

2004. However, there were modest increases amongst the transport drivers group. There are expected to be further substantial job losses amongst the plant & machine operators, who work in factories and on construction sites. An increase in employment levels is projected for transport drivers & operators.

Elementary Occupations

The final occupational group contains elementary occupations which are not classifiable elsewhere. Employment levels across this group of occupations have been on a long-term declining trend and this is projected to continue into the next decade. Job losses have occurred both for those unskilled occupations, which are linked to the primary and manufacturing sectors of the economy, (elementary occupations, (trades, plant and machine related)), as well as (to a much lesser extent) for the elementary occupations, (clerical and services related) group. The latter provide low skilled service sector jobs. The prospects for the last group are now regarded as much less optimistic than in *Working Futures 2002-2012*. The group is now projected to bear the brunt of the continuing impact of IT. Employment is projected to fall by a third of a million for this group between 2004 and 2014.

Table 4.2 Total Occupational Employment, 1994-2004
United Kingdom: All Industry Sectors

SOC 2000 Sub Major Groups	1994		2004		Change and components of change, 1994-2004							
	000s	%	000s	%	Net change %	Scale effect 000s	Occupation effect 000s	Industry mix effect 000s	%	000s	%	
11 Corporate Managers	2568	9.6	3500	11.6	36.3	932	341	506	19.7	86	3.3	
12 Managers & Proprietors	1068	4	1107	3.7	3.6	39	136	-189	-17.7	92	8.6	
21 Science/Tech Professionals	702	2.6	964	3.2	37.4	263	99	109	15.6	55	7.8	
22 Health Professionals	206	0.8	285	0.9	38.1	78	26	24	11.7	28	13.6	
23 Teaching/Research Prof.	1149	4.3	1478	4.9	28.6	329	133	104	9.1	92	8	
24 Business/Public service Prof.	614	2.3	808	2.7	31.7	195	81	54	8.8	60	9.7	
31 Science/Tech Associate Prof.	472	1.8	605	2	28.2	133	63	57	12.1	13	2.7	
32 Health Associate Prof.	888	3.3	1081	3.6	21.8	193	94	42	4.7	58	6.5	
33 Protective Service	273	1	407	1.4	49.1	134	38	96	35.1	0	0.1	
34 Culture/Media/Sport	397	1.5	653	2.2	64.8	257	50	152	38.3	55	13.9	
35 Bus/Public Serv. Assoc Prof.	1190	4.4	1554	5.2	30.6	364	153	179	15.1	31	2.6	
41 Administrative Occupations	2751	10.3	2845	9.5	3.4	94	307	-265	-9.6	52	1.9	
42 Secretarial & Related	1201	4.5	943	3.1	-21.4	-258	121	-448	-37.3	70	5.8	
51 Skilled Agricultural Trades	346	1.3	370	1.2	6.8	23	49	60	17.3	-85	-24.6	
52 Skilled Metal/Elect. Trades	1532	5.7	1258	4.2	-17.9	-274	223	-296	-19.4	-201	-13.1	
53 Skilled Construct. Trades	1031	3.9	1171	3.9	13.6	140	151	8	0.8	-19	-1.8	
54 Other Skilled Trades	730	2.7	639	2.1	-12.5	-91	91	-181	-24.7	-2	-0.2	
61 Caring Personal Service	974	3.6	1696	5.6	74.1	722	100	564	57.9	58	5.9	
62 Leisure/Oth Pers Service	538	2	550	1.8	2.2	12	62	-70	-13.1	20	3.8	
71 Sales Occupations	1662	6.2	1987	6.6	19.6	325	184	147	8.8	-5	-0.3	
72 Customer Service	208	0.8	424	1.4	103.4	216	23	187	89.9	5	2.4	
81 Process, Plant & Mach Ops	1603	6	1263	4.2	-21.2	-340	210	-258	-16.1	-291	-18.2	
82 Transport Drivers and Ops	992	3.7	1109	3.7	11.8	117	144	44	4.4	-71	-7.1	
91 Elementary: Trades/Plant/Storage	1312	4.9	1046	3.5	-20.3	-266	178	-270	-20.6	-174	-13.3	
92 Elementary: Admin/Service	2369	8.8	2357	7.8	-0.5	-12	268	-354	-14.9	74	3.1	
All occupations	26775		30099		12.4	3324	3324					

Source: CE/IER estimates, MDM01R1 C51F8A Forecast, Shiftshare.tab5a.c51.xls.

Table 4.3 Total Occupational Employment, 2004-2014
United Kingdom: All Industry Sectors

SOC 2000 Sub Major Groups	2004		2014		Change and components of change, 2004-2014							
					Net change		Scale effect	Occupation effect		Industry mix effect		
	000s	%	000s	%	%	000s	000s	000s	%	000s	%	
11 Corporate Managers	3500	11.6	4195	13.4	19.9	695	148	495	14.2	52	1.5	
12 Managers & Proprietors	1107	3.7	1031	3.3	-6.9	-76	47	-159	-14.4	36	3.2	
21 Science/Tech Professionals	964	3.2	1137	3.6	17.9	173	39	104	10.8	29	3	
22 Health Professionals	285	0.9	365	1.2	28.5	81	12	48	16.8	21	7.4	
23 Teaching/Research Prof.	1478	4.9	1796	5.7	21.5	318	66	230	15.6	22	1.5	
24 Business/Public service Prof.	808	2.7	923	2.9	14.3	115	34	46	5.6	35	4.4	
31 Science/Tech Associate Prof.	605	2	675	2.1	11.7	71	25	39	6.4	7	1.1	
32 Health Associate Prof.	1081	3.6	1165	3.7	7.8	84	50	-9	-0.8	43	3.9	
33 Protective Service	407	1.4	419	1.3	2.9	12	17	-10	-2.4	5	1.2	
34 Culture/Media/Sport	653	2.2	808	2.6	23.7	155	28	98	15.1	28	4.3	
35 Bus/Public Serv. Assoc Prof.	1554	5.2	1698	5.4	9.3	144	67	46	3	31	2	
41 Administrative Occupations	2845	9.5	2740	8.7	-3.7	-105	129	-246	-8.6	13	0.4	
42 Secretarial & Related	943	3.1	710	2.3	-24.8	-234	44	-315	-33.4	37	4	
51 Skilled Agricultural Trades	370	1.2	427	1.4	15.4	57	15	74	19.9	-32	-8.5	
52 Skilled Metal/Elect. Trades	1258	4.2	918	2.9	-27	-339	50	-313	-24.9	-76	-6	
53 Skilled Construct. Trades	1171	3.9	1397	4.4	19.2	225	46	258	22	-79	-6.7	
54 Other Skilled Trades	639	2.1	545	1.7	-14.7	-94	27	-118	-18.5	-3	-0.4	
61 Caring Personal Service	1696	5.6	2095	6.7	23.6	400	79	287	16.9	33	2	
62 Leisure/Oth Pers Service	550	1.8	588	1.9	6.9	38	25	-3	-0.5	16	2.9	
71 Sales Occupations	1987	6.6	2220	7.1	11.7	232	90	135	6.8	8	0.4	
72 Customer Service	424	1.4	559	1.8	31.8	135	19	110	25.9	6	1.4	
81 Process, Plant & Mach Ops	1263	4.2	955	3	-24.4	-308	52	-256	-20.3	-104	-8.2	
82 Transport Drivers and Ops	1109	3.7	1301	4.1	17.3	192	44	211	19	-63	-5.7	
91 Elementary: Trades/Plant/Storage	1046	3.5	674	2.1	-35.6	-372	43	-337	-32.2	-78	-7.4	
92 Elementary: Admin/Service	2357	7.8	2058	6.6	-12.7	-299	104	-415	-17.6	12	0.5	
All occupations	30099		31399		4.3	1300	1300	0		0		

Source: CE/IER estimates, MDM01R1 C51F8A Forecast, Shiftshare.tab5a.c51.xls

4.7 Components of Occupational Change

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

- The **scale effect** measures the impact of the overall expansion (or decline) of employment levels in the economy, assuming this applies strictly proportionally to all industries, and occupations.²⁸
- The **industrial mix effect** measures the impact of the changing patterns of final demands on the industrial structure of employment, whilst holding constant the occupational composition within the industries.
- The **occupational effect** measures the impact of organisational and technological changes on the occupational structure of employment within the industries.

Tables 4.2 and 4.3 present the results of the shift-share analysis for the historical period 1994-2004 and for the projection period 2004-2014. These tables show the projected net employment changes across each of the 25 sub-major occupations in terms of both absolute levels and percentages. These net changes are decomposed into the 3 component effects.

With a few notable exceptions, the dominant explanation of change for most occupations for the historical period is that attributable to occupational effects (see Table 4.2). However, the second most important explanation is the scale effect. All else being equal, this resulted in an increase of just over 12 per cent in each occupational employment level.²⁹ In many cases the occupational effect is of a much

greater magnitude. This can of course be positive (as in the case of many non-manual occupations) or negative (as is often the case for the manual occupations). In recent years the industry mix effect has only a relatively minor impact, although it has been important for a small number of occupations. These effects are negative for those occupations linked to the fortunes of declining sectors such as manufacturing or agriculture.³⁰ They are positive for those occupations linked most closely to growing service sectors such as culture, media and sports occupations.

The effects rarely all point in the same direction. The scale effect is uniformly positive over both the periods 1994-04 and 2004-14. It reflects the overall employment increases realised. The other two effects exhibit differing signs across the various occupational groups, summing across all occupations to zero.

For the forecast period scale and occupational effects are again dominant (see Table 4.3). All else being equal, the scale effect results in an increase of just over 4 per cent in employment levels, for each occupation over the 2004-14 period.³¹

The industry mix effect is of even less significance than over the previous decade. In absolute terms it is fairly insignificant, except in a small number of occupations, such as skilled trades and process plant & machine operatives, mainly linked to the fortunes of the manufacturing sector. These findings are consistent with the results for the earlier period 1994 to 2004 in Table 4.2.

This is in marked contrast to earlier decades. During the 1970s and 1980s, industry effects, notably the rapid loss of jobs in the primary and manufacturing sectors and the rapid expansion of employment in services, played a major

²⁸ In practice, the scale effect is calculated for each gender separately so the scale effect expressed as a percentage of employment in Tables 4.3 and 4.4 varies slightly between occupations because of different gender mix. This percentage is not shown in the table.

²⁹ But see previous footnote.

³⁰ During the 1980s when employment in primary and manufacturing industries declined especially rapidly, the industry mix effect was of much greater significance.

³¹ As noted in footnote 6 above, the scale effect is calculated for each gender separately so the percentage does vary slightly between occupations.

role in explaining changes in occupational employment patterns. The analysis reported in previous labour market assessments showed large industry effects, both positive and negative. The former tended to benefit white collar, non-manual occupations, in the growing service sectors, while the latter was concentrated on manual, blue collar jobs in industries such as agriculture, mining and many parts of manufacturing.

Although the industry mix, is strongly significant in only a few occupations, it makes a marginal contribution to many of the others. It impacts most significantly in positive fashion for health associate professional and managerial occupations, In the case of skilled trades, process, plant & machine operatives and the elementary occupations, it is a negative feature. These latter occupations are linked together by a dependence on final demand in the manufacturing and construction sectors of the economy.

Over the forecast period, the scale effect, which reflects the overall expansion (or decline) in employment levels, is important for all occupations. It is especially notable compared with the other effects for managers & proprietors, administrative & clerical occupations and sales occupations. Additionally, it also exerts a significant positive impact for secretarial & related occupations and the admin/service elementary occupational sub-major group.

The occupational effect is very strongly positive for most professional and associate professional groups and especially in the case of the caring personal service occupations and for customer service occupations. However, the occupational effect exercises a strong negative impact for managers & proprietors in agriculture and services, administrative & clerical occupations, secretarial & related occupations, as well as in the skilled metal & electrical trades, process, plant & machine operatives and in elementary occupations. In all of these sub-major groups, significant changes in organisation and technology within the employing industries are expected to have

a marked negative impact on employment levels.

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

Further shift share analysis is presented in Chapter 6, which shows how these effects have influenced occupational change within individual industries.

The shift-share analysis presented in Table 4.2 and 4.3 is carried out at a detailed industry level (the 41 industries used in MDM), for the 25 SOC sub-major occupational groups, for males and females separately. The industry and occupational effects, by definition sum to zero when added up across all occupations.

In Chapter 6 a slightly different shift-share analysis is presented. This is based on the data presented there which is for the 25 industries, 9 SOC major groups and for males and females combined. For an individual industry the occupational effects still sum to zero. But the industry effect does not. This shows the change in occupational employment that would have occurred in the industry had its occupational structure remained fixed. These changes can be positive or negative but they are the same percentage change for **every** occupation in the industry (= % increase in employment for the industry net of the increase for **all** industries).

If all the industry effects are summed across the 25 industries they will sum to zero across all occupations but for individual occupations may be positive or negative. If this analysis were undertaken at the same level of gender, occupation and industry analysis as in Tables 4.2 and 4.3 the results would be identical to those

presented there. Because they are not, minor discrepancies will arise. However the basic patterns in terms of industry effect becoming progressively less important and the patterns across occupations are the same in both sets of results.

4.8 Detailed Occupational Changes within Industries

The occupational projections vary considerably within different industries. Figure 4.6 presents a qualitative overview of the projections to 2014. The figure illustrates a number of features of the results, focussing on the 27 Sector matrix industries and the 2 digit SOC sub-major groups.^{32,33}

Those industries and occupations that are expected to grow or decline most rapidly are highlighted by shading of the row and column headers. Thus dark shading indicates that professional services; computing and related services; and other business services, are projected to grow by 10 per cent or more between 2004 and 2014. Similarly SOC categories 1.1 (corporate managers); 2.1-2.4 (professionals); 3.1 (technicians); 3.4 (culture, media and sport occupations); 5.1 and 5.3 (certain skilled trades; 6.1(caring personal service occupations); 7.1 and 7.2 (sales occupations); and 8.2 Machine & transport operatives); are projected to grow by 10 per cent or more.

In contrast, those industries and occupations that are expected to decline by 10 per cent or more are indicated by paler row and column headers. These tend to be the primary and manufacturing industries and blue collar and less skilled occupations.

Within the body of the figure, cells which include 100,000 or more people employed are shaded. These will be areas where there are significant replacement demands.

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

³² Note that these are not coterminous with the SSCs' footprints.

³³ This issue is also dealt with in detail in Chapter 6, which deals with each sector in turn.

Figure 4.6: Occupational change across the 27 Sector Skills Matrix Industries

	Sub-Major Groups																								
	11	12	21	22	23	24	31	32	33	34	35	41	42	51	52	53	54	61	62	71	72	81	82	91	92
Agriculture, etc			-					-	+			-		-							+	-		-	
Mining & quarrying								-	+			-		-			+			+	-		-		
Food, drink & tobacco									+		-	-	+		+					-		-	+	-	-
Textiles & clothing	-	-			-	-		-			-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
Wood, pulp & paper			-	+	+		-	-				-	+	-		-					-		-	-	-
Publishing & printing	+		+	+					+		-	-			+		-			-	-		+	-	-
Chemicals & non-metal minerals									+			-		-	-	-				+	-		-	-	
Metal & metal goods				+			+	-	+						-	+				+	-		-	-	
Machinery, electrical & optical eq.				+					+			-		-	+				+	+	+	-	-	-	
Transport equipment				+				-							-		-		+	+	+	-	-	-	
Other manufacturing & recycling			+	+					+		-	-	+		+		-				-	+	-	-	
Electricity, gas & water					-		-				-	-		-		-			-	+		-	-	-	
Construction												-		-	+		-				+	-	+	-	
Sale & maintenance of MVs		-	+				+					-	+	-	+		+			+	+	+	+		
Wholesale distribution			+	+			+					-	+	+	+		+			+	+	+	+		
Retailing	+			+	+	+			+			-	+		+		+	+		+	+	+	+	-	
Hotels & restaurants			+	+	+	+	+	+	+				+		+		+	+		+	+	+	+		
Transport	+			+			+		+		+			-	+		+	+	+	+	+	-	+	-	
Communications									+					+	-	+			+	+	+	+	+	-	
Financial services	+			+	+		+		+		+		-		-	+			+	+	+	+	-	-	
Professional services	+		+	+	+	+	+	+	+		+		-	+		+			+	+	+	+	+	-	
Computing services	+		+	+	+	+	+	+			+	+		+					+	+	+	+	+	+	
Other business services	+		+	+	+				+			-	+	-	+		+		+	+	+	+	+	-	
Public administration & defence	+				+				+			-		-	+	-	+				-		-	-	
Education												-	-		+	-	+				-		-	-	
Health & social work	+			+	+	+						-	+		+	-	+	-			-	+	-	-	
Other services	+		+	+	+	+	+	+	+		+			+		+	-	+		+			-	-	

- level of employment in 2004 and/or 2014 is 100000 or greater.
- + growth in employment between 2004 and 2014 is forecast to be 20% or greater.
- growth in employment between 2004 and 2014 is forecast to be -20% or less.
- + growth in employment in the sector or the occupation between 2004 and 2014 is forecast to be 10% or greater.
- growth in employment in the sector or the occupation between 2004 and 2014 is forecast to be -10% or less.

Source: CE/IER estimates, MDM01R1 C51F8A Forecast, SICSOCchartcolour.xls.

5. Replacement Demands

Key Messages

- It is important to take into account the need to replace those in the workforce who will be leaving because of retirement or other factors.
- Such outflows typically account for about a third of current employment levels and outweigh any projected employment declines.
- There will be a need to recruit and train new entrants into such jobs to replace those retiring from the workforce or leaving for other reasons.
- Where employment is projected to rise, such replacement demand elements will lead to even greater requirements.
- Variations in these patterns are likely. These are considered in more detail in the separate *Sectoral* and *Spatial Reports*.
- The key message from this analysis is the need for both policy analysts and other actors in the labour market to focus not just on the projected changes in occupational employment levels but on replacement needs, including important education and training requirements.
- There may be good job opportunities for young new entrants, into many areas where initial impressions based on projected employment levels are quite pessimistic.

5.1 Why Replacement Demands are Important

The projections of occupational employment, which were summarised in Tables 4.1 and 4.2, focus on the total numbers of people that are expected to be employed in such jobs in the future. Although these estimates provide a useful indication of areas of change, highlighting the likely 'gainers' and 'losers', they can give a misleading impression of job opportunities and any related training requirements. Even where the projections indicate significant occupational employment decline into the medium term, there may still be quite good career prospects with a significant number of job openings. This is because, as long as significant numbers are still likely to be employed in particular jobs in the future, employers will need to replace those workers who leave due to retirement,

career moves, mortality or related reasons. This so-called '*replacement demand*' may often be far more significant than any change which results from growth in employment in an occupational group. Such replacement demand can also easily outweigh any negative changes resulting from projected employment decline.

Traditionally the net change in employment projected in Chapter 4 has been referred to as "expansion demand" although where employment is declining this can be negative. The sum of *expansion demand* and *replacement demand* is referred to as the *net requirement*. Further details of definitions and methods used to calculate the replacement demands and total requirements are given in Box 5.1.

Box 5.1: Replacements Demands: Definitions and Methods***Methodology & Caveats***

The projections described in Chapter 4 define the expansion demand arising from growth or decline in occupational employment. This estimate is the net change in employment between two periods. This is only part of the demand that needs to be met if employers are to maintain their operations. In order to do this they also need to replace those members of their staff who leave.

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

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

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

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

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

Data on net migration are not readily available, so this is set equal to zero by assumption in all the tables. Net occupational mobility measures based on turnover of those who change occupations within a 12 month period are available from the LFS. These exclude those who remain in the same occupation. They also exclude those who may change jobs more than once in a 12 month period. They are therefore a lower bound estimate of total turnover. These have been used in previous estimates of replacement demands (for example, see those in Wilson, 2001a). However it has proved impossible to develop a consistent set of such estimates for all the detailed specific sectors and geographical areas in the Working Futures 2004-2014 database using data from the LFS. This is due to the latter's limited sample size. The estimates shown here and in the more detailed tables are therefore based just on estimated losses from retirements and mortality.

The methods for preparing estimates of replacement demands are described in more detail in the separate Technical Report. There is a brief summary of this in Annex A.4 of the present document.

5.2 Estimates of Replacement Demands

An analysis of replacement demand for the 25 occupational subgroups and total occupations, over the period 2004 to 2014, is presented in Table 5.1 and Figure 5.1. In every occupational group, the net requirement for workers turns out positive, as replacement demand is highly significant. This serves to outweigh negative *expansion demand* in a number of occupations. For all occupations together, replacement demand over the period 2004-2014 is over 8 times larger than *expansion demand*, see Table 5.1. Over the decade as a whole, there is expected to be a net requirement of over 12 million new job openings. Retirements from the workforce are the principal component of this estimate.

In many occupations, *expansion demand* is declining. These include occupations such as:

- managers & proprietors in agriculture & service industries;
- administrative, clerical & secretarial occupations;
- skilled metal & electrical trades;
- textiles, printing & other skilled trades;
- process, plant & machine operatives; and
- elementary trades.

In these cases, significant negative *expansion demand* (projected employment decline) is expected to be more than compensated by positive replacement demand. Again, the latter is primarily related to retirements from the workforce.

Expansion demand is positive in many other occupations, such as:

- corporate managers;
- science & technology professionals;
- teaching & research professionals;
- health associate professionals;
- business & public service associate professionals;
- caring personal service occupations; and
- sales occupations;

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

In principle, occupational mobility can also influence the scale of replacement demands, although such flows are not anything like as important as that for retirement. They can have both positive and negative effects. From previous analysis (Wilson, (2001a), one of the strongest mobility effects is likely to be for corporate managers, where a marked *inflow* from other occupations is likely to significantly *reduce* replacement demand (due to a negative occupational mobility flow as people move into such occupations as part of a process of natural career progression). Similar but lesser impacts arise for business & public service professionals, business & public service associate professionals, and administrative & clerical occupations. In other occupations, the mobility effect can produce an additional outflow and so *increase* replacement demand. From the previous analysis, the occupations with the strongest expected mobility net outflows are for skilled trades, sales occupations and the two elementary sub-major groups.

For reasons already outlined above, it proved impossible to obtain reliable estimates of such flows for the disaggregated estimates of replacement demands presented elsewhere. To facilitate comparisons across areas and industries it was therefore decided to exclude occupational mobility from the estimates presented here.

Geographical mobility (in the UK case international migration) is also assumed in these results to be negligible. This again reflects a lack of reliable data rather than reality, although such flows are almost certainly small in comparison with retirement flows. For individual LLSC areas, in principle, such flows may be of greater significance, but there are few, if

any, firm data to enable these to be quantified.³⁴

The estimates of outflows presented here are based on quite limited information using data from the Labour Force Survey. They should therefore be treated with some care. Nevertheless, they provide a broad indication of the scale of such flows, compared to the structural changes projected in Chapter 4.

The results in Chapter 4 indicated that further substantial changes in occupational employment structure are expected over the next decade. In many cases this will result in job losses. Despite this, there will be a need to recruit and train new entrants into such jobs to replace those retiring from the workforce or leaving for other reasons. Where employment is already projected to rise, such replacement demand elements will serve to reinforce this and lead to even greater requirements.

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

Perhaps the main message from this part of the analysis is the need for both policy analysts and other actors in the labour market to focus not just on the projected changes in occupational employment levels but on replacement demands. In many occupations, where employment is expected to decline, there are nevertheless important education and training needs in order to support existing

operations, as individuals retire from the workforce or leave for other reasons. This also means that there may be good job opportunities for young new entrants into many such areas, even where initial impressions may be quite pessimistic.

³⁴ For analysts working within SSCs or LLSCs, who have access to the full dataset underlying the projections, it is possible to impose alternative assumptions about such flows, so as to assess the sensitivity of the results to this assumption.

Table 5.1 Replacement Demand by SOC Sub-Major Group, 2004-2014

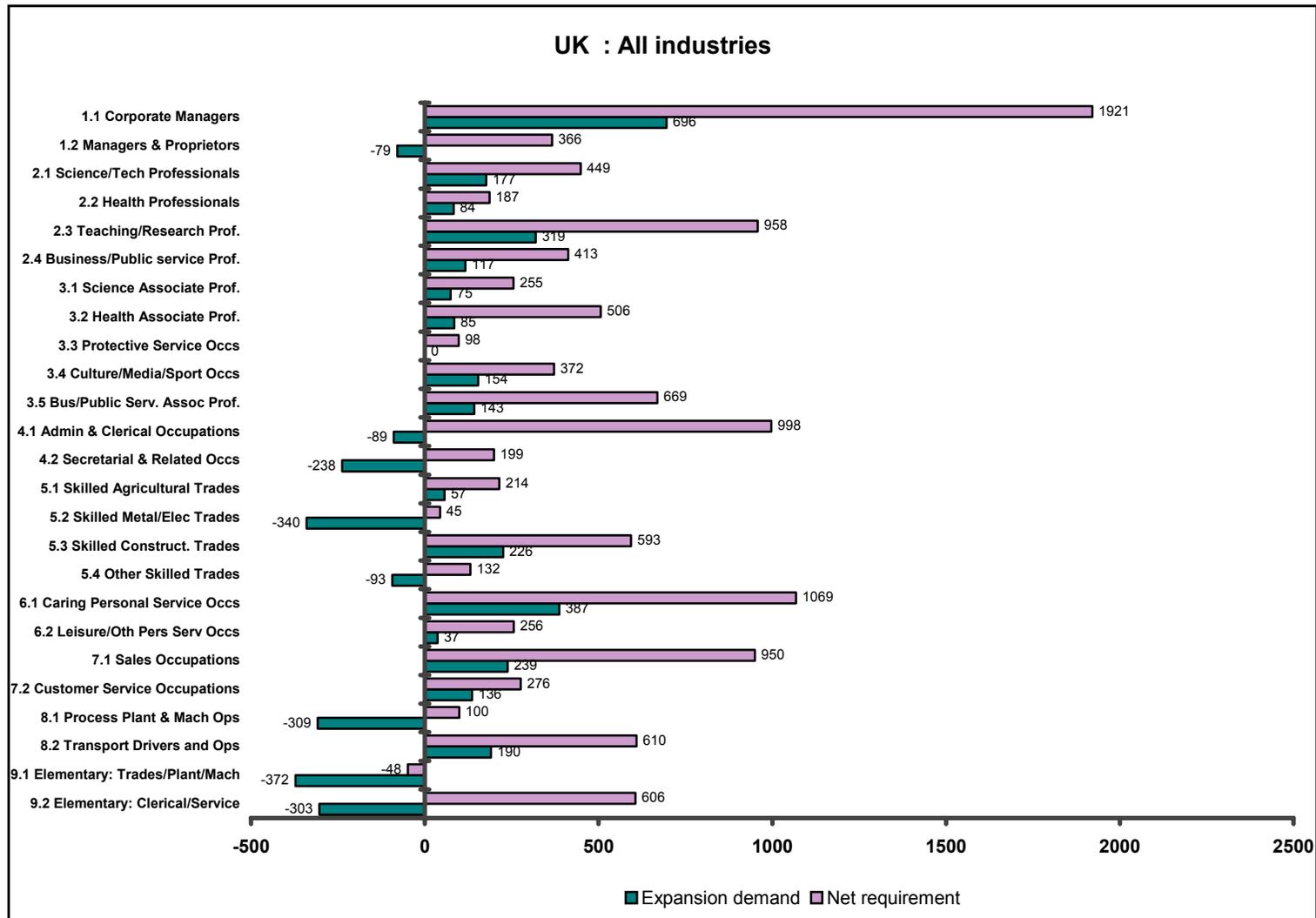
UK, All industries	Expansion demand	Replacement demands (retirements & mortality)	Net requirement (excluding occupational mobility)
<i>(Results in 000s)</i>			
Corporate Managers	696	1,225	1,921
Managers & Proprietors	-79	445	366
Science/Tech Professionals	177	272	449
Health Professionals	84	103	187
Teaching/Research Prof.	319	639	958
Business/Public service Prof.	117	296	413
Science Associate Prof.	75	180	255
Health Associate Prof.	85	422	506
Protective Service Occs	0	98	98
Culture/Media/Sport Occs	154	219	372
Bus/Public Serv. Assoc Prof.	143	526	669
Admin & Clerical Occupations	-89	1,086	998
Secretarial & Related Occs	-238	437	199
Skilled Agricultural Trades	57	157	214
Skilled Metal/Elec Trades	-340	385	45
Skilled Construct. Trades	226	367	593
Other Skilled Trades	-93	225	132
Caring Personal Service Occs	387	682	1,069
Leisure/Oth Pers Serv Occs	37	219	256
Sales Occupations	239	711	950
Customer Service Occupations	136	140	276
Process Plant & Mach Ops	-309	408	100
Transport Drivers and Ops	190	419	610
Elementary: Trades/Plant/Mach	-372	324	-48
Elementary: Clerical/Service	-303	910	606
All Occupations	1,300	10,894	12,194

Source: CE/IER estimates, based on LEFM Replacement Demand Module, MDM01R1 C51F8A Forecast, ReplacementDemands.xls, (Table5.1).

Notes: a) Numbers may not sum due to rounding.

b) Occupational and Geographical mobility are assumed to be zero for the purposes of these estimates.

Figure 5.1 Net Requirements by SOC 2000 Sub-major Group, 2004-2014



Source: CE/IER estimates, MDM01R1 C51F8A Forecast, ReplacementDemands.xls, (Figure 4.1a).

Notes: Figures for total requirements exclude replacement demands due to occupational mobility.

6. Detailed Industrial Prospects

Background

This chapter provides further detail of the projections for each of the industries distinguished in Chapter 3. These follow a standard format. In each case, the section begins with a brief qualitative and quantitative description of the industry group and its prospects. This is followed by a summary of key trends in output and productivity. The implications of these for employment, including breaks by gender and status, are then described. This is followed by a presentation of the likely developments in occupational structure, including replacement demands and total future requirements.

The opinions expressed in this chapter are those of the authors and do not necessarily reflect the views of the Sector Skills Development Agency and its partners, nor those of the individual Sector Skills Councils. The results should be regarded as indicative of general trends for the industry group rather than precise forecasts of what will happen, and should be used in conjunction with a variety of other sources of LMI.

The focus here is on the so called Sector Matrix Industries (SMIs) developed by the SSDA to describe the main sectoral development occurring across the whole economy. These are based on definitions taken from the Standard Industrial Classification (SIC). There are 27 SMIs (as defined in Table A.3 in Annex A).

A complementary analysis is also available in the *Sectoral Report*, which focuses on the 25 Sector Skills Councils. Historical time series data are not readily available for the SSCs, but the WF II results have been recast to reflect the **core** SSC footprints as defined by SIC. These results provide information which it is hoped will go some way to meeting the needs of SSCs for forward looking data on employment prospects.

A number of SSCs regard their remit as extending beyond that core to include some SIC categories which are covered within the core of other SSCs. No attempt is made to include such elements either here or in the *Sectoral Report*.

Following this introduction there are 25 sub-sections, one for each industry group. Some of the SSDA SMIs are quite small in employment terms and so, in a few cases, these have been aggregated together to form the 25 industry groups used here for reporting the results. This aggregation is necessary in order to obtain robust estimates. This applies to *Mining & quarrying* and *Gas, electricity & water* and to *Wood pulp & paper* and *Printing & publishing*.

For each of these 25 industry groups there is:

- a brief description of the industry, including SIC code and selected key indicators;
- a summary of output and productivity trends and their implications for employment;
- expected changes in employment structure by gender and status;
- occupational employment projections;
- a shift-share analysis of changes over time;
- implications for replacement demands.

For the two industry groups mentioned above, further details on the constituent SSDA Matrix Industries are also provided here.

Measurement of Productivity

The profiles of productivity presented here are based on output divided by employment. Output per head is a fairly crude but widely used measure. There are alternative possibilities. These include output per person hour and total factor productivity. The latter attempts to measure all factor inputs, not just labour. It is not readily available from the present set of results. The measures used here are sensitive to changes in the mix of full-time and part-time employment. This may be quite significant, particularly in some service industries. Part-timers typically work around half the hours of full-time workers.

Implications for Industry Employment

The employment prospects in each industry can be regarded as dependent upon two main factors: demand for the industry's output and projected productivity growth. Prospects for demand for each industry's output in turn depend upon a whole host of factors (as outlined in more detail in Chapter 3). These include:

- technological change;
- productivity growth;
- international competition;
- globalisation;
- specialisation and sub-contracting;
- economic growth and real incomes;
- shifts in patterns of consumer expenditure.

Productivity growth affects the numbers of people that need to be employed to produce the same level of output. This will depend upon factors such as technological change and the way work is organised (see Chapter 3 for further discussion). The faster output increases relative to productivity, the faster employment will rise (or conversely). In many industries output prospects are quite promising but this is offset by rapid productivity growth.

Patterns of employment by Gender and status

The results in this chapter also show the historical patterns of change and expected future developments in employment by gender and status in each industry. As described in more detail in Chapter 3, these changes are the consequence of a complex mix of supply and demand side factors. The former are often specific to particular industries and sectors, while the latter are of a more generic nature. The decline of employment requiring great physical strength in industries such as the primary and manufacturing sector, coupled with the expansion of services, has opened up many more jobs for women, especially of a part-time nature. In contrast, the number of opportunities for full-time work for men has declined. These developments have been reinforced by supply side changes, reflecting the greater propensity of women to want to take part in the formal economy, often in a part-time capacity.

Regulatory changes regarding the tax treatment of self-employment have reinforced other factors such as the falling number of small businesses in sectors such as agriculture and distribution, resulting in a declining self employment share. In some other parts of the economy there is, by contrast, a rapid increase in such activity, often linked to IT.

The general trends identified above can be observed within most individual industries although certain parts of the primary, manufacturing and construction sectors, have managed to resist the trend towards greater part-time working.

Occupational Change

Trends in occupational employment structure are also common across most industries, although there are dramatic differences in the occupational structures across industries. The observed historical and projected future changes reflect ongoing technological and organisational change.

Key drivers of changing skill requirements include:

- *technological change* - especially information and communications technology (ICT), which is affecting both the range of products and services available as well as the way they are produced;
- *competition and changing patterns of consumer demand* - which have increased the emphasis on customer handling skills and the need for part-time and shift working;
- *structural changes* - including globalisation, sub-contracting and extension of supply chains, emphasising the need for high quality managerial skills (across a greater range than previously and at a greater depth) at various levels;
- *working practices* - such as the introduction of team- or cell-based production in engineering, and call centres in financial services, resulting in increased demand for communication and team working skills and increased demand for part-timers; and
- *regulatory changes* (as well as increased concern about environmental issues), which have made important skill demands upon staff in some key sectors, including construction, finance, and the public sector, raising the demand for higher level skills.

6.1 AGRICULTURE, ETC

6.1.1 Description of the industry

INDUSTRY 1: AGRICULTURE, ETC		
SIC92 headings: 01,02, 05		
Arable farming, livestock production, horticulture and related services, forestry and provision of recreational facilities and roads by forestry units, and commercial sea and inland fishing.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	1.1	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	426,000	30,099,000
Share of total employment (% 2004):	1.4	100
Gender split (male:female) (% 2004):	77:33	54:46
Part-time share (% 2004):	14	28
Self-employment share (% 2004):	47	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.1.2 Industry Commentary

Agriculture has faced major problems since the mid1990s, with most farmers experiencing dramatic reductions in income. Net farm incomes are estimated to have fallen by 80 per cent between 1995 and 2000. Although average farm income on low-land farms increased nearly fivefold in 2003 and the first half of 2004, this was mainly due to exchange rate movements and the 2003 heatwave on the continent. A sharp fall in income is now estimated for 2004 because wet weather led to a poor grain harvest. Further sharp rises and falls in product prices are very likely.

BSE had an adverse effect on meat production and exports and on consumption in general, while over 2000-02, swine fever and the foot-and-mouth epidemic exacerbated the problems. The National Audit Office estimates that the foot-and-mouth epidemic cost agriculture and other affected industries some £5bn. Many farmers left the industry as a result.

A large overhaul of the European Common Agricultural Policy (CAP) was agreed in June 2003. Currently the UK receives about 9 per cent of the CAP subsidies and is a large net contributor to the policy. The EU enlargement of May 2004 has added further pressure to EU finances, even though the new members are receiving the subsidies at a reduced level, rising in stages to 100 per cent by 2013. The main goal of the latest reforms is to sever the link between production and subsidy, a concept known as “decoupling”. This should reduce distortions in agricultural markets caused by the CAP. In the past, the CAP has been blamed for huge European food surpluses and the more harmful practice of dumping (selling at less than cost price) food from the EU on developing economies. It is not expected that the total levels of subsidies paid to farmers will change, but decoupling is intended to divert more of the subsidies to smaller farms with lower production levels and to direct funds towards the environment and animal welfare. In a recent report commissioned by the OECD, it was concluded that there will be

a slight fall in the production of most agricultural produce covered by the CAP, but there will be a more substantial fall in the amount of produce exported from the EU. At the same time, world prices are expected to rise slightly. However, the exact scale of these changes depends upon the amount of 'decoupling' undertaken by the member states, (i.e. the degree to which the level of subsidy received is removed from the level of production). In the UK, the reforms were welcomed by the National Farmers' Union (NFU), which recognised that the current situation was unsustainable. However, the NFU warned that the retention of subsidies in certain EU member states could distort competition within the single market, leaving British farmers at a competitive disadvantage when CAP reforms are gradually phased in between 2005 and 2012.

For many years the Government has wanted to encourage farmers to diversify, so that the rural economy moves away from dependence on mainstream farming and embraces a host of new, mainly service-sector businesses. The 2000 England Rural Development Programme includes financial support for farmers wishing to diversify and this goes some way towards helping farmers to obtain the capital they need. However, many in the industry believe that diversification cannot be a panacea for the continuing decline of agriculture. Over 2001-02, farm based tourist attractions were severely affected by the restrictions in countryside access put in place during the foot-and-mouth epidemic, but visitor numbers began to rise again in 2003 and have continued to hold up in 2004.

Any immediate change in the UK fisheries policy looks unlikely. In December 2004, the Royal Commission on Environmental Pollution released a report which concluded that, in order to save fish stocks from the threat of extinction, up to a third of the UK's waters should be marine reserves, and therefore off limits to fishermen. It called for a new Marine Act, making harmful fishing practices illegal and enforcing a ban on fishing in these protected areas. If introduced as law, this would have a major effect upon the UK's fishing community. The Government's immediate reaction was to express reluctance to act on its own; it prefers to wait instead for action from the EU. However, the EU has consistently been reluctant to enforce radical changes in its Common Fisheries Policy, in the face of massive opposition from national fisheries industries. While this remains the case, it seems unlikely that any major changes will be made in the laws governing commercial fishing.

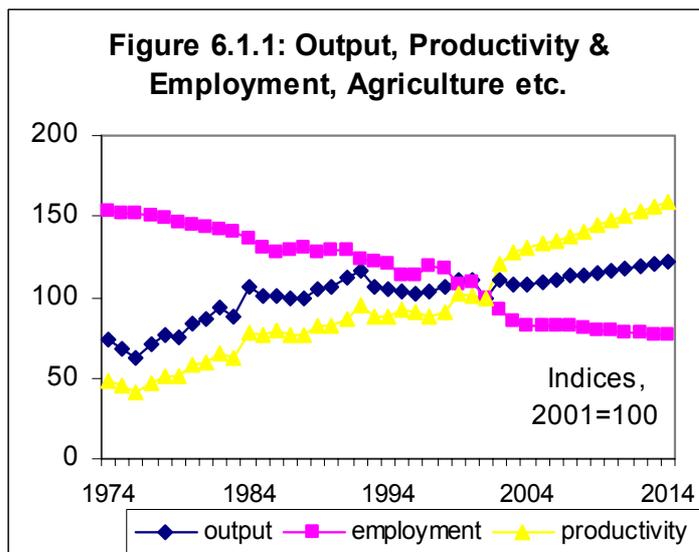
It is expected that output growth in agriculture in the UK will register only a slight increase in 2005, whilst the growth of imports is expected to slow. Total demand is forecast to rise in 2005, driven mainly by increased domestic demand. Investment demand will maintain steady growth in the short term.

6.1.3 Productivity and Output Trends

Table 6.1.1: Trends in Output, Productivity and Employment

Indicator	Average change in the period			
	1994-99	1999-2004	2004-09	2009-14
Gross Output (% pa)	1.0	-0.5	1.3	1.0
Employment (% pa)	-2.0	-4.0	-1.4	-1.8
Total change (000s)	-56	-97	-30	-34
Productivity (% pa)	3.0	3.7	2.8	2.8

Source: 6725output.xls (Figure 6.x.1)



- Output levels are expected to see only modest recovery following the problems experienced in the preceding 5 year period.
- Productivity is projected to show further steady growth, driven by technological change and continued restructuring of the sector.
- Employment has fallen quite sharply in recent years, continuing a long term pattern of steady decline.
- These patterns are expected to continue over the next decade, although the pace of job loss is expected to slow.

Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

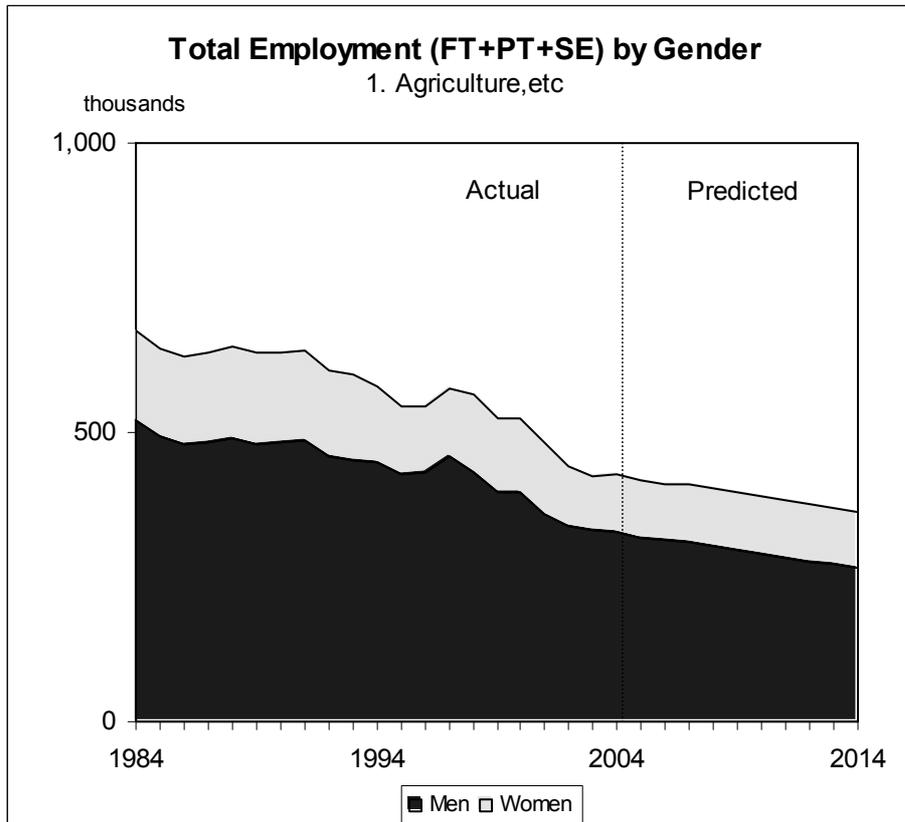
6.1.4 Employment by Status and Gender

Employment in this industry is predominately male. Self employment is very significant, accounting for more than half of all male jobs. Males generally, and self employment are expected to bear the brunt of the projected employment decline.

Table 6.1.2: Employment Levels by Gender and Status, Agriculture, etc

Employment Status Employment by Gender	Employment Status						Changes in Employment Status					
	FT	%	PT	%	SE	%	Total	FT	PT	SE	Total	
	shares		shares		shares		000s shares	2004-09			000s	
2004												
Male employment	125	(29.4)	30	(7)	172	(40.4)	328	(76.8)	-23	-7	-2	-32
Female employment	42	(9.7)	29	(6.8)	28	(6.6)	99	(23.2)	7	3	-8	2
Total employment	167	(39.2)	59	(13.8)	200	(47)	426	(100)	-16	-4	-10	-30
2009												
Male employment	103	(25.9)	23	(5.9)	170	(42.9)	296	(74.7)	-23	-2	-6	-31
Female employment	48	(12.2)	32	(8)	20	(5.2)	100	(25.3)	3	1	-7	-3
Total employment	151	(38.1)	55	(13.9)	191	(48.1)	396	(100)	-20	-1	-13	-34
2014												
Male employment	80	(22)	22	(6)	164	(45.3)	265	(73.2)	-46	-8	-8	-62
Female employment	51	(14.2)	32	(9)	13	(3.6)	97	(26.8)	10	4	-15	-2
Total employment	131	(36.2)	54	(14.9)	177	(48.9)	362	(100)	-36	-5	-23	-64

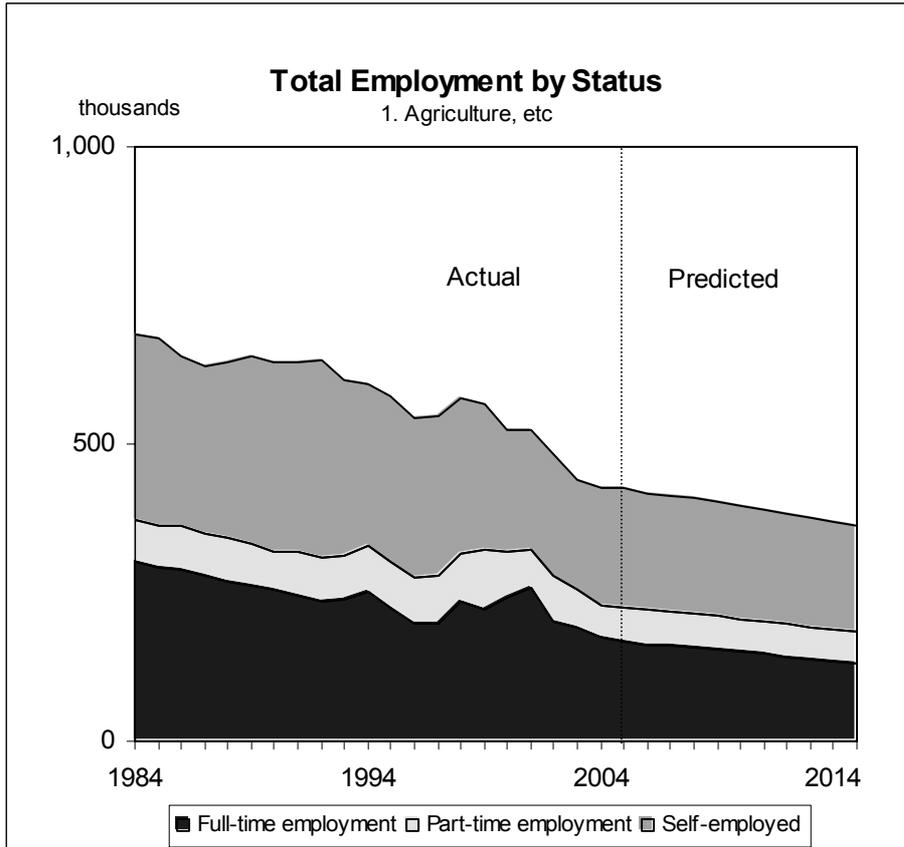
Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

Figure 6.1.2: Changing Patterns of Sectoral Employment by Gender

Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Fig 6.X.3 and Fig 6.X.2).

- Male employment still makes up the bulk of employment in this sector and has fallen much faster than that for females. This is projected to continue.

Figure 6.1.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Fig 6.X.3 and Fig 6.X.2).

- Self-employment has borne the brunt of recent job losses but full time employees are projected to be the main casualty of further job losses.

6.1.5 Projections of Employment by Occupation

Key aspects of occupational structure

Three occupations dominate employment (see Table 6.1.3).

- Managers & senior officials (including proprietors of small businesses);
- Skilled trades (mainly agriculture trades);
- Elementary occupations (manual jobs).

The last two are by far the most significant numerically. All three are becoming less significant as a proportion of total employment.

Main changes by occupation: recent past & future

- These three occupations, along with transport and machine operatives have borne the brunt of job decline.
- These patterns are projected to continue, with elementary occupations experiencing significant job losses.
- Whilst skilled trades will continue to lose some jobs, a slow down in the expected rate of job loss will result in a modest increase in the occupational share.
- Small increases are expected for personal service occupations, reflecting the increasing emphasis on tourism and leisure as opposed to traditional farming activities.

Shift share analysis

Table 6.1.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and

organisational factors on the occupational structure *within* the industry.

For agriculture, etc, the industry effect has played a major part in declining employment for many occupations. In the period 1984-94, the industry effect was almost -19 per cent. This more than doubled in 1994-2004. Over the projection period, the industry effect is projected to moderate to just over -19 per cent.

Over the projection period the occupational effects are broadly in line with those across all industries. During the historical periods shown the industry has experienced much more rapid job losses for the managers category, reflecting the closure of many small holdings.

Replacement demands

Table 6.1.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Although further job losses are expected in the industry this does not mean that there will not be a need to recruit new workers.
- There are significant replacement demands, especially for skilled trades occupations and elementary occupations. The requirements for the first of these groups has important implications for training requirements.
- Replacement demand is more than double the decline in expansion demand, so creating a net need for over 90 thousand new workers in the sector. The largest net requirement projected is for skilled trades. There is also a smaller demand for managers & senior officials and for personal service occupations. The latter reflects the new focus on tourism and leisure, as opposed to more traditional activities.

Table 6.1.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Agriculture etc Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	84	65	38	36	32	-5	14	9
2. Professional Occupations	6	6	4	3	3	-1	1	1
3. Associate Professional & Technical Occupations	11	11	8	8	8	-1	3	2
4. Administrative, Clerical & Secretarial Occupations	21	17	10	9	8	-2	4	2
5. Skilled Trades Occupations	265	228	184	188	189	5	77	82
6. Personal Service Occupations	29	30	32	30	31	-1	11	10
7. Sales & Customer Service Occupations	4	4	3	3	3	0	1	1
8. Machine & Transport Operatives	59	50	30	25	20	-9	10	1
9. Elementary Occupations	198	167	118	94	67	-50	37	-14
Total	677	579	426	396	362	-64	158	94

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	12	11	9	9	9	-15	38	23
2. Professional Occupations	1	1	1	1	1	-17	33	16
3. Associate Professional & Technical Occupations	2	2	2	2	2	-6	33	26
4. Administrative, Clerical & Secretarial Occupations	3	3	2	2	2	-18	42	24
5. Skilled Trades Occupations	39	39	43	47	52	3	42	45
6. Personal Service Occupations	4	5	8	8	9	-5	35	30
7. Sales & Customer Service Occupations	1	1	1	1	1	6	33	39
8. Machine & Transport Operatives	9	9	7	6	6	-31	33	2
9. Elementary Occupations	29	29	28	24	19	-43	31	-12
Total	100	100	100	100	100	-15	37	22

Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Table 6.x.3).

Figure 6.1.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Figure 6.x.4).

Table 6.1.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	-19	4	-16	-6	-27	8	-25	-10	-5	2	-7	0
2. Professional Occupations	0	0	-1	1	-2	1	-2	-1	-1	0	-1	0
3. Associate Professional & Technical Occupations	0	0	-2	1	-3	1	-4	0	-1	0	-2	1
4. Administrative, Clerical & Secretarial Occupations	-4	1	-4	-1	-8	2	-7	-3	-2	0	-2	0
5. Skilled Trades Occupations	-37	11	-50	2	-45	28	-89	16	5	8	-36	33
6. Personal Service Occupations	0	1	-6	5	3	4	-12	10	-1	1	-6	3
7. Sales and Customer Service Occupations	0	0	-1	1	-1	1	-2	0	0	0	-1	1
8. Machine & Transport Operatives	-9	3	-11	0	-20	6	-19	-7	-9	1	-6	-5
9. Elementary Occupations	-30	8	-37	-2	-50	21	-65	-6	-50	5	-23	-33
Total	-98	29	-127	0	-153	72	-225	0	-64	18	-82	0

	1984-1994				1994-2004				2004-2014			
				% change				% change				% change
1. Managers & Senior Officials	-22.1	4.3	-18.7	-7.7	-42.1	12.4	-38.8	-15.7	-14.5	4.3	-19.3	0.5
2. Professional Occupations	-4.7	4.3	-18.7	9.7	-35.2	12.4	-38.8	-8.8	-17.5	4.3	-19.3	-2.5
3. Associate Professional & Technical Occupations	-1.1	4.3	-18.7	13.4	-24.7	12.4	-38.8	1.6	-6.5	4.3	-19.3	8.6
4. Administrative, Clerical & Secretarial Occupations	-18.0	4.3	-18.7	-3.6	-43.3	12.4	-38.8	-16.9	-17.9	4.3	-19.3	-2.9
5. Skilled Trades Occupations	-13.8	4.3	-18.7	0.7	-19.5	12.4	-38.8	6.9	2.8	4.3	-19.3	17.8
6. Personal Service Occupations	1.4	4.3	-18.7	15.8	8.6	12.4	-38.8	35.0	-4.6	4.3	-19.3	10.4
7. Sales & Customer Service Occupations	-0.2	4.3	-18.7	14.2	-21.7	12.4	-38.8	4.6	6.0	4.3	-19.3	21.0
8. Machine & Transport Operatives	-14.9	4.3	-18.7	-0.4	-40.9	12.4	-38.8	-14.5	-30.9	4.3	-19.3	-15.9
9. Elementary Occupations	-15.3	4.3	-18.7	-0.8	-29.7	12.4	-38.8	-3.3	-42.7	4.3	-19.3	-27.7
Total	-14.5	4.3	-18.7	0.0	-26.4	12.4	-38.8	0.0	-15.0	4.3	-19.3	0.0

Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Table 6.x.3).

6.2 MINING & QUARRYING; ELECTRICITY, GAS & WATER

6.2.1 Description of the industry

INDUSTRY 2: MINING & QUARRYING ; ELECTRICITY, GAS & WATER				
SIC92 headings: 10, 11, 12, 13, 14, 40.1,40.2, 40.3, & 41				
<p>Deep coal mines and opencast coal working. Over 70 per cent of consumption is by the electricity industry. Exploration for, and extraction of, mineral oil etc. Provision of services incidental to oil and gas extraction. Mining of uranium & thorium. Metal ores and their preparation; quarrying of stone, sand and clay; production of salt, other mining and quarrying not elsewhere specified.</p> <p>Electricity generation, transmission, distribution and supply. Transportation, distribution and supply of gaseous fuels through a system of mains, manufacture of gaseous fuels with a specified calorific value; production of gas for the purpose of gas supply from coal, by-products or waste; production, collection and distribution of steam and hot water for heating, power and other purposes. Collection, purification and distribution of water.</p>				
INDUSTRY PROFILE				
	Total	Mining & Quarrying	Electricity, gas & water	All industries
Share of UK Output (% 2004):	2.3	0.4	1.8	100
Exposure to International Trade:	high			average
Concentration (market share of largest employers):	low			average
Total employment (2004):	183,000	61,000	122,000	30,099,000
Share of total employment (% 2004)	0.6	0.2	0.4	100
Gender split (male:female) (% 2004):	80:30	85:15	63:37	54:46
Part-time share (% 2004):	5	3	11	28
Self-employment share (% 2004):	4	6	4	13

Source: CE/IER estimates, MDM95 C51F8AForecast, 6725output.xls (Figure 6.x.1)

6.2.2 Industry Commentary

Mining & Quarrying

Britain's largest coal producer, UK Coal, reported mounting losses in 2002, driven by falls in wholesale electricity prices, and low international coal prices. Further reductions of capacity have resulted from the closure of the Selby complex in Yorkshire. The long-term future for the industry looks exceedingly bleak.

UK oil and gas production are currently near their peak, and output will probably fall over the longer term. At the same time,

world oil prices are likely to increase in real terms in the face of increasing energy demand (despite more efficient use of oil in oil-consuming countries) and a strengthening of OPEC's control over prices. World gas prices are also set to rise in real terms over the next decade. This will adversely impact on the UK, as demand for gas exceeds available supply and the UK becomes a net importer of gas by 2006.

Electricity, gas & water

Since the new electricity trading arrangements (NETA) were implemented

in 2001, generators have had to trade their electricity in short and long-term contracts with suppliers, and capacity payments have been removed. This resulted in significant falls in wholesale electricity prices, with prices close to variable costs and many producers were running trading losses. Inevitably the price of electricity has had to rise and in 2004 prices rose by about 10%, so registering the first price rise in real terms since 1995. Large industrial users in particular have faced rapidly increasing energy costs over the last year. UK electricity output is expected to see no growth in 2004, as electricity supplied by indigenous generators grew more slowly and imports rose substantially. Electricity demand also slowed in 2004 and is forecast to slow further in 2005, before recovering in 2006.

Concerns about the availability and cost of fossil fuels (in particular gas) and about global warming are leading to the re-emergence of nuclear power as an option for generation, especially as the government is committed to reducing UK CO₂ emissions. The increasing dependence on imported gas supplies, as production from the North Sea levels out, have led the UK government to indicate that it will not rule out the option of replacing some nuclear power stations. However, with very high capital costs, over twice those of a gas-fired plant, government assistance in the UK is likely to be required in some form if private investors are to finance the construction of a new generation of nuclear stations.

During the 1990s, UK natural gas production more than doubled, but since reaching a peak in 2000, production has been in decline and imports have been growing. Wholesale gas prices began to rise in 2003 and this has continued into 2004 and 2005. Underpinning these rises has been the international price of oil. In the face of rising world demand, oil prices in 2004 rose to above \$40 per barrel by summer and \$50 in October. In response to rising prices, producers have increased supply to record levels. OPEC's rate of production led to an oversupply towards the end of 2004, but as long as oil prices

remain well above \$40 pb, OPEC is unlikely to cut production. Oil at present meets some 40% of the world's primary energy demand, but the International Energy Authority stresses that this share may increase if there are no new government policies to speed the take-up of new technology. The IEA has trimmed its forecast demand for oil in 2005 to reflect a slow-down in economic growth.

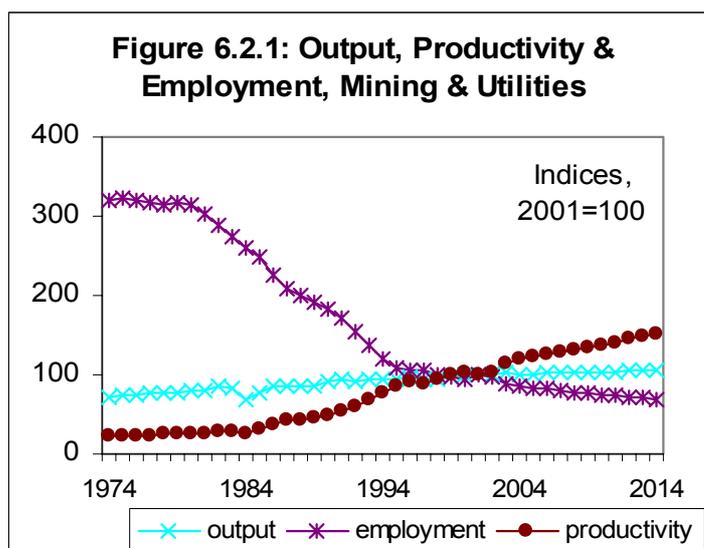
The demand for gas is forecast to rise substantially in the future, largely because it continues to be the fuel of choice for electric power generation, and has the advantage over oil in its environmental characteristics. The higher gas prices are likely to exert some downward pressure on demand, both industrial and household. In the medium term, prices are expected to stabilise as new sources of gas supply become available. Fairly strong growth in gas use for power generation and modest growth in household consumption are expected to outweigh sluggish or declining industrial demand, and lead to significant output growth over the next decade.

The water industry plays a leading role in sustaining the UK economy, especially the agricultural and domestic sectors. The considerable size of the industry means that it has a multiplier effect on sectors as diverse as construction, engineering, IT and telecommunications. However, as the water industry is facing increasing environmental demands and a strict pricing regime, it is in a period of great uncertainty and high operating costs. Since privatisation the water industry has made great efficiency gains. An Ofwat report published in 2004, makes clear that water companies in England and Wales have invested substantially in infrastructure and quality improvements over the past four years while continuing to improve their efficiency. Ofwat has determined a five-year price structure for the water industry and it allows for price increases of about 30% over the period. Output in water supply is expected to see modest growth in the short-term, but to be mainly flat over the longer term.

6.2.3 Productivity and Output Trends

Table 6.2.1: Trends in Output, Productivity and Employment
Average change in the period

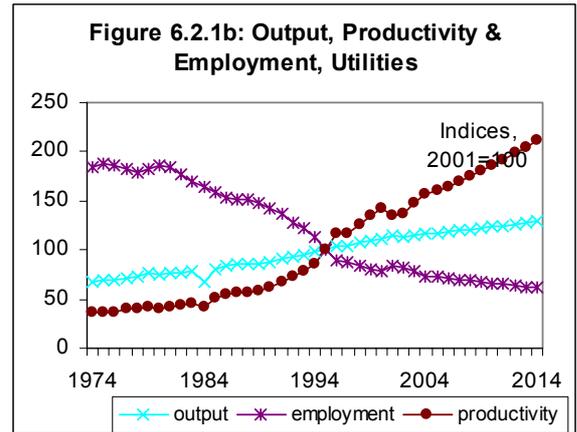
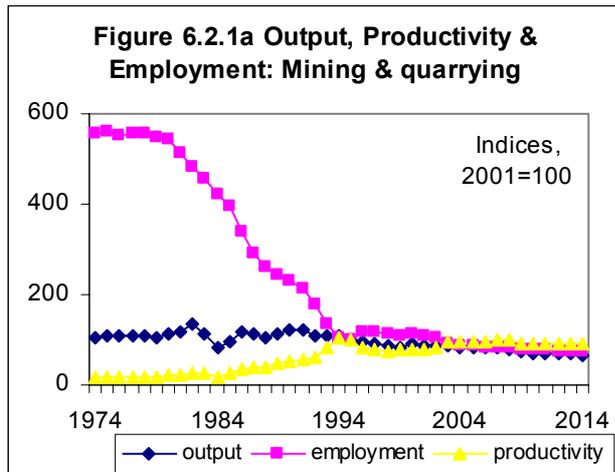
Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	0.5	0.9	0.3	0.7
Employment (% pa)	-4.3	-2.7	-1.8	-1.9
(000s)	-51	-27	-16	-15
Productivity (% pa)	5.0	3.7	2.2	2.6



Source: CE/IER estimates, MDM95 C51F8AForecast, 6725output.xls (Figure 6.x.1)

- Output levels for this group of industries obscure a number of offsetting trends, including the discovery and exploitation of North Sea oil and gas, as well as the demise of the coal mining industry.
- Output levels are expected to grow only very slowly over the next decade.
- Productivity levels have risen steadily in recent years and further gains, albeit at a slightly slower rate, are expected over the next 10 years.
- Employment is therefore expected to continue to fall although not as rapidly as over the 1980s and 1990s, when the coal industry was run down and privatisation of the utilities led to many job losses.

Productivity in component industries



- Employment losses have been most severe in mining and quarrying, with the coal industry the main casualty.
- Employment has also fallen rapidly in utilities, following the restructuring post-privatisation.
- Productivity growth is projected to continue to outweigh projected increase in output as the search for further efficiency gains and cost savings continues. Such growth will be most significant in the utility sector.

Table 6.2.1a: Productivity, Output & Employment in Component industries

Indicator	1994-99	1999-2004	2004-09	2009-14
2. Mining & quarrying				
Output (% pa)	-5.6	-0.7	-2.7	-1.5
Employment (% pa)	-7.9	-1.3	-2.0	-2.2
(000s)	-42	-5	-7	-7
Productivity (% pa)	2.6	0.6	-0.7	0.7
4. Electricity, gas and water				
Output (% pa)	2.7	1.2	0.4	0.2
Employment (% pa)	-7.0	-0.9	-2.1	-2.1
(000s)	-65	-6	-14	-13
Productivity (% pa)	10.5	2.1	2.6	2.3

Source: CE/IER estimates, MDM95 C51F8AForecast, 6725Output.xls (Figures for 27 extras).

6.2.4 Employment by Status and Gender

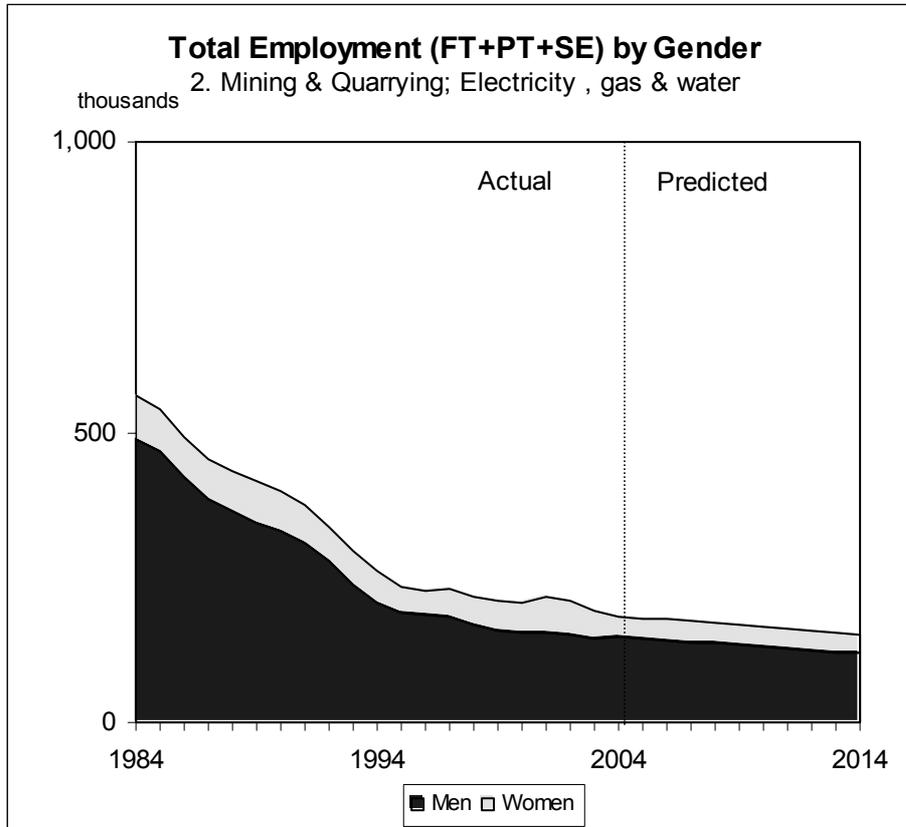
These industries are predominantly a source of jobs for males. Self-employment accounts for less than 1 in 20 jobs, but this is increasing. Part-time workers account for a growing share of total employment, especially in the utilities industries.

Table 6.2.2: Employment Levels by Gender and Status, Mining & quarrying; Electricity, gas & water

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			
Male employment	137	(75)	2	(1.1)	7	(3.9)	146	(79.9)	-14	0	0	-13
Female employment	30	(16.4)	7	(3.7)	0	(0)	37	(20.1)	-4	2	0	-3
Total employment	167	(91.4)	9	(4.7)	7	(3.9)	183	(100)	-18	2	0	-16
2009									2009-14			
Male employment	123	(73.8)	2	(1.3)	7	(4.3)	133	(79.5)	-14	0	0	-14
Female employment	26	(15.6)	8	(4.9)	0	(0)	34	(20.5)	-3	2	0	-1
Total employment	150	(89.4)	10	(6.3)	7	(4.3)	167	(100)	-17	2	0	-15
2014									2004-14			
Male employment	109	(71.7)	3	(1.7)	7	(4.8)	119	(78.2)	-28	1	0	-28
Female employment	23	(15.4)	10	(6.5)	0	(0)	33	(21.8)	-7	3	0	-4
Total employment	132	(87.1)	12	(8.1)	7	(4.8)	152	(100)	-35	4	0	-31

Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Table 6.X.2).

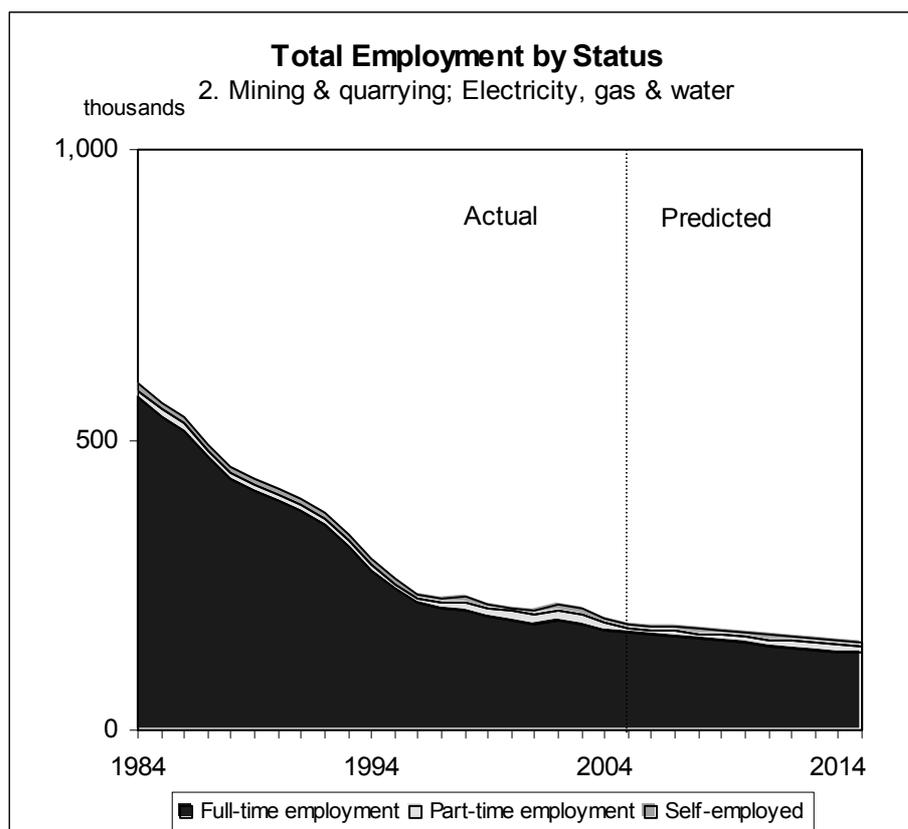
Figure 6.2.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Fig 6.X.3 and Fig 6.X.2).

- Male jobs have borne the brunt of job losses and this pattern is expected to continue.

Figure 6.2.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Fig 6.X.3 and Fig 6.X.2).

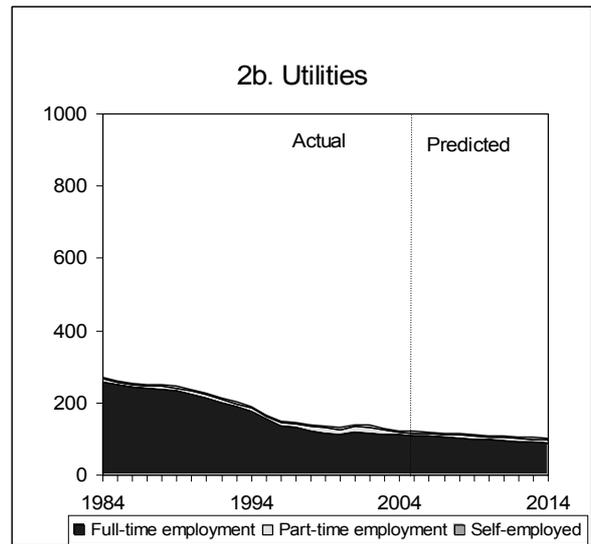
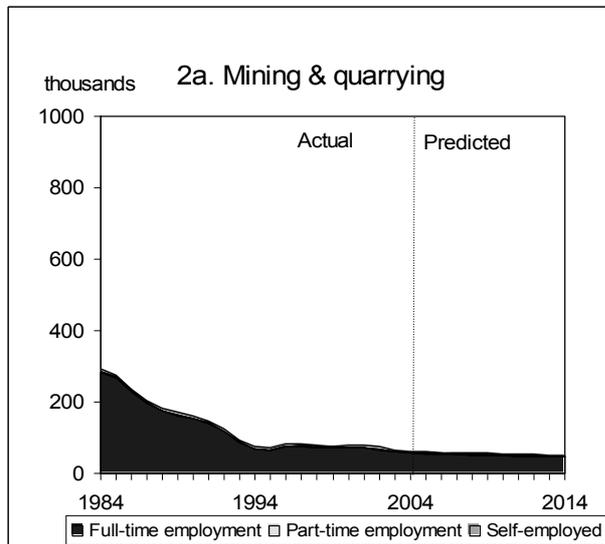
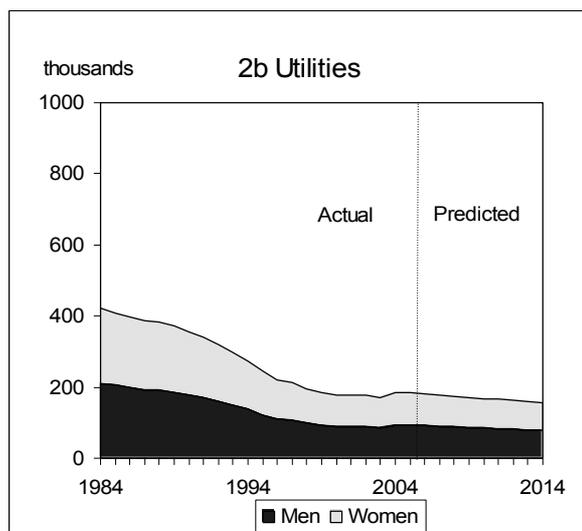
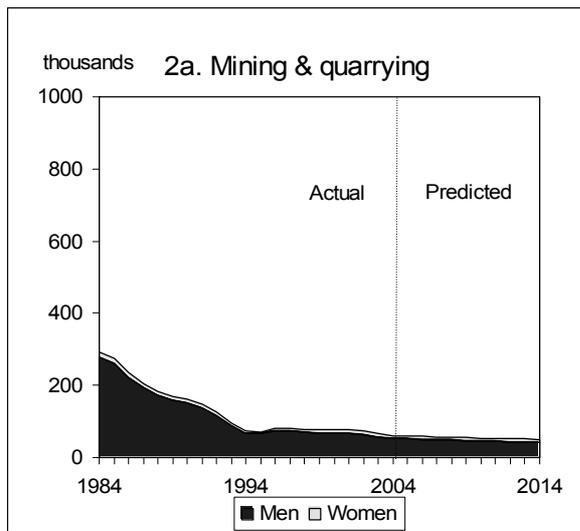
- Self-employment and part-time shares have grown but remain relatively small. These two types of employment are jointly expected to account for fewer than 20 thousand jobs in 2014.

Gender status shares in component industries

The four panels of Figure 6.2.3a illustrate how gender and status patterns vary in the two main industries which make up the group.

- Employment in Mining & quarrying is very much male dominated;
- Full-time employment is the norm in both parts of the industry group but part-time employment is projected to become slightly more important in Utilities.

Figure 6.2.3a: Changing Patterns of Employment Status and Gender in Component Industries



Source: CE/IER estimates, MDM95 C51F8AForecast, 27xUK.xls (Fig 6.X.3 & 2).

6.2.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Skilled trades account for the highest job share in the sector, with a little over 20 per cent, whilst transport and machine operatives and elementary occupations together account for another 24 per cent;
- Administrative, clerical and secretarial occupations currently have around 15 per cent of total employment, although this share has been in declining;
- Managerial, professional and associate professionals currently each account for about 20 per cent of all jobs.

Main change by occupation

- Following a period of rapid job loss, the next decade is expected to see much less dramatic change (see Figure 6.2.4).
- Employment is projected to decline for almost all occupations but the main burden of jobs losses falls upon skilled trades and, to a lesser extent, administrative, clerical and secretarial, transport and machine operatives and elementary occupations.
- Small increases are expected for sales and personal service occupations, while the managerial, professional and associate professional groups are projected to increase their shares of a declining total number of jobs.

Shift share analysis

Table 6.2.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and

organisational factors on the occupational structure *within* the industry.

For this group of industries the industry effect has played a major part in declining employment for all occupations. In the period 1984-94, the industry effect was almost -60%, resulting from the impact of privatisation and the running down of coal mining. The industry effect fell somewhat in 1994-2004, but was still -40%, reflecting continued efforts to cut costs and raise productivity. Over the projection period, the industry effect is projected to moderate to just over -20%.

Over the projection period, the occupational effects are broadly in line with those across all industries but there is a notably large positive effect for sales & customer service occupations. During the historical periods shown, skilled trades and elementary occupations experienced especially rapid job losses.

