Working Futures:
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Working Futures:
New Projections of Occupational Employment by Sector and Region, 2002-2012

Volume 1
NATIONAL REPORT

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PREFACE AND ACKNOWLEDGEMENTS

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The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the SSDA and/or the individual Sector Skills Councils. The results should be regarded as indicative of general trends rather than precise forecasts of what will happen. The projections relate to the broad sectoral definitions (6, 14, 25/27 and 67) as specified in Annex A. They are not necessarily co-terminus with Sector Skills Councils' definitions. They should be used in conjunction with a variety of other sources of labour market intelligence.

We hope that these projections will be useful to SSCs, RDAs, LSCs and their partners in securing an understanding of the evaluation of the labour market in the UK on a consistent and comparable basis, in particular with regard to sectoral, occupational and geographical change.

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SUMMARY

Background

This is the first of three volumes presenting Working Futures: New Projections of Occupational Employment by Sector and Region. The aim of these projections is to provide a range of useful labour market information and intelligence, and a sound statistical foundation for the deliberations of the Sector Skills Development Agency (SSDA) and the Learning and Skills Council (LSC). The work was undertaken on behalf of the LMI Champions Group.[1]

The projections are the latest in a long series, previously funded by the Department for Education and Skills (DfES). They are based on the use of a multi-sectoral, regional macroeconomic model, combined with occupational and replacement demand modules. The main projection period covered is 2002 to 2012.

Because of the SSDA's interest in detailed sectoral prospects and the concern of the local arms of the LSC (LLSCs) with developments at a local level, a much more detailed analysis is required than has been attempted previously. The present set of projections are the most detailed and extensive ever produced for the UK. Over half a million time series have been estimated and projected for employment alone. This reflects the increasing requirement from organisations such as the SSDA and LSC for information on individual industries and particular localities in order to meet the remit they have been set by the Government.

The present set of results exploit fully the currently available data. However, the data upon which the local level results are based have been pushed to their limits. Many of the official data sets have not been designed to provide robust information at such a detailed level. This raises some important issues for national Government, and those that provide official statistics, about how existing data sources need to be extended and improved to meet these new requirements.

The results take account of new data from the Census of Population 2001 and other sources. Together these suggest a number of new features in the changing pattern of occupational employment in the British economy.

The National Report Volume One focuses on results for the whole of the UK. It is complemented by a more detailed sectoral analysis presented in Volume Three, the Sectoral Report. This analysis provides results for up to 67 industry categories,[2] as specified in Annex A of the National Report. These are not necessarily co-terminus with Sector Skills Council definitions. Volume Two, the Regional Report, presents results for the English Regional Development Areas and for the other individual countries within the UK.

[1]As well as the SSDA, the LSC and its local arms, the LMI Champions Group also includes DfES, DWP, DTI, RDAs, Regional Observatories and Regional Government Offices.

[2]Where the data are sufficiently robust.

Macroeconomic Context

Economic activity

Following the uncertainties of the war in Iraq, the macroeconomic scenario underlying the 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 approximately 2.5% per annum, following a brief slow down over the first two years of the decade.

Inflation, the sterling exchange rate and public expenditure

Continued low inflation among the major OECD countries is expected. A stable value 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 a modest acceleration in public expenditure growth. 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 is expected to be just under 0.5% per annum, resulting in over 1.3 million additional jobs over the decade;
- the vast majority of the additional jobs are expected to be taken by women;
- the working age population and the labour force are expected to undergo significant growth, with the overall labour market participation rate[3] expected to remain at around 78% over the next decade. This reflects declining trends for males offset by some increases amongst females.
- the level of unemployment is expected to remain stable at relatively low levels compared with recent historical experience, with only a very modest increase. For most people unemployment will be a transitory experience, although a minority will continue to suffer long duration unemployment.

[3]Labour market participation rates are defined as those economically active (i.e. in employment or actively searching for work) as a percentage of the population of working age.

Sectoral Prospects

Projections of output by sector

The prospects for broad sectors to 2012 are as follows:

- PRIMARY & UTILITIES which includes agriculture, mining, electricity, gas and water, are all expected to display weak rates of growth or declines in output;
- MANUFACTURING output growth is forecast to average less than 2% per annum. There is high growth in technology and R&D-related industries, but other sectors such as textiles, clothing & leather and metals are expected to perform much less strongly, reflecting intense international competition.
- CONSTRUCTION is also expected to show only modest growth, with average rates below 2% per annum.
- DISTRIBUTION, TRANSPORT, ETC. includes a diverse range of industries. Transport & communications output is forecast to grow by over 4% per annum, with communications displaying the strongest growth of any services apart from computing. Output in distribution, retailing, and hotels and catering is forecast to grow by just over 2% per annum.
- BUSINESS & MISCELLANEOUS SERVICES: Business services (which includes computing and related industries) are expected to grow by around 4% per annum over the longer term but Banking and insurance 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. Public services output is projected to increase by about 1.5% per annum. Health and education services are expected to see much more rapid growth at around 2.5–3.5% per annum.

Sectoral employment prospects

Employment prospects to 2012 are intimately linked to output growth, but also depend on how rapidly productivity rises in each broad sector.

- The primary and utilities sector (which includes agriculture and mining) is expected to continue to experience significant job losses in the next few years, but losses are projected to slow thereafter;
- Long-term decline in employment in manufacturing is expected to continue, with a loss of just over 650 thousand jobs between 2002 and 2012:
  - engineering is the largest contributor to job loss, as employment declines by just under 150 thousand jobs;
  - metals & metal goods and textiles & clothing display large job losses, each losing around 100 thousand jobs over the period to 2012;

- Construction is projected to experience a slight fall in the total level of employment between 2002 and 2012;
- Employment in distribution transport etc., is expected to increase by around 400 thousand jobs between 2002 and 2012– with most of the growth accounted for by jobs in distribution; employment in transport and communications is expected to show little change.
- Employment in business & other services is forecast to increase by around 1.25 million by 2012, with other business services showing the fastest growth;
- Despite a projected increase in jobs in non-marketed services, this broad sectors share of all jobs is not expected to increase very significantly between 2002 and 2012:
  - most of the projected employment growth is accounted for by health & education services; while
  - public administration & defence are forecast to see a slight fall in employment.

Changes in Occupational Structure

Results from the Census of Population

The results take account of initial findings on changing patterns of occupational employment structure from the Census of Population 2001. However, only headline figures were available when the projections were prepared. The results presented here should therefore be regarded as indicative of general trends and tendencies rather than precise forecasts of what will necessarily occur at a detailed level.

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.

Much faster growth has been observed 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 and secretarial occupations;
- skilled manual and electrical trades;
- other skilled trades.

New Occupational Projections to 2012

Underlying trends, which have been apparent over the previous two decades, are expected to continue, with significant increases in employment over the period from 2002 to 2012 expected for:

- managers and professional occupations. Corporate managers and nearly all the sub-groups within the professionals group are projected to experience significant rates of growth of around 20% over the decade;
- associate professional & technical occupations. The science/technical group, protective service occupations and culture/media/sport occupations are projected to grow the fastest;
- personal service occupations (especially caring personal service occupations) and customer service occupations. These are expected to see a substantial increase, with women being the main beneficiaries.

Smaller or less rapid rates of increase are projected for the sales occupations group and for managers & proprietors.

Job losses are projected for administrative, clerical & secretarial occupations, (especially the latter); the impact of information and communication technology (ICT) has lead to the cessation of previously strong growth.

Job losses are also expected in a number of other areas:

- skilled trades occupations are expected to lose more than 500 thousand jobs, with largest job losses in skilled metal & electrical trades and other skilled trades;
- transport and machine operatives are projected to see further job losses, but this obscures a continued fall in jobs for process, plant & machine operators who work in factories and on construction sites. This is partially offset by an increase in the number of jobs for transport drivers and operatives;
- elementary occupations are expected to see the net loss of over 400 thousand jobs; this final SOC 2000 major group is expected to see job losses concentrated primarily in those unskilled occupations related to clerical and other routine service jobs, again reflecting the impact of ICT.

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 10 times larger than the net growth projected between 2002 and 2012. Over the decade there is expected to be a net requirement of about 13.5 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 and proprietors in agriculture and in service industries; administrative, clerical, secretarial and related occupations; skilled metal and 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 and research professionals; health and social welfare associate professionals; business and public service associate professionals; caring personal services; and sales occupations.

Detailed Prospects by Sector

The final chapter of the National Volume presents a detailed industrial analysis. Results are presented for each industry, showing key trends in:

- output, productivity and total employment;
- changing patterns of employment by gender and status;
- structural changes in occupation employment;
- replacement demands.

These detailed results highlight the changing fortunes of different industries and occupations, within the broader sectoral categories already discussed. This is complemented by an even more detailed breakdown of patterns within these industries in an extended sectoral report. The latter is presented in Volume Three, the Sectoral Report.

1. INTRODUCTION

1.1 Background

This report is the first of three volumes that present **Working Futures**: New Projections of Occupational Employment by Sector and Region. Volume One is the National Report, Volume Two the Regional Report and Volume Three the Sectoral Report. The work was undertaken on behalf of the LMI Champions Group and was commissioned jointly by the Sector Skills Development Agency (SSDA) and the Learning and Skills Council (LSC).[1] This first volume focuses on the National (UK) picture. This new set of forecasts updates earlier work commissioned by the Department for Education and Skills (DfES).[2] The results are intended to provide a sound statistical foundation, on a consistent and comparable basis, for the deliberations of the Sector Skills Councils (SSCs), Regional Development Agencies (RDAs) and Local Learning and Skills Councils (LLSCs), about future developments in occupational employment.

The present report provides an overview and summary, although it also presents considerable detail by the SSDA Sector Matrix Industries, (as detailed in Table A.3. of the Annex) focusing on the UK.[3] A detailed analysis of industry developments is presented in Chapter 6. This is complemented by an extended version of this chapter, which constitutes in Volume Three, the Sectoral Report. This considers each of the industries covered in Chapter 6 in much greater detail, providing further analysis of developments in up to 67, 2-digit, SIC92 categories.

Analyses for each of the regions covered by the nine English Regional Development Agencies (henceforth RDAs) and the constituent countries of Scotland, Wales and Northern Ireland within the UK are presented in a separate Regional Report (Volume Two).[4]

1.2 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 multi-sectoral macroeconomic model is required.[5]

The projections are based on the use of the Cambridge Econometrics (CE) multisectoral, 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.

[1]The LMI Champions Group comprises the SSDA and LSC, together with DfES, DWP, DTI, RDAs, Regional Observatories and Regional Government Offices.

[2]See Wilson (2001a and b).

[3]For further information on the SSDA Sector Matrix go to www.ssdamatrix.org.uk/

[4]Green, et al. (2003).

[5]This is regarded as standard practice in developing employment scenarios across the world. For further discussion see Wilson and Briscoe (2002) and Wilson (1994).

RMDM solves as a single system in which macroeconomic results are built up from the more detailed results at sectoral and regional level.[5] The long-term growth rate for the economy therefore reflects the expected performance of individual industries. This includes their rates of productivity growth and the demands for their output (including their international trade performance).[6] The model is a combination of orthodox time-series econometric relationships and cross-sectional input-output relationships. Aggregate demand is modelled in a Keynesian manner, with a consumption function and investment equations. However the model also includes equations for average earnings by industry and region. Other aspects of the supply side come in through the export and import equations, in which capacity utilisation affects trade performance. The detailed set of industry employment equations allows relative wages rates and interest rates to affect employment and therefore 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.[7]

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 normally operate at the level of some 49 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, SISC92 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 in the accompanying Technical Report.[8]

[5]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 macroeconomic model. A full description of the current approach to developing the employment projections can be found in Wilson et al. (2003).

[6]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.

[7]Wilson et al. (2003)

[8]Wilson et al. (2003).

At the industry level, all the 2-digit categories of the 1992 Standard Industrial Classification (SIC92) 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.

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.[9] The focus on industrial and spatial detail pushes the available data to the limits for which it was originally collected.[10] 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 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.

The views expressed in this report are those of the authors and do not necessarily reflect the views of the Sector Skills Development Agency and/or the individual Sector Skills Councils. The results should be regarded as indicative of general trends for sectoral groups as specified in Annex A, rather than precise forecasts of what will happen. They should be used in conjunction with a variety of other sources of LMI. The sectoral groups are not necessarily co-terminus with Sector Skills Council definitions.

[9] See Wilson and Briscoe (2002) for further discussion.

[10] For further details of the sources and methods used and the limitations of the data and estimates, see the Technical Report (Wilson et al., 2003).

1.3 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) and 25 sub-major occupational groups from the new 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.[11]

The occupational projections are developed using largely extrapolative methods, based on data from the Census of Population and the Labour Force Survey (LFS). At the time of writing, only limited data have been made available from the 2001 Census. So, although the results take into account headline data from the Census, they have not yet incorporated the detailed insights into changes in occupational employment structure that the Census allows. Such analysis is planned for the next round of projections. 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 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.

1.4 Data Sources and Methods

The results incorporate the latest sectoral employment data from ONS, including the 2001 Annual Business Inquiry. They also take note of the headline results emerging from the Census of Population for 2001. Information about sources and methods is presented in Annex A of the present document and in greater detail in the separate Technical Report.[12]

[11]Wilson et al. (2003).

[12]For further discussion see the Technical Report (Wilson et al., 2003) available from the SSDA.

2. MACROECONOMIC CONTEXT FOR THE PROJECTIONS

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. Finally, the sensitivity of these results to certain key assumptions is discussed in Section 2.5.

2.2 Exogenous Assumptions

The main exogenous variables in the CE macroeconomic model are:

- world growth in industrial production;
- world inflation in wholesale prices and in the prices of traded goods such as crude oil;
- UK population and regional activity rates for men and women;[1]
- UK natural resources (the main natural resources being 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.

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

Slower US growth over the last six months has raised doubts about short-term prospects. Concerns over the robustness of household expenditure in the light of continued stock market weakness and rising unemployment have dented hopes of an immediate strong US recovery. Expectations for US growth have been marked down as data for 2002 became available. The effects of the rapid loosening in monetary policy are still coming through, but inflation is still fairly low. The effects of the activity slowdown on inflation, which was already quite subdued, have been minimal. Average forecasts for 2003 show little impact.

[1] The latter is predicated, in the first instance, assuming a constant rate of unemployment

Table 2.1: Macroeconomic Indicators for the UK

	Historical Trends		Recent Trends		Projections		
	1992-97	1997-2002	1999-2000	2000-01	2001-02	2002-07	2007-12
GDP at market prices (% p.a.)	3.2	2.3	3.1	2.1	0.8	2.5	2.4
GVA at basic prices (% p.a.)	3.2	2.3	3.1	1.8	1.3	2.5	2.4
exl. Extra-Regio (% p.a.)	3.1	2.4	3.1	1.9	1.4	2.6	2.4
Manufacturing output (% p.a.)	2.1	-0.8	2.1	-2.5	-4.3	1.7	1.8
Household expenditure (% p.a.)	3.2	4.3	5.2	4.1	3.8	2.7	2.5
Employment (millions)	28.0	29.5	29.2	29.5	29.5	30.0	30.8
Unemployment (millions)	1.6	0.9	1.1	1.0	0.9	1.3	1.2
RPIX Inflation (% p.a.)	2.8	2.3	2.1	2.2	2.2	2.2	2.3
BP/GDP (%)	-0.2	-0.9	-2.0	-1.3	-0.9	-1.4	-1.1
PSNCR/GDP (%)	1.5	1.8	-4.0	-0.3	1.8	2.0	2.0

Source: CE/IER estimates; CE projections MDM95 C31F9S, 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

The outlook in Japan remains weak. Japan is still struggling to pull itself out of recession, with seemingly few policy options remaining, as nominal interest rates remain near zero, while fiscal policy is constrained by rising debt and deficit ratios. The domestic economy in Japan is suffering from low confidence while external demand is showing few signs of recovery in the short-term. The dollar's weakness over the last year has not helped plans for an export-led recovery in Japan, but it is the Japanese government's inability to push through much-needed reforms that continues to prevent sustained growth in GDP.

Consumer sentiment in Europe remains fragile as the unemployment rate is continuing to rise in many major economies, while the outlook for manufacturing remains bleak The emergence of a rapid slowdown in GDP growth through the last year has resulted in sharply lower expectations of a recovery in 2003.

The chances of a recovery in the UK being export-led have been reduced therefore by the slowing pace of recovery in the US, ongoing recession in Japan, and the continuing weakness of intra-EU trade, so long as domestic economies remain fragile and firms are reluctant to invest. The euro's recent gains against the dollar and sterling have also shifted the balance of competitiveness away from euro-zone producers.

Government action to boost activity has been limited by balanced budget requirements under the Growth and Stability Pact and the 3% limit on the deficit-to-GDP ratio. Several euro-zone governments have had to postpone planned tax cuts and planned increases in public expenditure that would have seriously jeopardised their return to fiscal balance. Any country exceeding this limit faces financial penalties. Germany and Portugal already run the risk of having to pay hefty fines for surpassing the 3% boundary.

Sterling has weakened a little as the euro has strengthened against the dollar. It has, once again, followed a middle course between the relative movements of the euro and the dollar. The sharp weakening of the dollar in the first part of 2002 was followed by six months of greater stability. Sterling's depreciation against the euro and its appreciation against the dollar left the sterling effective rate down a little during the first quarter of 2003. Sterling is still regarded as overvalued against the euro but the likelihood of a sharp depreciation has receded as the extent of the overvaluation has gradually lessened. The possibility of depreciation probably carries less weight now with the Bank of England, as it forms its view on monetary policy.

Provided that the expected slowdown in growth in domestic spending this year is not particularly sharp, the Bank of England is expected to keep interest rates on hold during the rest of 2003, and to begin to raise them gradually again in 2004 as the recovery strengthens.

Overall, it is anticipated that world economic activity will pick up in 2004. The recovery is expected to gather pace towards the end of 2003, and world growth is forecast to peak at around 3% over 2004-05. The US is expected to lead the recovery, with growth exceeding 3% in 2004. Only a weak recovery is expected in Japan, led by exports to the rest of Asia and to the US as demand picks up. Growth in Japan is assumed to reach around 1.5% in 2004. Growth in the euro-zone is expected to be around 2-2.5% in 2004.

Inflation and domestic spending

Within the UK, inflationary pressure from wages is modest. Over the past two years the rate of average earnings growth has generally declined in all main sectors and towards the end of 2002 was running at a little under 4%; given a reasonable rate of trend productivity growth this rate of wage inflation does not pose any threat to the Bank of England's RPIX target. The more volatile profile of average earnings in private services reflects the payment of large bonus payments at the end of 2000 and the sharp reduction in such payments at the end of 2001. The pick-up in public sector average earnings inflation towards the end of 2002 reflects the delay, from April to September, of the agreement of the local authority pay settlement. This affects about one quarter of all public sector workers. There are concerns that the expansion of spending on government services will result in higher public sector wage settlements, which would be of particular concern for inflation prospects if they are not associated with productivity improvements. Inflationary pressure is still modest, even given the acceleration in RPIX inflation in February 2003 to 3.0%, its highest rate since mid-1998. This reflected price increases for seasonal food and an unexpectedly large increase in some clothing items.

Following the swift ending of the war in Iraq (however long any military presence remains), it is expected that the global political environment will become somewhat more settled. In the short-term the prospect of lower oil prices and weak growth in the euro-zone suggest that inflationary pressure from external sources is likely to be modest. At the same time the Bank's decision to cut the so called repo rate to 3.75% in February will delay the expected correction to the imbalances in the domestic economy associated with household indebtedness.

UK household spending growth may be beginning to slow down. For much of the past three years (to late 2002) growth in household spending has led growth in GDP. Growth in retail sales has generally been even stronger. During 2002 this spending was financed by a rapid increase in borrowing, helped by low interest rates and rapid house-price inflation, and the saving ratio dropped sharply. Growth in household spending cannot continue to outpace growth in incomes indefinitely, but the enthusiasm of households to take on debt has so far shown little sign of abating. However, in early 2003 there were signs that household spending and retail sales growth had begun to slow. Retail sales fell in January and February so that the annual rate of growth halved from 6.1% in December 2002 to 3.2% in February. In the short-term, a period of slower household spending growth is anticipated, in which the saving ratio recovers somewhat, as households become less willing to take on debt.

UK exports of goods have slowed. The contrast between strong growth in UK household spending and relatively weak growth in world markets in 2002 was reflected in the weaker performance of exports than imports, and the continued trade deficit. Towards the end of the year, the volume of goods exports (excluding oil & erratics) fell further, whereas the decline in import volumes was stemmed. Goods exports to non-EU countries fell much more sharply than those to EU countries, reflecting the weakness of demand in North America and Japan. Similarly, goods imports from EU countries increased, whereas from non-EU countries they fell. Import growth would have been stronger but for the sharp decline in business investment during 2002.

Employment and output

In the second quarter of 2002, the year-on-year growth of workforce employment slowed to a halt. In the second half of the year employment in the UK was lower than a year earlier. There was an increase in part-time employment, particularly among men, but the numbers of both men and women in full-time employment fell. However, year-on-year growth of LFS employment quickened slightly to average 0.75% in 2002. Despite the slowdown in economic activity it seems some firms have been unwilling to shed staff in the current tight labour market conditions. Consequently, productivity growth was weak at less than 1.5% in 2002.

The unemployment claimant count fell below 950,000 in July 2002 and remained just below this figure for most of the second half of 2002. Over the same period, the ILO unemployment rate remained just above 5%. Unemployment is not expected to fall much further. As the working-age population is expected to increase by more than employment, it is projected that the level of unemployment will also start to increase gradually in the coming months.

Employment is forecast to fall slightly in the year to June 2003 as further job cuts are expected in most manufacturing industries. This reflects restructuring and productivity improvements. As a result, productivity growth for the whole economy is expected to pick up to 2.25% in 2003. As economic activity is forecast to peak in 2005, employment growth is expected to pick up to 0.5% per annum in 2005 and 2006, resulting in a longer-term increase to just under three million by 2012.

GDP growth of 2% is forecast in 2003, sustained by the continued strength of the growth of government spending. Domestic demand is forecast to grow by around 2.75% in 2003, a slight pick-up compared to 2.5% growth in 2002. During 2002 household wealth was eroded as the impact of falling equity values offset that of increasing house prices. Household spending growth is forecast to slow to 22.5% in 2003, and the saving ratio is expected to recover somewhat as households become less willing to take on debt. Investment fell by more than 3% in 2002 and only a gradual recovery in investment growth is forecast in 2003.

As a result, investment in 2003 is set to be 1.5% higher than in 2002, but even so it will remain well below its 2000 peak level. Public sector investment is expected to show further strong growth, and manufacturing investment is forecast to fall only slightly. Export growth is forecast to remain subdued this year and import growth is expected to pick up as the strength of domestic demand holds up. Net trade is forecast to curb growth by around 0.75 percentage points.

GDP growth is forecast to recover to 3% in 2004 as the global economy picks up but then settles down to around 2.5% per annum. Household spending growth is expected to accelerate a little to 3% in 2004 as renewed employment growth boosts incomes. It then also settles down to around 2.5% per annum Investment growth is forecast to accelerate to 3% in 2004, boosted by a recovery in corporate profits. Government consumption is expected to contribute a further 0.5 percentage points to overall growth. As recovery of world activity will gather pace towards the end of 2003, and strengthen in 2004, UK export growth is forecast to pick up to 5.5% in 2004, and import growth is forecast to strengthen further to meet the associated demand for imported inputs. Over the longer-term the balance of payments as a percentage of GDP is projected to continue to decline.

2.4 General Labour Market Prospects

Employment

In 2002, there were some 29 million people employed in the UK economy. Some 18 million of these were full-time employees, with part-timers accounting for around seven million, (see Figure 2.1). Males still account for the majority of jobs but females have been steadily increasing their share (see Figure 2.2). By 2002 females made up 47% of the total, with part-timers accounting for over 20%.

Employment by gender and status

Between 2002 and 2012 the total level of employment in the UK labour market is projected to grow by almost 1.5 million jobs (see Figure 2.3). Figure 2.4 illustrates that the majority of the additional jobs are expected to be taken up by women. The increase in the number of part-time jobs alone almost accounts for the entire increase. Substantial growth in the number of jobs for part-time males is also expected, but full-time employment levels for males are expected to remain static. Self-employment is expected to decline slightly, especially for males.

Unemployment

The general indications of a slowdown in UK economic activity have not yet been reflected in the labour market. This is partly because of the continued effect of various government initiatives aimed at reducing unemployment.

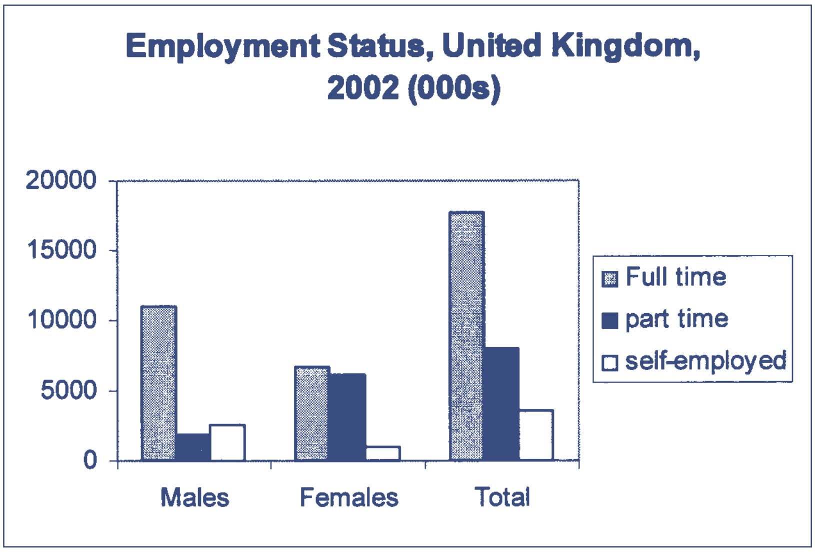
The labour market has tightened further in recent months, although the most recent unemployment statistics available do indicate a slight increase. Employment has continued to grow at the rate of about 1% per annum over the last year or two. Unemployment has fallen, in part at least, in response to various government initiatives. The rate of average earnings inflation has also continued to rise. However, over the medium to longer-term, these pressures are expected to ease, although no dramatic increase in unemployment is anticipated if general economic prospects remain favourable.

The labour force

The labour force is projected to grow somewhat less rapidly than the working age population up to 2012, (see Figure 2.3). This reflects a slight fall in labour market participation rates. By the end of the decade the overall labour market participation rate is projected to be just over 78% of the working age population. This change reflects declining participation for males, offset in part by the rising participation of women age 25-50 in the formal economy.

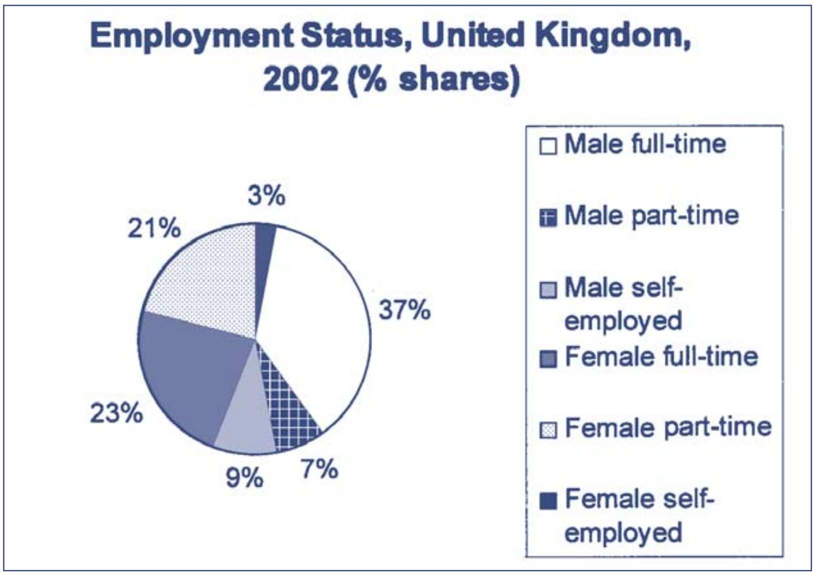
With employment opportunities growing at almost the same pace as the labour force, the projection is for little change in unemployment levels (see Figure 2.3). The average rate of unemployment for the whole of the UK economy is projected to be maintained at roughly the same level as in 2002 through to 2012, rising marginally. Problems of long duration unemployment will remain concentrated in particular localities and in certain parts of the community (e.g. ethnic minorities and older, less skilled, workers).

Figure 2.1



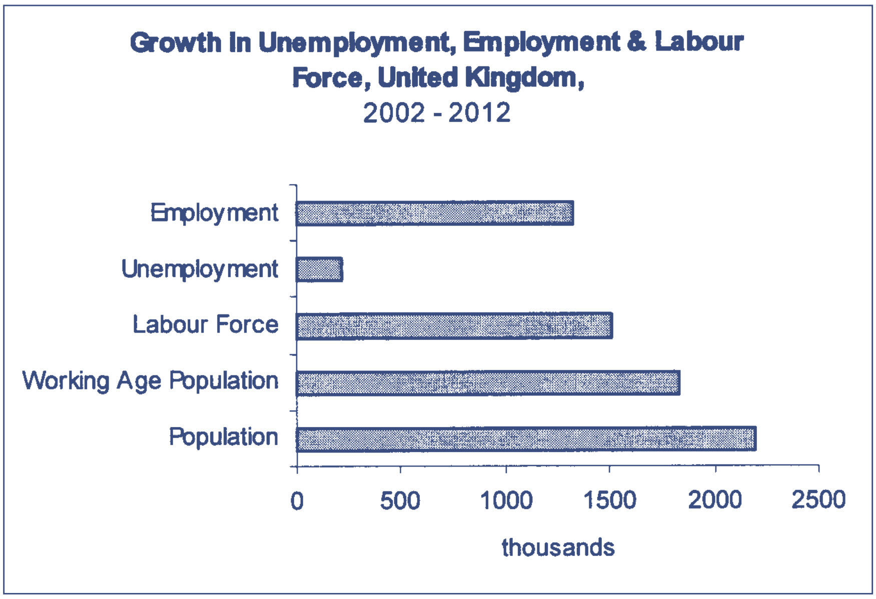
Source: CE/IER estimates, MDM95 F95F9S Forecast, Macrotables.xls, (Figures 2.1 to 2.4).

Figure 2.2



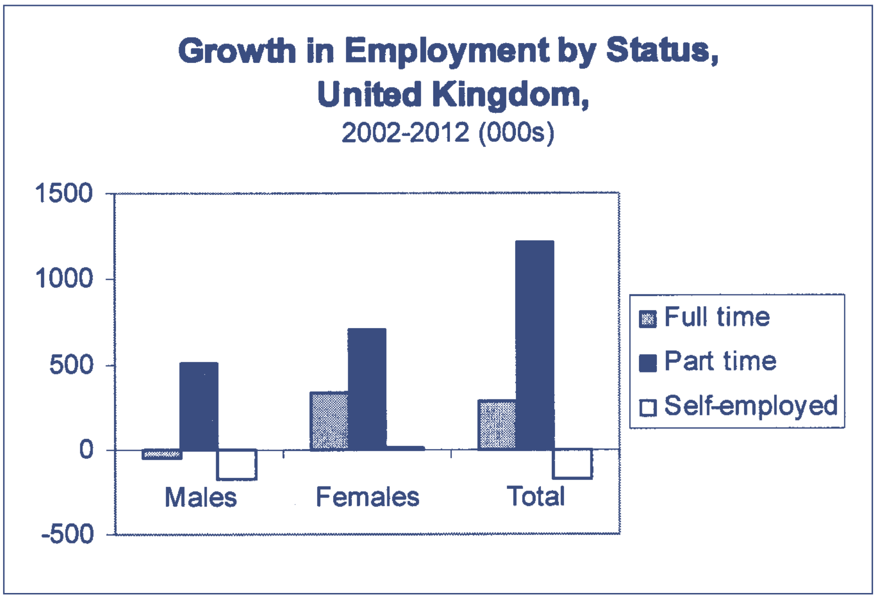
Source: CE/IER estimates, MDM95 F95F9S Forecast, Macrotables.xls, (Figures 2.1 to 2.4).

Figure 2.3



Source: CE/IER estimates, MDM95 F95F9S Forecast, Macrotables.xls, (Figures 2.1 to 2.4).

Figure 2.4



Source: CE/IER estimates, MDM95 F95F9S Forecast, Macrotables.xls, (Figures 2.1 to 2.4).

2.5 Macroeconomic Uncertainties

There are two main areas of uncertainty affecting the macroeconomic forecast. These relate to the housing market and the prospects for world growth.

Sharper correction to the housing market

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 softening of 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.

Slower pick-up in world growth

In the base forecast it is assumed that world activity will recover at the end of this year and peak over 2004-05 boosting the UK recovery in trade performance. A more protracted period of global uncertainty after the Iraq war, or the potential threat of a terrorist attack might defer this recovery in world activity.

The industries most vulnerable to a general slowdown in world trade are mainly in manufacturing, but also trade-related transport services and international business services might see weaker growth.

2.6 Comparison with Previous Forecasts

The present set of projections are broadly similar to those produced previously for DfES, (Wilson, 2001a). The previous forecasts were for an increase in employment of around two million between 1999 and 2010. The present projections suggest a slightly slower rate of increase of around 1.3 million between 2002 and 2012. However, the levels of employment projected for 2010 are quite similar (the present estimate is about 2% higher) and this difference primarily reflects revision to the historical database. Projected change over the period 1999-2010 in the present projections is 1.8 million. Patterns of change at the sectoral level are also broadly the same in the two sets of projections.

3. SECTORAL EMPLOYMENT PROSPECTS

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. It focuses on a number of broad sectoral categories as well as more detailed industrial prospects. A more detailed analysis based on 25/27 sectors can be found in Chapter 6.[1] These projections, therefore, relate to the broad sectoral definitions as specified in Annex A and are not necessarily co-terminus with Sector Skills Council definitions.

Section 3.2 begins with a brief review of the key drivers of sectoral change. Section 3.3 then describes the patterns of change for six **broad sectors** over the past few years and the prospects for the next decade. A more detailed analysis of sectoral prospects for output is presented in Section 3.4. This presents results for 14 **sectors**. Section 3.5 goes on to draw out the employment implications of these changes. Section 3.6 concludes with an overview of changing employment patterns by gender and status within the broad sectors.

3.2 Key Drivers of Sectoral Change

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;
- dramatic shifts in patterns of expenditure.

Technological change - especially information and communications technology (ICT), has affected both the products and services made and delivered as well as the way they are produced. This has had major implications for industrial employment structure, as well as resulting in increased demands for IT skills across a range of sectors and occupations. The growth of computing services and to a lesser extent electronic products are good examples of the development of new products and services. The impact of IT in the insurance and banking sector is an example of a major employment impact, as ways of producing and delivering the services have changed dramatically.

[1] SSDA and its partners have identified 27 sectors at national level but some of these are too small to enable a robust analysis. They have therefore been aggregated to 25 categories here and in Chapter 6. However, where the data are sufficiently robust, detail for the additional categories is provided.

Productivity growth is 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. 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. This 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 one of the key factors in stemming the downward trend in the motor vehicles industry, which seemed in imminent danger of complete collapse only a few years ago.

Specialisation and sub-contracting, including extension of supply chains, is also a key factor 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.

Changing patterns of consumer demand have also been influenced by technological changes, for example the dramatic growth in air travel.

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 and the media, and health and 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 multisectoral 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.[2]

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.

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.

Output

Although it remains a key component of the economy, the *primary and utilities* sector now accounts for less than 5% of total output (and an even smaller proportion of total employment). Output growth is expected to be weakest in mining, reflecting the running down of North Sea oil and gas activity.

The data in Table 3.1 also illustrate trends in the *manufacturing* sector. The latter still accounted for almost a quarter of total output in 1982, but this has now declined to less than 20%, with a further fall anticipated.

Construction, by contrast, has maintained a fairly steady share of total output in recent years, although this is expected to fall over the coming decade.

[2]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 detail see Annex A.

It is services that have seen their output shares increase, most notably marketed services such as *distribution, transport,* etc. and *business and other services.* Both of these broad sectors are projected to continue to increase their shares of total output.

Non-marketed services have seen a declining share of total output over the past two decades. This obscures very different trends for public administration and for health and education services, as discussed below. In total this broad sector is expected to maintain its share of a growing national cake over the next decade.

Table 3.1: Output by Broad Sector, 1982 – 2012

Shares (%)	**1982**	**1992**	**2002**	**2007**	**2012**
Primary and utilities	6.4	5.9	4.3	3.9	3.5
Manufacturing	23.8	23.5	18.7	17.8	17.1
Construction	5.6	5.8	5.5	5.2	5.0
Distribution, transport etc	21.4	22.9	26.3	26.8	27.6
Business and other services	19.6	22.0	27.8	28.8	29.5
Non-marketed services	23.3	20.0	17.5	17.5	17.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Growth (% p.a.)	**1982-92**	**1992-02**	**2002-07**	**2007-12**	**2002-12**
Primary and utilities	2.0	-0.1	0.4	0.2	0.3
Manufacturing	2.6	0.6	1.7	1.8	1.7
Construction	3.2	2.3	1.8	1.8	1.8
Distribution, transport etc	3.5	4.4	3.1	3.2	3.1
Business and other services	4.0	5.4	3.3	3.1	3.2
Non-marketed services	1.2	1.6	2.8	2.3	2.5
Total	**2.8**	**2.9**	**2.7**	**2.6**	**2.6**
Growth (% total)	**1982-92**	**1992-02**	**2002-07**	**2007-12**	**2002-12**
Primary and utilities	21.7	-1.5	2.3	1.2	3.4
Manufacturing	29.2	6.3	8.6	9.1	18.5
Construction	37.3	25.3	9.1	9.5	19.5
Distribution, transport etc	41.0	53.1	16.5	16.9	36.3
Business and other services	47.5	69.2	17.9	16.3	37.2
Non-marketed services	12.5	16.8	14.6	11.8	28.2
Total	**31.4**	**33.6**	**14.1**	**13.5**	**29.5**

Source: CE/IER estimates, MDM95 C31F9S, 6725output.xls (Table 3.1).

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

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 1982-2012. Figure 3.2 presents corresponding information in terms of annual percentage growth rates.

Employment is expected to continue to decline in the *primary and utilities* sector, with the loss of a further 100,000 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 1.5-2% p.a. is expected as firms seek to maintain competitiveness. Some 600,000 jobs are expected to be lost over the next 10 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 60,000 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 and catering is also expected to pick up as international tourism begins to recover. For transport and 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 400,000 additional jobs expected in the broad sector distribution, transport etc.