Replacement demands

Table 6.2.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- The pattern of replacement demands is very different from that for expansion demand. A projected decline of over 30 thousand becomes a net requirement of a similar order of magnitude.
- The most significant categories for replacement demand are administrative, clerical & secretarial and skilled trades.
- A number of other occupational groups have rapid increases in total requirements in percentage terms, including personal service occupations and sales & customer service occupations.
- Managerial, professional and associate professional groups are all projected to require replacements amounting to 30 per cent or more of current employment levels.

Table 6.2.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Mining, quarrying & utilities						2004 - 2014		
Employment Levels (000s)	1984	1994	2004	2009	2014	Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	37	26	22	21	19	-2	7	5
2. Professional Occupations	39	26	21	19	18	-3	6	3
3. Associate Professional & Technical Occupations	35	23	19	17	16	-3	6	3
4. Administrative, Clerical & Secretarial Occupations	74	44	27	23	21	-6	10	4
5. Skilled Trades Occupations	177	66	40	36	31	-9	13	3
6. Personal Service Occupations	6	4	3	3	3	0	1	1
7. Sales & Customer Service Occupations	12	10	9	10	11	2	3	5
8. Machine & Transport Operatives	104	38	27	25	23	-4	9	5
9. Elementary Occupations	79	25	16	13	10	-6	5	-1
Total	564	261	183	167	152	-31	60	29

	1984	1994	2004	2009	2014	Percentage Changes		
1. Managers & Senior Officials	7	10	12	12	13	-10	33	23
2. Professional Occupations	7	10	11	11	12	-13	30	17
3. Associate Professional & Technical Occupations	6	9	10	10	10	-15	30	15
4. Administrative, Clerical & Secretarial Occupations	13	17	15	14	14	-22	37	15
5. Skilled Trades Occupations	31	25	22	21	20	-23	31	8
6. Personal Service Occupations	1	2	2	2	2	-4	38	34
7. Sales & Customer Service Occupations	2	4	5	6	7	17	33	50
8. Machine & Transport Operatives	18	14	15	15	15	-15	33	19
9. Elementary Occupations	14	10	9	8	7	-36	31	-5
Total	100	100	100	100	100	-17	33	16

Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Table 6.x.3).

Figure 6.2.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (figure 6.x.4).

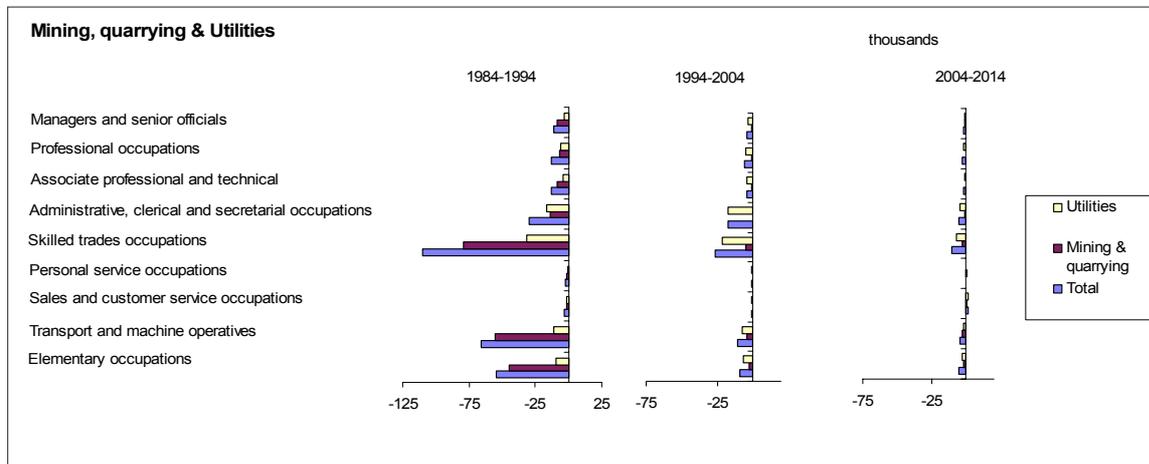
Table 6.2.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	-12	2	-22	8	-4	3	-11	4	-2	1	-5	1
2. Professional Occupations	-13	2	-23	8	-6	3	-11	2	-3	1	-4	1
3. Associate Professional & Technical Occupations	-13	2	-21	6	-4	3	-10	3	-3	1	-4	0
4. Administrative, Clerical & Secretarial Occupations	-30	3	-43	10	-17	5	-19	-4	-6	1	-6	-1
5. Skilled Trades Occupations	-110	8	-102	-15	-26	8	-28	-6	-9	2	-9	-2
6. Personal Service Occupations	-2	0	-4	1	-1	1	-2	1	0	0	-1	0
7. Sales & Customer Service Occupations	-3	1	-7	4	0	1	-4	2	2	0	-2	3
8. Machine & Transport Operatives	-66	4	-60	-10	-11	5	-16	0	-4	1	-6	1
9. Elementary Occupations	-54	3	-46	-12	-9	3	-11	-2	-6	1	-3	-3
Total	-303	24	-327	0	-78	32	-110	0	-31	8	-39	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	-31.0	4.3	-57.9	22.7	-15.1	12.4	-42.3	14.8	-10.3	4.3	-21.3	6.6
2. Professional Occupations	-32.9	4.3	-57.9	20.8	-21.7	12.4	-42.3	8.2	-13.2	4.3	-21.3	3.8
3. Associate Professional & Technical Occupations	-36.4	4.3	-57.9	17.3	-17.3	12.4	-42.3	12.5	-14.9	4.3	-21.3	2.1
4. Administrative, Clerical & Secretarial Occupations	-40.5	4.3	-57.9	13.2	-39.2	12.4	-42.3	-9.4	-22.3	4.3	-21.3	-5.3
5. Skilled Trades Occupations	-62.4	4.3	-57.9	-8.8	-39.3	12.4	-42.3	-9.5	-22.9	4.3	-21.3	-5.9
6. Personal Service Occupations	-36.9	4.3	-57.9	16.8	-16.5	12.4	-42.3	13.4	-4.4	4.3	-21.3	12.6
7. Sales & Customer Service Occupations	-22.3	4.3	-57.9	31.4	-4.6	12.4	-42.3	25.3	16.4	4.3	-21.3	33.4
8. Machine & Transport Operatives	-63.6	4.3	-57.9	-9.9	-28.9	12.4	-42.3	0.9	-14.7	4.3	-21.3	2.3
9. Elementary Occupations	-68.3	4.3	-57.9	-14.7	-36.8	12.4	-42.3	-6.9	-35.9	4.3	-21.3	-18.9
Total	-53.7	4.3	-57.9	0.0	-29.9	12.4	-42.3	0.0	-17.0	4.3	-21.3	0.0

Source: CE/IER estimates, MDM95 C51F8AForecast, 25UK.xls (Table 6.x.3).

Figure 6.2.4a Changing Composition of Employment by Occupation, in Component industries

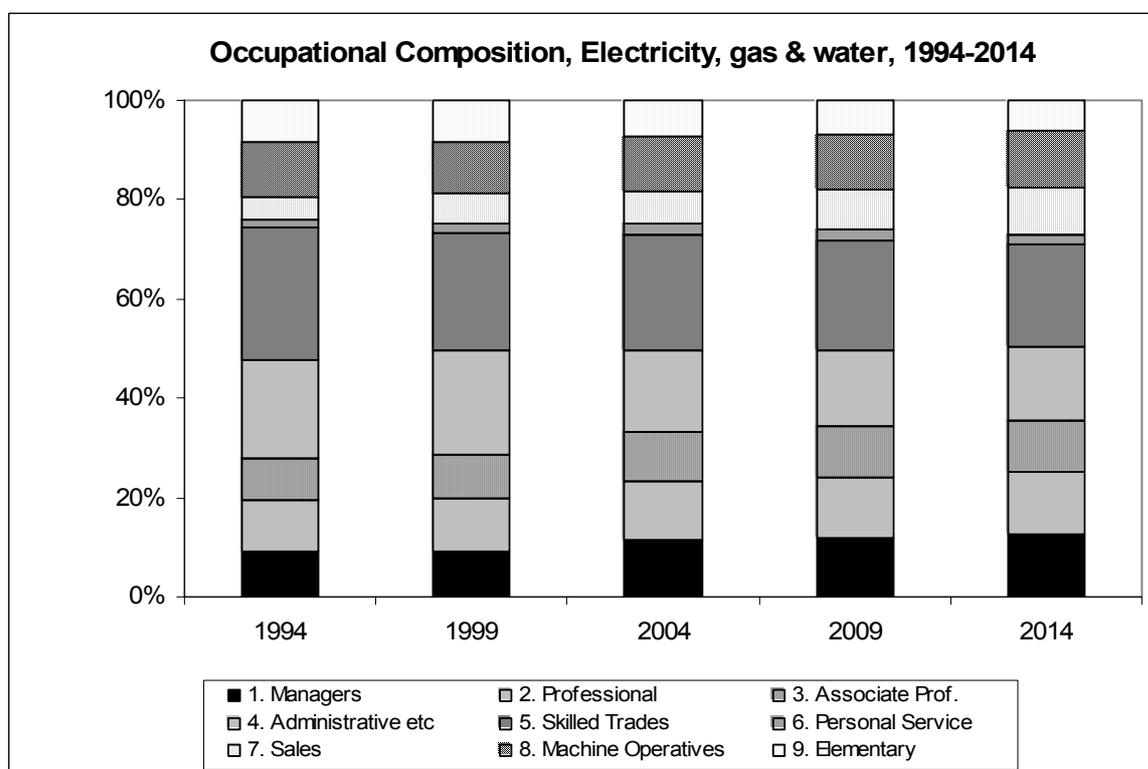
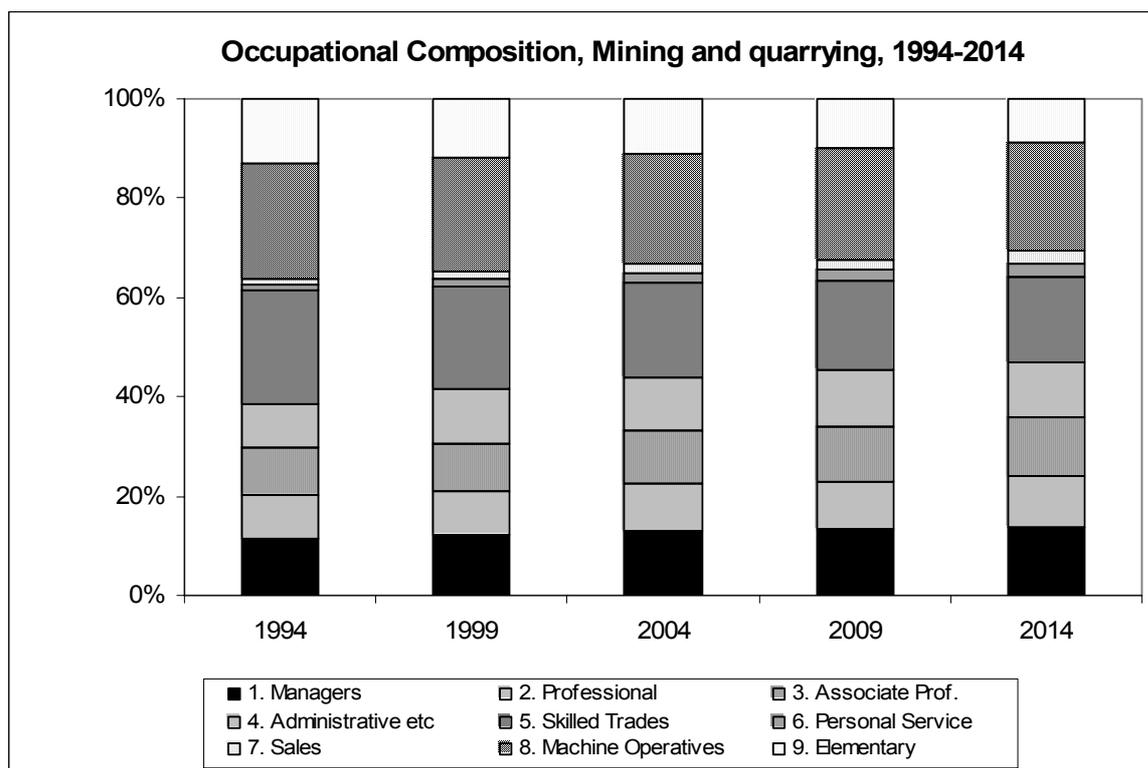


Source: CE/IER estimates, MDM95 C51F8AForecast, 27xUK.xls (Figure 6.X.4b).

Changes in Occupational structure within component industries

- The main differences in occupational employment structure and the changes observed over recent years and projected for the next decade are illustrated in Figures 6.2.4a and b.
- Figure 6.2.4a focuses on net changes and also compares the component industries directly with the industry group as a whole. Figure 6.2.4b compares the occupational structures of the two component industries, as well as showing how these have changed and are expected to change over the next decade.
- In the early 1990s both parts of the industry employed a significant proportion of skilled trades and plant and machine operatives. These shares have fallen, but especially so for utilities.
- Most white collar occupations are projected to make up an increasing share of employment, in both component industries.
- The job losses amongst manual workers, which were dramatic in the 1980s (and to a lesser extent in the 1990s), are expected to continue but at a much more modest pace.

Figure 6.2.4b: Structure of Employment by Occupation, in Component industries



Source: CE/IER estimates, MDM95 C51F8AForecast, 27xUK.xls (Figure 6.X.10).

6.3 FOOD, DRINK & TOBACCO

6.3.1 Description of the industry

INDUSTRY 3: FOOD, DRINK & TOBACCO		
SIC92 headings: 15.1-15.8, 15.9, 16		
Production, processing and preserving of meat, fish, fruit and vegetables, vegetable and animal oils and fats, dairy products; grain milling, cereals and starches; animal feed; bread, pastry goods, biscuits; sugar, cocoa, confectionery etc., tea, coffee; seasonings and other food products not elsewhere specified. Distilling of spirits including ethyl alcohol; manufacturing of wine, cider and other fruit wines; manufacture of beer and malt; production of mineral waters and soft drinks. Manufacture of tobacco products: cigarettes, cigars, pipe tobacco, snuff.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	2.4	100
Exposure to International Trade:	high	average
Concentration (market share of largest employers):	medium	average
Total employment (2004):	458,000	30,099,000
Share of total employment (%2004):	1.5	100
Gender split (male:female) (% 2004):	67:33	54:46
Part-time share (% 2004):	10	28
Self-employment share (% 2004):	3	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.3.2 Industry Commentary

Competition to supply UK supermarkets now dominates the food industry. Before the 1980s, the food industry consisted of many low-volume producers, but during the 1980s and 1990s the industry was transformed by mergers and consolidation, increasing efficiency and potential economies of scale. Food production is relatively unaffected by cycles in consumer spending; even if output declines in most manufacturing industries, food resists the trend and overall output does not fall.

While demand for British food abroad is now recovering, domestic demand remains largely stable. The level of domestic supply is also very stable: any increase in demand is now being met by imports, mainly because price wars between supermarkets limit prices paid to domestic producers. Domestic supply is

moving towards concentrating on the production of high value-added foodstuffs: demand for low value-added foods is being met more and more by imports. The commercial viability of genetically-modified (GM) food is currently one of the biggest issues for the food industry. The British public does not consider GM food safe to eat and, in view of the conflicting conclusions of recent studies, it does not appear that it is a debate that is going to be settled soon. Meanwhile nearly all supermarket and fast-food chains have banned the use of GM ingredients, while many are promoting organic produce.

Drink is a global industry: the UK drinks market is dominated by multinational firms, and nearly 75% of demand is met by imports while over 60% of production is exported. The sub-sectors of the industry are also dominated by a few large firms. The soft drinks industry is a virtual duopoly, with PepsiCo and Coca-Cola

accounting for nearly 70% in 2003. The market for bottled water is rapidly expanding, but as both firms are working to increase their shares of the non-carbonated drinks market, the domination of these global giants seems unlikely to be challenged.

The brewing industry in the UK is dominated by four large companies who collectively have an 85% market share. Regulation and legislation play a key role in the global drinks industry. Believing that much legislation governing the consumption of alcohol is outdated, the Government has proposed a radical alteration of legislation to make local government rather than magistrates the licensing authorities and to allow pubs to stay open 24 hours a day.

The cigarette and tobacco market in the UK is dominated by two firms, Gallaher

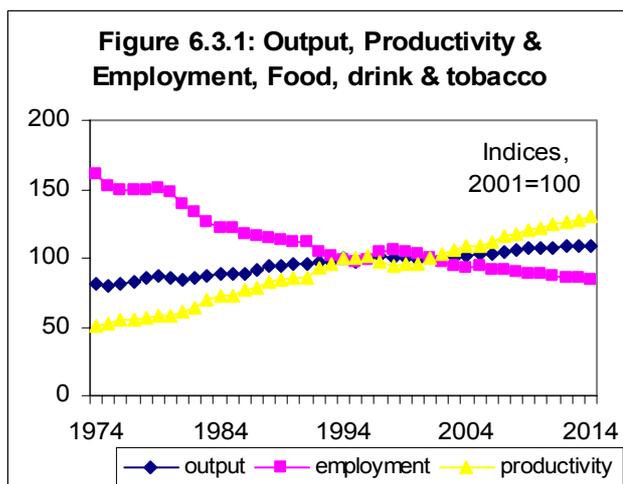
and Imperial Tobacco, which control 80% of the market. British American Tobacco (BAT), manufactures cigarettes in the UK but sells almost all of them abroad. The UK imports a high volume of cigarettes. Mechanisation in the UK tobacco industry has led to a 35% reduction in the workforce since 1995. The large tobacco companies do not expect bans on advertising to have much impact on sales, but there is concern about possible government proposals to ban smoking in public places where food is served.

Output growth for the whole sector is expected to accelerate in 2005, supported by increases in both export growth and domestic sales growth. Growth is expected to remain broadly constant over 2006-07, maintained by export and domestic demand growth, although both are forecast to slow from 2006 onwards.

6.3.3 Productivity and Output trends

Table 6.3.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-99	1999-2004	2004-09	2009-14
Gross Output (% pa)	0.1	0.2	1.1	0.5
Employment (% pa)	1.0	-2.2	-1.0	-1.1
(000s)	26	-53	-23	-23
Productivity (% pa)	-1.0	2.4	2.1	1.6



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Trends in output have been positive over most of the past two decades but growth has stalled over the past 5 years or so. Some modest recovery is expected over the next decade.
- Productivity growth is expected to pick up, following further rationalisation and implementation of technological improvements.
- Employment levels are expected to continue their downward trend.

6.3.4 Employment by Status and Gender

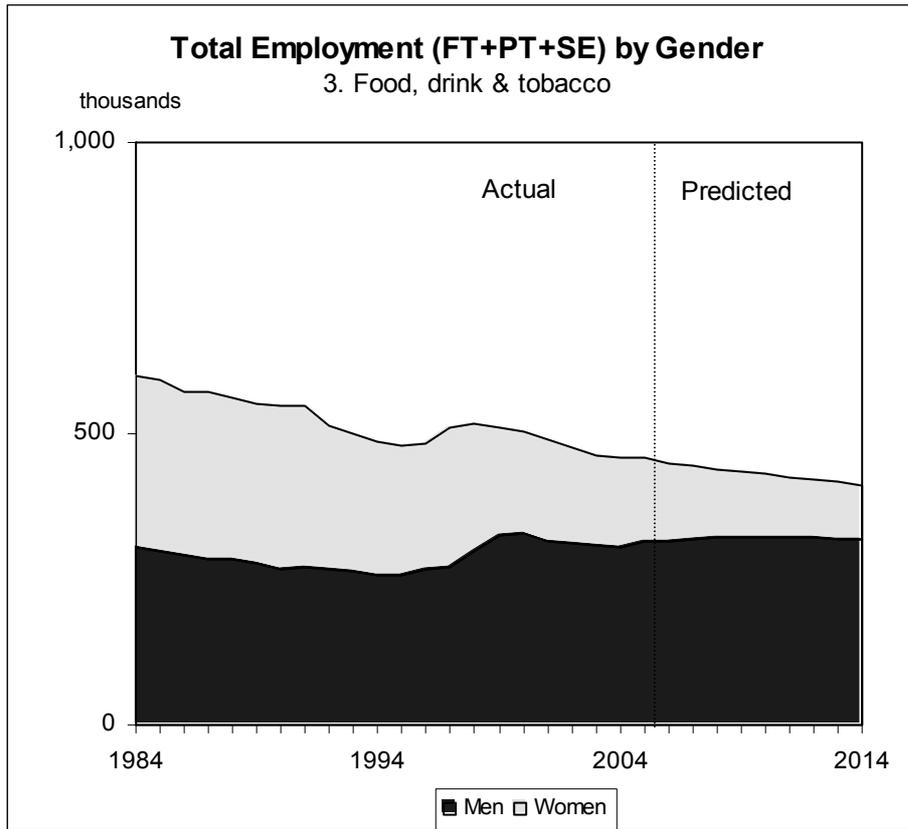
The food, drink and tobacco industry employs quite a large number of females, who account for around a third of all jobs. Part-time employment currently accounts for just over 1 in 10 jobs, being more important for women. Self-employment is relatively insignificant.

Part-time employment currently accounts for just over 1 in 10 jobs, being more important for women. Self-employment is relatively insignificant.

Table 6.3.2: Employment Levels by Gender and Status, Food, Drink & Tobacco

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	shares				000s
2004								2004-09				
Male employment	283	(61.9)	11	(2.4)	10	(2.3)	305	(66.6)	28	-7	-2	18
Female employment	113	(24.8)	36	(8)	3	(0.6)	153	(33.4)	-9	-30	-2	-41
Total employment	397	(86.7)	48	(10.4)	13	(2.9)	458	(100)	19	-37	-4	-23
2009								2009-14				
Male employment	311	(71.5)	4	(0.9)	8	(1.9)	323	(74.3)	-1	-1	-2	-5
Female employment	104	(24)	6	(1.5)	1	(0.2)	112	(25.7)	-16	-2	-1	-19
Total employment	415	(95.5)	10	(2.4)	9	(2.1)	435	(100)	-17	-3	-3	-23
2014								2004-14				
Male employment	310	(75.3)	3	(0.7)	6	(1.4)	318	(77.4)	27	-8	-5	14
Female employment	89	(21.5)	4	(1)	0	(0.1)	93	(22.6)	-25	-32	-3	-60
Total employment	399	(96.8)	7	(1.7)	6	(1.5)	412	(100)	2	-41	-7	-46

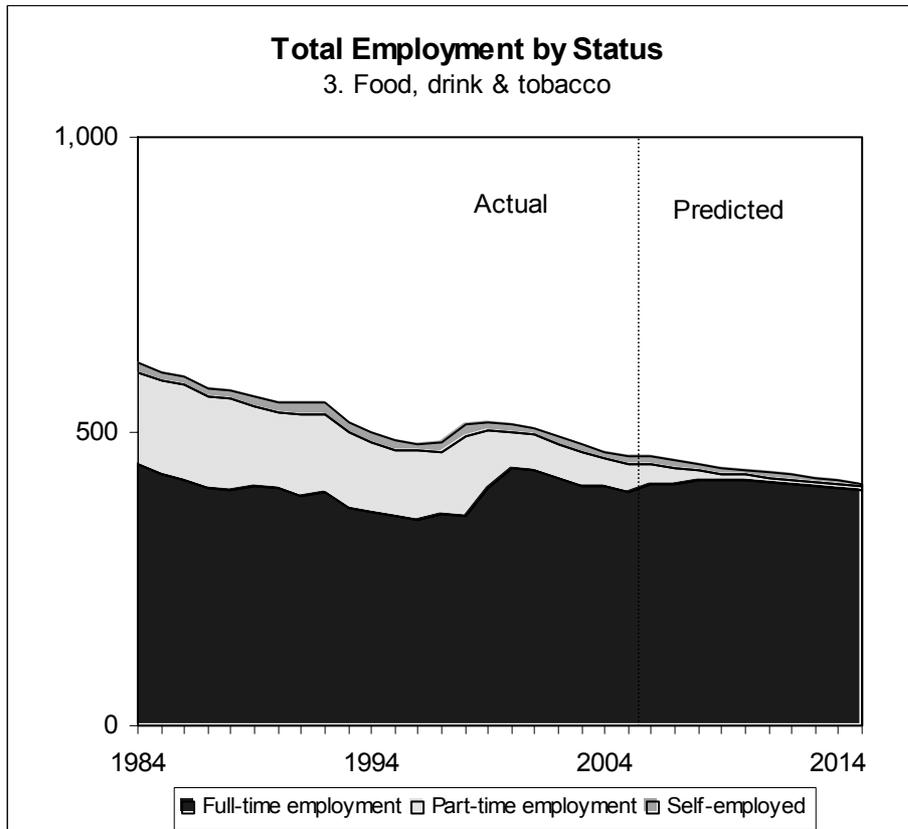
Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

Figure 6.3.2: Changing Patterns of Sectoral Employment by Gender

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Employment levels have stabilised in recent years, but further decline is now projected, with males increasing their share slightly. The number of females employed is projected to continue to fall sharply, reflecting recent trends. This prediction is based on extrapolation of recent trends and it is possible that these patterns may be reversed over the next decade.

Figure 6.3.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The share of full-time employment is projected to rise significantly, reflecting structural change within the industry and, in particular the decline in importance of female jobs. This prediction is based on extrapolation of recent trends and it is possible that these patterns may be reversed over the next decade.

6.3.5 Projections of Employment by Occupation

Key aspects of occupational structure

Table 6.3.3 illustrates that:

- Machine operatives are the most important occupational group, accounting for over a quarter of all jobs.
- Skilled trades and elementary occupations have also been important in the past but have seen their employment shares fall sharply.
- Groups such as managers, associate professionals and sales and customer service occupations have seen increases in their shares of the total.

Future changes

- Job losses in the next decade are concentrated in the skilled trades, transport & machine operatives and especially elementary occupation groups. Some job losses are also projected for sales and customer service occupations over the next decade.
- Small increases are projected for most other occupations other than the administrative, clerical and secretarial category.

Shift share analysis

Table 6.3.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

For this group of industries the industry effect has played a major part in declining employment for many occupations. In the

period 1984-94, the industry effect was a very significant negative impact. The industry effect fell somewhat in 1994-2004, but was still around 18 per cent. Over the projection period, the industry effect is projected to decline further but will still result in the loss of 14 per cent of jobs across all occupations.

Over the projection period managers and professionals are projected to benefit particularly from positive occupational effects. Administrative & clerical, sales & customer service occupations and elementary occupations are expected to experience especially rapid job losses. These patterns broadly follow those for the previous two decades.

Replacement demands

Table 6.3.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- The overall decline in employment levels projected for the industry over the next decade (of around 10 per cent) is more than offset by replacement demands.
- In total, these amount to almost 160 thousand jobs, with a net total requirement of over 110 thousand.
- Managers & senior officials, transport & machine operators, skilled trades and associate professionals & technical occupations are the main areas where new recruits will be needed.

Table 6.3.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Food, drink & tobacco Employment Levels (000s)	1984	1992	2002	2007	2012	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	41	44	59	65	68	9	20	29
2. Professional Occupations	15	14	18	19	20	2	6	8
3. Associate Professional & Technical Occupations	34	33	39	39	39	0	13	13
4. Administrative, Clerical & Secretarial Occupations	70	52	40	31	28	-11	16	4
5. Skilled Trades Occupations	104	81	68	66	62	-7	22	16
6. Personal Service Occupations	5	4	4	3	3	0	1	1
7. Sales & Customer Service Occupations	33	34	35	27	27	-8	11	3
8. Machine & Transport Operatives	162	131	122	121	115	-7	44	38
9. Elementary Occupations	133	92	73	63	49	-24	25	1
Total	599	485	458	435	412	-46	158	112

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						1984-1994	1994-2004	2004-2014
1. Managers & Senior Officials	7	9	13	15	17	15	34	49
2. Professional Occupations	3	3	4	4	5	13	33	46
3. Associate Professional & Technical Occupations	6	7	9	9	9	0	32	32
4. Administrative, Clerical & Secretarial Occupations	12	11	9	7	7	-28	39	11
5. Skilled Trades Occupations	17	17	15	15	15	-10	33	23
6. Personal Service Occupations	1	1	1	1	1	-11	39	28
7. Sales & Customer Service Occupations	6	7	8	6	7	-23	31	8
8. Machine & Transport Operatives	27	27	27	28	28	-6	36	31
9. Elementary Occupations	22	19	16	14	12	-33	34	2
Total	100	100	100	100	100	-10	35	25

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.3.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C31F95 Forecast, 25UK.xls (Figure 6.x.4).

Table 6.3.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	3	2	-10	10	15	5	-8	18	9	3	-9	15
2. Professional Occupations	-1	1	-4	2	4	2	-3	4	2	1	-3	4
3. Associate Professional & Technical Occupations	-2	1	-8	5	6	4	-6	8	0	2	-6	4
4. Administrative, Clerical & Secretarial Occupations	-19	3	-16	-5	-12	6	-9	-9	-11	2	-6	-7
5. Skilled Trades Occupations	-23	4	-24	-3	-12	10	-15	-8	-7	3	-10	0
6. Personal Service Occupations	-1	0	-1	0	0	0	-1	0	0	0	-1	0
7. Sales & Customer Service Occupations	1	1	-8	7	1	4	-6	3	-8	2	-5	-5
8. Machine & Transport Operatives	-31	7	-38	0	-9	16	-24	-2	-7	5	-17	6
9. Elementary Occupations	-41	6	-31	-16	-19	11	-17	-14	-24	3	-11	-17
Total	-114	26	-140	0	-27	60	-88	0	-46	20	-66	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	6.1	4.3	-23.3	25.1	34.8	12.4	-18.1	40.4	14.8	4.3	-14.4	24.9
2. Professional Occupations	-8.9	4.3	-23.3	10.2	25.8	12.4	-18.1	31.5	12.7	4.3	-14.4	22.7
3. Associate Professional & Technical Occupations	-4.6	4.3	-23.3	14.4	18.9	12.4	-18.1	24.6	0.1	4.3	-14.4	10.2
4. Administrative, Clerical & Secretarial Occupations	-26.3	4.3	-23.3	-7.2	-23.8	12.4	-18.1	-18.2	-28.2	4.3	-14.4	-18.2
5. Skilled Trades Occupations	-22.2	4.3	-23.3	-3.2	-15.4	12.4	-18.1	-9.8	-9.8	4.3	-14.4	0.3
6. Personal Service Occupations	-20.3	4.3	-23.3	-1.3	-9.0	12.4	-18.1	-3.4	-10.6	4.3	-14.4	-0.5
7. Sales & Customer Service Occupations	3.0	4.3	-23.3	22.0	2.5	12.4	-18.1	8.1	-23.0	4.3	-14.4	-12.9
8. Machine & Transport Operatives	-19.2	4.3	-23.3	-0.2	-7.1	12.4	-18.1	-1.5	-5.5	4.3	-14.4	4.5
9. Elementary Occupations	-30.8	4.3	-23.3	-11.7	-20.5	12.4	-18.1	-14.8	-32.8	4.3	-14.4	-22.7
Total	-19.0	4.3	-23.3	0.0	-5.6	12.4	-18.1	0.0	-10.0	4.3	-14.4	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.4 TEXTILES & CLOTHING

6.4.1 Description of the industry

INDUSTRY 4: TEXTILES & CLOTHING		
SIC92 headings: 17, 18, 19		
Preparation and spinning of textile fibres (cotton, wool, flax, silk, threads etc.); weaving and finishing of textiles; manufacture of made-up textile articles (soft furnishings, blankets, table linen etc.); manufacture of carpets and rugs; manufacture of other textiles not elsewhere specified; manufacture of knitted and crocheted fabrics including hosiery pullovers, cardigans and similar articles. Clothing including workwear, coats, suits, jackets, trousers, dresses, skirts etc, underwear, hats swimwear and fur articles. Tanning and dressing of leather; manufacture of luggage, handbags and the like; manufacture of footwear for all purposes.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	0.6	100
Exposure to International Trade:	high	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	183,000	30,099,000
Share of total employment (% 2004):	0.6	100
Gender split (male:female) (% 2004):	55:45	54:46
Part-time share (% 2004):	12	28
Self-employment share (% 2004):	15	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.4.2 Industry Commentary

The textile & clothing industry in the UK has been experiencing employment decline for many years. Output levels have fallen as a result of sharp competition from low wage countries. Demand for such goods is highly price-sensitive. Rising import penetration has been mirrored by declining export volumes. Further closures in an already denuded industry seem likely, especially given China's recent accession to the WTO, and forthcoming EU enlargement to include a number of countries with low-cost textile industries. Defensive mergers and management buyouts are set to remain a strong feature of the industry.

Imports now account for more than three-quarters of textiles, and this growth is set

to continue strongly with prices continuing to fall in real terms. Almost all shoes sold in Britain are made abroad. Retailers are sourcing more and more of their goods from abroad.

Traditional textile industries are not only being forced to lay off workers but are also facing skills shortages. As mass-production of textiles continues to be transferred overseas, creating the perception that the industry has no future in the UK, companies are finding increasingly that appropriately-skilled workers are choosing to work in other industries. However, the UK has been able to carve out a competitive advantage in some specialised sectors. Here companies need to recruit trained staff and the firms are having to work to change skilled workers' perceptions of the

industry. The UK concentrates on high value, low-volume niche manufacturing, which tends to be shielded from the high-volume end of the industry that is now mainly located offshore.

As mass production of textiles becomes increasingly competitive and less viable for UK companies, the industry's long-term decline continues to be seen in factory closures and job losses. As a result of the competition from overseas, the prospects for the industry look bleak. Job losses are likely to be most pronounced in areas,

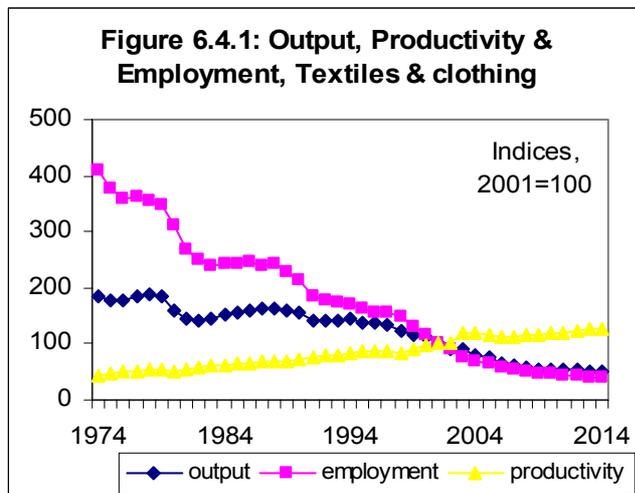
such as Yorkshire, where textiles once thrived. Large firms such as Ciba and Castleblair have recently closed down factories. The last textile mill in Aberdeen is scheduled for closure. Several UK companies have suffered since Marks & Spencer began to source from overseas in order to remain competitive on the high street.

6.4.3 Productivity and Output Trends

Table 6.4.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-09	2009-14
Gross Output (% pa)	-4.2	-7.0	-7.1	-1.6
Employment (% pa)	-5.2	-12.3	-6.5	-3.5
(000s)	-108	-169	-53	-21
Productivity (% pa)	1.1	6.0	-0.6	2.0

Source: 6725output.xls



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output levels in this industry have declined steadily in recent years as a result of stiff foreign competition and increasing import penetration.
- Further decline in output is anticipated over the next decade, with relatively high rates of decline in the short term.
- Productivity levels have improved especially rapidly over the past 5 years, following a pattern of steady improvement over much of the past 30 years. Whilst this long term trend is expected to stall in the short term, the reprieve is only likely to be short-lived.
- In combination, these trends result in a continued rapid decline in employment averaging around 5 per cent per annum and accounting for the loss of about 75 thousand jobs over the next decade.

6.4.4 Employment by Status and Gender

Women have traditionally had a large share of the jobs in this industry. However, this pattern has been changing. Females currently account for a 45 per cent share in employment and if recent trends continue this is projected to fall further.

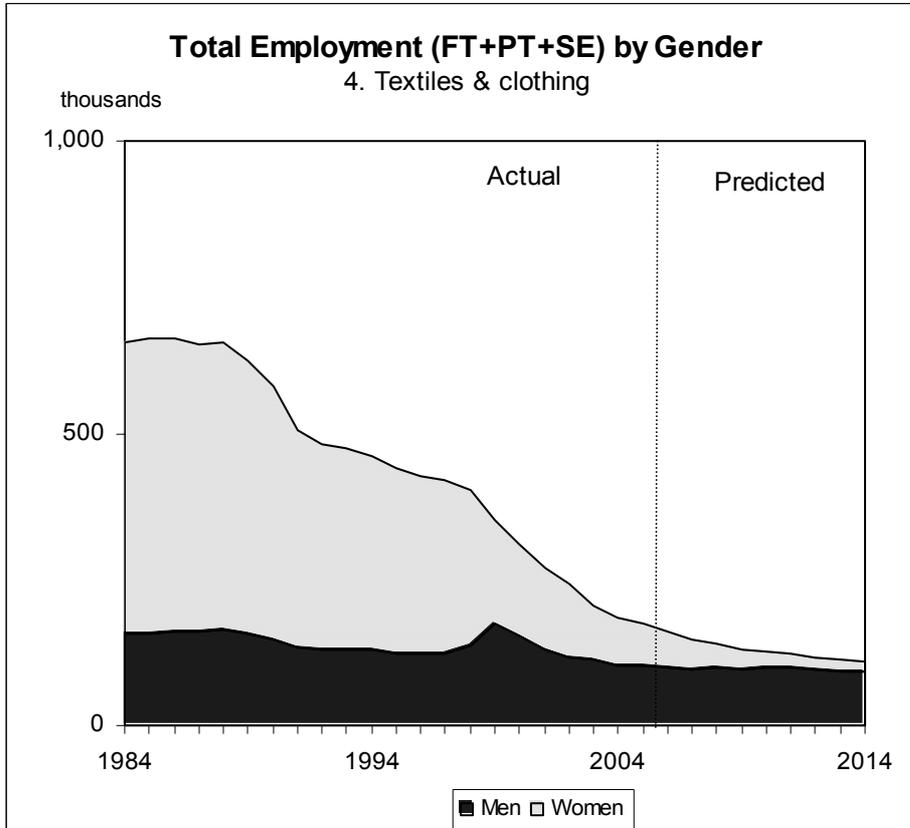
Both self-employment and part-time employment have historically been relatively unimportant but self employment is accounting for an increasingly important share of the total.

Table 6.4.2: Employment Levels by Gender and Status, Textiles & Clothing

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	share	%	share	%	share	%	share	%				
2004									2004-09			000s
Male employment	84	(45.7)	6	(3.4)	11	(6.2)	101	(55.3)	-4	-1	0	-4
Female employment	51	(27.8)	15	(8.2)	16	(8.8)	82	(44.7)	-37	-8	-3	-48
Total employment	134	(73.4)	21	(11.6)	27	(15)	183	(100)	-41	-8	-3	-53
2009									2009-14			
Male employment	80	(61.3)	6	(4.4)	11	(8.5)	97	(74.1)	-4	0	-1	-5
Female employment	14	(10.3)	7	(5.4)	13	(10.1)	34	(25.9)	-11	-3	-2	-16
Total employment	94	(71.7)	13	(9.8)	24	(18.6)	131	(100)	-15	-4	-2	-21
2014									2004-14			
Male employment	76	(69.6)	5	(4.8)	10	(9.6)	92	(84)	-8	-1	-1	-10
Female employment	2	(2)	4	(3.6)	11	(10.5)	17	(16)	-49	-11	-5	-64
Total employment	78	(71.6)	9	(8.4)	22	(20.1)	109	(100)	-56	-12	-6	-74

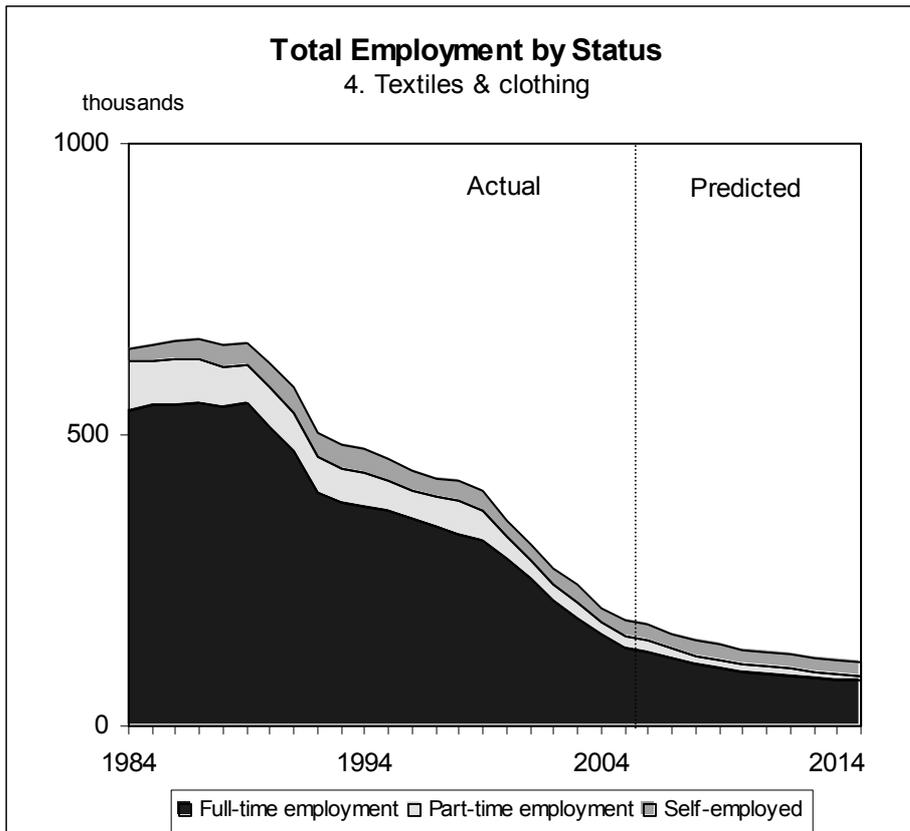
Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

Figure 6.4.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Sharply declining employment levels have hit females hardest. The projections shown here assume a continuation of these recent trends, with a consequent further dramatic reduction in the share of females in employment. This results in a projected reduction of females employment levels to a very low level. In practice, it is possible that the reductions in female jobs may not be quite so severe as projected here.

Figure 6.4.3: Changing Patterns of Sectoral Employment by Status

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Both full-time and part-time workers are expected to lose job share in the overall declining employment market. Self-employment will increase its share, although the absolute level of such employment is not projected to change much.

6.4.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Traditionally, employment has been dominated by jobs for semi-skilled operatives. These have typically accounted for almost one in every two jobs. By 2004 their share of total employment had fallen to just about a third.
- The other main type of jobs have fallen into the skilled trades and elementary occupations categories. The employment shares of such occupations have also been declining.
- The fastest increase in employment shares over the past decade have been for the managers and senior officials occupational group.

Future change

- Job losses are projected for all occupations.
- The main employment decline occurs amongst the (transport and) machine operatives group, with the loss of a further 30 thousand jobs.

Shift share analysis

Table 6.4.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

For this group of industries the industry effect has played a key role in the observed patterns of declining employment for many occupations. In the

period 1984-94, the industry effect accounted for a reduction of a third of employment. The industry effect more than doubled in the period 1994-2004. Over that decade almost 3 in every 4 jobs disappeared. Over the next decade this effect is only expected to moderate slightly. The industry effect is projected to result in the loss of some 44 per cent of jobs across all occupations.

Managers and professionals have tended to benefit from positive occupational effects over all three decades but these have generally been insufficient to offset the huge industry effects. Over the projection period there is also a small positive occupational effect for skilled trades, but this is more than offset by the large negative industry effect.

Replacement demands

Table 6.4.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

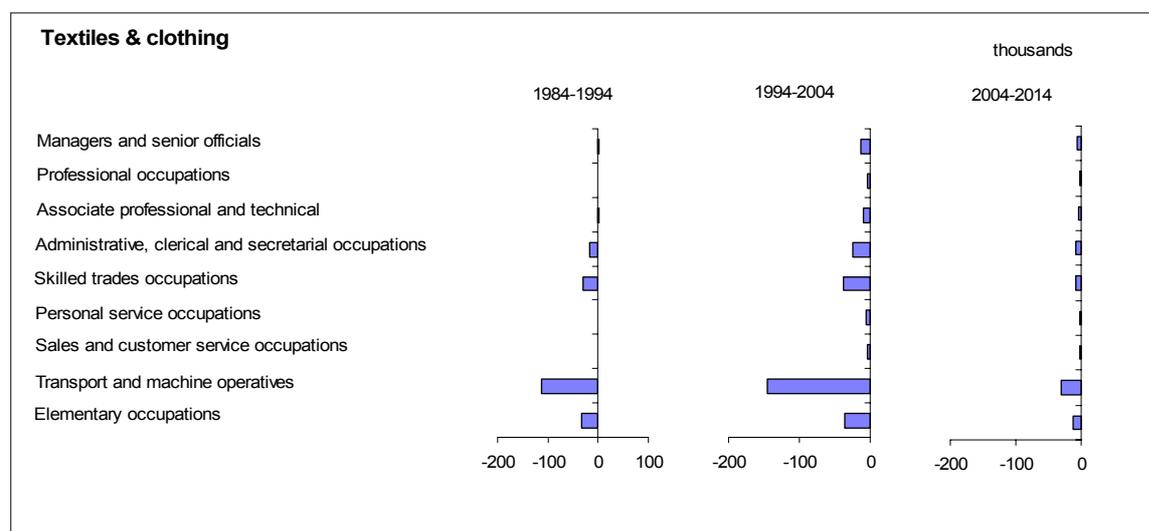
- Replacement demands will in large measure offset most of these projected declines.
- The largest level of replacement demand will arise amongst machine & transport operatives, but significant changes will occur in many other occupations.
- On average around a third of the current workforce will need to be replaced over the next 10 years.

Table 6.4.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Textiles & clothing Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	41	43	30	25	23	-6	10	4
2. Professional Occupations	10	9	6	5	5	-1	2	1
3. Associate Professional & Technical Occupations	24	25	16	13	12	-4	5	1
4. Administrative, Clerical & Secretarial Occupations	56	37	13	7	5	-8	5	-3
5. Skilled Trades Occupations	94	63	26	21	18	-7	9	1
6. Personal Service Occupations	12	10	5	4	3	-2	2	0
7. Sales & Customer Service Occupations	10	8	4	3	2	-2	1	-1
8. Machine & Transport Operatives	316	205	60	37	29	-31	23	-8
9. Elementary Occupations	93	60	24	17	12	-11	8	-3
Total	656	460	183	131	109	-74	65	-9

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	6	9	16	19	21	-21	34	13
2. Professional Occupations	1	2	3	4	4	-23	34	12
3. Associate Professional & Technical Occupations	4	5	9	10	11	-27	33	6
4. Administrative, Clerical & Secretarial Occupations	8	8	7	5	4	-63	40	-24
5. Skilled Trades Occupations	14	14	14	16	17	-29	33	4
6. Personal Service Occupations	2	2	3	3	3	-43	40	-3
7. Sales & Customer Service Occupations	2	2	2	2	2	-48	33	-15
8. Machine & Transport Operatives	48	44	33	29	27	-51	38	-13
9. Elementary Occupations	14	13	13	13	11	-49	35	-14
Total	100	100	100	100	100	-40	36	-5

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.4.4: Changing Composition of Employment by Occupation


Source: CE/IER estimates, MDM95 C31F95 Forecast, 25UK.xls (Figure 6.x.4).

Table 6.4.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	2	2	-14	14	-13	5	-31	13	-6	1	-13	6
2. Professional Occupations	-1	0	-3	2	-3	1	-6	2	-1	0	-3	1
3. Associate Professional & Technical Occupations	1	1	-8	8	-9	3	-18	6	-4	1	-7	2
4. Administrative, Clerical & Secretarial Occupations	-18	2	-19	-2	-24	5	-27	-2	-8	1	-6	-3
5. Skilled Trades Occupations	-31	4	-32	-3	-37	8	-46	1	-7	1	-12	3
6. Personal Service Occupations	-2	1	-4	2	-6	1	-8	1	-2	0	-2	0
7. Sales & Customer Service Occupations	-2	0	-3	1	-4	1	-6	1	-2	0	-2	0
8. Machine & Transport Operatives	-112	14	-108	-18	-144	25	-149	-21	-31	3	-27	-7
9. Elementary Occupations	-33	4	-32	-5	-37	7	-44	0	-11	1	-11	-2
Total	-195	28	-223	0	-277	57	-334	0	-74	8	-82	0

	1984-1994		% change		1994-2004		% change		2004-2014		% change	
	total	scale	total	% change	total	scale	total	% change	total	scale	total	% change
1. Managers & Senior Officials	5.4	4.3	-34.1	35.2	-30.9	12.4	-72.6	29.3	-21.4	4.3	-44.7	19.0
2. Professional Occupations	-8.2	4.3	-34.1	21.6	-33.0	12.4	-72.6	27.2	-22.8	4.3	-44.7	17.6
3. Associate Professional & Technical Occupations	4.1	4.3	-34.1	33.9	-34.9	12.4	-72.6	25.3	-26.5	4.3	-44.7	13.8
4. Administrative, Clerical & Secretarial Occupations	-32.9	4.3	-34.1	-3.1	-65.9	12.4	-72.6	-5.6	-63.3	4.3	-44.7	-22.9
5. Skilled Trades Occupations	-32.6	4.3	-34.1	-2.8	-58.9	12.4	-72.6	1.3	-28.8	4.3	-44.7	11.5
6. Personal Service Occupations	-14.3	4.3	-34.1	15.5	-53.5	12.4	-72.6	6.7	-43.2	4.3	-44.7	-2.8
7. Sales & Customer Service Occupations	-17.2	4.3	-34.1	12.6	-48.8	12.4	-72.6	11.4	-47.9	4.3	-44.7	-7.5
8. Machine & Transport Machine Operatives	-35.4	4.3	-34.1	-5.6	-70.6	12.4	-72.6	-10.4	-51.3	4.3	-44.7	-10.9
9. Elementary Occupations	-35.6	4.3	-34.1	-5.8	-60.9	12.4	-72.6	-0.7	-48.6	4.3	-44.7	-8.3
Total	-29.8	4.3	-34.1	0.0	-60.2	12.4	-72.6	0.0	-40.4	4.3	-44.7	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.5 WOOD, PULP & PAPER; PRINTING & PUBLISHING

6.5.1 Description of the industry

INDUSTRY 5: WOOD, PULP & PAPER; PRINTING & PUBLISHING				
SIC92 headings 20, 21, 22				
Sawmilling and planing of wood; manufacture of veneer sheets, plywood, laminated board, fibreboard etc; manufacture of builders' carpentry and joinery; manufacture of wooden containers, and other products of wood. Manufacture of pulp, paper and paperboard; articles of paper and paperboard including bags, containers, sanitary goods, stationery, wallpaper and other articles of paper nes.				
Printing & publishing of books, newspapers, periodicals and miscellaneous products; reproduction of recorded media including records, CDs, tapes, videos and computer media.				
INDUSTRY PROFILE				
	Total	Wood, pulp & paper	Printing & Publishing	All industries
Share of UK Output (% 2004):	2.5	0.7	1.8	100
Exposure to International Trade:	medium			average
Concentration (market share of largest employers):	low			average
Total employment (2004):	566,000	188,000	378,000	30.099,000
Share of total employment (% 2004)	1.9	0.6	1.3	100
Gender split (male:female) (% 2004):	67:33	76:24	59:31	54:46
Part-time share (% 2004):	11	16	14	28
Self-employment share (% 2004):	12	10	9	13

Source: 6725output.xls (industry profile). CE/IER estimates based on ONS data.

6.5.2 Industry Commentary

Wood pulp & paper

This industry is fairly cyclical and vulnerable to exchange rate movements and international competition. While demand remains buoyant due to demand from the construction industry. British producers are benefiting from some easing of what has in recent years been very stiff competition from imports, particularly from the Baltic area. Even the extremely hard-pressed wooden pallet sub-sector has seen improved market conditions and firmer prices. Demand for decking and other DIY garden products, one of the more favourable market segments, also continues to be buoyant.

Demand for good-quality hardwood remains firm, whereas that for lower-quality woods continues to be weak and trading conditions are difficult. In general, demand from paper and board producers has been good, as has demand for hardwood from the one British mill that uses this input to manufacture flutings. Nevertheless, some producers have suffered as a result of a switch by Britain's only integrated newsprint mill to using recycled products rather than virgin fibre.

The continuing global economic recovery is boosting demand for all paper and board products, and a wide range of producers are reporting increased sales volumes and indications that forward

demand is firm. Sustained high energy prices will inevitably lead to higher prices for pulp and paper as these contracts end and are renegotiated. Several paper and board producers have commented that it will be difficult to pass these higher input prices on to customers. As the global economy peaks in the current cycle, the short-run outlook for output in wood & paper is negative. After output is forecast to have grown in 2004, it is expected to fall back slightly in 2005. The wood & paper industry normally suffers when the UK economy is performing better than its competitors, because import competition is strong and export markets are sluggish.

Printing & Publishing

Despite fears that competition from electronic media would depress demand, book production and sales remain very strong in the UK. The ending of the Net Book Agreement restriction on prices has led to increased price competition in the consumer segment of the market and hence sales revenues have not increased proportionately with sales volumes. Lads magazines are proving to be commercially successful in the generally buoyant magazine sector. There are some mixed fortunes in the book publishing sector.

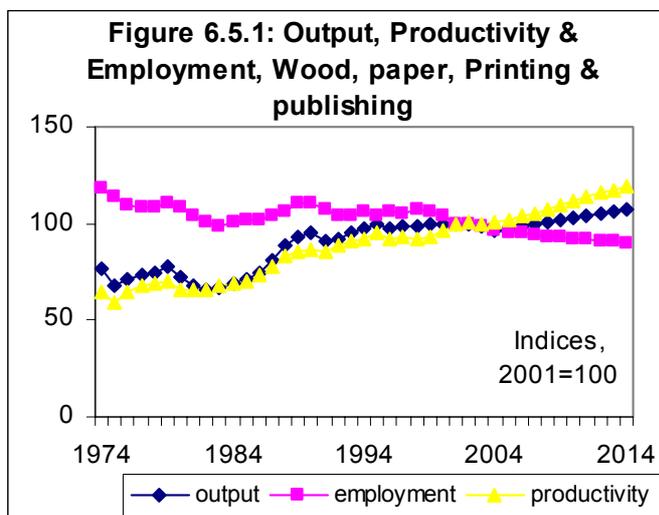
Newsprint prices continue to be squeezed. The tabloids continue to be engaged in a price war, with varying success for different titles, while prices have generally risen in the broadsheet segment. Magazines' circulation figures are increasing although advertising revenues remain poor. Overall, the prospects look good for continued growth in this industry,. After falling in 2004, output and employment growth in Printing & Publishing are expected to improve over 2005-07 as the global economy strengthens. Moreover, improvements in productivity will help the UK industry maintain modest real growth in the long-term. Investment growth slowed dramatically in 2004, but the improving output growth is forecast to support a pick-up in investment growth in medium term and long term.

6.5.3 Productivity and Output trends

Table 6.5.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	0.3	-0.5	1.1	1.0
Employment (% pa)	-0.1	-2.0	-0.6	-0.7
(000s)	-2	-59	-18	-19
Productivity (% pa)	0.4	1.5	1.7	1.8

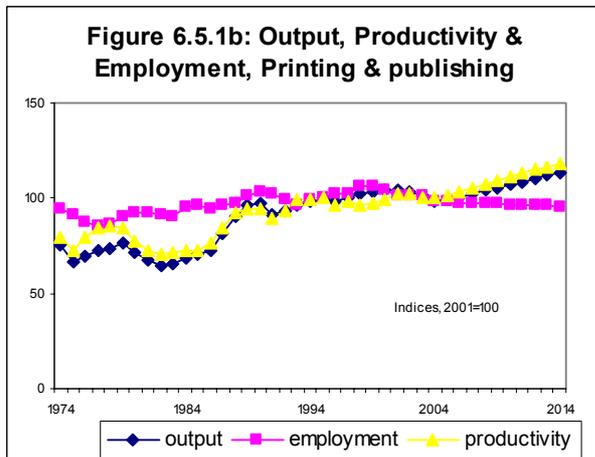
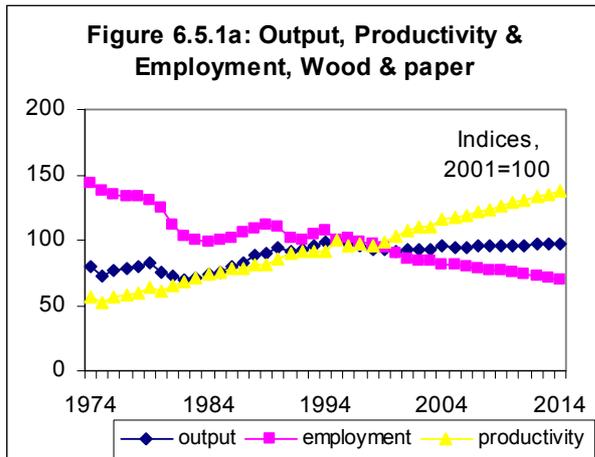
Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1).



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output trends for this group of industries have been fairly flat in recent years, if anything declining slightly over the past 5 years. A modest recovery is projected over the next decade but growth rates are well below the average rates for manufacturing as a whole.
- Productivity growth has increased recently and this is expected to be continued over the next decade, although, again the rates of change are modest compared with many other parts of the manufacturing sector.
- Together these trends result in a projection of further modest job losses for the industry as a whole.

Productivity in component industries



- The two main parts of this industry have both experienced slow but steady improvements in productivity over the past few decades. These patterns are expected to continue.
- Output has not grown very much in either sector over the last decade. Over the next decade output growth is expected to be much stronger in the printing & publishing industries than in wood & paper.
- As a consequence, employment prospects are projected to be rather more optimistic in the printing & publishing industries, although even here small declines are anticipated.

Table 6.5.1a: Productivity, Output & Employment in Component industries

Indicator	1994-99	1999-2004	2004-09	2009-14	
15. & 16. Wood, pulp & paper					
Output (% pa)		-1.2	0.5	0.2	0.1
Employment (% pa)		-2.5	-2.9	-1.4	-1.6
(000s)		-29	-29	-13	-14
Productivity (% pa)		1.3	3.5	1.6	1.8
17 Publishing & printing					
Output (% pa)		1.0	-0.9	1.4	1.4
Employment (% pa)		1.4	-1.5	-0.3	-0.3
(000s)		27	-30	-5	-5
Productivity (% pa)		-0.4	0.6	1.7	1.7

Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725Output.xls (Figures for 27 extras).

6.5.4 Employment by Status and Gender

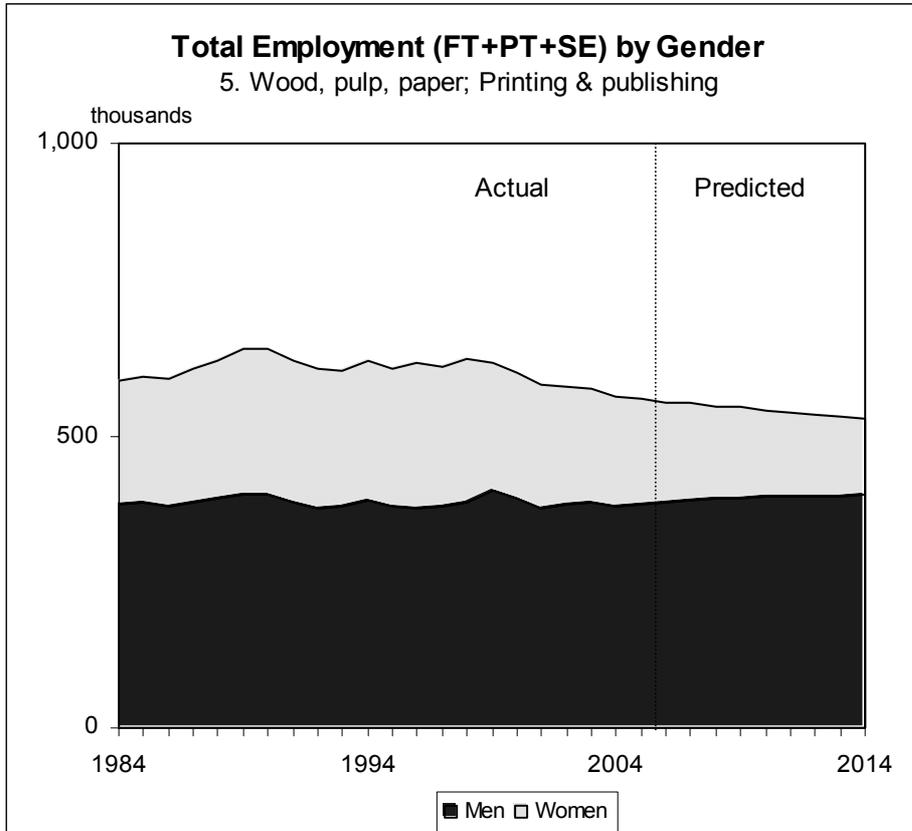
Women account for about a third of all jobs in this industry group. Part-time working currently accounts for around 10 per cent of employment, whilst self-employment accounts for around 1 in 8 jobs.

Table 6.5.2: Employment Levels by Gender and Status, Wood, pulp & paper and printing & publishing

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total	FT	PT	SE	Total	
	shares	%	shares	%	shares	%	000s					000s
2004								2004-09				
Male employment	312	(55.2)	20	(3.5)	48	(8.5)	380	(67.2)	12	-1	3	14
Female employment	125	(22.1)	42	(7.4)	19	(3.4)	186	(32.8)	-15	-19	1	-32
Total employment	437	(77.2)	61	(10.9)	67	(11.9)	566	(100)	-2	-20	4	-18
2009								2009-14				
Male employment	325	(59.2)	18	(3.3)	51	(9.3)	394	(71.9)	4	-1	1	4
Female employment	110	(20.1)	23	(4.2)	21	(3.8)	154	(28.1)	-17	-7	1	-23
Total employment	435	(79.4)	42	(7.6)	72	(13.1)	548	(100)	-13	-8	2	-19
2014								2004-14				
Male employment	328	(62.1)	17	(3.3)	52	(9.9)	398	(75.2)	16	-2	4	18
Female employment	93	(17.7)	16	(3.1)	21	(4)	131	(24.8)	-31	-26	2	-55
Total employment	422	(79.7)	33	(6.3)	74	(13.9)	529	(100)	-15	-28	6	-37

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

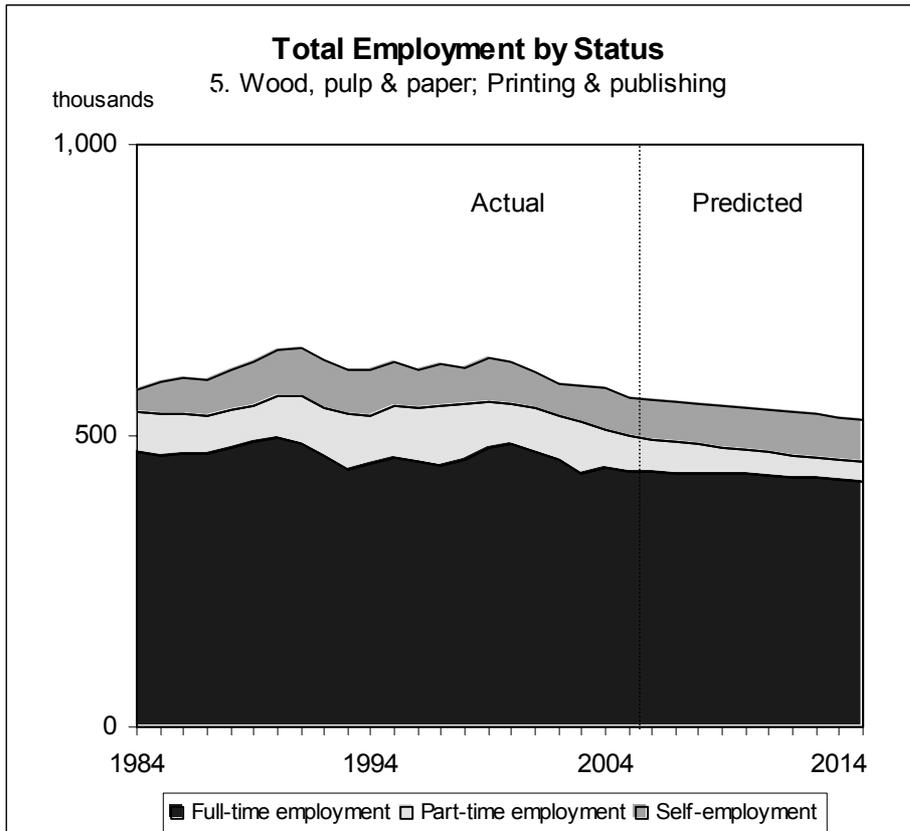
Figure 6.5.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The female share of jobs is projected to decline quite rapidly over the period to 2014. This reflects a continuation of recent trends over the past decade.

Figure 6.5.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Self-employment is expected to show a small increase in its share of total employment in future years.
- Part-time working is projected to decline, mainly as a result of the expected reduction in the number of female jobs. Again, this is the result of an assumption of a continuation of

recent trends which show a quite sharp change. In practice, future shares may change less rapidly, so this result should only be regarded as indicative.

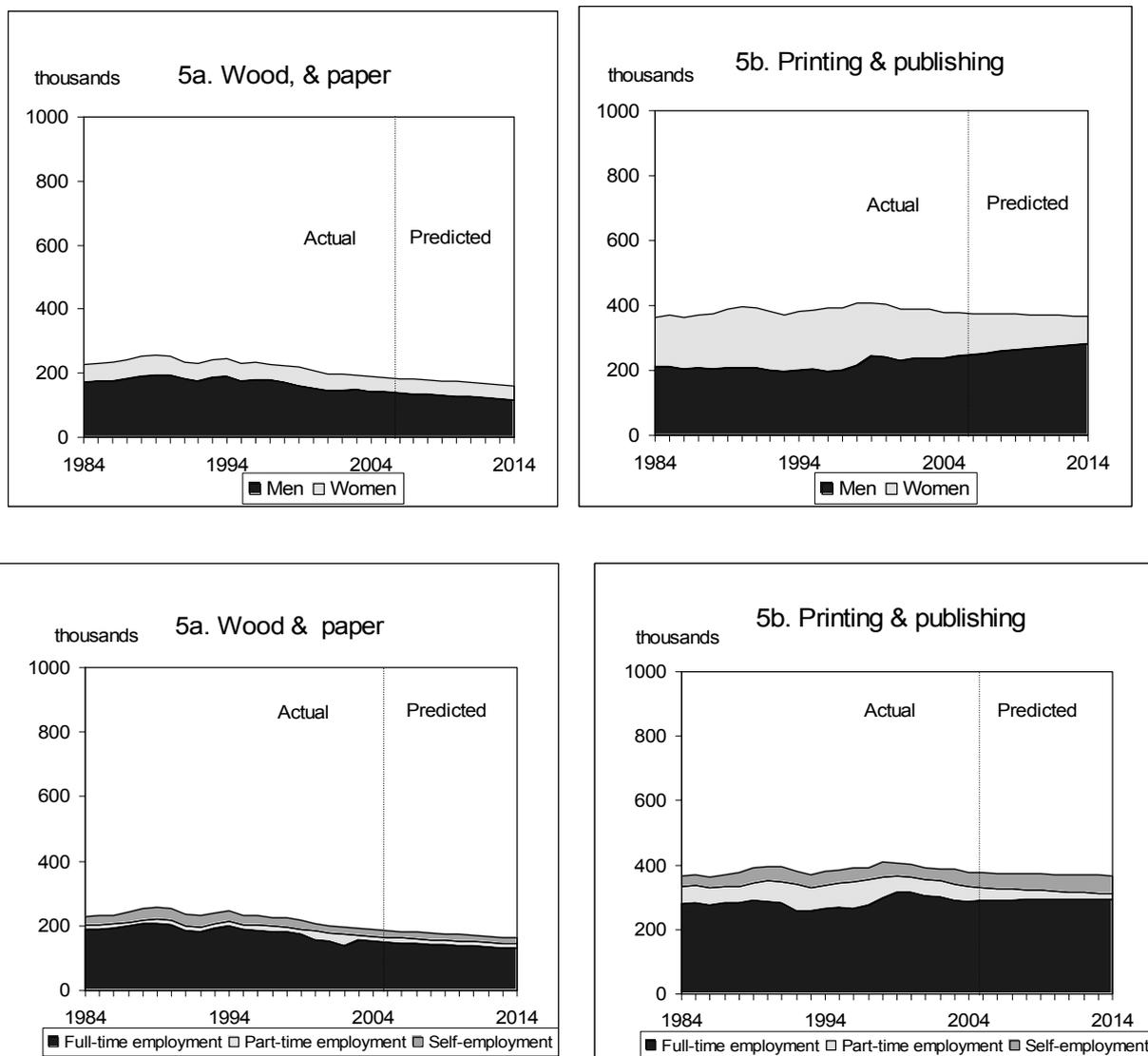
Gender status shares in component industries

The four panels of Figure 6.2.3a illustrate how gender and status patterns vary in the two main industries which make up the group.

- Historically, wood & paper has been rather more male dominated, although the female share of employment is increasing slightly.

- In printing & publishing the share of female employment has fallen rapidly in recent years and this is the pattern that is projected to continue into the future.
- Full-time employment is the predominant form of employment in both parts of the industry group. Self employment is projected to become more important in printing & publishing.

Figure 6.5.3a: Changing Patterns of Employment Status and Gender in Component Industries



Source: CE/IER estimates, MDM95 C51F8A Forecast, 27xUK.xls (Figure 6.X.3 & 2).

6.5.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Managers, associate professionals and administrative and clerical workers each account for between 10 and 20 per cent of employment in the industry as a whole.
- Skilled trades and transport and machine operatives similarly each account for almost 20 per cent of employment.

Future change

- Further employment growth is projected for managers and senior officials and associate professional and technical occupations.
- In contrast, modest job losses are projected for skilled trades and rather more substantial ones for transport and machine operatives and elementary occupations.
- These patterns reflect the continuing impact of technological change and the restructuring of the industry group, especially printing & publishing.

Shift share analysis

Table 6.5.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and

organisational factors on the occupational structure *within* the industry.

During the period 1984-94, the industry effect for this group of industries was modestly positive. This changed significantly in the next decade, the industry effect resulting in the loss of more than one in every five jobs. This is expected to moderate over the next decade, but the industry effect will still account for the loss of one in every 10 jobs.

Over the projection period managers and professionals are projected to continue to benefit from positive occupational effects. Administrative & clerical, personal service occupations, sales & customer service occupations and elementary occupations are expected to see especially significant negative occupational effects. These patterns broadly follow those for the previous decade.

Replacement demands

Table 6.5.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Total requirements amount to about 160 thousand net jobs, despite a decline in expansion demand.
- The largest growth areas are for managers & senior officials, associate professionals and skilled trades, which each have total requirements of almost 30-40 thousand over the decade.
- Quite strong job requirements are also apparent for machine & transport operatives.

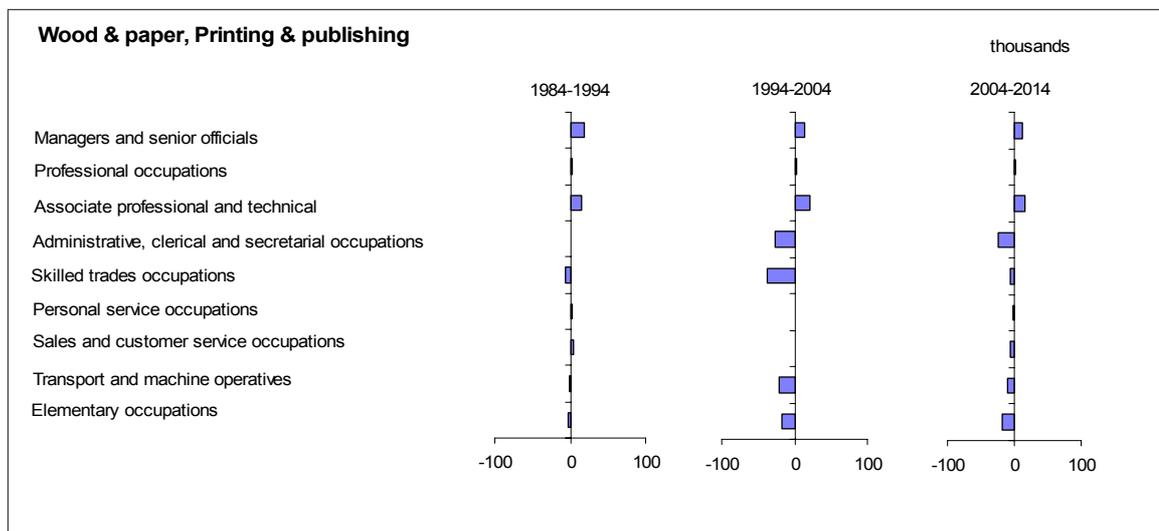
Table 6.5.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Wood, paper & publishing Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	57	75	90	97	101	11	31	42
2. Professional Occupations	17	21	24	25	26	3	8	11
3. Associate Professional & Technical Occupations	64	79	101	109	116	16	33	49
4. Administrative, Clerical & Secretarial Occupations	86	87	61	47	37	-23	24	1
5. Skilled Trades Occupations	155	149	112	109	107	-6	36	30
6. Personal Service Occupations	10	12	14	12	11	-3	5	3
7. Sales & Customer Service Occupations	15	19	20	17	15	-5	7	2
8. Machine & Transport Operatives	117	115	94	89	83	-11	33	22
9. Elementary Occupations	71	68	51	42	32	-19	17	-2
Total	592	627	566	548	529	-37	194	157

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	10	12	16	18	19	12	34	47
2. Professional Occupations	3	3	4	5	5	11	33	45
3. Associate Professional & Technical Occupations	11	13	18	20	22	16	33	48
4. Administrative, Clerical & Secretarial Occupations	14	14	11	9	7	-38	40	1
5. Skilled Trades Occupations	26	24	20	20	20	-5	32	27
6. Personal Service Occupations	2	2	2	2	2	-21	40	19
7. Sales & Customer Service Occupations	3	3	4	3	3	-26	34	9
8. Machine & Transport Operatives	20	18	17	16	16	-11	35	23
9. Elementary Occupations	12	11	9	8	6	-37	33	-4
Total	100	100	100	100	100	-7	34	28

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.5.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

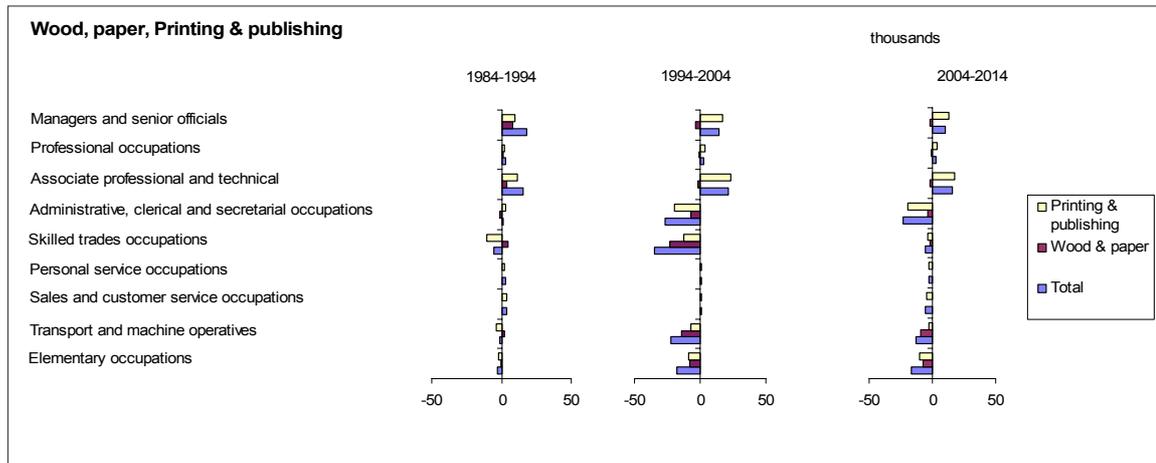
Table 6.5.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	18	2	1	14	15	9	-17	22	11	4	-10	17
2. Professional Occupations	3	1	0	2	3	3	-5	5	3	1	-3	4
3. Associate Professional & Technical Occupations	15	3	1	12	21	10	-18	29	16	4	-11	22
4. Administrative, Clerical & Secretarial Occupations	2	4	1	-3	-27	11	-19	-18	-23	3	-7	-19
5. Skilled Trades Occupations	-6	7	2	-15	-37	19	-33	-22	-6	5	-12	2
6. Personal Service Occupations	3	0	0	2	1	2	-3	2	-3	1	-1	-2
7. Sales & Customer Service Occupations	4	1	0	3	1	2	-4	3	-5	1	-2	-4
8. Machine & Transport Operatives	-1	5	2	-8	-21	14	-26	-10	-11	4	-10	-5
9. Elementary Occupations	-3	3	1	-7	-17	8	-15	-11	-19	2	-6	-15
Total	35	25	10	0	-61	78	-139	0	-37	24	-61	0

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	% change	total	scale	industry	% change	total	scale	industry	% change
1. Managers & Senior Officials	30.9	4.3	1.6	25.0	19.5	12.4	-22.2	29.2	12.3	4.3	-10.8	18.9
2. Professional Occupations	17.8	4.3	1.6	11.9	15.2	12.4	-22.2	24.9	11.4	4.3	-10.8	17.9
3. Associate Professional & Technical Occupations	23.9	4.3	1.6	18.0	27.0	12.4	-22.2	36.7	15.5	4.3	-10.8	22.0
4. Administrative, Clerical & Secretarial Occupations	1.9	4.3	1.6	-4.0	-30.5	12.4	-22.2	-20.7	-38.3	4.3	-10.8	-31.8
5. Skilled Trades Occupations	-3.6	4.3	1.6	-9.5	-24.7	12.4	-22.2	-14.9	-5.0	4.3	-10.8	1.6
6. Personal Service Occupations	28.9	4.3	1.6	23.0	9.8	12.4	-22.2	19.5	-21.0	4.3	-10.8	-14.5
7. Sales & Customer Service Occupations	26.6	4.3	1.6	20.7	4.1	12.4	-22.2	13.9	-25.5	4.3	-10.8	-19.0
8. Machine & Transport Operatives	-1.2	4.3	1.6	-7.1	-18.6	12.4	-22.2	-8.9	-11.4	4.3	-10.8	-4.9
9. Elementary Occupations	-3.9	4.3	1.6	-9.7	-25.5	12.4	-22.2	-15.7	-36.8	4.3	-10.8	-30.3
Total	5.9	4.3	1.6	0.0	-9.8	12.4	-22.2	0.0	-6.5	4.3	-10.8	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.5.4a: Changing Composition of Employment by Occupation, in Component industries, 1982-2012



Source: CE/IER estimates, MDM95 C51F8A Forecast, 27xUK.xls (Figure 6.X.4b).