In *business and other services,* there is a mixed picture. In banking and insurance the prospects are less optimistic than in some other areas of business services. Following recent cuts in employment, prospects in the former are likely to improve slightly but this growth is likely to be modest, due to increased investment in IT, etc. Amongst the latter, activity should recover quite strongly, leading to a renewed employment growth. About 1.3 million extra jobs are projected in total between 2002 and 2012.

In *non-marketed services,* prospects are again mixed, with pressures to reduce the number of people employed in public administration and 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 just under half a million additional jobs are projected for the broad sector as a whole.

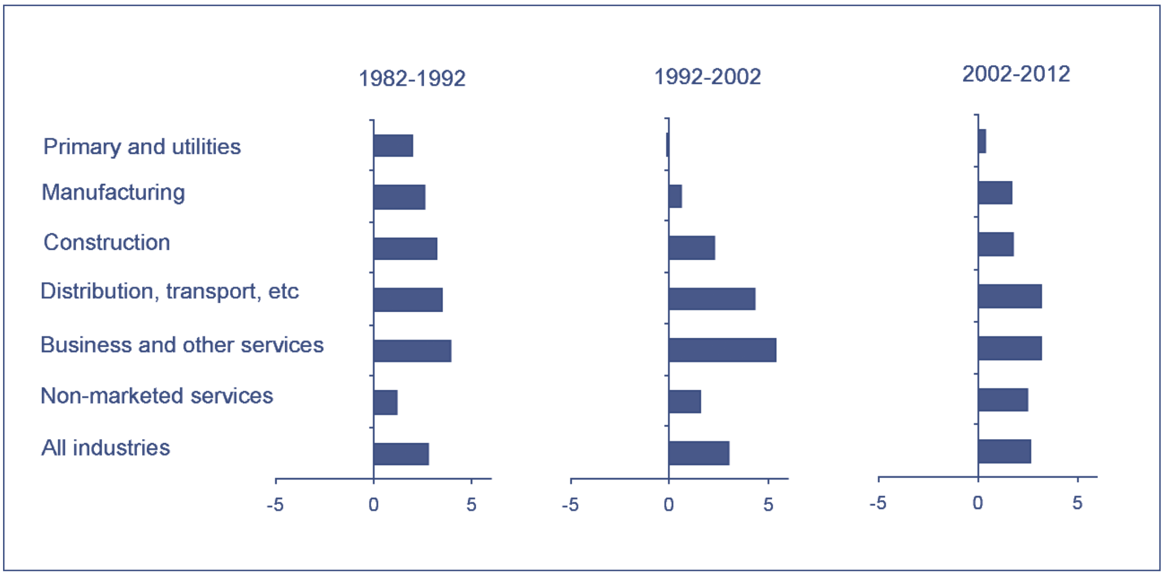
Table 3.2: Employment by Broad Sector, 1982-2012

Levels (000s)	**1982**	**1992**	**2002**	**2007**	**2012**
Primary & utilities	1,308	928	660	589	551
Manufacturing	5,721	4,431	3,867	3,480	3,229
Construction	1,676	1,866	1,854	1,820	1,795
Distribution, transport, etc.	7,139	7,725	8,669	8,781	9,062
Business & other servs.	4,157	5,631	7,498	8,010	8,780
Non-marketed services	5,187	6,060	6,787	7,092	7,241
Total	**25,186**	**26,639**	**29,336**	**29,772**	**30,658**
Shares (%)	**1982**	**1992**	**2002**	**2007**	**2012**
Primary & utilities	5.2	3.5	2.2	2.0	1.8
Manufacturing	22.7	16.6	13.2	11.7	10.5
Construction	6.7	7.0	6.3	6.1	5.9
Distribution, transport, etc.	28.3	29.0	29.6	29.5	29.6
Business & other servs.	16.5	21.1	25.6	26.9	28.6
Non-marketed services	20.6	22.7	23.1	23.8	23.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Growth (% p.a.)	**1982-1992**	**1992-1902**	**2002-2007**	**2007-2012**	**2002-2012**
Primary & utilities	-3.4	-3.1	-2.2	-1.3	-1.8
Manufacturing	-2.5	-1.2	-2.1	-1.5	-1.8
Construction	1.1	-0.1	-0.4	-0.3	-0.3
Distribution, transport, etc.	0.8	1.1	0.3	0.6	0.4
Business & other servs.	3.1	2.6	1.3	1.9	1.6
Non-marketed services	1.6	1.0	0.9	0.4	0.6
Total	**0.6**	**0.9**	**0.3**	**0.6**	**0.4**
Change (000s)	**1982-1992**	**1992-1902**	**2002-2007**	**2007-2012**	**2002-2012**
Primary & utilities	-380	-268	-70	-38	-109
Manufacturing	-1,290	-563	-387	-251	-638
Construction	190	-11	-34	-25	-59
Distribution, transport, etc.	586	944	112	281	393
Business & other servs.	1,474	1,867	512	770	1,282
Non-marketed services	873	728	304	149	453
Total	**1,453**	**2,697**	**436**	**886**	**1,322**

Source: CE/IER estimates, MDM95 C31F9S, 6UK.xls (Table 3.2).

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

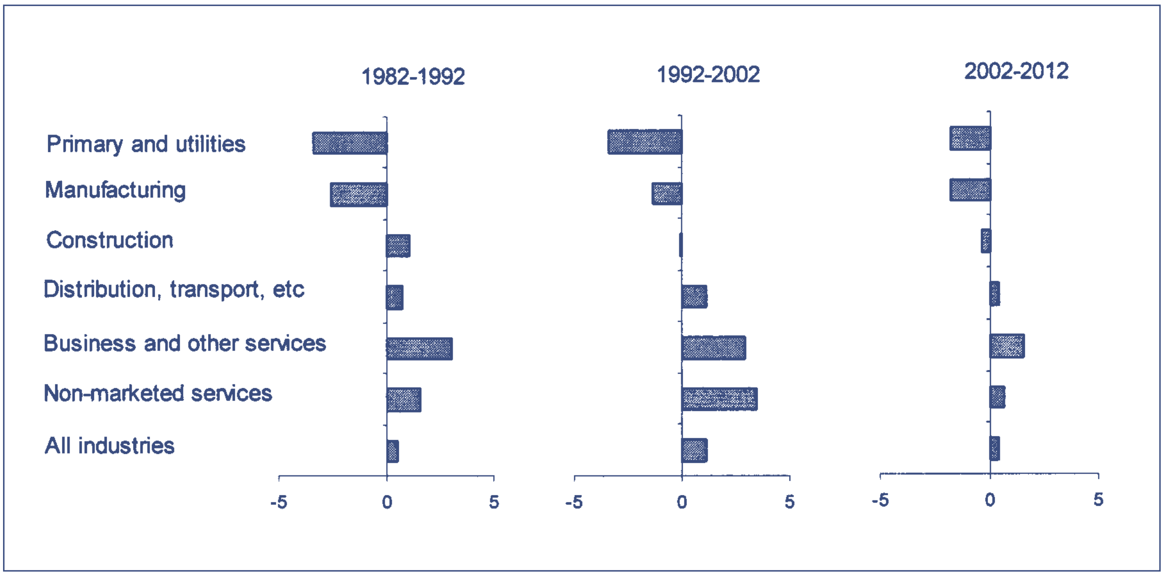
Figure 3.1: Changes in Output by Broad Sector, 1982-2012 (% p.a.)



Source: CE/IER estimates, MDM95 C31F9S, 6725output.xls, (Figure 3.1).

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

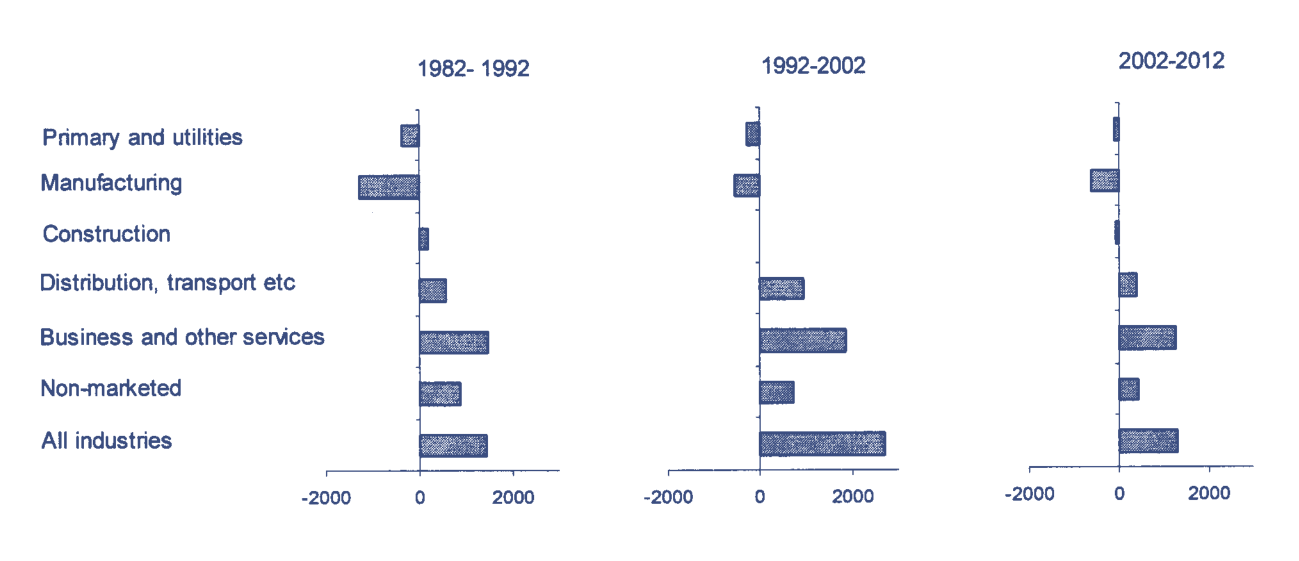
Figure 3.2: Change in Employment by Broad Sector, 1982-2012 (% p.a.)



Source: CE/IER estimates, MDM95 F95F9S 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, 1982-2012 (000s)



Source: CE/IER estimates, MDM95 F95F9S Forecast, 6UK.xls, (Figure 3.3).

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

3.3 Detailed Sectoral Prospects

This section explores sectoral prospects in more detail, focusing on the 14 **sectors** used by ONS, and a more detailed breakdown of **industries** based on the SSDA's Sector Matrix Industries, which are detailed in Table A.3. of the Annex. The results are presented in Table 3.3 and 3.4 and in Figures 3.4 and 3.5. They are discussed in terms 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, following a sharp decline in output in 2001 (almost an 11% fall), some recovery in output levels growth is expected in the short-term, although over the long-term, growth is expected to remain subdued.

Mining and quarrying has seen very mixed fortunes over the past two decades, with the demise of the coal mining industry and the rise and imminent decline of North Sea oil and gas activity.

In the oil and gas industry, output is expected to show an overall decline over 2002-12. This is mainly because gas production is forecast to decline from 2005 onwards, as increased output from fields west of Shetland and from the smaller deposits fail to offset the sharp decline in production from established UK North Sea fields as they become exhausted.

Output growth is also expected to slow in electricity, gas and water supply, following periods of more rapid growth linked to privatisation and restructuring.

Manufacturing

Manufacturing output is estimated to have fallen by 4.25% in 2002, an even sharper fall than in 2001 (2.5%). The key factor (aside from sector-specific developments such as the continued weakness in ICT demand) was the slowdown in world markets, and in particular the sluggish growth in the euro-zone, the most important market for UK exporters. The euro's recent gains against the dollar and sterling have improved the competitiveness of UK producers exporting to the euro-zone, but until the prospects for recovery become clearer in the euro-zone (consumer sentiment is fragile and firms are reluctant to invest), export growth is expected to remain weak. Furthermore, the US economy is taking longer to recover than initially expected. When this is added to the weakness in many euro-zone markets, the prospects for an export-led manufacturing revival in the short-term look bleak.

Manufacturing output is expected to show no growth in 2003, before returning to growth of around 2.25% in 2004, on the assumption that the world economy picks up. In the long-term, manufacturing output is expected to grow by around 1.5-2% p.a.some 0.5 pp p.a. below the annual rate of output growth of the economy as a whole.

Within manufacturing the strongest growth is expected in *chemicals,* most especially in pharmaceuticals. The latter is in any case less sensitive to cyclical fluctuations than most industries. Growth expected here is driven by structural factors, such as population demographics, demands of developments in medical technology and the increase in government spending on healthcare.

However, the expiry of patent protection on many high-selling drugs and the consequent inroads to the market made by generic producers are expected to curb output growth of UK-based firms in the long-term, to some degree.

Electronics should return to growth, as output begins to rise strongly again once inventory levels return to normal. Long-term prospects for the sector remain bright, although output growth is expected to remain below the rates enjoyed over 1995-2000. The general recovery is bound to lead to increased demand for electronic goods and components, especially as inventories are rebuilt. In *telecommunications,* however, the over-investment, particularly in the US during the late 1990s, will take some time to be worked off. Moreover, because sales of mobile phones will probably be lower than they were in the late 1990s, and 3G mobile telephones will be diffused more slowly than the industry anticipated when 3G licences were sold, less capacity is likely to be installed, and at a slower pace, than the industry forecast barely two years ago.

In *textiles and clothing and leather*, following the major restructuring of the past few years, the rate of decline in output is expected to slow. However, firms are likely to continue to raise levels of overseas sourcing in order to reduce costs and remain competitive against cheaper imports. Imports will be further encouraged by ongoing liberalisation with the result that import penetration will rise still further and firms will continue to raise levels of overseas sourcing in order to reduce costs.

In *motor vehicles,* the expected accession to the EU in 2004 of eight central and eastern European countries is likely to accelerate the transfer abroad of volume car production, as manufacturers are likely to take advantage of the location and cost competitiveness of these countries by switching production facilities away from western Europe. Manufacturing labour costs in central and eastern Europe are in some cases as low as one-fifth of those in western Europe. However, this does not necessarily imply that volume car manufacturing will no longer take place in the UK. Another factor influencing investment decisions is the specific characteristics of existing plants. This seems to have been the deciding factor in Nissan's decision to proceed with the manufacture of the new Micra at Sunderland.

Construction

Construction output growth is expected to slow in 2003. The uncertain economic environment is likely to ensure that any recovery in business investment in 2003 is likely to be weak, resulting in subdued demand for business premises, including offices, warehouses and factories, and a reduction in new commercial and industrial work. However, the impact of this will be partly offset by strong growth in government spending. In the long-term construction output growth is expected to be more modest than in recent years, at around 1.75% p.a., in line with growth in the overall economy, as the steep increases in government spending come to an end.

Distribution, transport, etc.

This broad sector is expected to see rapid growth in output, with communications leading the way.

Growth in real household disposable income is estimated to have slowed sharply in 2002, and a further slowdown is expected in 2003 as employment prospects weaken. Output growth in *retailing* is forecast to slow sharply in 2003, indicating that the anticipated slowdown in household spending and retail sales growth may have begun. From 2004 onwards, retail sales volumes are expected to return to more sustainable rates of growth, and output of retailing is expected to grow at a similar rate to that of the overall economy.

In *hotels and catering,* the expected recovery from the output falls of recent years has yet to occur due to the continuation of international political and economic uncertainty regarding the Iraq crisis and the threat of SARS. The number of tourists is expected to increase from 2004, albeit slowly due to fewer US tourists. Output is forecast to grow modestly in the short-term, and in line with the overall economy in the medium and long-term.

Strong output growth (around 4% p.a.). is expected in transport and especially in *communications* between 2002-12. In the longer-term much of the growth is expected in the latter, although this will be sensitive to issues such as whether broadband penetration rises sharply following BT's decision to cut its wholesale broadband charges, and if a market for 3G mobile telephony develops. In spite of doubts regarding the roll-out and take-up of 3G mobile telephony, it is hoped that the development of a common 3G standard (so consumers will not be tied to specific combinations of handset, network and service, as they are in the current market) will boost take-up.

Prospects in *rail* transport appear less certain. Once the rail system regains an acceptable level of service, further improvements (beyond the Channel Tunnel Rail Link and the West Coast Main Line upgrade) will require massive investment. However, virtually all of the public funds allocated to rail in the government's 10-year plan for transport (published in 2000) will probably have to be used to restore and maintain the system. Unless large new sums of public money are allocated, the private sector is the only possible source of further investment. However, sufficient private investment is unlikely to be forthcoming in the absence of a reasonable prospect of a return (from fares, government subsidies or both). Public investment is likely to be limited to maintaining the system, concentrating on the most travelled routes.

Following the unprecedented difficulties faced by air transport in 2001 and 2002, fears over airline security and weakness of world economic growth have continued to affect demand for intercontinental air travel in general, and premium passenger traffic in particular. Growth in *air transport* is expected to return to more solid rates in the longer-term as capacity constraints loosen and world economic activity picks up. Although intense competition is expected to give rise to further expansion of the industry, the incentives (deregulation and liberalisation) that drove the massive expansion of the industry in the second half of the 1990s appear to have played themselves out.

Business and other services

This sector has seen some of the most rapid increases in output in recent years and this above-average performance is expected to continue (see Figure 3.5).

Financial and business services as a whole are expected to grow by around, 3-3.5% p.a. in the medium and long-term. This is some 1 percentage point per annum above the rate of growth of the overall economy. In *professional services,* following the retrenchment of 2002-03, output is expected to bounce back sharply in 2004 as expenditure on IT and merger and acquisition activity recovers. Strong output growth is expected in the long-term as the growing commercial needs of globalisation and for professional advice drive the sector forward vigorously.

Early signs of recovery can be expected to turn into stronger demand in the US and Europe for *computing services* in the medium and long-term, but the pace of growth in this industry is bound to be slower than in the late 1990s. The most reliable drivers of growth in computing services over the short-term are likely to be government procurement (particularly given the government's commitment to increase investment in public services) due to the requirements of large public-sector organisations (especially in health and education) and outsourcing by major companies. The over-hyped promise of 3G telephony, e-commerce and digital entertainment will most likely give place to respectable growth, as these innovations are diffused more slowly than originally expected.

In *banking and insurance,* output growth is forecast to follow the pattern of the general economy, reflecting the pro-cyclical nature of the industry, in particular its investment banking component.

Non-marketed services

This broad sector has also seen rapid growth over much of the last half century. More recently expenditure on *public administration* and defence has moderated reflecting the concerns about the size of government, as well as the peace dividend following the collapse of the 'iron curtain'. Education and more especially health services have taken up the baton.

The growth in government spending on central administrative and related services, especially in broad areas such as housing, town and country planning and the fire service, is expected to remain strong in the short-term, boosting growth in public administration and defence to 3% in 2003. However, based on published plans little further growth is expected in 2004.

In the longer-term government spending on central services is expected to continue to rise at a modest rate of 1.5% p.a, and output is forecast to rise similarly. This represents a change from the trend of the 1980s and 1990s, but is close to the growth rates seen during the 1970s. It is, however, much slower than the average for the economy as a whole.

Sharp rises in output are expected in *education* and in *health and social work* in the short-to-medium term, as the large increases in funding take effect. For example, the 2002 Budget provided for NHS spending to rise by around 7% p.a. in real terms over 2002-07. In the longer-term, government spending is expected to fall back; from 2006 in education, when the current spending round is complete, and from 2007 in health, when the large increases in spending are expected to cease.

3.4 Detailed Employment Prospects by Sector and Industry

Future prospects for employment in the various sectors depend upon the balance between on the one hand, the output growth anticipated for the sector and on the other hand the impact of productivity gains (which mean that more output can be produced with 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 and 3.4. Figure 3.4 presents annual changes between selected years over the period 1992-2012. 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 2007 and 2012.