Changes in Occupational structure within component industries

The main differences in occupational employment structure and the changes observed over recent years and projected for the next decade are illustrated in Figures 6.5.4a and b.

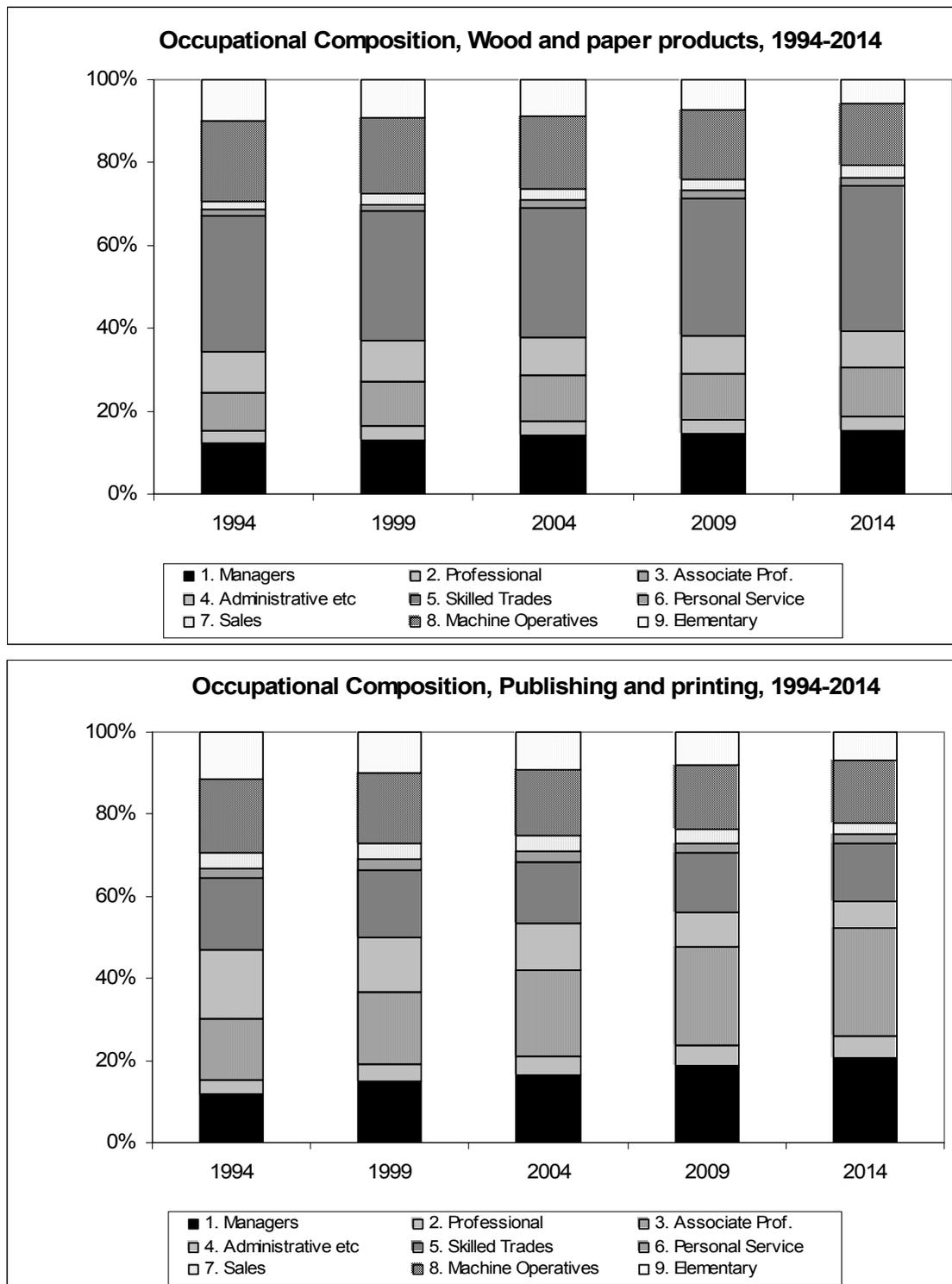
Figure 6.5.4a focuses on net changes and also compares the components directly with the industry group as a whole. Figure 6.5.4b compares the occupational structures of the two component industries, as well as showing how these have changed and are expected to change over the next decade.

Wood & paper employs a much higher proportion of blue collar manual occupations such as skilled trades, machine operatives and labourers

(elementary occupations). In contrast, printing & publishing employment is much more heavily concentrated amongst white collar occupations such as managers, professionals and especially associate professionals. In both cases, technological and other changes are projected to favour the white collar occupations, but the occupational structures will remain very different.

Patterns of change over the next decade are expected to continue those evident over the 1990s, with further job increases for managerial and associate professional occupations in printing & publishing, and job losses amongst skilled trades, machine operatives and elementary occupations in wood & paper.

Figure 6.5.4b: Structure of Employment by Occupation, in Component industries



Source: CE/IER estimates, MDM95 C51F8A Forecast, 27xUK.xls (Figure 6.X.11).

6.6 CHEMICALS & OTHER NON-METALLIC MINERAL PRODUCTS

6.6.1 Description of the industry

INDUSTRY 6: CHEMICALS & OTHER NON-METALLIC MINERAL PRODUCTS		
SIC92 headings: 23, 24, 25, 26		
<p>Manufacture of coke, refined petroleum products and processing and reprocessing of nuclear fuel. Investigation, perfecting and production of basic pharmaceutical products; manufacture of pharmaceuticals and medicaments. Manufacture of basic chemicals incl. industrial gases, dyes and pigments, inorganic and organic basic chemicals, fertilizers, plastics and synthetic rubber in primary forms; pesticides, paints, varnishes and inks; detergents, cleaning and toilet preparations; other chemical and unrecorded media (tapes, cassettes, discs); manufacture of man-made fibres. Manufacture of rubber products, such as rubber tyres and inner tubes, including products made from reclaimed rubber; retreating and rebuilding of rubber tyres (repair work by garages excluded); manufacture of other rubber products; production of finished and semi manufactured plastic goods, including plates, sheets, tubes and profiles, packing goods, builders' ware and other plastic products.</p> <p>Manufacture of various building materials, such as glass; ceramic products, bricks, tiles and clay products; cement, lime and plaster; articles of concrete, plaster and cement; cutting and finishing of stone; abrasive products; and other non-metallic products not elsewhere specified.</p>		
INDUSTRY PROFILE		All Industries
Share of UK Output (% 2004):	3.9	100
Exposure to International Trade:	high	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	599,000	30,099,000
Share of total employment: (% 2004)	2.0	100
Gender split (male:female) (% 2004):	74:26	54:46
Part-time share (% 2004):	6	28
Self-employment share (% 2004):	5	13

Source 6725output.xls, (industry profile). CE/IER estimates based on ONS data.

6.6.2 Industry Commentary

Pharmaceutical companies are necessarily large, given the costs and time-scale for new drug development. Mergers can also be used to maintain and increase market share. Biotech companies are likely to be an increasingly important part of future merger activity in the industry. The need for new products is especially important as patents expire and their generic equivalents capture market share. In addition several EU member

countries are attempting to control health care expenditures by encouraging the supply of generics whenever possible, and capping the amount that they will rebate to patients. The market will be under further pressure after the EU expansion in 2004, since several of the new member countries have large and well-established pharmaceutical companies producing new and generic drugs. Together these factors make the US an increasingly attractive market for the large pharmaceutical

companies. The industry is one of the UK's most important export earners.

The pharmaceutical industry is well protected from the economic cycle because government typically acts as a key purchaser. Output growth is expected to continue to be robust in 2005 supported by both domestic sales and exports. Growth is expected to fall back a little in 2006 and 2007 as the growth in domestic and export demand slows. Productivity gains in the industry continue to be strong in 2005 but are expected to slow slightly after 2006 and small employment declines are projected.

Merger and acquisition has often been used as a strategy to try to maintain and increase market share. Merger activity among the dominant chemicals companies has often not delivered the anticipated cost savings, and increases in the prices of raw materials coupled with the slowdown in the global economy have seen a slowdown in demand. However, Chinese economic growth promises some buoyancy to future global demand. Output in chemicals is now beginning to increase after the longest and deepest recession in the sector for 30 years. Output growth for

chemicals is expected to continue rising in 2005 supported by demand from exports and other manufacturing sectors. This growth is expected to continue into the longer term, albeit at a slightly lower rate as export demand stabilises.

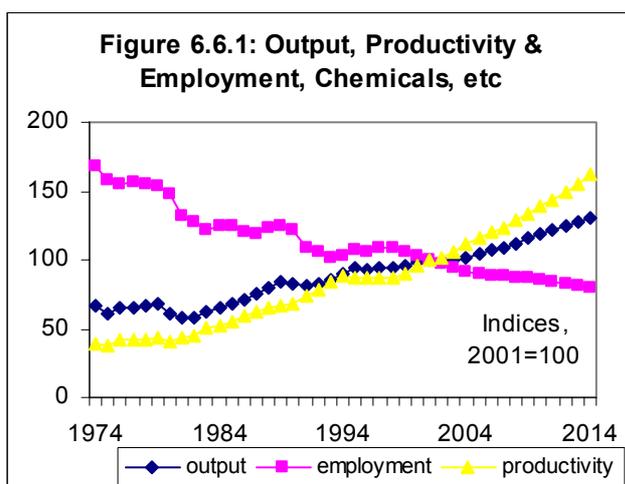
Most of the output of the rubber industry is in the form of tyres for motor vehicles which was previously very labour intensive but now is becoming more technologically advanced with consequent improvements in productivity. The remainder of the sector produces plastics and comprises specialised SMEs. The sector as a whole is very sensitive to raw material price changes (oil and rubber) and waste/recycling policy. In the long term, rubber & plastics is expected to be a slow growth sector.

The manufacture of non-metallic mineral products part of the industry group includes various building materials, such as glass; ceramic products, various building materials and prefabricated components. The companies engaged in this type of activity are therefore highly dependent on the construction industry.

6.6.3 Productivity and Output trends

Table 6.6.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-99	1999-2004	2004-09	2009-14
Gross Output (% pa)	1.0	1.4	2.6	2.4
Employment (% pa)	0.5	-2.9	-1.0	-1.5
(000s)	18	-93	-31	-42
Productivity (% pa)	0.5	4.4	3.6	3.9



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725Output.xls (Figure 6.X.1)

- The chemicals industry has enjoyed above average output growth rates for much of the past 20 years but rates have slowed in recent years. Some recovery is projected, with growth rates of around 2½ per cent per annum.
- Productivity growth also slowed in the early 1990s but has picked up again subsequently. This is projected to be maintained at 3-4 per cent per annum over the next decade.
- As a result employment is projected to fall, but at a slower rate than in previous years.

6.6.4 Employment by Status and Gender

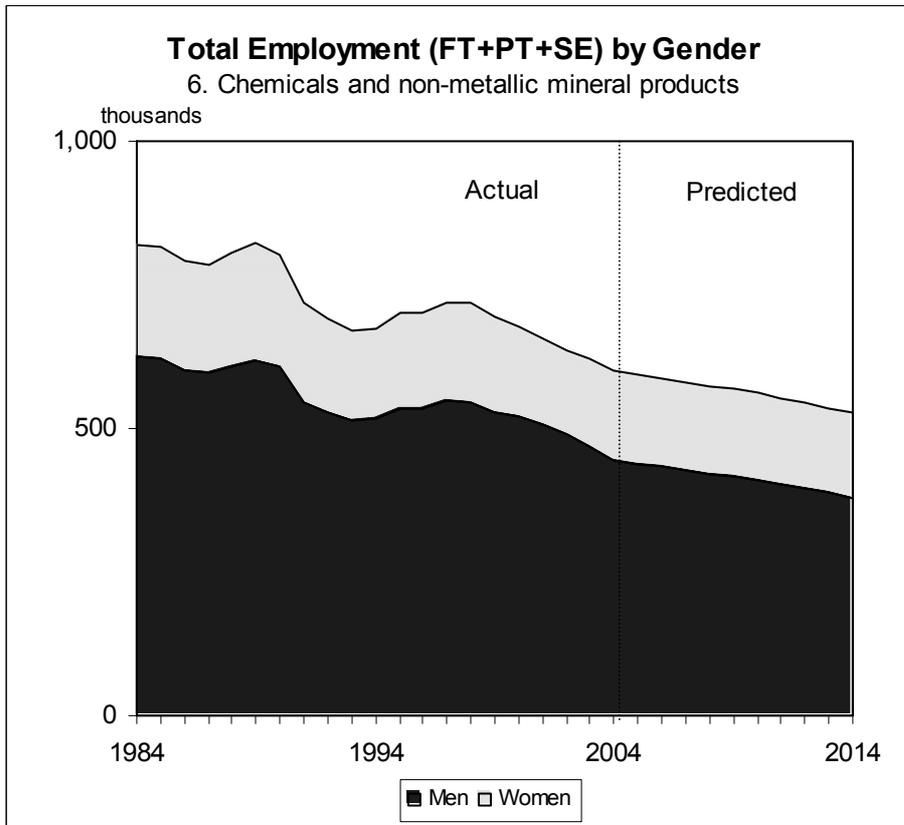
The chemicals industry is very strongly dominated by male employment. Currently men account for almost one in four of all jobs. Most jobs are full-time and self-employment is relatively small.

Table 6.6.2: Employment Levels by Gender and Status, Chemicals & Other Non-Metallic Mineral Products

Employment Status							Changes in Employment Status					
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			000s
Male employment	412	(68.7)	10	(1.7)	24	(4)	446	(74.3)	-30	3	-3	-29
Female employment	117	(19.5)	28	(4.7)	9	(1.5)	154	(25.7)	-4	2	0	-1
Total employment	528	(88.1)	38	(6.4)	33	(5.5)	599	(100)	-34	6	-2	-31
2009									2009-14			
Male employment	382	(67.1)	14	(2.4)	21	(3.7)	416	(73.2)	-36	3	-2	-36
Female employment	113	(19.8)	31	(5.4)	9	(1.7)	153	(26.8)	-8	1	0	-6
Total employment	494	(86.9)	44	(7.8)	30	(5.3)	569	(100)	-44	4	-2	-42
2014									2004-14			
Male employment	345	(65.5)	16	(3.1)	19	(3.5)	380	(72.1)	-66	6	-5	-65
Female employment	105	(19.9)	32	(6.1)	10	(1.9)	147	(27.9)	-12	4	1	-7
Total employment	450	(85.5)	48	(9.2)	28	(5.4)	527	(100)	-78	10	-4	-73

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

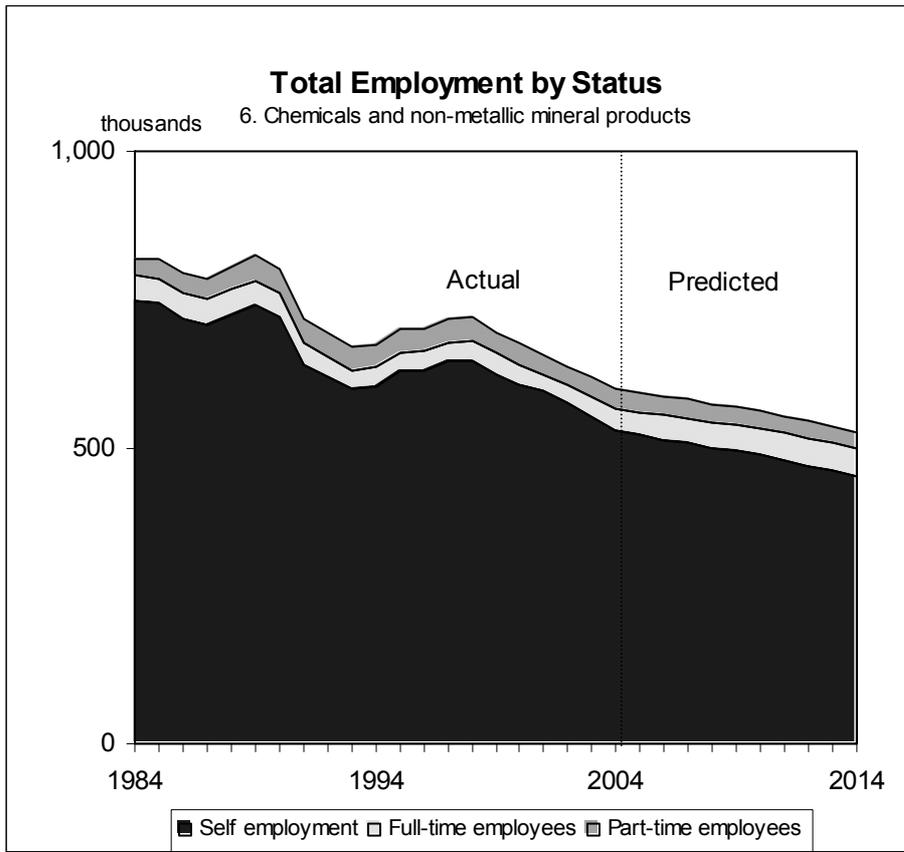
Figure 6.6.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Males are expected to lose a small share of total employment, as women increase their share to 28 per cent by 2014.

Figure 6.6.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Self-employment and part-time working are expected to continue to account for only a small share of future jobs, although the shares for part-time jobs are expected to increase marginally.

6.6.5 Projections of Employment by Occupation

Key aspects of occupational structure

- This group of industries employs significant numbers of plant & machine operatives, skilled trades and elementary occupations. These three groups combined accounted for over 50 per cent of all jobs in the industry in 2004.
- The industry also employs quite significant numbers of managerial, professional and associate professional occupations.

Future changes

- Significant job losses have occurred in recent years for administrative, clerical & secretarial occupations, skilled trades, transport & machine operatives and elementary occupations.
- Managerial and associate professional occupations are expected to increase their employment shares, but the increase in absolute employment levels is only expected to be very modest.

Shift share analysis

Table 6.6.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered.

Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

The industry effect has played a major part in declining employment for many occupations within this group of industries over the past two decades. In both periods the industry effect accounted for a reduction of employment of just over 20 per cent. This is projected to fall slightly over the projection period.

Over the projection period most occupations are projected to experience positive occupational effects, the main exception being elementary occupations.

Replacement demands

Table 6.6.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- A projected decline of employment of some 70 thousand for the industry is in marked contrast to the estimated replacement demands of just over 200 thousand.
- This translates into significant net requirements for a number of occupations including managers & senior officials, associate professionals & technicians and machine & transport operatives.
- For most occupations, replacement demands for the period 2004-14 are around a third or more of 2004 employment levels.

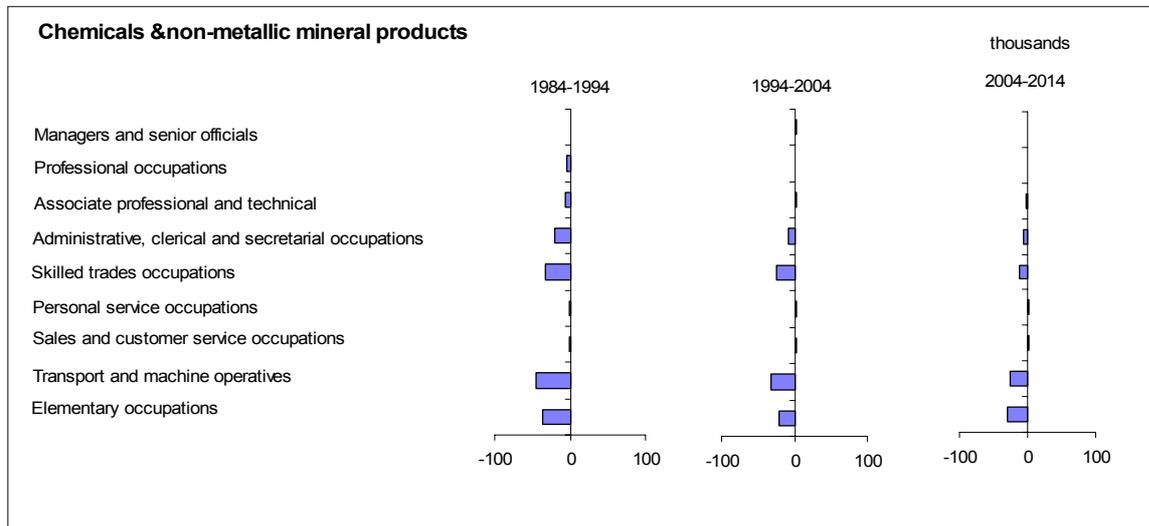
Table 6.6.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Chemicals & non-metal minerals Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		Total Requirement
						Net Change	Replacement Demands	
1. Managers & Senior Officials	76	78	81	81	81	0	27	27
2. Professional Occupations	50	45	45	45	45	-1	14	14
3. Associate Professional & Technical Occupations	70	64	67	66	64	-3	21	18
4. Administrative, Clerical & Secretarial Occupations	83	63	54	51	49	-5	21	16
5. Skilled Trades Occupations	150	117	91	85	79	-12	31	18
6. Personal Service Occupations	11	10	13	14	14	1	5	6
7. Sales & Customer Service Occupations	14	12	16	17	18	3	5	8
8. Machine & Transport Operatives	230	185	153	143	128	-25	54	29
9. Elementary Occupations	136	101	80	67	50	-30	26	-4
Total	819	675	599	569	527	-73	204	131

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	
1. Managers & Senior Officials	9	12	14	14	15	0	34	33
2. Professional Occupations	6	7	8	8	8	-1	32	30
3. Associate Professional & Technical Occupations	9	9	11	12	12	-4	31	27
4. Administrative, Clerical & Secretarial Occupations	10	9	9	9	9	-10	40	30
5. Skilled Trades Occupations	18	17	15	15	15	-14	34	20
6. Personal Service Occupations	1	2	2	2	3	10	38	48
7. Sales & Customer Service Occupations	2	2	3	3	3	17	32	50
8. Machine & Transport Operatives	28	27	26	25	24	-16	35	19
9. Elementary Occupations	17	15	13	12	9	-38	33	-5
Total	100	100	100	100	100	-12	34	22

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.6.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.x.4).

Table 6.6.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	2	3	-17	15	3	10	-18	12	0	4	-13	10
2. Professional Occupations	-5	2	-11	4	0	6	-11	5	-1	2	-7	5
3. Associate Professional & Technical Occupations	-6	3	-15	7	3	8	-15	10	-3	3	-11	5
4. Administrative, Clerical & Secretarial Occupations	-20	4	-18	-6	-8	8	-15	-1	-5	2	-9	1
5. Skilled Trades Occupations	-33	6	-33	-7	-26	14	-28	-13	-12	4	-15	-1
6. Personal Service Occupations	0	0	-2	1	2	1	-2	3	1	1	-2	3
7. Sales & Customer Service Occupations	-2	1	-3	1	3	2	-3	5	3	1	-3	5
8. Transport & Machine Operatives	-44	10	-50	-4	-33	23	-44	-12	-25	7	-25	-6
9. Elementary Occupations	-36	6	-30	-12	-21	13	-24	-10	-30	3	-13	-20
Total	-145	35	-180	0	-76	84	-159	0	-73	26	-98	0

	1984-1994		% change		1994-2004		% change		2004-2014		% change	
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	2.2	4.3	-21.9	19.9	4.2	12.4	-23.6	15.4	-0.3	4.3	-16.4	11.8
2. Professional Occupations	-9.4	4.3	-21.9	8.2	0.9	12.4	-23.6	12.1	-1.5	4.3	-16.4	10.6
3. Associate Professional & Technical Occupations	-8.1	4.3	-21.9	9.5	4.7	12.4	-23.6	15.9	-4.2	4.3	-16.4	7.9
4. Administrative, Clerical & Secretarial Occupations	-24.5	4.3	-21.9	-6.9	-13.4	12.4	-23.6	-2.2	-10.0	4.3	-16.4	2.1
5. Skilled Trades Occupations	-22.2	4.3	-21.9	-4.6	-21.9	12.4	-23.6	-10.7	-13.7	4.3	-16.4	-1.6
6. Personal Service Occupations	-4.4	4.3	-21.9	13.3	21.6	12.4	-23.6	32.8	10.0	4.3	-16.4	22.1
7. Sales & Customer Service Occupations	-12.5	4.3	-21.9	5.1	26.2	12.4	-23.6	37.4	17.3	4.3	-16.4	29.5
8. Transport & Machine Operatives	-19.3	4.3	-21.9	-1.6	-17.6	12.4	-23.6	-6.4	-16.3	4.3	-16.4	-4.2
9. Elementary Occupations	-26.2	4.3	-21.9	-8.6	-20.9	12.4	-23.6	-9.7	-37.7	4.3	-16.4	-25.6
Total	-17.6	4.3	-21.9	0.0	-11.2	12.4	-23.6	0.0	-12.1	4.3	-16.4	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.7 METALS & METAL GOODS

6.7.1 Description of the industry

INDUSTRY 7: METALS & METAL GOODS		
SIC92 headings: 27, 28		
<p>Manufacture of basic iron and steel and ferro-alloys including pig iron and steel and hot-rolled or cold-rolled products such as sheets, bars, rods and rails; manufacture of tubes and other first processing of iron and steel; manufacture of basic precious and non-ferrous metals, including aluminium, lead, zinc, tin and copper; casting of metals (ferrous and non-ferrous). Manufacture of fabricated metal products, excluding machinery and equipment, but including: structural metal products, doors and windows; tanks, reservoirs, boilers and steam generators; forging, pressing and stamping; general hardware; light metal packaging; other fabricated metal products not elsewhere specified.</p>		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	1.7	100
Exposure to International Trade:	high	average
Concentration (market share of largest employers):	medium	average
Total employment (2004):	470,000	30,099,000
Share of total employment (% 2004):	1.6	100
Gender split (male:female) (% 2004):	84:16	54:46
Part-time share (% 2004):	6	28
Self-employment share (% 2004):	9	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.7.2 Industry Commentary

Major UK and EU steel makers have restructured in recent years, but the process of rationalisation still has along way to go. The enlargement of the EU is likely to have only a limited impact on the location of European steelmaking. Demand is expected to remain strong and removal of surplus capacity will mean that prices remain solid. Domestic steel demand is driven by motor vehicles, engineering and construction output. Unprecedented demand, from China in particular, partly compensates for relatively flat demand throughout the EU.

Corus, the Anglo-Dutch company that is the UK's main steelmaker, moved into profit for the first time in 2004. This improvement came in part from higher prices and in part from cost savings

yielded by restructuring. The company is concentrating its UK production on three sites - Port Talbot and Llanwern in South Wales, and Scunthorpe in Lincolnshire.

Non-ferrous metal prices, with the exception of nickel which is a key alloy in stainless steel, are weak. Overall, the industry is continuing to restructure, and this should generate greater stability in the future than has been evident in the recent past.

Similar restructuring is taking place in the metal goods sector. Faced with a shrinking market associated with the general decline in manufacturing, the sector is attempting to move into high quality niche products, and to move production to low cost areas in Eastern Europe and Asia. Chinese economic

growth is again an important driver of demand.

For the sector as a whole, output in the longer term is forecast to stagnate. Increased efficiency will continue to reduce labour force requirements and, coupled with rising output, will boost

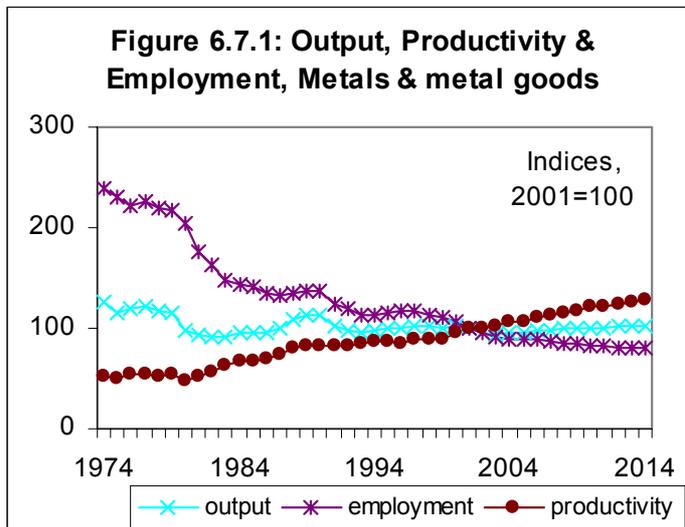
productivity. Trade inter-penetration is expected to continue to grow. Domestic prices are likely to continue increasing, supporting improved profitability, while the trade balance will stabilise.

6.7.3 Productivity and Output trends

Table 6.7.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	0.4	-1.0	1.0	0.6
Employment (% pa)	-0.6	-4.2	-1.2	-1.1
(000s)	-16	-112	-27	-25
Productivity (% pa)	1.0	3.3	2.2	1.7

- The profile of output over time for this group of industries has been quite erratic. This reflects the particular problems faced by the steel industry.
- Prospects are for only modest growth over the next decade.
- Productivity levels are projected to continue growing, although not quite as strongly as over recent years.
- Employment is therefore projected to continue its steady downward trend, with the loss of a further 50 thousand jobs in the next decade.



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

6.7.4 Employment by Status and Gender

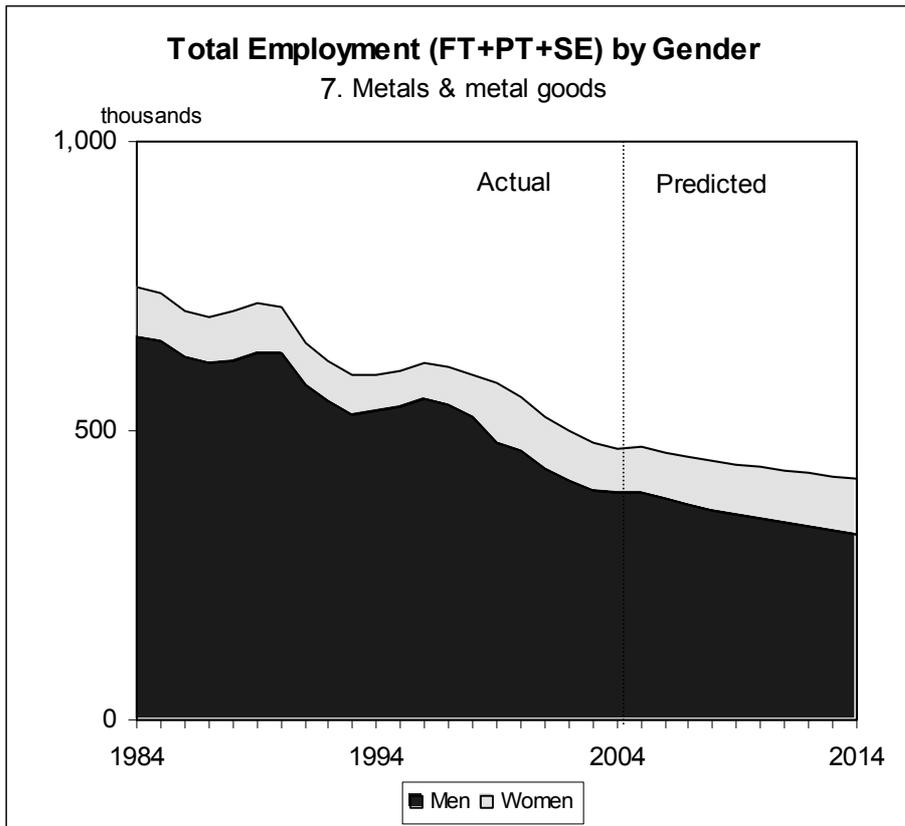
Over 4 in 5 jobs in this group of industries are currently held by men. Self-employment is relatively small, currently accounting for fewer than 1 in 10 jobs. Part-time jobs currently account for only 6 per cent of all jobs.

Table 6.7.2: Employment Levels by Gender and Status, Metals & Metal Goods

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	shares				
2004								2004-09				
Male employment	350	(74.5)	7	(1.6)	37	(7.9)	395	(84)	-44	0	5	-39
Female employment	50	(10.7)	19	(4.1)	6	(1.2)	75	(16)	6	4	1	12
Total employment	400	(85.1)	27	(5.7)	43	(9.2)	470	(100)	-37	4	6	-27
2009								2009-14				
Male employment	306	(69.2)	7	(1.6)	42	(9.5)	356	(80.3)	-39	0	4	-35
Female employment	57	(12.8)	23	(5.2)	7	(1.6)	87	(19.7)	6	4	1	10
Total employment	363	(82)	30	(6.9)	49	(11.1)	443	(100)	-33	3	5	-25
2014								2004-14				
Male employment	268	(64.1)	7	(1.6)	46	(11)	321	(76.7)	-82	-1	9	-74
Female employment	62	(14.9)	27	(6.4)	8	(2)	97	(23.3)	12	7	2	22
Total employment	330	(79)	34	(8)	54	(12.9)	418	(100)	-70	7	11	-52

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

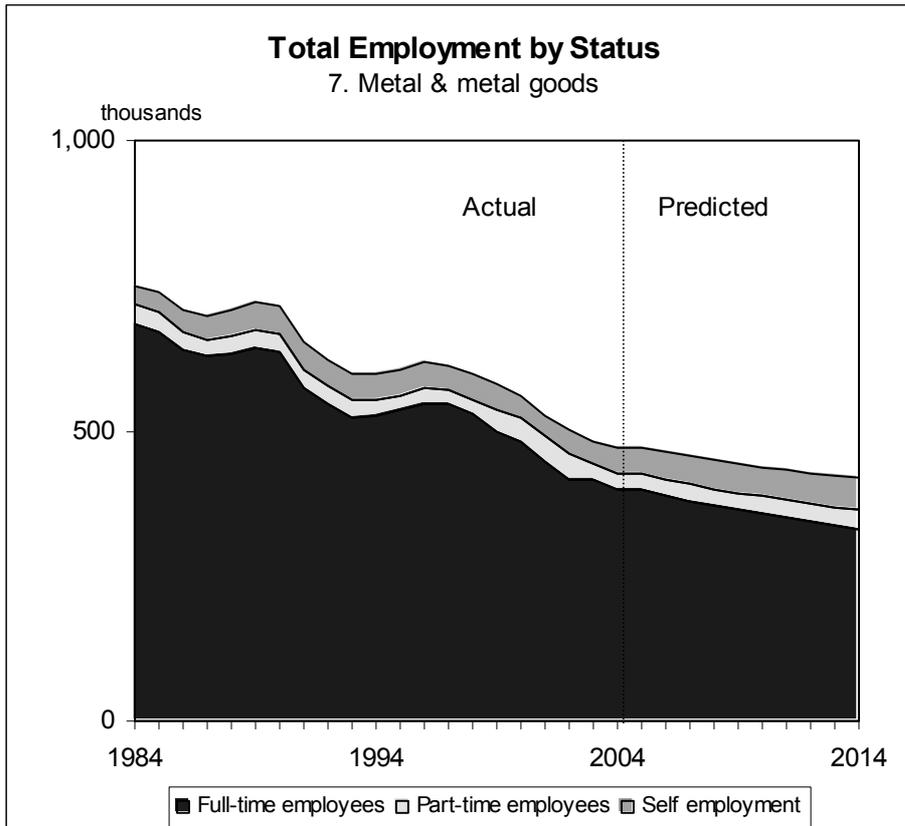
Figure 6.7.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Males are expected to bear the brunt of the expected future job losses. The share of females in total employment is projected to increase.

Figure 6.7.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Full-time jobs are expected to bear the brunt of the projected employment decline, while part-time working is expected to increase in importance.

6.7.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Historically, skilled trades have accounted for well over a third of all jobs but this has declined significantly over the past two decades
- Machine operatives and elementary occupations also remain important areas of employment.

Future change

- The projected losses in employment are expected to be focussed amongst concentrated in skilled trades and, to a lesser extent, amongst transport and machine operatives and elementary occupations.
- Increasing shares of employment are projected for managers and senior officials and, to a lesser extent, professional and associate professional occupations.

Shift share analysis

Table 6.7.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

The industry effect for this group of industries has also played a major part in

declining employment for all occupations. In the period 1984-94, the industry effect accounted for the loss of 1 in every 4 jobs. The industry effect was even higher over the period 1994-2004, accounting for the loss of 1 in every 3 jobs. Over the projection period, the industry effect is projected to be less significant, falling to around -15 per cent.

Over the projection period elementary occupations are expected to suffer from a particularly significant negative occupational effect.

Replacement demands

Table 6.7.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Although the projections are for quite sharp job losses, as in most other manufacturing industries, there will be significant needs to replace members of the existing workforce. In this industry replacement demand is three times larger than the job losses arising from new demand.
- These replacement needs are most significant for skilled trades and amongst machine & transport operatives. These generally offset the large projected declines in expansion demand.
- Total requirements are around a third of current employment levels for all the managerial, professional, associate professional and administrative support occupations, as well as for personal service and sales occupations.

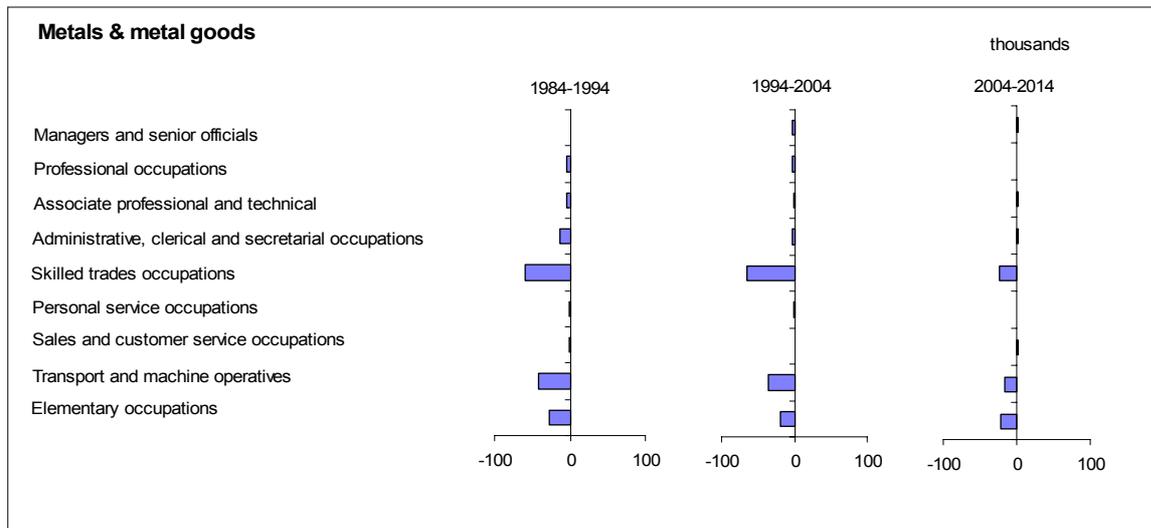
Table 6.7.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Metal & metal goods						2004 - 2014		
Employment Levels (000s)	1984	1994	2004	2009	2014	Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	64	66	62	62	65	2	21	23
2. Professional Occupations	34	31	28	27	28	0	8	8
3. Associate Professional & Technical Occupations	43	39	37	38	39	2	11	13
4. Administrative, Clerical & Secretarial Occupations	45	32	30	31	32	2	12	14
5. Skilled Trades Occupations	264	204	140	127	116	-23	44	20
6. Personal Service Occupations	6	6	5	5	6	0	2	2
7. Sales & Customer Service Occupations	7	6	8	9	10	2	2	5
8. Machine & Transport Operatives	183	141	105	97	89	-16	37	21
9. Elementary Occupations	102	74	55	47	33	-22	17	-5
Total	749	598	470	443	418	-52	154	102

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
1. Managers & Senior Officials	9	11	13	14	15	4	33	37
2. Professional Occupations	5	5	6	6	7	0	31	31
3. Associate Professional & Technical Occupations	6	6	8	8	9	5	30	35
4. Administrative, Clerical & Secretarial Occupations	6	5	6	7	8	8	39	47
5. Skilled Trades Occupations	35	34	30	29	28	-17	31	14
6. Personal Service Occupations	1	1	1	1	1	2	36	38
7. Sales & Customer Service Occupations	1	1	2	2	2	31	31	62
8. Machine & Transport Operatives	24	24	22	22	21	-15	35	20
9. Elementary Occupations	14	12	12	11	8	-40	31	-9
Total	100	100	100	100	100	-11	33	22

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.7.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C31F95 Forecast, 25UK.xls (Figure 6.x.4).

Table 6.7.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	1	3	-16	14	-3	8	-22	11	2	3	-10	9
2. Professional Occupations	-4	1	-8	3	-3	4	-10	3	0	1	-4	3
3. Associate Professional & Technical Occupations	-4	2	-10	5	-1	5	-13	7	2	2	-6	6
4. Administrative, Clerical & Secretarial Occupations	-13	2	-11	-4	-2	4	-11	5	2	1	-5	6
5. Skilled Trades Occupations	-60	11	-65	-7	-64	25	-69	-21	-23	6	-22	-8
6. Personal Service Occupations	-1	0	-2	0	0	1	-2	1	0	0	-1	1
7. Sales & Customer Service Occupations	-1	0	-2	0	1	1	-2	3	2	0	-1	3
8. Machine & Transport Operatives	-42	8	-45	-5	-37	18	-48	-6	-16	5	-16	-4
9. Elementary Occupations	-27	4	-25	-7	-19	9	-25	-3	-22	2	-8	-16
Total	-151	32	-183	0	-128	74	-203	0	-52	20	-72	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	2.0	4.3	-24.4	22.1	-5.2	12.4	-33.9	16.3	3.8	4.3	-15.4	14.9
2. Professional Occupations	-11.0	4.3	-24.4	9.1	-10.1	12.4	-33.9	11.3	0.1	4.3	-15.4	11.1
3. Associate Professional & Technical Occupations	-9.4	4.3	-24.4	10.7	-3.3	12.4	-33.9	18.1	5.2	4.3	-15.4	16.2
4. Administrative, Clerical & Secretarial Occupations	-28.7	4.3	-24.4	-8.6	-6.1	12.4	-33.9	15.3	8.0	4.3	-15.4	19.1
5. Skilled Trades Occupations	-22.7	4.3	-24.4	-2.6	-31.5	12.4	-33.9	-10.1	-16.7	4.3	-15.4	-5.7
6. Personal Service Occupations	-13.3	4.3	-24.4	6.9	-2.2	12.4	-33.9	19.2	2.1	4.3	-15.4	13.1
7. Sales & Customer Service Occupations	-14.6	4.3	-24.4	5.6	23.4	12.4	-33.9	44.8	31.2	4.3	-15.4	42.2
8. Machine & Transport Operatives	-22.9	4.3	-24.4	-2.8	-25.9	12.4	-33.9	-4.4	-15.0	4.3	-15.4	-3.9
9. Elementary Occupations	-27.0	4.3	-24.4	-6.9	-25.6	12.4	-33.9	-4.2	-40.1	4.3	-15.4	-29.1
Total	-20.1	4.3	-24.4	0.0	-21.4	12.4	-33.9	0.0	-11.1	4.3	-15.4	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.8 MACHINERY, ELECTRICAL & OPTICAL EQUIPMENT

6.8.1 Description of the industry

INDUSTRY 8: MACHINERY, ELECTRICAL & OPTICAL EQUIPMENT		
SIC92 headings: 29, 30, 32, 31, 33		
<p>Manufacture of machinery and equipment including: engines for mechanical power; furnaces; general purpose machinery (including lifting and handling equipment, cooling and ventilation equipment; tractors and other agric. machinery); machine tools; special purpose machinery (e.g. for quarrying and construction; food, drink and tobacco processing; textiles and clothing production); weapons and ammunition; domestic appliances. Manufacture of office machinery (including calculators, franking machines and terminals for dispensing tickets, banknotes etc) and computers (including peripheral units such as printers or optical readers); manufacture of radio, television and communication equipment and apparatus (including valves tubes and other components). Manufacture of: electric motors, generators and transformers; electricity distribution and control apparatus; insulated wires and cables; batteries, lighting equipment and electric lamps; electrical equipment not elsewhere specified. Manufacture of electric domestic appliances (fridges, razors, ovens, toasters etc.). Manufacture of: medical and surgical equipment and orthopaedic devices; instruments for measuring, checking, testing, navigating and other purposes; industrial process control equipment; optical instruments and photographic equipment; watches and clocks.</p>		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	3.2	100
Exposure to International Trade:	high	average
Concentration (market share of largest employers):	medium	average
Total employment (2004):	681,000	29,336,000
Share of total employment (% 2004):	2.3	100
Gender split (male:female) (% 2004):	78:22	53:47
Part-time share (% 2004):	6	27
Self-employment share (% 2004):	6	12

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.8.2 Industry Commentary

Mechanical engineering is very sensitive to fluctuations in the global economy because of its dependence on capital goods investment by other manufacturing sectors. International competitiveness is apparently falling and some companies are therefore scaling back their UK operations and moving production abroad. This is exacerbated by continuing uncertainty over Britain's entry into the euro, and by the struggling aerospace sector which has been particularly hard hit by international events such as 9/11. However, UK machinery, electrical &

optical equipment enjoyed positive output growth in 2004, after a number of years of weak performance.

The UK mechanical engineering industry is one of the largest in Europe, after Germany, France and Italy. All sectors are well-represented, but the UK is particularly strong in chemical machinery. In terms of the actual number of enterprises, the manufacture of general purpose machinery remains the largest sector within the industry with over 5,000 enterprises. A number of UK mechanical machinery, electrical & optical equipment firms have recently reported improved

sales and profitability performance, but rising steel prices continue to raise engineering costs.

Rapid technological change throughout the 1990s led to strong growth in the electronics and electrical engineering sectors, but this trend has slowed somewhat after the millennium. The take-up of 3G mobile phones was initially much weaker than anticipated, but there are now signs of improvement in this fiercely internationally competitive market. There remains a global glut of computer chips and investment in this area is in general decline world-wide. UK mobile phone manufacturing has almost all been transferred to low cost manufactures in eastern Europe and south-east Asia, as has much of TV manufacturing. Growth in electronics is forecast to strengthen and become positive once again in 2005 as export demand picks up and firms make new investments to integrate operations and improve competitiveness. Overall, electronics is expected to enjoy stronger growth over 2005-06. However, with strong productivity growth, employment declines in the industry are forecast to continue, albeit at a slower rate than in the recent past.

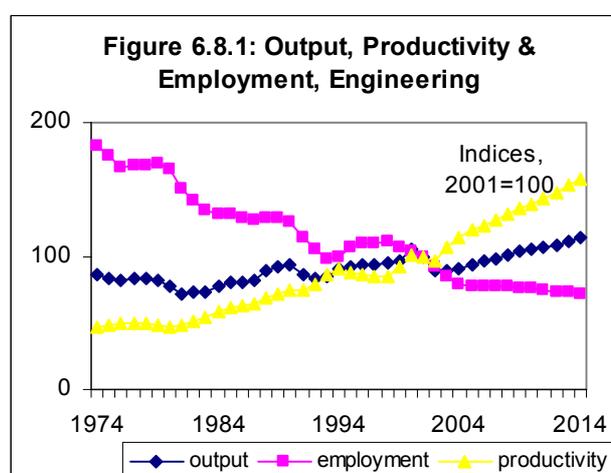
UK companies have considerable experience and skills in engineering related to North Sea oil and gas and to oil and gas-fired generation of electricity. In principle these skills could be redirected towards engineering for the second round of offshore wind farms, which, if all goes according to plan, will be built between 2006 and 2010. Until now other European companies have played a far greater role than UK companies in machinery, electrical & optical equipment for UK wind farms, but new opportunities are expected to arise for domestic engineers over the next decade.

More detailed tailored forecasts are available from SEMTA, for part of its footprint, and these have been agreed with their industry's employers for 8 of its sub-sectors. The underlying data and model framework SEMTA use are essentially the same as those used in *Working Futures* but SEMTA have developed the projections for more detailed sub-sectors, working with panels of sector employers. Despite the similarity in data and models used, the results obtained from developing future scenarios with employers can look rather different, which reflects varying underlying assumptions used to develop the future scenarios and different vintages of data. In some sub-sectors there has been a greater departure than others, for example where industry experts felt the economic assumptions were unduly pessimistic, they have considered more optimistic outcomes if they felt operating companies could improve their performance beyond historical levels. SEMTA has also developed higher replacement demand estimates. The SEMTA forecasts are available from: www.semta.org.uk/

Alternative Forecasts

6.8.3 Productivity and Output trends

- Output levels in machinery, electrical & optical equipment have followed a cyclical but generally positive trend over the past few decades. However in the past 5 year there has been a significant decline.
- Following this recession a modest recovery is projected, with overall growth rates of between 2 and 3 per cent per annum, mainly benefiting the electronics industry.
- Productivity levels are expected to increase at slightly more rapid rates of over 3 per cent per annum.
- The inevitable complications for employment are for further job losses, continuing the long-term trend decline. Overall, Some 65 thousand jobs are expected to go over the next 10 years.



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

Table 6.8.1: Trends in Output, Productivity and Employment

Indicator	Average change in the period			
	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	1.5	-1.3	2.6	2.0
Employment (% pa)	1.2	-5.6	-0.8	-1.2
(000s)	52	-229	-26	-39
Productivity (% pa)	0.3	4.6	3.4	3.2

Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

6.8.4 Employment by Status and Gender

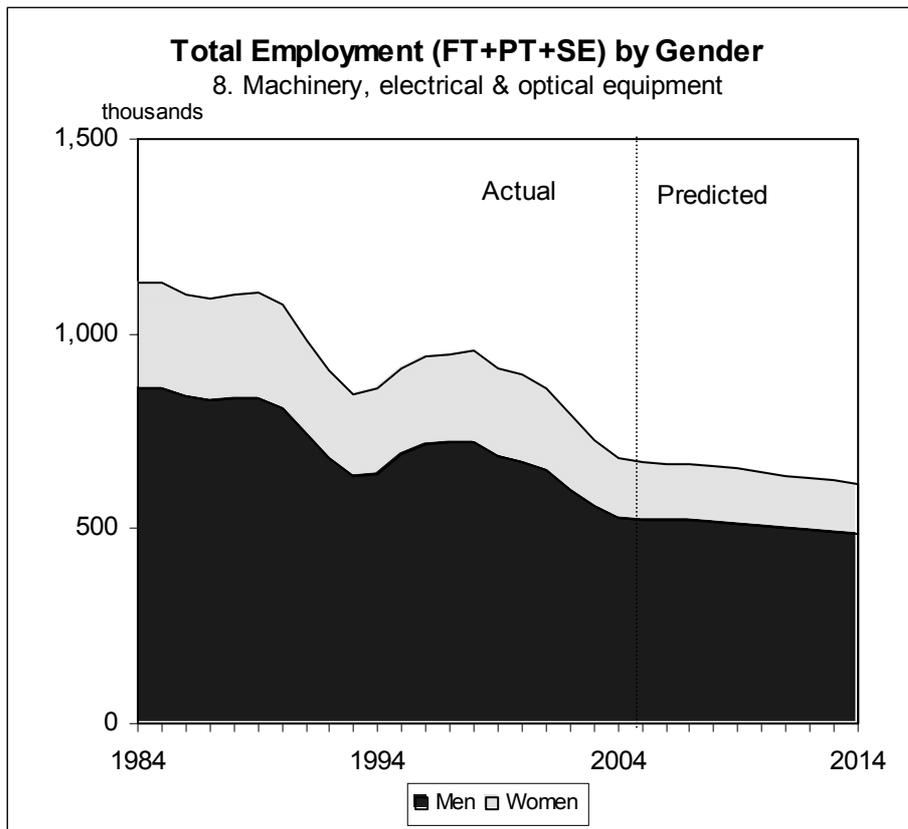
Employment in machinery, electrical & optical equipment is predominantly male. Females account for fewer than 1 in 4 jobs. Most jobs are full-time. Self-employment accounts for only about 1 in 20 jobs.

Table 6.8.2: Employment Levels by Gender and Status, Machinery, electrical & optical equipment

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004								2004-09				
Male employment	483	(70.9)	11	(1.6)	36	(5.3)	530	(77.8)	-23	3	4	-16
Female employment	117	(17.2)	29	(4.3)	5	(0.7)	151	(22.2)	-16	5	0	-10
Total employment	600	(88.1)	40	(5.9)	41	(6)	681	(100)	-38	8	4	-26
2009								2009-14				
Male employment	460	(70.3)	14	(2.1)	40	(6.1)	514	(78.4)	-34	2	2	-29
Female employment	101	(15.5)	35	(5.3)	5	(0.8)	141	(21.6)	-15	4	1	-10
Total employment	562	(85.7)	48	(7.4)	45	(6.9)	655	(100)	-48	6	4	-39
2014								2004-14				
Male employment	427	(69.2)	16	(2.6)	42	(6.8)	485	(78.6)	-56	5	6	-45
Female employment	87	(14.1)	39	(6.3)	6	(1)	132	(21.4)	-30	9	2	-20
Total employment	514	(83.3)	54	(8.8)	49	(7.9)	617	(100)	-87	14	8	-64

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.X.2).

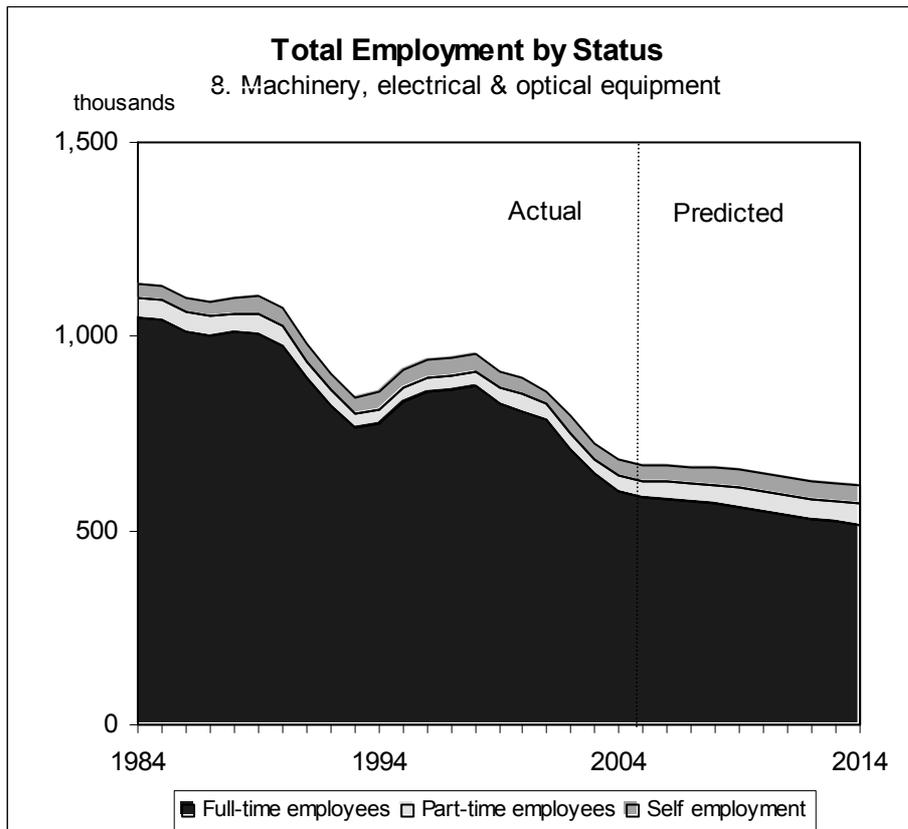
Figure 6.8.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Males are expected to maintain their share of employment, at around 80 per cent of the total.

Figure 6.8.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The industry will continue to be a source of predominantly full-time jobs, but the share of both part-time and self-employed jobs is projected to increase, albeit each by a relatively small amount.

6.8.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Skilled trades account for around 1 in 5 jobs in 2004; a much lower percentage when compared to earlier years.
- Machine operatives account for a somewhat smaller share of the total.
- Managerial, professional and associate professional occupations together accounted for 40 per cent of employment in 2004; a share which has increased steadily over the past two decades.

Future change

- Further job losses are expected to be concentrated amongst:
 - Skilled trades
 - Machine operatives
 - Elementary occupations, and
 - Administrative clerical and secretarial occupations.
- Most other occupations are expected to see fairly stable employment levels, with a small increase for sales and customer services.

Shift share analysis

Table 6.8.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

As for most other manufacturing industries, the industry effect has played a major part in declining employment for all occupations. In the period 1984-94, the industry effect was almost -30 per cent. The industry effect increased slightly to

account for the loss of 1 in every 3 jobs in 1994-2004. Over the projection period, the industry effect is projected to moderate to just under -14 percent.

There are negative occupational effects for skilled trades and, more especially, elementary occupations over the projection period, exacerbating the projected negative industry effects.

Replacement demands

Table 6.8.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Substantial replacement demands are estimated for all occupations in this industry. Overall, the replacement demand over the decade is for 230 thousand jobs, a requirement that far outweighs the projected declines projected for “expansion” demand.
- The largest increases are for skilled trades and amongst machine & transport operatives.
- However there are also significant replacement needs for all the managerial, professional and associate professional groups, as well as for administrative & clerical and elementary occupations.

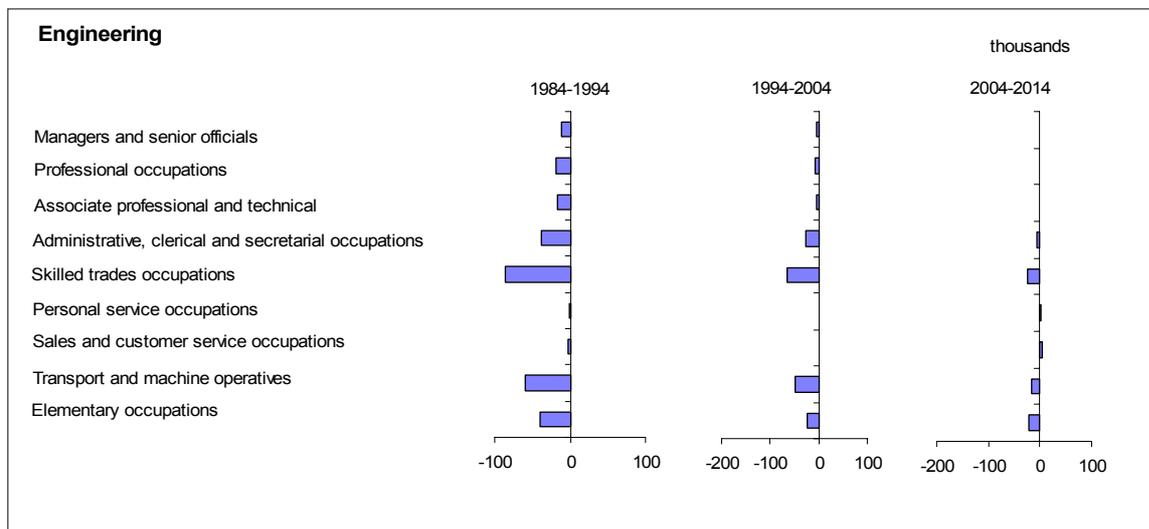
Table 6.8.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Engineering Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	121	110	106	106	105	-1	35	35
2. Professional Occupations	98	79	73	73	73	0	22	22
3. Associate Professional & Technical Occupations	109	91	87	87	86	-2	26	25
4. Administrative, Clerical & Secretarial Occupations	128	89	62	59	57	-6	25	19
5. Skilled Trades Occupations	303	217	151	140	128	-23	49	25
6. Personal Service Occupations	10	9	10	11	11	1	4	5
7. Sales & Customer Service Occupations	18	14	16	18	20	4	5	9
8. Machine & Transport Operatives	228	168	120	112	102	-17	43	25
9. Elementary Occupations	119	80	56	48	35	-21	18	-3
Total	1,133	858	681	655	617	-64	227	162

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	11	13	16	16	17	-1	33	33
2. Professional Occupations	9	9	11	11	12	0	30	31
3. Associate Professional & Technical Occupations	10	11	13	13	14	-2	30	28
4. Administrative, Clerical & Secretarial Occupations	11	10	9	9	9	-9	40	31
5. Skilled Trades Occupations	27	25	22	21	21	-15	32	17
6. Personal Service Occupations	1	1	1	2	2	9	39	48
7. Sales & Customer Service Occupations	2	2	2	3	3	28	32	60
8. Machine & Transport Operatives	20	20	18	17	17	-15	36	21
9. Elementary Occupations	11	9	8	7	6	-38	32	-6
Total	100	100	100	100	100	-9	33	24

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.8.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C31F95 Forecast, 25UK.xls (Figure 6.x.4).

Table 6.8.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	-11	5	-34	18	-4	14	-36	19	-1	5	-15	9
2. Professional Occupations	-19	4	-28	5	-6	10	-26	10	0	3	-10	7
3. Associate Professional & Technical Occupations	-17	5	-31	9	-4	11	-30	15	-2	4	-12	7
4. Administrative, Clerical & Secretarial Occupations	-39	5	-37	-8	-27	11	-29	-8	-6	3	-9	0
5. Skilled Trades Occupations	-86	13	-87	-13	-66	27	-72	-21	-23	7	-21	-9
6. Personal Service Occupations	-1	0	-3	2	1	1	-3	2	1	0	-1	2
7. Sales & Customer Service Occupations	-3	1	-5	1	1	2	-5	4	4	1	-2	6
8. Machine & Transport Operatives	-60	10	-65	-4	-49	21	-56	-14	-17	5	-17	-6
9. Elementary Occupations	-40	5	-34	-11	-23	10	-26	-7	-21	2	-8	-16
Total	-275	49	-324	0	-177	107	-283	0	-64	29	-94	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	-9.0	4.3	-28.6	15.3	-3.4	12.4	-33.0	17.2	-0.7	4.3	-13.8	8.7
2. Professional Occupations	-19.2	4.3	-28.6	5.1	-8.2	12.4	-33.0	12.4	0.5	4.3	-13.8	9.9
3. Associate Professional & Technical Occupations	-16.1	4.3	-28.6	8.2	-4.2	12.4	-33.0	16.4	-1.8	4.3	-13.8	7.7
4. Administrative, Clerical & Secretarial Occupations	-30.3	4.3	-28.6	-6.0	-29.8	12.4	-33.0	-9.2	-9.1	4.3	-13.8	0.4
5. Skilled Trades Occupations	-28.4	4.3	-28.6	-4.1	-30.4	12.4	-33.0	-9.8	-15.3	4.3	-13.8	-5.8
6. Personal Service Occupations	-6.4	4.3	-28.6	17.9	6.3	12.4	-33.0	26.9	9.0	4.3	-13.8	18.5
7. Sales & Customer Service Occupations	-18.2	4.3	-28.6	6.1	8.0	12.4	-33.0	28.6	28.0	4.3	-13.8	37.4
8. Machine & Transport Operatives	-26.1	4.3	-28.6	-1.8	-28.9	12.4	-33.0	-8.3	-14.6	4.3	-13.8	-5.1
9. Elementary Occupations	-33.4	4.3	-28.6	-9.1	-29.1	12.4	-33.0	-8.5	-38.1	4.3	-13.8	-28.6
Total	-24.3	4.3	-28.6	0.0	-20.6	12.4	-33.0	0.0	-9.5	4.3	-13.8	0.0

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

6.9 TRANSPORT EQUIPMENT

6.9.1 Description of the industry

INDUSTRY 9: TRANSPORT EQUIPMENT		
SIC92 headings: 34, 35		
<p>Manufacture of: cars, commercial vehicles, buses and coaches; motor vehicles engines and chassis; bodies (coachwork) for motor vehicles, trailers and semi-trailers; parts and accessories for motor vehicles and their engines. (Electrical parts (such as sparking plugs, lighting, windscreen wipers and defrosters) are classified to industry 8). Manufacture of: aeroplanes, helicopters, gliders, dirigibles and balloons, spacecraft, satellites and launch vehicles; major assemblies such as fuselages, wings, doors, landing gear, rotor blades and engines of a kind typically found on aircraft; ground flying trainers. (Manufacture of instruments and navigation systems is classified to industry 8). Building and repairing of ships (merchant, warships, fishing vessels and pleasure boats), hovercraft and drilling platforms; manufacture of railway and tramway locomotives and rolling stock, specialised parts (such as brakes, axles, coupling devices), signalling equipment; manufacture of motorcycles and bicycles, invalid carriages and other transport equipment not elsewhere specified.</p>		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	1.9	100
Exposure to International Trade:	high	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	362,000	30,099,000
Share of total employment (%2004):	1.2	100
Gender split (male:female) (% 2004):	89:11	54:46
Part-time share (% 2004):	3	28
Self-employment share (% 2004):	5	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.9.2 Industry Commentary

In the last decade there has been considerable consolidation and forging of alliances among car manufacturers. New manufacturing processes and organisation such as lean manufacturing and just-in-time delivery have had implications for the component suppliers too, which are increasingly merging in order to grow or diversify into related components and systems.

UK (and EU) productivity in car manufacturing still remains far behind that in Japan. Even the most productive car

plant in the EU (Nissan's plant in Sunderland) is only half as productive as the best plant in Japan (Mitsubishi Motors Mitsushima factory). The low productivity plant of MG Rover in Birmingham has recently been closed down. Continuing improvements in productivity will exacerbate the world-wide over-capacity and further dent profitability. Many large global car manufacturers continue to post losses and those based in the EU look set to transfer production to eastern European countries following the recent enlargement, as labour costs are much lower there.

Demand for new cars in the UK remains strong, although it showed signs of slowing down in 2004. Off-roaders, diesel and luxury cars continued to experience strong growth, as did commercial vehicles. The new car markets in other EU countries remain weak. Much of UK car production is aimed at the export market.

The closure of UK plants does not, on the whole, indicate industry-wide problems: it is expected that the UK motor vehicles industry will maintain its competitiveness, with stronger levels of investment forecast from 2006 onwards. The production of motor vehicles is closely linked to the national and international economic cycles. It is expected that the present business cycle in growth of world trade will reach its peak over 2004-05, coinciding with the peaks of the present business cycle in the US and Japan. Stronger export demand in 2005 will result in slightly stronger output growth.

Long term growth in productivity means that the decline in employment which has been experienced over the last two decades seems set to continue. Major economic and political decisions on the UK's entry into the euro, and EU environmental legislation regarding

recycling could also have major long-term consequences for the industry in the UK.

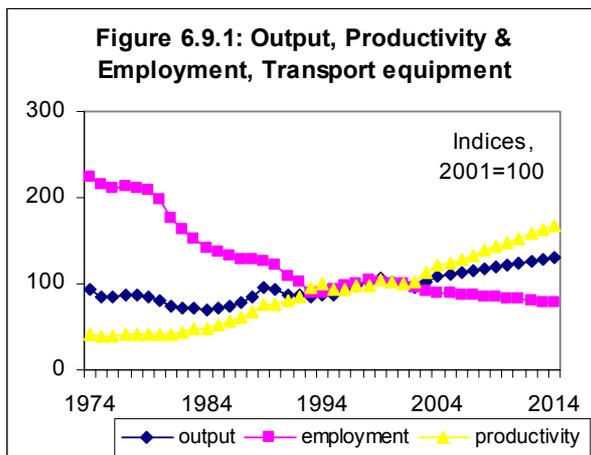
Commercial aircraft manufacturers have seen improvements following the post 9/11 crisis in air travel, while continuing military operations have supported sales in the aerospace defence sub-sector. The introduction of the European Airbus will stimulate demand for new and replacement aircraft in the second half of the present decade. UK shipbuilding has recently received a boost from the biggest naval construction programme since the Second World War.. Major rail replacement projects are also expected to contribute significantly to output growth. The renovation of the London Underground is important to this market.

The recovery in the civil aerospace industry and the renewed strength of the shipbuilding industry is estimated to have resulted in output growth of more than 10% in 2004. Output growth is expected to be more subdued in 2005 as new civil aircraft orders and global defence spending is reduced. Declines in employment are expected to accelerate in the short term as companies complete new orders and undertake rationalisation and restructuring programmes to remain competitive.

6.9.3 Productivity and Output trends

Table 6.9.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.9	0.4	2.1	1.8
Employment (% pa)	2.8	-2.5	-1.2	-1.4
(000s)	52	-49	-21	-24
Productivity (% pa)	1.1	3.0	3.4	3.3



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output levels in this group of industries have shown only very modest growth over the past few years, reflecting uncertainties about rail and air transport as well as the continuing trials and tribulations of the UK motor industry.
- Some modest recovery is expected over the next decade, with output expected to grow annually at about 2 per cent on average.
- Productivity growth is projected to accelerate as producers innovate and respond to intense international competition.
- Employment consequently is projected to fall quite sharply, with some 45 thousand jobs lost between 2004 and 2014. The recent job losses at MG Rover are an indication that this process is already underway.

6.9.4 Employment by Status and Gender

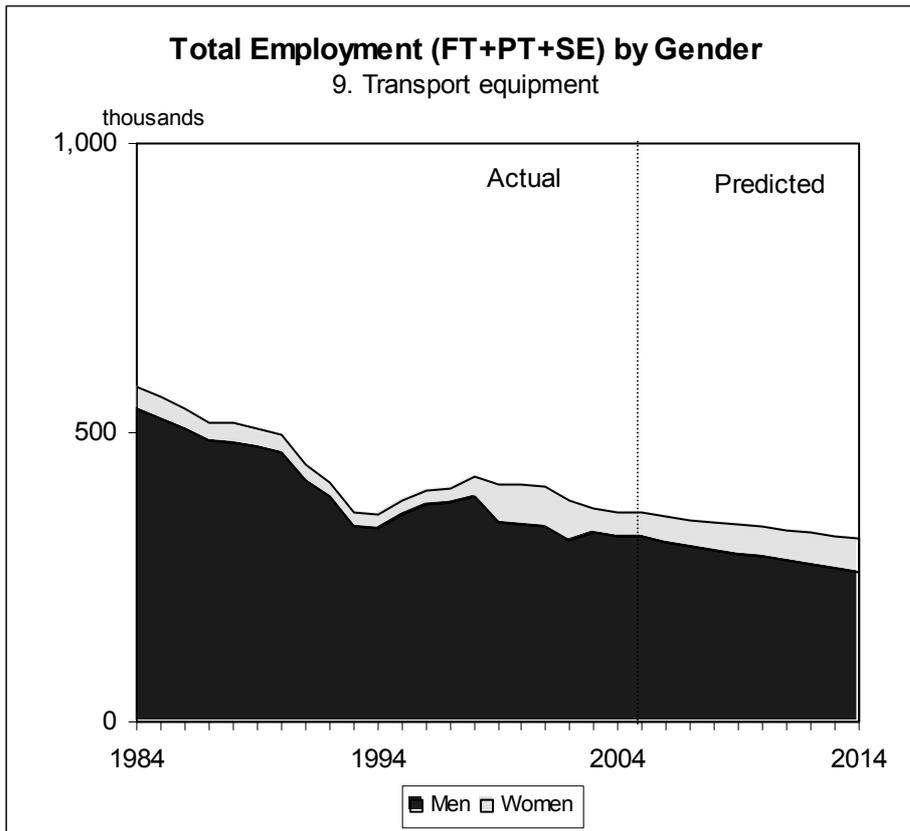
Employment in the transport equipment industry is predominantly male. Part-time employment and self-employment are relatively tiny but increasing in importance.

Table 6.9.2: Employment Levels by Gender and Status, Transport equipment

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	shares				
2004									2004-09			
Male employment	303	(83.7)	4	(1)	16	(4.3)	322	(89)	-35	2	2	-31
Female employment	33	(9.2)	6	(1.7)	1	(0.2)	40	(11)	8	3	0	10
Total employment	336	(92.8)	10	(2.7)	16	(4.5)	362	(100)	-27	4	1	-21
2009									2009-14			
Male employment	268	(78.7)	5	(1.5)	17	(5.1)	291	(85.3)	-35	1	1	-32
Female employment	41	(12)	9	(2.6)	0	(0)	50	(14.7)	6	2	0	9
Total employment	309	(90.8)	14	(4.1)	17	(5.1)	341	(100)	-28	3	1	-24
2014									2004-14			
Male employment	234	(73.7)	6	(2)	18	(5.8)	258	(81.5)	-69	3	3	-64
Female employment	48	(15)	11	(3.4)	0	(0)	59	(18.5)	14	5	0	19
Total employment	281	(88.7)	17	(5.5)	18	(5.8)	317	(100)	-55	8	2	-45

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

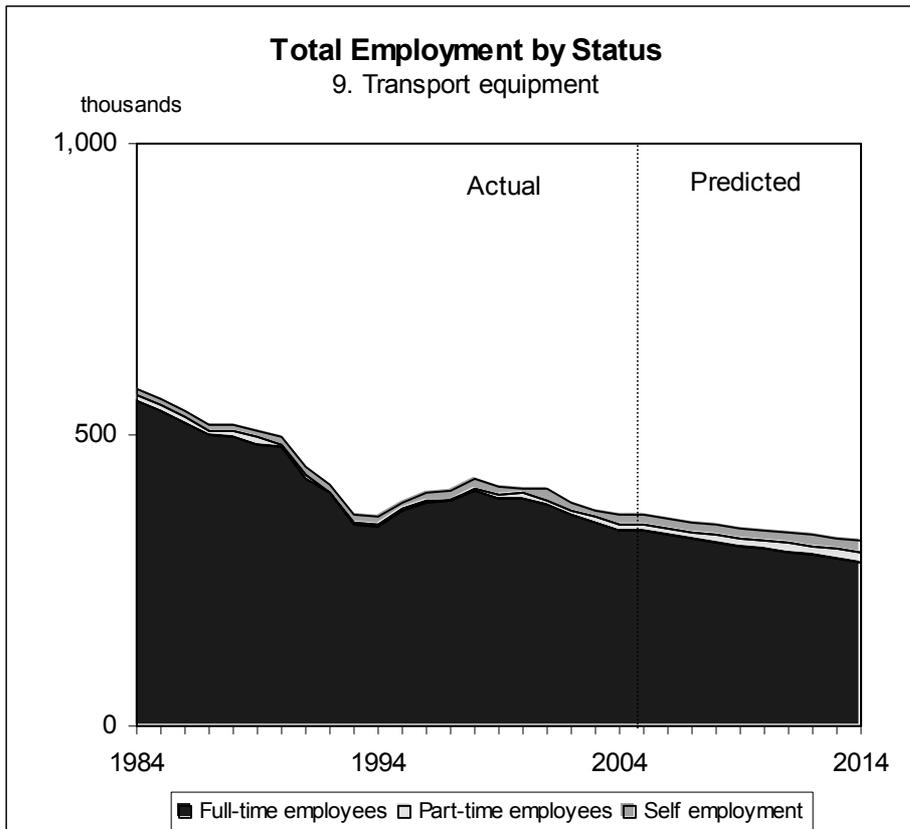
Figure 6.9.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Males are projected to see a slight loss of their share of total employment but they are still expected to account for over 80 per cent of all jobs in 2014.