Primary and utilities

Employment is expected to continue to decline in the primary and utilities sector. In *agriculture,* even though the worst of the foot-and-mouth epidemic appears to have passed, employment has continued its sharp decline. A fall of more than 8% was recorded in 2002, and employment in the industry is expected to decline similarly in 2003. A much slower pace of decline (1.5% p.a.) is expected over 2004-05.

In the long-term, employment will continue to decline. Even prior to the onset of the 2001 foot-and-mouth crisis, a continuing decline in employment in agriculture was expected over the next few years and into the long-term (although it is likely that job losses will slow somewhat compared to those seen in the 1980 and 1990s). This is not surprising, as globalisation and agricultural reforms are forcing the industry to search for even greater productivity gains, while slow output growth means that productivity improvements come at the expense of jobs.

The UK *coal mining* industry seems set to face a continuing decline over the short-term as deep mined capacity is closed in line with UK coal's strategy of increasing efficiency and competing more effectively with imports in a weakening domestic market. Employment is expected to decline sharply. Thereafter, the pace of job shedding should remain steady at around 2.5% p.a. The sharp decline in oil and gas production from 2005 onwards is likely to be reflected in further job losses in the industry.

In *electricity, gas and water,* the decline in employment is expected to continue in the long-term, albeit at a much slower rate than in the early- 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.

Manufacturing

Manufacturing employment is estimated to have fallen by around 4% in 2002, and a further fall of 3% is expected in 2003. In spite of an expected improvement in prospects, around 100,000 manufacturing jobs are likely to be shed in the year to June 2003, with a sharp retrenchment in *electronics* and *electrical engineering* contributing 24,000 of the job losses. The rate of decline in manufacturing employment is not expected to be checked much over 2004-05, even though output growth is expected to pick up. Job cuts are expected in most manufacturing industries, reflecting restructuring and productivity improvements.

In the long-term, a decline in manufacturing employment overall of around 1.5-2% p.a. is expected as firms seek to maintain competitiveness.

In *food, drink and tobacco*, employment is forecast to decline, reflecting pressure to supply supermarkets at the lowest price possible. This is squeezing smaller firms out of the market and forcing large firms to increase their productivity. In *textiles and clothing,* for example, although the rate of output decline is expected to ease in the longer-term, retailers will continue to source greater quantities of supplies from overseas to reduce costs. As a consequence, demand for UK-manufactured products is likely to remain weak, and employment will continue its downward trend. Even in industries that are expected to grow strongly in the long-term, little or no employment growth is expected. Among *chemical and non-metallic mineral* products, employment is likely to continue to decline, even in the fast-growing pharmaceuticals industry, due to strong productivity growth resulting from specialisation in production. Among engineering firms, in electronics, with advances in technology being the principal driver, the scope offered by rapid technological change for raising productivity is greatest, and so employment is likely to decline. Among *transport equipment* manufacturers, the migration of volume car production away from the UK towards central and eastern European countries will be reflected in a long-term decline in employment.

Construction

In *construction,* the current boost to government spending is expected to lead to an increase in employment in the short-term. Nevertheless, the industry is currently operating close to full capacity in a tight labour market, and consequently the large planned increase in public spending could lead to severe bottlenecks in the industry. Furthermore, unit labour costs have risen sharply over the past few years, as wage increases have offset gains from productivity improvements, and as a result construction output prices are rising.

On the assumption that recruitment difficulties do not ease significantly in the longer-term, the lack of new entrants into the industry, combined with the drive to increase productivity, should lead to a further increase in the use of factory-built (prefabricated) components and an overall decline in employment in construction.

Distribution, transport, etc.

In *retail and distribution,* over the short-term the largest job gains are expected to be in retailing. Many of the jobs created are expected to be part-time. Employment in *hotels and catering* is expected to grow once international tourism begins to recover as the world economy picks up and confidence among transatlantic air travellers returns, but at a lower rate than in the late 1990s, as many hotels may be tempted to find ways of cutting operational costs.

In *transport and communications,* the various difficulties surrounding the rail, air transport and communications industries mean that employment may decline in the short-term. In the long-term, rail and air transport industries should recover, although demand for these services is unlikely to grow as fast as during the mid-to-late 1990s, and employment should show a modest increase. With much of the growth in communications being driven by technological development, strong output growth will not be reflected in much employment growth.

Business and other services

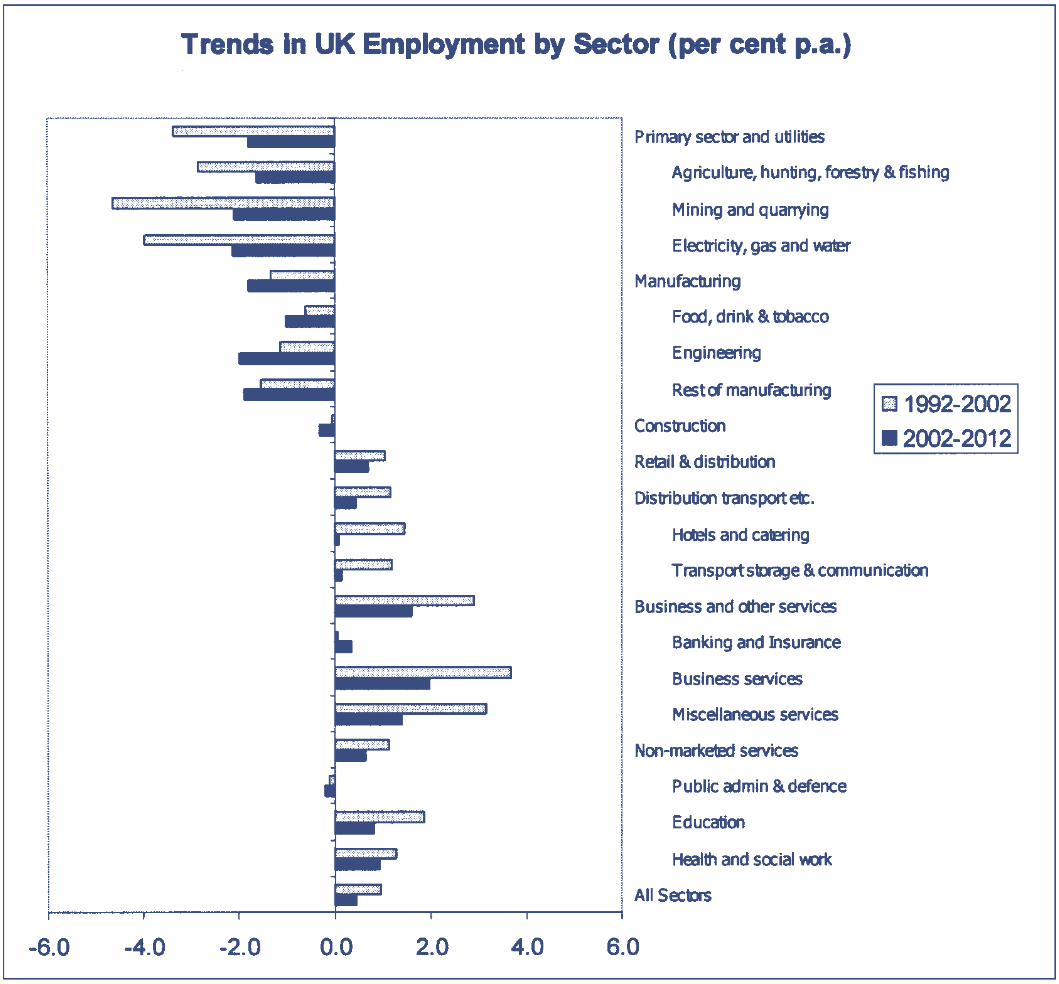
In banking and insurance and other related financial services, following recent cuts in employment due to downturn in investment banking and difficult trading conditions for insurance, employment is likely to increase in the short-term. However, this growth is likely to be modest, due to increased investment in IT as new equipment and systems are introduced as the sector strives for greater productivity growth. In the long-term, employment is expected to decline in banking but small increases are expected in insurance.

In *professional services,* the modest recovery of the industry in 2003 from the slowdown of 2002 will generate job losses in 2003 and a slow increase in 2004. In the longer-term, from 2005 onwards, expenditure on IT and mergers and acquisitions activity (M&A) should recover. The growing commercial needs of globalising clients for professional advice in M&A, IT and business restructuring is likely to lead to a resumption of employment growth in these high-skilled activities. In *computing services,* over the next few years government expenditure seems likely to be the mainstay of both growth in demand and output. The next cycle of growth is expected to depend on developments centred on the extensive spread of broadband access and third-generation wireless telephony. This should provide a further boost to employment in the long-term.

Non-marketed services

The number of people employed in *public administration and defence* has increased sharply recently, alongside strong growth in resources, with increases recorded in both central and local government employment. The recent increases go some way to reversing the falls seen throughout the 1990s. The number of people employed in local authorities has also increased in a wide range of areas, including central service areas like engineering and finance as well as in more specific service areas such as housing, town and country planning and the fire service. However, other areas including construction and refuse collection and disposal have declined further. In the longer-term government spending on central services is expected to continue to rise at a modest rate, much slower than the average for the economy as a whole. The pressure to improve productivity, most visible through departmental service agreements, can be expected to continue beyond the period of the current spending review. As a result, the decline in jobs expected in 2004 is forecast to continue in the long-term.

Figure 3.4



Source: CE/IER estimates, MDM95 C31F9S, 6725Output.xls, (Figures 3.4 and 3.5).

Notes: See notes to Table 3.3.

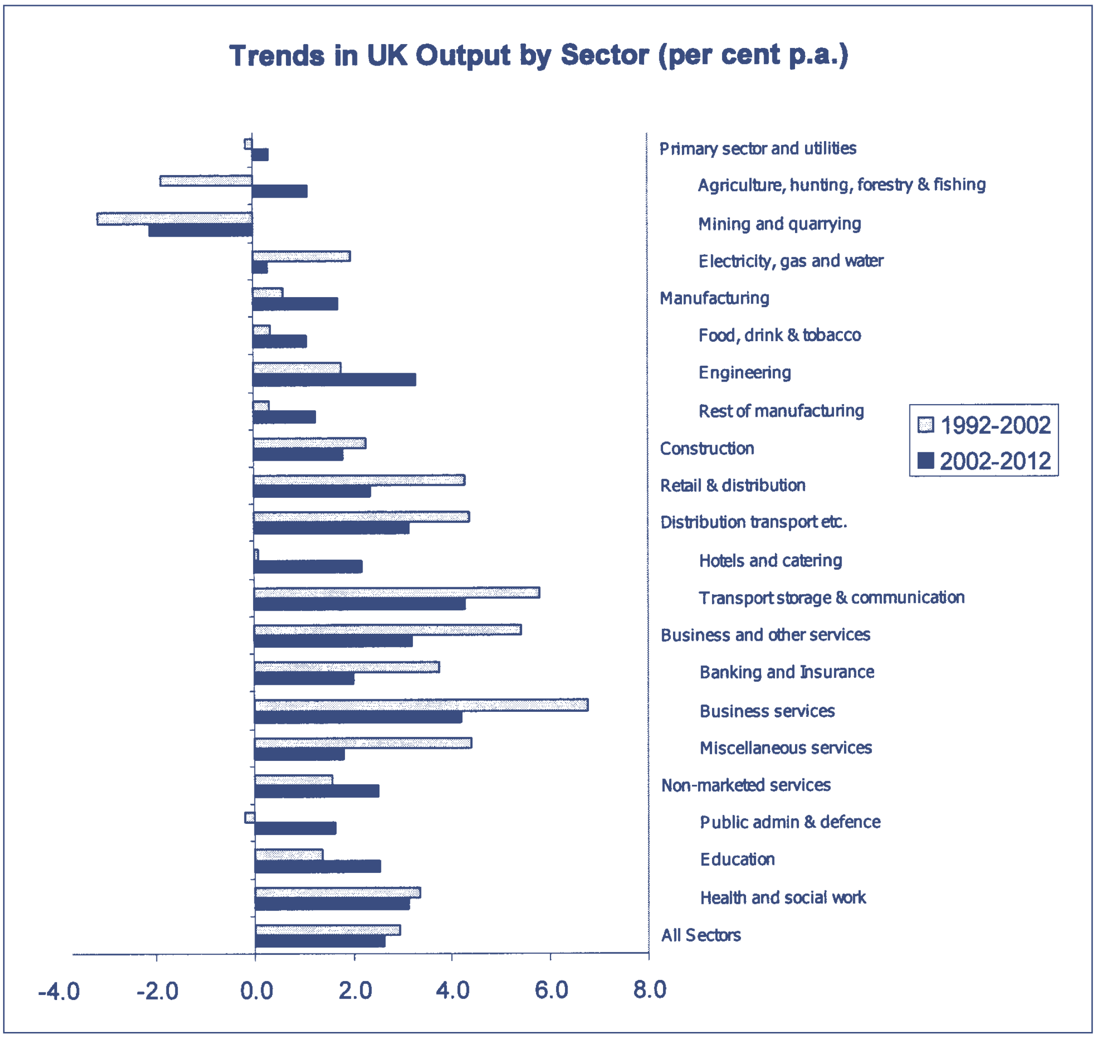
Table 3.3: Projections of Output and Employment by Detailed Sector (% per annum)

	Output				Employment			
	1992-97	1997-2002	2002-07	2007-12	1992-97	1997-2002	2002-07	2007-12
Primary and utilities[b]	-0.4	0.1	0.4	0.2	-2.8	-3.9	-2.2	-1.3
1. Agriculture, hunting, forestry & fishing	-2.4	-1.3	1.5	0.7	-0.6	-5.1	-2.3	-1.0
2. Mining and quarrying	-5.6	-0.7	-2.7	-1.5	-7.9	-1.3	-2.0	-2.2
4. Electricity, gas and water	2.7	1.2	0.4	0.2	-7.0	-0.9	-2.1	-2.1
3. Manufacturing[b]	2.1	-0.8	1.7	1.8	0.1	-2.7	-2.1	-1.5
Food, drink & tobacco[c]	1.0	-0.3	1.3	0.9	-0.2	-1.1	-0.9	-1.2
Engineering[c]	4.0	-0.4	3.1	3.5	0.8	-3.1	-2.3	-1.6
Rest of manufacturing[c]	1.7	-1.1	1.3	1.3	-0.2	-2.9	-2.3	-1.5
5. Construction[b]	1.8	2.8	1.8	1.8	-1.8	1.7	-0.4	-0.3
Distribution transport etc[b]	4.8	3.9	3.1	3.2	1.0	1.3	0.3	0.6
6. Retail & distribution	4.9	3.6	2.4	2.3	1.2	0.9	0.6	0.8
7. Hotels and catering	1.2	-0.9	2.0	2.3	1.5	1.4	-0.3	0.5
8. Transport storage & communication	6.0	5.6	4.2	4.3	0.1	2.2	0.0	0.2
Business and other services[b]	5.8	5.0	3.3	3.1	3.0	2.8	1.3	1.9
9. Banking and Insurance	3.6	3.9	2.2	1.9	-0.1	0.2	0.4	0.3
10. Business services	7.4	6.2	4.3	4.0	3.9	3.5	1.5	2.4
14. Miscellaneous services	5.3	3.5	2.0	1.6	3.3	3.0	1.4	1.3
Non-marketed services[b]	1.5	1.7	2.8	2.3	0.4	1.9	0.9	0.4
11. Public admin & defence	-1.0	0.6	1.7	1.6	-1.5	1.3	-0.1	-0.3
12. Education	1.6	1.1	2.8	2.2	0.8	2.9	1.1	0.5
13. Health and social work	3.7	3.0	3.5	2.7	1.1	1.5	1.2	0.6
All Sectors	3.3	2.6	2.7	2.6	0.8	1.1	0.3	0.6

Source: CE/IER estimates, MDM95 C31F9S, 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 Regional 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 Regional Report.

Figure 3.5



Source: CE/IER estimates, MDM95 C31F9S, 6725Output.xls, (Figures 3.4 and 3.5).

Notes: See notes to Table 3.3.

Table 3.4: Projections of Employment by Industry

	Absolute levels and changes (000s)					
	Levels			Changes		
	2002	2007	2012	2002-07	2007-12	2002-12
Agriculture, etc	443	394	375	-49	-19	-67
Mining & quarrying, Utilities (of which:)	217	195	175	-22	-20	-42
Mining and quarrying[a]	*77*	*70*	*62*	*-7*	*-7*	*-15*
Utilities[a]	*140*	*126*	*113*	*-14*	*-13*	*-27*
Food drink & tobacco	482	462	435	-20	-27	-47
Textiles & clothing	247	185	145	-63	-39	-102
Wood, paper, Printing & publishing (of which:)	581	575	571	-6	-3	-10
Wood and paper[a]	*192*	*174*	*160*	*-18*	*-14*	*-32*
Printing and publishing[a]	*389*	*400*	*411*	*11*	*11*	*22*
Chemicals & non-metallic mineral products	637	574	531	-63	-42	-106
Metals & metal goods	497	434	402	-63	-32	-95
Engineering	800	713	656	-87	-57	-144
Transport equipment	388	311	259	-77	-52	-129
Manufacturing & recycling	234	227	229	-7	2	-6
Construction	1854	1820	1795	-34	-25	-59
Sale & maintenance of motor vehicles	664	687	694	23	7	30
Wholesale distribution	1286	1288	1329	2	40	43
Retailing	3052	3167	3332	115	165	280
Hotels & catering	1860	1830	1876	-31	46	15
Transport	1261	1272	1294	11	22	33
Communications	547	538	538	-9	0	-9
Banking & insurance	1146	1168	1187	22	20	42
Professional services	734	841	1007	107	167	274
Computing & related	548	665	883	117	218	335
Other business services	3252	3382	3616	130	234	365
Public administration	1461	1450	1430	-11	-20	-31
Education	2289	2421	2484	132	64	195
Health	3038	3221	3327	183	106	289
Miscellaneous services	1819	1954	2086	135	131	267
Total	**29336**	**29772**	**30658**	**436**	**886**	**1322**

Source: CE/IER estimates, MDM95 C31F9S, 25UK.xls, (Table 3.4a).

Note: 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.

In *education,* the government's aim of recruiting many more school staff over the coming years is well-known, and numbers on teacher training courses have risen. Employment, which rose by 2.25% in 2002, is expected to increase by a further 1.5% in both 2003 and 2004. At the same time, the focus on changing working regimes, and promoting innovation in both management and in teaching, is intended to improve productivity, which has not increased rapidly in the past. After 2006, which is the end of the current spending review, the assumption that growth in government spending on education will rise in line with the overall growth in the economy, combined with productivity improvements that are expected from the reforms, should result in a modest increase in employment in the long-term of about 0.5% p.a.

In health and social work, employment has increased rapidly over the last three years. More job gains are expected in the short-term, supported by the strong growth in demand and by the effects of measures to attract more staff that have been put in place in the last couple of years. In the longer-term, it is expected that the current focus on changing existing methods of delivery through technical innovation and organisational change will enable productivity gains in the future to exceed past performance. Consequently, employment will still increase, but at a slower rate than previously.

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 and 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.

In broad sectors such as *construction, distribution, transport*, etc. and in *business* and *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 3.5 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 3.6 presents the data in terms of the percentage shares of each gender status group, whilst the complementary Table 3.7 shows the same information in terms of changes in absolute numbers.

Gender shares

The female share of employment is expected to continue to increase slowly over the next decade. The number of females in employment is projected to increase by over a million, whilst the corresponding figure for males increases by just under 300,000 jobs. By 2012 females are expected to account for just over 48% of all jobs.

The tables and charts also illustrate that these patterns vary significantly across sectors. However the underlying trends are common across nearly all industries.

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 modest increase in the number of full-time jobs is projected, but this is entirely due to increases in female full-time work. The number of full-time male jobs is predicted to decline by 50,000 over the forecast period, (see Table 3.7).

Again, although the overall shares of part-time jobs vary across sectors, the underlying trend towards an increasing share for part-time working is common across almost all sectors (see Table 3.8).

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 3.8 and Figures 3.6 and 3.7. 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 3.8 and the individual sector panels in Figure 3.6). These three 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 has 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.

Table 3.5: Employment Status for the UK

2002				**000s**
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	11,064	1,916	2,561	15,541
Female employment	6,686	6,145	964	13,795
Total employment	**17,751**	**8,061**	**3,525**	**29,336**
2007				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	10,926	2,144	2,456	15,526
Female employment	6,806	6,480	960	14,246
Total employment	**17,732**	**8,624**	**3,416**	**29,772**
2012				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	11,013	2,423	2,383	15,819
Female employment	7,018	6,853	967	14,839
Total employment	**18,031**	**9,276**	**3,350**	**30,658**

Source: CE/IER estimates, MDM95 C31F9S Forecast, AllUK.xls, (Table 3.4a).

Table 3.6: Shares by Employment Status for the UK

2002				%
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	37.7	6.5	8.7	53.0
Female employment	22.8	20.9	3.3	47.0
Total employment	**60.5**	**27.5**	**12.0**	**100.0**
2007				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	36.7	7.2	8.2	52.2
Female employment	22.9	21.8	3.2	47.8
Total employment	**59.6**	**29.0**	**11.5**	**100.0**
2012				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	35.9	7.9	7.8	51.6
Female employment	22.9	22.4	3.2	48.4
Total employment	**58.8**	**30.3**	**10.9**	**100.0**

Source: CE/IER estimates, MDM95 C31F9S Forecast, AllUK.xls, (Table 3.4a).

Table 3.7: Changes in Employment Status for the UK

2002-2007				000s
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	-138	229	-105	-15
Female employment	119	335	-3	451
Total employment	**-19**	**564**	**-109**	**436**
2007-2012				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	87	278	-73	292
Female employment	213	374	7	593
Total employment	**299**	**652**	**-66**	**886**
2002-2012				
Employment by Gender	**FT**	**PT**	**SE**	**Total**
Male employment	-52	507	-178	278
Female employment	332	709	4	1,044
Total employment	**280**	**1,216**	**-174**	**1,322**

Source: CE/IER estimates, MDM95 C31F9S Forecast, AllUK.xls, (Table 3.4a).

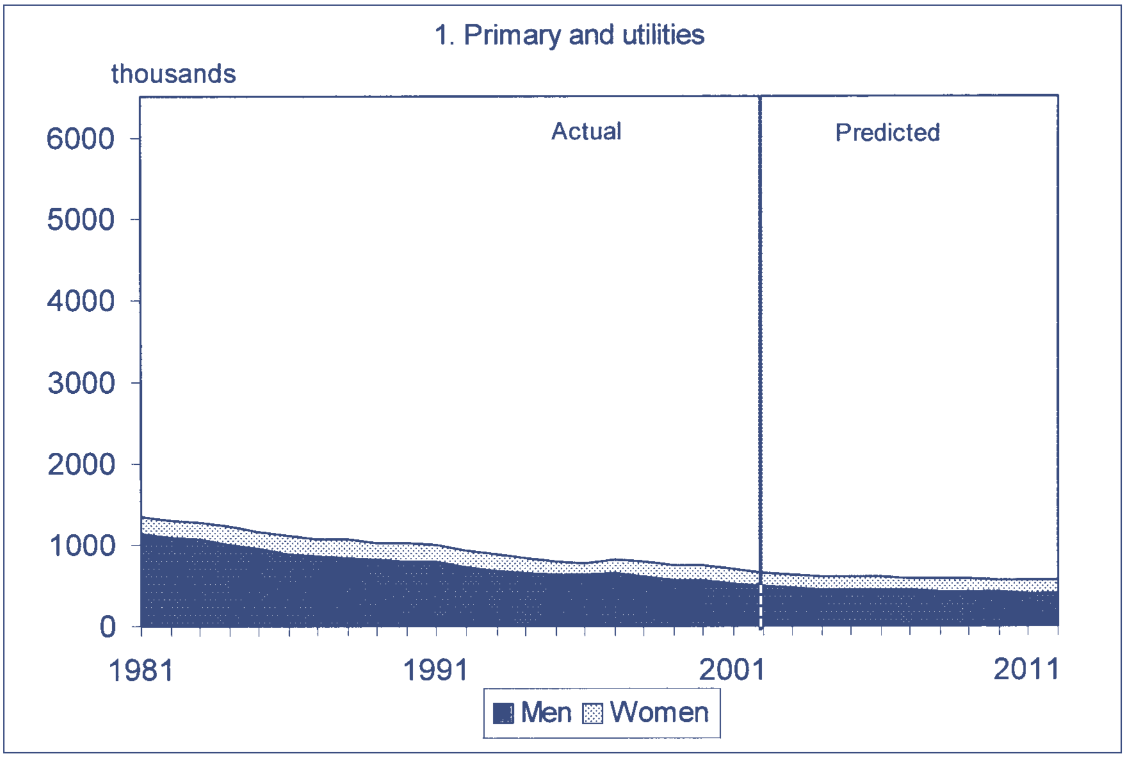
Table 3.8: Composition of Employment by Broad Industrial Sector, 1982-2012

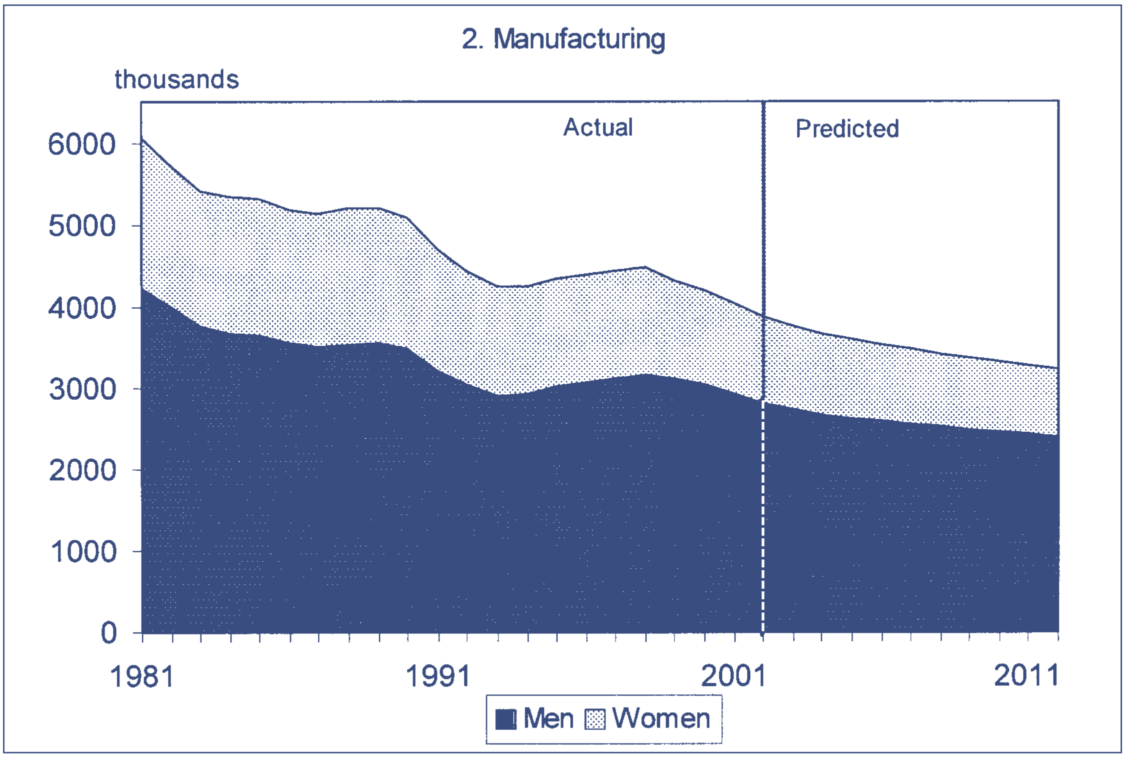
Share of total employment (%)	1982	1992	2002	2007	2012
***Primary and utilities*[b], of which:**	**5.2**	**3.5**	**2.2**	**2.0**	**1.8**
Female employees[c]	16.4	22.1	25.0	26.4	27.8
Self-employed[c]	23.7	31.0	29.4	26.0	23.0
Part-time employees[c]	6.8	9.0	12.6	14.3	16.1
***Manufacturing*[b], of which:**	**22.7**	**16.6**	**13.2**	**11.7**	**10.5**
Female employees[c]	30.2	31.5	27.5	26.6	25.8
Self-employed[c]	3.0	6.5	6.2	5.3	4.6
Part-time employees[c]	9.4	9.2	8.4	9.6	10.9
***Construction*[b], of which:**	**6.7**	**7.0**	**6.3**	**6.1**	**5.9**
Female employees[c]	9.9	10.6	9.9	9.9	9.9
Self-employed[c]	27.4	43.3	39.3	39.6	39.8
Part-time employees[c]	4.2	4.0	5.2	5.2	5.2
***Distribution, transport etc.*[b], of which:**	**28.3**	**29.0**	**29.6**	**29.5**	**29.6**
Female employees[c]	42.9	46.2	46.9	47.9	48.9
Self-employed[c]	12.8	12.8	9.9	8.7	7.5
Part-time employees[c]	29.4	33.1	35.8	37.4	39.1
***Business and other services*[b], of which:**	**16.5**	**21.1**	**25.6**	**26.9**	**28.6**
Female employees[c]	46.7	49.4	47.2	45.5	44.1
Self-employed[c]	12.0	14.2	15.1	14.9	14.3
Part-time employees[c]	20.2	21.0	23.9	23.5	23.1
***Non-marketed services*[b], of which:**	**20.6**	**22.7**	**23.1**	**23.8**	**23.6**
Female employees[c]	66.0	70.6	70.5	72.4	74.2
Self-employed[c]	3.6	4.5	5.4	5.6	5.9
Part-time employees[c]	35.5	40.4	39.2	41.5	43.8
All industries	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Female employees[c]	41.9	46.7	47.0	47.8	48.4
Self-employed[c]	10.1	12.9	12.0	11.5	10.9
Part-time employees[c]	21.7	25.4	27.5	29.0	30.3

Source: CE/IER estimates, MDM95 C31F9S Forecast, 6UK.xls, (Table 3.8).

Note: a) The sectoral groupings are defined in Annex, Table A.2.
b) Percentages of total employment
c) Percentages of employment within the sector

Figure 3.6: Changing Patterns of Employment by Gender in Broad Sectors, 1981-2012

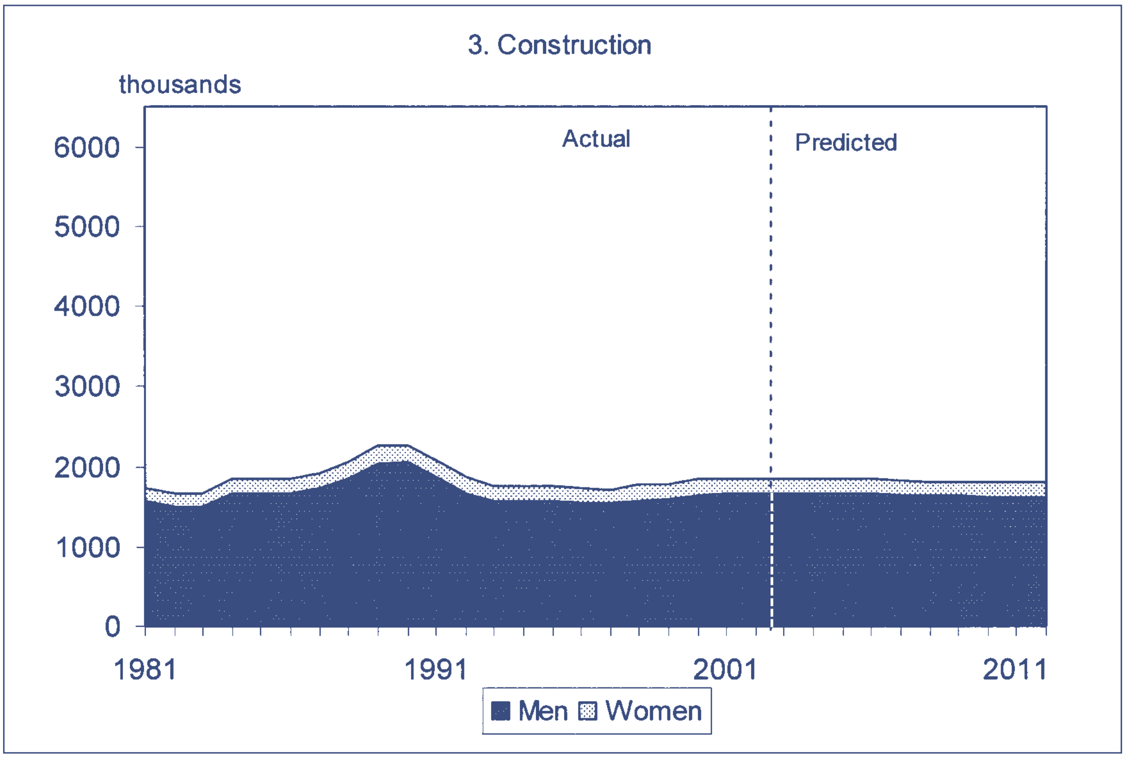


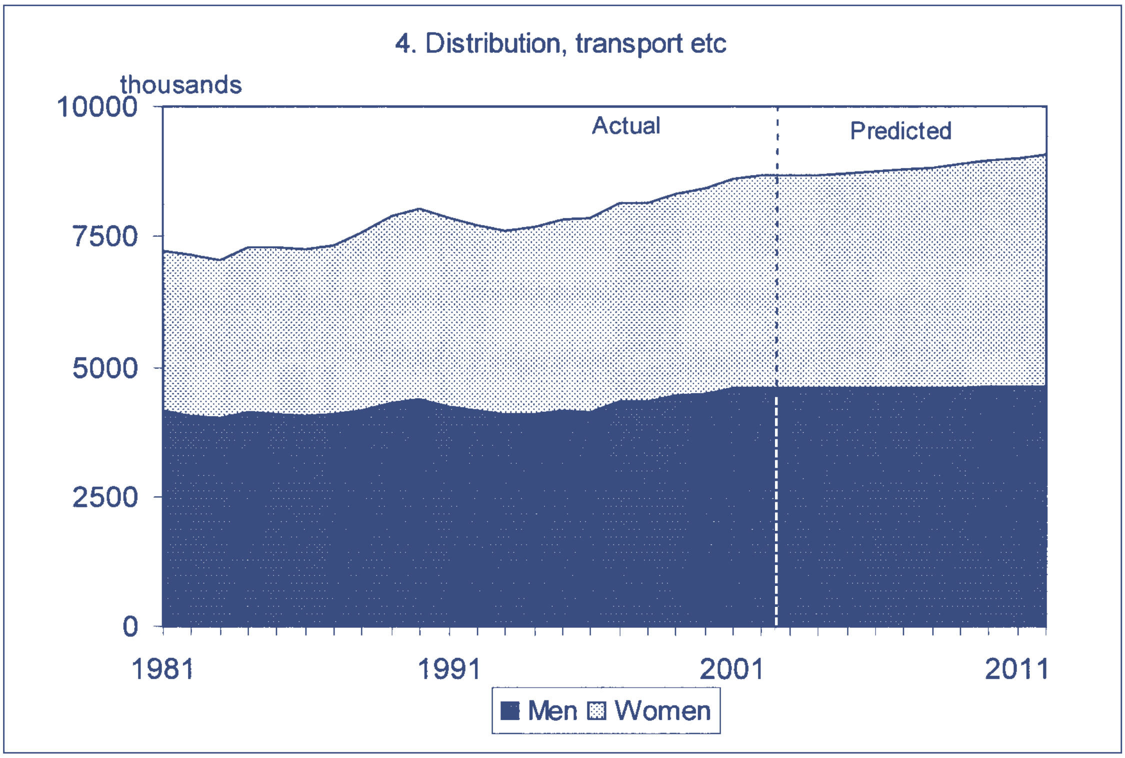


Source: CE/IER estimates, MDM95 C31F9S Forecast, 6UK.xls, (Figure 3.6).

Notes: Vertical scales differ between some panels.