Figure 6.9.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A
Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Full-time jobs will remain the norm in this industry, with part-time employment and self-employment growing slowly but remaining relatively insignificant.

6.9.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Skilled trades and machine operatives continue to be the most important occupations, although the former have seen a sharp decline in their employment share over the past two decades.
- Managers, professionals and associate professionals have all increased their employment shares in recent years, in combination reaching over 25 per cent of the total in 2004.

Future change

- Future job losses are projected to be concentrated in the manual occupations such as skilled trades, machine operatives and elementary occupations.
- The managerial, professional and associate professional groups are projected to increase their shares of employment, whilst their employment levels will fall slightly.

Shift share analysis

Table 6.9.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

The industry effect resulted in a loss of over 40 per cent of all jobs in the period 1984-94. This played a major part in declining employment for all occupations in the industry. Subsequently the industry effect moderated, as inward investment helped to boost output. The industry effect on employment fell to just -12 per cent over the period 1994-2004. Over the projection period, the industry effect is projected to increase again, resulting in the loss of around 17 per cent of jobs across all occupations.

Over the projection period skilled trades and elementary occupations are expected to experience negative occupational effects which reinforce these changes.

Replacement demands

Table 6.9.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Replacement demands are significant for many occupations in this industry and these are sufficient to generate a total industry requirement of over 70 thousand new workers by 2014.
- In absolute terms the largest elements of replacement demand are for skilled trades occupations (more than cancelling out the 27 thousand projected decline in expansion demand) and a need for some 28 thousand replacement transport operatives, which again more than offsets the projected decline due to structural changes.

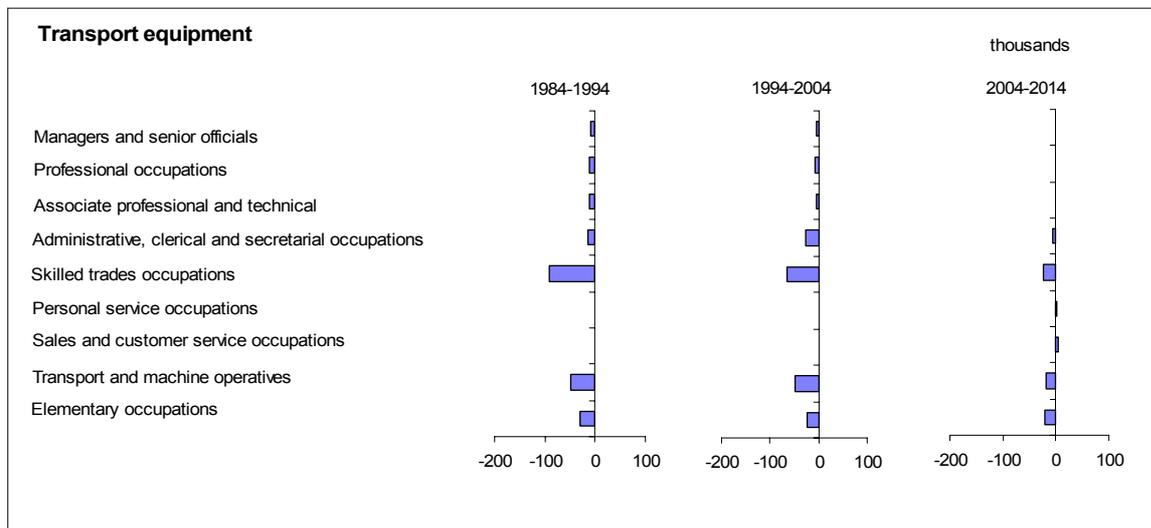
Table 6.9.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Transport equipment Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	39	29	35	34	34	0	11	11
2. Professional Occupations	41	28	31	31	31	0	9	9
3. Associate Professional & Technical Occupations	40	28	33	32	31	-2	9	8
4. Administrative, Clerical & Secretarial Occupations	34	20	25	27	29	4	9	14
5. Skilled Trades Occupations	216	126	106	91	79	-27	33	6
6. Personal Service Occupations	4	3	4	5	5	1	1	3
7. Sales & Customer Service Occupations	4	3	5	7	8	3	2	4
8. Machine & Transport Operatives	129	81	80	76	71	-9	28	18
9. Elementary Occupations	70	41	43	38	28	-15	13	-1
Total	578	359	362	341	317	-45	116	71

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	7	8	10	10	11	-1	33	32
2. Professional Occupations	7	8	9	9	10	-1	30	29
3. Associate Professional & Technical Occupations	7	8	9	9	10	-5	29	24
4. Administrative, Clerical & Secretarial Occupations	6	5	7	8	9	16	38	54
5. Skilled Trades Occupations	37	35	29	27	25	-25	31	6
6. Personal Service Occupations	1	1	1	1	2	31	36	67
7. Sales & Customer Service Occupations	1	1	1	2	3	49	29	78
8. Machine & Transport Operatives	22	23	22	22	22	-11	34	23
9. Elementary Occupations	12	11	12	11	9	-34	30	-3
Total	100	100	100	100	100	-12	32	20

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.9.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C31F95 Forecast, 25UK.xls (Figure 6.x.4).

Table 6.9.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	-9	2	-16	5	5	4	-3	5	0	1	-6	4
2. Professional Occupations	-13	2	-17	3	3	3	-3	2	0	1	-5	4
3. Associate Professional & Technical Occupations	-12	2	-17	3	5	3	-3	5	-2	1	-5	2
4. Administrative, Clerical & Secretarial Occupations	-15	1	-14	-2	5	2	-2	5	4	1	-4	7
5. Skilled Trades Occupations	-91	9	-91	-9	-20	16	-15	-21	-27	5	-18	-14
6. Personal Service Occupations	-1	0	-2	0	1	0	0	1	1	0	-1	2
7. Sales & Customer Service Occupations	-1	0	-2	0	2	0	0	2	3	0	-1	3
8. Machine & Transport Operatives	-48	6	-55	1	-1	10	-9	-2	-9	3	-13	1
9. Elementary Occupations	-29	3	-30	-3	2	5	-5	2	-15	2	-7	-9
Total	-219	25	-244	0	3	45	-42	0	-45	16	-61	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	-23.7	4.3	-42.2	14.2	17.4	12.4	-11.6	16.5	-1.0	4.3	-16.8	11.4
2. Professional Occupations	-31.2	4.3	-42.2	6.7	9.5	12.4	-11.6	8.7	-0.8	4.3	-16.8	11.6
3. Associate Professional & Technical Occupations	-29.9	4.3	-42.2	8.0	18.0	12.4	-11.6	17.1	-5.0	4.3	-16.8	7.5
4. Administrative, Clerical & Secretarial Occupations	-42.8	4.3	-42.2	-4.9	27.6	12.4	-11.6	26.8	16.5	4.3	-16.8	28.9
5. Skilled Trades Occupations	-41.9	4.3	-42.2	-4.1	-15.6	12.4	-11.6	-16.4	-25.3	4.3	-16.8	-12.9
6. Personal Service Occupations	-26.7	4.3	-42.2	11.1	42.6	12.4	-11.6	41.8	30.8	4.3	-16.8	43.2
7. Sales & Customer Service Occupations	-31.4	4.3	-42.2	6.5	78.1	12.4	-11.6	77.2	48.9	4.3	-16.8	61.3
8. Machine & Transport Operatives	-37.1	4.3	-42.2	0.8	-1.2	12.4	-11.6	-2.1	-11.4	4.3	-16.8	1.0
9. Elementary Occupations	-41.5	4.3	-42.2	-3.6	4.6	12.4	-11.6	3.8	-34.2	4.3	-16.8	-21.7
Total	-37.9	4.3	-42.2	0.0	0.8	12.4	-11.6	0.0	-12.4	4.3	-16.8	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.10 OTHER MANUFACTURING & RECYCLING

6.10.1 Description of the industry

INDUSTRY 10: OTHER MANUFACTURING & RECYCLING		
SIC92 headings: 36, 37		
<p>Manufacture and upholstery of furniture (incl. chairs and seats, office and shop furniture, fitted kitchens, other furniture and mattresses). Other manufacturing & recycling including: jewellery, musical instruments, sports goods, games and toys, and miscellaneous products. Recycling of metal and non-metal waste and scrap; (but excluding new products from secondary raw material, e.g. paper from pulp).</p>		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	0.7	100
Exposure to International Trade:	medium	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	233,000	30,099,000
Share of total employment (% 2004):	0.8	100
Gender split (male:female) (% 2004):	72:28	54:46
Part-time share (% 2004):	11	28
Self-employment share (% 2004):	13	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.10.2 Industry Commentary

This industry grouping is a highly heterogeneous mixture of sectors. In general, demand in these sectors is rather sensitive to the business cycle. Furniture is the largest sub-sector, and this is now a net importer following increased imports from the Far East over the last decade. Most other sub-sectors, such as games and sports goods, are also dominated by imported goods.

The UK games market is currently the third-largest in the world after the US and Japan. The leading companies in this sector (such as Eidos, Kuju Entertainment, Codemasters, Lionhead Studios and SCI) are very vulnerable to swings in the market. In 2003, at least twenty computer games developers in the UK closed down mainly as a result of a slowing in the market, especially in the US, where trading conditions are highly competitive.

Many small games publishers will not be able to compete with big players in the longer term and the industry will probably follow the film industry, where there are only limited numbers of developers who use smaller companies for specialist work.

The industry group also includes recycling. The EU directives on recycling are based on the 'polluter pays' principle. Increased requirements for the proportion of components recycled for the car industry and the electronics industry will necessitate new investment in recycling equipment. The UK recycling business needs to double in size by 2018 in order to meet EU targets. However it remains unclear as to whether such a target can be feasibly met.

In 2001, WRAP (Waste and Resources Action Plan) was introduced to reduce the volume of UK waste. WRAP is designed to remove or reduce barriers that prevent

recycling in order to achieve the target announced in the waste strategy of quadrupling the recycling of household waste over the next 15 years. In the UK confusion has arisen over EU environmental regulations aimed at reducing chlorofluorocarbons (CFCs) in the atmosphere. This has led to the creation of 'fridge mountains' and its has damaged manufacturers' confidence in the government's handling of waste strategies

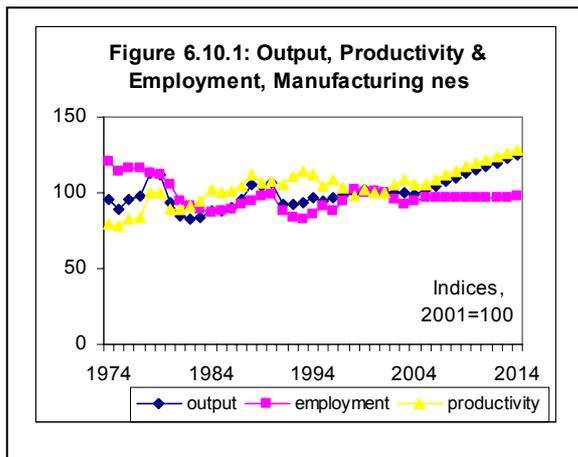
and raised fears that similar problems may arise with cars and electrical equipment.

Output across this sector is projected to grow in both the medium and the long term. This growth will be fuelled by continuing strong domestic and export demand. Only small employment increases are likely.

6.10.3 Productivity and Output trends

Table 6.10.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	1.2	-0.7	2.7	2.0
Employment (% pa)	3.1	-1.2	0.6	0.1
(000s)	35	-15	7	2
Productivity (% pa)	-1.8	0.6	2.1	1.9



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Long-term output trends in this group of industries have been fairly flat although with a strong cyclical pattern. Following a recent downturn things are expected to pick up, with recycling doing especially well.
- Productivity growth is also expected to accelerate, at about the same rate as output growth.
- The net impact of such changes is to produce growth that is mainly jobless, with only minimal change in employment levels.

6.10.4 Employment by Status and Gender

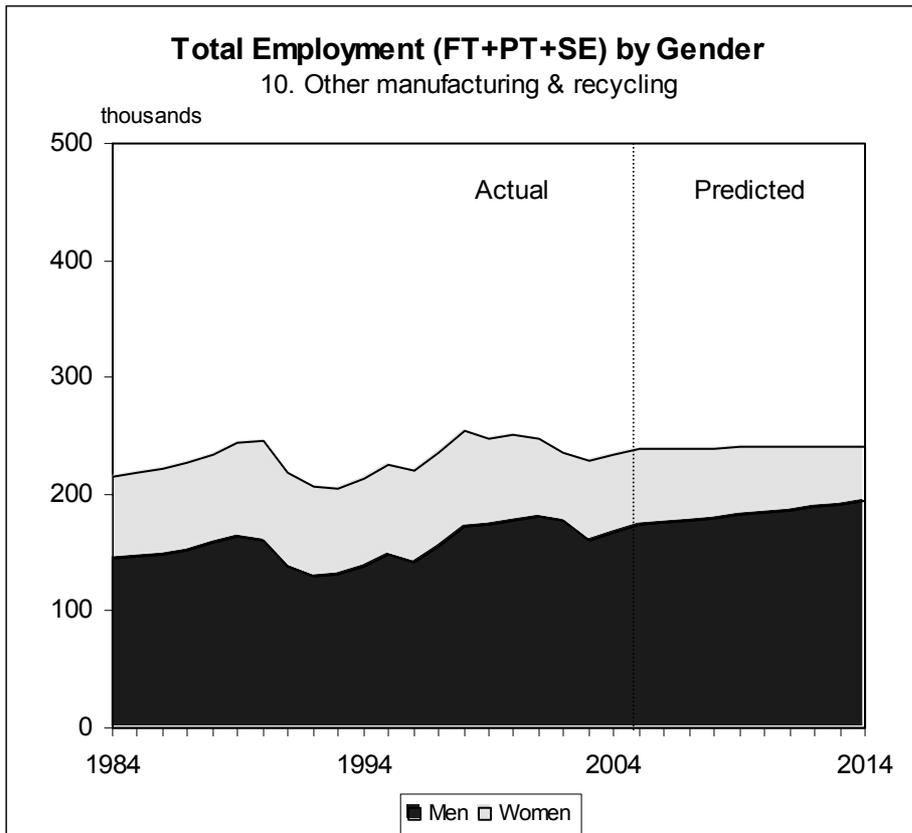
Females account for just over a quarter of jobs in this industry. Part-time employment accounts for around 10 per cent of jobs. Self-employment accounts for a slightly higher share.

Table 6.10.2: Employment Levels by Gender and Status, Other manufacturing & recycling

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			000s
Male employment	136	(58.5)	7	(3)	24	(10.4)	168	(71.9)	12	0	3	15
Female employment	41	(17.5)	18	(7.8)	6	(2.8)	65	(28.1)	-7	-1	0	-8
Total employment	177	(76.1)	25	(10.8)	31	(13.2)	233	(100)	4	-1	4	7
2009									2009-14			
Male employment	148	(61.8)	7	(2.9)	27	(11.4)	183	(76.1)	9	0	3	11
Female employment	34	(14)	17	(7)	7	(2.9)	57	(23.9)	-8	-2	0	-10
Total employment	182	(75.7)	24	(9.9)	34	(14.3)	240	(100)	1	-2	3	2
2014									2004-14			
Male employment	157	(65)	7	(2.8)	30	(12.4)	194	(80.3)	21	0	6	26
Female employment	25	(10.4)	15	(6.4)	7	(2.9)	48	(19.7)	-16	-3	1	-18
Total employment	182	(75.5)	22	(9.2)	37	(15.4)	241	(100)	5	-3	6	8

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

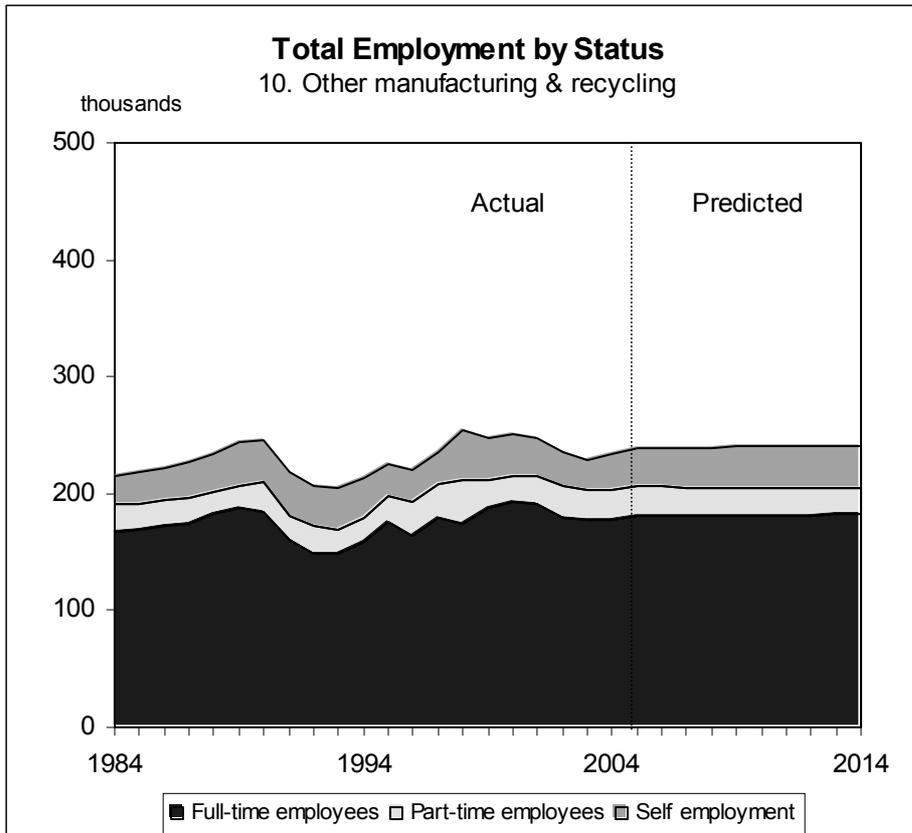
Figure 6.10.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Males are expected to gradually increase their share of a stable employment level. This result is based on an assumption of a continuation of recently observed trends.

Figure 6.10.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Part-time employment is likely to fall slightly as the female job share is projected to decline. Self employment is expected to continue to increase its share of employment slightly, with 15 per cent of the workforce in this status category by 2014.

6.10.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Skilled trades and machine operatives in combination still account for over half the jobs in this industry, with the former being the most important.
- Managers and associate professionals have seen some of the fastest growth and together they accounted for just over 1 in 5 jobs in 2004.

Future changes

- Declines in employment are projected for transport & machine operatives and elementary occupations, but skilled trades are likely to experience some significant growth.
- The white collar groups are projected continue to increase their employment shares.

Shift share analysis

Table 6.10.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

For this group of industries the industry effect has played a less significant role. In the period 1984-94, the industry effect

accounted for the loss of around 1 in 20 jobs and in 1994-2004 it was just -3 per cent. Over the projection period, the industry effect is actually projected to turn positive (+4 per cent).

Over the projection period the occupational effects are similar to those for all industries and services. Strong positive effects are projected for managerial, professional and associate professional occupations, while there are significant negative effects for most manual occupations. However, in contrast to the results for all industries, there are quite strong positive effects for skilled trades. These patterns broadly follow those for the previous decade.

Replacement demands

Table 6.10.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

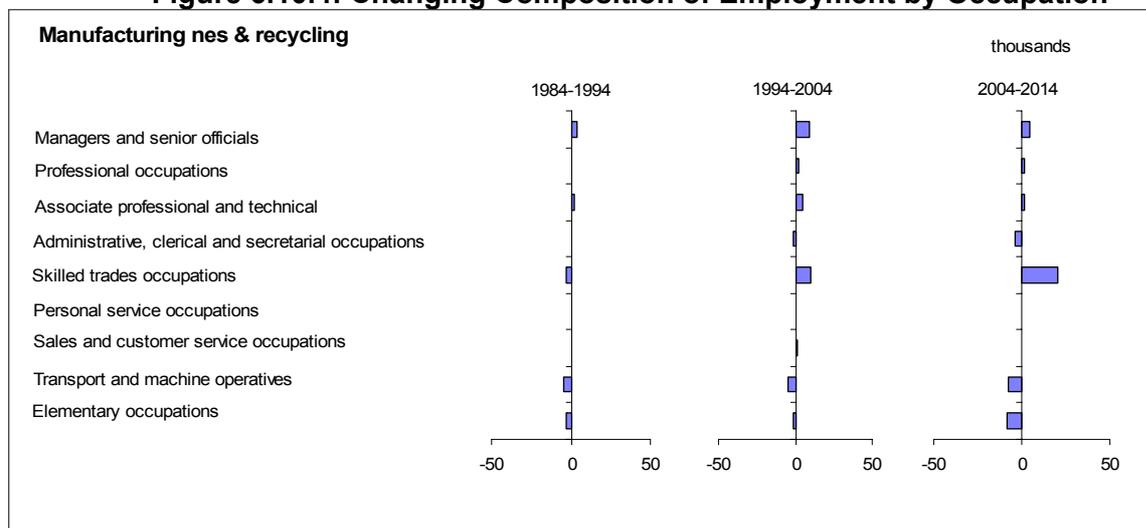
- Overall employment levels in this industry are projected to remain stable, with no dramatic shifts in occupational structure. Replacement demands are much more important than any expansion demand and they are expected to lead to around 80 thousand workers needing to be replaced over the decade.
- Patterns of replacement demand and total requirements therefore mirror the current patterns of employment, with the largest increase being for skilled trades and machine & transport operatives.

Table 6.10.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Manufacturing nes & recycling Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	19	22	32	34	36	4	11	15
2. Professional Occupations	5	6	8	9	9	1	3	4
3. Associate Professional & Technical Occupations	10	13	17	18	19	2	5	7
4. Administrative, Clerical & Secretarial Occupations	20	20	19	17	15	-4	8	4
5. Skilled Trades Occupations	70	67	78	89	98	21	26	46
6. Personal Service Occupations	1	2	2	3	2	0	1	1
7. Sales & Customer Service Occupations	3	4	5	5	5	0	2	2
8. Machine & Transport Operatives	60	55	51	47	43	-7	18	11
9. Elementary Occupations	26	23	22	19	14	-8	7	-1
Total	215	213	233	240	241	8	80	89

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	9	11	14	14	15	13	34	47
2. Professional Occupations	2	3	3	4	4	18	33	51
3. Associate Professional & Technical Occupations	5	6	7	7	8	10	32	42
4. Administrative, Clerical & Secretarial Occupations	9	10	8	7	6	-20	40	20
5. Skilled Trades Occupations	33	32	33	37	41	27	33	60
6. Personal Service Occupations	1	1	1	1	1	-4	38	33
7. Sales & Customer Service Occupations	2	2	2	2	2	-3	34	31
8. Machine & Transport Operatives	28	26	22	20	18	-15	36	21
9. Elementary Occupations	12	11	9	8	6	-37	34	-4
Total	100	100	100	100	100	3	34	38

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.10.4: Changing Composition of Employment by Occupation


Source: CE/IER estimates, MDM95 C31F95 Forecast, 25UK.xls (Figure 6.x.4).

Table 6.10.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	4	1	-1	4	9	3	-1	7	4	1	0	3
2. Professional Occupations	1	0	0	1	2	1	0	2	1	0	0	1
3. Associate Professional & Technical Occupations	2	0	-1	2	4	2	0	3	2	1	0	1
4. Administrative, Clerical & Secretarial Occupations	0	1	-1	0	-1	3	-1	-3	-4	1	0	-5
5. Skilled Trades Occupations	-3	3	-4	-2	10	8	-2	4	21	3	-1	18
6. Personal Service Occupations	0	0	0	0	1	0	0	0	0	0	0	0
7. Sales & Customer Service Occupations	1	0	0	1	1	0	0	1	0	0	0	0
8. Transport & Machine Operatives	-5	3	-3	-4	-5	7	-2	-10	-7	2	0	-9
9. Elementary Occupations	-3	1	-1	-2	-1	3	-1	-3	-8	1	0	-9
Total	-2	9	-11	0	20	26	-6	0	8	10	-2	0

	1984-1994		% change		1994-2004		% change		2004-2014		% change	
	total	scale	total	scale	total	scale	total	scale	total	scale	total	scale
1. Managers & Senior Officials	20.7	4.3	-5.2	21.7	40.4	12.4	-2.9	30.8	13.4	4.3	-0.8	9.9
2. Professional Occupations	13.6	4.3	-5.2	14.6	36.1	12.4	-2.9	26.6	17.9	4.3	-0.8	14.4
3. Associate Professional & Technical Occupations	21.3	4.3	-5.2	22.3	35.0	12.4	-2.9	25.5	10.2	4.3	-0.8	6.7
4. Administrative, Clerical & Secretarial Occupations	1.5	4.3	-5.2	2.5	-6.4	12.4	-2.9	-16.0	-20.4	4.3	-0.8	-23.9
5. Skilled Trades Occupations	-3.7	4.3	-5.2	-2.7	15.2	12.4	-2.9	5.7	26.7	4.3	-0.8	23.2
6. Personal Service Occupations	17.9	4.3	-5.2	18.9	35.1	12.4	-2.9	25.6	-4.3	4.3	-0.8	-7.8
7. Sales & Customer Service Occupations	16.2	4.3	-5.2	17.2	35.4	12.4	-2.9	25.9	-3.3	4.3	-0.8	-6.8
8. Machine & Transport Operatives	-7.7	4.3	-5.2	-6.8	-8.9	12.4	-2.9	-18.4	-14.8	4.3	-0.8	-18.3
9. Elementary Occupations	-10.3	4.3	-5.2	-9.4	-5.2	12.4	-2.9	-14.7	-37.4	4.3	-0.8	-40.9
Total	-0.9	4.3	-5.2	0.0	9.5	12.4	-2.9	0.0	3.5	4.3	-0.8	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.11 CONSTRUCTION

6.11.1 Description of the industry

INDUSTRY 11: CONSTRUCTION		
SIC92 headings: 45		
General construction work including: site preparation and demolition; building of complete constructions or parts thereof and civil engineering (including all types of buildings, bridges, tunnels, pipelines, roads, airfields, sports facilities, water projects etc.); installation and completion (including wiring, insulation, plumbing, plastering, painting and glazing).		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	6.3	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	2,090,000	30,099,000
Share of total employment (% 2004):	6.9	100
Gender split (male:female) (% 2004):	90:10	54:46
Part-time share (% 2004):	4	28
Self-employment share (% 2004):	39	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.11.2 Industry Commentary

Greater consolidation in what is a traditionally a fragmented industry is being driven by a number of key factors. There is the trend towards more Private Finance Initiative (PFI) schemes and greater private sector participation in large infrastructure projects. There is a strong demand arising from regeneration projects, funded by a mix of public and private sector capital. There is an associated growth in brown-field site redevelopment which involves a mix of residential (especially flats) and commercial property requiring greater financial resources and thus larger companies.

Skill-shortages are a persistent problem. The industry has a poor image, and the volatility in the past has made it less attractive to young people as a profession. Large deficits in the skills required are set to become more severe due to an aging workforce. The industry fails to recruit

enough women or ethnic minority workers into its labour force. CITB - ConstructionSkills has invested substantial resources in 2005 to try to address some of these problems. Some of the skill needs are expected to be met by immigrant labour, especially craft operatives from the east European countries that have recently joined the expanded EU.

A sharp increase in government projects, including public buildings and the number of PFI projects in education and health in particular, led to a strong output growth in the early 2000s. This was accompanied by new private commercial work mainly in retail and entertainment, and continued strong demand for housing. However, there were some significant regional variations in construction output. Development in the South East region was often constrained by shortages of suitable land plots with planning permissions.

Future infrastructure expansion plans, in roads, rail and airport capacity, suggest

continued strong growth in the industry through the remainder of the decade. This will be enhanced if British companies are able to gain contracts for the reconstruction projects overseas. Domestically, the major house builders especially will gain from recently announced plans for further extensive developments in the South East, despite the falling off in the rate of growth of house prices forecast for the medium term. There remains an urgent need for more affordable houses, especially in London and the South East. The Barker Review has drawn attention to this problem.

Output is expected to continue to rise into the medium term, but acute skill-shortages may result inhibit growth in employment. Some of the skill needs will continue to be met by immigrant labour. Over the long term increased use of prefabricated components are expected to raise site productivity and this will lead to small falls in employment, given only modest output growth. The industry will continue to require a high proportion of skilled trades.

Alternative Forecasts

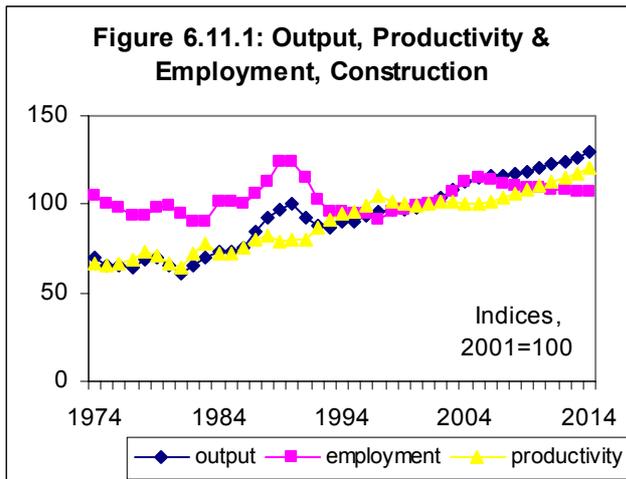
More detailed tailored forecasts are available from ConstructionSkills, which have been agreed with their industry's employers. These forecasts involve input from a panel of industry experts about likely productivity and occupational trends in the different sub-sectors of the industry. They also reflect the pattern of growth in employment in the industry in recent years. They project higher future employment, particularly for skilled trades, and also take into account labour flows between the sector and the rest of the workforce. They are presented in such a way as to allow comparison to be made between demand for skills and actual supply through training on a national and local basis, and are used by ConstructionSkills and its partners in planning training provision. The ConstructionSkills forecasts are available from:

www.citb.co.uk/research

6.11.3 Productivity and Output trends

Table 6.11.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	1.4	3.0	1.1	1.7
Employment (% pa)	0.2	3.1	-0.5	-0.4
(000s)	18	297	-51	-41
Productivity (% pa)	1.2	-0.1	1.6	2.1



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- The construction industry is notoriously cyclical. Recent history has been of fairly steady output and employment growth. Output growth is projected to continue, albeit at somewhat more modest rates of 1- 2 per cent per annum.
- Over the longer term, productivity has improved steadily but most recently has stagnated. This has reflected the use of large numbers of relatively low skilled migrant workers in some parts of the sector. This is not expected to be sustainable over the medium term. A steady increase of just over 2 per cent per annum is projected.
- As a consequence, employment levels are projected to fall slightly to 2014.

6.11.4 Employment by Status and Gender

Construction is one of the most male dominated of all the industries featured here. Females account for barely 1 in 10 of all jobs. Despite efforts by the Inland Revenue to tighten up rules and regulations, self-employment is still very important in the sector, accounting for

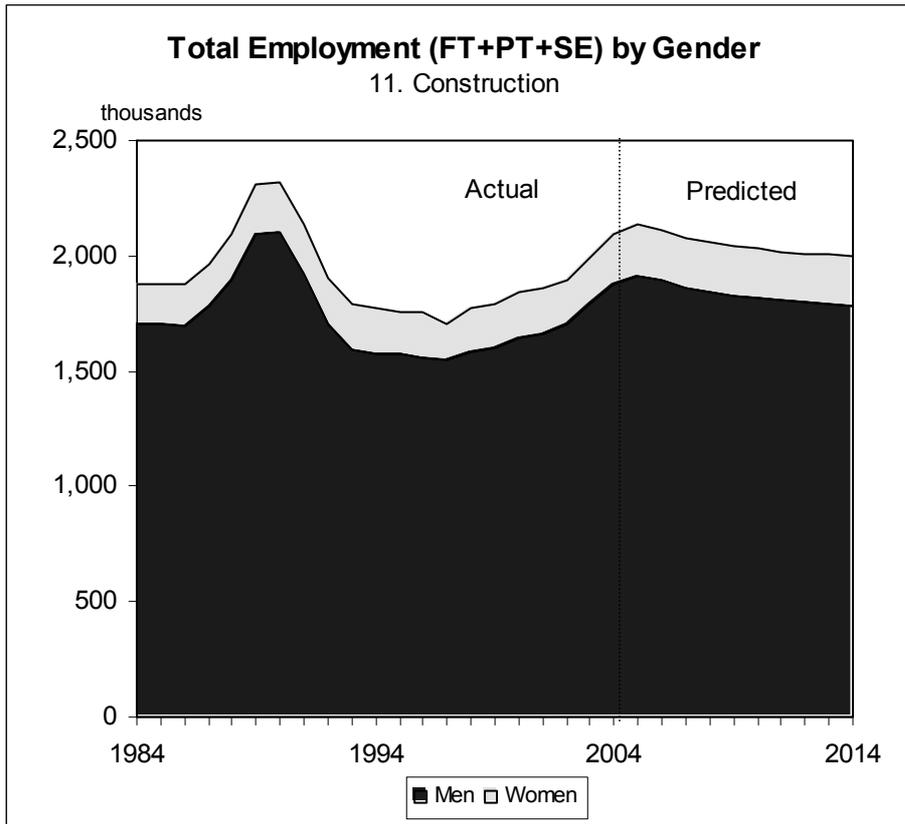
almost 40 per cent of total employment in 2004. This follows a sharp downturn after the tightening up of regulations on self-employment status. Part-time employment is relatively unimportant compared to the patterns of full-time working that are dominant in the industry and this is expected to remain the case.

Table 6.11.2: Employment Levels by Gender and Status, Construction

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004								2004-09				
Male employment	1,053	(50.4)	25	(1.2)	799	(38.2)	1,877	(89.8)	-14	3	-40	-51
Female employment	125	(6)	65	(3.1)	23	(1.1)	213	(10.2)	0	1	-1	1
Total employment	1,178	(56.4)	90	(4.3)	822	(39.3)	2,090	(100)	-14	4	-41	-51
2009								2009-14				
Male employment	1,039	(50.9)	28	(1.4)	759	(37.2)	1,826	(89.5)	-11	3	-35	-42
Female employment	126	(6.2)	66	(3.2)	22	(1.1)	214	(10.5)	1	1	-1	1
Total employment	1,164	(57.1)	94	(4.6)	781	(38.3)	2,039	(100)	-10	4	-35	-41
2014								2004-14				
Male employment	1,028	(51.4)	31	(1.6)	724	(36.2)	1,784	(89.3)	-25	6	-75	-93
Female employment	127	(6.3)	67	(3.4)	21	(1.1)	215	(10.7)	1	2	-2	2
Total employment	1,155	(57.8)	99	(4.9)	745	(37.3)	1,999	(100)	-23	9	-77	-92

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

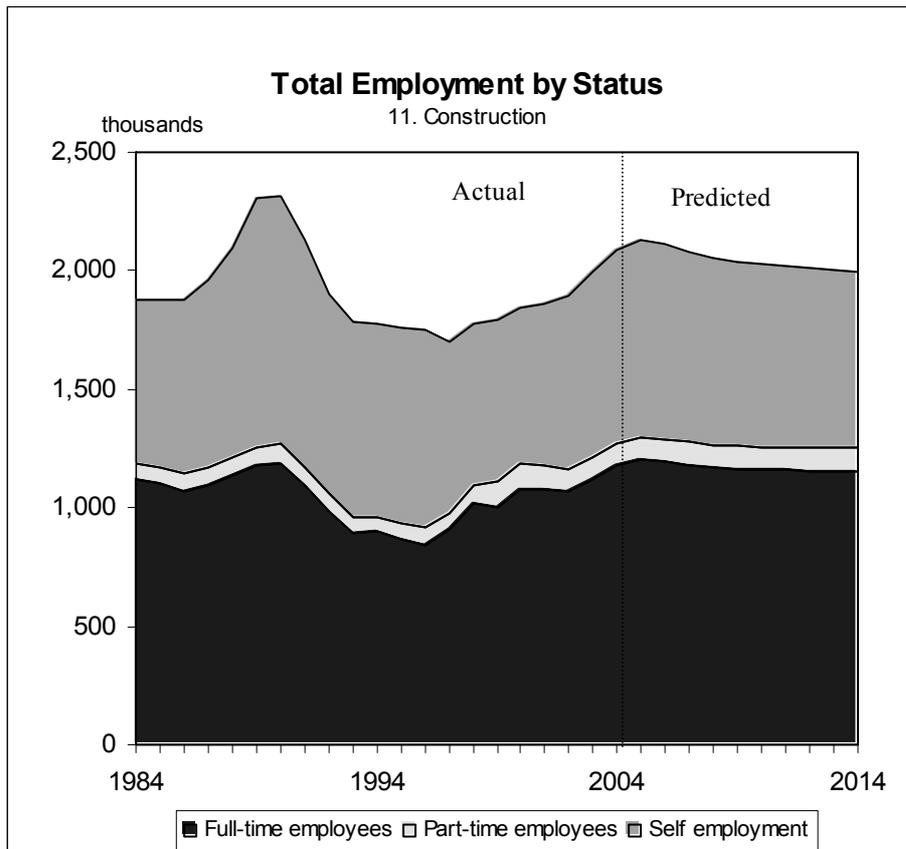
Figure 6.11.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Males are expected to maintain their predominant share of employment in this industry despite attempts by ConstructionSkills to encourage more female entrants into the industry.

Figure 6.11.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Self-employment is likely to remain a very important feature of future employment in the industry. It is expected to stabilise its share of total employment. The share is expected to remain at its current level, as the effects of recent restructuring peter out. It will continue to account for more than 1 in three jobs.

6.11.5 Projections of Employment by Occupation

Key aspects of occupational structure

- In 2004, skilled trades continued to account for just under half of all jobs in the industry.
- The only other occupational groups with job shares of more than 10 per cent are managers & senior officials and transport & machine operatives. The elementary occupations have experienced significant job losses over the last two decades, as demand for unskilled labour has fallen.

Future changes

- Skilled trades are expected to see a slow decline in jobs through to 2014, but this is not expected to have any significant impact on their employment share.
- Job losses are also projected for the elementary occupations, transport & machine operatives and administrative, clerical & secretarial occupations. The job shares of each of these groups are expected to fall slightly.
- These losses are partially offset by small employment increases for managerial, professional and also the associate professional & technical group.

Shift share analysis

Table 6.11.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

During the period 1984-94 the industry effect was negative, accounting for the loss of around 1 in 10 jobs. Over the next decade this had turned into a positive effect as the industry boomed as a result of a combination of demands from both the private and public sectors. A rather less optimistic picture is expected for the next decade, as the combination of slower output growth and significantly faster productivity improvements, is projected to result in the loss of 1 in every 10 jobs.

Over the projection period occupational effects are projected to be positive for most occupations. However there are negative effects for administrative & clerical occupations and more especially elementary occupations.

Replacement demands

Table 6.11.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Whilst these projections indicate a modest decline in employment for the industry, this hides a very substantial need to replace members of the existing workforce who will retire or leave for other reasons over the next decade. This will have significant implications for training of new entrants.
- The occupation requiring the largest number of replacements is skilled trades, where a high percentage of craftsmen are nearing retirement age. Replacement demands for this group are estimated at over 300 thousand, more than offsetting the small decline in the projected expansion demand.
- Significant replacement demands are projected for many other groups. These include managers, administrative, clerical & secretarial occupations, professionals and associate professional & technical occupations, as well as transport & machine operatives and elementary occupations.

Table 6.11.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Construction Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	156	183	272	278	290	18	90	108
2. Professional Occupations	79	82	112	113	117	6	34	40
3. Associate Professional & Technical Occupations	70	80	118	119	121	4	36	40
4. Administrative, Clerical & Secretarial Occupations	151	146	141	131	121	-20	56	36
5. Skilled Trades Occupations	983	880	994	982	975	-19	310	291
6. Personal Service Occupations	7	7	9	10	10	1	3	5
7. Sales & Customer Service Occupations	14	17	26	29	30	4	8	12
8. Machine & Transport Operatives	222	206	234	221	210	-24	76	52
9. Elementary Occupations	197	175	186	157	124	-62	55	-7
Total	1,880	1,776	2,090	2,039	1,999	-92	669	577

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	8	10	13	14	15	7	33	40
2. Professional Occupations	4	5	5	6	6	5	30	36
3. Associate Professional & Technical Occupations	4	5	6	6	6	3	30	34
4. Administrative, Clerical & Secretarial Occupations	8	8	7	6	6	-14	40	26
5. Skilled Trades Occupations	52	50	48	48	49	-2	31	29
6. Personal Service Occupations	0	0	0	0	1	15	38	53
7. Sales & Customer Service Occupations	1	1	1	1	2	15	32	47
8. Machine & Transport Operatives	12	12	11	11	10	-10	33	22
9. Elementary Occupations	11	10	9	8	6	-33	30	-4
Total	100	100	100	100	100	-4	32	28

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.11.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.11.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	27	7	-15	36	89	23	10	56	18	12	-24	30
2. Professional Occupations	3	3	-8	7	30	10	4	15	6	5	-10	11
3. Associate Professional & Technical Occupations	10	3	-7	14	37	10	4	23	4	5	-10	9
4. Administrative, Clerical & Secretarial Occupations	-5	6	-15	3	-5	18	8	-31	-20	6	-12	-14
5. Skilled Trades Occupations	-103	42	-96	-49	115	109	46	-41	-19	43	-86	24
6. Personal Service Occupations	0	0	-1	0	2	1	0	1	1	0	-1	2
7. Sales & Customer Service Occupations	2	1	-1	3	9	2	1	6	4	1	-2	5
8. Machine & Transport Operatives	-17	10	-22	-4	28	26	11	-9	-24	10	-20	-14
9. Elementary Occupations	-22	8	-19	-11	11	22	9	-20	-62	8	-16	-54
Total	-104	80	-184	0	314	221	94	0	-92	90	-182	0

	1984-1994				1994-2004				2004-2014			
				% change				% change				% change
1. Managers & Senior Officials	17.5	4.3	-9.8	23.1	48.4	12.4	5.3	30.7	6.7	4.3	-8.7	11.1
2. Professional Occupations	3.7	4.3	-9.8	9.2	36.5	12.4	5.3	18.8	5.2	4.3	-8.7	9.6
3. Associate Professional & Technical Occupations	14.9	4.3	-9.8	20.5	46.4	12.4	5.3	28.7	3.3	4.3	-8.7	7.7
4. Administrative, Clerical & Secretarial Occupations	-3.2	4.3	-9.8	2.3	-3.8	12.4	5.3	-21.4	-14.1	4.3	-8.7	-9.7
5. Skilled Trades Occupations	-10.5	4.3	-9.8	-5.0	13.0	12.4	5.3	-4.7	-1.9	4.3	-8.7	2.5
6. Personal Service Occupations	0.4	4.3	-9.8	5.9	28.0	12.4	5.3	10.3	14.7	4.3	-8.7	19.1
7. Sales & Customer Service Occupations	17.0	4.3	-9.8	22.5	54.7	12.4	5.3	37.0	15.4	4.3	-8.7	19.8
8. Machine & Transport Operatives	-7.5	4.3	-9.8	-1.9	13.5	12.4	5.3	-4.2	-10.2	4.3	-8.7	-5.8
9. Elementary Occupations	-11.3	4.3	-9.8	-5.7	6.0	12.4	5.3	-11.7	-33.4	4.3	-8.7	-29.0
Total	-5.5	4.3	-9.8	0.0	17.7	12.4	5.3	0.0	-4.4	4.3	-8.7	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.12 SALE & MAINTENANCE OF MOTOR VEHICLES

6.12.1 Description of the industry

INDUSTRY 12: SALE & MAINTENANCE OF MOTOR VEHICLES		
SIC92 headings: 50		
Sale, maintenance and repair of motor vehicles and motorcycles (but excluding renting, classified to Industry 21, Other Business Services); retail sale of automotive fuel.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	2.4	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	641,000	30,099,000
Share of total employment (% 2004):	2.1	100
Gender split (male:female) (% 2004):	77:23	54:46
Part-time share (% 2004):	14	28
Self-employment share (% 2004):	13	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.12.2 Industry Commentary

Distribution is divided into two main sub-sectors: wholesale distribution (dealing with the general sale of products to retailers or professional users) and the motor trade (the sale of motor vehicles and related products). The motor trade has always been a special case, with specific distribution problems partly created by exceptional distribution regulations. This is now changing to some extent, as a consequence of the modest changes to the block exemption from EU competition laws.

In recent years much has occurred to change the nature of the car distribution sector. New competition rules announced by the EU in 2002 are expected to gradually change the relationship between car manufacturers and dealers. Independent service centres will be able to carry out car servicing without being tied to a manufacturer franchise, where prices are tightly controlled. Later in 2005, dealerships will be able to expand into

other EU states. This more competitive market place should lead to a lowering of service costs, but further reduced profit margins for garages and car distributors.

New car registrations of 2.58 million were achieved in the peak sales year of 2003. Thereafter the car industry has recorded a downturn in new car sales of just under 10%. During 2004, new car prices started to rise, after several years of decline. The Society of Motor Manufacturers and Traders has revised its forecasts for new car sales in 2005 and 2006 downwards but by less than 5%. This hit the last British owned major severely leading to the closure of Rover/MG.

There remain a large stock of existing vehicles (30 million plus) that require maintenance and servicing. Many of these cars are relatively old and a significant amount of annual expenditure is needed to keep them on the road. Garages have traditionally earned high profits from after-sales service on motor vehicles. The more sophisticated technology associated with

the newer generations of cars means that the DIY enthusiast is often unable to carry out the repairs and servicing, so garages profit.

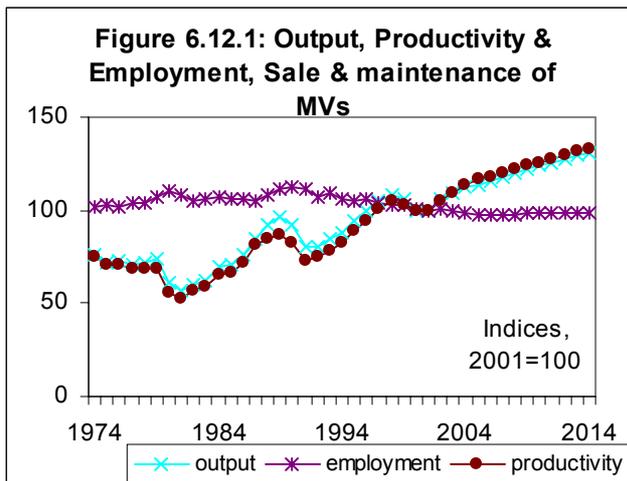
number of petrol retailers has dropped by around one third in the last decade, a trend exacerbated by the increase in petrol retailing by the large supermarket chains.

Petrol sales are extremely competitive, and petrol outlets have had to diversify in order to survive. Despite these efforts, the

6.12.3 Productivity and Output trends

Table 6.12.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.7	1.2	1.7	1.5
Employment (% pa)	-0.7	-0.8	-0.1	0.0
(000s)	-24	-25	-4	1
Productivity (% pa)	4.5	2.0	1.8	1.4



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- After strong growth in the second half of the 1990s, the rate of growth in output levels fell over the past 5 years.
- This is projected to be reversed over the next decade, with some modest acceleration but growth rates are projected to remain modest at 1½ -2 per cent per annum.
- Productivity growth also slowed rapidly in recent years. Some further growth is projected to 2014 as competitive pressures to reduce cost take effect, but this remains below 2 per cent per annum.
- As a consequence, employment levels are expected to remain fairly static, as productivity gains offset the projected growth in output levels.

6.12.4 Employment by Status and Gender

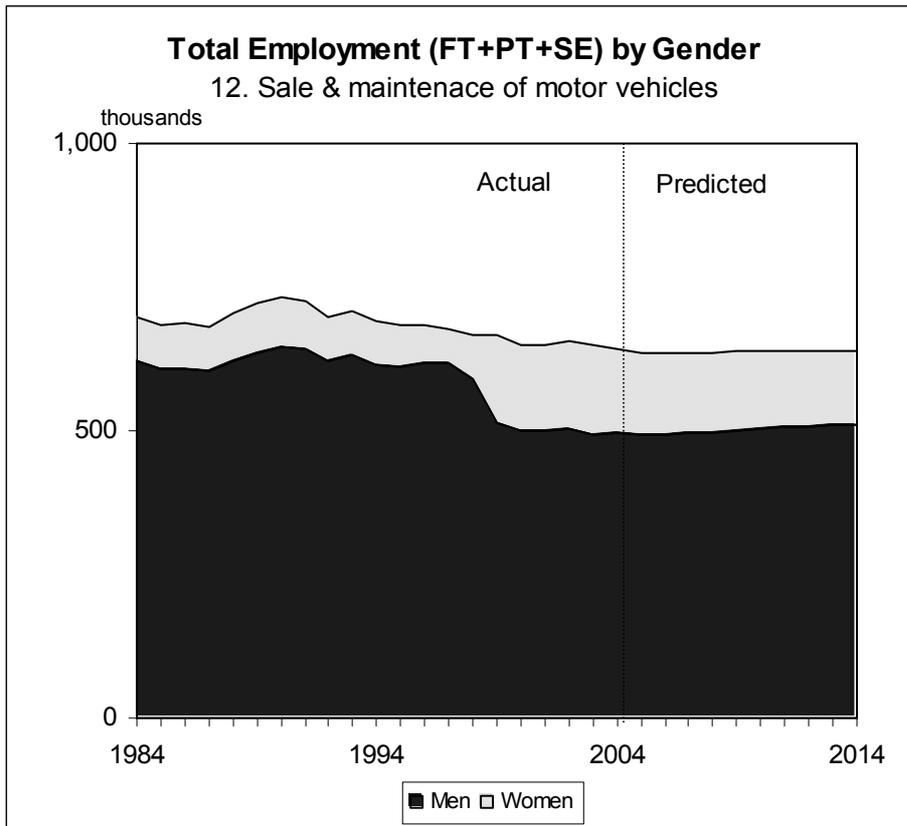
Women currently account for just under a quarter of the jobs in this industry. The historical picture is somewhat hazy, the official statistics presenting a somewhat erratic pattern. Self-employment is important, accounting for around 1 in 8 jobs. Part-time working currently accounts for a somewhat higher share of total employment.

Table 6.12.2: Employment Levels by Gender and Status, Sale & maintenance of Motor Vehicles

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			000s
Male employment	382	(59.5)	42	(6.5)	72	(11.2)	495	(77.2)	9	7	-10	6
Female employment	79	(12.3)	58	(9.1)	9	(1.4)	146	(22.8)	-3	-3	-4	-10
Total employment	461	(71.8)	100	(15.5)	81	(12.6)	641	(100)	6	5	-14	-4
2009									2009-14			
Male employment	390	(61.2)	49	(7.7)	62	(9.7)	501	(78.6)	11	9	-9	10
Female employment	76	(11.9)	55	(8.7)	5	(0.8)	136	(21.4)	-3	-3	-3	-9
Total employment	466	(73.1)	104	(16.3)	67	(10.5)	638	(100)	8	6	-12	1
2014									2004-14			
Male employment	401	(62.8)	58	(9)	53	(8.3)	512	(80.1)	19	16	-19	17
Female employment	74	(11.5)	52	(8.2)	2	(0.3)	127	(19.9)	-5	-6	-8	-19
Total employment	475	(74.3)	110	(17.2)	55	(8.6)	639	(100)	14	10	-26	-2

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

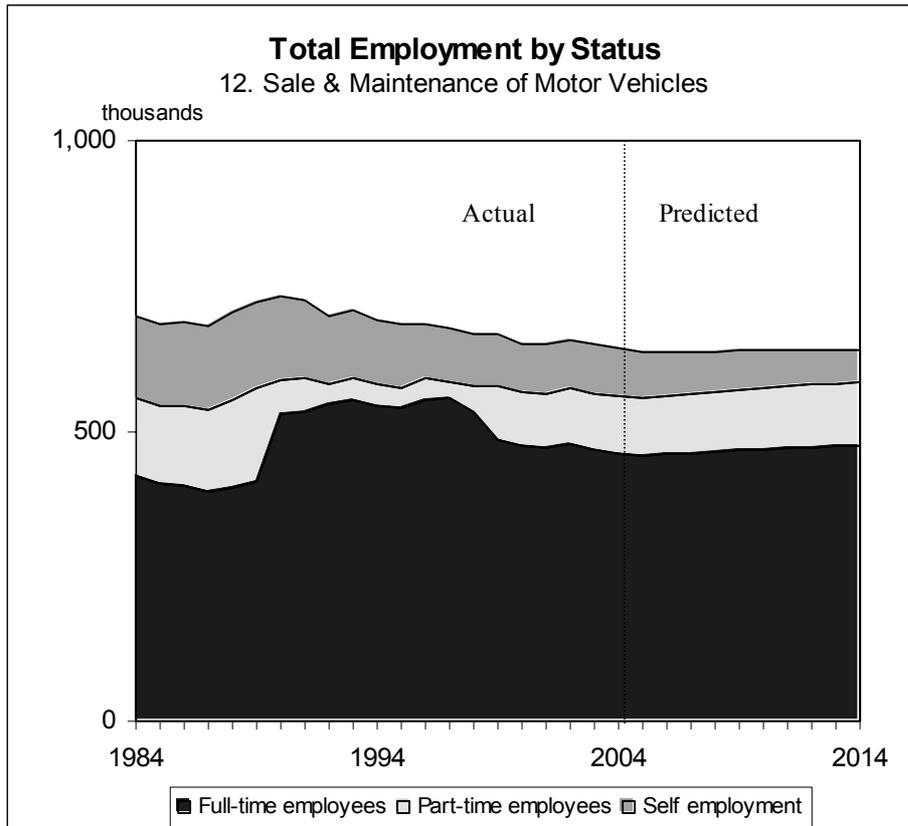
Figure 6.12.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- During the late 1990s females increased their employment share substantially. This trend appears to have now petered out. The projections are for a maintenance of the current balance between male and female jobs.

Figure 6.12.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Over the next decade full-time employment is projected to increase its employment share at the expense of self employment.
- Self-employment shares are expected to continue the recent downward trend.
- Part-time working is projected to maintain a fairly constant level of employment, continuing the pattern evident from the late 1990s

6.12.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Sales and customer service occupations, with a 26 per cent job share, is the main occupation, followed by managers & senior officials with over 20 per cent.
- Skilled trades used to account for almost a fifth of all jobs in this industry, but this has declined sharply over the past two decades.

Future change

- Sales & customer service occupations are expected to have further job increases over the next decade. Small job gains are also projected for operatives and many of the white collar occupations, but these are all of a modest magnitude.
- Modest job losses are projected for skilled trades, and also for administrative, clerical & secretarial occupations and elementary occupations. This reflects the continuing impact of productivity change, especially related to ICT, on such work.

Shift share analysis

Table 6.12.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and

organisational factors on the occupational structure *within* the industry.

The industry effect represented a modest negative factor of -5 per cent in the 1984-94 period but this increased almost 4-fold over the period 1994-2004. Over the projection period, it is projected to be a rather less significant factor, falling again to just under 5 per cent.

Over the projection period skilled trades, administrative & clerical occupations and elementary occupations are projected to experience significant negative occupational effects.

Replacement demands

Table 6.12.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

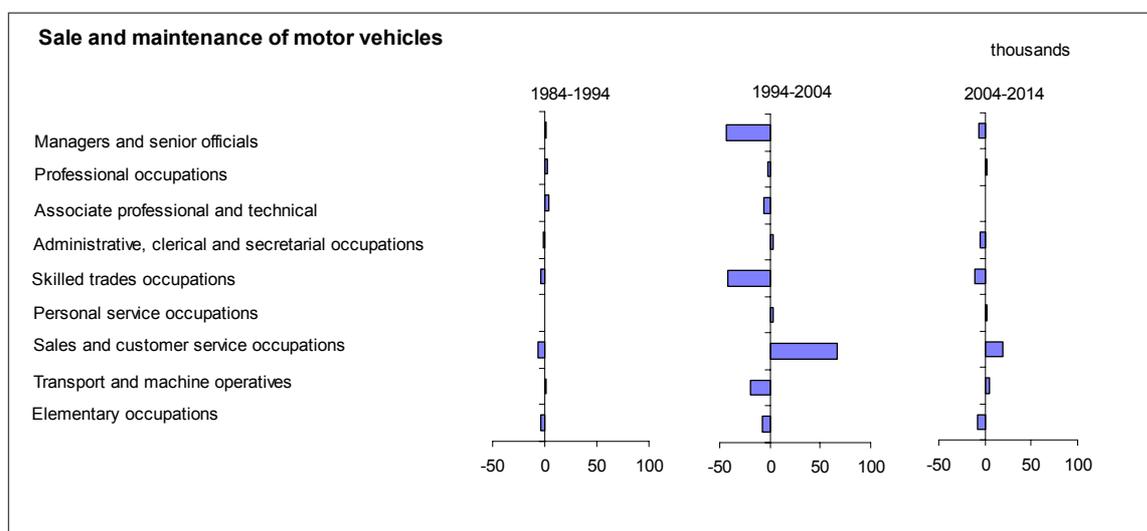
- Although very little change in total employment is projected, there will inevitably be substantial replacement demands to be met in this industry and this amounts to over 200 thousand replacement jobs.
- The largest element is for sales & customer service occupations, closely followed by the managers & senior officials.
- Even those occupations projected to decline in importance (as measured by declining job shares) will have significant needs to replace existing workers. On average, it is expected that just over one third of the current workforce will need to be replaced over the next 10 years.

Table 6.12.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Distribution relating to motors Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	177	179	136	132	130	-6	47	40
2. Professional Occupations	19	21	18	19	20	2	6	8
3. Associate Professional & Technical Occupations	54	58	52	52	53	1	16	17
4. Administrative, Clerical & Secretarial Occupations	33	32	35	32	29	-6	13	7
5. Skilled Trades Occupations	134	130	88	82	77	-11	28	17
6. Personal Service Occupations	19	19	22	23	25	3	9	11
7. Sales & Customer Service Occupations	109	102	169	178	187	19	51	70
8. Machine & Transport Operatives	74	75	55	57	60	5	19	24
9. Elementary Occupations	77	73	66	62	57	-8	21	12
Total	697	690	641	638	639	-2	209	207

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
1. Managers & Senior Officials	25	26	21	21	20	-4	34	30
2. Professional Occupations	3	3	3	3	3	11	33	44
3. Associate Professional & Technical Occupations	8	8	8	8	8	2	31	33
4. Administrative, Clerical & Secretarial Occupations	5	5	5	5	5	-16	37	21
5. Skilled Trades Occupations	19	19	14	13	12	-13	32	19
6. Personal Service Occupations	3	3	3	4	4	12	40	51
7. Sales & Customer Service Occupations	16	15	26	28	29	11	30	42
8. Machine & Transport Operatives	11	11	9	9	9	9	34	43
9. Elementary Occupations	11	11	10	10	9	-12	31	19
Total	100	100	100	100	100	0	33	32

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.12.4: Changing Composition of Employment by Occupation


Source: CE/IER estimates, MDM95 C31F95 Forecast, 25UK.xls (Figure 6.x.4).

Table 6.12.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	2	8	-9	4	-43	22	-35	-30	-6	6	-6	-6
2. Professional Occupations	2	1	-1	2	-3	3	-4	-1	2	1	-1	2
3. Associate Professional & Technical Occupations	3	2	-3	4	-6	7	-11	-2	1	2	-2	1
4. Administrative, Clerical & Secretarial Occupations	-1	1	-2	-1	3	4	-6	5	-6	2	-2	-6
5. Skilled Trades Occupations	-4	6	-7	-3	-42	16	-26	-33	-11	4	-4	-11
6. Personal Service Occupations	0	1	-1	0	3	2	-4	4	3	1	-1	3
7. Sales & Customer Service Occupations	-7	5	-6	-6	66	13	-20	74	19	7	-8	19
8. Machine & Transport Operatives	1	3	-4	2	-20	9	-15	-15	5	2	-3	5
9. Elementary Occupations	-4	3	-4	-3	-8	9	-14	-2	-8	3	-3	-8
Total	-7	30	-36	0	-49	86	-135	0	-2	28	-30	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	1.1	4.3	-5.2	2.0	-24.0	12.4	-19.6	-16.9	-4.5	4.3	-4.7	-4.2
2. Professional Occupations	12.1	4.3	-5.2	13.0	-12.2	12.4	-19.6	-5.1	11.4	4.3	-4.7	11.7
3. Associate Professional & Technical Occupations	6.3	4.3	-5.2	7.3	-10.2	12.4	-19.6	-3.1	1.7	4.3	-4.7	2.1
4. Administrative, Clerical & Secretarial Occupations	-3.3	4.3	-5.2	-2.4	9.4	12.4	-19.6	16.5	-16.4	4.3	-4.7	-16.1
5. Skilled Trades Occupations	-2.9	4.3	-5.2	-2.0	-32.4	12.4	-19.6	-25.3	-12.8	4.3	-4.7	-12.5
6. Personal Service Occupations	1.4	4.3	-5.2	2.3	13.7	12.4	-19.6	20.9	11.5	4.3	-4.7	11.9
7. Sales & Customer Service Occupations	-6.1	4.3	-5.2	-5.1	65.0	12.4	-19.6	72.1	11.1	4.3	-4.7	11.4
8. Machine & Transport Operatives	1.4	4.3	-5.2	2.3	-26.5	12.4	-19.6	-19.3	9.0	4.3	-4.7	9.3
9. Elementary Occupations	-5.0	4.3	-5.2	-4.1	-10.4	12.4	-19.6	-3.2	-12.5	4.3	-4.7	-12.1
Total	-0.9	4.3	-5.2	0.0	-7.2	12.4	-19.6	0.0	-0.3	4.3	-4.7	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.13 WHOLESALE DISTRIBUTION

6.13.1 Description of the industry

INDUSTRY 13: WHOLESALE DISTRIBUTION		
SIC92 heading: 51		
Wholesale and commission trade of new and used goods to retailers, industrial, commercial, institutional or profession users; acting as agents; usual manipulations such as assembling, sorting and grading of goods.		
INDUSTRY PROFILE		
		All Industries
Share of UK Output (% 2004):	5.1	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	1,269,000	30,099,000
Share of total employment: (% 2004)	4.2	100
Gender split (male:female) (% 2004):	70:30	54:46
Part-time share (% 2004):	13	28
Self-employment share (% 2004):	12	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.13.2 Industry commentary

Production techniques and logistics have historically made the division of distribution into wholesale and retail the most efficient means of taking goods from producer to consumer. In recent years, improved production methods reducing the 'lead-time' between orders and production and the general convergence of consumer tastes have made it increasingly possible for companies to manage ever larger distribution networks. Many supermarkets and DIY stores have taken advantage of these trends.

In many areas of distribution this is leading to consolidation as there are large economies of scale to be won. Vertical integration is increasing, and many companies, such as grocery supermarkets, department stores and fashion houses now control both their own distribution networks and the retail outlets. For the most part, it has been the retailers bringing their distribution in-house that has led to a blurring of this division.

Wholesale distribution, like retailing, is strongly influenced by the growth of e-commerce. Modern technology now allows consumers to bypass retailers and to buy direct from the wholesaler or distributor. One prime example of this trend is the rise of Amazon.com in the world of books and media distribution.

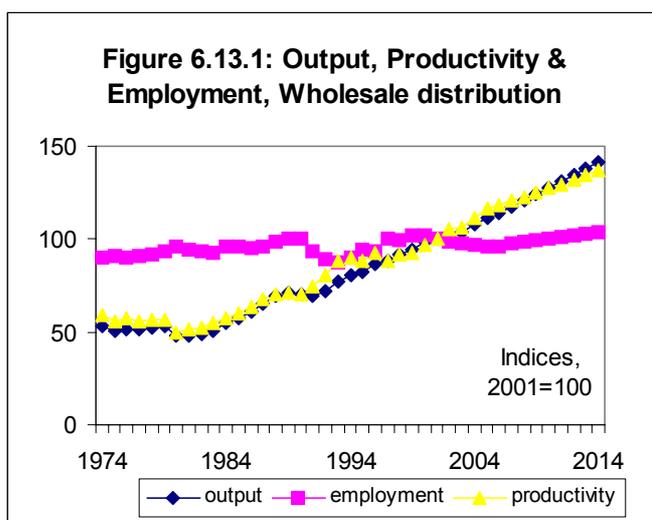
Despite a slowing housing market in 2004, builders' merchants and importers of construction materials increased their sales output. DIY distribution outlets have also continued to expand as the demand for housing improvements remains strong. Such trends have tended to offset job losses elsewhere in the industry as restructuring and adoption of new technologies take effect.

Overall, distribution output experienced modest growth in 2004 and any future growth is likely to be strongly related to national economic growth trends. Recent declines in distribution employment are expected to come to an end and a small amount of growth is projected for the longer term.

6.13.3 Productivity and Output Trends

Table 6.13.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.2	2.7	2.9	2.7
Employment (% pa)	2.5	-1.0	0.5	0.8
(000s)	154	-66	35	53
Productivity (% pa)	0.7	3.7	2.4	1.9



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725Output.xls (Figure 6.X.1)

- Output has grown steadily in recent years and this pattern is expected to continue.
- Growth rates are projected to remain at just under 3 per cent per annum over the period to 2014.
- Productivity has also improved steadily in recent years but the pace of change is expected to slow as the opportunities for further gains become harder to find.
- Employment is likely to increase slightly as a result, contrasting with the job losses incurred in recent years.

6.13.4 Employment by Status and Gender

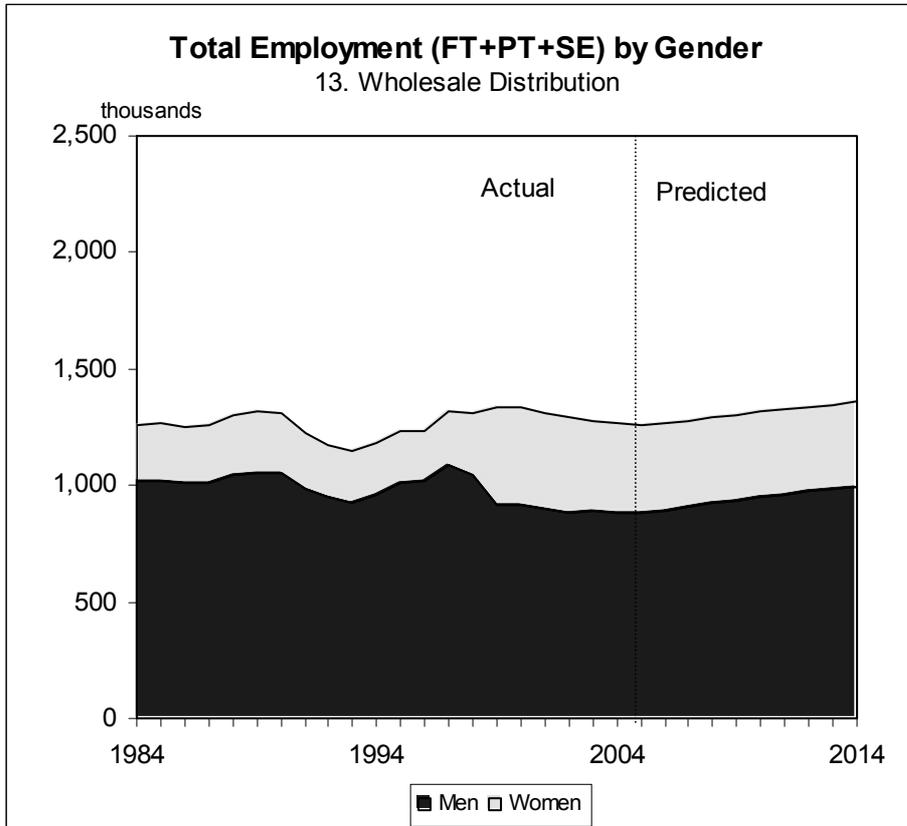
Once again, this is an industry in which men predominate. They account for around 7 out of every 10 jobs. Around $\frac{3}{4}$ of employment is full-time. Part-time employment and self employment each currently account for around 1 in 8 jobs.

Table 6.13.2: Employment Levels by Gender and Status, Wholesale distribution

Employment Status Employment by Gender	Employment Status						Changes in Employment Status			
	FT	PT	SE	Total	FT	PT	SE	Total		
	shares	shares	shares	000s	shares	000s	000s	000s		
2004										
Male employment	708 (55.8)	49 (3.8)	126 (9.9)	883 (69.5)	59	5	-12	51		
Female employment	254 (20)	109 (8.6)	24 (1.9)	387 (30.5)	-7	2	-11	-16		
Total employment	962 (75.8)	157 (12.4)	150 (11.8)	1,269 (100)	52	6	-23	35		
2009										
Male employment	767 (58.8)	53 (4.1)	113 (8.7)	934 (71.6)	70	5	-13	63		
Female employment	248 (19)	110 (8.4)	13 (1)	371 (28.4)	-5	3	-8	-10		
Total employment	1,014 (77.8)	164 (12.5)	126 (9.7)	1,304 (100)	65	9	-21	53		
2014										
Male employment	837 (61.7)	59 (4.3)	101 (7.4)	996 (73.4)	129	10	-25	114		
Female employment	243 (17.9)	114 (8.4)	5 (0.3)	361 (26.6)	-11	5	-19	-25		
Total employment	1,080 (79.6)	172 (12.7)	105 (7.8)	1,358 (100)	118	15	-44	88		

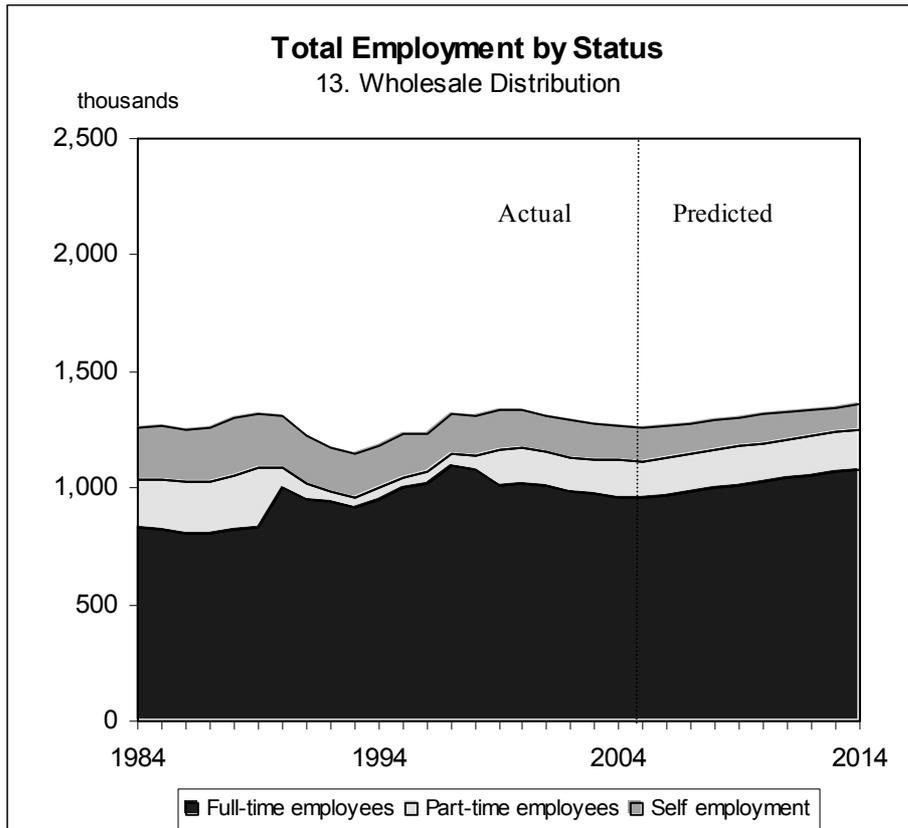
Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

Figure 6.13.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The female share of total employment is projected to decline slightly. This is based on a continuation of recent trends.

Figure 6.13.3: Changing Patterns of Sectoral Employment by Status

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The historical data on part-time employment based on official sources look implausible over the period 1989-1998. There appears to be an off-setting error in other parts of retailing.
- The projections are based on more recent trends. The share of part-timers is projected to remain fairly constant.
- A slight reduction in self employment shares is projected.

6.13.5 Projections of Employment by Occupation

Key Aspects of Occupational Structure

- Sales & customer service occupations are the most important group of workers, with slightly more than a quarter job share. Next come managers & senior officials with just over 20 per cent in 2004.
- Skilled trades occupations was in 2004 the only other large group with more than 10 per cent of all jobs. Elementary occupations were once important, but, as elsewhere, now are in long-term decline.

Future Changes

- Whilst sales & customer service occupations are expected to increase their share of all jobs over the period 2004-2014, the skilled trades group is projected to become less important in the future.
- In most other respects occupational structure is expected to remain relatively stable over the next decade.

Shift share analysis

Table 6.13.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and

organisational factors on the occupational structure *within* the industry.

In Wholesale distribution, the industry effect has represented a significant negative impact on occupational employment levels over the past two decades. In the period 1984-94, the industry effect accounted for the loss of 1 in 10 jobs but was only half this size over the period 1994-2004 (around -5 per cent). Over the projection period, the industry effect is projected to actually be a positive one (just under 3 per cent), reflecting the increasing importance of wholesale distribution in a modern economy.

Over the projection period negative occupational effects are projected for administrative & clerical occupations and skilled trades and elementary occupations.

Replacement demands

Table 6.13.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Replacement demands for this industry are relatively high at over 400 thousand over the next 10 years.
- The sales & customer service occupations generate the highest replacement demand with more than 100 thousand workers, but managers & senior officials are close behind with over 90 thousand replacements.
- There are also substantial replacement needs across all other occupational groups.