Figure 3.6: Changing Patterns of Employment by Gender, 1981-2012 (continued)

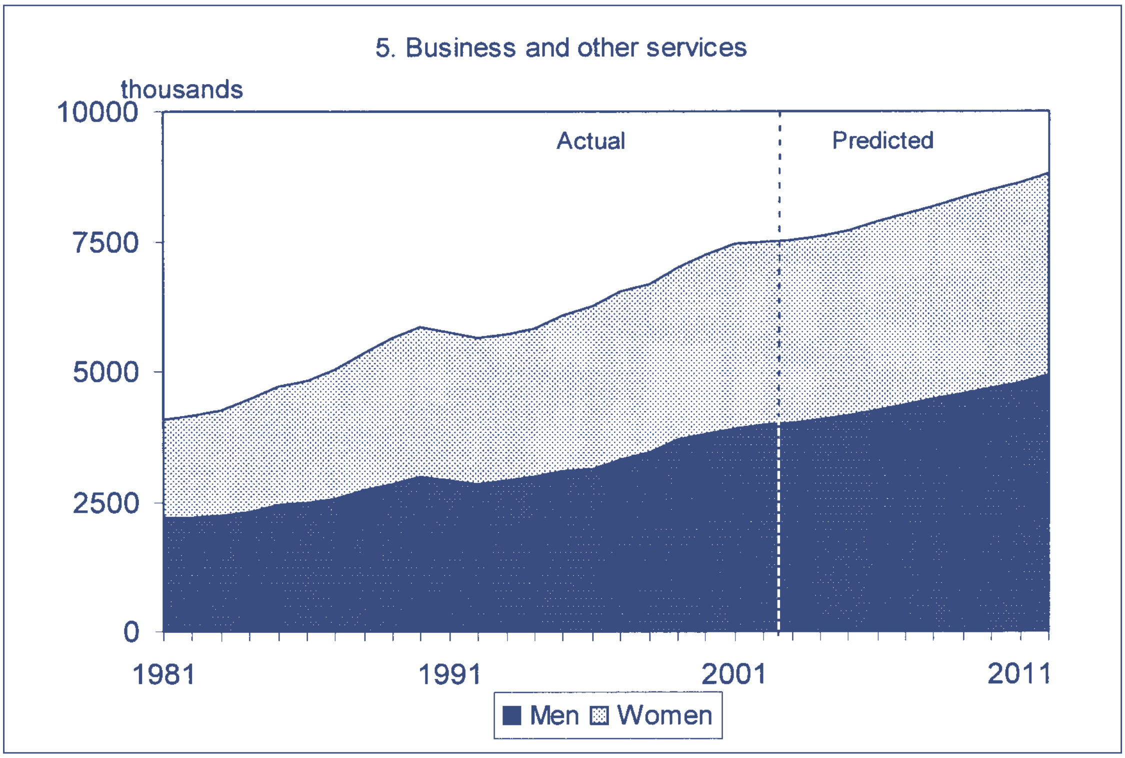


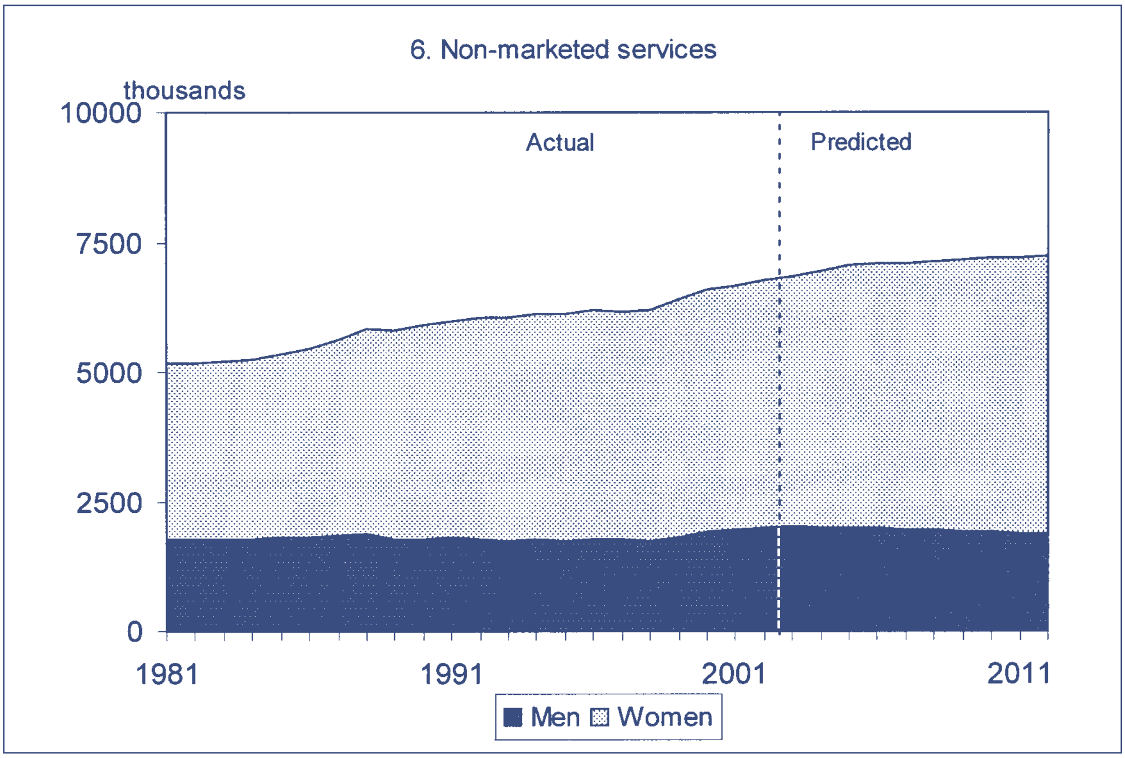


Source: CE/IER estimates, MDM95 C31F9S Forecast, 6UK.xls, (Figure 3.6).

Notes: Vertical scales differ between some panels.

Figure 3.6: Changing Patterns of Employment by Gender in Broad Sectors, 1981-2012 (continued)

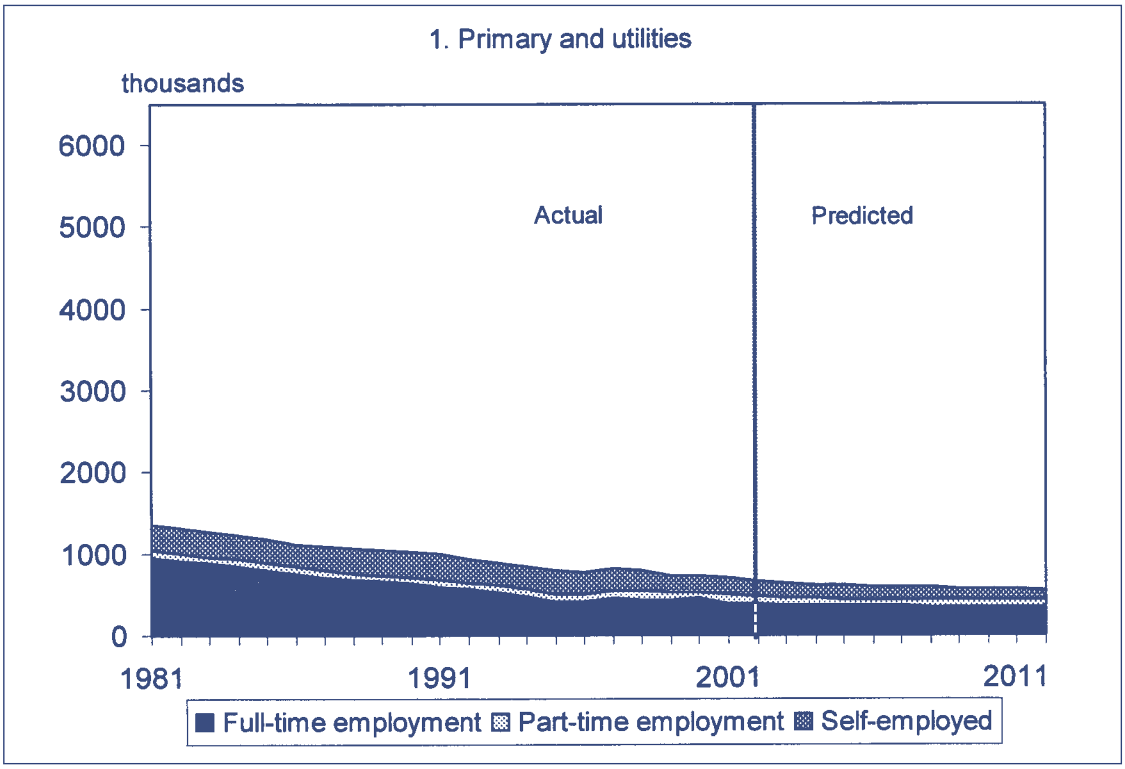


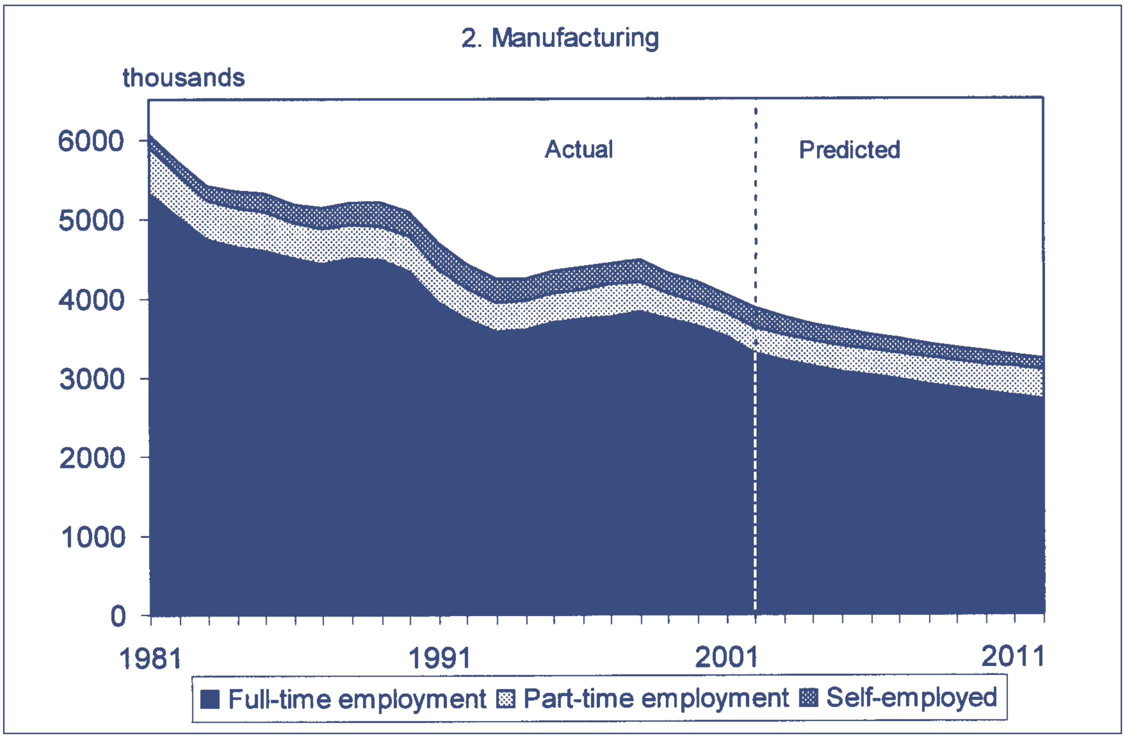


Source: CE/IER estimates, MDM95 C31F9S Forecast, 6UK.xls, (Figure 3.6).

Notes: Vertical scales differ between some panels.

Figure 3.7: Changing Patterns of Employment by Status in Broad Sectors, 1981-2012

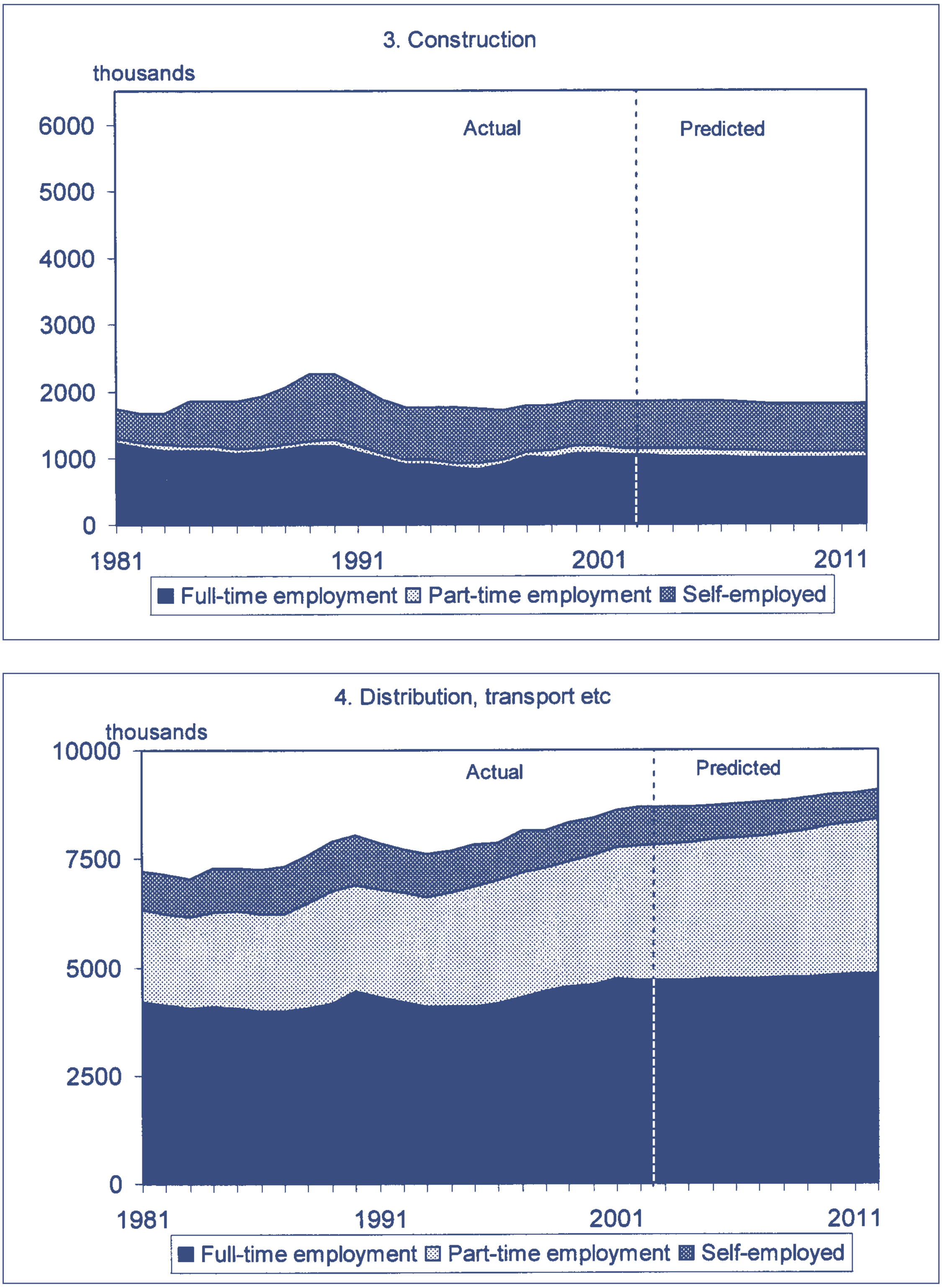




Source: CE/IER estimates, MDM95 C31F9S Forecast, 6UK.xls, (Figure 3.7).

Notes: Vertical scales differ between some panels.

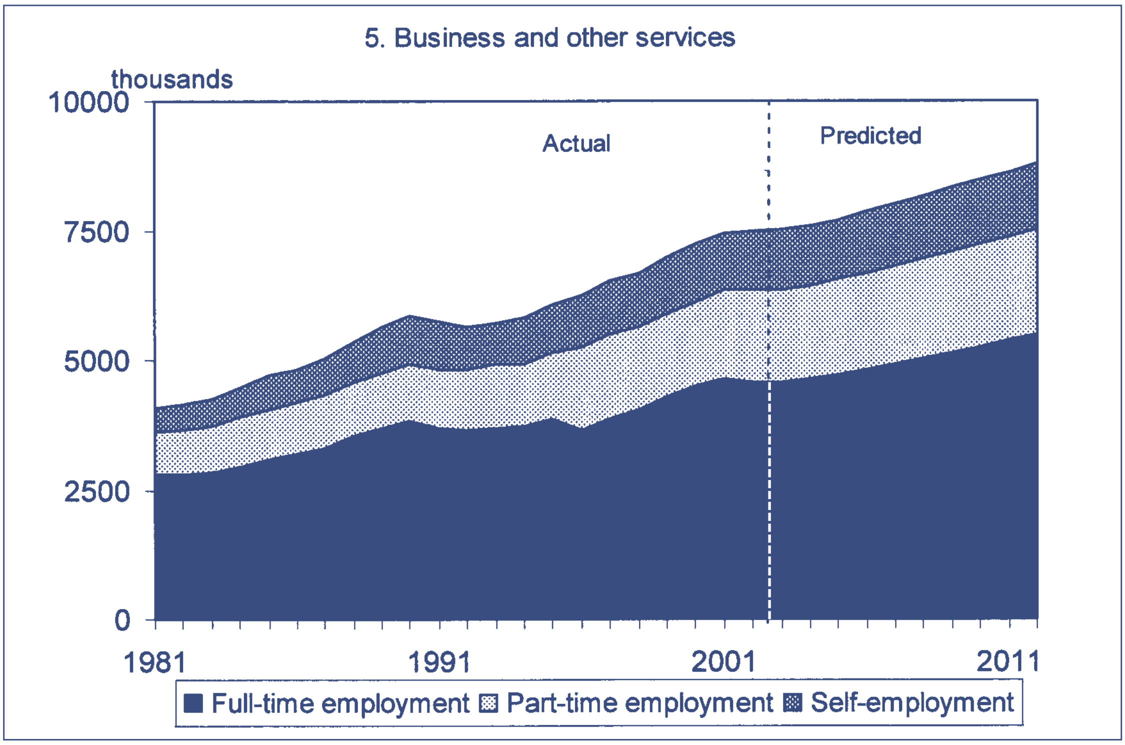
Figure 3.7: Changing Patterns of Employment by Status in Broad Sectors, 1981-2012 (continued)

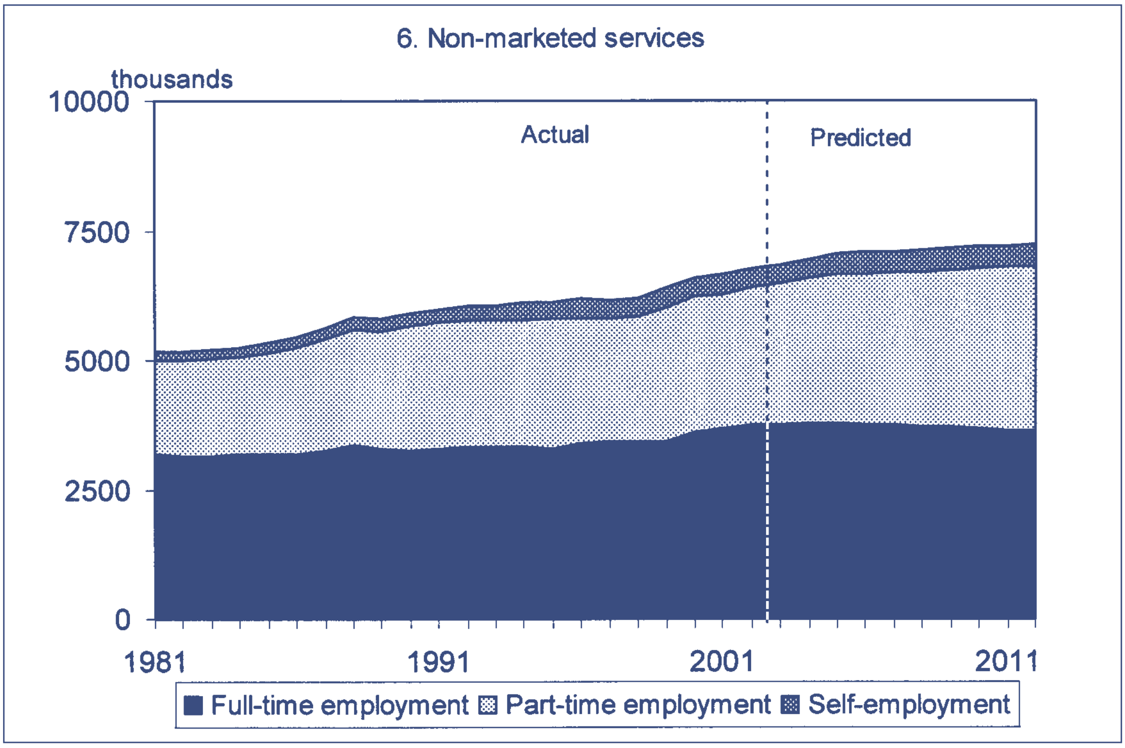


Source: CE/IER estimates, MDM95 C31F9S Forecast, 6UK.xls, (Figure 3.7).

Notes: Vertical scales differ between some panels.

Figure 3.7: Changing Patterns of Employment by Status in Broad Sectors, 1981-2012 (continued)





Source: CE/IER estimates, MDM95 C31F9S Forecast, 6UK.xls, (Figure 3.7).

Notes: Vertical scales differ between some panels.

4. CHANGING OCCUPATIONAL STRUCTURE

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.[1] 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 (nine categories).[2] The results take account of the latest data from the Census of Population, 2001.[3]

Such data provide a useful indicator of changing patterns of demand for skills. However, it is important to focus not just on projections of changing levels of employment by occupation, but also on replacement demands. Projections of the structural change in employment levels provide only part of the picture of how the demand for skills is changing. Estimation of replacement demands recognises the need to replace those retiring from the existing workforce. 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 various factors that influence occupational structure include:

- *structural changes* that affect the industrial pattern of goods and services produced in the economy, including sub-contracting;
- *technological and organisational* changes in the way in which labour is used to produce these goods and services.

The projected pattern of changes in industrial *structure* will depend upon a variety of factors, such as changing patterns of final demands for goods and services and changes in international competitiveness, sector by sector. These developments are all built into the macroeconomic model and have been summarised in Chapters 2 and 3.

The changing patterns of demand for skills *within industries* are analysed (at a detailed level) using data from the Censuses of Population (CoP), including the most recent Census for 2001, and Labour Force Surveys. Historical patterns of change are extrapolated into the future to derive the detailed projections discussed in this section. Details of the Institute's Occupational Model, which is used to produce the forecasts, are given in the *Annex* to this report and (in more detail) in the companion *Technical Report.*[4]

[1]This requires an extensive reclassification of historical data. Details are given in the Annex and the accompanying *Technical Report* (Wilson et al. (2003)).

[2]Full detail of these classifications is provided in the Annex.

[3]The full Census data were not available in time to be incorporated into the analysis. The present results draw upon headline data only. For further details see the discussion in the Annex to this report and the separate *Technical Report*.

[4]Wilson *et al.* (2003).

4.2 Historical Influences on Occupational Employment Structure

Changing patterns of industrial specialisation have had profound implications for the demand for different occupations. Variations in such specialisation also play 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 years gone by;
- 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, has led to substantial additional jobs for:

- professional, managerial and clerical workers in public administration;
- doctors and nurses in health services; and
- teachers in education services.

Similarly, growth in private sector, marketed services has resulted in many new jobs for:

- leisure and other personal service occupations (in hotels, catering and miscellaneous services);
- sales occupations in distribution; and
- professional, associate professional, clerical and secretarial in business and financial services.

These developments have been reinforced by very significant changes in the nature of many jobs ***within*** particular industries, including major restructuring of the way that work is organised. These changes have been influenced by technology and other factors. In recent years it has been the application of information technology that has been especially important. This has had a variety of effects, some of which are of a very direct nature. For example, the displacement of many clerical and secretarial jobs previously concerned with information processing using paper technology. On the other hand, information technology has opened up many new areas where information services can be provided which were previously not feasible. This has tended to create jobs of a professional, associate professional and managerial nature. The application of IT in other areas such as manufacturing has also led to the displacement of many skilled workers as their jobs have been taken over by computer controlled machinery, such as robots in motor manufacturing and assembly.

Job losses can also, of course, arise indirectly via the forces of international competition, with more advanced companies stealing the markets of those who have failed to keep up with the latest developments. Factors other than technology have also been important here. 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.

4.3 Future Influences on Occupational Change

The projected patterns of occupational change for the next decade mirror those of the recent past (see Figure 4.1). The same basic forces are expected to operate. Changes in the industrial structure of employment in favour of the service sector 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. Similarly, the introduction of new technologies in manufacturing will tend to displace many skilled workers. On the other hand, 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.

4.4 Changes for Broad Occupational Groups: Historical Perspective

There have been some significant revisions to the historical database, including the publication of results from the latest Census of Population. The estimates presented here reflect the latest data available, including those from the 2001 Census.[5] At the major group level, the trends over the period since 1982 are broadly similar to those presented in the previous analysis conducted on behalf of the DfES.[6]

[5]New data from the Census have only just become available and although they have been used to calibrate headline figures, they were not available in time to be incorporated into the detailed analysis. Revised projections incorporating the full Census data will be available in due course.

[6]See, for example, Wilson (2001a).

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

The key features are:

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

The preliminary results from the Census suggest some significant changes to the perception of changes in the pattern of occupational employment over the past decade. This has important implications for likely prospects for the next ten years. The main differences compared to the previous projections are as follows.

Much faster growth than has been estimated previously 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 and secretarial occupations;
- skilled manual and 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 confirms that, despite this, managerial occupations have been one of the most rapidly growing areas of employment (see Figure 4.1).

4.5 Projections to 2012

Table 4.1 and Figure 4.1 present the employment projections for the nine major occupations in the period to 2012. The groups that are expected to show significant increases in employment over the next decade are managers and senior officials, professional occupations, associate professional and 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.

Somewhat less optimistic prospects are expected for the sales and customer service occupation group.

Administrative, clerical and secretarial occupations are computed to see further job losses, although this category will continue to employ over 3.5 million people.

Declining employment levels are projected for skilled trades occupations; transport and machine operatives; and elementary occupations. Amongst these declining groups, it is the skilled trades occupations and elementary occupations which are expected to see the largest absolute reduction in numbers, with job losses over the decade of around 550,000 and 680,000 respectively.

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 and 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.

4.6 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 200,000 and 300,000 new jobs, respectively, are projected between 2002 and 2012.

For women the occupations providing the largest number of new jobs are the associate professional and technical occupations (with a projected increase of almost 800,000) and personal service occupations (projected to rise by over 700,000).

Professional occupations are also expected to provide a large number of new employment opportunities for women.

For men a significant number of job losses, (around 500,000) are forecast for the skilled trades occupations.

For women significant job losses are expected for administrative, clerical and secretarial occupations and for elementary occupations. The latter group of occupations, which contains mainly unskilled workers, is forecast to decline by almost 700,000.

Overall, in the decade through to 2012, female employment is expected to increase by around four times as much as the increase in male employment, taken across all occupations.

4.7 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 and senior officials (SOC major groups 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 be static.

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 and secretarial occupations there are sharp declines, especially amongst full-time females.

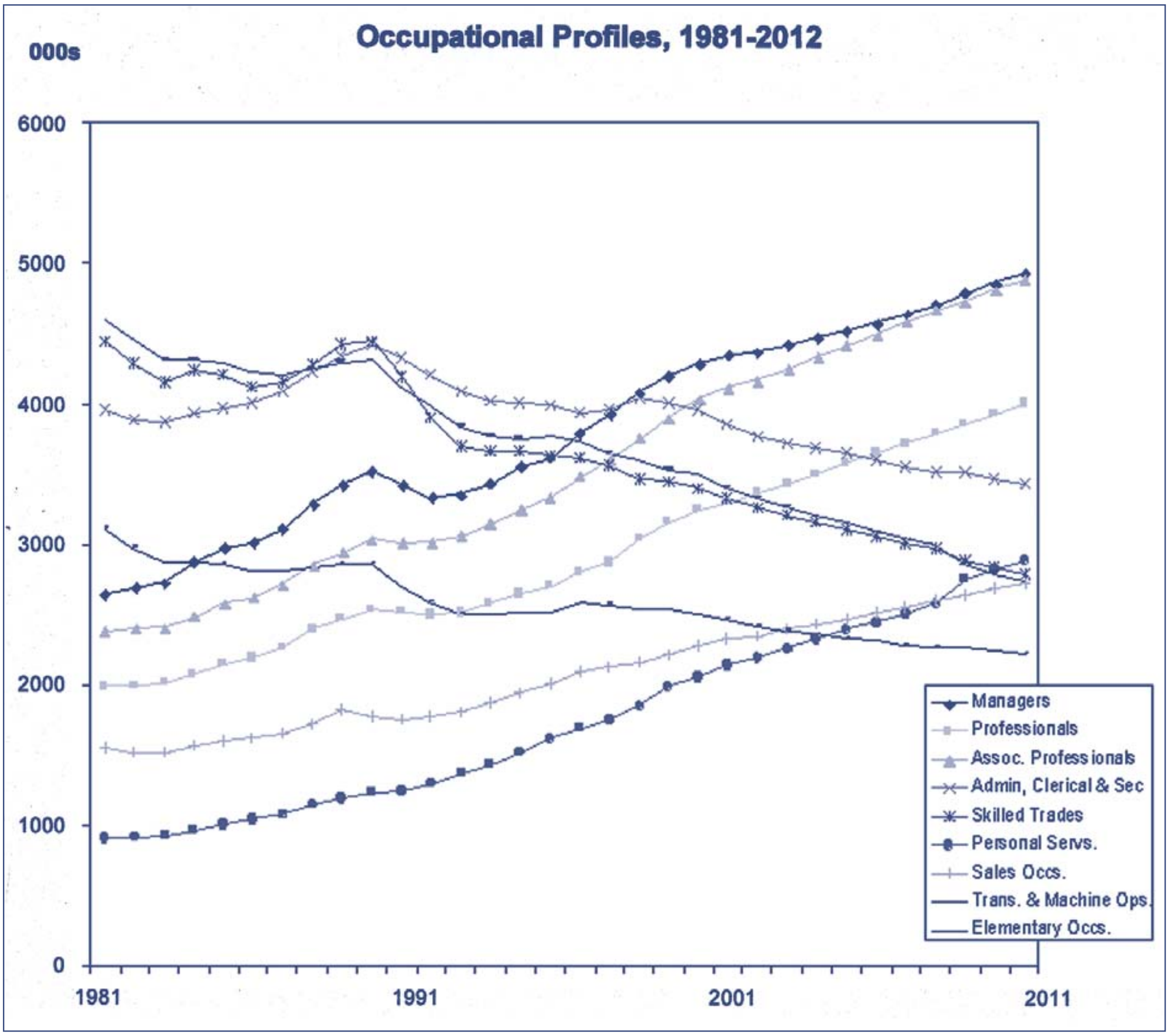
For personal service occupations and for sales and customer service occupations, the main growth is for part-time jobs.

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 slight growth in part-time jobs for women but declines in full-time ones.

More detailed results by sector and region are presented in Chapter 6 of the present volume and in the separate *Regional* volume.

Figure 4.1



Source: CE/IER estimates, MDM95 C31F9S Forecast, AllUK.xls, (Figure 4.1a).

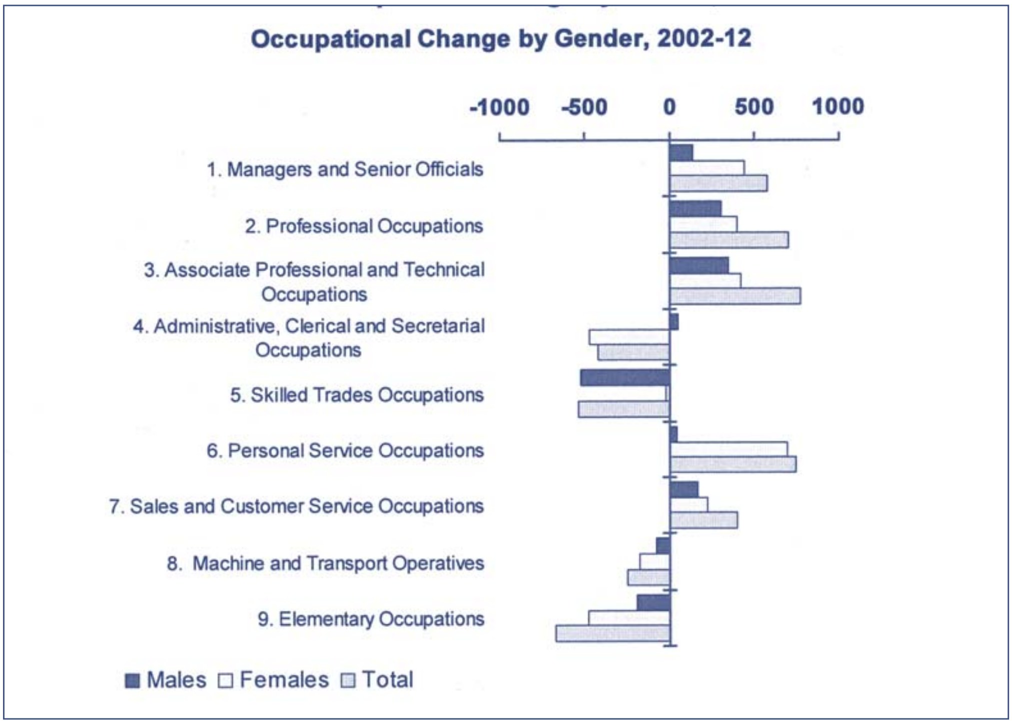
Table 4.1: Occupational Categories SOC 2000 – Major Groups United Kingdom: All Industry Sectors

Employment Levels (000s)	1982	1992	2002	2007	2012
1. Managers and senior officials	2,698	3,336	4,349	4,580	4,934
2. Professional occupations	2,003	2,501	3,305	3,650	4,008
3. Associate professional and technical occupations	2,406	3,023	4,121	4,500	4,895
4. Administrative, clerical and secretarial occupations	3,895	4,205	3,857	3,603	3,434
5. Skilled trades occupations	4,289	3,901	3,341	3,062	2,801
6. Personal service occupations	925	1,310	2,147	2,449	2,894
7. Sales and customer service occupations	1,527	1,784	2,334	2,518	2,732
8. Transport and machine operatives	2,981	2,591	2,473	2,316	2,225
9. Elementary occupations	4,463	3,989	3,409	3,094	2,735
Total	**25,186**	**26,639**	**29,336**	**29,772**	**30,658**

Percentage Shares	1982	1992	2002	2007	2012
1. Managers and senior officials	10.7	12.6	14.9	15.4	16.2
2. Professional occupations	8.0	9.4	11.3	12.2	12.9
3. Associate professional and technical occupations	9.6	11.3	14.0	15.1	16.0
4. Administrative, clerical and secretarial occupations	15.5	15.8	13.2	12.2	11.4
5. Skilled trades occupations	17.0	14.6	11.4	10.2	9.1
6. Personal service occupations	3.7	4.9	7.3	8.2	9.4
7. Sales and customer service occupations	6.1	6.7	7.9	8.5	9.0
8. Transport and machine operatives	11.8	9.7	8.4	7.7	7.2
9. Elementary occupations	17.7	15.0	11.6	10.4	8.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

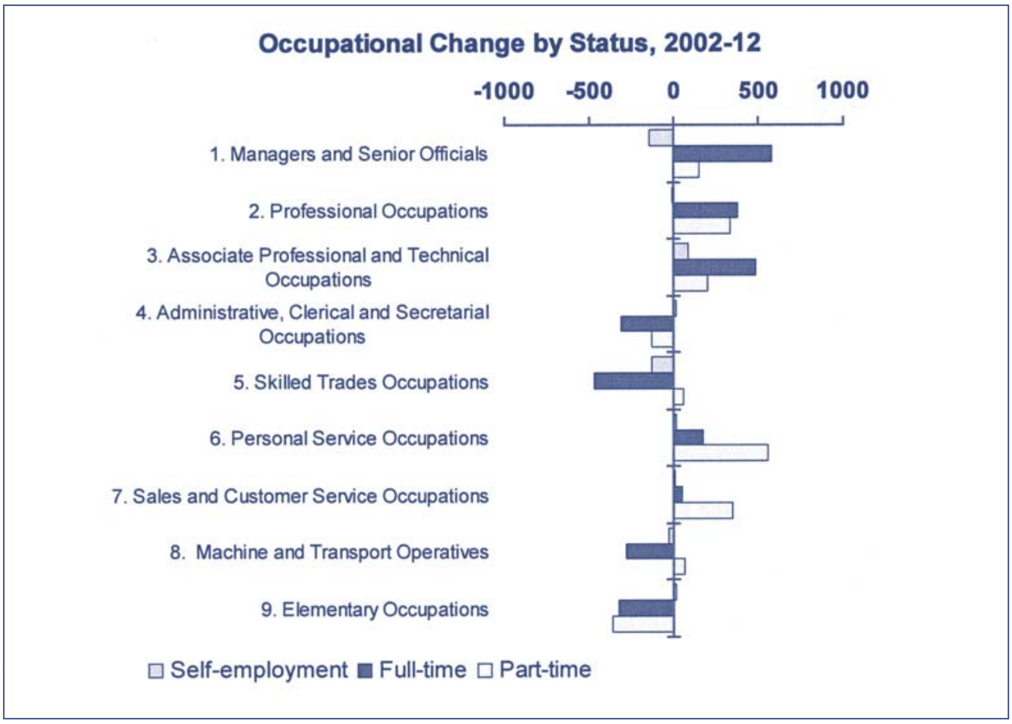
Source: CE/IER estimates, MDM95 F95F9S Forecast, AllUK.xls, (Table 4.1).

Figure 4.2



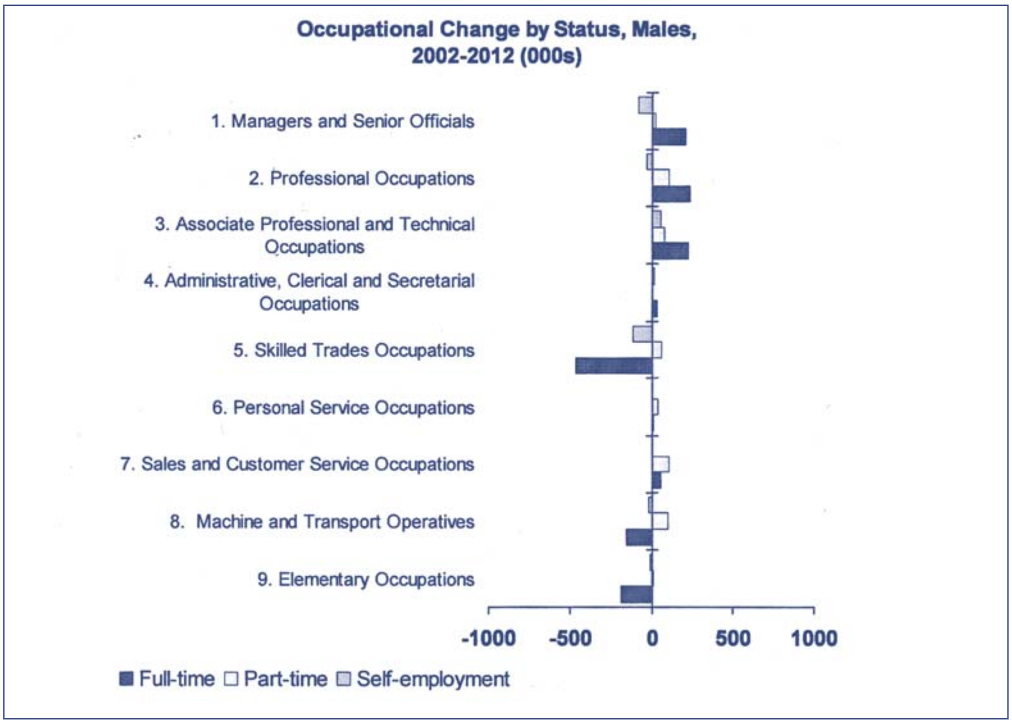
Source: CE/IER estimates, MDM95 C31F9S Forecast, Alluk.xls, (Figures 4.1 to 4.4).