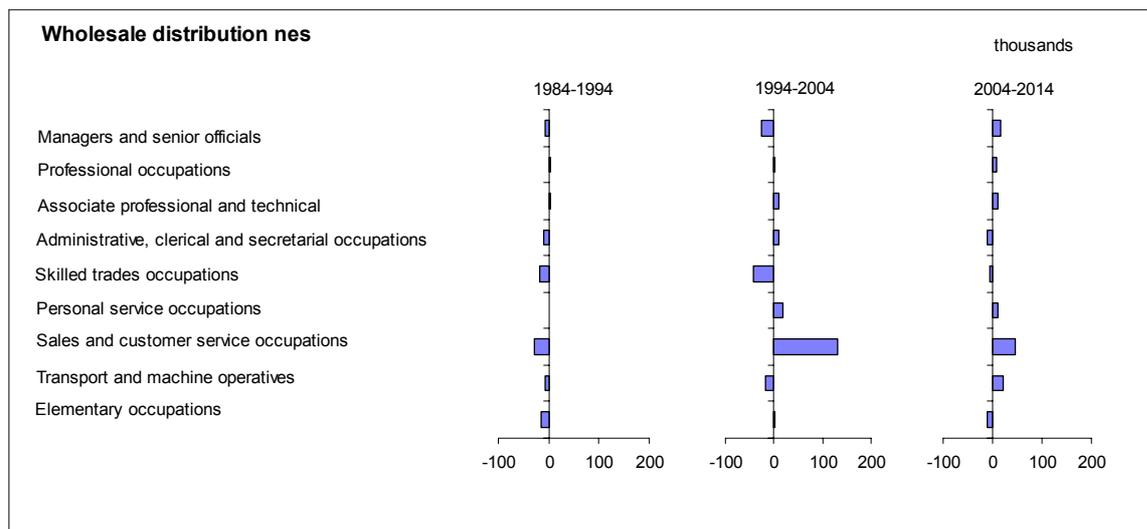
Table 6.13.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Wholesale distribution nes						2004 - 2014		
Employment Levels (000s)	1984	1994	2004	2009	2014	Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	299	292	267	274	284	17	93	110
2. Professional Occupations	32	35	37	40	45	8	12	20
3. Associate Professional & Technical Occupations	95	98	108	112	119	11	35	45
4. Administrative, Clerical & Secretarial Occupations	82	73	84	77	72	-12	33	21
5. Skilled Trades Occupations	224	206	163	161	159	-4	52	48
6. Personal Service Occupations	35	36	54	60	66	12	22	34
7. Sales & Customer Service Occupations	224	196	327	348	373	46	106	152
8. Machine & Transport Operatives	126	119	102	112	124	22	35	57
9. Elementary Occupations	140	125	126	121	116	-10	41	30
Total	1,258	1,181	1,269	1,304	1,358	88	429	517

Percentage Shares						Percentage Changes		
	1984	1994	2004	2009	2014			
1. Managers & Senior Officials	24	25	21	21	21	6	35	41
2. Professional Occupations	3	3	3	3	3	22	34	55
3. Associate Professional & Technical Occupations	8	8	9	9	9	10	32	42
4. Administrative, Clerical & Secretarial Occupations	7	6	7	6	5	-14	39	24
5. Skilled Trades Occupations	18	17	13	12	12	-3	32	29
6. Personal Service Occupations	3	3	4	5	5	22	40	63
7. Sales & Customer Service Occupations	18	17	26	27	27	14	32	46
8. Machine & Transport Operatives	10	10	8	9	9	21	35	56
9. Elementary Occupations	11	11	10	9	9	-8	32	24
Total	100	100	100	100	100	7	34	41

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.13.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

WORKING FUTURES 2004-2014: NATIONAL REPORT

Table 6.13.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	-7	13	-31	11	-24	36	-14	-46	17	12	7	-2
2. Professional Occupations	3	1	-3	5	2	4	-2	-1	8	2	1	5
3. Associate Professional & Technical Occupations	3	4	-10	9	10	12	-5	3	11	5	3	3
4. Administrative, Clerical & Secretarial Occupations	-9	4	-9	-4	11	9	-4	5	-12	4	2	-18
5. Skilled Trades Occupations	-18	10	-23	-4	-43	26	-10	-59	-4	7	4	-16
6. Personal Service Occupations	1	1	-4	3	18	5	-2	15	12	2	1	8
7. Sales & Customer Service Occupations	-28	10	-23	-14	131	24	-10	116	46	14	9	23
8. Machine & Transport Operatives	-7	5	-13	1	-17	15	-6	-26	22	4	3	15
9. Elementary Occupations	-15	6	-15	-6	1	16	-6	-8	-10	5	3	-19
Total	-77	54	-131	0	88	147	-59	0	88	55	34	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	-2.3	4.3	-10.4	3.8	-8.4	12.4	-5.0	-15.9	6.3	4.3	2.7	-0.7
2. Professional Occupations	8.5	4.3	-10.4	14.6	6.0	12.4	-5.0	-1.5	21.7	4.3	2.7	14.7
3. Associate Professional & Technical Occupations	3.0	4.3	-10.4	9.1	10.0	12.4	-5.0	2.6	9.9	4.3	2.7	2.9
4. Administrative, Clerical & Secretarial Occupations	-11.0	4.3	-10.4	-4.8	14.8	12.4	-5.0	7.3	-14.4	4.3	2.7	-21.4
5. Skilled Trades Occupations	-8.0	4.3	-10.4	-1.9	-21.0	12.4	-5.0	-28.4	-2.7	4.3	2.7	-9.6
6. Personal Service Occupations	3.6	4.3	-10.4	9.7	48.8	12.4	-5.0	41.4	22.2	4.3	2.7	15.3
7. Sales & Customer Service Occupations	-12.5	4.3	-10.4	-6.4	66.7	12.4	-5.0	59.2	14.1	4.3	2.7	7.1
8. Machine & Transport Operatives	-5.4	4.3	-10.4	0.7	-14.1	12.4	-5.0	-21.5	21.5	4.3	2.7	14.5
9. Elementary Occupations	-10.7	4.3	-10.4	-4.6	1.0	12.4	-5.0	-6.4	-8.3	4.3	2.7	-15.3
Total	-6.1	4.3	-10.4	0.0	7.5	12.4	-5.0	0.0	7.0	4.3	2.7	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.14 RETAILING

6.14.1 Description of the industry

INDUSTRY 14: RETAILING		
SIC92 heading: 52		
Retail of new and used goods to the general public for personal or household consumption or utilisation, by shops, department stores, stalls, mail-order houses, consumer co-operatives etc.; retail sale by commission agents; repair and installation of personal or household goods.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	6.3	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	medium	average
Total employment (2004):	3,145,000	30,099,000
Share of total employment (% 2004):	10.4	100
Gender split (male:female) (% 2004):	38:62	54:46
Part-time share (% 2004):	54	28
Self-employment share (% 2004):	8	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.14.2 Industry Commentary

Competition based on price has intensified in recent years. Technological innovations and better supply chain management have contributed to this trend. Supermarket chains compete daily on a range of products and seasonal sales have seen greater discounts available. Consumers are increasingly aware of this price competition through advertising and their use of the internet. This enables them to compare prices quickly and directly. Retail capacity continues to increase and there is evidence of excess space. This has led to a number of take-overs in the sector, the most prominent being the acquisition of Safeway by Wm. Morrison. Independent convenience stores are finding it harder to survive as supermarket chains expand in the sector. Clothing retailers have been struggling to maintain sales volumes in the most recent trading period, 2004-5.

Some previous growth areas such as mobile phone retailing have slowed significantly, as consumers need less support now that they are more familiar with the product. Moreover, as wealth grows, consumers are spending a lower and lower proportion of their income on retail goods. As a result, there is intense competition in some areas, such as electrical retailing, and some outlets will undoubtedly close or merge in the near future. Furniture retailers have also been feeling the chill wind of increasing competition, as Ikea has strengthened its market share. Further rationalisation is likely in this retail sector.

The most significant change in the next decade is expected to be the growth of e-commerce. While currently accounting for only a tiny fraction of total sales, in certain segments it is already very important. A good example is budget air travel. Further growth seems likely as broadband becomes more widespread.

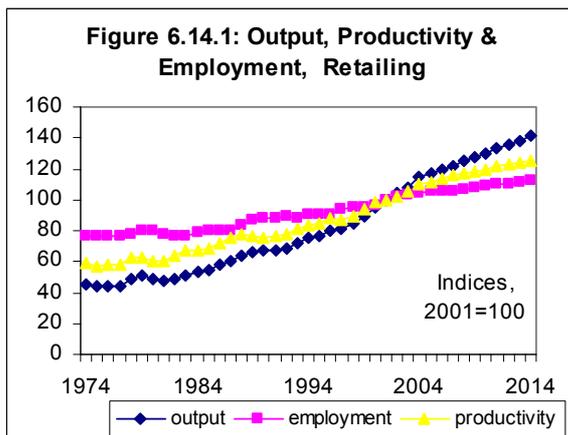
In the long term, although spending via the internet is expected to make up an increasing proportion of retail spending, there is not expected to be a substantial impact on total spending. Retailing output growth is expected to increase in line with

household spending growth over the same period. Employment is expected to continue growing slowly over the same period.

6.14.3 Productivity and Output Trends

Table 6.14.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.4	5.1	2.1	2.1
Employment (% pa)	1.0	1.9	0.7	0.8
(000s)	137	280	117	133
Productivity (% pa)	2.4	3.2	1.4	1.3



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output has been on a rapidly rising trend for the last two decades. Growth has slowed very recently and the prospects for the next decade are expected to continue at a much more moderate rate of around 2 per cent per annum.
- The time profile for productivity is similar, with a marked slow down in growth expected over the next decade as opportunities for continuing efficiency gains become harder to find.
- In response to the rapid increases in output, employment levels have risen steadily for many years. This trend is expected to continue, albeit at a much less rapid rate, with some 280 thousand extra jobs projected over the next decade.

6.14.4 Employment by Status and Gender

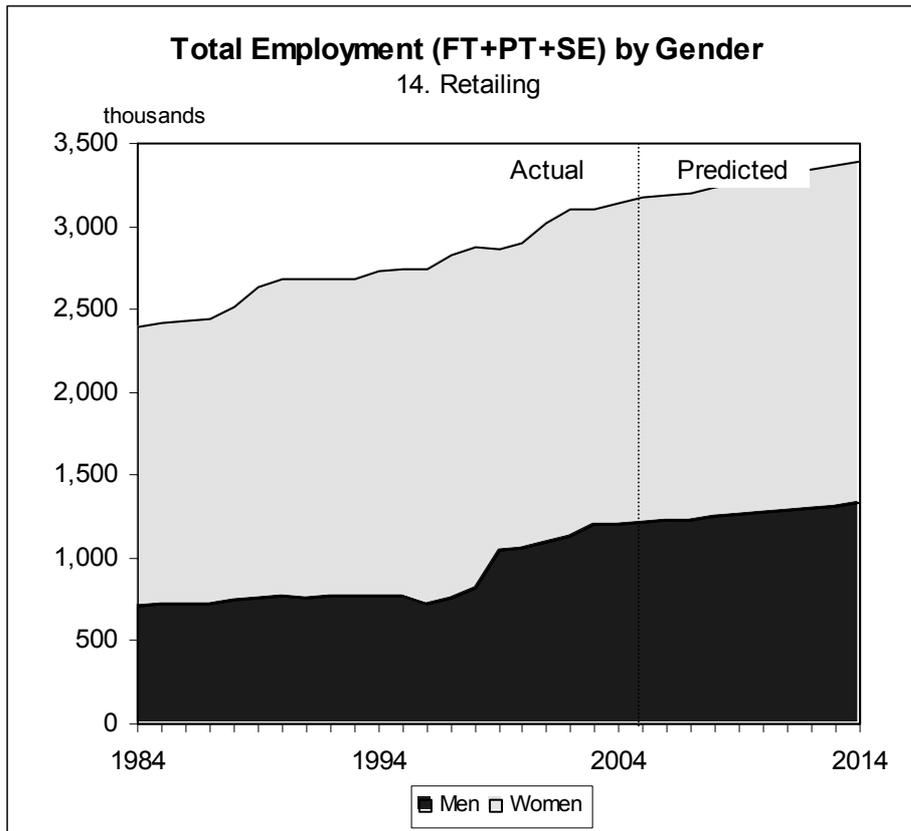
Females account for around 3 out of every 5 jobs in this industry. Part-time employment accounts for over half of all the jobs. Self employment accounts for a relatively small and diminishing share of the total.

Table 6.14.2: Employment Levels by Gender and Status, Retailing

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	shares				
2004									2004-09			
Male employment	618	(19.7)	437	(13.9)	144	(4.6)	1,199	(38.1)	32	59	-29	61
Female employment	572	(18.2)	1,255	(39.9)	118	(3.8)	1,945	(61.9)	5	55	-5	56
Total employment	1,190	(37.8)	1,693	(53.8)	262	(8.3)	3,145	(100)	37	115	-34	117
2009									2009-14			
Male employment	650	(19.9)	496	(15.2)	114	(3.5)	1,261	(38.7)	34	67	-32	69
Female employment	577	(17.7)	1,311	(40.2)	113	(3.5)	2,001	(61.3)	6	64	-5	65
Total employment	1,227	(37.6)	1,807	(55.4)	228	(7)	3,262	(100)	40	130	-37	133
2014									2004-14			
Male employment	684	(20.2)	563	(16.6)	82	(2.4)	1,329	(39.2)	66	126	-62	130
Female employment	583	(17.2)	1,374	(40.5)	108	(3.2)	2,065	(60.8)	11	119	-10	120
Total employment	1,267	(37.3)	1,937	(57.1)	190	(5.6)	3,395	(100)	77	245	-72	250

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

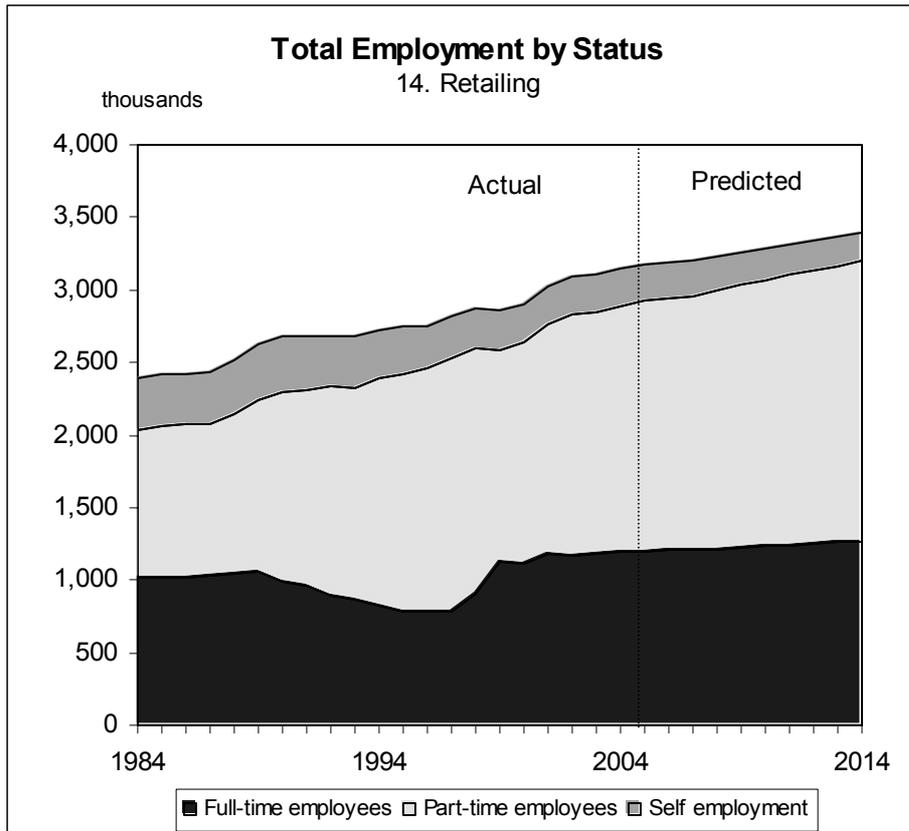
Figure 6.14.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The already relatively large share of employment held by females is projected to be maintained. Little change is expected in this share.

Figure 6.14.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Part-time employment is projected to make small gains in the share of the total, increasing to almost 60 per cent of all employment by 2014.
- Self employment shares are projected to continue their long-term decline.

6.14.5 Projections of Employment by Occupation

Key Aspects of Occupational Structure

- Sales & customer service occupations are easily the most important group, accounting for more than 1 in every 3 jobs in 2004.
- Managers & senior officials, are also a key occupational group, with a 17 per cent job share. Of the remainder, administrative, clerical & secretarial occupations and the elementary occupations are the only two other groups that have a 10 per cent or more share.

Future changes

- Inevitably, sales & customer service occupations are expected to be the main beneficiaries of projected employment growth, although their job share is not expected to increase by much.
- The only occupation that is expected to significantly increase employment share and benefit from above average growth is managers & senior officials. Most other occupations will have more or less constant job shares.
- Both administrative, clerical & secretarial occupations and elementary occupations are projected to experience some modest job losses.

Shift share analysis

Table 6.14.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and

organisational factors on the occupational structure *within* the industry.

In retailing, the industry effect has played a major part in increasing employment for many occupations. In the period 1984-94, the industry effect was a very significant positive factor accounting for a 10 per cent increase in employment across the board. The industry effect moderated in 1994-2004, but is expected to increase again slightly to just under 4 per cent in the projection period.

Over the period to 2014 professional occupations, associate professional occupations and most especially personal service occupations are projected to benefit from strong occupational effects. In contrast, these result in significant job losses for administrative & clerical, skilled trades and elementary occupations.

Replacement demands

Table 6.14.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- The quarter of a million expansion demand projected between 2004 and 2014 is rendered comparatively tiny by replacement demands which are almost five times as large.
- Sales & customer service occupations alone will need over 400 thousand people to replace those leaving the workforce. Managers & senior officials have replacement needs of almost 200 thousand, while administrative, clerical & secretarial occupations and elementary occupations have replacement demands of over 100 thousand.
- Most other occupations are also projected to have very substantial total requirements.

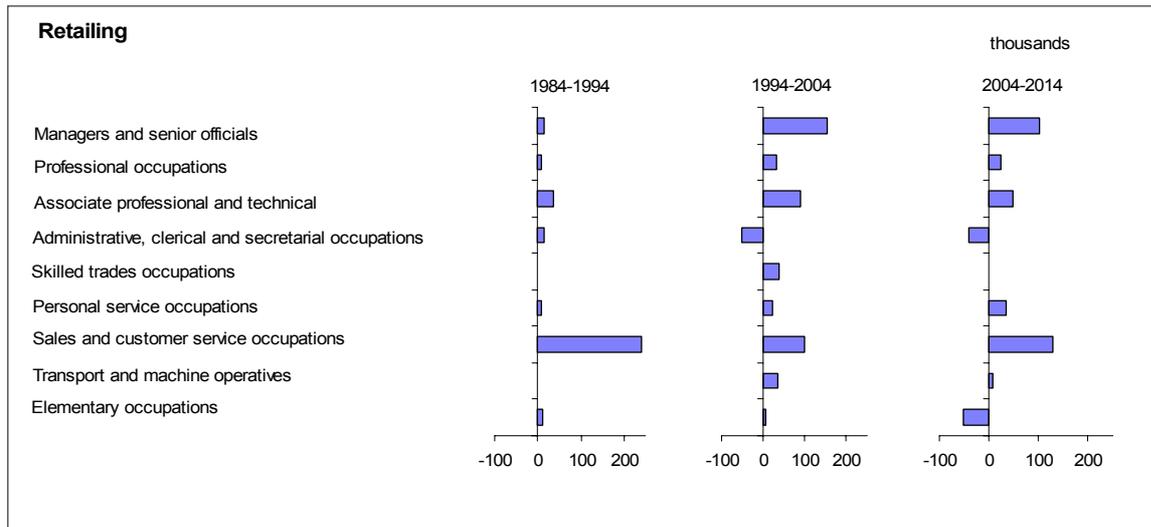
Table 6.14.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Retailing distribution nes Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	360	374	527	574	629	102	197	298
2. Professional Occupations	42	51	82	91	105	23	29	52
3. Associate Professional & Technical Occupations	136	173	261	280	310	49	91	140
4. Administrative, Clerical & Secretarial Occupations	362	375	323	299	282	-41	134	93
5. Skilled Trades Occupations	216	215	252	250	250	-1	85	84
6. Personal Service Occupations	53	63	83	107	119	35	34	69
7. Sales & Customer Service Occupations	793	1,032	1,133	1,197	1,261	128	427	555
8. Machine & Transport Operatives	141	142	176	180	183	7	63	70
9. Elementary Occupations	291	303	308	284	256	-51	116	65
Total	2,395	2,728	3,145	3,262	3,395	250	1,176	1,426

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	15	14	17	18	19	19	37	57
2. Professional Occupations	2	2	3	3	3	28	35	63
3. Associate Professional & Technical Occupations	6	6	8	9	9	19	35	54
4. Administrative, Clerical & Secretarial Occupations	15	14	10	9	8	-13	41	29
5. Skilled Trades Occupations	9	8	8	8	7	0	34	33
6. Personal Service Occupations	2	2	3	3	3	43	41	83
7. Sales & Customer Service Occupations	33	38	36	37	37	11	38	49
8. Machine & Transport Operatives	6	5	6	6	5	4	36	40
9. Elementary Occupations	12	11	10	9	8	-17	38	21
Total	100	100	100	100	100	8	37	45

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.14.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.14.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	14	15	35	-36	153	46	11	96	102	23	19	60
2. Professional Occupations	9	2	4	3	31	6	1	23	23	4	3	16
3. Associate Professional & Technical Occupations	37	6	13	18	88	22	5	62	49	11	10	28
4. Administrative, Clerical & Secretarial Occupations	13	16	35	-37	-52	47	11	-109	-41	14	12	-66
5. Skilled Trades Occupations	-2	9	21	-32	37	27	6	4	-1	11	9	-21
6. Personal Service Occupations	9	2	5	2	21	8	2	11	35	4	3	29
7. Sales & Customer Service Occupations	239	34	76	129	100	128	30	-58	128	49	41	38
8. Machine & Transport Operatives	1	6	14	-19	34	18	4	12	7	8	6	-7
9. Elementary Occupations	12	12	28	-28	5	38	9	-42	-51	13	11	-76
Total	332	103	230	0	417	339	78	0	250	136	115	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	3.9	4.3	9.6	-10.0	41.0	12.4	2.9	25.8	19.3	4.3	3.6	11.3
2. Professional Occupations	20.9	4.3	9.6	7.0	61.2	12.4	2.9	45.9	27.9	4.3	3.6	19.9
3. Associate Professional & Technical Occupations	27.2	4.3	9.6	13.4	50.8	12.4	2.9	35.5	18.6	4.3	3.6	10.7
4. Administrative, Clerical & Secretarial Occupations	3.6	4.3	9.6	-10.3	-13.9	12.4	2.9	-29.2	-12.6	4.3	3.6	-20.6
5. Skilled Trades Occupations	-0.8	4.3	9.6	-14.7	17.2	12.4	2.9	1.9	-0.5	4.3	3.6	-8.4
6. Personal Service Occupations	17.8	4.3	9.6	4.0	32.9	12.4	2.9	17.6	42.6	4.3	3.6	34.7
7. Sales & Customer Service Occupations	30.2	4.3	9.6	16.3	9.7	12.4	2.9	-5.6	11.3	4.3	3.6	3.3
8. Machine & Transport Operatives	0.5	4.3	9.6	-13.4	24.0	12.4	2.9	8.8	4.0	4.3	3.6	-4.0
9. Elementary Occupations	4.1	4.3	9.6	-9.8	1.6	12.4	2.9	-13.7	-16.7	4.3	3.6	-24.7
Total	13.9	4.3	9.6	0.0	15.3	12.4	2.9	0.0	8.0	4.3	3.6	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.15 HOTELS & RESTAURANTS

6.15.1 Description of the industry

INDUSTRY 15: HOTELS & RESTAURANTS		
SIC92 headings: 55		
Hotels: licensed/unlicensed hotels, motels and guest houses, other tourist or short-stay accommodation (incl. camping and caravan sites, holiday camps and conference centres). Catering: licensed and unlicensed eating places, including take-aways; public houses and bars; night clubs, including residential clubs; canteens; contract catering for airlines, corporate hospitality, weddings etc.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	3.8	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	1,962,000	30,099,000
Share of total employment (% 2004):	6.5	100
Gender split (male:female) (% 2004):	45:55	54:46
Part-time share (% 2004):	54	28
Self-employment share (% 2004):	7	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.15.2 Industry Commentary

The sector is vulnerable to fluctuations in the tourism industry, and national and global events in the early 2000s, such as foot-and-mouth and the aftermath of 9/11, had very significant effects on the sector. London in particular was hard hit, especially at the luxury end of the market, although budget hotels continued to do well. In 2004, London hotels staged a strong recovery and hotels elsewhere in the UK enjoyed increased profitability.

The large US hotel chains still dominate the world market and continue to grow through merger and acquisition activity. Few UK and European groups are truly pan-European, although some UK-owned hotel chains are expanding, mostly through acquisitions outside of the UK. Hoteliers are consequently increasingly conscious of the need to pool resources

such as centralised reservation systems, grouped marketing and quality-enhancement initiatives in order to compete effectively with the US companies. These hotels are choosing to expand by means of integrated chains and franchising rather than by direct ownership, in part because of the reduction in banks' involvement in property markets, and the scarcity of land in many of Europe's key cities.

While there is still a strong demand for luxury accommodation, consumers increasingly believe that they are paying for unnecessary products and services when staying at mid-market hotels. Research shows that many tourists prefer to stay in cheap hotels, and so effectively constrain their hotel costs. This preference is transforming the mid-market hotel structure. Many of the three-star hoteliers are increasingly being squeezed out of the

market by the lower cost operators, such as Travel Inns and Premier Lodges.

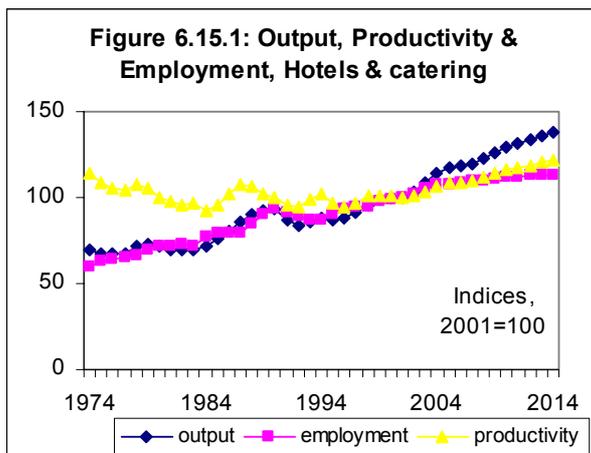
The fast food and café sector continues to experience net growth, and employment in the sector is forecast to grow in the coming years as the industry recovers from a series of damaging events. Higher consumer incomes lead to more spending in the restaurant sector and increasing numbers of people now “eat out” rather

than cook at home. The impact of possible smoking bans on restaurants and any measures that are taken to combat problems caused by binge drinking in public houses are currently uncertain but seem unlikely remain to cause major change in the steady upward path in demand for such services.

6.15.3 Productivity and Output Trends

Table 6.15.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	2.4	2.8	2.1	1.8
Employment (% pa)	2.5	1.9	0.6	0.5
(000s)	205	177	65	48
Productivity (% pa)	-0.1	0.9	1.4	1.3



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Despite the adverse effects on tourist visit to the UK in recent years, output trends have continued to be quite positive.
- This trend is projected to be maintained over the medium term, albeit at rather more modest rates of growth.
- Productivity levels have been flat over much of the 1980s and 1990s but some improvement are anticipated as attempts to cut costs look for savings in personnel in what is a quite labour intensive activity.
- The growth in employment levels is therefore expected to slow somewhat although significant increases are still expected, amounting to around 100 thousand extra jobs by 2014.

6.15.4 Employment by Status and Gender

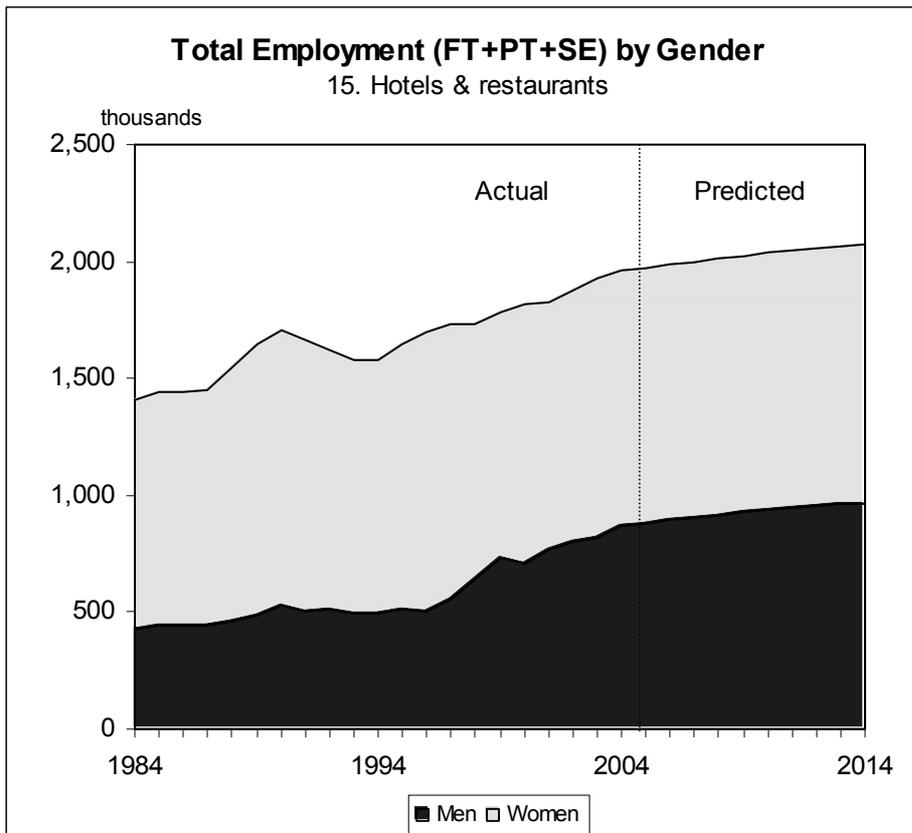
Females currently account for the majority of employment in the industry. Well over half the jobs in the industry are also part-time. Self employment accounts for only a relatively small and declining share of employment (around 7 per cent).

Table 6.15.2: Employment Levels by Gender and Status, Hotels & restaurants

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	% shares	shares	%	shares	%	000s	shares					
2004								2004-09				
Male employment	411	(21)	389	(19.8)	73	(3.7)	873	(44.5)	57	17	-21	53
Female employment	351	(17.9)	676	(34.5)	61	(3.1)	1,089	(55.5)	40	-6	-23	12
Total employment	763	(38.9)	1,065	(54.3)	134	(6.8)	1,962	(100)	97	12	-45	65
2009								2009-14				
Male employment	468	(23.1)	407	(20.1)	51	(2.5)	926	(45.7)	53	13	-23	42
Female employment	392	(19.3)	670	(33.1)	38	(1.9)	1,100	(54.3)	36	-13	-17	6
Total employment	860	(42.4)	1,077	(53.2)	89	(4.4)	2,026	(100)	89	-1	-41	48
2014								2004-14				
Male employment	521	(25.1)	419	(20.2)	28	(1.3)	968	(46.7)	110	30	-45	95
Female employment	428	(20.6)	657	(31.7)	21	(1)	1,106	(53.3)	77	-19	-41	17
Total employment	949	(45.8)	1,077	(51.9)	49	(2.3)	2,074	(100)	186	11	-85	112

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

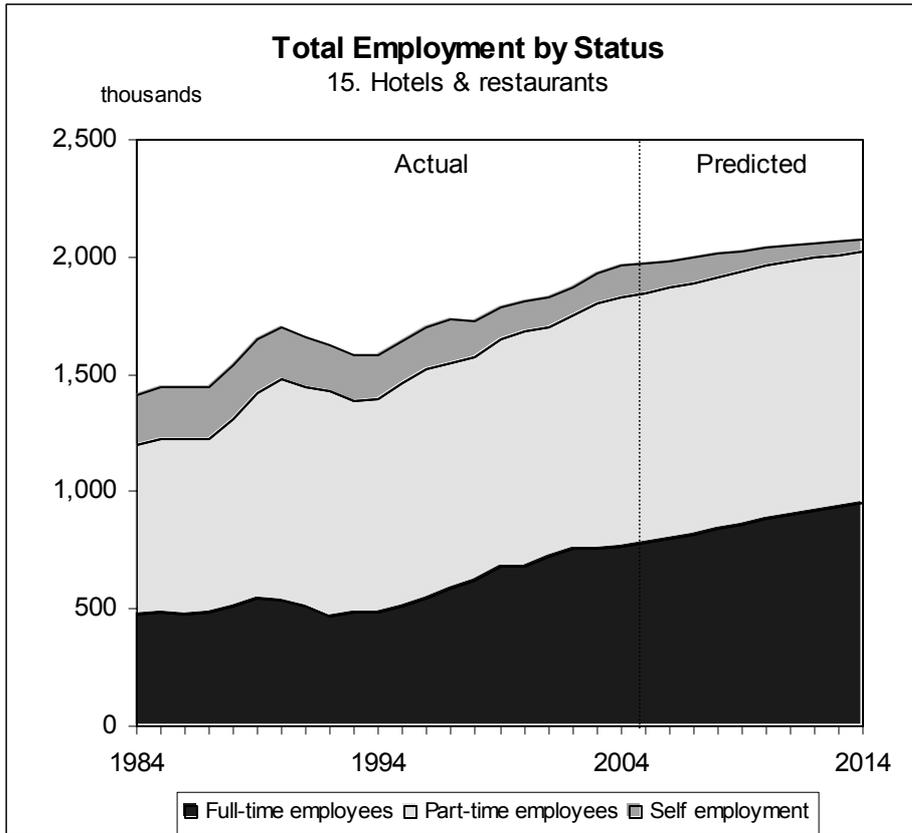
Figure 6.15.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Gender shares of employment are expected to remain fairly stable, with only a slight reduction in the female share.

Figure 6.15.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Self employment shares are projected to level off after a period of long-term decline.
- Full-time employees are expected to increase their employment shares.

6.15.5 Projections of Employment by Occupation

Key Aspects of Occupational Structure

- Two groups dominate employment in this sector, managers & senior officials at one end of the job spectrum and, at the other, elementary occupations. They each account for around 30 per cent of employment.
- Skilled trades are the next most important occupational category and they have only just over 10 percent job share.

Future changes

- These patterns are not considered likely to change much over the net decade. All groups except administrative, clerical & secretarial occupations are expected to have employment increases.
- Previous upward trends in the share of the managers group are projected to cease and level out. The historical pattern of declining shares for elementary occupations is however predicted to continue, but at a slower rate.
- One of the main beneficiaries of restructuring in this industry is the personal service occupations, where strong future growth is projected.

Shift share analysis

Table 6.15.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry

over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

As with many other service industries, the industry effect has played a major part in expanding employment for many occupations in this industry. In the period 1984-94, the industry effect was just under 8 per cent, rising to just under 12 per cent in 1994-2004. Over the projection period, however, the industry effect is projected to fall back to just over 1 per cent.

Over 2004-14, the most significant occupational effect is an almost 50 per cent increase for personal service occupations.

Replacement demands

Table 6.15.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- In addition to new demand-driven employment growth, there will also be very significant, replacement demand needs for all occupations.
- Over the next 10 years it is estimated that around 750 new workers may be needed to replace existing personnel.
- By far the largest increases are in the elementary occupations and the managers & senior officials groups. These present some marked differences and challenges in terms of education and training needs.
- All other occupations will also require significant proportions of the current workforce to be replaced over the next 10 years.

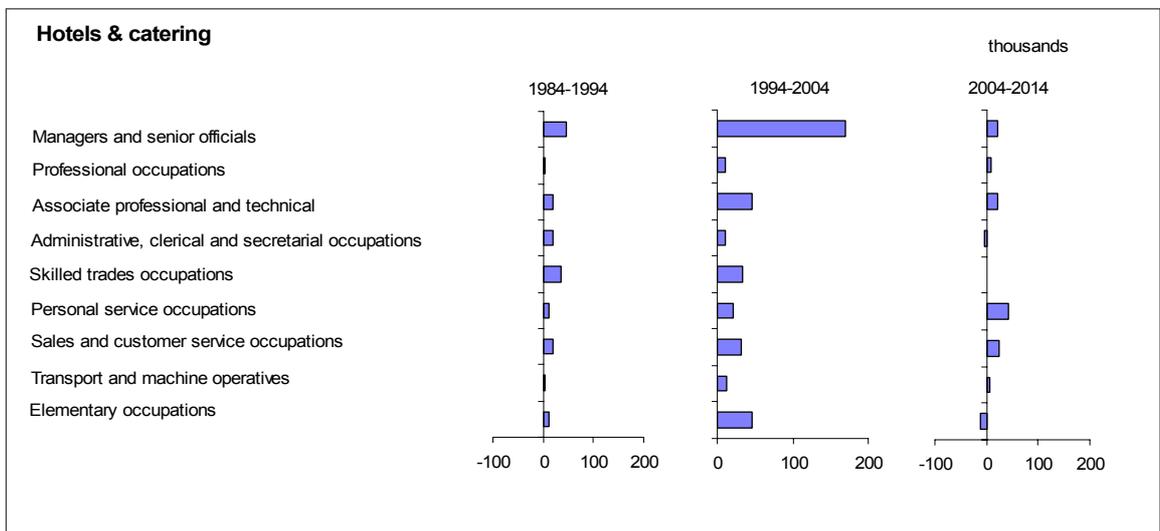
Table 6.15.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Hotels and catering Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	352	399	569	584	592	23	211	234
2. Professional Occupations	11	16	26	29	34	9	10	18
3. Associate Professional & Technical Occupations	37	58	105	116	127	22	35	57
4. Administrative, Clerical & Secretarial Occupations	93	111	123	122	120	-3	50	47
5. Skilled Trades Occupations	142	178	211	213	213	2	80	82
6. Personal Service Occupations	50	60	81	100	122	41	33	75
7. Sales & Customer Service Occupations	52	71	103	116	126	23	38	61
8. Machine & Transport Operatives	22	26	38	42	44	6	14	20
9. Elementary Occupations	650	660	707	703	696	-11	286	275
Total	1,408	1,579	1,962	2,026	2,074	112	755	868

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	25	25	29	29	29	4	37	41
2. Professional Occupations	1	1	1	1	2	34	38	72
3. Associate Professional & Technical Occupations	3	4	5	6	6	21	33	55
4. Administrative, Clerical & Secretarial Occupations	7	7	6	6	6	-2	40	38
5. Skilled Trades Occupations	10	11	11	11	10	1	38	39
6. Personal Service Occupations	4	4	4	5	6	51	41	92
7. Sales & Customer Service Occupations	4	5	5	6	6	22	36	59
8. Machine & Transport Operatives	2	2	2	2	2	16	36	52
9. Elementary Occupations	46	42	36	35	34	-2	40	39
Total	100	100	100	100	100	6	39	44

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.15.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.15.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	47	15	28	4	170	50	47	74	23	25	8	-10
2. Professional Occupations	5	0	1	3	10	2	2	6	9	1	0	7
3. Associate Professional & Technical Occupations	21	2	3	16	47	7	7	33	22	5	1	16
4. Administrative, Clerical & Secretarial Occupations	19	4	7	7	11	14	13	-16	-3	5	2	-10
5. Skilled Trades Occupations	37	6	11	19	33	22	21	-10	2	9	3	-10
6. Personal Service Occupations	10	2	4	4	21	7	7	6	41	3	1	37
7. Sales & Customer Service Occupations	19	2	4	13	32	9	8	15	23	4	1	17
8. Machine & Transport Operatives	3	1	2	1	12	3	3	6	6	2	1	4
9. Elementary Occupations	11	28	51	-68	46	82	78	-114	-11	31	10	-51
Total	171	60	111	0	382	196	186	0	112	85	27	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	13.4	4.3	7.9	1.2	42.7	12.4	11.8	18.5	4.0	4.3	1.4	-1.7
2. Professional Occupations	40.4	4.3	7.9	28.3	61.8	12.4	11.8	37.6	34.0	4.3	1.4	28.3
3. Associate Professional & Technical Occupations	54.8	4.3	7.9	42.6	80.7	12.4	11.8	56.5	21.3	4.3	1.4	15.6
4. Administrative, Clerical & Secretarial Occupations	20.1	4.3	7.9	7.9	10.0	12.4	11.8	-14.2	-2.5	4.3	1.4	-8.2
5. Skilled Trades Occupations	25.7	4.3	7.9	13.6	18.5	12.4	11.8	-5.7	1.0	4.3	1.4	-4.7
6. Personal Service Occupations	21.1	4.3	7.9	8.9	34.6	12.4	11.8	10.4	51.2	4.3	1.4	45.5
7. Sales & Customer Service Occupations	37.7	4.3	7.9	25.6	45.1	12.4	11.8	20.9	22.2	4.3	1.4	16.5
8. Machine & Transport Operatives	15.0	4.3	7.9	2.8	48.0	12.4	11.8	23.8	16.2	4.3	1.4	10.5
9. Elementary Occupations	1.6	4.3	7.9	-10.5	7.0	12.4	11.8	-17.2	-1.5	4.3	1.4	-7.3
Total	12.1	4.3	7.9	0.0	24.2	12.4	11.8	0.0	5.7	4.3	1.4	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.15 HOTELS & RESTAURANTS

6.15.1 Description of the industry

INDUSTRY 15: HOTELS & RESTAURANTS		
SIC92 headings: 55		
Hotels: licensed/unlicensed hotels, motels and guest houses, other tourist or short-stay accommodation (incl. camping and caravan sites, holiday camps and conference centres). Catering: licensed and unlicensed eating places, including take-aways; public houses and bars; night clubs, including residential clubs; canteens; contract catering for airlines, corporate hospitality, weddings etc.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	3.8	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	1,962,000	30,099,000
Share of total employment (% 2004):	6.5	100
Gender split (male:female) (% 2004):	45:55	54:46
Part-time share (% 2004):	54	28
Self-employment share (% 2004):	7	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.15.2 Industry Commentary

The sector is vulnerable to fluctuations in the tourism industry, and national and global events in the early 2000s, such as foot-and-mouth and the aftermath of 9/11, had very significant effects on the sector. London in particular was hard hit, especially at the luxury end of the market, although budget hotels continued to do well. In 2004, London hotels staged a strong recovery and hotels elsewhere in the UK enjoyed increased profitability.

The large US hotel chains still dominate the world market and continue to grow through merger and acquisition activity. Few UK and European groups are truly pan-European, although some UK-owned hotel chains are expanding, mostly through acquisitions outside of the UK. Hoteliers are consequently increasingly conscious of the need to pool resources

such as centralised reservation systems, grouped marketing and quality-enhancement initiatives in order to compete effectively with the US companies. These hotels are choosing to expand by means of integrated chains and franchising rather than by direct ownership, in part because of the reduction in banks' involvement in property markets, and the scarcity of land in many of Europe's key cities.

While there is still a strong demand for luxury accommodation, consumers increasingly believe that they are paying for unnecessary products and services when staying at mid-market hotels. Research shows that many tourists prefer to stay in cheap hotels, and so effectively constrain their hotel costs. This preference is transforming the mid-market hotel structure. Many of the three-star hoteliers are increasingly being squeezed out of the

market by the lower cost operators, such as Travel Inns and Premier Lodges.

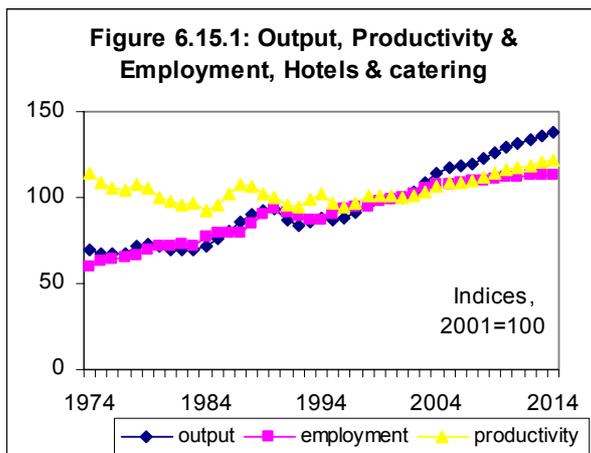
The fast food and café sector continues to experience net growth, and employment in the sector is forecast to grow in the coming years as the industry recovers from a series of damaging events. Higher consumer incomes lead to more spending in the restaurant sector and increasing numbers of people now “eat out” rather

than cook at home. The impact of possible smoking bans on restaurants and any measures that are taken to combat problems caused by binge drinking in public houses are currently uncertain but seem unlikely remain to cause major change in the steady upward path in demand for such services.

6.15.3 Productivity and Output Trends

Table 6.15.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	2.4	2.8	2.1	1.8
Employment (% pa)	2.5	1.9	0.6	0.5
(000s)	205	177	65	48
Productivity (% pa)	-0.1	0.9	1.4	1.3



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Despite the adverse effects on tourist visit to the UK in recent years, output trends have continued to be quite positive.
- This trend is projected to be maintained over the medium term, albeit at rather more modest rates of growth.
- Productivity levels have been flat over much of the 1980s and 1990s but some improvement are anticipated as attempts to cut costs look for savings in personnel in what is a quite labour intensive activity.
- The growth in employment levels is therefore expected to slow somewhat although significant increases are still expected, amounting to around 100 thousand extra jobs by 2014.

6.15.4 Employment by Status and Gender

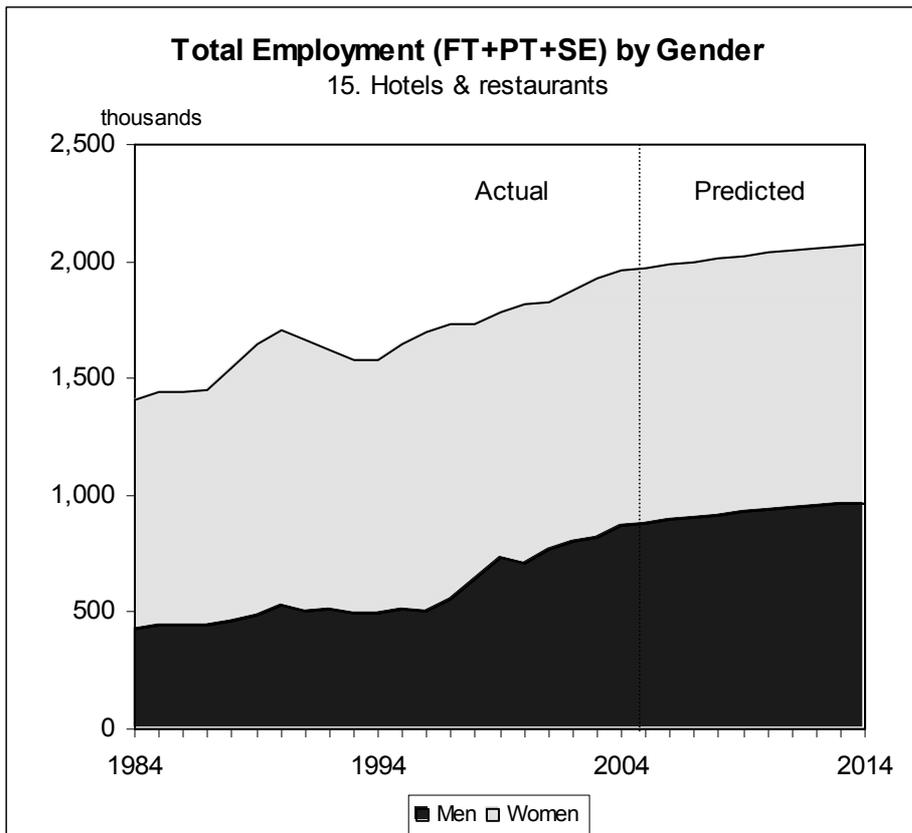
Females currently account for the majority of employment in the industry. Well over half the jobs in the industry are also part-time. Self employment accounts for only a relatively small and declining share of employment (around 7 per cent).

Table 6.15.2: Employment Levels by Gender and Status, Hotels & restaurants

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	% shares	shares	%	shares	%	000s	shares					
2004								2004-09				
Male employment	411	(21)	389	(19.8)	73	(3.7)	873	(44.5)	57	17	-21	53
Female employment	351	(17.9)	676	(34.5)	61	(3.1)	1,089	(55.5)	40	-6	-23	12
Total employment	763	(38.9)	1,065	(54.3)	134	(6.8)	1,962	(100)	97	12	-45	65
2009								2009-14				
Male employment	468	(23.1)	407	(20.1)	51	(2.5)	926	(45.7)	53	13	-23	42
Female employment	392	(19.3)	670	(33.1)	38	(1.9)	1,100	(54.3)	36	-13	-17	6
Total employment	860	(42.4)	1,077	(53.2)	89	(4.4)	2,026	(100)	89	-1	-41	48
2014								2004-14				
Male employment	521	(25.1)	419	(20.2)	28	(1.3)	968	(46.7)	110	30	-45	95
Female employment	428	(20.6)	657	(31.7)	21	(1)	1,106	(53.3)	77	-19	-41	17
Total employment	949	(45.8)	1,077	(51.9)	49	(2.3)	2,074	(100)	186	11	-85	112

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

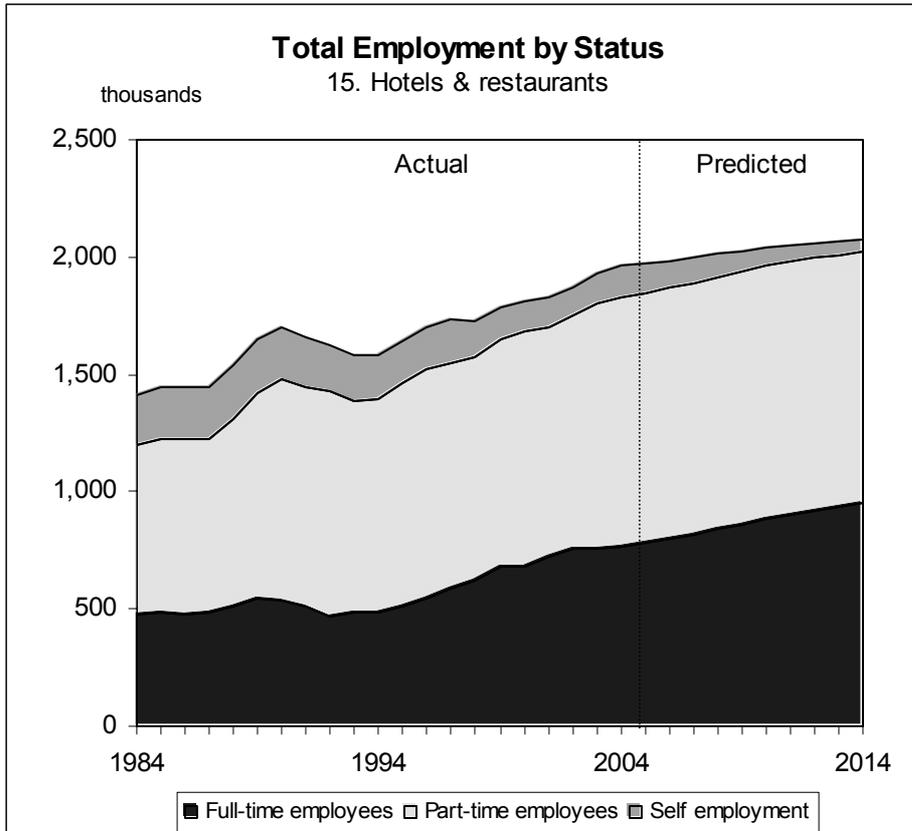
Figure 6.15.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Gender shares of employment are expected to remain fairly stable, with only a slight reduction in the female share.

Figure 6.15.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Self employment shares are projected to level off after a period of long-term decline.
- Full-time employees are expected to increase their employment shares.

6.15.5 Projections of Employment by Occupation

Key Aspects of Occupational Structure

- Two groups dominate employment in this sector, managers & senior officials at one end of the job spectrum and, at the other, elementary occupations. They each account for around 30 per cent of employment.
- Skilled trades are the next most important occupational category and they have only just over 10 percent job share.

Future changes

- These patterns are not considered likely to change much over the net decade. All groups except administrative, clerical & secretarial occupations are expected to have employment increases.
- Previous upward trends in the share of the managers group are projected to cease and level out. The historical pattern of declining shares for elementary occupations is however predicted to continue, but at a slower rate.
- One of the main beneficiaries of restructuring in this industry is the personal service occupations, where strong future growth is projected.

Shift share analysis

Table 6.15.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry

over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

As with many other service industries, the industry effect has played a major part in expanding employment for many occupations in this industry. In the period 1984-94, the industry effect was just under 8 per cent, rising to just under 12 per cent in 1994-2004. Over the projection period, however, the industry effect is projected to fall back to just over 1 per cent.

Over 2004-14, the most significant occupational effect is an almost 50 per cent increase for personal service occupations.

Replacement demands

Table 6.15.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- In addition to new demand-driven employment growth, there will also be very significant, replacement demand needs for all occupations.
- Over the next 10 years it is estimated that around 750 new workers may be needed to replace existing personnel.
- By far the largest increases are in the elementary occupations and the managers & senior officials groups. These present some marked differences and challenges in terms of education and training needs.
- All other occupations will also require significant proportions of the current workforce to be replaced over the next 10 years.

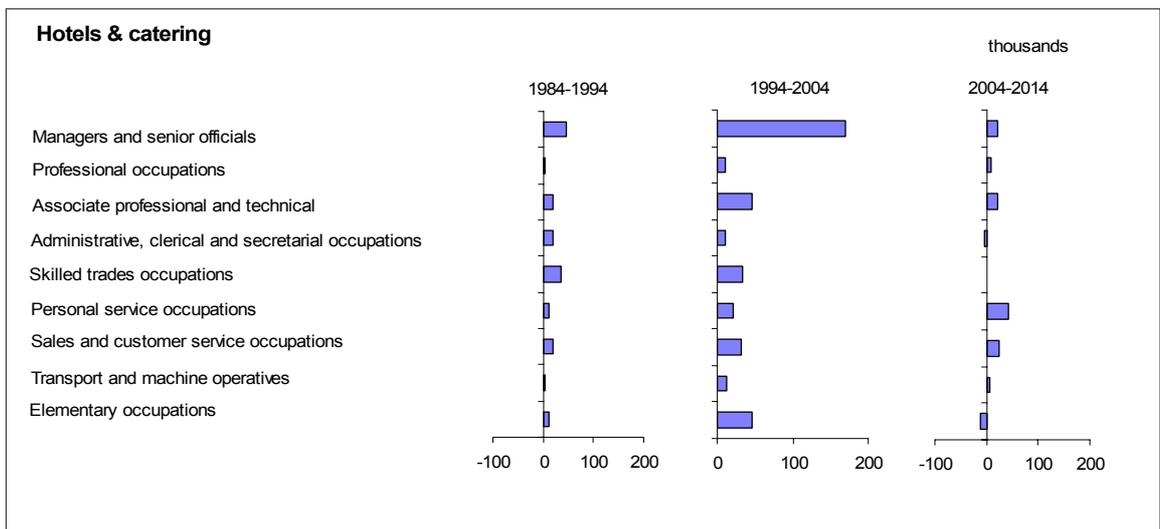
Table 6.15.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Hotels and catering Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	352	399	569	584	592	23	211	234
2. Professional Occupations	11	16	26	29	34	9	10	18
3. Associate Professional & Technical Occupations	37	58	105	116	127	22	35	57
4. Administrative, Clerical & Secretarial Occupations	93	111	123	122	120	-3	50	47
5. Skilled Trades Occupations	142	178	211	213	213	2	80	82
6. Personal Service Occupations	50	60	81	100	122	41	33	75
7. Sales & Customer Service Occupations	52	71	103	116	126	23	38	61
8. Machine & Transport Operatives	22	26	38	42	44	6	14	20
9. Elementary Occupations	650	660	707	703	696	-11	286	275
Total	1,408	1,579	1,962	2,026	2,074	112	755	868

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	25	25	29	29	29	4	37	41
2. Professional Occupations	1	1	1	1	2	34	38	72
3. Associate Professional & Technical Occupations	3	4	5	6	6	21	33	55
4. Administrative, Clerical & Secretarial Occupations	7	7	6	6	6	-2	40	38
5. Skilled Trades Occupations	10	11	11	11	10	1	38	39
6. Personal Service Occupations	4	4	4	5	6	51	41	92
7. Sales & Customer Service Occupations	4	5	5	6	6	22	36	59
8. Machine & Transport Operatives	2	2	2	2	2	16	36	52
9. Elementary Occupations	46	42	36	35	34	-2	40	39
Total	100	100	100	100	100	6	39	44

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.15.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.15.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	47	15	28	4	170	50	47	74	23	25	8	-10
2. Professional Occupations	5	0	1	3	10	2	2	6	9	1	0	7
3. Associate Professional & Technical Occupations	21	2	3	16	47	7	7	33	22	5	1	16
4. Administrative, Clerical & Secretarial Occupations	19	4	7	7	11	14	13	-16	-3	5	2	-10
5. Skilled Trades Occupations	37	6	11	19	33	22	21	-10	2	9	3	-10
6. Personal Service Occupations	10	2	4	4	21	7	7	6	41	3	1	37
7. Sales & Customer Service Occupations	19	2	4	13	32	9	8	15	23	4	1	17
8. Machine & Transport Operatives	3	1	2	1	12	3	3	6	6	2	1	4
9. Elementary Occupations	11	28	51	-68	46	82	78	-114	-11	31	10	-51
Total	171	60	111	0	382	196	186	0	112	85	27	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	13.4	4.3	7.9	1.2	42.7	12.4	11.8	18.5	4.0	4.3	1.4	-1.7
2. Professional Occupations	40.4	4.3	7.9	28.3	61.8	12.4	11.8	37.6	34.0	4.3	1.4	28.3
3. Associate Professional & Technical Occupations	54.8	4.3	7.9	42.6	80.7	12.4	11.8	56.5	21.3	4.3	1.4	15.6
4. Administrative, Clerical & Secretarial Occupations	20.1	4.3	7.9	7.9	10.0	12.4	11.8	-14.2	-2.5	4.3	1.4	-8.2
5. Skilled Trades Occupations	25.7	4.3	7.9	13.6	18.5	12.4	11.8	-5.7	1.0	4.3	1.4	-4.7
6. Personal Service Occupations	21.1	4.3	7.9	8.9	34.6	12.4	11.8	10.4	51.2	4.3	1.4	45.5
7. Sales & Customer Service Occupations	37.7	4.3	7.9	25.6	45.1	12.4	11.8	20.9	22.2	4.3	1.4	16.5
8. Machine & Transport Operatives	15.0	4.3	7.9	2.8	48.0	12.4	11.8	23.8	16.2	4.3	1.4	10.5
9. Elementary Occupations	1.6	4.3	7.9	-10.5	7.0	12.4	11.8	-17.2	-1.5	4.3	1.4	-7.3
Total	12.1	4.3	7.9	0.0	24.2	12.4	11.8	0.0	5.7	4.3	1.4	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.16 TRANSPORT

6.16.1 Description of the industry

INDUSTRY 16: TRANSPORT		
SIC92 headings: 60.1, 60.2, 60.3, 61, 62, 63		
<p>This sector includes: Passenger and freight transport by inter-city and inter-urban railways; Operation of tramways and underground or elevated railways; Sea and coastal water transport of passengers and freight; Inland water transport of passengers and freight; Cargo handling, harbour operation and other auxiliary activities; Transport of passengers or freight by air or via space, including scheduled and non-scheduled (e.g. charter) services; The operation of terminal facilities, cargo handling, etc; Supporting and auxiliary transport activities, including cargo handling, storage and warehousing; Operation of terminal facilities such as railway stations, bus stations, parking lots or garages, harbours and piers, navigations, pilotage and berthing, airports and air traffic control; Activities of travel agencies and tour operators, and other transport agencies such as freight forwarding, customs agents.</p>		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	5.1	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	1,286,000	30,099,000
Share of total employment (% 2004):	4.3	100
Gender split (male:female) (% 2004):	74:26	54:46
Part-time share (% 2004):	11	28
Self-employment share (% 2004):	19	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.16.2 Industry Commentary

Passenger and freight rail transport grew strongly in the late 1990s, but a series of accidents (Paddington and Hatfield) reversed this trend and brought to light just how severe the deterioration in the rail infrastructure had become over the last 20-30 years. Investment needs for basic maintenance and repair far exceed committed funds and Network Rail (the successor to Railtrack) announced reduced improvement projects as a result. For example, while some West Coast modernisation will take place as planned, its scope has been curtailed and the timescale lengthened. There are on-going

problems with some franchise operators too. The government has recently put forward a new structure for administration of the UK's railways that reassigns responsibilities and reduces the importance of strategic long term planning. There is a concerted drive to improve punctuality and reliability without sacrificing safety standards. The most important rail market remains commuters and business travellers.

Travel by road continues to dominate total passenger kilometres travelled in the UK. Public transport use, particularly local

buses, fell substantially in the 1990s. This trend has been reversed in London since the introduction of the congestion charge, an experiment which seems likely to be repeated in other major cities given its undoubted success. Investment on the London Underground is set to increase following the introduction of private-public partnership arrangements in 2003. However, whether such arrangements will lead to improvements in service remains an open question. Outside of London, most of the UK's light rail and tram systems are failing to achieve their full potential economic benefits.

The shipping freight sector remains very competitive, with capacity increasing faster than volumes as the new generation of large container ships comes on stream.

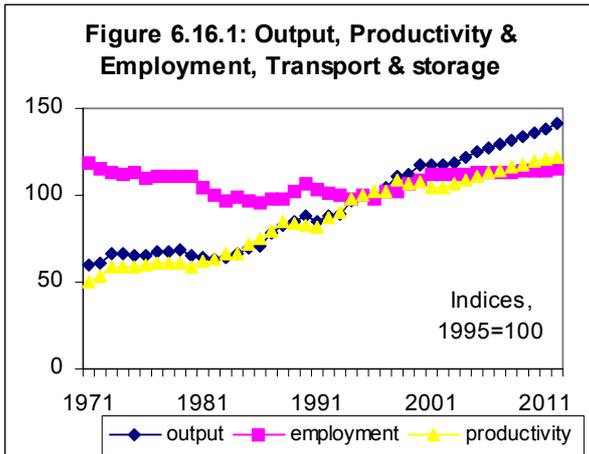
Passenger ferries, have also struggled with overcapacity, especially with competition from the Channel Tunnel and cheap budget airlines.

Air transport was severely affected by the events of 9/11, and international airlines cut capacity and staff in the aftermath simply in order to survive. The conflict in Iraq further dented the industry's prospects. In recent years, budget airlines have captured an increasing market share, forcing many traditional carriers to restructure and consolidate their operations in order to remain profitable. Regional airports have benefited enormously from the growth in budget airlines and their future prospects remain very good.

6.16.3 Productivity and Output Trends

Table 6.16.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.6	2.3	1.8	1.6
Employment (% pa)	1.3	1.5	0.1	0.6
(000s)	77	92	4	37
Productivity (% pa)	2.2	0.8	1.7	1.1



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output trends have been strongly positive in this industry for many years. This has slowed somewhat in recent years, as a consequence of the kinds of problems outlined above. This more modest rate of increase is expected to continue over the next decade, with growth of 1 ½ - 2 per cent per annum.
- Productivity growth was also very strong when output was rising rapidly, but recent events have resulted in a much slower rate of increase. Growth is expected to pick up to around 1-1½ per cent per annum over the next decade.
- As a consequence, only very modest increases in employment are projected, with overall levels growing by about 40 thousand jobs over the decade.

6.16.4 Employment by Status and Gender

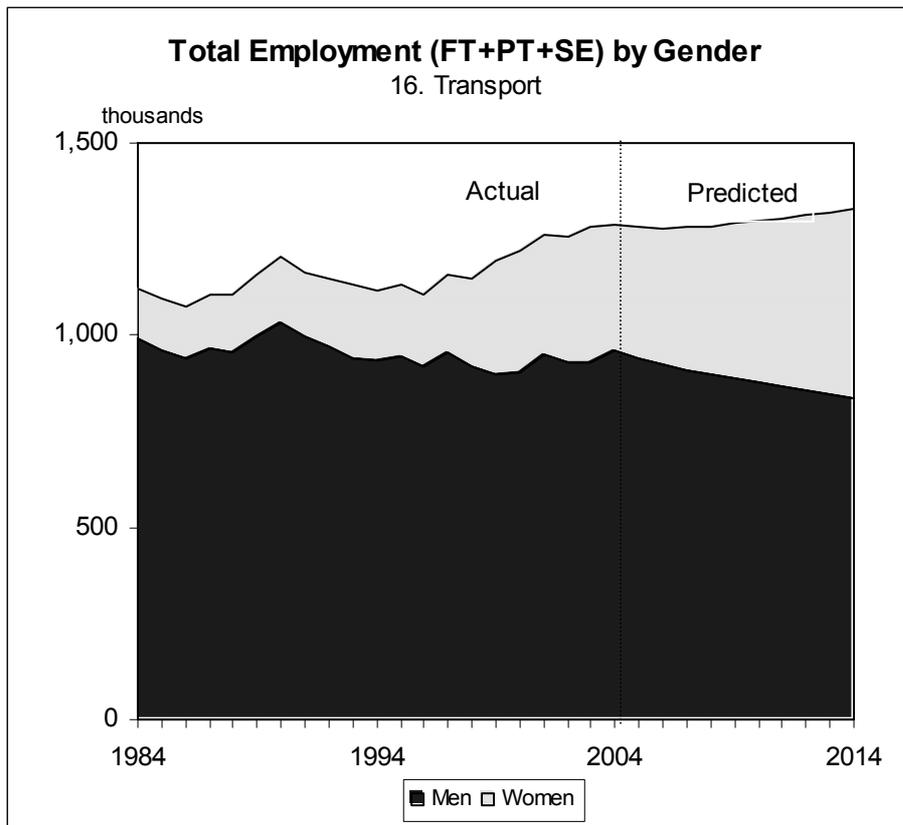
Women currently account for about a quarter of all jobs in this industry. Part-time employment remains low compared to many other service industries. Self employment is very significant, especially in the road transport sector. In total, this accounts for almost 1 in 5 of all jobs.

Table 6.16.2: Employment Levels by Gender and Status, Transport

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total	FT	PT	SE	Total	
	shares	%	shares	%	shares	000s	000s					
2004								2004-09				
Male employment	684	(53.1)	59	(4.6)	215	(16.7)	958	(74.5)	-82	20	-11	-72
Female employment	225	(17.5)	78	(6.1)	26	(2)	328	(25.5)	41	33	2	76
Total employment	908	(70.6)	137	(10.7)	241	(18.7)	1,286	(100)	-40	53	-9	4
2009								2009-14				
Male employment	602	(46.7)	80	(6.2)	205	(15.9)	886	(68.7)	-69	23	-6	-51
Female employment	266	(20.6)	111	(8.6)	27	(2.1)	404	(31.3)	49	37	3	88
Total employment	868	(67.3)	190	(14.8)	232	(18)	1,290	(100)	-20	60	-3	37
2014								2004-14				
Male employment	533	(40.2)	103	(7.8)	199	(15)	835	(62.9)	-150	44	-17	-123
Female employment	315	(23.7)	147	(11.1)	30	(2.2)	492	(37.1)	90	69	4	164
Total employment	848	(63.9)	250	(18.9)	228	(17.2)	1,327	(100)	-60	113	-12	41

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

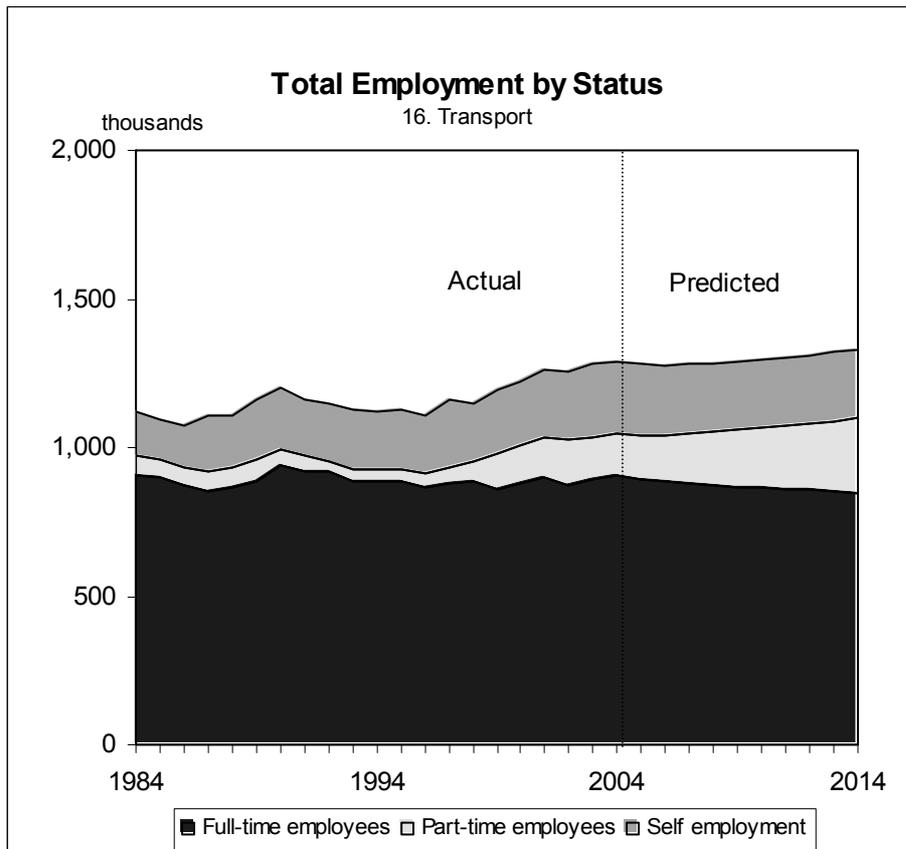
Figure 6.16.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- On the basis of recent trends, women are expected to increase their share of employment substantially, approaching a third of the total by 2014.

Figure 6.16.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Self employment will continue to be important in some parts of the industry, but overall its share of all jobs is projected to decline.
- The share in part-time employment is expected to increase slightly, continuing recent trends. The presence of more women in the industry will help to encourage such a trend.

6.16.5 Projections of Employment by Occupation

Key Aspects of Occupational Structure

- Machine & transport operatives (especially drivers) remain the largest occupational group in this industry, despite declines in their employment share over recent decades. In 2004, this group accounted for over a quarter of all jobs.
- Other occupations such as administrative, clerical & secretarial, skilled trades and elementary occupations are also important, although the latter two groups have been declining.
- Managers & senior officials today occupy more than 1 in 10 of the industry jobs.

Future Changes

- Changes in occupation structure inevitably will favour white collar groups such as managers, professionals and associate professionals. Administrative, clerical & secretarial occupations are also projected to have an increasing job share.
- There are also small but significant increases for personal service occupations and sales & customer service occupations.
- Against such growth, significant job losses are projected for skilled trades and elementary occupations, whilst transport drivers & machine operatives are projected to suffer small job losses *pro rata*.

Shift share analysis

Table 6.16.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry

over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

In Transport the industry effect was a negative one of just under -5 per cent over the period 1984-94. This turned into a slightly positive effect over the last decade but this is projected to turn into a slight negative effect over the next decade, accounting for a loss of just over 1 in a hundred jobs across all occupations.

Over the projection period occupational effects are generally positive but notable negative effects are projected for skilled trades, transport & machine operatives and elementary occupations.

Replacement demands

Table 6.16.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Once again, although only a modest increase in total employment is projected, the need to replace those who will be leaving the current workforce will be very substantial, more than 10 times the employment demand arising from output growth.
- In total, replacement demands over the next 10 years are estimated at well over 400 thousand. By far the largest figures are for transport & machine operatives, followed by administrative, clerical & secretarial occupations, elementary occupations and managers & senior officials
- In all other occupations, a substantial proportion of the current workforce will need to be replaced over the next decade, typically these average around a third of current employment levels.

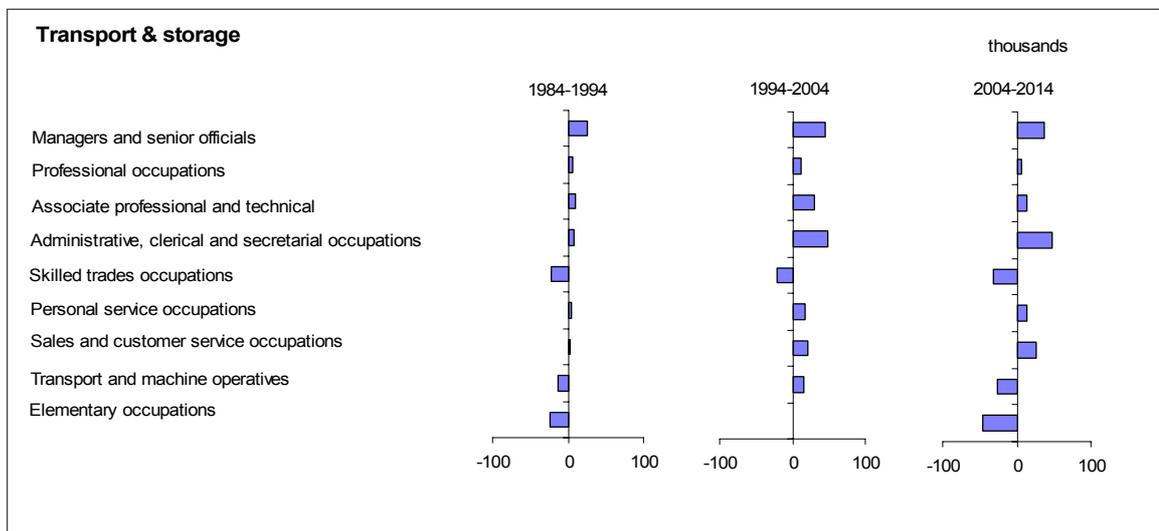
Table 6.16.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Transport and storage Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	80	105	150	163	186	36	52	88
2. Professional Occupations	41	47	59	61	65	7	18	25
3. Associate Professional & Technical Occupations	75	84	115	120	129	14	35	49
4. Administrative, Clerical & Secretarial Occupations	144	151	201	216	248	47	78	125
5. Skilled Trades Occupations	183	161	139	121	107	-32	43	11
6. Personal Service Occupations	30	34	52	66	66	14	20	35
7. Sales & Customer Service Occupations	17	20	41	52	67	27	13	40
8. Machine & Transport Operatives	348	335	350	334	323	-27	121	94
9. Elementary Occupations	204	181	182	158	136	-46	57	11
Total	1,121	1,118	1,286	1,290	1,327	41	437	478

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	7	9	12	13	14	24	35	59
2. Professional Occupations	4	4	5	5	5	12	31	43
3. Associate Professional & Technical Occupations	7	7	9	9	10	12	31	43
4. Administrative, Clerical & Secretarial Occupations	13	14	16	17	19	24	39	62
5. Skilled Trades Occupations	16	14	11	9	8	-23	31	8
6. Personal Service Occupations	3	3	4	5	5	28	39	67
7. Sales & Customer Service Occupations	2	2	3	4	5	65	33	98
8. Machine & Transport Operatives	31	30	27	26	24	-8	35	27
9. Elementary Occupations	18	16	14	12	10	-25	31	6
Total	100	100	100	100	100	3	34	37

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.16.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.16.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	25	3	-4	25	45	13	3	29	36	6	-2	32
2. Professional Occupations	6	2	-2	6	12	6	1	5	7	3	-1	5
3. Associate Professional & Technical Occupations	9	3	-3	9	31	10	2	18	14	5	-1	10
4. Administrative, Clerical & Secretarial Occupations	8	6	-7	8	49	19	4	26	47	9	-2	41
5. Skilled Trades Occupations	-23	8	-8	-22	-21	20	4	-46	-32	6	-2	-37
6. Personal Service Occupations	4	1	-1	5	17	4	1	12	14	2	-1	13
7. Sales & Customer Service Occupations	3	1	-1	3	20	3	1	17	27	2	0	25
8. Machine & Transport Operatives	-13	15	-16	-12	15	42	9	-36	-27	15	-4	-38
9. Elementary Occupations	-23	9	-9	-23	1	22	5	-27	-46	8	-2	-52
Total	-4	48	-52	0	169	139	30	0	41	56	-15	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	31.1	4.3	-4.6	31.4	42.7	12.4	2.7	27.6	24.4	4.3	-1.2	21.2
2. Professional Occupations	13.7	4.3	-4.6	14.1	25.9	12.4	2.7	10.8	11.8	4.3	-1.2	8.6
3. Associate Professional & Technical Occupations	12.2	4.3	-4.6	12.5	36.9	12.4	2.7	21.9	12.2	4.3	-1.2	9.1
4. Administrative, Clerical & Secretarial Occupations	5.5	4.3	-4.6	5.8	32.4	12.4	2.7	17.3	23.6	4.3	-1.2	20.5
5. Skilled Trades Occupations	-12.4	4.3	-4.6	-12.1	-13.4	12.4	2.7	-28.5	-23.2	4.3	-1.2	-26.4
6. Personal Service Occupations	14.8	4.3	-4.6	15.2	50.8	12.4	2.7	35.7	27.5	4.3	-1.2	24.3
7. Sales & Customer Service Occupations	19.8	4.3	-4.6	20.1	101.0	12.4	2.7	85.9	65.4	4.3	-1.2	62.3
8. Machine & Transport Operatives	-3.7	4.3	-4.6	-3.3	4.4	12.4	2.7	-10.7	-7.6	4.3	-1.2	-10.8
9. Elementary Occupations	-11.5	4.3	-4.6	-11.1	0.4	12.4	2.7	-14.7	-25.4	4.3	-1.2	-28.5
Total	-0.3	4.3	-4.6	0.0	15.1	12.4	2.7	0.0	3.2	4.3	-1.2	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.17 COMMUNICATIONS

6.17.1 Description of the Industry

INDUSTRY 17: COMMUNICATIONS		
SIC92 headings: 64		
National post and courier activities, including collection, distribution and delivery of national and international mail and parcels. Telecommunications, including the transmission of sound, images, data or other information via cables, broadcasting, relay or satellite; this includes maintenance of the network and transmission of radio and television programmes.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	3.3	100
Exposure to International Trade:	medium	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	527,000	30,099,000
Share of total employment (% 2004):	1.8	100
Gender split (male:female) (% 2004):	74:26	54:46
Part-time share (% 2004):	15	28
Self-employment share (% 2004):	2	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.17.2 Industry Commentary

This group of industries experienced very strong growth in the late 1990s due to liberalisation of fixed-line telecommunication networks and the adoption of mobile telephony. This has now largely come to an end. The roll-out of broadband was initially slower than expected, in part because many of the firms that intended to take part in the expansion were heavily indebted. Since early 2003, BT has accelerated the rate at which it is rolling out its high-speed broadband services and the wholesale prices charged to other providers have been reduced.

The mobile telephony companies who were successful in bidding £22bn for the UK 3G licences have been faced with uncertainty about the take-up of 3G services amongst their customers. This slow take-up combined with high levels of corporate debt initially delayed the roll-out of 3G telecoms services. However, there is

emerging evidence that take-up is now accelerating as the leading UK mobile operators, Vodaphone, Orange, T-Mobile and mm02, introduce their new range of services.

The slowdown in the sector post-2000 was been driven by near saturation in the mobile telephone sector, where the number of reported mobile customers in the UK passed 54 million in 2004. Retrenchment created a climate that discouraged investment in new ICT equipment. Despite this, output is forecast to grow rapidly over the next decade, although employment will show little or no growth, in the face of strong productivity growth

Employment in the sector is dominated by the postal and related services component of the industry as opposed to the telecommunications side. The Royal Mail is currently restructuring to eliminate large losses and has moved into profit in 2005.

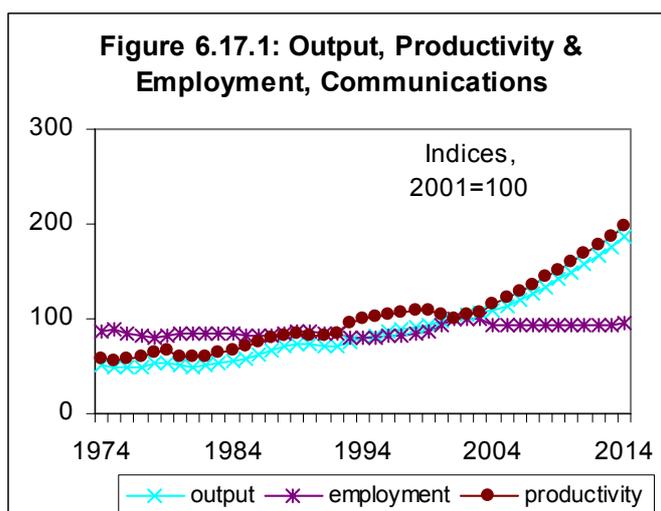
These changes could result in even greater job losses than projected here, as a number of services, such as the second delivery, are withdrawn. The possibility of the postal market being liberalised sooner than expected will force Royal Mail to remain focused on becoming more efficient and competitive. Competition in

the market will exert downward pressure on prices and encourage Royal Mail to expand into more profitable activities, as it did with financial services.

6.17.3 Productivity and Output Trends

Table 6.17.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.4	2.8	5.6	5.7
Employment (% pa)	1.6	1.6	0.0	0.3
(000s)	38	40	1	7
Productivity (% pa)	1.7	1.2	5.5	5.4



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- In recent years, output trends in this industry have been very strong, following an almost exponential growth path and making this one of the UK's fastest growing sectors. Some slowdown is anticipated over the next 10 years but with rates of increase of almost 6 per cent per annum it remains a high growth area.
- Productivity has also followed a rising trend, although slowing in the last few years. This pattern is not expected to continue over the next decade. A much faster rate of productivity increase is now anticipated as further technological change takes place and pressures to save cost grow. Productivity is projected to rise at a similar pace to the growth in output.
- Consequently the industry is not expected to see significant increases in employment. Rather a pattern of "jobless" growth, with little or no change in employment levels is expected.

6.17.4 Employment by Status and Gender

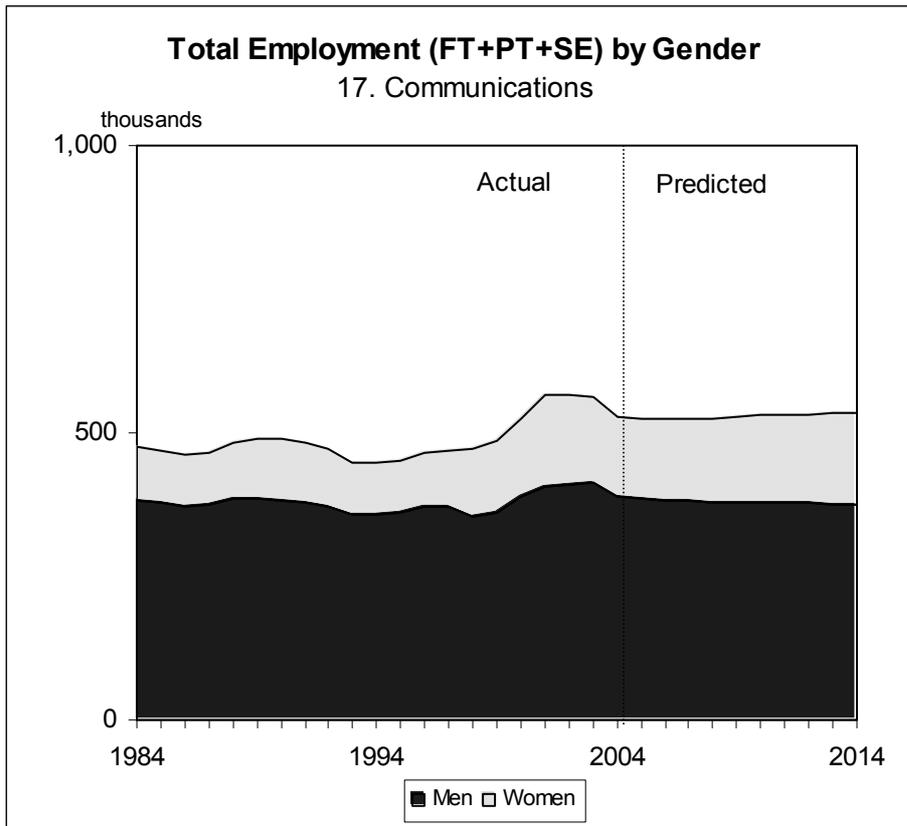
Females currently account for about a quarter of all jobs but this has been rising. Part-time employment is quite important, currently representing about 16 per cent of all jobs. Self employment remains trivial by comparison.

Table 6.17.2: Employment Levels by Gender and Status, Communications

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			
Male employment	341	(64.7)	41	(7.9)	6	(1.2)	389	(73.8)	-17	8	0	-9
Female employment	93	(17.6)	40	(7.6)	5	(1)	138	(26.2)	4	6	0	10
Total employment	434	(82.4)	81	(15.5)	11	(2.2)	527	(100)	-13	14	0	1
2009									2009-14			
Male employment	325	(61.5)	49	(9.3)	6	(1.2)	380	(71.9)	-13	8	0	-5
Female employment	96	(18.3)	46	(8.8)	5	(1)	148	(28.1)	5	7	0	12
Total employment	421	(79.7)	96	(18.1)	11	(2.2)	528	(100)	-8	15	0	7
2014									2004-14			
Male employment	312	(58.2)	57	(10.7)	6	(1.2)	375	(70.1)	-29	16	0	-14
Female employment	101	(19)	53	(10)	5	(1)	160	(29.9)	9	13	0	22
Total employment	413	(77.2)	111	(20.7)	11	(2.1)	535	(100)	-21	29	0	8

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

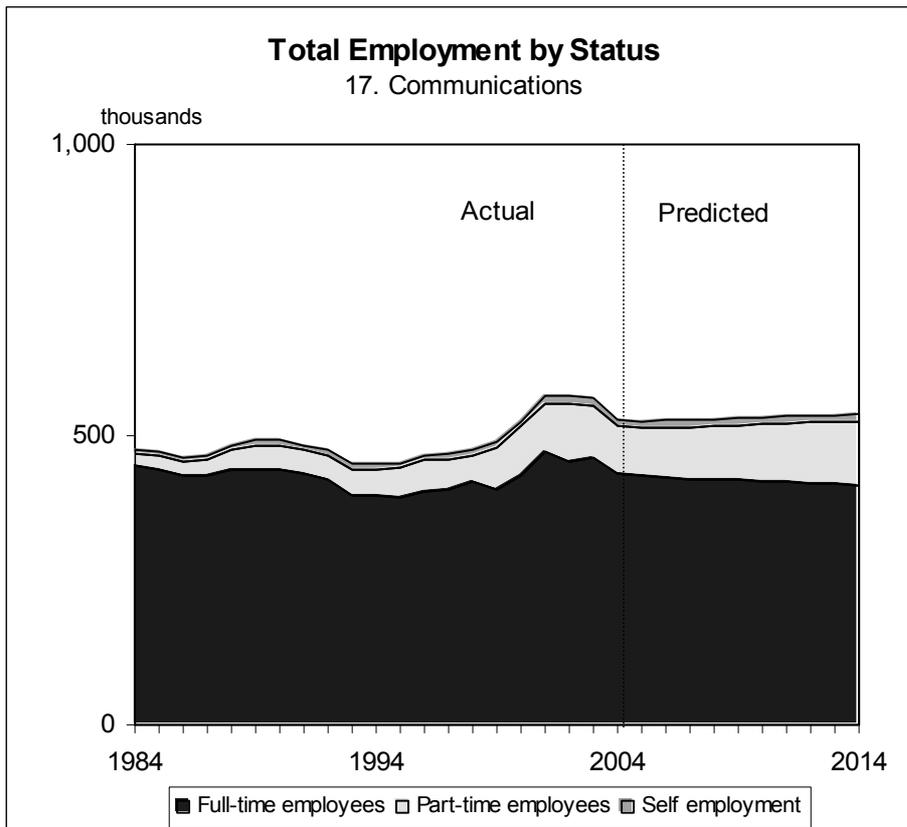
Figure 6.17.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Females are expected to increase their share of a static employment total, reaching about 30 per cent of the total by 2014.

Figure 6.17.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Part-time employment is expected to increase in importance, accounting for around 1 in 5 jobs by 2014.
- Self employment will remain insignificant.

6.17.5 Projections of Employment by Occupation

Key Aspects of Occupational Structure

- Currently employment share is concentrated in four main occupations:
 - administrative, clerical & secretarial
 - skilled trades
 - transport & machine operatives
 - elementary occupations
- This reflects the dominance of the postal and deliveries side of the industry as opposed to telecommunications.
- In recent years, all but the first of these occupations have seen their employment shares decline, as those of the white collar occupations have strengthened their shares.

Future Changes

- Modest reductions in employment in the skilled trades and the elementary occupations are projected as the industry continues to restructure, especially in postal services.
- These are expected to be offset by small job gains in the administrative, clerical & secretarial category, as well as for managerial and sales & customer service occupations. Elsewhere employment changes are likely to be quite tiny.

Shift share analysis

Table 6.17.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry

over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

In communications there has also been a turnaround from a quite significant negative industry effect of around -10 per cent in the period 1984-94. This was transformed into a positive one of just under 5 percent over the past decade. Over the next decade this is again expected to turn negative but only a relatively modest -2.8 per cent.

Over the projection period occupational effects are generally positive, the main exception being skilled trades and, to a lesser extent, elementary occupations.

Replacement demands

Table 6.17.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

Replacement Demand

- Although little change is expected in total employment there will be significant replacement needs to be met, especially in the postal delivery service, with its ageing workforce.
- These are predominantly concentrated in the four occupations highlighted above. A total replacement demand of some 180 thousand workers is expected across the sector.
- The total requirements show some of the highest rates of increase to be in some of the newly emerging occupations such as the sales & customer service group.

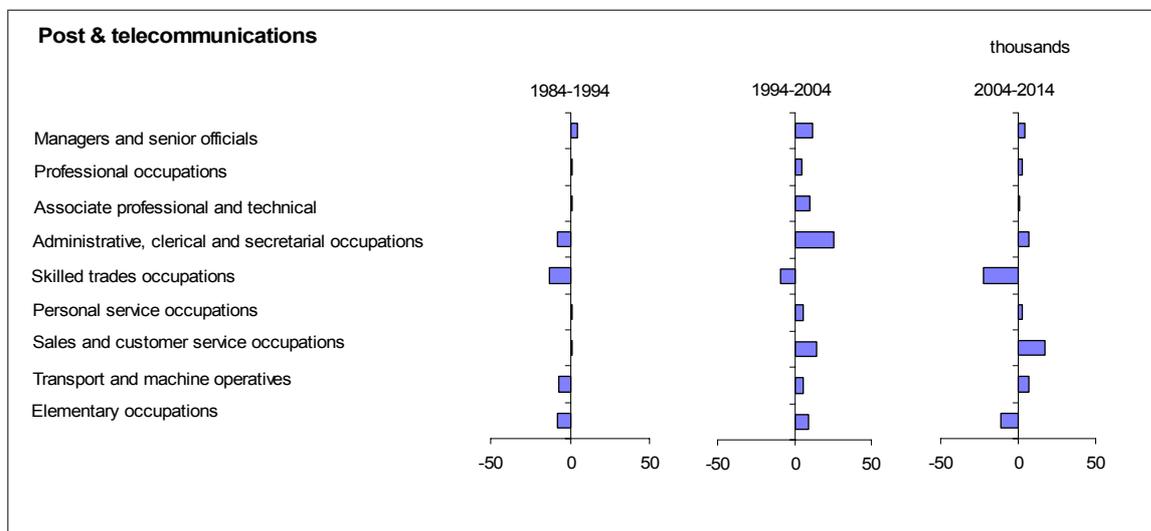
Table 6.17.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Post & telecommunications Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	25	29	41	43	46	5	14	19
2. Professional Occupations	18	19	25	25	27	2	7	10
3. Associate Professional & Technical Occupations	24	26	36	36	37	1	11	12
4. Administrative, Clerical & Secretarial Occupations	91	83	108	111	115	7	41	48
5. Skilled Trades Occupations	116	103	94	83	71	-22	29	7
6. Personal Service Occupations	8	9	15	18	18	3	5	8
7. Sales & Customer Service Occupations	14	15	29	36	46	17	9	26
8. Machine & Transport Operatives	102	95	101	103	108	7	35	42
9. Elementary Occupations	77	70	78	72	67	-11	25	14
Total	475	449	527	528	535	8	177	185

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	5	7	8	8	9	11	35	46
2. Professional Occupations	4	4	5	5	5	9	30	39
3. Associate Professional & Technical Occupations	5	6	7	7	7	3	30	34
4. Administrative, Clerical & Secretarial Occupations	19	18	21	21	21	6	38	44
5. Skilled Trades Occupations	24	23	18	16	13	-24	31	7
6. Personal Service Occupations	2	2	3	3	3	18	36	54
7. Sales & Customer Service Occupations	3	3	6	7	9	58	32	90
8. Machine & Transport Operatives	21	21	19	20	20	7	34	41
9. Elementary Occupations	16	15	15	14	13	-14	32	18
Total	100	100	100	100	100	2	34	35

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.17.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.x.4).

Table 6.17.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	4	1	-2	6	12	4	1	7	5	2	-1	4
2. Professional Occupations	1	1	-2	2	5	2	1	2	2	1	-1	2
3. Associate Professional & Technical Occupations	2	1	-2	3	10	3	1	5	1	2	-1	1
4. Administrative, Clerical & Secretarial Occupations	-8	4	-9	-3	25	10	4	11	7	5	-3	5
5. Skilled Trades Occupations	-13	5	-11	-7	-9	13	5	-27	-22	4	-3	-24
6. Personal Service Occupations	1	0	-1	2	6	1	0	4	3	1	0	2
7. Sales & Customer Service Occupations	1	1	-1	2	14	2	1	12	17	1	-1	17
8. Machine & Transport Operatives	-7	4	-10	-1	6	12	5	-11	7	4	-3	6
9. Elementary Occupations	-8	3	-8	-4	9	9	3	-3	-11	3	-2	-12
Total	-26	20	-47	0	78	56	22	0	8	23	-15	0

	1984-1994		% change		1994-2004		% change		2004-2014		% change	
	total	scale	total	scale	total	scale	total	scale	total	scale	total	scale
1. Managers & Senior Officials	17.1	4.3	-9.8	22.6	40.6	12.4	4.9	23.3	11.0	4.3	-2.8	9.5
2. Professional Occupations	7.7	4.3	-9.8	13.2	26.4	12.4	4.9	9.1	8.9	4.3	-2.8	7.4
3. Associate Professional & Technical Occupations	6.5	4.3	-9.8	12.0	38.0	12.4	4.9	20.7	3.4	4.3	-2.8	1.8
4. Administrative, Clerical & Secretarial Occupations	-9.1	4.3	-9.8	-3.6	30.5	12.4	4.9	13.1	6.2	4.3	-2.8	4.7
5. Skilled Trades Occupations	-11.2	4.3	-9.8	-5.7	-8.7	12.4	4.9	-26.1	-23.9	4.3	-2.8	-25.4
6. Personal Service Occupations	13.2	4.3	-9.8	18.7	63.3	12.4	4.9	46.0	17.9	4.3	-2.8	16.4
7. Sales & Customer Service Occupations	10.6	4.3	-9.8	16.1	93.2	12.4	4.9	75.8	58.3	4.3	-2.8	56.8
8. Machine & Transport Operatives	-6.8	4.3	-9.8	-1.3	6.1	12.4	4.9	-11.2	7.2	4.3	-2.8	5.6
9. Elementary Occupations	-10.0	4.3	-9.8	-4.5	12.8	12.4	4.9	-4.5	-14.3	4.3	-2.8	-15.9
Total	-5.5	4.3	-9.8	0.0	17.3	12.4	4.9	0.0	1.5	4.3	-2.8	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.18 FINANCIAL SERVICES

6.18.1 Description of the Industry

INDUSTRY 18: FINANCIAL SERVICES		
SIC92 headings: 65, 66, 67		
Financial intermediation, other than for insurance and pension funding, including: central banking, banks, building societies, financial leasing, factoring, mortgage finance, investment and unit trusts, venture capital and financial intermediation not elsewhere specified. Insurance, including friendly societies, benevolent funds and Lloyd's underwriters, covering life insurance, pensions and non-life insurance. Activities auxiliary to financial intermediation, including administration of financial markets, broking of securities, insurance agents and brokers.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	5.0	100
Exposure to International Trade:	medium	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	1,162,000	30,099,000
Share of total employment (% 2004):	3.9	100
Gender split (male:female) (% 2004):	47:53	54:46
Part-time share (% 2004):	17	28
Self-employment share (% 2004):	6	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.18.2 Industry Commentary

In recent years, the banking industry in Europe has gone through a wave of integration and consolidation, triggered by the widespread deregulation of financial activities. However, many formidable barriers to entry into other EU markets still remain: different tax systems, different accounting standards, different solvency controls, different supervisory bodies, different consumer protection rules and different take-over directives. These barriers are more significant for retail banking than for other types of banking, such as money markets and wholesale banking. Since the introduction of the euro, merger and acquisitions and strategic alliances have emerged as the two favourite forms of market integration in retail banking institutions. Other forms of integration such as direct cross-border

sales of financial products and the establishment of branches and subsidiaries in a foreign country have proved less effective in overcoming these barriers.

The high costs associated with entry into the banking sector have tended to keep the European financial markets relatively fragmented, but it is hoped that new banking and accounting standards (Basel Capital Accord due to be introduced in 2006) will in future lead to more integration and consolidation across the EU. Acquisition of national brands is still the predominant way in which banks enter new foreign markets, despite the growth of e-commerce options. The latter are usually less successful due to significant cultural barriers.

Profitability in UK banking is remains strong and it is one of the highest in the EU, despite increasing provision for bad debts being made due to rising consumer debt. Recent data show that the health of banking continues to improve and it is expected to remain strong in the immediate future. However, banks are very concerned to cut costs and improve productivity and this has resulted in significant numbers of UK jobs being transferred off-shore.

The insurance industry is now subject to greater scrutiny and regulation following a series of high profile failures. This is not without costs for the industry, and coupled with a weak equity market, life assurers continue to reduce policy returns and performance in the sector is likely to continue to be poor. Similarly, pension funds are performing poorly, but the UK

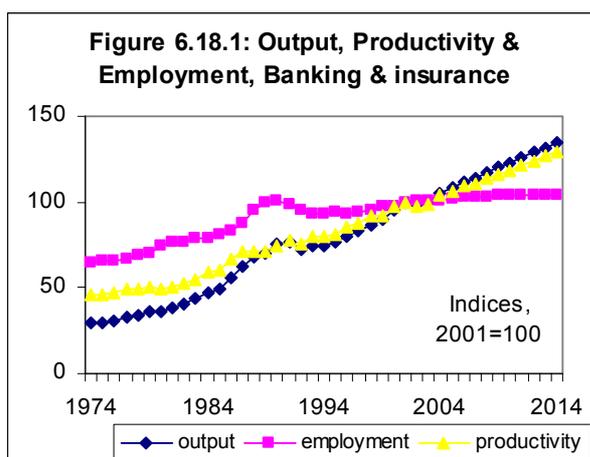
government is concerned to encourage higher levels of savings for pensions. Output growth is expected to be in line with the overall growth of the economy. The trend to outsource insurance jobs overseas is likely to continue.

Profitability in UK banking is still good, and is one of the highest in the EU, despite increasing provision for bad debts being made due to rising consumer debt. Recent data show that the health of banking continues to improve and it is expected to remain strong in the immediate future. However banks are very concerned to cut costs and improve productivity and this has resulted in some UK jobs being transferred off-shore.

6.18.3 Productivity and Output Trends

Table 6.18.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.8	3.1	2.7	2.2
Employment (% pa)	0.8	0.7	0.5	0.1
(000s)	46	42	29	3
Productivity (% pa)	3.0	2.4	2.2	2.2



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output in this industry has been growing strongly for many years. Over the most recent decade growth continued at around 3 per cent per annum.
- This pace is projected to slow a little over the next decade but increases of around 2 ½ per cent per annum are still expected.
- Productivity growth has followed a similar path to output. It is projected to slow somewhat over the next 10 years but to remain above 2 per cent per annum.
- Future trends in employment are expected to remain fairly flat, with only modest increase to 2014, as productivity improvements offset the expected output growth.

6.18.4 Employment by Status and Gender

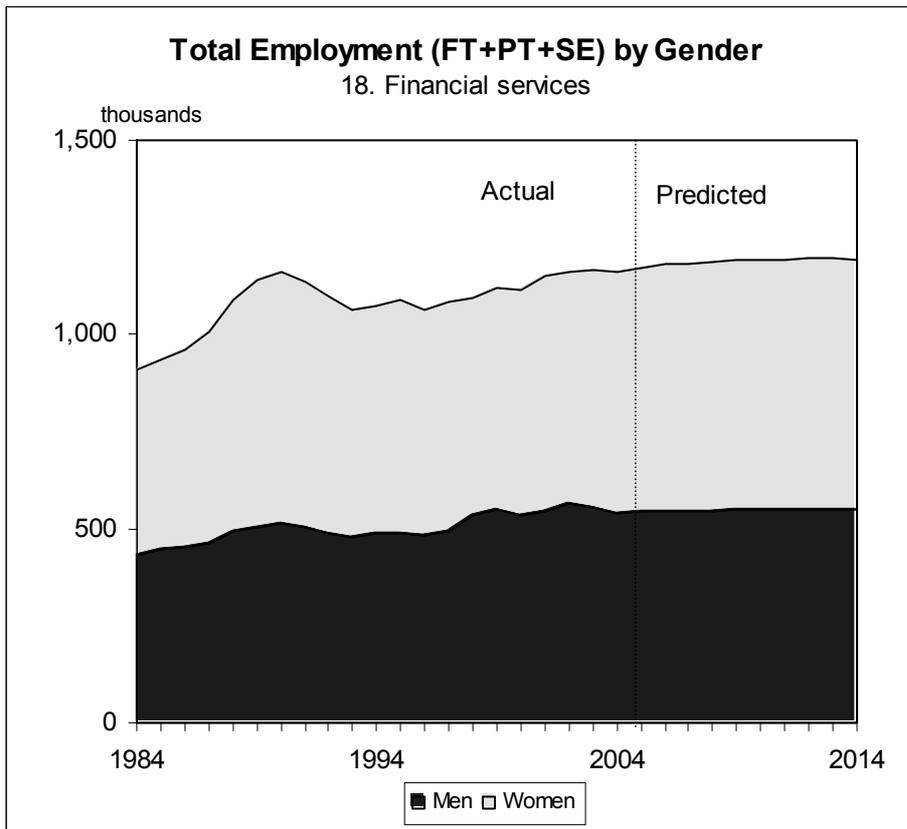
Employment in this industry is dominated by females although many of these work only part-time. More of the men are self employed. In total, part time working currently accounts for around 17 per cent of all jobs. Self employment is much less significant.

Table 6.18.2: Employment Levels by Gender and Status, Financial services

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004								2004-09				
Male employment	464	(40)	32	(2.7)	45	(3.9)	541	(46.5)	26	-17	-2	7
Female employment	435	(37.4)	164	(14.2)	22	(1.9)	621	(53.5)	8	12	3	22
Total employment	899	(77.4)	196	(16.9)	67	(5.7)	1,162	(100)	33	-5	1	29
2009								2009-14				
Male employment	490	(41.1)	14	(1.2)	43	(3.6)	547	(46)	12	-9	-3	0
Female employment	443	(37.2)	176	(14.8)	24	(2)	643	(54)	-5	6	2	3
Total employment	932	(78.3)	191	(16)	67	(5.7)	1,190	(100)	7	-3	-1	3
2014								2004-14				
Male employment	502	(42.1)	5	(0.5)	40	(3.3)	548	(45.9)	38	-26	-5	7
Female employment	438	(36.6)	182	(15.3)	26	(2.2)	646	(54.1)	3	18	5	25
Total employment	940	(78.7)	188	(15.7)	66	(5.5)	1,194	(100)	41	-8	0	32

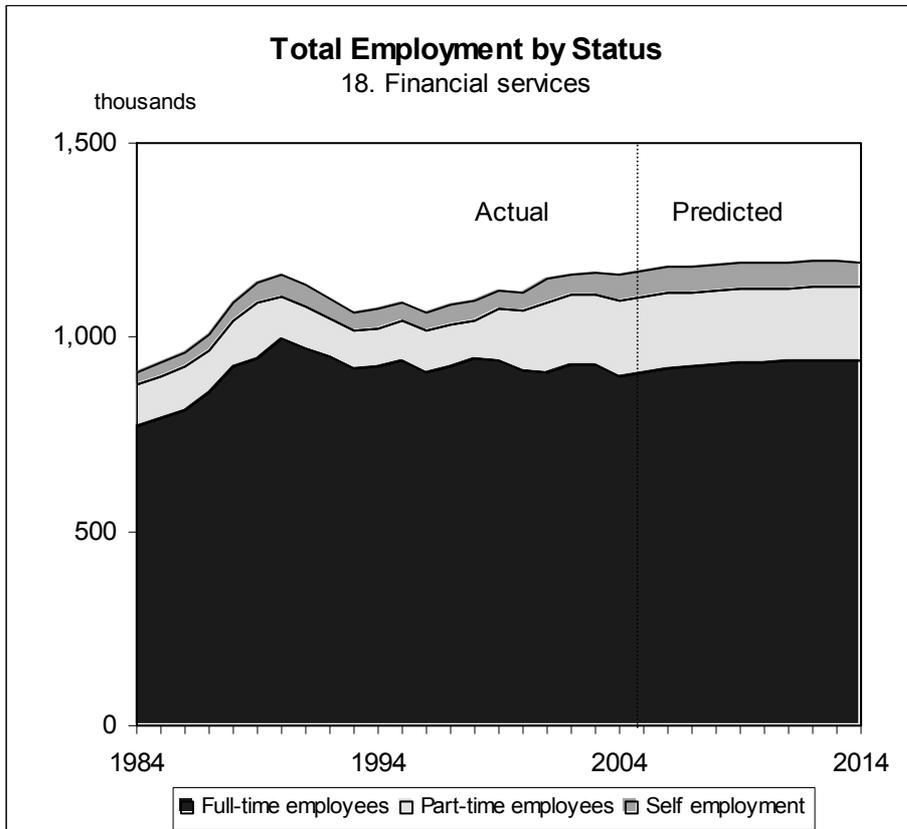
Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

Figure 6.18.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The gender mix of employment is not projected to change radically. The sector remains an attractive area of employment for females and, if anything, there employment share is expected to increase slightly.

Figure 6.18.3: Changing Patterns of Sectoral Employment by Status

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- A slight increase in self employment is projected, continuing the recent trend, but it will remain a tiny part of total employment.
- Part-time working is projected to remain more or less unchanged as a share of total employment.

6.18.5 Projections of Employment by Occupation

Key Aspects of Occupational Structure

- In 2004 administrative, clerical & secretarial workers still accounted for some 45 per cent of all jobs in this industry, despite significant declines over the earlier decades.
- Managerial and associate professional & technical occupations were also significant, each accounting for around 1 in 8 jobs.

Future Changes

- Recent declines in the share of the administrative, clerical & secretarial occupations are projected to continue, as on-line banking services reduce the demand for front line staff.
- These job losses are likely to be offset by small increases elsewhere for the managers & senior officials and the associate professional categories and also for sales & customer service occupations. Marketing activities have become increasingly important in this sector.

Shift share analysis

Table 6.18.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

In Financial services the industry effect played a major positive role for the 1984-94 period. During the past decade this changed dramatically into a negative effect. Over the projection period, the industry effect is projected to remain negative as a result of continuing pressures to rationalise and improve, cut costs, and improve productivity.

Managers and professionals as well as personal service occupations and sales and customer service occupations are projected to benefit particularly from positive occupational effects. Administrative & clerical, skilled trades and machine & transport operatives and elementary occupations are projected to experience the negative occupational effects.

Replacement demands

Table 6.18.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Total replacement demands for the industry are well over 10 times the very modest scale of expansion demand.
- Replacement demands are dominated by the administrative, clerical & secretarial group which, although in decline, will account for almost half of all replacement needs.
- The other occupational groups already highlighted make up most of the balance of almost 400 thousand replacements that will be needed between 2004 and 2014.

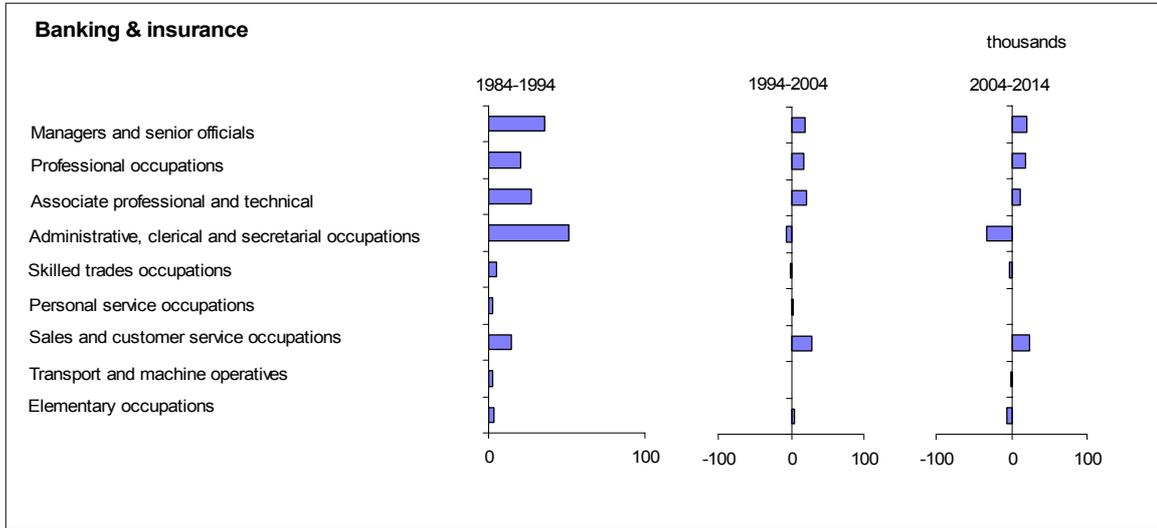
Table 6.18.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Banking & insurance						2004 - 2014		
Employment Levels (000s)	1984	1994	2004	2009	2014	Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	110	145	165	177	186	21	58	79
2. Professional Occupations	52	72	90	100	110	19	30	50
3. Associate Professional & Technical Occupations	96	123	144	150	155	11	46	58
4. Administrative, Clerical & Secretarial Occupations	480	532	526	521	492	-33	207	173
5. Skilled Trades Occupations	29	34	34	34	32	-2	12	10
6. Personal Service Occupations	12	15	16	15	18	1	6	8
7. Sales & Customer Service Occupations	56	71	100	112	123	23	34	57
8. Machine & Transport Operatives	19	22	22	22	21	-1	8	6
9. Elementary Occupations	57	60	65	62	58	-7	24	17
Total	910	1,074	1,162	1,190	1,194	32	425	457

Percentage Shares						Percentage Changes		
	1984	1994	2004	2009	2014			
1. Managers & Senior Officials	12	14	14	15	16	12	35	48
2. Professional Occupations	6	7	8	8	9	21	34	55
3. Associate Professional & Technical Occupations	11	11	12	13	13	8	32	40
4. Administrative, Clerical & Secretarial Occupations	53	50	45	44	41	-6	39	33
5. Skilled Trades Occupations	3	3	3	3	3	-5	35	29
6. Personal Service Occupations	1	1	1	1	1	7	39	46
7. Sales & Customer Service Occupations	6	7	9	9	10	24	34	57
8. Machine & Transport Operatives	2	2	2	2	2	-6	35	29
9. Elementary Occupations	6	6	6	5	5	-11	37	26
Total	100	100	100	100	100	3	37	39

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.18.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.18.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	36	5	15	16	20	18	-6	8	21	7	-3	16
2. Professional Occupations	21	2	7	11	18	9	-3	12	19	4	-1	17
3. Associate Professional & Technical Occupations	28	4	13	10	21	15	-5	11	11	6	-2	7
4. Administrative, Clerical & Secretarial Occupations	52	21	66	-35	-6	66	-22	-50	-33	23	-8	-48
5. Skilled Trades Occupations	5	1	4	0	0	4	-1	-3	-2	1	-1	-3
6. Personal Service Occupations	3	0	2	1	2	2	-1	1	1	1	0	1
7. Sales & Customer Service Occupations	15	2	8	4	29	9	-3	23	23	4	-2	21
8. Machine & Transport Operatives	2	1	3	-1	0	3	-1	-1	-1	1	0	-2
9. Elementary Occupations	3	2	8	-7	4	7	-3	0	-7	3	-1	-9
Total	164	39	125	0	88	133	-45	0	32	50	-18	0

	1984-1994		% change		1994-2004		% change		2004-2014		% change	
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	32.8	4.3	13.7	14.7	13.6	12.4	-4.2	5.4	12.5	4.3	-1.6	9.7
2. Professional Occupations	39.7	4.3	13.7	21.6	24.9	12.4	-4.2	16.7	21.5	4.3	-1.6	18.7
3. Associate Professional & Technical Occupations	28.8	4.3	13.7	10.8	16.9	12.4	-4.2	8.7	7.7	4.3	-1.6	5.0
4. Administrative, Clerical & Secretarial Occupations	10.8	4.3	13.7	-7.2	-1.1	12.4	-4.2	-9.3	-6.4	4.3	-1.6	-9.1
5. Skilled Trades Occupations	17.2	4.3	13.7	-0.8	-1.2	12.4	-4.2	-9.4	-5.5	4.3	-1.6	-8.2
6. Personal Service Occupations	25.2	4.3	13.7	7.2	13.3	12.4	-4.2	5.1	7.1	4.3	-1.6	4.3
7. Sales & Customer Service Occupations	26.0	4.3	13.7	8.0	40.9	12.4	-4.2	32.7	23.6	4.3	-1.6	20.8
8. Machine & Transport Operatives	12.9	4.3	13.7	-5.1	2.3	12.4	-4.2	-5.9	-5.9	4.3	-1.6	-8.7
9. Elementary Occupations	5.7	4.3	13.7	-12.3	7.5	12.4	-4.2	-0.7	-10.9	4.3	-1.6	-13.6
Total	18.0	4.3	13.7	0.0	8.2	12.4	-4.2	0.0	2.8	4.3	-1.6	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.19 PROFESSIONAL SERVICES

6.19.1 Description of the industry

INDUSTRY 19: PROFESSIONAL SERVICES		
SIC92 headings: 70, 71, 73		
Real estate activity, including development, buying and selling, letting and management of real estate. Renting of machinery, equipment, personal and household goods, incl. motor vehicles and other transport equipment. R&D on natural sciences, engineering, social sciences etc.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	7.7	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	768,000	30,099,000
Share of total employment (% 2004):	2.6	100
Gender split (male:female) (% 2004):	60:40	54:46
Part-time share (% 2004):	23	28
Self-employment share (% 2004):	16	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.19.2 Industry Commentary

This sector contains a very varied group of professional occupations, one sub-group of whose activities are focused on real estate, including development, buying and selling, letting and management of property. The residential housing market which has exhibited strong performance in recent years has flattened out in 2004-5, although activity remains relatively buoyant. House prices increased very rapidly in the late 1990s and early 2000s and this has resulted in many potential first time buyers being pushed out of the market. Inevitably, activity has slowed down somewhat.

The commercial property market, on the other hand was in the doldrums until recently, but it has begun a recovery over the last year, especially in central London. Demand for offices, retail space and entertainment property appears to be strengthening. Most regional property markets are expected to maintain activity levels in the short term.

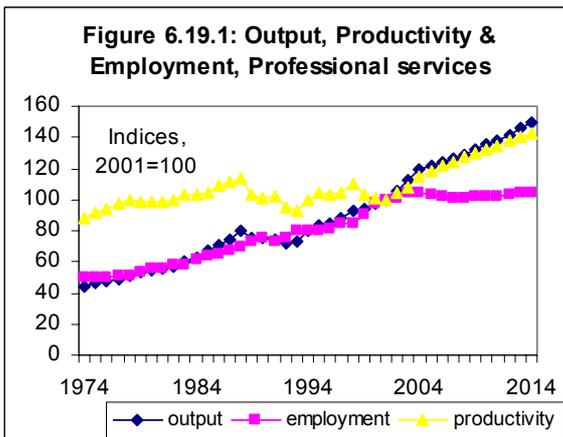
Another area of activity is concerned with the renting of machinery, equipment, and personal and household goods, to include motor vehicles and other transport equipment. Plant and machinery rental has been affected by the general slowdown in economic activity since 2000. However, the buoyant construction sector in the last year or so has led to some recovery in this sector more recently. Small contractors make widespread use of plant hire, as they can rarely afford to buy new plant. This sector has seen strong growth in the last few years.

The final area of activity is based around research and development in natural sciences, engineering and social sciences. The services sector is beginning to increase its spending on research and development, as firms seek to raise productivity levels. Much of this increase is attributable to high-tec industries, but some traditional industries, such as retailing, are also investing more in R&D.

6.19.3 Productivity and Output trends

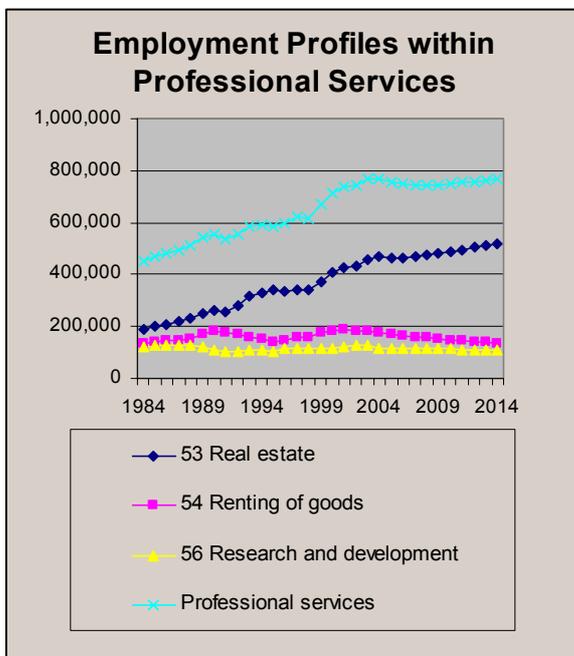
Table 6.19.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.2	4.9	2.0	2.5
Employment (% pa)	2.4	2.8	-0.6	0.6
(000s)	76	100	-22	22
Productivity (% pa)	0.8	2.0	2.6	1.9



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output in this sector grew strongly as the UK property market flourished over the last decade. Whilst growth prospects for the next ten years is rather less certain, positive output growth is projected, albeit at a slightly lower rate than previously. Increases at or just above 2 per cent per annum are projected.
- Productivity appears to have slowed significantly in the period between 1998 and 2001 but has subsequently picked up rapidly.
- Employment has risen steadily since the early 1990s. This trend is not projected to continue in the immediate future, with a slight fall in the short term but a pick up towards the end of the period to 2014.
- This disguises significant compositional effects within the industry, as illustrated in the supplementary figure. Real estate has been by far the fastest growing component but growth here is projected to slow. The prospects for the other two elements are less optimistic, especially for the renting of goods.



6.19.4 Employment by Status and Gender

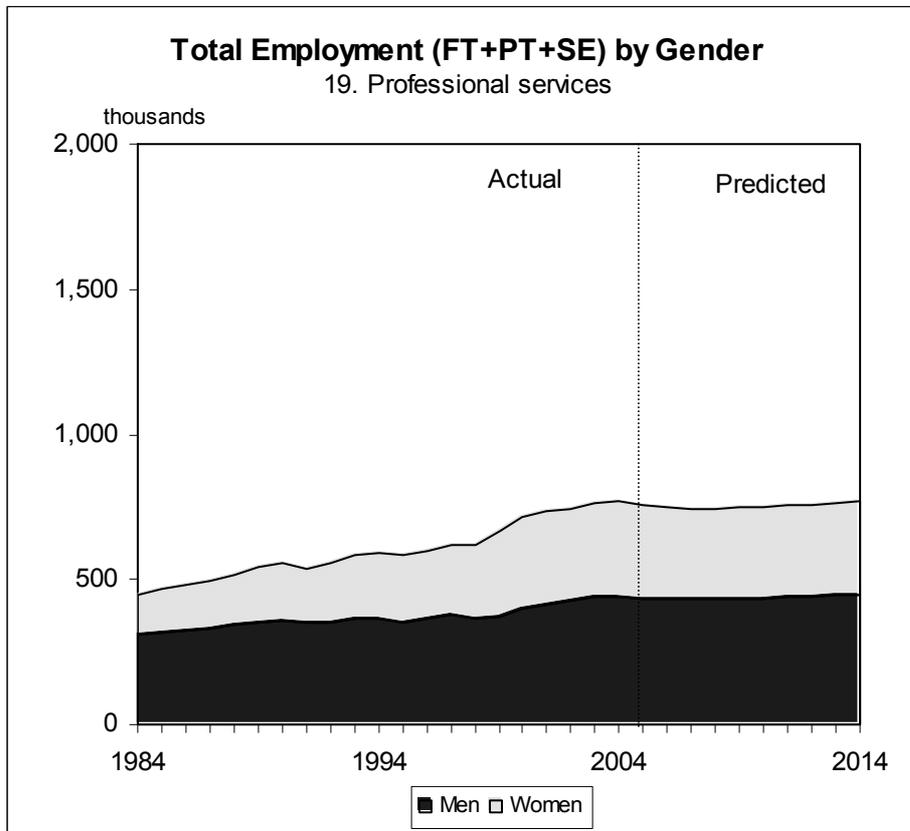
Males account for just over half the jobs in this industry. Part-time workers account for 1 in every 5 jobs. They are predominantly held by females. Self employment accounts for around 16 per cent of all jobs, but in this case males predominate.

Table 6.19.2: Employment Levels by Gender and Status, Prof. Services

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	shares				
2004								2004-09				
Male employment	314	(40.9)	41	(5.3)	87	(11.4)	442	(57.5)	-10	5	-4	-9
Female employment	182	(23.7)	106	(13.9)	37	(4.9)	326	(42.5)	-11	-6	5	-12
Total employment	496	(64.6)	147	(19.2)	125	(16.2)	768	(100)	-21	-1	1	-22
2009								2004-14				
Male employment	304	(40.7)	46	(6.1)	83	(11.1)	433	(58)	2	13	0	15
Female employment	171	(22.9)	100	(13.4)	42	(5.7)	314	(42)	-1	0	8	7
Total employment	476	(63.7)	146	(19.5)	125	(16.8)	747	(100)	2	13	8	22
2014								2004-14				
Male employment	307	(39.9)	58	(7.6)	83	(10.8)	448	(58.3)	-8	18	-4	6
Female employment	171	(22.2)	100	(13)	50	(6.5)	320	(41.7)	-12	-7	12	-6
Total employment	477	(62.1)	158	(20.6)	133	(17.3)	769	(100)	-19	11	8	0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

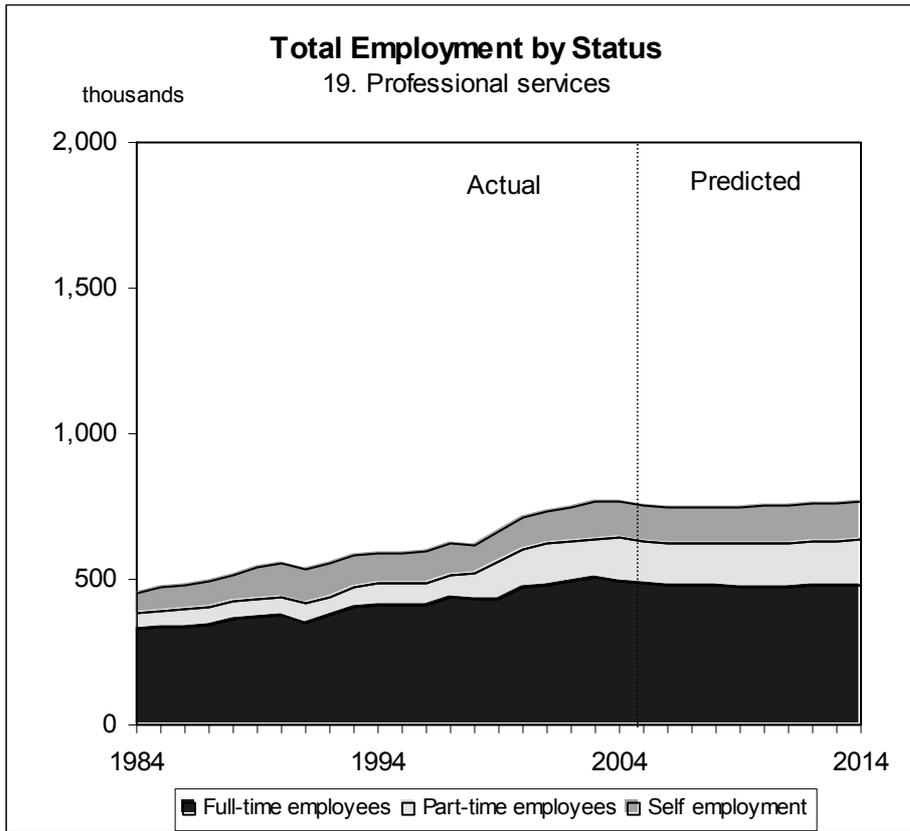
Figure 6.19.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Females are projected to maintain their share of the total number of jobs in this industry at just over 40 per cent.

Figure 6.19.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Both part-time employment and self employment are expected to increase in importance, marginally over the projection period.

6.19.5 Projections of Employment by Occupation

Key aspects of occupational employment structure

- Again four groups dominate employment:
 - managers & senior officials;
 - professional occupations;
 - association professional and technical occupations;
 - administrative, clerical & secretarial occupations.
- Each of the first three of these accounts for around 1 in every 5 jobs.
- As in other industries, the first three occupations have seen a rising share of employment, while the last one has experienced a declining share in recent years, as the effects of ICT have hit.

Future changes

- Occupational structure is not expected to change radically. The same three occupations will all see employment growth.
- Personal service occupations and sales & customer service occupations are also expected to see a significant increase in both their share of total employment and the absolute number of jobs.

Shift share analysis

Table 6.19.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect

demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

For the Professional services industry, the industry effect has played a major part in expanding employment in the past two decades, accounting for an increase of around 28 per cent in the period 1984-94 falling slightly to 17 per cent in the 1994-2004. Over the projection period, the industry effect is however projected to turn negative as compositional effects, generally poorer output prospects, coupled with projected productivity gains, take effect.

Over the projection period administrative & clerical and elementary occupations are the main exceptions to the rule of positive occupational effects.

Replacement demands

Table 6.19.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Expansion demands are expected to be trivial but replacement needs will add more than a quarter of a million to total requirements by 2014.
- Replacement needs affect all occupations, but are especially important for the 4 occupations highlighted above and the personal service occupations group.

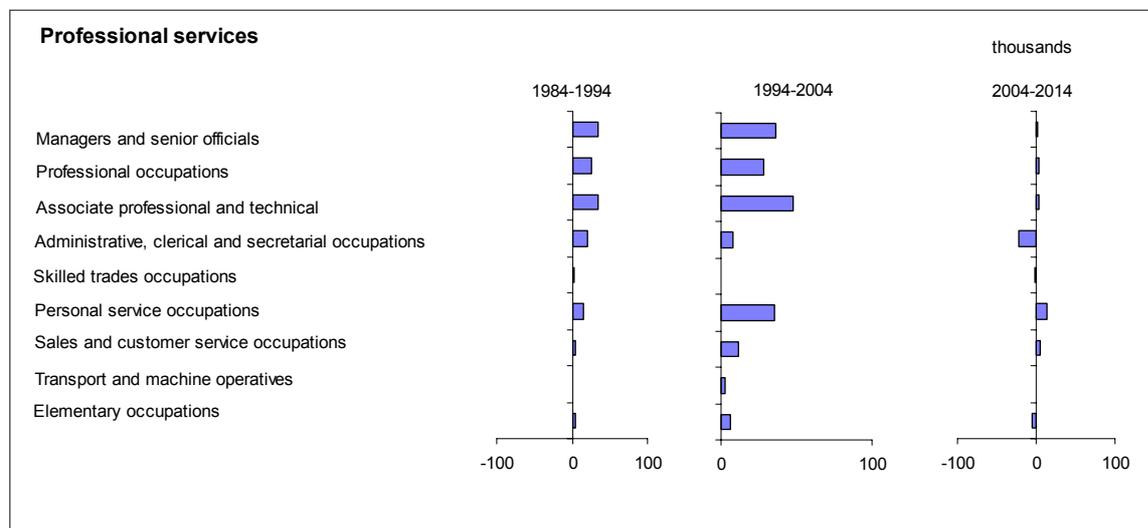
Table 6.19.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Professional services Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	81	117	152	151	154	2	55	57
2. Professional Occupations	71	96	124	124	128	4	40	43
3. Associate Professional & Technical Occupations	77	111	159	157	163	4	50	54
4. Administrative, Clerical & Secretarial Occupations	96	116	125	110	103	-22	50	28
5. Skilled Trades Occupations	32	35	36	34	34	-2	12	9
6. Personal Service Occupations	17	32	67	71	81	14	27	41
7. Sales & Customer Service Occupations	12	16	27	29	33	5	9	15
8. Machine & Transport Operatives	23	25	27	27	28	0	10	10
9. Elementary Occupations	40	43	50	44	45	-5	18	13
Total	449	592	768	747	769	0	270	271

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	18	20	20	20	20	1	36	37
2. Professional Occupations	16	16	16	17	17	3	32	35
3. Associate Professional & Technical Occupations	17	19	21	21	21	2	32	34
4. Administrative, Clerical & Secretarial Occupations	21	20	16	15	13	-17	40	23
5. Skilled Trades Occupations	7	6	5	5	4	-6	33	26
6. Personal Service Occupations	4	5	9	10	11	21	40	61
7. Sales & Customer Service Occupations	3	3	4	4	4	20	34	53
8. Machine & Transport Operatives	5	4	4	4	4	1	35	36
9. Elementary Occupations	9	7	6	6	6	-9	36	27
Total	100	100	100	100	100	0	35	35

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.19.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.19.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	35	3	22	10	36	14	20	1	2	7	-6	2
2. Professional Occupations	25	3	20	3	28	12	17	-1	4	5	-5	4
3. Associate Professional & Technical Occupations	34	3	21	9	48	14	19	15	4	7	-7	4
4. Administrative, Clerical & Secretarial Occupations	21	4	26	-10	8	14	20	-26	-22	5	-5	-22
5. Skilled Trades Occupations	3	1	9	-7	1	4	6	-9	-2	2	-2	-2
6. Personal Service Occupations	15	1	5	9	35	4	6	26	14	3	-3	14
7. Sales & Customer Service Occupations	4	0	3	1	11	2	3	7	5	1	-1	5
8. Machine & Transport Operatives	2	1	6	-6	2	3	4	-5	0	1	-1	0
9. Elementary Occupations	4	2	11	-9	6	5	8	-7	-5	2	-2	-5
Total	143	19	123	0	176	73	103	0	0	33	-33	0

	1984-1994		% change		1994-2004		% change		2004-2014		% change	
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	43.6	4.3	27.5	11.9	30.8	12.4	17.4	1.0	1.3	4.3	-4.3	1.3
2. Professional Occupations	35.5	4.3	27.5	3.8	29.0	12.4	17.4	-0.8	3.0	4.3	-4.3	2.9
3. Associate Professional & Technical Occupations	43.6	4.3	27.5	11.8	43.0	12.4	17.4	13.2	2.3	4.3	-4.3	2.2
4. Administrative, Clerical & Secretarial Occupations	21.4	4.3	27.5	-10.4	7.2	12.4	17.4	-22.6	-17.5	4.3	-4.3	-17.5
5. Skilled Trades Occupations	10.8	4.3	27.5	-21.0	2.8	12.4	17.4	-27.0	-6.3	4.3	-4.3	-6.4
6. Personal Service Occupations	83.4	4.3	27.5	51.7	110.4	12.4	17.4	80.6	21.0	4.3	-4.3	21.0
7. Sales & Customer Service Occupations	37.2	4.3	27.5	5.4	72.7	12.4	17.4	42.9	19.7	4.3	-4.3	19.7
8. Machine & Transport Operatives	7.4	4.3	27.5	-24.4	9.2	12.4	17.4	-20.6	0.7	4.3	-4.3	0.7
9. Elementary Occupations	9.6	4.3	27.5	-22.1	14.6	12.4	17.4	-15.2	-9.1	4.3	-4.3	-9.1
Total	31.8	4.3	27.5	0.0	29.8	12.4	17.4	0.0	0.1	4.3	-4.3	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.20 COMPUTING SERVICES

6.20.1 Description of the Industry

INDUSTRY 20: COMPUTING SERVICES		
SIC92 headings: 72		
Hardware consultancy; software consultancy and supply including development, production, supply and documentation of customised and on-customised software; data processing including facilities management; database activities including on-line data retrieval; maintenance and repair of computer equipment; and other computer related activities.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	3.3	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	550,000	30,099,000
Share of total employment (% 2004):	1.8	100
Gender split (male:female) (% 2004):	65:35	54:46
Part-time share (% 2004):	11	28
Self-employment share (% 2004):	14	13

Source: 6725output.xls (industry profile) CE/IER estimates based on ONS data.

6.20.2 Industry Commentary

This sector grew very rapidly in the 1990s driven by the expansion in internet usage, the continued spread of PCs, the widespread adoption of mobile telephony and continued specialisation and outsourcing of the IT function. The liberalisation of telecommunications within the EU also contributed along with the demand for product upgrades and services associated with the turn of the millennium. Larger organisations in particular saw their ICT requirements expand significantly. This expansion benefited the UK since it enjoys more than one fifth of the total western Europe ICT market, which in itself is around 30 per cent of the world market.

In the 1990s computing services focused mainly on the needs of large organisations (companies, government, institutions), which were most affected by the new regulatory climate, by liberalisation and the potential of IT. They had the resources to

acquire the new technologies and they needed professional advice and practical help on such complex issues as designing IT systems, reciprocally modifying IT and other business systems, developing new business models and identifying new markets. These needs normally outstripped the capacities of their own IT departments. Most software development tackled the management and interpretation of data within large organisations and the systems required by IT equipment. The provision of services and software became ever more profitable.

The IT market in the present decade seems likely to be dominated, at least in developed countries, by the diffusion of such technologies as broadband, by near-universal computing and by mobile phone services linked to the internet. In many ways this projected development continues the pattern of the 1990s, except that the building of information highways are now largely complete and the focus is

shifting from stationary to mobile applications. This structure will accentuate the move towards services rather than hardware provision.

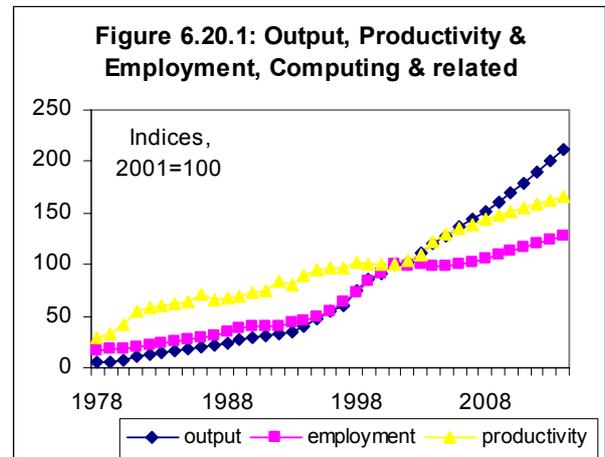
The early 2000s saw a sharp slowdown in technology spending, followed by a slow recovery in 2003-4. While the computer services industry had significant output growth in 2004, industry employment fell following strong productivity gains and some off-shore job switching. Future large-scale government projects in health, judiciary and customs and excise will provide some support to the industry, but its prospects are heavily dependent on the timing of the business cycle and the adoption of new mobile ICT applications.

Alternative Forecasts

More detailed tailored forecasts are available from e-skills-UK, for part of its footprint, namely IT, and these have been agreed with their industry’s employers. However, because of its interest in IT skills needs across the economy, e-skills-UK has also extended its projections beyond the IT industry and developed an occupational aspect to its forecasts. The employment projections e-skills-UK use are based on a model linked to the Experian macroeconomic model. The underlying employment data and model

framework are based on LFS and other data. In broad terms the projections of e-skills-UK paint a similar picture of rapid employment growth with a particular emphasis on higher occupations. However, their projections provide more detail occupationally. The e-skills UK forecasts are available from: www.e-skills.com/bin/wms.pl/1055.

6.20.3 Productivity and Output Trends



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

Table 6.20.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	16.1	7.3	5.9	5.7
Employment (% pa)	13.6	3.2	1.9	3.3
(000s)	222	80	55	106
Productivity (% pa)	2.2	3.9	3.9	2.4

Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- This industry has shown one of the most rapidly rising trends in output, with growth in the past 10 years averaging 10 per cent per annum. The phenomenal growth of ICT has been the driving force.
- This growth is expected to slow somewhat over the next decade, but, in comparative terms, projected growth at just below 6 per cent per annum remains very strong.
- Productivity has followed an equally impressive trend (as measured by output per person employed).
- Employment growth is slow in the short period until 2009, thereafter it is projected to pick up again, reaching over 3 per cent per annum and resulting in an additional 160 thousand extra jobs by 2014.

6.20.4 Employment by Status and Gender

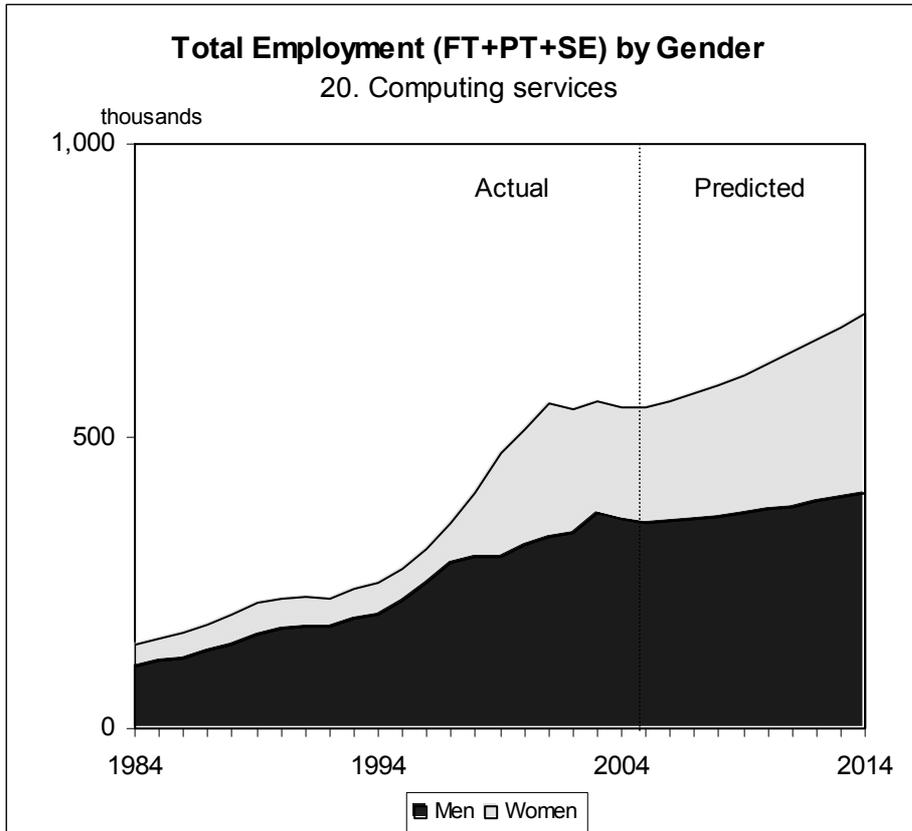
Females currently account for just over a third of all 10 jobs in this industry but this has been rising. Part-time employment is also on a rising trend, currently accounting for around 14 per cent of all jobs. Self employment accounted for around 1 in 10 jobs in 2004, but this has been on a declining trend.

Table 6.20.2 Employment Levels by Gender and Status, Computing services

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	shares				
2004									2004-09			000s
	286	(52)	20	(3.6)	52	(9.5)	358	(65)	28	5	-24	10
	128	(23.2)	59	(10.7)	6	(1.1)	192	(35)	32	17	-4	45
	414	(75.1)	79	(14.3)	58	(10.6)	550	(100)	60	23	-27	55
2009									2009-14			
Male employment	314	(51.8)	25	(4.2)	28	(4.7)	368	(60.7)	47	8	-19	36
Female employment	159	(26.3)	76	(12.6)	2	(0.4)	238	(39.3)	47	25	-1	71
Total employment	473	(78.2)	101	(16.7)	31	(5.1)	605	(100)	94	33	-20	106
2014									2004-14			
Male employment	360	(50.7)	33	(4.7)	9	(1.3)	403	(56.7)	74	13	-43	45
Female employment	206	(29)	101	(14.2)	1	(0.1)	308	(43.3)	79	42	-5	116
Total employment	567	(79.7)	134	(18.9)	10	(1.5)	711	(100)	153	56	-48	161

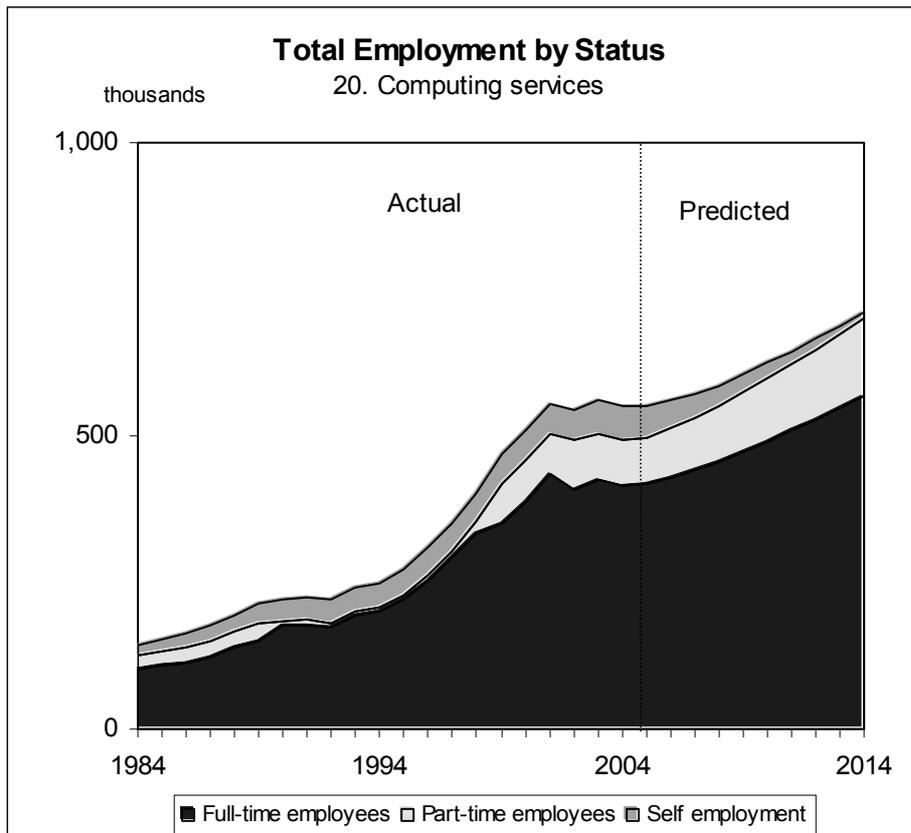
Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

Figure 6.20.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Females are projected to continue to share in the rapid growth of employment in this industry. They are expected to increase their share quite significantly to around 43 per cent by 2014.

Figure 6.20.3: Changing Patterns of Sectoral Employment by Status

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Based on a continuation of recent trends, part-time employment is projected to see a further rise in its share.
- Self-employment shares, by contrast are projected to fall sharply, again based on a continuation of recent patterns. The changes may be less extreme than indicated here.

6.20.5 Projections of Employment by Occupation

Key aspects of Occupational Structure

- Four occupational groups dominate employment in this industry, each accounting for around 1 in 5 jobs.
- These occupations are:
 - managers and senior officials;
 - professionals occupations;
 - associate professional & technical occupations; and
 - administrative, clerical & secretarial occupations.

All other occupations have very low employment job shares.

Future changes

- These patterns are expected to remain essentially unchanged over the next 10 years, with employment for all four key occupational groups growing substantially.
- Sales & customer service occupations are also projected to benefit and to increase their share of the job total.

Shift share analysis

Table 6.20.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect

demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

In Computing & related services there has been a huge and growing industry effect. This was 70 per cent in the period 1984-94, rising to 109 per cent in 1994-2004. This represented a period of unprecedented growth. The industry effect is expected to moderate to around 25 per cent over the projection period.

Over the projection period some sharp negative occupational effects for skilled trades, transport & machine operatives and elementary occupations serve to offset some of these positive effects.

Replacement demands

Table 6.20.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Total requirements are twice as large as the already significant expansion demand projected.
- These replacement demands are also concentrated in the four main occupations already highlighted.

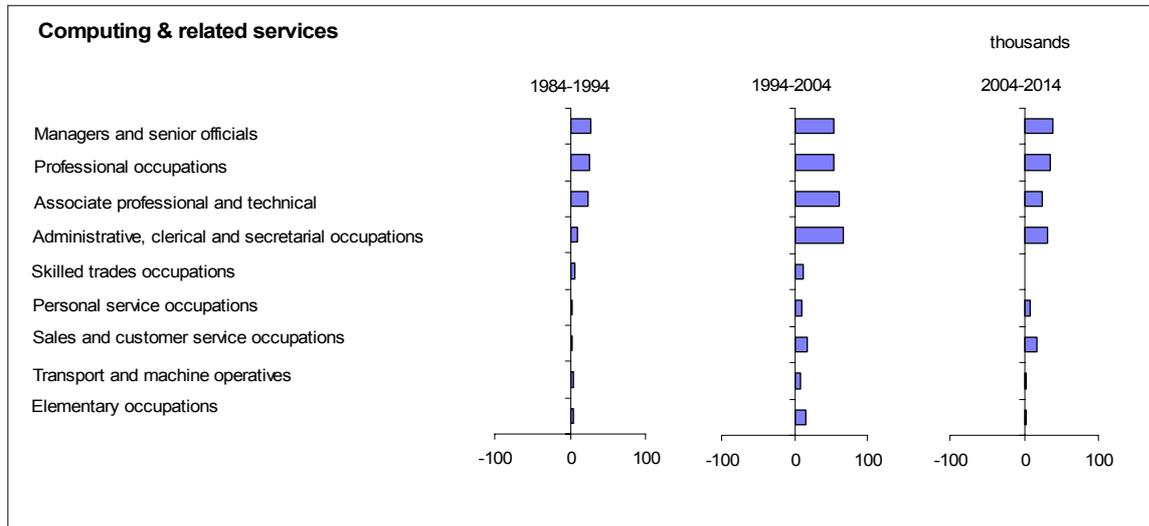
Table 6.20.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Computing & related services Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	24	51	106	118	144	38	36	75
2. Professional Occupations	27	53	106	118	141	35	33	68
3. Associate Professional & Technical Occupations	25	49	111	117	136	25	34	59
4. Administrative, Clerical & Secretarial Occupations	33	43	110	123	141	31	46	77
5. Skilled Trades Occupations	10	17	29	29	31	2	10	12
6. Personal Service Occupations	3	4	14	18	22	8	5	13
7. Sales & Customer Service Occupations	4	6	23	31	41	18	8	26
8. Machine & Transport Operatives	7	11	21	21	23	2	7	9
9. Elementary Occupations	10	14	30	31	33	2	10	13
Total	143	248	550	605	711	161	190	351

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	17	20	19	19	20	36	34	71
2. Professional Occupations	19	21	19	19	20	33	31	64
3. Associate Professional & Technical Occupations	17	20	20	19	19	23	31	54
4. Administrative, Clerical & Secretarial Occupations	23	17	20	20	20	28	41	70
5. Skilled Trades Occupations	7	7	5	5	4	6	34	40
6. Personal Service Occupations	2	2	3	3	3	56	38	94
7. Sales & Customer Service Occupations	3	2	4	5	6	76	34	110
8. Machine & Transport Operatives	5	5	4	4	3	10	35	46
9. Elementary Occupations	7	6	5	5	5	8	33	41
Total	100	100	100	100	100	29	34	64

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.20.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.20.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	27	1	17	9	55	6	55	-7	38	5	26	7
2. Professional Occupations	26	1	19	7	53	7	58	-11	35	5	26	4
3. Associate Professional & Technical Occupations	24	1	17	5	62	6	53	3	25	5	28	-7
4. Administrative, Clerical & Secretarial Occupations	10	1	23	-15	67	5	47	15	31	5	28	-1
5. Skilled Trades Occupations	7	0	7	-1	12	2	18	-8	2	1	7	-7
6. Personal Service Occupations	2	0	2	0	10	1	5	4	8	1	4	4
7. Sales & Customer Service Occupations	2	0	3	-1	17	1	7	10	18	1	6	11
8. Machine & Transport Operatives	4	0	5	-1	9	1	12	-5	2	1	5	-4
9. Elementary Occupations	4	0	7	-4	16	2	16	-2	2	1	8	-6
Total	106	6	100	0	302	31	271	0	161	24	137	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	111.8	4.3	70.0	37.5	108.3	12.4	109.1	-13.2	36.3	4.3	25.0	7.0
2. Professional Occupations	99.0	4.3	70.0	24.7	100.9	12.4	109.1	-20.6	33.0	4.3	25.0	3.7
3. Associate Professional & Technical Occupations	96.0	4.3	70.0	21.7	128.0	12.4	109.1	6.5	22.6	4.3	25.0	-6.7
4. Administrative, Clerical & Secretarial Occupations	29.8	4.3	70.0	-44.5	156.3	12.4	109.1	34.8	28.2	4.3	25.0	-1.1
5. Skilled Trades Occupations	67.3	4.3	70.0	-7.0	73.6	12.4	109.1	-48.0	5.5	4.3	25.0	-23.7
6. Personal Service Occupations	70.6	4.3	70.0	-3.7	221.7	12.4	109.1	100.2	56.1	4.3	25.0	26.8
7. Sales & Customer Service Occupations	60.3	4.3	70.0	-14.0	277.5	12.4	109.1	155.9	75.8	4.3	25.0	46.5
8. Machine & Transport Operatives	57.7	4.3	70.0	-16.6	79.9	12.4	109.1	-41.7	10.4	4.3	25.0	-18.9
9. Elementary Occupations	39.3	4.3	70.0	-35.0	109.8	12.4	109.1	-11.7	8.1	4.3	25.0	-21.2
Total	74.3	4.3	70.0	0.0	121.5	12.4	109.1	0.0	29.3	4.3	25.0	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.21 OTHER BUSINESS SERVICES

6.21.1 Description of the industry

INDUSTRY 21: OTHER BUSINESS SERVICES		
SIC92 headings: 74		
Other business services incl.: recruitment agencies; security services; industrial cleaning; photographic, packaging and secretarial services; and other business services nes. Other professional services incl.: legal, accountancy, tax, market research, other consultancy, architects, engineering services, weather forecasting, surveying; technical testing; advertising.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	7.9	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	3,465,000	30,099,000
Share of total employment (% 2004):	11.5	100
Gender split (male:female) (% 2004):	57:43	54:46
Part-time share (% 2004):	23	28
Self-employment share (% 2004):	15	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.21.2 Industry Commentary

This sector covers the high value services provided by accountants, lawyers and consultants of various kinds to both the private and public sector. Scale economies are important and there are now very few large accountancy firms which offer a much wider range of business advice than their previously rather narrowly defined accounting role. This in turn makes them rather more vulnerable to the economic cycle. The downturn in merger and acquisition activity in the early 2000s, on which these firms grew rapidly during the 1980s and 1990s, together with the fall and flattening out in stock prices, have led to a reduction in the demand for their services. As a result, there have been some well-publicised cutbacks amongst these firms. Some restructuring has been required in accountancy firms and this is further inspired by forthcoming greater EU

regulation that will present new skill challenges. Increasingly, globalisation is shaping the profession in the UK.

Advertising is very sensitive to the economic cycle and it has struggled somewhat since the turn of the century, although 2004 saw a return to strong growth in advertising spending. Advertising agencies are having to find new ways to reach consumers, beyond the printed media and television.

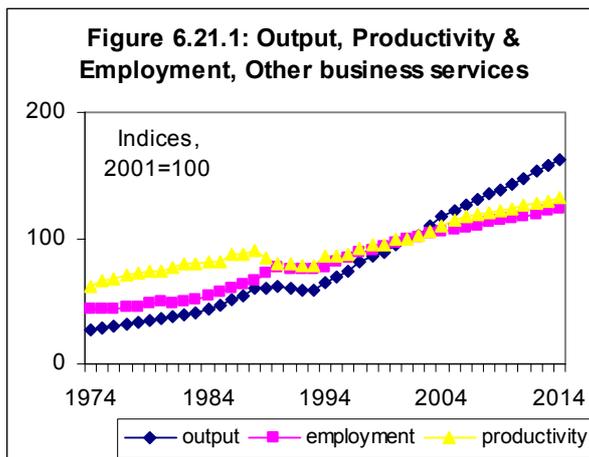
Legal services continue to generate high revenues for a small number of employees. Even during economic downturns, multinational firms require global legal firms to deal with the intricacies of the legal frameworks which govern cross-border transactions. More disclosure of financial information is allowing greater comparison among law firms.

The general economic turndown in the early 2000s affected recruitment and personnel services, which enjoyed good growth in the 1990s, given the kinds of labour sought and supplied through such agencies. Recruitment agencies saw a return to stronger growth in 2004.

6.21.3 Productivity and Output trends

Table 6.21.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	6.4	5.7	3.6	3.2
Employment (% pa)	4.2	2.5	1.6	1.6
(000s)	564	402	278	310
Productivity (% pa)	2.2	3.2	2.0	1.6



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output growth in this diverse industrial group has been maintained at relatively high levels in recent years. This pattern is expected to continue over the next decade, albeit at a somewhat reduced pace.
- Productivity growth has also been quite strong since the early 1990s and whilst there is expected to be a slight slowdown, further improvements are projected.
- The relatively optimistic outlook for output more than offsets the impact of productivity gains, resulting in significant projected increases in employment. These are expected to amount to well over half a million jobs over the next 10 years.

6.21.4 Employment by Status and Gender

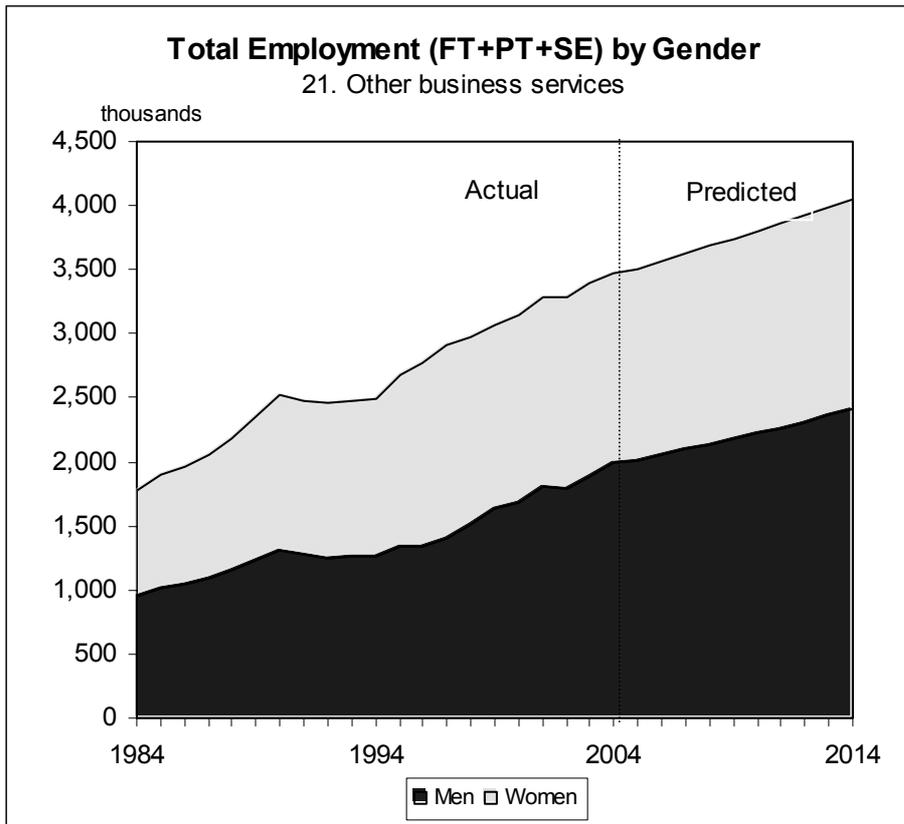
Females currently account for just over 40 per cent of the jobs in this industry. Many of these are part-time. In total, part-time jobs account for around a quarter of all employment. Self employment is rather less significant, accounting for around 15 per cent of the total, although this still amounted to over half a million jobs in 2004.

Table 6.21.2: Employment Levels by Gender and Status, Other bus. Services

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			000s
Male employment	1,326	(38.3)	279	(8.1)	381	(11)	1,986	(57.3)	132	30	35	197
Female employment	797	(23)	534	(15.4)	148	(4.3)	1,479	(42.7)	64	21	-5	80
Total employment	2,123	(61.3)	813	(23.4)	529	(15.3)	3,465	(100)	196	52	30	278
2009									2009-14			
Male employment	1,458	(38.9)	309	(8.3)	416	(11.1)	2,183	(58.3)	152	37	40	229
Female employment	861	(23)	555	(14.8)	143	(3.8)	1,559	(41.7)	71	17	-7	81
Total employment	2,319	(62)	864	(23.1)	559	(14.9)	3,743	(100)	223	54	33	310
2014									2004-14			
Male employment	1,609	(39.7)	347	(8.6)	456	(11.2)	2,412	(59.5)	283	68	75	426
Female employment	932	(23)	572	(14.1)	136	(3.4)	1,640	(40.5)	135	38	-12	161
Total employment	2,542	(62.7)	919	(22.7)	592	(14.6)	4,052	(100)	419	106	63	587

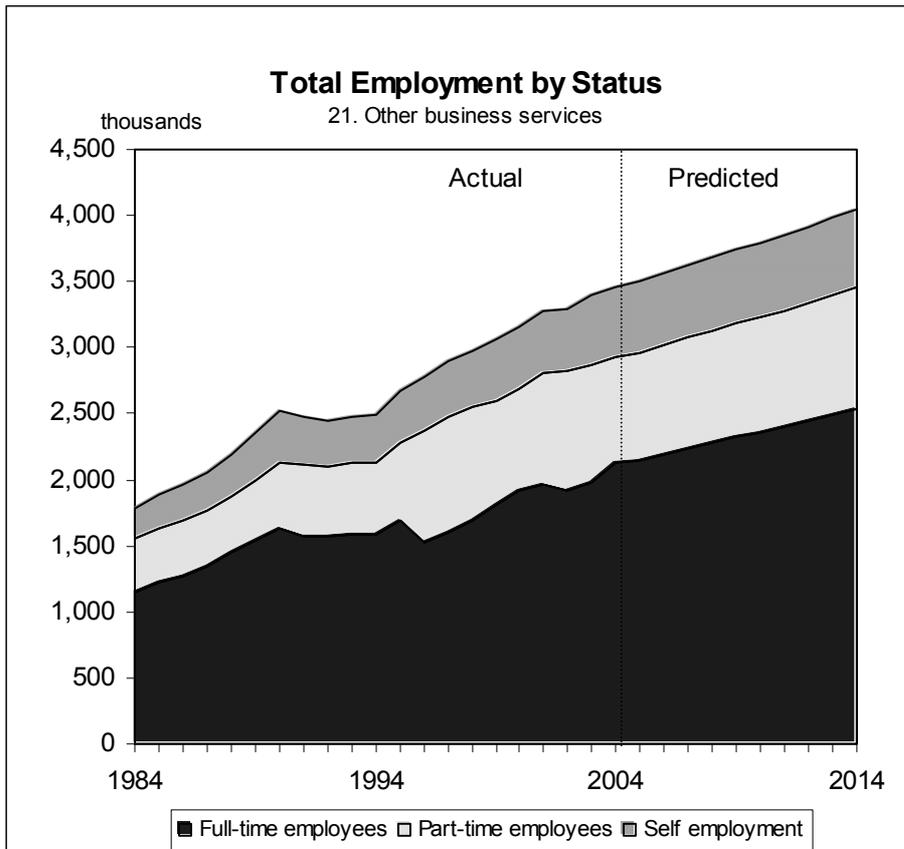
Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

Figure 6.21.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The female share of employment in this industry is projected to remain fairly stable over the decade, (falling very slightly).

Figure 6.21.3: Changing Patterns of Sectoral Employment by Status

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Full-time working will continue to be the most common pattern of employment.
- Part-time and self employment shares are not expected to change dramatically over the next decade (both falling slightly).

6.21.5 Projections of Employment by Occupation

Key aspects of occupational employment structure

- Four white-collar occupations dominate employment in this industry:
 - managers & senior officials;
 - professional occupations;
 - associate professional & technical occupations; and
 - administrative, clerical & secretarial occupations.

It is not a sector in which manual trades have much of a job share.

- In 2004 each of the four key occupations accounted for between 15 and 20 per cent of all employment. However, whereas the first three had been increasing their employment shares, the administrative & clerical group has seen a steady decline.

Future changes

- Employment gains are expected to continue in the managerial, professional and associate professional groups and, to a lesser extent, in personal service occupations.
- The administrative, clerical & secretarial group is likely to see significant job losses, as technological change makes inroads into jobs in these occupations.

Shift share analysis

Table 6.21.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect

demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

For Other business services there has also been a very strongly positive industry effect. In the period 1984-94, this was a very significant 36 per cent, declining slightly to just under 25 per cent in 1994-2004. Over the projection period, the industry effect is projected to decline further but will still result in the increase of employment of 12½ per cent across all occupations.

Over the projection period this is partially offset by negative occupational effects for administrative & clerical occupations and elementary occupations. These patterns broadly follow those for the previous decade.

Replacement demands

Table 6.21.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- In total, replacement demands are more than twice as large as the already exceptionally large expansion demand. The latter by itself projects almost 600 thousand more jobs by 2014.
- Replacement demands are concentrated heavily in all four of the white-collar occupations highlighted at the start of this section.
- Total requirements are projected to amount to over 1.8 million over the next 10 years.

Table 6.21.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Other business services						2004 - 2014		
Employment Levels (000s)	1984	1994	2004	2009	2014	Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	265	417	646	717	794	148	233	381
2. Professional Occupations	224	337	537	604	678	141	175	316
3. Associate Professional & Technical Occupations	263	423	699	772	857	159	223	382
4. Administrative, Clerical & Secretarial Occupations	531	671	659	646	621	-38	268	230
5. Skilled Trades Occupations	105	129	165	178	184	19	54	73
6. Personal Service Occupations	72	129	239	270	332	93	96	189
7. Sales & Customer Service Occupations	53	83	144	171	196	52	48	100
8. Machine & Transport Operatives	80	98	131	143	155	24	46	70
9. Elementary Occupations	184	213	246	243	235	-10	89	78
Total	1,778	2,498	3,465	3,743	4,052	587	1,232	1,819

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
1. Managers & Senior Officials	15	17	19	19	20	23	36	59
2. Professional Occupations	13	13	15	16	17	26	33	59
3. Associate Professional & Technical Occupations	15	17	20	21	21	23	32	55
4. Administrative, Clerical & Secretarial Occupations	30	27	19	17	15	-6	41	35
5. Skilled Trades Occupations	6	5	5	5	5	11	33	44
6. Personal Service Occupations	4	5	7	7	8	39	40	79
7. Sales & Customer Service Occupations	3	3	4	5	5	36	33	70
8. Machine & Transport Operatives	4	4	4	4	4	18	35	54
9. Elementary Occupations	10	9	7	6	6	-4	36	52
Total	100	100	100	100	100	17	36	32

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.21.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.21.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	152	11	96	44	228	52	110	67	148	28	82	39
2. Professional Occupations	113	10	81	22	200	42	89	69	141	23	68	50
3. Associate Professional & Technical Occupations	160	11	95	53	276	52	111	112	159	30	88	40
4. Administrative, Clerical & Secretarial Occupations	140	23	192	-75	-12	83	176	-271	-38	28	83	-150
5. Skilled Trades Occupations	24	4	38	-19	36	16	34	-14	19	7	21	-9
6. Personal Service Occupations	57	3	26	27	111	16	34	61	93	10	30	53
7. Sales & Customer Service Occupations	30	2	19	8	61	10	22	29	52	6	18	28
8. Machine & Transport Operatives	18	3	29	-14	33	12	26	-5	24	6	17	2
9. Elementary Occupations	28	8	67	-46	33	26	56	-49	-10	11	31	-52
Total	720	76	644	0	967	310	656	0	587	150	438	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	57.2	4.3	36.2	16.6	54.8	12.4	26.3	16.1	22.9	4.3	12.6	6.0
2. Professional Occupations	50.2	4.3	36.2	9.7	59.3	12.4	26.3	20.6	26.3	4.3	12.6	9.3
3. Associate Professional & Technical Occupations	60.6	4.3	36.2	20.1	65.3	12.4	26.3	26.6	22.7	4.3	12.6	5.7
4. Administrative, Clerical & Secretarial Occupations	26.4	4.3	36.2	-14.1	-1.8	12.4	26.3	-40.5	-5.8	4.3	12.6	-22.8
5. Skilled Trades Occupations	22.8	4.3	36.2	-17.7	28.1	12.4	26.3	-10.6	11.4	4.3	12.6	-5.5
6. Personal Service Occupations	78.2	4.3	36.2	37.7	85.9	12.4	26.3	47.2	38.9	4.3	12.6	22.0
7. Sales & Customer Service Occupations	55.8	4.3	36.2	15.3	73.5	12.4	26.3	34.8	36.5	4.3	12.6	19.5
8. Machine & Transport Operatives	22.5	4.3	36.2	-18.0	34.1	12.4	26.3	-4.6	18.5	4.3	12.6	1.5
9. Elementary Occupations	15.3	4.3	36.2	-25.2	15.7	12.4	26.3	-23.0	-4.3	4.3	12.6	-21.2
Total	40.5	4.3	36.2	0.0	38.7	12.4	26.3	0.0	17.0	4.3	12.6	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.22 PUBLIC ADMINISTRATION & DEFENCE

6.22.1 Description of the Industry

INDUSTRY 22: PUBLIC ADMINISTRATION & DEFENCE		
SIC92 headings: 75		
General public service activities, including administration of central, regional and local bodies; business and government regulation agencies; foreign affairs, defence activities and judicial activities; police and fire services and compulsory social security.		
HM forces are not included in the main tables in this section		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	5.4	100
Exposure to International Trade:	zero	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	1,535,000	30,099,000
Share of total employment (% 2004):	5.1	100
Gender split (male:female) (% 2004):	51:49	54:46
Part-time share (% 2004):	18	28
Self-employment share (% 2004):	1	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.22.2 Industry Commentary

Although the long-term trend in employment in public administration & defence over the 1970s and 1980s was negative, as a result of cuts in expenditure, in part aided by the introduction of new technologies, the automation of some areas of service provision, as well as contracting out. More recently there have been sharp increases in employment in both central and local government.

Employment in public administration & defence has been growing steadily since 1998, as government has increased spending in a range of areas such as transport and various aspects of local government. Defence spending has also increased in the build-up to and aftermath of the Iraq war.

The government is concerned to achieve efficiency savings in public administration & defence. This objective will in part be met by the introduction of new technologies and automation of some areas of service provision, as well as contracting out. Removal of uncompetitive practices from government procurement will also assist the quest for higher productivity, but large scale efficiency savings are likely to prove elusive. It is quite likely that the removal of uncompetitive practices from government procurement may help to realise some savings.

The ageing of the population is also likely to have an impact on public administration & defence, not only through the changing demands on government services, such as education and health,

but also through the demands that will be made on the pension system, since many people are still largely dependent on the state-funded pension.

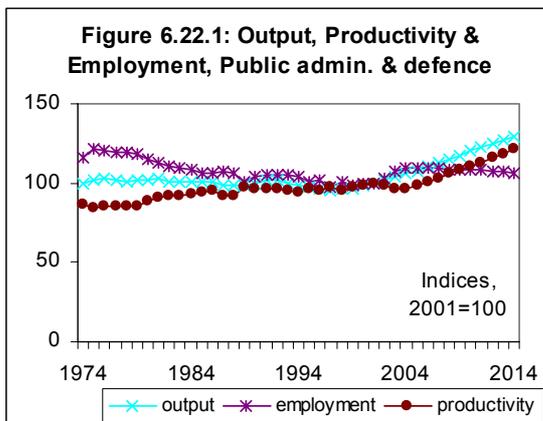
Output growth in public administration & defence & defence will quicken in the short term but job losses are expected subsequently. Currently, there is limited sharing of information among the different regulators that operate in the government sector. If more information were shared,

then it would reduce the need for duplicate inspections. The sharing of information could be facilitated by the merging of some public-service inspectorates. One option under consideration is to merge a variety of different functions into a much smaller number of inspectorates covering local government, health and social care, children and education, and criminal justice.

6.22.3 Productivity and Output trends

Table 6.22.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	-0.4	1.9	2.1	2.0
Employment (% pa)	-1.1	2.2	-0.1	-0.4
(000s)	-81	156	-8	-27
Productivity (% pa)	0.7	-0.2	2.3	2.3



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output in this industry is measured by public expenditure on such services. This has been fairly flat, in real terms, in recent years, although the government commitment to increase spending on public services has boosted output growth in the most period.
- Modest increases are projected over the next decade, in line with government announcements, as plans to improve services such as the police and fire services take effect.
- Productivity is difficult to measure in this sector. Trends in productivity have been flat, or even declining, over recent years. Some modest acceleration is projected, as policies to modernise and restructure a number of public services take effect.
- As a result of these trends, employment levels are expected to change very little. A very small decline is projected over the period to 2014.

6.22.4 Employment by Status and Gender

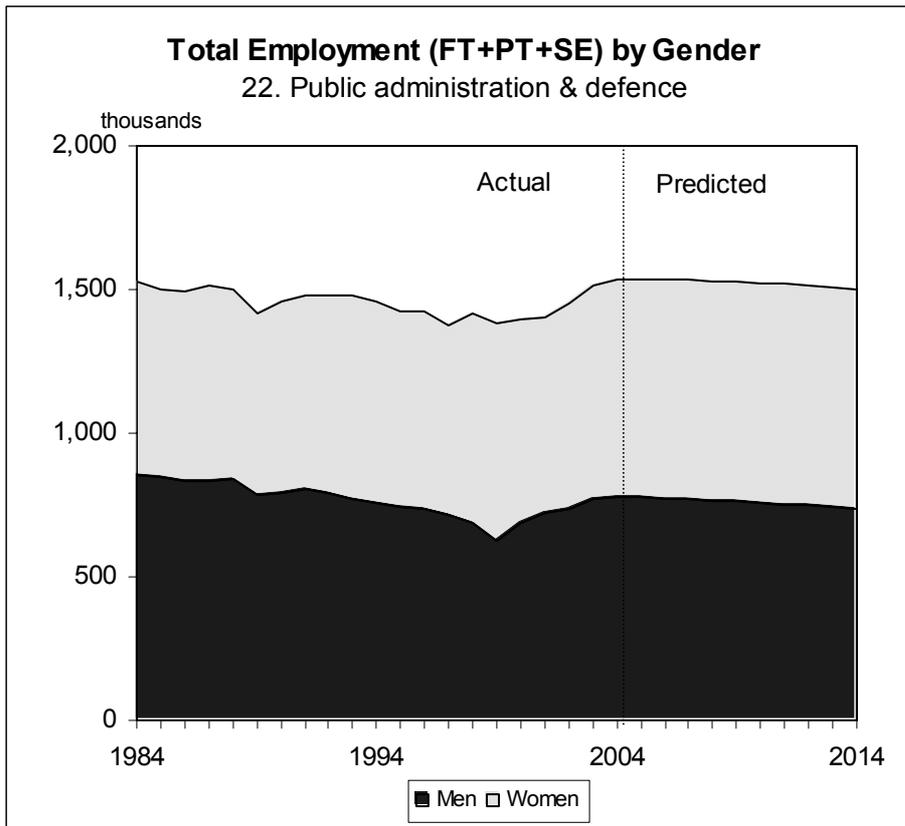
Employment in this industry is divided fairly equally between men and women. However, a much greater proportion of females work part-time. In total, part-timers account for just under 1 in 5 jobs. Self employment is insignificant.

Table 6.22.2: Employment Levels by Gender and Status, Public admin. & defence

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			000s
Male employment	710	(46.2)	56	(3.6)	12	(0.8)	777	(50.6)	-26	6	4	-16
Female employment	531	(34.6)	221	(14.4)	6	(0.4)	758	(49.4)	-3	10	0	8
Total employment	1,241	(80.8)	277	(18)	17	(1.1)	1,535	(100)	-29	16	4	-8
2009									2009-14			
Male employment	684	(44.8)	62	(4.1)	16	(1)	761	(49.9)	-34	6	4	-25
Female employment	529	(34.6)	231	(15.1)	6	(0.4)	766	(50.1)	-9	7	0	-2
Total employment	1,212	(79.4)	293	(19.2)	22	(1.4)	1,527	(100)	-43	12	4	-27
2014									2004-14			
Male employment	650	(43.3)	68	(4.5)	19	(1.3)	737	(49.1)	-60	12	8	-41
Female employment	520	(34.6)	238	(15.8)	6	(0.4)	764	(50.9)	-12	17	1	6
Total employment	1,169	(77.9)	305	(20.3)	26	(1.7)	1,500	(100)	-72	28	8	-35

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

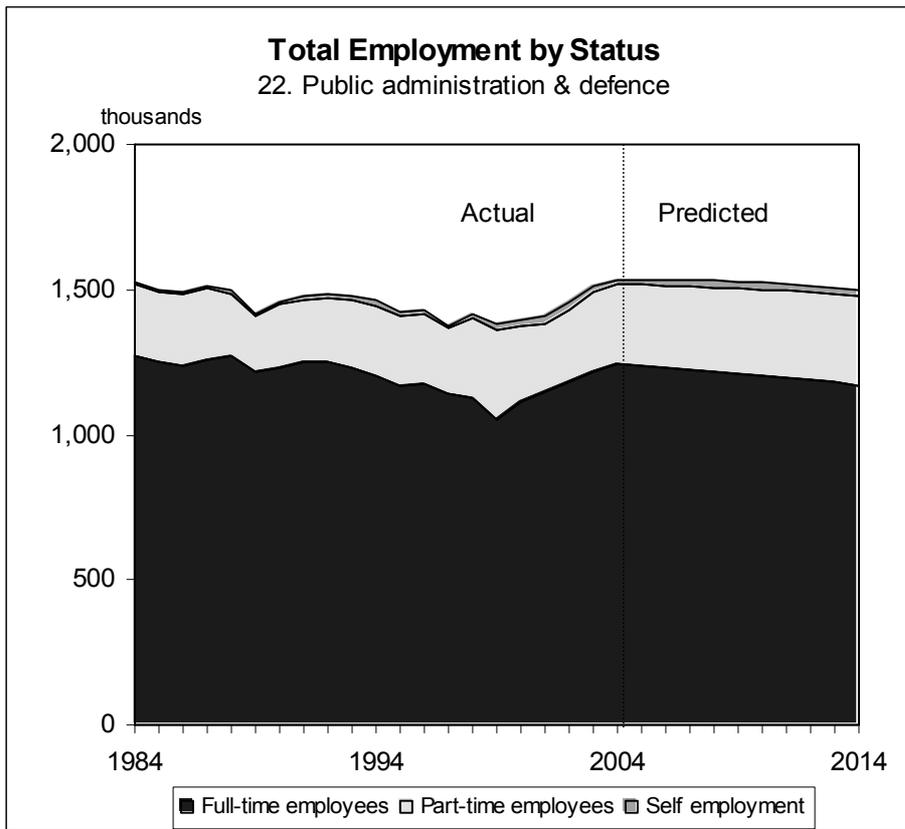
Figure 6.22.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Women are expected to continue to slowly increase their share of total employment. This sector is a popular source of jobs for women, especially those looking for part-time employment.

Figure 6.22.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Part-time working will continue to slowly increase its share of total employment, whilst self-employment will remain insignificant.

6.22.5 Projections of Employment by Occupation

Key Aspects of Occupational Employment Structure

- Administrative, clerical & secretarial occupations were the largest occupational group in 2004, although the employment share had fallen sharply in recent years to below 30 per cent.
- This group was closely followed by the associate professional and technical group, which accounted for over 20 per cent of all jobs in 2004.
- Managerial, professional and elementary occupations were also significant, each accounting for around 1 in 10 of all jobs.

Future Changes

- Occupational structures are only projected to evolve slowly, with further declines in share for the administrative, clerical & secretarial group and for elementary occupations.
- These losses are projected to be offset by small increases for managers & senior officials and the professional occupations.

Shift share analysis

Table 6.22.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

The industry effect has been negative for public administration & defence over the past two decades, accounting for a loss of around 9 per cent of jobs in the period 1984-94 and just over 7 per cent in 1994-2004. Over the projection period, the industry effect is projected to remain at a similar level, resulting in the loss of just under 7 per cent of jobs across all occupations.

Over the projection period, this is reinforced by negative occupational effects for administrative & clerical, skilled trades and elementary occupations, and to a lesser extent skilled trades. For most other occupations, positive occupational effects offset the negative industry effect. These patterns broadly follow those for the previous two decades.

Replacement demands

Table 6.22.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Despite a small decline in expansion demand, replacement demand for this industry will be substantial, with about half a million members of the current workforce needing to be replaced by 2014.
- The bulk of these replacement demands are for the administrative, clerical & secretarial occupations, and associate professional & technical occupations.
- However, there will also be significant replacement needs for people in most non manual occupations and additionally those in the elementary occupations.

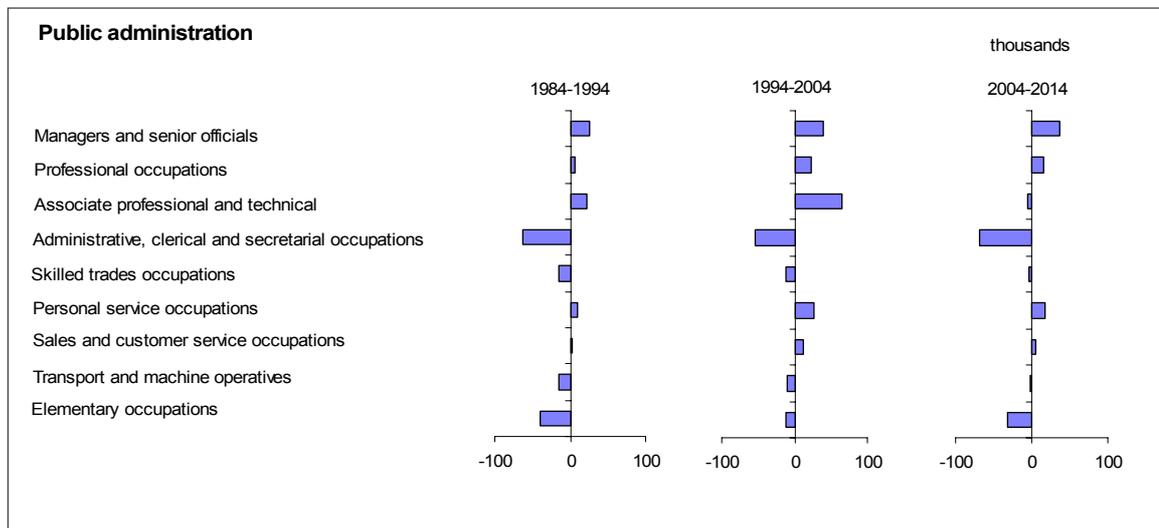
Table 6.22.3 Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Public admin and defence Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	135	162	201	220	238	37	73	110
2. Professional Occupations	135	141	164	174	181	17	58	74
3. Associate Professional & Technical Occupations	247	270	335	335	330	-5	98	93
4. Administrative, Clerical & Secretarial Occupations	535	472	418	387	348	-69	165	96
5. Skilled Trades Occupations	82	66	53	52	50	-3	18	14
6. Personal Service Occupations	41	51	76	85	93	17	30	47
7. Sales & Customer Service Occupations	22	25	36	40	41	5	12	17
8. Machine & Transport Operatives	81	66	55	54	54	-1	19	18
9. Elementary Occupations	248	209	198	181	166	-32	68	36
Total	1,528	1,461	1,535	1,527	1,500	-35	541	506

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	9	11	13	14	16	18	36	55
2. Professional Occupations	9	10	11	11	12	10	35	45
3. Associate Professional & Technical Occupations	16	18	22	22	22	-2	29	28
4. Administrative, Clerical & Secretarial Occupations	35	32	27	25	23	-17	40	23
5. Skilled Trades Occupations	5	5	3	3	3	-7	33	26
6. Personal Service Occupations	3	3	5	6	6	22	40	62
7. Sales & Customer Service Occupations	1	2	2	3	3	14	34	48
8. Machine & Transport Operatives	5	4	4	4	4	-3	35	33
9. Elementary Occupations	16	14	13	12	11	-16	34	18
Total	100	100	100	100	100	-2	35	33

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.22.4 Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.22.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	26	6	-12	32	39	20	-12	31	37	9	-13	42
2. Professional Occupations	6	6	-12	12	23	18	-10	15	17	7	-11	20
3. Associate Professional & Technical Occupations	22	11	-21	33	65	33	-20	51	-5	14	-22	2
4. Administrative, Clerical & Secretarial Occupations	-63	23	-46	-40	-55	59	-34	-79	-69	18	-28	-60
5. Skilled Trades Occupations	-16	3	-7	-12	-12	8	-5	-16	-3	2	-4	-2
6. Personal Service Occupations	9	2	-4	11	26	6	-4	23	17	3	-5	19
7. Sales & Customer Service Occupations	3	1	-2	4	11	3	-2	10	5	2	-2	6
8. Machine & Transport Operatives	-16	3	-7	-12	-11	8	-5	-14	-1	2	-4	0
9. Elementary Occupations	-39	11	-21	-28	-11	26	-15	-22	-32	9	-13	-27
Total	-67	65	-132	0	75	181	-107	0	-35	66	-101	0
	26	6	-12	32	39	20	-12	31	37	9	-13	42
	1984-1994			% change	1994-2004			% change	2004-2014			% change
1. Managers & Senior Officials	19.5	4.3	-8.7	23.9	24.3	12.4	-7.3	19.2	18.5	4.3	-6.6	20.8
2. Professional Occupations	4.4	4.3	-8.7	8.8	15.9	12.4	-7.3	10.8	10.1	4.3	-6.6	12.4
3. Associate Professional & Technical Occupations	9.1	4.3	-8.7	13.5	24.1	12.4	-7.3	19.0	-1.5	4.3	-6.6	0.7
4. Administrative, Clerical & Secretarial Occupations	-11.8	4.3	-8.7	-7.4	-11.6	12.4	-7.3	-16.7	-16.5	4.3	-6.6	-14.3
5. Skilled Trades Occupations	-19.5	4.3	-8.7	-15.1	-19.0	12.4	-7.3	-24.1	-6.5	4.3	-6.6	-4.2
6. Personal Service Occupations	22.6	4.3	-8.7	27.0	50.8	12.4	-7.3	45.7	22.2	4.3	-6.6	24.5
7. Sales & Customer Service Occupations	12.7	4.3	-8.7	17.0	45.2	12.4	-7.3	40.1	14.0	4.3	-6.6	16.3
8. Machine & Transport Operatives	-19.4	4.3	-8.7	-15.0	-16.1	12.4	-7.3	-21.2	-2.5	4.3	-6.6	-0.3
9. Elementary Occupations	-15.8	4.3	-8.7	-11.4	-5.3	12.4	-7.3	-10.5	-16.0	4.3	-6.6	-13.7
Total	-4.4	4.3	-8.7	0.0	5.1	12.4	-7.3	0.0	-2.3	4.3	-6.6	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.23 EDUCATION

6.23.1 Description of the industry

INDUSTRY 23: EDUCATION		
SIC92 headings: 80		
Public and private education at any level or for any profession, oral or written as well as by radio or television, including: primary, secondary, technical, vocational and higher education; adult education including driving schools, other private training providers, TECs, LECs and LLSCs.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	5.9	100
Exposure to International Trade:	zero	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	2,443,000	30,099,000
Share of total employment (% 2004):	8.1	100
Gender split (male:female) (% 2004):	30:70	54:46
Part-time share (% 2004):	45	28
Self-employment share (% 2004):	5	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.23.2 Industry Commentary

Employment in Education services has experienced underlying growth for many decades, and this has been accelerated by the present government's stated commitment to go on expanding education. However, schools are still under severe financial constraints with much of the increase in their budgets automatically absorbed by future increases in pay and existing shortfalls, rather than being available for increasing the number of classroom assistants as planned. Vacancy rates for teachers remain high, especially in London, although even these have fallen in recent years, with the recruitment of a number of overseas staff and rising numbers emerging from teacher training.

The five-year education strategy published in July 2004 provided for a large increase in the number of city academies, as opposed to traditional schools. Academies

are located in areas of disadvantage and either they replace one or more existing schools facing challenging circumstances or are established where there is a need for additional school places. They are all-ability schools and are established by sponsors from business, faith or voluntary groups, who are required to provide significant funding towards the capital costs of each school. It is intended that there will be 200 academies either operating or planned by 2010, but in order to meet the target it has been realised that the level of funding required by the sponsors needs to be lowered.

University funding is set to increase significantly over the next few years, and a radical shake-up of student finance is due to be introduced in 2006. This move to higher fees payable after graduation will be coupled with a range of incentives to promote wider social access to higher education. It is intended that 50 per cent of

young people should have the opportunity to take a course in higher education.

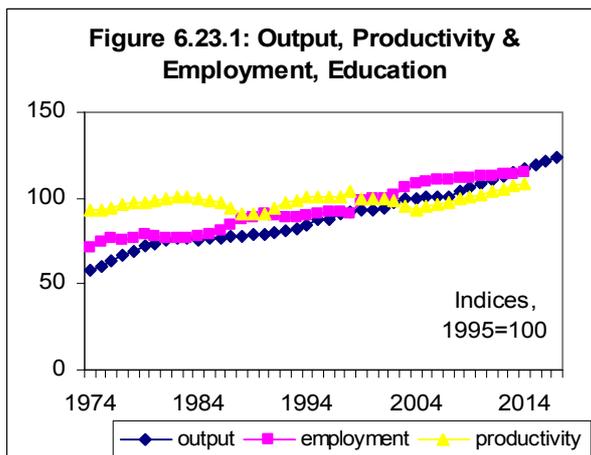
The rate of growth in investment in education in the long term is expected to be rather more modest than that seen in the last five to ten years, when the strong growth in investment focused in part on

improving the education infrastructure. While there will continue to be a need to invest in new technologies, there will also be a downward trend in the number of children of school age.

6.23.3 Productivity and Output Trends

Table 6.23.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	1.5	0.6	2.2	2.0
Employment (% pa)	1.8	1.9	0.6	0.5
(000s)	188	221	76	64
Productivity (% pa)	-0.3	-1.3	1.5	1.5



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- In this case output is measured by public expenditure. Recently announced government plans to boost output in this sector have not to date shown through in the growth statistics. However, over the next decade, further substantial growth is expected, reinforced by private sector demand.
- Measured average productivity growth in the period 1994 to 2004 has apparently been predominantly negative, as more teachers have been employed and class sizes have declined. There is probably an issue about how to measure productivity in this sector in a meaningful way. The projections assume that there will be positive productivity improvements averaging around 1½ per cent per annum over the next decade.
- Employment has grown rapidly in recent years, although much of this increase has been for part-time workers. The combination of strong output growth and only modest productivity gains will result in many thousands of extra jobs by 2014. This employment growth rate will not be as rapid as that achieved in the preceding decade.

6.23.4 Employment by Status and Gender

Females dominate employment in this industry, especially in primary and secondary education. Currently they account for around 70 per cent of all jobs.

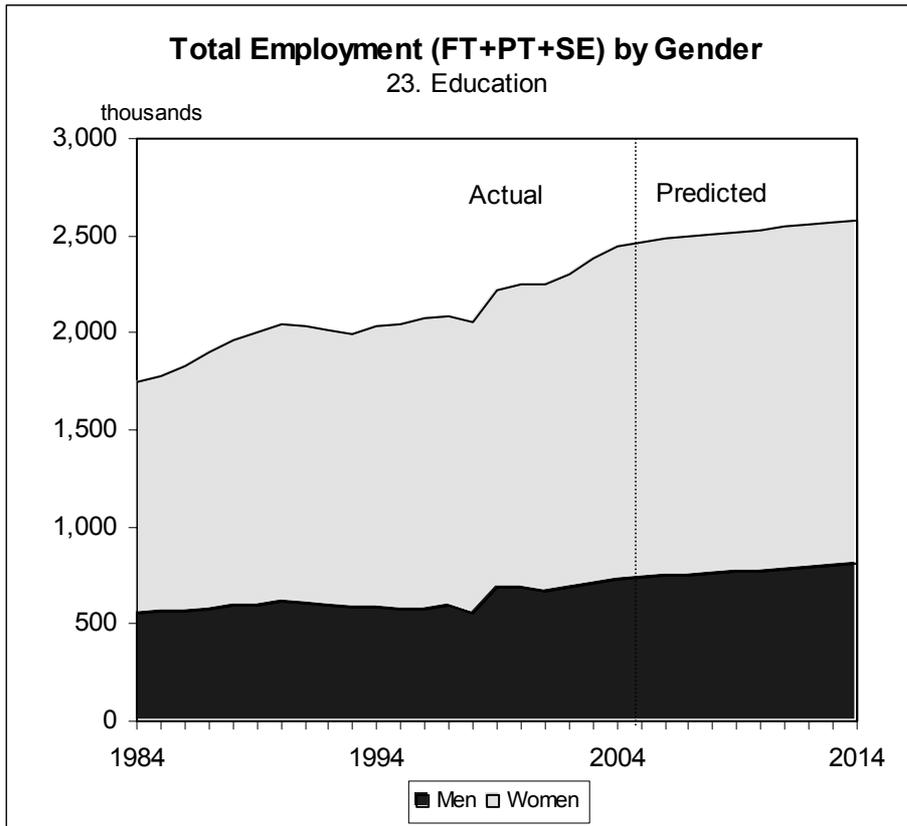
Part-time employment is very important, accounting for about 45 per cent of all jobs. Self employment is not very important as a share of the total, although it did account for around 130 thousand jobs in 2004.

Table 6.23.2: Employment by Gender and Status, Education

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			
Male employment	480	(19.7)	177	(7.2)	68	(2.8)	725	(29.7)	12	25	7	43
Female employment	735	(30.1)	921	(37.7)	62	(2.5)	1,718	(70.3)	-6	40	-2	33
Total employment	1,215	(49.7)	1,098	(44.9)	130	(5.3)	2,443	(100)	6	65	5	76
2009									2009-14			
Male employment	492	(19.5)	202	(8)	75	(3)	768	(30.5)	9	24	7	41
Female employment	729	(28.9)	961	(38.2)	60	(2.4)	1,750	(69.5)	-11	36	-2	23
Total employment	1,221	(48.5)	1,163	(46.2)	135	(5.4)	2,519	(100)	-1	61	4	64
2014									2004-14			
Male employment	501	(19.4)	226	(8.7)	82	(3.2)	809	(31.3)	21	49	14	84
Female employment	718	(27.8)	998	(38.6)	58	(2.2)	1,774	(68.7)	-16	77	-4	56
Total employment	1,220	(47.2)	1,223	(47.4)	139	(5.4)	2,582	(100)	5	125	10	140

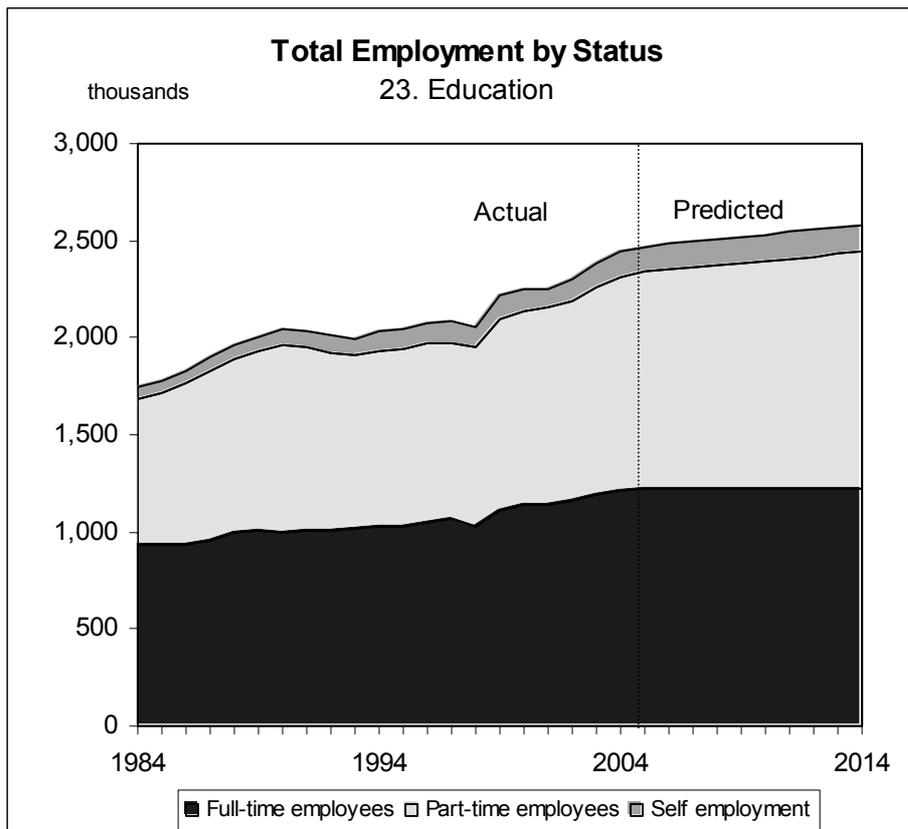
Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

Figure 6.23.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The share of female jobs is expected to remain more or less constant, falling only slightly.
- As salaries have increased significantly in this sector, teaching jobs have become increasingly attractive to men.

Figure 6.23.3: Changing Patterns of Sectoral Employment by Status

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Part-timers will account for most of the net increase in the number of jobs available.
- Self-employment in this industry is comparatively small and it is not likely to change much over the next ten years.

6.23.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Inevitably, teachers and lecturers within the professional occupational group account for over 1 in every 2 jobs in the industry and this share is on a rising trend.
- They have been increasingly supported by associate professionals, personal service and managerial occupations.
- Administrative, clerical and secretarial and elementary occupations have become much less significant and are of declining importance in this sector.

Future changes

- Recent historical patterns are projected to continue. The professional groups will be the main beneficiary of job growth, with almost a ¼ of a million additional jobs.
- Associate professionals and the managerial occupations are also expected to benefit, but to a much lesser extent.
- Further job losses are expected amongst the administrative, clerical & secretarial and elementary occupations. The practice of sub-contracting out of many tasks, such as cleaning and catering, impacts adversely on the elementary occupations. In particular, the use of the Private Financial Initiative in school construction and maintenance will transfer jobs out of this industry and into construction
- Personal service occupations, and to a lesser extent the associate professional and managerial groups will also benefit.

Shift share analysis

Table 6.23.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect

demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

In Education, the industry effect was strongly positive in the period 1984-94, accounting for an increase in all occupations of around 12 per cent. This fell off to around 8 per cent in the last decade. A further reduction to around just over 1 per cent is projected for the period 2004-2014.

Over the projection period this is offset by significant negative occupational effects for admin. & clerical and elementary occupations. For most other occupations, positive occupational effects reinforce the positive industry effect. These patterns broadly follow those for the previous two decades.

Replacement demands

Table 6.23.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

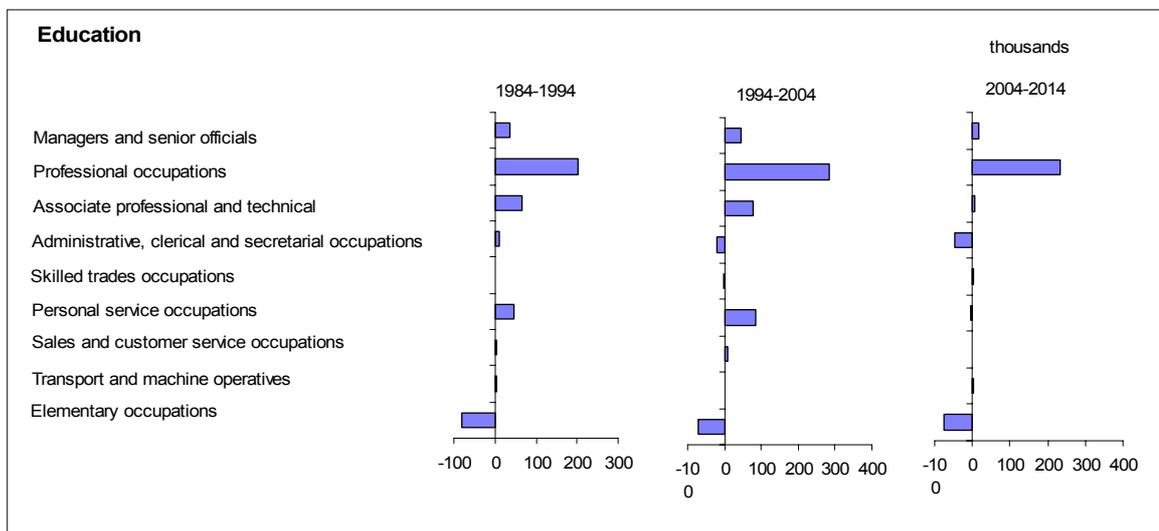
- As in most other industries, replacement demands far outweigh the projected expansion demands. Replacement demand is some 7 times larger than expansion demand so that the total employment requirement over the decade is for almost one million. Well over half this figure relates to professional occupations.
- Other occupations which will face the need for substantial replacements are associate professional & technical occupations and the personal service occupations.

Table 6.23.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Education Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	52	88	132	144	150	18	52	70
2. Professional Occupations	796	998	1,281	1,405	1,514	234	551	784
3. Associate Professional & Technical Occupations	172	238	317	322	324	7	112	119
4. Administrative, Clerical & Secretarial Occupations	157	168	148	127	103	-45	62	17
5. Skilled Trades Occupations	32	32	30	30	31	1	10	12
6. Personal Service Occupations	124	170	257	252	254	-3	104	101
7. Sales & Customer Service Occupations	15	19	26	26	25	-1	9	9
8. Machine & Transport Operatives	45	48	50	51	52	2	18	20
9. Elementary Occupations	352	273	203	160	130	-73	85	12
Total	1,745	2,033	2,443	2,519	2,582	140	1,004	1,144
Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
1. Managers & Senior Officials	3	4	5	6	6	14	39	53
2. Professional Occupations	46	49	52	56	59	18	43	61
3. Associate Professional & Technical Occupations	10	12	13	13	13	2	35	38
4. Administrative, Clerical & Secretarial Occupations	9	8	6	5	4	-30	42	12
5. Skilled Trades Occupations	2	2	1	1	1	4	35	39
6. Personal Service Occupations	7	8	11	10	10	-1	41	39
7. Sales & Customer Service Occupations	1	1	1	1	1	-3	37	33
8. Machine & Transport Operatives	3	2	2	2	2	3	37	40
9. Elementary Occupations	20	13	8	6	5	-36	42	6
Total	100	100	100	100	100	6	41	47

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.23.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.23.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	37	2	6	28	44	11	7	26	18	6	2	11
2. Professional Occupations	202	34	98	70	283	124	77	82	234	55	18	160
3. Associate Professional & Technical Occupations	66	7	21	37	79	30	18	31	7	14	4	-11
4. Administrative, Clerical & Secretarial Occupations	12	7	19	-14	-20	21	13	-54	-45	6	2	-53
5. Skilled Trades Occupations	0	1	4	-6	-2	4	2	-8	1	1	0	-1
6. Personal Service Occupations	47	5	15	26	86	21	13	52	-3	11	4	-18
7. Sales & Customer Service Occupations	3	1	2	1	7	2	1	3	-1	1	0	-2
8. Machine & Transport Operatives	2	2	6	-5	2	6	4	-7	2	2	1	-1
9. Elementary Occupations	-79	15	43	-137	-69	34	21	-124	-73	9	3	-85
Total	289	75	214	0	409	252	157	0	140	106	34	0

	1984-1994			% change	1994-2004			% change	2004-2014			% change
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	70.5	4.3	12.3	53.9	49.4	12.4	7.7	29.2	13.9	4.3	1.4	8.2
2. Professional Occupations	25.3	4.3	12.3	8.8	28.3	12.4	7.7	8.2	18.2	4.3	1.4	12.5
3. Associate Professional & Technical Occupations	38.1	4.3	12.3	21.5	33.1	12.4	7.7	13.0	2.3	4.3	1.4	-3.4
4. Administrative, Clerical & Secretarial Occupations	7.4	4.3	12.3	-9.2	-12.1	12.4	7.7	-32.2	-30.5	4.3	1.4	-36.2
5. Skilled Trades Occupations	-0.8	4.3	12.3	-17.4	-5.7	12.4	7.7	-25.8	3.9	4.3	1.4	-1.8
6. Personal Service Occupations	37.9	4.3	12.3	21.4	50.6	12.4	7.7	30.5	-1.2	4.3	1.4	-6.9
7. Sales & Customer Service Occupations	21.5	4.3	12.3	4.9	38.2	12.4	7.7	18.0	-3.3	4.3	1.4	-9.0
8. Machine & Transport Operatives	5.4	4.3	12.3	-11.1	4.6	12.4	7.7	-15.5	3.3	4.3	1.4	-2.4
9. Elementary Occupations	-22.5	4.3	12.3	-39.0	-25.5	12.4	7.7	-45.6	-36.2	4.3	1.4	-41.9
Total	16.5	4.3	12.3	0.0	20.1	12.4	7.7	0.0	5.7	4.3	1.4	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.24 HEALTH & SOCIAL WORK

6.24.1 Description of the Industry

INDUSTRY 24: HEALTH & SOCIAL WORK		
SIC92 headings: 85		
Human health activities including: hospital, medical and dental practices; nurses, midwives, speech therapists, etc. working other than in hospitals; medical laboratories, blood banks and ambulance transport. Veterinary activities. Social work activities incl.: hostels/homes for children, the aged, the handicapped, homeless etc.; day care activities; and social, counselling, refugee, and similar activities.		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	7.2	100
Exposure to International Trade:	zero	average
Concentration (market share of largest employers):	high	average
Total employment (2004):	3,224,000	30,099,000
Share of total employment (% 2004):	10.7	100
Gender split (male:female) (% 2004):	18:82	54:46
Part-time share (% 2004):	45	28
Self-employment share (% 2004):	8	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.24.2 Industry Commentary

Increasing demands associated with an ageing population and ever more sophisticated (and expensive) treatments have led to greater pressures still on the health sector. There have been numerous initiatives to improve the operation of the state sector, with targets, and attempts to improve efficiency by introducing competition, and greater autonomy in provision for both hospitals and GP services. Unfortunately, new indicators appear to show that health sector productivity over recent years has actually been falling, but this may be the result of measuring productivity without regard to the number of hours actually worked, as opposed to using only the number of workers employed.

The sector is projected to expand significantly over the next decade, in part driven by the implementation and upgrade of the NHS information network, including major electronic record and booking

systems. The Wanless report suggested that health spending may need to rise to more than 12 per cent of GDP by 2022, although larger efficiency gains may reduce this to 'only' 10 per cent. This will result in significant increase in the demand for labour. Although the number of people working in the NHS has risen steadily over recent years, the organisation continues to suffer staff shortages, both doctors and nurses. Many such shortages are currently being met by overseas recruitment.

The demand for health and social care will be driven by a number of long-term factors, such as the increase in the size of the elderly population, rising expectations about what health care should be available and increasing disposable incomes. The demographic trends will stimulate demand from both government and individuals and this is expected to lead to significant long-term output and employment growth in the industry.

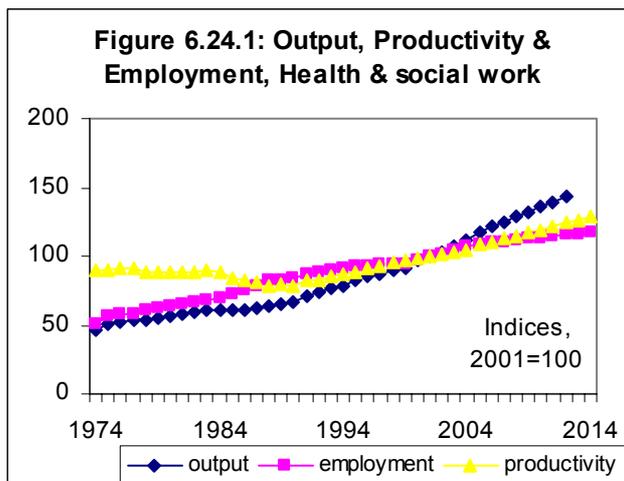
The government is now allowing certain hospital trusts, those which have demonstrated clinical and financial excellence, to apply for Foundation Trust status which will give them greater financial and operational freedom from government control. They are run by local managers and staff and members of the public and are able to tailor their activities to the needs of the local population. It is hoped that this will bring a measure of greater efficiency to the NHS.

The government has also moved to increase the NHS's use of private health care suppliers and has recently increased the presence of overseas providers in the UK. It is likely that the overseas operators, having established a presence in the NHS market, will look to increase their share of the private market, placing increasing pressure on the existing hospital groups. In addition, operators are coming under increasing pressure from patients and medical insurers to reduce costs.

6.24.3 Productivity and Output Trends

Table 6.24.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	3.2	3.9	3.4	2.7
Employment (% pa)	0.8	2.4	1.1	0.7
(000s)	114	362	183	129
Productivity (% pa)	2.4	1.5	2.3	1.9



Source: CE/IER estimates, MDM95 C51F8A Forecast, 6725output.xls (Figure 6.x.1)

- Output in this industry is again measured mainly by public expenditure on health care. This has risen rapidly in recent years, as the government has committed an increasing proportion of fiscal expenditure into the NHS. This pattern of strong growth, at or around 3 per cent per annum, is projected to continue over the next decade.
- Productivity has also apparently increased quite fast over the last 10 years or so, as advances in medical and surgical techniques have enabled more patients to be treated in a shorter time span. The prospects for the future are for further substantial productivity improvements.
- Employment has also grown rapidly. This is projected to continue although the rate of increase is expected to slow somewhat compared to 1999-2004. Despite this, more than 300 thousand additional jobs are projected in the period to 2014.

6.24.4 Employment by Status and Gender

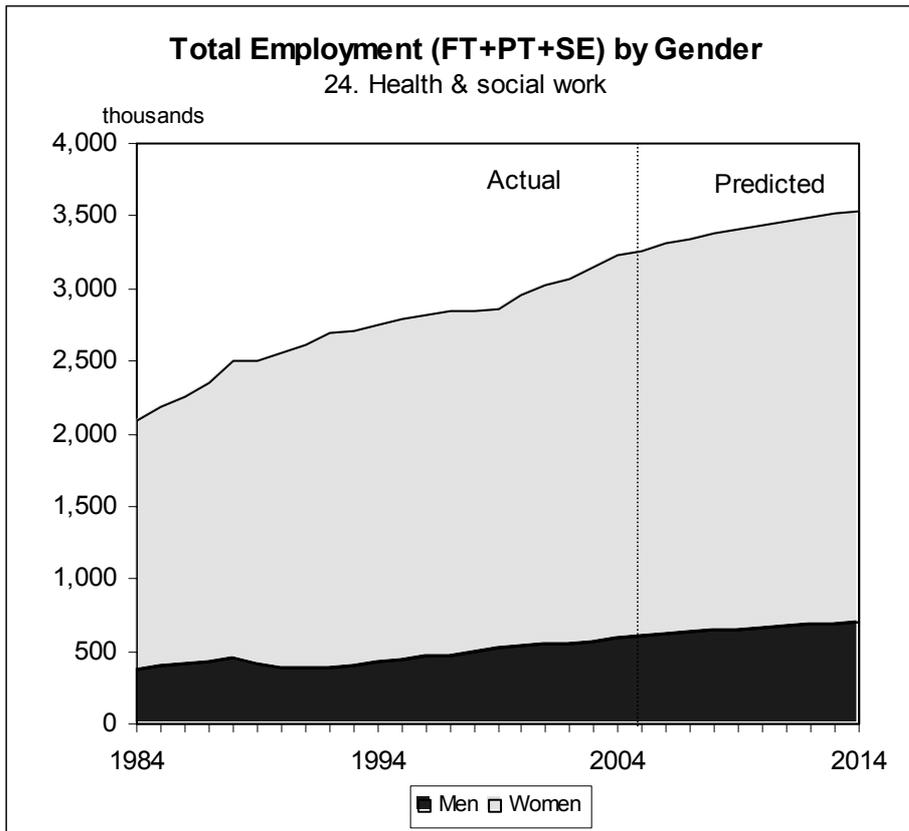
- The health and social work industry employs more females than any other industry. Females account for over 4 in every 5 jobs in the industry.
- Part-time employment, that is predominantly female, is very important for nursing. Almost half of all the jobs are part time.
- Self employment is much less significant, although a number of key personnel such as GPs fall into this category. In total, there were just under 300 thousand self employed in 2004.

Table 6.24.2: Employment Levels by Gender and Status, Health & Social Work

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004									2004-09			000s
Male employment	367	(11.4)	136	(4.2)	91	(2.8)	594	(18.4)	29	30	-1	58
Female employment	1,125	(34.9)	1,323	(41)	182	(5.6)	2,629	(81.6)	47	78	0	125
Total employment	1,492	(46.3)	1,459	(45.3)	272	(8.4)	3,224	(100)	76	109	-2	183
2009									2009-14			
Male employment	396	(11.6)	167	(4.9)	89	(2.6)	652	(19.1)	24	30	-3	51
Female employment	1,172	(34.4)	1,401	(41.1)	181	(5.3)	2,754	(80.9)	27	56	-4	79
Total employment	1,568	(46)	1,568	(46)	271	(7.9)	3,407	(100)	50	86	-7	129
2014									2004-14			
Male employment	420	(11.9)	197	(5.6)	86	(2.4)	703	(19.9)	53	61	-5	108
Female employment	1,199	(33.9)	1,456	(41.2)	178	(5)	2,833	(80.1)	74	134	-4	204
Total employment	1,618	(45.8)	1,654	(46.8)	264	(7.5)	3,536	(100)	126	194	-9	312

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

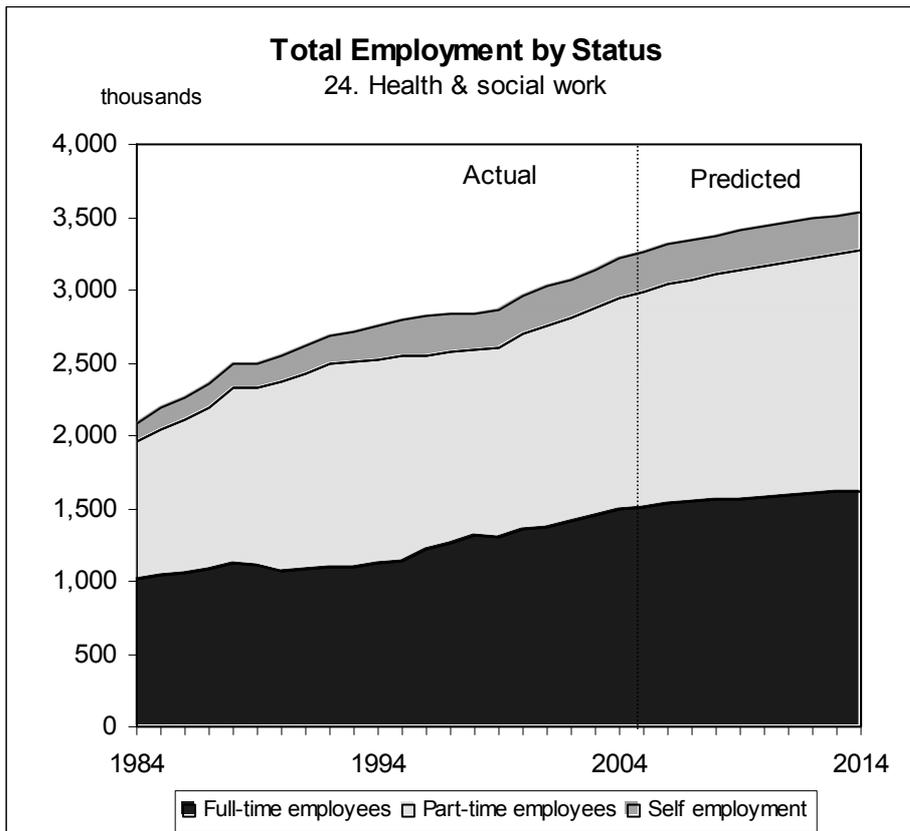
Figure 6.24.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The share of males is expected to stabilise over the next ten years. Whilst females will take the majority of the additional jobs, their job share will fall marginally.

Figure 6.24.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- The share of part-time working is expected to continue to increasing in an attempt to meet needs for flexibility for both employers and employees. Job sharing schemes are likely to remain. Such jobs are vitally important for filling skill shortages in the sector.
- The share of self-employment in the total is projected to fall back slightly over the decade.

6.24.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Nurses and other associate professional and technical occupations have enjoyed substantial employment increases in recent years but their job share has changed very little.
- Doctors, who are classified in the professional group, have seen both their absolute numbers and their shares of employment rise. Managers and senior officials have also become more important in the NHS and their job share is on a rising trend, although this is partially offset by declines for administrative, clerical and secretarial occupations.
- The group that has grown most rapidly is the personal service occupations, whose growth is partially offset by declines amongst the elementary occupations

Future changes

- Further job losses are projected for the administrative, clerical and secretarial group and amongst elementary occupations.
- This is more than offset by increases elsewhere. The managerial, professional and associate professional groups are all projected to see strong job gains.
- However, the main beneficiaries are expected to be amongst the less skilled, personal service occupations, which alone are projected to gain some 170 thousand extra jobs by 2014.

Shift share analysis

Table 6.24.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect

demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

In Health & social work there was a very strong positive industry effect of almost 28 per cent in the period 1984-94. This fell off to just under 5 per cent in 1994-2004, and a similar impact is projected for 2004-14.

Over the projection period this is offset by negative occupational effects for administrative & clerical, skilled trades, transport & machine operatives and elementary occupations. For most other occupations positive occupational effects reinforce the positive industry effect. These patterns broadly follow those for the previous two decades.

Replacement demands

Table 6.24.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- The quite substantial increase projected for total employment is expected to be reinforced many times over by replacement demands. The expansion demand of just over 300 thousand translates into a total requirement of almost 1.3 million. There are likely to be some difficult issues in filling these vacancies over the next decade.
- Two main groups account for this enormous growth, associate professional and technical occupations (which incorporates all qualified nurses) and personal service occupations (including home helps for the elderly).
- There are also very large replacement demands for managers & senior officials and for professional occupations.

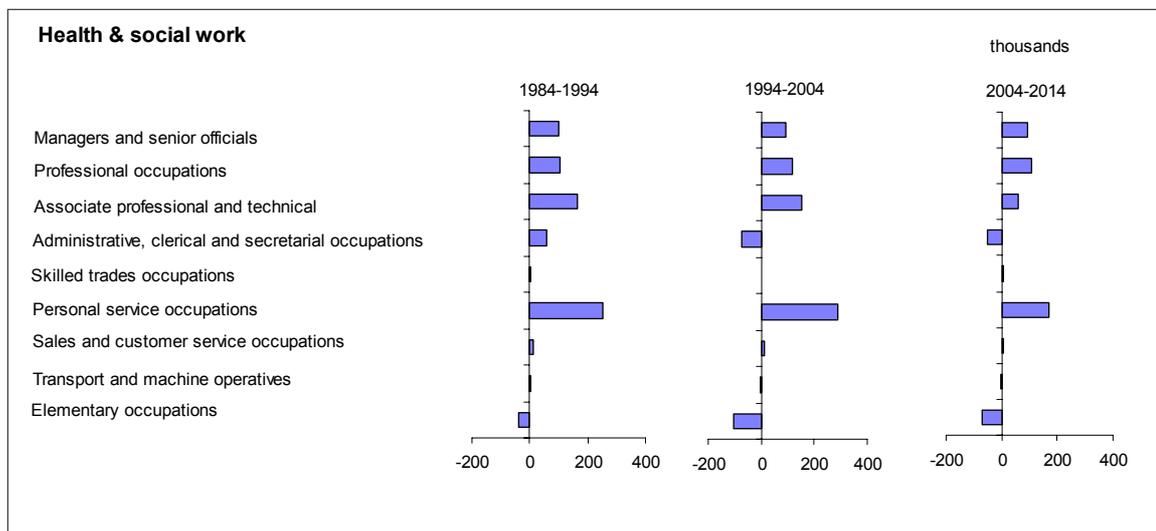
Table 6.24.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Health & social work Employment Levels (000s)	1984	1994	2004	2009	2014	2004 - 2014		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	184	283	377	434	469	92	148	240
2. Professional Occupations	199	303	420	477	526	106	181	286
3. Associate Professional & Technical Occupations	598	765	916	964	973	58	357	414
4. Administrative, Clerical & Secretarial Occupations	293	351	277	260	226	-51	118	67
5. Skilled Trades Occupations	53	56	57	61	62	5	21	26
6. Personal Service Occupations	356	608	896	960	1,067	171	362	533
7. Sales & Customer Service Occupations	29	42	51	56	56	5	19	24
8. Machine & Transport Operatives	51	55	52	53	51	-1	20	19
9. Elementary Occupations	321	284	178	141	105	-73	73	0
Total	2,084	2,747	3,224	3,407	3,536	312	1,297	1,609

Percentage Shares	1984	1994	2004	2009	2014	Percentage Changes		
						Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	9	10	12	13	13	24	39	64
2. Professional Occupations	10	11	13	14	15	25	43	68
3. Associate Professional & Technical Occupations	29	28	28	28	28	6	39	45
4. Administrative, Clerical & Secretarial Occupations	14	13	9	8	6	-18	42	24
5. Skilled Trades Occupations	3	2	2	2	2	9	37	46
6. Personal Service Occupations	17	22	28	28	30	19	40	60
7. Sales & Customer Service Occupations	1	2	2	2	2	10	38	47
8. Machine & Transport Operatives	2	2	2	2	1	-2	38	35
9. Elementary Occupations	15	10	6	4	3	-41	41	0
Total	100	100	100	100	100	10	40	50

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.24.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.x.4).

Table 6.24.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	000s occupation	total	scale	industry	000s occupation	total	scale	industry	000s occupation
1. Managers & Senior Officials	99	8	51	40	94	35	14	44	92	16	20	56
2. Professional Occupations	105	9	55	41	117	38	15	64	106	18	23	65
3. Associate Professional & Technical Occupations	167	26	165	-24	151	95	38	18	58	40	49	-31
4. Administrative, Clerical & Secretarial Occupations	58	13	81	-35	-74	44	17	-135	-51	12	15	-78
5. Skilled Trades Occupations	3	2	15	-14	1	7	3	-8	5	2	3	0
6. Personal Service Occupations	252	15	98	139	287	76	30	182	171	39	48	85
7. Sales & Customer Service Occupations	13	1	8	3	9	5	2	2	5	2	3	0
8. Machine & Transport Operatives	4	2	14	-12	-3	7	3	-12	-1	2	3	-6
9. Elementary Occupations	-37	14	89	-139	-107	35	14	-156	-73	8	10	-90
Total	664	89	574	0	476	341	135	0	312	139	173	0

	1984-1994				1994-2004				2004-2014			
	total	scale	industry	% change	total	scale	industry	% change	total	scale	industry	% change
1. Managers & Senior Officials	53.5	4.3	27.6	21.7	33.0	12.4	4.9	15.7	24.5	4.3	5.4	14.8
2. Professional Occupations	52.6	4.3	27.6	20.7	38.6	12.4	4.9	21.3	25.1	4.3	5.4	15.5
3. Associate Professional & Technical Occupations	27.9	4.3	27.6	-3.9	19.8	12.4	4.9	2.4	6.3	4.3	5.4	-3.4
4. Administrative, Clerical & Secretarial Occupations	19.8	4.3	27.6	-12.0	-21.0	12.4	4.9	-38.4	-18.5	4.3	5.4	-28.1
5. Skilled Trades Occupations	5.7	4.3	27.6	-26.2	2.5	12.4	4.9	-14.8	8.9	4.3	5.4	-0.8
6. Personal Service Occupations	70.9	4.3	27.6	39.1	47.2	12.4	4.9	29.8	19.1	4.3	5.4	9.5
7. Sales & Customer Service Occupations	43.5	4.3	27.6	11.6	22.3	12.4	4.9	5.0	9.6	4.3	5.4	-0.1
8. Machine & Transport Operatives	8.3	4.3	27.6	-23.6	-4.7	12.4	4.9	-22.0	-2.1	4.3	5.4	-11.8
9. Elementary Occupations	-11.5	4.3	27.6	-43.3	-37.5	12.4	4.9	-54.9	-40.9	4.3	5.4	-50.6
Total	31.9	4.3	27.6	0.0	17.3	12.4	4.9	0.0	9.7	4.3	5.4	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

6.25 OTHER SERVICES

6.25.1 Description of the industry

INDUSTRY 25: OTHER SERVICES		
SIC92 headings: 99, 90		
<p>Business, professional, religious and political organisations; trade unions; recreational, cultural and sporting facilities including: film, radio and television, theatre, arts facilities, museums, sports arenas and organisations, betting; other service activities including dry cleaning, hairdressing, funerals. Sewage and refuse disposal, sanitation etc., including collection of solid wastes, transportation and treatment by incineration or other means, sewage removal and disposal, and maintenance of sewers and drains. Recycling of waste with an industrial process is classified to Industry 10, Manufacturing & Recycling. Collection and purification of water is classified to part of Industry 2, Water Supply.</p>		
INDUSTRY PROFILE		
		All industries
Share of UK Output (% 2004):	5.3	100
Exposure to International Trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2004):	1,871,000	30,099,000
Share of total employment (% 2004)	6.2	100
Gender split (male:female) (% 2004):	48:52	54:46
Part-time share (% 2004):	31	28
Self-employment share (% 2004):	26	13

Source: 6725Output.xls (industry profile). CE/IER estimates based on ONS data.

6.25.2 Industry Commentary

This sector includes a wide range of services, from waste treatment to various cultural and sporting activities. It is a very diverse group. Waste treatment companies have improved their systems in recent years, and have implemented technological innovations such as cleaner incineration. Government legislation is obliging companies to use waste management facilities more, rather than dispose of their own waste. Companies are encouraged to recycle more waste rather than incurring higher landfill charges. More hazardous waste, such as asbestos, electrical and radioactive waste, have required new facilities, given greater regulation on their disposal.

The emphasis in current EU legislation is to shift the burden of waste management

away from consumers and local services towards the productive side of the economy. The main result is that manufacturers are held responsible for the environmentally-friendly disposal or re-use of the goods they produce. Recent examples of such policies are the end-of-life vehicles directive and the waste electrical and electronic equipment directive.

Elsewhere in this sector, developments in digital technology are allowing households to receive TV channels by satellite, conventional broadcasting and high-speed telephone or cable platforms, and also allowing a greater number of channels to be transmitted on the same bandwidth. As a result, the supply of television channels is rising. The technology also provides better images and enhanced transmission capabilities, such as video-on-demand,

pay-per-view services, software downloading and interactive TV services. The government hopes to switch off analogue TV signals by the end of this decade.

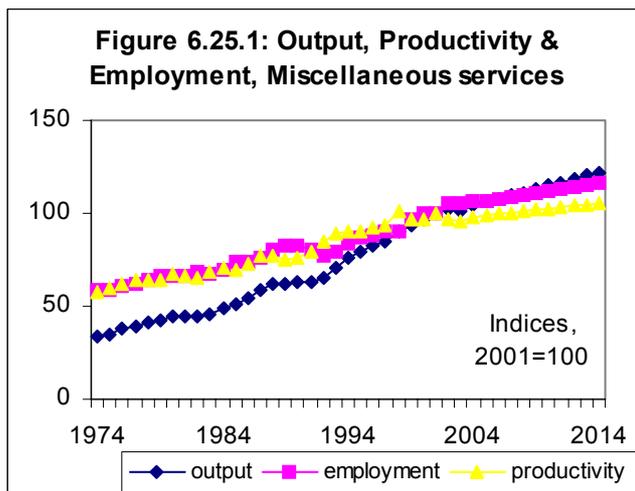
Overall, output and employment is expected to increase in the cultural and

sporting sectors over the next decade, fuelled by greater consumer leisure and entertainment spending. In the long term output growth in this sector is expected to grow roughly in line with UK economic growth and small increases in employment are projected.

6.25.3 Productivity and Output Trends

Table 6.25.1: Trends in Output, Productivity and Employment
Average change in the period

Indicator	1994-1999	1999-2004	2004-2009	2009-2014
Gross Output (% pa)	4.2	2.3	1.6	1.6
Employment (% pa)	2.7	1.9	0.9	0.9
(000s)	215	171	86	89
Productivity (% pa)	1.5	0.3	0.7	0.7



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output trends in this industry have been strongly positive for many years. This is expected to continue although the pace of change is projected to slow somewhat, with average annual growth of just over 1½ per cent per annum.
- Productivity growth has also been somewhat erratic over recent years and it slowed noticeably in the past 5 years or so. A pattern of slow productivity growth is expected to continue over the next decade. This partly reflects changes in the industry mix as well as the increasing use of part-time employment.
- As a result of output growth well ahead of productivity growth, employment is projected to grow significantly, with some 170 thousand extra jobs being created over the decade.

6.25.4 Employment by Status and Gender

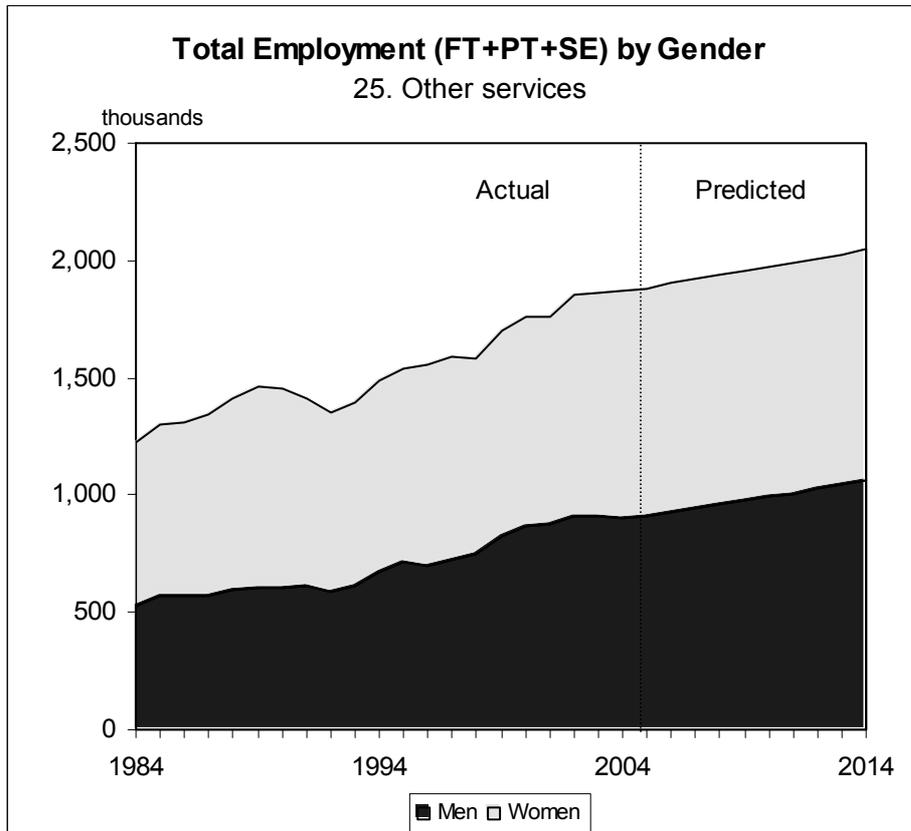
Employment in this industry is evenly divided between men and women. Part-time working is very important, accounting for 1 in three jobs in 2004. Self employment is also very significant, accounting for a quarter of all jobs.

Table 6.25.2: Employment Levels by Gender and Status, Misc. Services

Employment Status								Changes in Employment Status				
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
	shares	%	shares	%	shares	%	000s	%				
2004								2004-09				
Male employment	474	(25.4)	180	(9.6)	244	(13)	898	(48)	103	-35	10	78
Female employment	329	(17.6)	393	(21)	251	(13.4)	973	(52)	12	7	-11	7
Total employment	803	(42.9)	573	(30.6)	495	(26.4)	1,871	(100)	115	-28	-1	86
2009								2009-14				
Male employment	578	(29.5)	144	(7.4)	254	(13)	976	(49.9)	111	-36	10	85
Female employment	341	(17.4)	400	(20.4)	239	(12.2)	980	(50.1)	12	5	-13	4
Total employment	919	(47)	544	(27.8)	493	(25.2)	1,956	(100)	123	-31	-4	89
2014								2004-14				
Male employment	689	(33.7)	108	(5.3)	264	(12.9)	1,061	(51.9)	214	-71	20	163
Female employment	353	(17.3)	405	(19.8)	226	(11)	984	(48.1)	24	12	-25	11
Total employment	1,042	(51)	513	(25.1)	490	(23.9)	2,045	(100)	239	-60	-5	174

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.X.2).

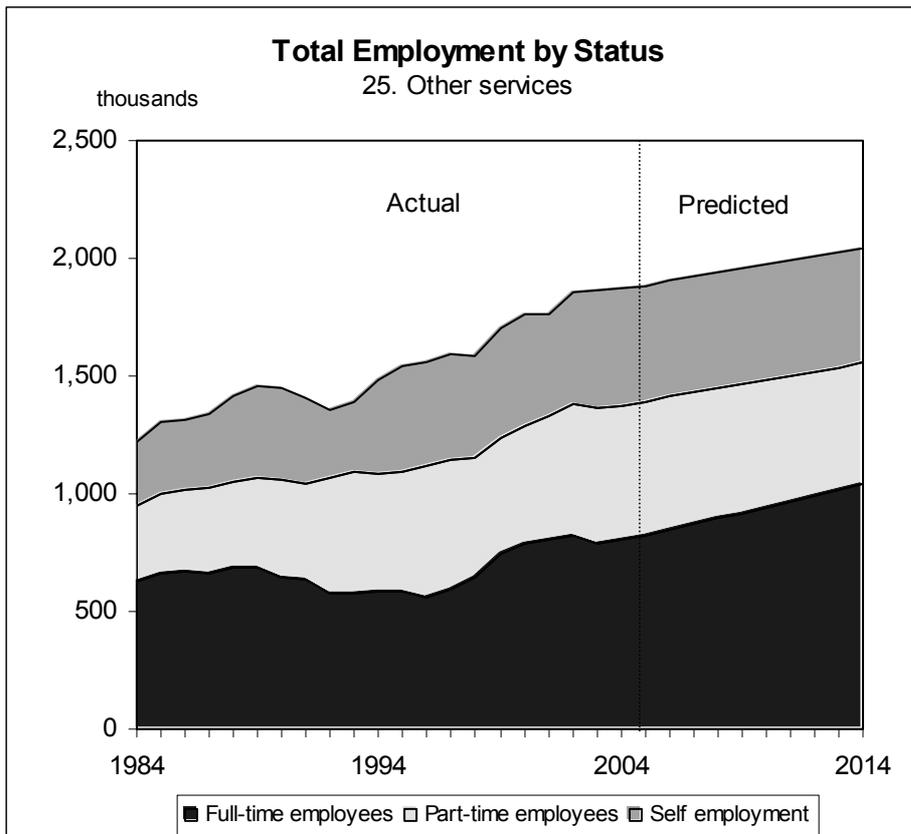
Figure 6.25.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Men and women are both expected to benefit from the rise in employment in this industry.
- Gender shares are expected to shift slightly in favour of male jobs.

Figure 6.25.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

- Part-time working is now expected to decline slightly as more of the jobs being created favour men rather than women.
- Self-employment will also show a small decline in its employment share. The result of this is the share of full-time jobs will now increase.

6.25.5 Projections of Employment by Occupation

Key aspects of occupational structure

- The largest occupational group is associate professional and technical occupations. In 2004 this group accounted for about 1 in 5 of all jobs.
- Other significant groups with smaller job shares, are managers and senior officials, professionals, administrative, clerical and secretarial occupations, personal service occupations and elementary occupations.

Future changes

- It is the associate professional and technical group that is expected to benefit most from the projected employment increase, with almost an extra 100 thousand jobs being created.
- Most of the other groups mentioned above are also expected to see job growth.
- The exception to this observation is the elementary occupations group, which is projected to see the loss of around 65 thousand jobs. This continues a long-term trend for the less skilled occupations to lose job share to the more highly skilled.
- The only other group to experience job losses is the administrative, clerical and secretarial group, although little change is expected here.

Shift share analysis

Table 6.25.4 presents an analysis of the relative importance of scale, industry and occupational effects in the observed and projected changes. The scale effect shows what would have happened had the industry maintained its overall share of total employment. The industry effect demonstrates the impact of the overall decline or growth of this particular industry over the various sub-periods covered. Finally, the occupational effect illustrates

the impact of changes in technology and organisational factors on the occupational structure *within* the industry.

This final group of industries has also benefited from strong positive industry effects (just over 17 per cent in the period 1984-94, and just under 14 percent over 1994-2004). Over the projection period, the industry effect is projected to be a more modest 5 per cent.

This positive effect is offset by negative occupational effects for administrative & clerical, transport & machine operatives and elementary occupations. For most other occupations positive occupational effects reinforce the positive industry effect. These patterns broadly follow those for the previous two decades.

Replacement demands

Table 6.25.3 also presents estimates of replacement demands. These take into account the need to replace those leaving because of retirement or other factors.

- Replacement demands are once again expected to add a large number to the required employment levels in this industry over the next decade. Replacement demands are expected to be more than 4 times as big as expansion demand of around 170 thousand jobs.
- The largest replacement demands are projected amongst managers, & senior officials, associate professionals, personal service occupations and elementary occupations, each of which requires replacements in excess of 90 thousand staff.
- Total requirements are projected to be around 860 thousand jobs, with the largest number in associate professional & technical occupations, which alone accounts for well over 200 thousand.

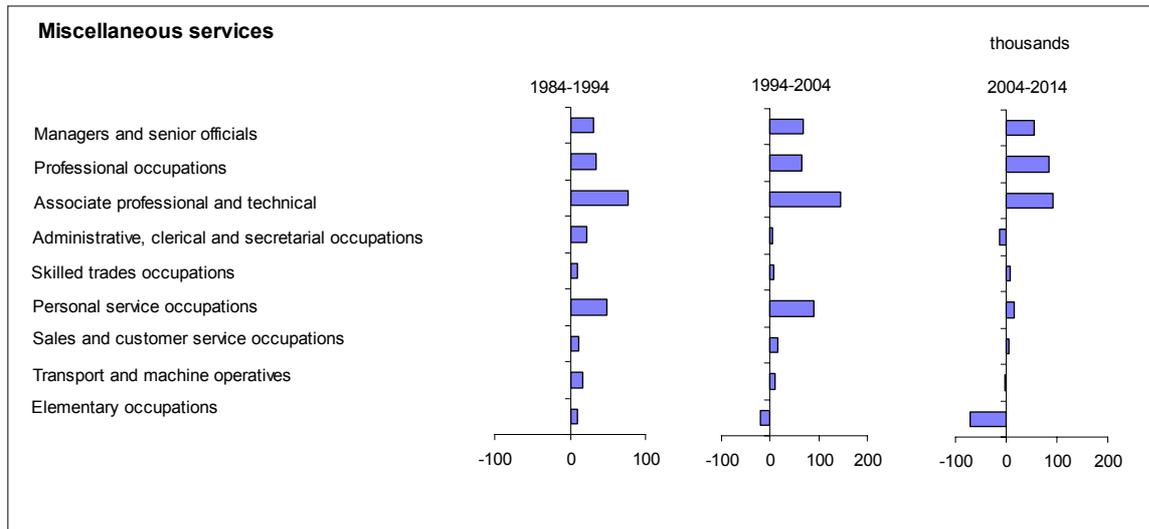
Table 6.25.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Miscellaneous services						2004 - 2014		
Employment Levels (000s)	1984	1994	2004	2009	2014	Net Change	Replacement Demands	Total Requirement
1. Managers & Senior Officials	216	246	314	337	370	55	122	177
2. Professional Occupations	103	139	204	240	288	84	70	155
3. Associate Professional & Technical Occupations	183	259	404	444	496	91	133	224
4. Administrative, Clerical & Secretarial Occupations	145	168	173	162	160	-12	69	57
5. Skilled Trades Occupations	73	83	91	94	99	8	33	41
6. Personal Service Occupations	133	181	271	302	287	16	109	125
7. Sales & Customer Service Occupations	29	41	57	58	62	5	20	25
8. Machine & Transport Operatives	87	103	112	113	109	-3	40	37
9. Elementary Occupations	254	265	245	206	174	-71	92	21
Total	1,222	1,485	1,871	1,956	2,045	174	688	862

Percentage Shares						Percentage Changes		
	1984	1994	2004	2009	2014			
1. Managers & Senior Officials	18	17	17	17	18	18	39	56
2. Professional Occupations	8	9	11	12	14	41	35	76
3. Associate Professional & Technical Occupations	15	17	22	23	24	23	33	55
4. Administrative, Clerical & Secretarial Occupations	12	11	9	8	8	-7	40	33
5. Skilled Trades Occupations	6	6	5	5	5	9	36	45
6. Personal Service Occupations	11	12	14	15	14	6	40	46
7. Sales & Customer Service Occupations	2	3	3	3	3	10	35	45
8. Machine & Transport Operatives	7	7	6	6	5	-3	36	33
9. Elementary Occupations	21	18	13	11	8	-29	38	9
Total	100	100	100	100	100	9	37	46

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Figure 6.25.4: Changing Composition of Employment by Occupation



Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (figure 6.x.4).

Table 6.25.4: Shift-share Analysis of Changes in Occupational Employment

	1984-1994			000s	1994-2004			000s	2004-2014			000s
	total	scale	industry	occupation	total	scale	industry	occupation	total	scale	industry	occupation
1. Managers & Senior Officials	30	9	37	-16	68	31	34	4	55	14	16	26
2. Professional Occupations	35	4	18	13	65	17	19	29	84	9	10	65
3. Associate Professional & Technical Occupations	76	8	31	37	146	32	35	78	91	17	20	54
4. Administrative, Clerical & Secretarial Occupations	22	6	25	-9	5	21	23	-38	-12	7	9	-28
5. Skilled Trades Occupations	10	3	12	-5	8	10	11	-13	8	4	5	0
6. Personal Service Occupations	48	6	23	20	90	22	25	43	16	12	14	-9
7. Sales & Customer Service Occupations	12	1	5	6	15	5	6	4	5	2	3	0
8. Machine & Transport Operatives	17	4	15	-2	9	13	14	-18	-3	5	6	-14
9. Elementary Occupations	10	11	44	-44	-20	33	36	-89	-71	11	12	-94
Total	262	52	210	0	386	184	202	0	174	81	93	0

	1984-1994		% change	1994-2004		% change	2004-2014		% change			
	total	scale	industry	total	scale	industry	total	scale	industry			
1. Managers & Senior Officials	14.1	4.3	17.2	-7.4	27.7	12.4	13.6	1.7	17.5	4.3	5.0	8.2
2. Professional Occupations	34.2	4.3	17.2	12.7	46.8	12.4	13.6	20.7	41.4	4.3	5.0	32.1
3. Associate Professional & Technical Occupations	41.8	4.3	17.2	20.3	56.3	12.4	13.6	30.2	22.6	4.3	5.0	13.3
4. Administrative, Clerical & Secretarial Occupations	15.5	4.3	17.2	-6.0	3.1	12.4	13.6	-22.9	-7.2	4.3	5.0	-16.5
5. Skilled Trades Occupations	14.4	4.3	17.2	-7.1	9.9	12.4	13.6	-16.1	9.1	4.3	5.0	-0.2
6. Personal Service Occupations	36.3	4.3	17.2	14.9	49.9	12.4	13.6	23.8	6.0	4.3	5.0	-3.3
7. Sales & Customer Service Occupations	41.8	4.3	17.2	20.4	36.8	12.4	13.6	10.8	9.7	4.3	5.0	0.4
8. Machine & Transport Operatives	19.1	4.3	17.2	-2.4	8.6	12.4	13.6	-17.4	-2.9	4.3	5.0	-12.3
9. Elementary Occupations	4.1	4.3	17.2	-17.4	-7.6	12.4	13.6	-33.6	-29.0	4.3	5.0	-38.3
Total	21.4	4.3	17.2	0.0	26.0	12.4	13.6	0.0	9.3	4.3	5.0	0.0

Source: CE/IER estimates, MDM95 C51F8A Forecast, 25UK.xls (Table 6.x.3).

Annex A: SOURCES AND METHODS

This annex provides a brief technical description of the methods and data sources used to produce the projections. A more detailed explanation may be found in the separate *Technical Report* (Wilson *et al.* (2006b)).

A.1 The macroeconomic model: Sectoral and Regional Dimensions

Labour market projections need to be firmly grounded on an understanding of how the economy as a whole is changing. Analysis of changes in employment structure is therefore intimately tied up with a detailed analysis of the development of the economy more generally. This has been operationalised in the form of the multi-sectoral dynamic model of the economy (MDM) developed by Cambridge Econometrics (CE). Details of MDM and its relationship with other model elements are given in the *Technical Report*.¹

MDM is based on a detailed analysis of economic and other behavioural relationships, statistically estimated via robust econometric methods. The current version is based on a “bottom-up” treatment of regional economic prospects. The model offers a combination of great detail and a high level of sophistication. The use of a fully specified, formal macroeconomic regional multi-sectoral model provides a number of advantages over more *ad hoc* extrapolation methods. These include enforcement of logical and accounting constraints, and emphasis on making explicit the underlying assumptions built into the projections.

MDM therefore projects future trends using a complex set of behavioural equations. Together these provide an explanation of the various phenomena which have resulted in past patterns of structural change. These relate the

derived demand for labour to the prospects for output growth in each sector and the relative costs of labour and other inputs. The model reflects the various sources of demand for goods and services. It also incorporates the various technical linkages between different sectors, including the impact of technological change on productivity levels as well as the effects of changes in the way activities are classified as a result of the sub-contracting out of many functions.

The sectoral analysis therefore derives directly from the multi-sectoral regional macroeconomic model of the economy as described above. This model is used to generate estimates for output and productivity for the main industrial sectors and projections of total employment by industry, based on the 2003 update of the 1992 Standard Industrial Classification (SIC2003). In all, 67 industries are distinguished, although for presentational purposes these have often been reduced to much more aggregate groups. The estimates and projections of employment produced are consistent with the official ONS estimates.

The latest version of MDM incorporates the system of UK National Accounts consistent with ESA95, the 2001 price base and the input-output table for 2001 estimated from official data. The latest National Accounts and associated data from the ONS have also been incorporated into the model database and equation estimates.

¹ See Wilson *et al.* (2006b).

A.2 Occupational Projections

The methods for projecting occupational employment change are based on extrapolative procedures. The present methodology is based on the use of the SOC2000 classification. Projections were developed for the 25 Sub-major Groups (see Table A.12 for details). The approach involves two stages. First, projections of the likely changes in industrial employment by region are made using the multi-sectoral dynamic macroeconomic model of the economy. Secondly, projections of the occupational structure of employment within each industry are made using material from the Censuses of Population (basically extrapolations of past trends). These occupational coefficients are then combined with the projected levels of industrial employment to obtain projected levels of employment by occupation. All this is undertaken at a regional level for the 25 sub-major groups.

The occupational employment projections are therefore based on a sub-model which takes as input the regional/industrial projections produced by the macroeconomic model. It is a 'top-down' approach, the industrial and regional employment projections being disaggregated into the 25 occupational categories for each industry.

A further important element is the use of data from recent Labour Force Surveys (LFS). This information is used to calibrate the occupation model over the recent past and to modify the projections in the light of the latest information on emerging trends. These trends are compared with that emerging from the occupational model. The results of this exercise are used to modify the projected changes in the light of recent and current developments in occupational structure that may not reflect a simple continuation of long-term trends between Census years.

The present results incorporate data from the Census of Population for 2001. This has enabled a reassessment of trends over the past decade. For many detailed sectors and geographies, this has resulted

in quite significant changes to the perception of detailed historical developments and therefore future prospects. The overall patterns are however very similar to those presented in *Working Futures 2002-2012*.

Users of the results are cautioned that they should not be seen as precise predictions but rather indicative of general trends and tendencies. This applies with particular force to the more detailed disaggregations.

Margins of Error

The employment estimates make use of a wide variety of sources, as described in more detail below. As a consequence, it is not possible to calculate precise margins of error.² From an analysis of previous projections it is clear that these margins can be quite large.³ Industry employment levels are typically projected within ± 10 per cent over a 5-10 year horizon. The directions of change are projected correctly in almost 90 per cent of cases. The errors in terms of annual percentage growth rates are usually of the same order of magnitude as the observed changes.

Occupational employment levels are typically projected with ± 7 per cent over a 5-10 year horizon. The direction of change is correctly projected in about 80 per cent of all cases. Occupational shares are usually projected within ± 2 percentage points. (The typical share is around 4 percentage points).

Historical revisions to the data account for a very large part of the forecast errors. However, it is important to appreciate that the purpose of the projections is not to make precise forecasts of employment **levels**. Rather, the aim is to provide policy analysts with useful information about the general nature of **changing employment patterns** and their implications for skill requirements.

² For further discussion see the *Technical Report* (Wilson *et al.*, 2006b).

³ See Wilson *et al.* (2004c).

The results provide a useful benchmark for debate and policy deliberations about underlying employment trends. However, they should not be regarded as more precise than the general statements in the text. Many years of international research have demonstrated that detailed manpower planning is not a practicable proposition. The results presented here should be regarded as indicative of general trends and orders of magnitude, given the assumptions set out below, rather than precise forecasts of what will necessarily happen.⁴

A.3 Development of Databases and Procedures

Data Sources and Methods: The Database

A new employment database was developed for 2002-2012 in order to meet the requirements of the SSDA and its partners for more detailed data. This has now been extended to 2014. This involved:

- extended sectoral detail, covering all 2-digit SIC2003 categories;
- revised geographies covering the LLSC areas;
- revised treatment of occupations, including development of SOC2000 historical data series and projections for the new sectors and local areas described above.

This process has had a number of important elements:

- establishing a new historical database of employment and output by detailed sector and LLSC area;
- development of occupational data and relating to the new sectors and geographical areas;
- development of models and procedures to generate consistent projections across these various dimensions;

- development of a new replacement demand (RD) module to generate RD estimates across the various dimensions.

Detailed Sectoral estimates

Historical data on employees in employment for male and female, full-time and part-time and estimates for self-employment, were available based on information from the ABI and the LFS. This was adjusted using various other official data to develop a consistent data set covering 67 SIC two digit categories and all 47 LLSC areas. The results incorporate the latest sectoral employment data from ONS, including the 2003 Annual Business Inquiry.

For economic indicators such as GDP, the total employment estimates by 41 industries for the counties was multiplied by regional productivity to create an estimate of GDP for the area. Other variables were treated in an analogous fashion, using data from CE's counties databank to do the reallocation and create historical data.

Occupation, Gender and Status

Historical data on employment for male and female, full-time and part-time and estimates for self-employment by 41 industries for all the local authority districts were available from the original IER database. These were expanded to provide an occupation dimension within each sector using data from the Census of Population and LFS. These were extended to 67 SIC categories assuming common patterns of occupation, gender and status mix as for the broader sectoral categories.

The revised occupational employment projections are based on data taken from the Census of Population (CoP), supplemented by information from the Labour Force Survey (LFS). Together these were used to generate a series of employment matrices based on 41 industries (SIC2003) and the old 22

⁴ See Wilson and Briscoe (2002) for further discussion.

SOC1990 Sub-Major occupational groups for each of the new RDA areas. Details of the occupational groupings are shown in Table A.11, based on SOC2000. Further details on the conversion process from SOC1990 are given in the separate *Technical Report*.

Industry by occupation employment matrices were produced for 1981 and 1991 using the latest available information base on similar matrices already developed for the old Standard Planning Regions and using SOC1990. These were based on estimates from both the CoP for 1991 and Census of Employment (CoE) estimates. Conversion matrices were developed to translate the data on to the new Government Office/ RDA definitions and on to a SOC2000 basis. The CoP data were enhanced by use of the Labour Force Survey in order to provide more up to date information on on-going trends by occupation beyond 1991, providing a firm base year estimate for 2004.

Information from the Census of Population 2001 was used to calibrate the estimates at an aggregate level. The resulting sector by occupation employment matrices were then used to develop projections of occupational employment in future years by applying projected occupational shares in each industry to the sectoral forecasts from the macroeconomic model. Further details of the procedures are given in the *Technical Report*.⁵

Projections of occupational shares at this level place considerable demands on the data available and the situation on the ground can be changed rapidly and substantially by technological and other changes. It is important to appreciate the assumptions used and the range of factors which it is felt are likely to influence immediate future trends, including how these may diverge from previous patterns of change. These issues are discussed in more detail in the main text.

The results should be regarded as providing a benchmark for thinking about changing employment structure. They paint a broad-brush picture of such trends and should be regarded as indicative and not a precise forecast.

A.4 Replacement Demand

Net changes in occupational employment are only one indicator of future demand. Another measure, which is important for assessing education and training provision, is the replacement demand needed to offset outflows due to retirements, occupational mobility etc. Procedures have been developed to produce such estimates linked to the main occupational projections.

The analysis of occupational trends and prospects described above provide predictions of the changes in the number of people employed in particular occupational categories. However, education and training requirements are not simply dependent on which occupations are growing rapidly. Even in those occupations where employment levels are expected to decline substantially, there may be a need to train, simply to maintain the existing stock of skills at the required level. In addition to examining likely **net changes** in the numbers in each occupational category, it is also important, therefore, to assess **replacement demands**. These represent the numbers needed to maintain the existing stock of skills due to losses resulting from retirements and other outflows.

The use of common assumptions across all geographical areas and sectors ensures that the estimates add up. In practice such parameters are likely to vary across these dimensions.

The key components are:

- information on the age and gender structure of occupational employment;
- information on rates of outflows due to

⁵ See Wilson *et al.* (2006b)

- retirement (and other reasons for leaving the workforce);
- inter-occupational mobility;
- mortality.

Data on age structure are required, since many of the flows, especially retirements and mortality, are age specific. Age structures also vary significantly by occupation.

Retirement rates also vary by gender and by age. The estimates are based on data from the LFS which show the percentage of those employed one year ago who have retired from employment either temporarily or permanently. For males the main outflows are associated with retirement per se. For females, in particular, there is a significant outflow for younger age groups associated with family formation.

Another potential outflow is due to mortality. Information on mortality rates is available by age and gender from ONS. While losses due to death are not great for individual age groups up to the age of 65, they can cumulate to produce significant losses over an extended period of time. The rates used are again based on data for the whole of the UK. However, mortality rates are unlikely to vary very much across broad occupational categories.

Potentially, occupational mobility is a more important source of loss for many occupations. Some occupations tend to gain employment as people are promoted from other occupations. For other occupations, losses due to retirement understate the overall replacement demands. Although data on such flows are available from the LFS, for the whole of the UK, they proved insufficiently robust to obtain estimates customised by industry and geographical areas. The replacement demand estimates presented here therefore exclude occupational mobility flows.

A.5 Choice of Sectors for analysis and reporting

Industries used in RMDM

The industries used in the CE multisectoral dynamic macroeconomic model (MDM) are as set out in Table A.1. These are based on data on 41 industries available from the ONS, especially data relating to input-output information which is central to MDM. They are classified according to the updated 1992/2003 Standard Industrial classification (SIC2003), as shown in the table.

Detailed Industries

For the purposes of the present project, the analysis has been extended to cover all 2-digit categories. These are shown in Table A.2. Including employment in private households and extra territorial organisations expands the total number of categories to 67. However, very few data are available for these last two categories. Also, it is not possible to identify any output data for Sector 6, Uranium Mining. So effectively there are 64 substantive industries for which there are comprehensive data. These are the groupings for which most of the detailed analysis was undertaken. They are referred to as **detailed industries**. They form the basis for the development of estimates for the SSC industrial footprints. Effectively each SSC is defined in terms of whole of part of each detailed industry. The shares for those detailed industries split over more than one SSCs are based on ABI data.

The other projections are presented at a variety of different sectoral levels using two main types of definition:

Broad sectoral definitions are based on groups of 6, 14 or 27 sectors, and defined by Standard Industrial Classification (SIC 2003) codes. These preserve the traditional manufacturing, services and public sector groupings of the economy. They are hierarchically related, with the 6 broadest sectors being a more aggregated grouping of the 14 sectors, and so on. The

14 and 27 groups have been adopted by the SSDA in their Sector Skills Matrix database and hence are referred to as the Sector Matrix Industries (SMI). These are not coterminous with the SSCs' footprints; and

Sector Skills Councils definitions use SIC code groupings that most closely match the SSC footprints. These definitions are a 'best fit' of each SSC's core business sectors. These specify the core SIC codes that are undisputed and do not overlap with any other SSC. The extent to which this is an exact fit varies between SSCs. In some cases, the use of the core SIC codes excludes elements of the SSC footprint because they are included in other areas. SSCs can provide further depth analysis of skills and future employment within their sector (see their individual websites for details, Annex D provides addresses).

Reporting at national (UK) level (Sector Matrix Industries)

The SSDA and LSC have adopted 27 industrial categories for the *New Employer Skills Survey* and other purposes. These are referred to as the Sector Matrix Industries (SMIs) These are shown in Table A.3.

The 27-fold categorization has obvious attractions from the point of view of consistency with other things the SSDA and LSC are doing. However, a number of the categories used in Table A.3 (and also in Table A.4) are very small (notably mining and quarrying, wood and paper, other manufacturing & recycling, and electricity, gas and water). These pose problems in terms of obtaining statistically reliable historical and projected employment data, especially when additional breaks are required by gender, employment status and occupation.

For the purpose of reporting of the national projections in the *National Report* for the UK, a slightly more aggregated set of categories (as shown in Table A.5) is used. There are 25 categories here, most

of which correspond to those in Table A.3. Even so, categories 2 (Mining & quarrying and electricity, gas & water), 4 (textiles and clothing) and 10 (other manufacturing & recycling) remain small. These are referred to as **Industries**.

Reporting at Sectoral level (SSCs)

The development of the Skills for Business network (SfBN) and its constituent Sectors Skills Councils, has led to the need for a new focus on the categories represented by the footprints of the SSCs as defined by SIC. The *Sectoral Report* is structured around these **SSC categories**.

Reporting at regional level (Regional Sectors)

At regional level, the categories published by ONS for "Government Office Regions" are shown in Table A.6. These are even more aggregated than those for the UK, for obvious reasons. This level of categorization does not present *any* detail for manufacturing industries.

In order to provide *some* detail within manufacturing, the categories set out in Table A.7 have been developed. These allow for some sub-manufacturing detail, while maintaining the minimum cell sizes required for statistical reliability across the regional dimension.

Note that these are not the same as those based on the groupings used by ONS for the "Standard Regions". The latter do not correspond very closely with the aggregations used in Table A.5. In particular, category DL adopted by ONS, cuts across the engineering grouping used there. ONS category DL includes only SIC2003 sectors 30-33. Mechanical engineering (SIC2003, 29) is included in the remainder of manufacturing. In the present analysis the DL category and the residual "remainder of D" adopted by ONS, are replaced by two categories based on categories or aggregations of those used in Table A.5. These are "engineering" (category 8 in Table A.5) and the corresponding residual. These are referred to as **(Regional) Sectors**.

Headline reporting at national (UK) level (Broad Sectors)

For summary/ headline reporting, a 6-fold categorization is used. This is shown in Table A.8. The purpose of the reporting at this level is to give an overview of the main sectoral developments rather than providing sectoral detail (which is presented later in the report).

This was the main “aggregate” categorization used in previous reports produced for DfES (e.g. Wilson *et al.* (2001a). It therefore allows comparison with earlier projections. It can also be replicated across the constituent countries and regions within the UK for comparability.

Table A.1: Classification of Industries in RMDM

Industries	SIC2003	25 industries	27 industries
1. Agriculture	01,01,05	1	1
2. Coal etc.	10	2	2
3. Oil & Gas	11,12	2	2
4. Other Mining	13,14	2	2
5. Food, Drink & Tobacco	15, 16	3	3
6. Textiles, Clothing & Leather	17, 18, 19	4	4
7. Wood & Paper	20, 21	5	5
8. Printing & Publishing	22	5	6
9. Manufactured Fuels	23	6	7
10. Pharmaceuticals	24.4	6	7
11. Chemicals nes	24 (ex 24.4)	6	7
12. Rubber & Plastics	25	6	7
13. Non-Metallic Mineral Products	26	6	7
14. Basic Metals	27	7	8
15. Metal Goods	28	7	8
16. Mechanical Engineering	29	8	9
17. Electronics	30, 32	8	9
18. Electrical Engineering & Instruments	31, 33	8	9
19. Motor Vehicles	34	9	10
20. Other Transport Equipment	35	9	10
21. Manufacturing nes	36, 37	10	11
22. Electricity	40.1	2	12
23. Gas Supply	40.2, 40.3	2	12
24. Water Supply	41	2	12
25. Construction	45	11	13
26. Distribution	50, 51	12, 13	14, 15
27. Retailing	52	14	16
28. Hotels & Catering	55	15	17
29. Land Transport	60, 63	16	18
30. Water Transport	61	16	18
31. Air Transport	62	16	18
32. Communications	64	17	19
33. Banking & Finance	65, 67	18	20
34. Insurance	66	18	20
35. Computing Services	72	20	22
36. Professional Services	70, 71, 73, 74.1-74.4	19	21
37. Other Business Services	74.5-74.8	21	23
38. Public Administration & Defence	75	22	24
39. Education	80	23	25
40. Health & Social Work	85	24	26
41. Miscellaneous Services	90-99	25	27
42. Unallocated			

Table A.2: Detailed Industries (Ind67)

Ind67	Ind67 name ⁶	SIC2003	SAM41 (MDM)	25 industries
1	Agriculture	01	1	1
2	Forestry	02	1	1
3	Fishing	05	1	1
4	Coal mining	10	2	2
5	Oil and gas	11	3	2
6	Uranium mining	12	3	2
7	Metal ores	13	4	2
8	Other mining	14	4	2
9	Food	15.1-15.8	5	3
10	Drink	15.9	5	3
11	Tobacco	16	5	3
12	Textiles	17	6	4
13	Clothing	18	6	4
14	Leather	19	6	4
15	Wood and wood products	20	7	5
16	Paper and paper products	21	7	5
17	Publishing and printing	22	8	5
18	Manufactured fuels	23	9	6
19	Pharmaceuticals	24.4	10	6
20	Chemicals nes	24 (ex 24.4)	11	6
21	Rubber and plastics	25	12	6
22	Non-metallic mineral products	26	13	6
23	Basic metals	27	14	7
24	Metal goods	28	15	7
25	Mechanical engineering	29	16	8
26	Computers and office machinery	30	17	8
27	Electrical engineering	31	18	8
28	TV and radio	32	17	8
29	Instruments	33	18	8
30	Motor vehicles	34	19	9
31	Aerospace	35.3	20	9
32	Other transport equipment	35 (ex 35.3)	20	9
33	Manufacturing nes	36	21	10
34	Recycling	37	21	10
35	Electricity	40.1	22	2
36	Gas supply	40.2, 40.3	23	2
37	Water supply	41	24	2
38	Construction	45	25	11
39	Sale and maintenance of motor vehicles	50	26	12
40	Distribution nes	51	26	12
41	Retailing nes	52	27	14
42	Hotels and catering	55	28	15
43	Rail transport	60.1	29	15
44	Other land transport	60.2, 60.3	29	15
45	Water transport	61	30	15
46	Air transport	62	31	15
47	Other transport services	63	29	15
48	Post and courier services	64.1	32	16
49	Telecommunications	64.2	32	16
50	Banking and finance	65	33	18
51	Insurance	66	34	18
52	Financial support services	67	33	18
53	Real estate	70	36	19
54	Renting of goods	71	36	19
55	Computing services	72	35	20
56	Research and development	73	36	19
57	Professional services nes	74.1-74.4	36	21
58	Other business services	74.5-74.8	37	21
59	Public administration and defence	75	38	22
60	Education	80	39	23
61	Health and social work	85	40	24
62	Waste disposal	90	41	25
63	Membership organisations	91	41	25
64	Culture and sport	92	41	25
65	Other services	93	41	25
66	Private household	95	41	25
67	Extra-territorial organisations	99	41	25

⁶ They are abbreviated from the full names used by ONS.

Table A.3 Classification of 27 SSDA Sector Matrix Industries

Industries	SIC2003
1. Agriculture, etc	01-02, 05
2. Mining & quarrying	10-14
3. Food, drink & tobacco	15-16
4. Textiles & clothing	17-19
5. Wood, pulp & paper,	20-21
6. Printing & publishing	22
7. Chemicals, & non-metallic mineral products	23-26
8. Metals & metal goods	27-28
9. Machinery, electrical & optical equipment	29-33
10. Transport equipment	34-35
11. Other manufacturing & recycling	36-37
12. Electricity, gas & water	40-41
13. Construction	45
14. Sale & maintenance of motor vehicles	50
15. Wholesale distribution	51
16. Retailing	52
17. Hotels & restaurants	55
18. Transport	60-63
19. Communications	64
20. Financial services	65-67
21. Professional services	70, 71, 73
22. Computing services	72
23. Other business services	74
24. Public administration & defence	75
25. Education	80
26. Health & social work	85
27. Other services	90-99

Table A.4: Defining SSCs in terms of SIC2003

SSCs	SIC2003
1 Lantra	01, 02, 05, 02, 85.2, 92.53
2 Cogent	11, 23, 24.11-24.2, 24.41-24.63, 24.65, 24.66, 25.13-25.24, 50.5
3 Proskills	10, 12-14, 21, 22.2, 24.3, 26.1, 26.26, 26.4-26.8, 40.3
4 ImproveLtd	15.11-15.91, 15.93-15.98, 51.38
5 Skillfast-UK	17-19, 24.7, 51.16, 51.24, 51.41, 51.42, 52.71, 93.01
6 SEMTA	25.11, 25.12, 27.4-28.3, 28.5-28.7, 29-35
7 Energy & Utility Skills	37, 40.1, 40.2, 41, 51.54, 51.55, 60.3, 90
8 ConstructionSkills	45.1, 45.2, 45.32, 45.34, 45.4, 45.5, 71.32, 74.2
9 SummitSkills	45.31, 45.33, 52.72
10 Automotive Skills	50.1-50.4, 71.1
11 Skillsmart Retail	52.1-52.6
12 People 1 st	55.1, 55.21, 55.23, 55.3-55.5, 63.3, 92.33, 92.71
13 GoSkills	60.1, 60.21-60.23, 61, 62.1, 62.2, 63.2, 80.41
14 Skills for Logistics	60.24, 63.1, 63.4, 64.1
15 Financial Services Skills Council	65-67
16 Asset Skills	70, 74.7
17 e-skills UK	22.33, 64.2, 72, 74.86
18 Central Government	75.1, 75.21, 75.22, 75.25, 75.3
19 Skills for Justice	75.23, 75.24
20 Lifelong Learning UK	80.22, 80.3, 80.42, 92.51
21 Skills for Health	85.1
22 Skills for Care and Development	85.3
23 Skillset	22.32, 24.64, 74.81, 92.1, 92.2
24 Creative & Cultural Skills	22.14, 22.31, 36.3, 74.4, 92.31, 92.32, 92.34, 92.4, 92.52
25 SkillsActive	55.22, 92.6, 93.04
26 Non-SSC employers (Primary)	05.01, 15.92, 16, 20, 22.11-22.13, 22.15, 26.21-26.25, 26.3, 27.1-27.3, 28.4, 36.1, 36.2, 36.4-36.6
27 Non-SSC employers (Wholesale / Retail)	51.11-51.15, 51.17-51.23, 51.25-51.37, 51.39, 51.43-51.53, 51.56-51.90, 52.73, 52.74
28 Non-SSC employers (Business services / Public services)	62.3, 71.2, 71.31, 71.33, 71.34, 71.4, 73, 74.1, 74.3, 74.5, 74.6, 74.82, 74.85, 74.87, 80.10, 80.21, 91, 92.72, 93.02, 93.03, 93.05

Table A.5: General Classification for Presenting Sectors in National Report

Industries	SIC2003	MDM Industries
1. Agriculture, etc	01-02, 05	1
2. Mining & quarrying; Electricity, gas & water	10-14,40-41	2-4, 22-24
3. Food, drink & tobacco	15-16	5,
4. Textiles & clothing	17-19	6
5. Wood, pulp & paper; Printing & publishing	20-22	7,8
6. Chemicals, & non-metallic mineral products	23-26	9-13
7. Metals & metal goods	27-28	14,15
8. Machinery, electrical & optical equipment	29-33	16-18
9. Transport equipment	34-35	19,20
10. Other manufacturing & recycling	36-37	21
11. Construction	45	25
12. Sale & maintenance of motor vehicles	50	26 (part)
13. Wholesale distribution	51	26 (part)
14. Retailing	52	27
15. Hotels & restaurants	55	28
16. Transport	60-63	29-31
17. Communications	64	32
18. Financial services	65-67	33,34
19. Professional services	70, 71,73	36 (part)
20. Computing services	72	35
21. Other business services	74	36 (part), 37
22. Public administration & defence	75	38
23. Education	80	39
24. Health & social work	85	40
25. Other services	90-99	41

Note: (a) Most of these sectors are identical to the 27 categories in Table A.3. The exceptions are industries 2 and 5, which are aggregates of 2 such categories.

Table A.6: Industries for which ONS supply data for the Government Office Regions (employees only)

		SIC 2003	SAM41 (MDM)
1	Agriculture, hunting, forestry, fishing	(AB)	01 to 05 1
2	Mining & quarrying	(C)	10-14 2-4
3	Manufacturing	(D)	15-37 5-21
4	Electricity gas & water supply	(E)	40/41 22-24
5	Construction	(F)	45 25
6	Personal household goods	(G)	50 to 52 26,27
7	Hotels & restaurants	(H)	55 28
8	Transport storage & communication	(I)	60 to 64 29-32
9	Financial intermediation	(J)	65 to 67 33,34
10	Real estate renting & business activities	(K)	70 to 74 35-37
11	Public admin. & defence; compulsory social security	(L)	75 38
12	Education	(M)	80 39
13	Health & social work	(N)	85 40
14	Other community, social & personal service activities; private households organisations & bodies	(O,P,Q)	90 to 99 41

Table A.7: Sectoral Categories for Regional Reporting

	SIC 2003	SAM41 (MDM)	Broad Sector Group
1	Agriculture, etc ^(a)	(AB) 01 to 05	1 1
2	Mining & quarrying ^(a)	(C) 10-14	2-4 1
	Manufacturing, of which: ^(b)	(D) 15-37	5-21 2
3	Food drink & tobacco	(DA) 15-16	5 2
4	Engineering	(DL+) 29-33	16-18 2
5	Rest of manufacturing	(rest of D)	6-15,19-21 2
6	Electricity, gas & water ^(a)	(E) 40/41	22-24 1
7	Construction	(F) 45	25 3
8	Retail, distribution	(G) 50 to 52	26,27 4
9	Hotels & restaurants	(H) 55	28 4
10	Transport & communication	(I) 60 to 64	29-32 4
11	Financial services ^(b)	(J) 65,66,67	33,34 5
12	Other business activities ^(b)	(K) 70 to 74	35-37 5
13	Public admin. & defence	(L) 75	38 6
14	Education	(M) 80	39 6
15	Health & social work	(N) 85	40 6
16	Other services	(O,P,Q) 90 to 99	41 5

Notes: a) Although these categories are shown here, small sample sizes preclude producing some, more detailed, breaks for these sectors.

b) These categories are modified from those adopted by ONS for regional reporting in order to avoid cutting across the categories used in Table A.6.

Table A.8: Aggregate Sectors (and Comparison with Industry Groups used in Previous projections)

Broad Sector	Old Industry Group ^a	MDM Industries
1. Primary sector and utilities	1. Agriculture	1
	2. Mining etc.	2,3,4
	9. Utilities	22-24
2. Manufacturing	3. Food, drink and tobacco	5
	4. Textiles and clothing	6
	5. Chemicals	9-12
	6. Metals, and mineral products	13-15
	7. Engineering	16-20
	8. Other manufacturing	7,8,21
	10. Construction	25
4. Distribution, transport etc.	11. Distribution, hotels etc.	26-28
	12. Transport and communication	29-32
5. Business and other services	13. Banking and business services	33,34,37
	14. Professional services	36
	15. Other services	42
6. Non-marketed services	16. Health and education services	39,40
	17. Public administration and defence	38

Note: (a) As used in Wilson (2001a).

Table A.9: Broad Sectors, Sector Matrix, Industries and RMDM Industries

Broad Sector	25 / 27 industries ^a	RMDM Industries
1. Primary sector and utilities	1. Agriculture, etc	1
	2. Mining & quarrying	2-4
	Electricity, gas & water ^a	22-24
2. Manufacturing	3. Food, drink and tobacco	5
	4. Textiles and clothing	6
	5. Wood, pulp & paper	7
	Printing & publishing ^a	8
	6. Chemicals, non-metallic min. prods.	9-12
	7. Metals and metal goods	13-15
	8. Machinery, electrical & optical eq.	16-18
	9. Transport Equipment	19-20
	10. Other manufacturing & recycling	21
	3. Construction	11. Construction
4. Distribution, transport etc.	12. Sale & maintenance of motors	26 (part)
	13. Wholesale distribution	26 (part)
	14. Retailing	27
	15. Hotels & restaurants	28
	16. Transport	29-31
	17. Communications	32
	5. Business and other services	18. Financial services
19. Professional services		36 (part)
20. Computing services		35
21. Other business services		37 (+ part of 36)
25. Other services		41
6. Non-marketed services	22. Public administration & defence	38
	23. Education services	39
	24. Health & social work	40

Note: (a) Most of these sectors are identical to the 27 categories in Table A.3. The exceptions are industries 2 and 5, which are aggregates of 2 such categories.

Table A.10: Relationship between Industry (25) and Detailed Industry (67)

Industry	Detailed Industry	SIC2003
1 Agriculture, etc	1 Agriculture	01
	2 Forestry	02
	3 Fishing	05
2 Mining & quarrying; Electricity, gas & water	4 Coal mining	10
	5 Oil and gas	11
	6 Uranium mining	12
	7 Metal ores	13
	8 Other mining	14
	35 Electricity	40.1, 40.3
	36 Gas supply	40.2
3 Food, drink and tobacco	37 Water supply	41
	9 Food	15.1-15.8
	10 Drink	15.9
4 Textiles and clothing	11 Tobacco	16
	12 Textiles	17
5 Wood, pulp & paper; Printing and publishing	13 Clothing	18
	14 Leather	19
	15 Wood and wood products	20
	16 Paper and paper products	21
6 Chemicals and non-metallic mineral products	17 Publishing and printing	22
	18 Manufactured fuels	23
	19 Pharmaceuticals	24.4
	20 Chemicals nes	24 (ex 24.4)
	21 Rubber and plastics	25
7 Metals & metal goods	22 Non-metallic mineral products	26
	23 Basic metals	27
	24 Metal goods	28
8 Machinery, electrical & optical equipment	25 Mechanical engineering	29
	26 Computers and office machinery	30
	27 Electrical engineering	31
	28 TV and radio	32
	29 Instruments	33
9 Transport equipment	30 Motor vehicles	34
	31 Aerospace	35.3
	32 Other transport equipment	35 (ex 35.3)
10 Other manufacturing & recycling	33 Manufacturing nes	36
	34 Recycling	37
11 Construction	38 Construction	45
12 Sale and maintenance of motor vehicles	39 Distribution relating to motors	50
13 Wholesale distribution	40 Distribution nes	51
14 Retailing	41 Retailing nes	52
15 Hotels & restaurants	42 Hotels and catering	55
16 Transport	43 Rail transport	60.1
	44 Other land transport	60.2, 60.3
	45 Water transport	61
	46 Air transport	62
	47 Other transport services	63
	48 Post and courier services	64.1
	49 Telecommunications	64.2
18 Financial services	50 Banking and finance	65
	51 Insurance	66
	52 Financial support services	67
19 Professional services	53 Real estate	70
	54 Renting of goods	71
	56 Research and development	73
	55 Computing services	72
20 Computing services	57 Professional services nes	74.1-74.4
21 Other business services	58 Other business services	74.5-74.8
	59 Public administration and defence	75
22 Public administration & defence	60 Education	80
23 Education	61 Health and social work	85
24 Health & social work	62 Waste disposal	90
25 Other services	63 Membership organisations	91
	64 Culture and sport	92
	65 Other services	93
	66 Private household	95
	67 Extra-territorial organisations	99

Table A.11: SOC2000 Classification of Occupational Categories (Sub-major Groups)

	Sub-major groups	Occupations	Occupation minor group number ^a
11	Corporate managers	Corporate managers and senior officials; production managers; functional managers; quality and customer care managers; financial institution and office managers; managers in distribution and storage; protective service officers; health and social services managers	111, 112, 113, 114, 115, 116, 117, 118
12	Managers/proprietors in agriculture and services	Managers in farming, horticulture, forestry and fishing; managers and proprietors in hospitality and leisure services; managers and proprietors in other service industries	121, 122, 123
21	Science and technology professionals	Engineering professionals; information and communication technology professionals	211, 212, 213
22	Health professionals	Health professionals, including medical and dental practitioners and veterinarians	221
23	Teaching and research professionals	Teaching professionals, including primary and secondary school teachers and higher and further education lecturers; research professionals (scientific)	231, 232
24	Business and public service professionals	Legal professionals; business and statistical professionals; architects, town planners, and surveyors; public service professionals; librarians and related professionals	241, 242, 243, 244, 245
31	Science and technology associate professionals	Science and engineering technicians; draughtspersons and building inspectors; IT service delivery occupations	311, 312, 313
32	Health and social welfare associate professionals	Health associate professionals, including nurses and other paramedics; therapists; social welfare associate professionals	321, 322, 323
33	Protective service occupations	Protective service occupations	331
34	Culture, media and sports occupations	Artistic and literary occupations; design associate professionals; media associate professionals; sports and fitness occupations	341, 342, 343, 344
35	Business and public service associate professionals	Transport associate professionals; legal associate professionals; financial associate professionals; business and related associate professionals; conservation associate professionals; public service and other associate professionals	351, 352, 353, 354, 355, 356
41	Administrative and clerical occupations	Administrative/clerical occupations: government and related organisations; finance; records; communications; general	411, 412, 413, 414, 415
42	Secretarial and related occupations	Secretarial and related occupations	421
51	Skilled agricultural trades	Agricultural trades	511
52	Skilled metal and electrical trades	Metal forming, welding and related trades; metal machining, fitting and instrument making trades; vehicle trades; electrical trades	521, 522, 523, 524
53	Skilled construction and building trades	Construction trades; building trades	531, 532
54	Other skilled trades	Textiles and garment trades; printing trades; food preparation trades; skilled trades n.e.c.	541, 542, 543, 549
61	Caring personal service occupations	Healthcare and related personal services; childcare and related personal services; animal care services	611, 612, 613
62	Leisure and other personal service occupations	Leisure and other personal service occupations; hairdressers and related occupations; housekeeping occupations; personal service occupations n.e.c.	621, 622, 623, 629
71	Sales occupations	Sales assistants and retail cashiers; sales related occupations	711, 712
72	Customer service occupations	Customer service occupations	721
81	Process plant and machine operatives	Process operatives; plant and machine operatives; assemblers and routine operatives	811, 812, 813
82	Transport and mobile machine drivers and operatives	Transport drivers and operatives; mobile machine drivers and operatives	821, 822
91	Elementary occupations: trades, plant and machine related	Elementary occupations: agricultural trades related; process and plant related; mobile machine related	911, 912, 913, 914
92	Elementary occupations: clerical and services related	Elementary occupations: clerical related; personal services related; cleansing services; security and safety services; sales related	921, 922, 923, 924, 925

Notes: (a) Standard Occupational Classification, ONS 2001.

Annex B: COMPARISON WITH OTHER PROJECTIONS

Overview

This annex provides a brief technical analysis of how the *Working Futures 2004-2014* (WF II) projections compare with those published in *Working Futures 2002-2012* (WF I), as well as with a selection of those produced by individual SSCs. More complete details can be found in the separate *Technical Report*.⁷

Comparisons with *Working Futures 2002-2012*

In comparing the present results with those from WF I a number of considerations need to be borne in mind. These include:

- Different periods covered
- Revisions to historical data;
- New views about exogenous assumptions;
- Revised perceptions of underlying trends;
- Model and other forecasting errors.

Each of these will affect the patterns of employment projected and can contribute to differences between the two sets of projections. The main differences can be discussed under the following headings:

- Changes to base levels;
- Gender status structure and changes in gender status trends;
- Sectoral structure and changes in sectoral trends;
- Occupational structure and changes in occupational trends;
- Replacement demands.

Each of these elements is now discussed in turn. The *Technical Report* provides a more detailed analysis.⁸

Changes to overall employment levels

The latest data from the Annual Business Inquiry and the Census of Population have resulted in quite significant changes to the official perception of the historical position. Employment levels have been revised upwards quite substantially. In WF I, the Total level of employment in the UK in 2002 was estimated as 29.336 million. The corresponding figure for WF II is 29.562 million (some $\frac{3}{4}$ of a per cent higher). The base year for the WF II forecast is 2004 by which time further increase in employment to a total level of some 30.099 million had occurred (a difference compared to the WF I base level (2002) of 2.6 per cent).

The general assumptions about prospects for the world and domestic economies are not too different in the WF I and WF II forecasts. The overall projections of employment change for the next decade are very similar. This results in a very similar projection of net change over the two forecast periods (2002-12 and 2004-14 respectively) of around 1.3 million extra jobs.

Gender / status mix

Within these totals, the perception of both historical and future trends in gender status have changed, as a result of revised data from the ABI and elsewhere.

As a consequence the estimated share of females in employment has now been revised downwards especially for full-time employees while the employment shares of men have been revised upwards across the board.

By 2012 this results in a significantly higher proportion of males in employment than was projected in WF I. By 2014 the share of male full-time

⁷ Wilson *et al.* (2006b).

⁸ Wilson *et al.* (2006b).

employees is now projected to be over 1 percentage point higher than the corresponding estimate in WF I for 2012. Female part-time jobs are projected to see an almost opposite effect. Self employment shares generally are now projected to be slightly higher than in WF I (by around half a percentage point). This especially benefits men.

Sectoral change

In general, the changing patterns of employment by sector look very similar in WF I and WF II. The base level estimates suggest a slightly faster rate of historical decline for manufacturing industries offset by slightly higher employment in construction and non-marketed services.

Patterns of change over the future are also generally similar in the two sets of forecast. Manufacturing industries are projected to decline slightly less rapidly in the latest projections while business & other services are projected to grow slightly less quickly.

Occupational Change

The latest LFS data, together with the final results from the 2001 Census of Population, have suggested a number of detailed changes to both perceptions of historical changes in occupational structure and the prospects for the future.

The latest estimates suggest higher employment shares for managers & senior officials as well as for professional occupations. These are offset by lower shares for administrative, clerical & secretarial occupations.

For the forecast period somewhat slower rates of decline are now projected for skilled trades and slower growth for associate professionals and personal service occupations. These reflect both industry and occupational effects.

Replacement demands

Estimates of replacement demands and total requirements are based on detailed information on age structures and flow rates taken from the Labour Force Survey. These estimates are subject to quite large margins of error and the resulting estimates of replacement needs can vary quite a lot as a consequence. The general pattern of the results in the two sets of projections is very similar although the overall scale of replacement needs is slightly lower in the latest set of results. This partly reflects the gradual unwinding of demographic effects (as the effect of the "baby boom" generation reaching retirement age begins to tail off). However, given the uncertainties with some of the data, too much should not be read into this difference.

The key message remains that replacement needs are, generally speaking, quantitatively much more significant than the expansion demand (growth or decline) that is projected for each occupation.

Comparison with other forecasts

A number of other organisation produce employment projections. In particular some Sector Skills Councils conduct such exercises as part of their assessment of skill needs in their sectors.

A detailed assessment of a selection of these results and how they compare with Working Futures has been carried out as part of the present exercise. This is reported in the separate *Sectoral Report* and also discussed in more detail in the *Technical Report*.⁹ Annex C below provides a summary.

⁹ See Dickerson *et al.* (2006) and Wilson *et al.* (2006b).

Annex C: COMPARISON WITH PROJECTIONS FROM SSCs

Overview

This annex presents a brief comparison of the results from *Working Futures 2004-2014* (WF II) with those produced by a small selection of SSCs. The aim is to explain to readers why such projections may differ.

The WF II results for **SSCs** presented here are developed from more detailed projections based on (mainly 2-digit) Industrial Classification (**SIC**) categories. The SSC estimates of employment (historical and projected) are formed by combining these detailed SIC categories, weighting them together using information from the Annual Business Inquiry (ABI) and the LFS. This effectively provides a map from SIC to SSC categories.¹⁰

Such results can be compared with alternative views of the future produced by the SSCs themselves. A number of established SSCs (including, ConstructionSkills, e-skills UK and SEMTA) already produce their own projections. For these SSCs, a detailed comparison was undertaken.

Ideally, such a comparison requires detailed access to the results (and underlying models and assumptions used) in each case and then a detailed and in-depth **technical** analysis of how this compares with the new projections. Limited resources precluded such a technocratic

solution. Instead the emphasis was on developing a more **qualitative** comparison. This was done by holding a series of bi-lateral meetings, to compare different approaches and results. This included discussions about methodological differences and modelling assumptions, as well as variations in data and classifications used. The aim was to explain why the *Working Futures* projections might differ from those produced by the SSCs themselves.

These discussions highlighted a number of key areas and reasons for differences arising. These include: definitions; sectoral and occupational coverage; geographical coverage; period covered; data sources used; vintage of forecast and data inputs used; models and approaches adopted; underlying assumptions (including macroeconomic, sectoral prospects (output & productivity), changing occupational mix and replacement demands).

The following reports have been agreed with the SSC as representing a common understanding of the main differences and the reasons that they arise. The accompanying tables provide a summary of the main differences identified. Results are presented for 3 SSCs:

- ConstructionSkills;
- e-skills UK; and
- SEMTA.

These are all very different and illustrate a number of contrasting problems in carrying out such comparisons.

¹⁰ These patterns vary significantly by gender and status and so different "maps" are used. Such mappings may also vary across spatial areas and over time. However, in order to avoid problems of inconsistency and "adding-up", variations in the mappings are limited to the aforementioned.

ConstructionSkills

ConstructionSkills have produced some very detailed occupational projections as part of their *Sector Skills Agreement* and the related *Skills Needs Assessment*.¹¹ This is part of a large, multifaceted programme of research. The quantitative employment projections are based on a model linked to the Experian macroeconomic model. The underlying employment data and model framework are now based primarily on LFS data, although various other sources are also used. As a consequence there are a number of differences compared to *Working Futures*. These differences not only reflect differences and data sources and models but also different underlying assumptions used to develop the future scenarios.

The key differences in terms of the final outcomes are related to:

- different views of the overall prospects for output growth in the sector *WF II* adopts a more pessimistic view of overall prospects for demand for the sector's output (around 1 % p.a. less);
- different views of developments in productivity growth (*WF II* assumes a faster rate of productivity growth by around 1% p.a.);
- some relatively minor differences in emphasis on changing skill patterns with total employment;
- different views about replacement needs.

Despite these differences the overall implications for the need to cover changes in demand plus replace those

leaving the workforce are not very different, although there are, of course, many detailed differences in emphasis.

e-skills UK

e-skills UK have produced detailed projections as part of their *Sector Skills Agreement for IT* and the related *Skills Needs Assessment*.¹² This is part of a large, multifaceted programme of research. The quantitative employment projections are based on a model linked to the Experian macroeconomic model. The underlying employment data and model framework are based on LFS data and other data. Reflecting its concerns with IT skills needs across ALL sectors, the projections work uses both an industry and an occupational "footprint". To facilitate comparison here, the e-skills UK results are in some cases (e.g. for output and productivity trends) compared with just the Computing services industry from *Working Futures*, although there are parts of other sectors that also form part of the SSC's overall industry footprint.

There are a number of differences compared to *Working Futures*. These differences not only reflect differences and data sources and models but also different underlying assumptions used to develop the future scenarios.

In broad terms the projections paint a similar picture, of rapid employment growth with particular emphasis on higher level occupations. The detailed emphasis varies depending upon the focus (SIC versus SOC footprint; the most appropriate way of measuring replacement needs, etc).

¹¹ See http://www.constructionskills.net/ssa/pdf/ssa_full.pdf and http://www.constructionskills.net/ssa/pdf/skills_needs_analysis.pdf

¹² See *IT Insights: Employment Forecasts*, <http://www.e-skills.com/cgi-bin/wms.pl/1055>

One clear message that emerges from this particular comparison, is the need for some SSCs to focus in much greater occupational detail than the 25 SOC sub-major groups.

SEMTA

In the case of SEMTA the underlying data and model framework are essentially the same as used in *Working Futures*. Despite this, the results obtained when developing future scenarios can look rather different. This reflects both different underlying assumptions used to develop the future scenarios as well as different vintages of data used, etc. SEMTA have produced employment projections for 8 detailed sectors. In some cases, these projections form the core of the view of the future underlying the published Sector Skills Agreements (e.g. for Electronics). In others, they have been a smaller part of developing an agreed view of future prospects. For example, in both the Aerospace and Automotive sectors, the forecast presented in WF I (which formed the point of departure for the SEMTA projections) were felt to be unduly pessimistic. The *Working Futures* results are predicated on a continuation of past patterns of behaviour and performance. If companies operating in these sectors are able to improve their performance then more optimistic outcomes may be

possible. In the case of Aerospace, much hangs on the success of the new Airbus project. For the Automotive sector, the experience of Rover highlights the difficulties of breaking away from past existing trends.

The other area of scepticism regarding the benchmark projections concerned the scale of replacement demand estimates. For many of the detailed sectoral and occupational categories covered, the estimated scale of replacement needs is insufficient to outweigh the projected negative expansion demands. This results in a negative total requirement, yet those companies that do survive still need to retain, recruit and train new staff. Unless those released from companies that are closing down can be retained in the industry, the implication is that new entrants will need to be suitably educated and trained to fill these gaps. The benchmark projections of replacement demands presented here may therefore underestimate the scale of training needs.

The latest SEMTA assessments for each of the sectors it covers can be found under Sector Skills Agreements at:

<http://www.semta.org.uk/>

Table C1: Comparison of Projections with those from ConstructionSkills

Criterion	Working Futures	ConstructionSkills
1. Definition of Sector	SIC 2003 categories 45.1, 45.2, 45.32, 45.34, 45.4, 45.5, 71.32, 74.2	As WF II but there is also some recognition of the need to go beyond the narrow SIC footprint for some purposes.
2. Occupational definitions	SOC 2000, 2 digit level (25 sub-major groups)	Detailed focus on 22 aggregated occupational groups, consisting of specific 4 digit SOC 2000 occupations
3. Geographical coverage	UK, constituent countries and English regions & 47 LLSCs	UK, with limited regional coverage (headline occupational figures)
4. Source of sectoral employment data	Employee estimates based on ABI (2003) data and self employment from the LFS (both adjusted to match ONS estimates as published in <i>Labour Market Trends</i>).	Predominantly based on the LFS Census used to focus on geographical detail
5. Source of Occupational structural data	Census of Population (2001) and Labour Force Surveys (constrained to match sectoral totals.	Labour Force Survey and ConstructionSkills' triennial Survey on Employment by Occupation (inform..?? National Occupational Standards)
6. Base Year and Forecast Horizon	2004-2014 (WF II)	2004-08 (SSA & SNA 2005)
7. Source of output projections	Multi-sectoral macro model (CE MDM C51F8A Forecast)	Experian macro model and other sector specific views
8. Sectoral employment model	Econometric analysis (error –correction) linked to output and factor prices	Econometric analysis (error –correction); top-down, shift share methods for regions
9. Macro scenario	GDP growth 2004-14 = 2½ % p.a.	GDP growth 2004-08 = 2½ % p.a.
10. Output growth assumptions (SIC)	2004-14: 1-2% p.a. (not available for the SSC <i>per se</i> .)	2004-08 = 2.3% p.a.
11. Productivity model	Implicit in employment equations	Implicit in employment equations. Productivity forecasts are derived from research done by Reading University
12. Productivity (output per person employed)	2004-14: around 2 % p.a. (n/a for the SSC <i>per se</i>)	Around 1% p.a.
13. Overall employment projections (SSC)	Base level 2004: 2.1 million 2004-14: decline of 9,000 (½ %) p.a.	Base level 2004, SIC footprint: 2,039,000 2004-08 = growth of 34,000 (1.3 %) p.a.
14. Occupational model	Econometric equations mainly driven by time trends in occupational employment shares), plus trend extrapolations	Shift-share & extrapolative methods modified using other evidence and expert opinion
15. Key features of occupational change projected	Job losses, especially for admin & clerical, semi skilled operatives and elementary occupations. Modest growth in managerial, professional and associate professional occupations.	Growth for almost all occupational categories other than clerical and plasterers
16. Replacement demand	Driven by age structure by occupation and flow rates (data from LFS); Mainly focussed on retirements	Sectoral focus; gross separations; focus on “training needs” (the view is that people do not retire from construction but move into other areas of employment).
17. Key features of replacement demand results	Total replacement needs of around 70,000 p.a., for all occupations but especially skilled trades	Total replacement demands of around 50,000 p.a. covering all occupations but especially skilled trades.

Table C.2: Comparison of Projections with those from e-skills UK

Criterion	Working Futures	e-skills UK
1. Definition of Sector	SIC 2003 categories 22.33, 64.2, 72, 74.86. The comparisons of output and productivity trends below focus upon SIC 72, Computing services.	Similar, but including (SIC 2003, 30.02). However the SSC recognises the need to go beyond SIC based footprints and to also use an alternative footprint based on occupational (SOC) codes.
2. Occupational definitions	SOC 2000, 2 digit level (25 sub-major groups).	Similar, but also focussing upon more detailed IT specific occupations.
3. Geographical coverage	UK, constituent countries and English regions & 47 LLSCs.	UK plus some regional coverage (not all published).
4. Source of sectoral employment data	Employee estimates based on ABI 2003 data and self employment from the LFS (both adjusted to match ONS estimates as published in <i>Labour Market Trends</i>).	Similar, but based on ABI 2002. Census data are used to focus on geographical detail.
5. Source of Occupational structural data	Census of Population (2001) and Labour Force Surveys (constrained to match sectoral totals).	Similar.
6. Base Year and Forecast Horizon	2004-2014 (WF II).	2002-2014 (<i>IT Insights: Employment Forecasts, (2004)</i>).
7. Source of output projections	Multi-sectoral macroeconomic model (CE MDM C51F8A Forecast)	Experian macro model
8. Sectoral employment model	Econometric equations linked to output and factor prices	Econometric analysis; shift share methods
9. Macro scenario	GDP growth 2004-14 = 2½ % p.a.	GDP growth 2004-14 = 2½ % p.a.
10. Output growth assumptions (SIC)	2004-14: 6 % p.a. (Computing & related industries only).	Alternative scenarios used but the results for the SSC are not explicit.
11. Productivity model	Implicit in employment equations	Similar
12. Productivity (output per person employed)	2004-14: 3-4% p.a. (Computing & related industries only).	Not explicit
13. Overall employment projections (SSC)	2004 level: 550,000 (Computing & related industries only). 2004-14: 16,000 (2½ %) p.a.	SIC footprint: 630,000; Change, 16,000 (2½ %) p.a. SOC footprint: 1.1 million, 10,000 (1%) p.a.
14. Occupational model	Econometric equations mainly driven by time trends in occupational employment shares), plus trend extrapolations	Shift-share & extrapolative methods some econometrics
15. Key features of occupational change projected	Growth amongst managers, professional and associate professional. Rapid but smaller increase for sales and personal service occupations.	Main projected employment growth is for professional and managerial occupations.
16. Replacement demand	Driven by age structure by occupation and flow rates (data from LFS); Mainly focussed on retirements	Sectoral focus, with the emphasis on gross separations. This reflects a view that there is a rapid obsolescence of IT skills.
17. Key features of replacement demand results	For the SSC as a whole replacement needs are estimates at around 30,000 p.a. The main replacement needs are amongst managerial, professional and associate professional staff, with smaller increases for sales and personal service occupations.	Considerably larger in scale, due to the focus on total separations (c. 100,000 p.a.).

Table C.3: Comparison of Projections with those from SEMTA

Criterion	Working Futures	SEMTA
1. Definition of Sector	The SSC covers SIC 2003 categories 25.11, 25.12, 27.4-28.3, 28.5-28.7, 29-35. In the National Report industries 7, 8 & 9 are covered by SEMTA.	SEMTA's most recent projections are based on 8 SIC industries, covering SIC 2003 categories 27-34. These are presented as part of SEMTA's various Sector Skills Agreements
2. Occupational definitions	SOC 2000, 2 digit level (sub-major groups)	SOC 2000, 2 digit level (sub-major groups)
3. Geographical coverage	UK, constituent countries and English regions & 47 LLSCs	UK plus constituent countries and regions
4. Source of sectoral employment data	Employee estimates based on ABI (2003) data and self employment from the LFS (both adjusted to match ONS estimates as published in <i>Labour Market Trends</i>).	Similar, but based primarily on the <i>Working Futures</i> database, which uses ABI 2001.
5. Source of Occupational structural data	Census of Population (2001) and Labour Force Surveys (constrained to match sectoral totals).	Similar.
6. Base Year and Forecast Horizon	2004-2014 (WF II)	2002-2012 (WF I, plus customisation)
7. Source of output projections	Multi-sectoral macroeconomic model (CE MDM C51F8A Forecast)	Linked to CE MDM C41 Forecast
8. Sectoral employment model	Econometric equations linked to output and factor prices	Similar, with facility to develop customised scenarios
9. Macro scenario	GDP growth 2004-14 = 2½ % p.a.	GDP growth 2002-12 = ½ % p.a.
10. Output growth assumptions (SIC)	2004-14: ranges from 1-2½ % p.a. depending in the sector	Range of alternative scenarios for a number of sub-sectors
11. Productivity model	Implicit in employment equations	Similar methods; facility to customise
12. Productivity (output per person employed)	2004-14: range from 2-3½ % p.a. depending on the sector (n/a for SSC <i>per se</i>)	
13. Overall employment projections (SSC)	2004 base level: 1.45 million (SSC) 2004-14: losses ranging from 1-1½ % p.a. depending upon the sector. Overall loss rate of c. 20,000 p.a.	2002 base level: 1.69 million 2002-2012: -2 % p.a., overall rate of job losses around 35,000 p.a. Some more optimistic alternative scenarios.
14. Occupational model	Econometric equations mainly driven by time trends in occupational employment shares), plus trend extrapolations	Similar methods; facility to customise trends
15. Key features of occupational change projected	Job losses focussed amongst skilled trades, operatives and elementary occupations. Some modest growth amongst managerial, professional and associate professional.	Similar, but with more emphasis on some higher level skill needs in some alternative scenarios.
16. Replacement demand	Driven by age structure by occupation and flow rates (data from LFS); Mainly focussed on retirements	Similar methods; facility to customise trends. Concerns that the implication of negative total requirements in some cases underestimates of training needs in some sectors.
17. Key features of replacement demand results	Similar picture to 15. Main Replacements demands are for skilled trades and operatives despite projected job losses.	Similar, but with more emphasis on some higher level skill needs in some alternative scenarios, and an emphasis on the need still to replace those leaving even when overall total requirements are negative.

Annex D: SSC DEFINITIONS

This Annex presents details for each Sector Skills Councils (SSC), including its web address, qualitative definition, core SIC codes and identifies problems with SIC coverage of the SSC's footprint. The SSCs are listed in the following table together with a description of the sector and a definition in terms of Standard Industrial Classification (SIC). These cover a particular footprint which includes the core business sectors, and hence employers, that the SSC represents on the ground. This is defined qualitatively using a wordy definition. They also employ a definition based on SIC code groupings that most closely match the SSC sectoral footprint.

These SIC definitions are a 'best fit' of each SSC's core business sectors and industries. These specify the core SIC codes that are undisputed and do not overlap with any other SSC. The extent to which this is an exact fit varies between SSCs. In some cases, the use of the core SIC codes exclude elements of the SSC footprint because they are included in

other areas. In these sectors SSCs will work in partnership with other SSCs. Individual SSCs can provide further in depth analysis of skills and future employment within their sector. The table below sets out the definitions that were current at the time of undertaking the analysis for *Working Futures 2004-2014*.

SSCs are specialists in their sector and therefore can provide further in-depth analysis of skills and productivity within their sector. Users should consult the SSCs' individual websites for further information as outlined below.

The category 'non-SSC employers' represent those SICs not allocated to an SSC at the time of the study.

SSCs are ordered in the table below according to where the 'core' of the industry which the SSC represents falls, running through from primary and manufacturing to service sectors.

Table D.1: SSC Sector Names, SIC Definitions and Description

SSC name	SSC description	SIC definition
Lantra Web www.lantra.co.uk	Environmental and land-based industries	01, 02, 05.02, 85.2, 92.53
Lantra also cover industries which are small elements of other SIC codes not necessarily within their core, e.g. floristry, fencemaking, farriers.		
Cogent Web www.cogent-ssc.com	Chemicals, nuclear, oil and gas, petroleum and polymer industries	11, 23, 24.11-24.2, 24.41-24.63, 24.65, 24.66, 25.13-25.24, 50.5
Cogent also cover the nuclear industry and sign making, but it is not possible to isolate these in terms of SIC.		
Proskills Web www.proskills.co.uk	Process and manufacturing of extractives, coatings, refractories, building products, paper and print	10, 12-14, 21, 22.2, 24.3, 26.1, 26.26, 26.4-26.8, 40.3

Continued...

Table D.1: SSC Sector Names, SIC Definitions and Description (continued)

SSC name	SSC description	SIC definition
ImproveLtd Web www.improveltd.co.uk	Food and drink manufacturing and processing	15.11-15.91, 15.93-15.98, 51.38
Skillfast-UK Web www.skillfast-uk.org	Apparel, footwear and textile industry	17-19, 24.7, 51.16, 51.24, 51.41, 51.42, 52.71, 93.01
SEMTA Web www.semta.org.uk	Science, engineering and manufacturing technologies	25.11, 25.12, 27.4-28.3, 28.5-28.7, 29-35
SEMTA also cover science sectors, not exclusively defined by SIC		
Energy & Utility Skills Web www.euskills.co.uk	Electricity, gas, waste management and water industries	37, 40.1, 40.2, 41, 51.54, 51.55, 60.3, 90
Energy and Utility Skills also have an interest in gas fitters, covered by SummitSkills SSC		
ConstructionSkills Web www.citb-constructionskills.net	Development and maintenance of the Built Environment	45.1, 45.2, 45.32, 45.34, 45.4, 45.5, 71.32, 74.2
A substantial proportion of construction work is sub-contracted to self-employed individuals (without employees).		
SummitSkills Web www.summitskills.org.uk	Building services engineering (electro-technical, heating, ventilating, air conditioning, refrigeration and plumbing)	45.31, 45.33, 52.72
Automotive Skills Web www.automotiveskills.org.uk	Retail motor industry	50.1-50.4, 71.1
Skillsmart Retail Web www.skillsmartretail.com	Retail industry	52.1-52.6

Continued...

Table D.1: SSC Sector Names, SIC Definitions and Description (continued)

SSC name	SSC description	SIC definition
People 1 st Web www.people1st.co.uk	Hospitality, leisure, travel and tourism	55.1, 55.21, 55.23, 55.3-55.5, 63.3, 92.33, 92.71
Goskills Web www.goskills.org	Passenger transport	60.1, 60.21-60.23, 61, 62.1, 62.2, 63.2, 80.41
Skills for Logistics Web www.skillsforlogistics.org	Freight logistics industry	60.24, 63.1, 63.4, 64.1
Skills for Logistics also cover rail and water freight transport, for which there are no specific SIC codes		
Financial Services Web www.fssc.org.uk	Financial services industry	65-67
Asset Skills Web www.assetskills.org	Property, housing, cleaning and facilities management	70, 74.7
Facilities Management, although as an industry is included in SIC code 70, is also an occupation employed across all industries, so is not fully represented through SIC. Some social Housing Management activity also falls within 85.31 Social Work activities with accommodation.		
e-skills UK Web www.e-skills.com	IT, Telecoms and Contact Centres	22.33, 64.2, 72, 74.86
e-skills UK covers IT & Telecoms professionals across all industries. Additionally, as a fast changing sector, sector boundaries are continually changing.		
Central Government	Central government	75.1, 75.21, 75.22, 75.25, 75.3
Most of the above SIC codes also incorporate local government. It is not possible to identify through SIC central or local government establishments.		

Continued...

Table D.1: SSC Sector Names, SIC Definitions and Description (continued)

SSC name	SSC description	SIC definition
Skills for Justice Web www.skillsforjustice.com	Custodial care, community justice and police	75.23, 75.24
Lifelong Learning UK Web www.lifelonglearninguk.org	Community-based learning and development, further education, higher education, library and information services, work-based learning	80.22, 80.3, 80.42, 92.51
Skills for Health Web www.skillsforhealth.org.uk	NHS, independent and voluntary health organisations	85.1
Skills for Care and Development	Social care including children, families and young children	85.3
Skillset Web www.skillset.org	Broadcast, film, video, interactive media and photo imaging	22.32, 24.64, 74.81, 92.1, 92.2
Photo-imaging is spread across a range of SIC codes, it is not possible to isolate the retail element. Interactive media, the largest sector in scope to Skillset, is not exclusively coded and is included within the core of e-skills UK. Additionally, self-employed people without employees represent most of the sector in areas such as film production and independent production. For these reasons, the data presented for Skillset should be interpreted with caution.		
Creative and Cultural Web www.ccskills.org.uk	Arts, museums and galleries, heritage, crafts and design	22.14, 22.31, 36.3, 74.4, 92.31, 92.32, 92.34, 92.4, 92.52
SkillsActive Web www.skillsactive.com	Sport and Recreation, Health and Fitness, Playwork, the Outdoors and Caravans.	55.22, 92.6, 93.04
SkillsActive covers sectors which form only a portion of other SIC codes.		
Non-SSC establishments	All sectors not covered by an SSC at this point in time, spread across manufacturing and service sectors	
Non-SSC employers (Primary)	05.01, 15.92, 16, 20, 22.11-22.13, 22.15, 26.21-26.25, 26.3, 27.1-27.3, 28.4, 36.1, 36.2, 36.4-36.6	
Non-SSC employers (Wholesale / Retail)	51.11-51.15, 51.17-51.23, 51.25-51.37, 51.39, 51.43-51.53, 51.56-51.90, 52.73, 52.74	
Non-SSC employers (Business services / Public services)	62.3, 71.2, 71.31, 71.33, 71.34, 71.4, 73, 74.1, 74.3, 74.5, 74.6, 74.82, 74.85, 74.87, 80.10, 80.21, 91, 92.72, 93.02, 93.03, 93.05	

REFERENCES

- Barker, T. and W. Peterson, (1987). (editors) *The Cambridge Multisectoral Dynamic Model of the British Economy*, Cambridge University Press, Cambridge, Great Britain.
- Barker, T *et al.*, (2001). 'The Regional Cambridge Multisectoral Dynamic Model of the UK Economy', pp. 79-96 in G Clarke and M Madden (editors) *Regional Science in Business*, Springer-Verlag, Heidelberg.
- Briscoe, G. and R. A. Wilson, (1991). 'Explanations of the Demand for Labour in the United Kingdom Engineering Sector'. *Applied Economics* 23, 913-26.
- Briscoe, G. and R. A. Wilson, (2003). 'Modelling UK Occupational Employment'. *International Journal of Manpower*. No 5. Vol 24
- Cambridge Econometrics, (1996). *Regional Economic Prospects* May 1996. Cambridge Econometrics, Cambridge
- Cambridge Econometrics, (1997). *Regional Economic Prospects* Feb 1997. Cambridge Econometrics, Cambridge
- Cambridge Econometrics (2003) *Industrial Report, February*. Cambridge Econometric: Cambridge.
- Dickerson, A., K. Homenidou and R. Wilson, (2006). *Working Futures 2004-2014: Sectoral Report*. Sector Skills Development Agency: Wath on Dearne.
- Green, A.G.,K. Homenidou and R. Wilson, (2004). *Working Futures 2002-2012: Regional Report*. Sector Skills Development Agency: Wath on Dearne.
- Green, A.G. K. Homenidou R. White and R. Wilson, (2006). *Working Futures 2004-2014: Spatial Report*. Sector Skills Development Agency: Wath on Dearne.
- Institute for Employment Research/ CMM (2001) DfES Skillsbase website: <http://skillsbase.dfes.gov.uk/>
- Lindley, R.M. (1994). 'A Perspective on IER Forecasting Activities and Future Developments'. *Labour Market Forecasts by Occupation and Education: The Forecasting Activities of Three European Labour Market Research Institutes*. ed. H. Heijke. Massachusetts: Kluwer Academic, 167-79.
- Lindley, R.M. (2003). 'Projections and institutions: the state of play in Britain'. *Forecasting Labour Markets in OECD Countries*. Ed. M. Neugart. Cheltenham: Edward Elgar.
- National Skills Task Force (2000) *Skills for All*. DfES Nottingham.
- Polenske, K, (1980). *The US Multiregional Input-Output Accounts and Model*, Lexington Books, Lexington, Mass. US.
- Wanless, D. (2002). *Securing our Future Health: Taking a Long-term View*. Public Enquiry Unit, HM Treasury: London.
- Wilson, R, A. (1994). 'Modelling and Forecasting the Structure of Employment in the United Kingdom'. *Labour Market Forecasts by Occupation and Education*. Ed H. Heijke. Massachusetts: Kluwer Academic, 9-35.
- Wilson, R.A. and G. Briscoe, (2002) *The impact of human capital on economic growth: A review*. CEDEFOP: Thessaloniki.
- Wilson R. A. (ed.) (2000). *Projections of Occupations and Qualifications, 1999/2000*. Department for Education and Employment/University of Warwick, Institute for Employment Research, Coventry.

- Wilson, R, A. (1999). 'EMTA Quantitative Forecasting Model: Detailed specification.' Institute for Employment Research, University of Warwick: Coventry
- Wilson, R. A. (2001c) *Forecasting Skill requirements at National and company Levels*, in P. Descy and M. Tessaring (eds.) (2001), *Training in Europe (2nd report on Vocational Training Research in Europe 2000: Background Report, Volume 2)* CEDEFOP Reference Series, Luxembourg, Office for Official Publications of the European Communities, pp561-609.
- Wilson, R.A. (ed.) (2001a). *Projections of Occupations and Qualifications: 2000/2001*, Department for Education and Employment/Institute for Employment Research: Coventry.
- Wilson, R.A. (ed.) (2001b). *Projections of Occupations and Qualifications: 2000/2001:Regional Results*. Department for Education and Employment/Institute for Employment Research: Coventry.
- Wilson, R, and D. Bosworth, (2006). *Working Futures 2004-2014: Qualifications Report*. Sector Skills Development Agency: Wath on Dearne.
- Wilson, R, K. Homenidou, and A. Dickerson, (2004a). *Working Futures 2002-2012: National Report*. Sector Skills Development Agency: Wath on Dearne.
- Wilson, R, K. Homenidou, and A. Dickerson, (2004b). *Working Futures 2002-2012: Technical Report*. Sector Skills Development Agency: Wath on Dearne.
- Wilson, R, K. Homenidou, and A. Dickerson, (2006a). *Working Futures 2004-2014: National Report Report*. Sector Skills Development Agency: Wath on Dearne.
- Wilson, R, K. Homenidou, and A. Dickerson, (2006b). *Working Futures 2004-2014: Technical Report*. Sector Skills Development Agency: Wath on Dearne.
- Wilson, R., I. Woolard and D. Lee, (2004c). *Developing a National Skills Forecasting Tool for South Africa*. South African Department of Labour/ Human Science Research Council/Warwick Institute for Employment Research: Pretoria.



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