Figure 4.3



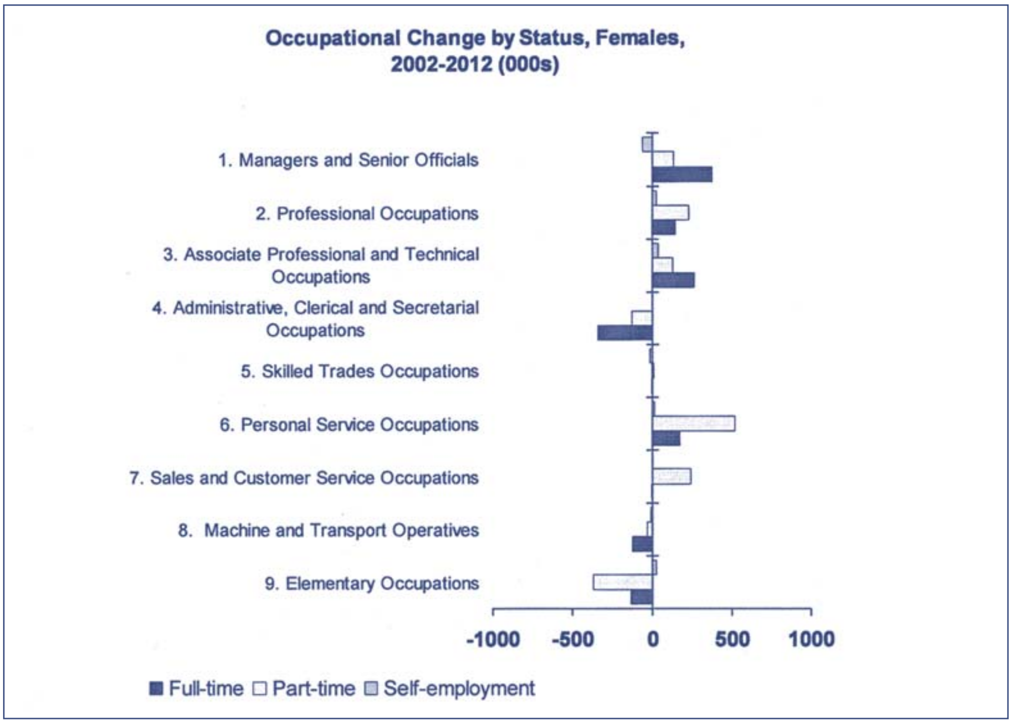
Source: CE/IER estimates, MDM95 C31F9S Forecast, Alluk.xls, (Figures 4.1 to 4.4).

Figure 4.4



Source: CE/IER estimates, MDM95 C31F9S Forecast, Alluk.xls, (Figures 4.1 to 4.4).

Figure 4.5



Source: CE/IER estimates, MDM95 C31F9S Forecast, Alluk.xls, (Figures 4.1 to 4.4).

4.8 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 and 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 2012. The latest Census information suggests that the pace of growth will be faster than previously anticipated.

Professional occupations

Amongst professional occupations, all sub-major groups have experienced rapid growth. This is projected to continue. The highest rate of growth is projected for business and public service professionals. For teaching and research professionals and also for science and technology professionals (which includes engineers), substantial increases of around 200,000-300,000 jobs are projected in each case. All these professional groups will increase their share of overall employment between 2002 and 2012.

Associate professional and 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. Very 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 over a third of a million jobs between 1992 and 2002. Essentially, these patterns are projected to continue, albeit at a more modest pace. The fastest rates of growth over the period 2002 to 2012 are expected for the culture/ media/sports occupations, but the largest absolute increase is again for the business and public service group.

Administrative, clerical and secretarial occupations

Amongst the administrative, clerical and secretarial occupations, the latest Census data now suggest a decline in employment 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, all occupations, except for skilled agricultural trades, are now estimated to have experienced declining employment over the past decade. Over the next 10 years, the highest job losses are expected to be in the skilled metal and electrical trades. These are most closely associated with the engineering industry. Significant losses over the next 10 years are also forecast in the skilled construction and building 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 0.75 million jobs over the last decade. Over the next 10 years, most 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 and 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 over a 0.75 million jobs. The former is projected to grow by around 10% between 2002 and 2012. Customer service occupations are also 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.

Transport and machine operatives

There is a wide diversity of different occupations within the transport and machine operatives group. Many of these jobs are related to manufacturing, construction and transport activity. Employment declined quite rapidly for the process and plant machine operators over the last decade, with the loss of around 0.25 million jobs between 1992 and 2002. However, there were modest increases amongst the transport drivers group. There are expected to be further job losses amongst the plant and machine operators, who work in factories and on construction sites. A small increase in employment levels is projected for transport drivers and operators.

Elementary occupations

The final occupational group contains all other 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 reduction occurs 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 for the elementary occupations, (clerical and services related) group, which provide low-skilled service sector jobs. The prospects for the latter are now regarded as even less optimistic than in the previous forecast round, this group bearing the brunt of the impact of IT. Employment fell by 0.5 million for this group between 1992 and 2002 and a similar scale of job loss is projected over the next 10 years.

Table 4.2: Total Occupational Employment, 1992-2002 United Kingdom: All Industry Sectors

SOC 2000 Sub Major Groups	1992		2002		Change and components of change, 1992-2002						
					Net change		Scale effect	occupation effect		industry mix effect	
	000s	%	000s	%	%	000s	000s	000s	%	000s	%
11 Corporate Managers	2,314	8.7	3,251	11.1	40.5	936	226	626	27.0	84	3.6
12 Managers & Proprietors	1,022	3.8	1,098	3.7	7.5	77	102	-111	-10.8	85	8.4
21 Science/Tech Professionals	696	2.6	901	3.1	29.4	205	67	74	10.6	64	9.2
22 Health Professionals	180	0.7	262	0.9	45.5	82	18	33	18.5	31	17.0
23 Teaching/Research Prof.	1,071	4.0	1,369	4.7	27.8	298	111	95	8.9	91	8.5
24 Business/Public service Prof.	554	2.1	774	2.6	39.7	220	54	108	19.6	57	10.2
31 Science/Tech Associate Prof.	402	1.5	589	2.0	46.5	187	39	133	33.0	15	3.8
32 Health Associate Prof.	866	3.2	1,017	3.5	17.5	151	93	28	3.3	30	3.4
33 Protective Service	253	1.0	407	1.4	60.8	154	24	129	51.0	0	0.1
34 Culture/Media/Sport	355	1.3	617	2.1	73.9	262	36	161	45.5	65	18.3
35 Bus/Public Serv. Assoc Prof.	1,147	4.3	1,490	5.1	29.9	343	114	188	16.4	41	3.6
41 Administrative Occupations	2,939	11.0	2,843	9.7	-3.3	-96	311	-454	-15.4	47	1.6
42 Secretarial & Related	1,266	4.8	1,014	3.5	-19.9	-252	138	-480	-37.9	90	7.1
51 Skilled Agricultural Trades	340	1.3	355	1.2	4.4	15	33	55	16.2	-73	-21.5
52 Skilled Metal/Elect. Trades	1,693	6.4	1,305	4.4	-22.9	-388	159	-332	-19.6	-216	-12.7
53 Skilled Construct. Trades	1,051	3.9	1,040	3.5	-1.1	-11	99	-14	-1.3	-96	-9.1
54 Other Skilled Trades	817	3.1	641	2.2	-21.5	-175	83	-261	-32.0	3	0.3
61 Caring Personal Service	806	3.0	1,568	5.3	94.5	762	88	643	79.7	32	3.9
62 Leisure/Oth Pers Service	504	1.9	579	2.0	14.9	75	53	-11	-2.1	33	6.6
71 Sales Occupations	1,656	6.2	1,928	6.6	16.4	272	176	68	4.1	29	1.7
72 Customer Service	128	0.5	407	1.4	217.5	278	14	261	204.1	4	2.8
81 Process, Plant & Mach Ops.	1,670	6.3	1,415	4.8	-15.3	-255	165	-161	-9.7	-259	-15.5
82 Transport Drivers and Ops.	921	3.5	1,059	3.6	15	138	87	85	9.2	-34	-3.7
91 Elementary: Trades/Plant/Storage	1,252	4.7	1,170	4.0	-6.5	-82	123	-22	-1.8	-182	-14.6
92 Elementary: Admin/Service	2,736	10.3	2,238	7.6	-18.2	-498	285	-844	-30.8	60	2.2
All occupations	**26,639**		**29,336**		**10.1**	**2,697**	**2,697**	**0**		**0**	

Source: CE/IER estimates, MDM95 F95F9S Forecast, Shiftsharetables16.xls.

Table 4.3: Total Occupational Employment, 2002-2012 United Kingdom: All Industry Sectors

SOC 2000	2002		2012		Change and components of change, 2002-2012						
					Net change		Scale effect	occupation effect		industry mix effect	
Sub Major Groups	000s	%	000s	%	%	000s	000s	000s	%	000s	%
11 Corporate Managers	3,251	11.1	3,912	12.8	20.4	662	122	480	14.8	60	1.8
12 Managers & Proprietors	1,098	3.7	1,021	3.3	-7.0	-77	45	-153	-13.9	30	2.7
21 Science/Tech Professionals	901	3.1	1,103	3.6	22.5	203	24	100	11.1	79	8.7
22 Health Professionals	262	0.9	312	1.0	19.1	50	11	28	10.6	11	4.2
23 Teaching/Research Prof.	1,369	4.7	1,642	5.4	19.9	273	76	167	12.2	30	2.2
24 Business/Public service Prof.	774	2.6	951	3.1	23.0	178	30	94	12.2	53	6.9
31 Science/Tech Associate Prof.	589	2.0	733	2.4	24.5	144	19	115	19.5	10	1.7
32 Health Associate Prof.	1,017	3.5	1,147	3.7	12.8	130	67	21	2.1	42	4.1
33 Protective Service	407	1.4	490	1.6	20.3	83	11	71	17.4	1	0.2
34 Culture/Media/Sport	617	2.1	810	2.6	31.3	193	26	112	18.1	56	9.0
35 Bus/Public Serv. Assoc Prof.	1,490	5.1	1,715	5.6	15.1	225	66	117	7.9	41	2.8
41 Administrative Occupations	2,843	9.7	2,663	8.7	-6.3	-180	169	-344	-12.1	-5	-0.2
42 Secretarial & Related	1,014	3.5	771	2.5	-24.0	-244	74	-324	-32.0	7	0.7
51 Skilled Agricultural Trades	355	1.2	365	1.2	2.9	10	9	31	8.8	-30	-8.5
52 Skilled Metal/Elect. Trades	1,305	4.4	898	2.9	-31.2	-408	25	-340	-26.0	-93	-7.1
53 Skilled Construct. Trades	1,040	3.5	950	3.1	-8.6	-90	19	-54	-5.2	-55	-5.3
54 Other Skilled Trades	641	2.2	588	1.9	-8.4	-54	24	-63	-9.9	-14	-2.2
61 Caring Personal Service	1,568	5.3	2,271	7.4	44.8	703	110	558	35.6	35	2.2
62 Leisure/Oth Pers Service	579	2.0	624	2.0	7.8	45	33	-5	-0.9	17	2.9
71 Sales Occupations	1,928	6.6	2,129	6.9	10.5	202	114	55	2.8	33	1.7
72 Customer Service	407	1.4	603	2.0	48.2	196	24	171	42.1	1	0.2
81 Process, Plant & Mach Ops.	1,415	4.8	1,104	3.6	-22.0	-311	46	-219	-15.5	-138	-9.7
82 Transport Drivers and Ops.	1,059	3.6	1,121	3.7	5.8	62	22	83	7.9	-44	-4.1
91 Elementary: Trades/Plant/Storage	1,170	4.0	957	3.1	-18.2	-213	34	-152	-13.0	-95	-8.1
92 Elementary: Admin/Service	2,238	7.6	1,778	5.8	-20.6	-460	118	-548	-24.5	-30	-1.3
All occupations	**29,336**		**30,658**		**4.5**	**1,322**	**1,322**	**0**		**0**	

Source: CE/IER estimates, MDM95 F95F9S Forecast, Shiftsharetables16.xls.

4.9 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.[7]
- 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 1992-2002 and for the projection period 2002-2012. 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 three 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 results in an increase of just over 10% in each occupational employment level.[8] 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.[9] 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 1992-02 and 2002-12. 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.

[7] 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.

[8] But see footnote 7.

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

For the forecast period occupational effects are again dominant (see Table 4.3). Again the scale effect is also important. All else being equal, this results in an increase of just under 8% in each occupational employment level over the 2002-12 period.[10] 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 and machine, mainly linked to the fortunes of the manufacturing sector. These findings are consistent with the results for the earlier period 1992 to 2002 in Table 4.2.

Over the forecast period, the scale effect, which reflects the overall expansion in the economy, is important for all occupations but is especially notable compared with the other effects for managers and proprietors, administrative and clerical occupations and sales occupations. Additionally, it also exerts a significant positive impact for secretarial and 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 and proprietors in agriculture and services, administrative and clerical occupations, secretarial and related occupations, as well as in the skilled trades occupations, process, plant and 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 third effect, the industry mix, is strongly significant in only a few occupations, although it makes a marginal contribution to many of the others. It impacts most significantly in positive fashion for science/technology and business/public service professionals and for culture media and sports occupations, In the case of skilled trades, process, plant and 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.

4.10 Key Messages

This chapter has presented new projections of employment by occupation, based on SOC 2000 categories. The occupational structure of employment has changed very substantially over the past decade. The historical database has been revised to take account of amendments and new information available from the Labour Force Survey and in a more limited way from the latest Census conducted in 2001. This has resulted in some changes to both perceived historical and expected future changes in occupational structure.

The main differences compared to the previous projections are as follows. Much faster growth has been observed for:

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

[10]As noted in footnote 7 above, the scale effect is calculated for each gender separately so the percentage does vary slightly between occupations.

More rapid declines than previously measured have been observed for:

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

Further substantial changes in occupational structure are expected over the next 10 years. These will favour managers, professional and associate professional jobs as well as personal service and some sales occupations. Job losses are expected to be concentrated amongst manual occupations, especially certain skilled trades linked to the operations of manufacturing industries in decline, and for unskilled jobs in a range of occupations and sectors.

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. It is male, full-time workers who 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 and secretarial occupations and in elementary occupations.

5. REPLACEMENT DEMANDS

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.**

5.2 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 identified above. 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 need to replace those members of their staff who leave.

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

- losses due to retirement from the workforce, which require positive replacement;[1]
- 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 the sum of these four elements. When this total replacement demand 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 estimates of replacement demands should, therefore, be regarded as indicative rather than precise.

[1]These include losses at all ages, such as women leaving work during family formations, not just retirement for reasons of old age.

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 proven impossible to develop such estimates for specific sectors or geographical areas from the LFS due to its limited sample size. The estimates shown here and in the more detailed tables are therefore based on just estimated losses from retirements and mortality.

The methods for preparing estimates of replacement demands are described in more detail in the separate *Technical Report*.[2] There is a brief summary of this in Annex A.4 of the present document.

5.3 Estimates of Replacement Demands

An analysis of replacement demand for the 25 occupational subgroups and total occupations, over the period 2002 to 2012, 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 2002-2012 is about 10 times larger than expansion demand, see Table 5.1. Over the decade as a whole, there is expected to be a net requirement of some 13.5 million new job openings. Retirements from the workforce are the principle component of this estimate.

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

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

[2] Wilson *et al.* (2003)

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

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

- corporate managers;
- science and technology professionals;
- teaching and research professionals;
- health associate professionals;
- business and 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 and public service professionals, business and public service associate professionals, and administrative and 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.

5.4 Key Messages

This chapter has presented estimates of replacement demands by occupation, based on SOC 2000 categories. These estimates take into account the need to replace those in the workforce who will be leaving because of retirement or other factors. These outflows are estimated using quite limited information based on 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 permit such customised estimate of age structures and flow rates to be produced. 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 Regional Reports.*

A key message from 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.

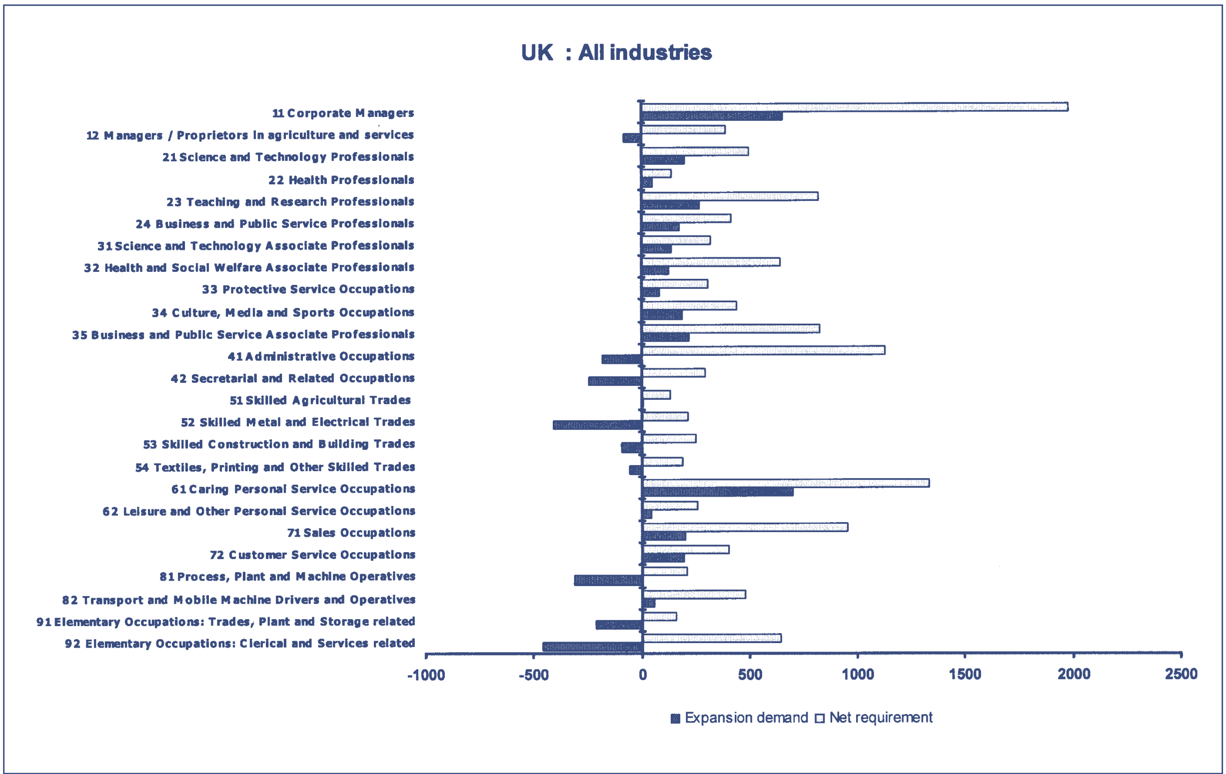
Table 5.1: Replacement Demand by SOC Sub-Major Group, 2002-2012

UK, All industries (Results in 000s)	**Expansion demand**	**Replacement demands (retirements & mortality)**	**Net requirement (excluding occupational mobility)**
Corporate Managers	662	1,321	1,983
Managers and Proprietors	-77	469	392
Science/Tech Professionals	203	299	502
Health Professionals	50	93	143
Teaching/Research Prof.	273	552	825
Business/Public service Prof.	178	244	422
Science Associate Prof.	144	178	322
Health Associate Prof.	130	514	644
Protective Service Occs.	83	230	312
Culture/Media/Sport Occs.	193	252	445
Bus/Public Serv. Assoc Prof.	225	604	829
Admin & Clerical Occupations	-180	1,309	1,129
Secretarial & Related Occs	-244	540	296
Skilled Agricultural Trades	10	123	134
Skilled Metal/Elec Trades	-408	627	219
Skilled Construct. Trades	-90	342	252
Other Skilled Trades	-54	248	194
Caring Personal Service Occs.	703	633	1,336
Leisure/Oth Pers Serv Occs.	45	214	259
Sales Occupations	202	755	957
Customer Service Occupations	196	211	407
Transport & Mach Ops.	-311	519	208
Transport Drivers and Ops.	62	421	482
Elementary: Trades/Plant/Mach.	-213	376	163
Elementary: Clerical/Service	-460	1,108	647
All Occupations	**1,322**	**12,181**	**13,503**

Source: CE/IER estimates, based on LEFM Replacement Demand Module, MDM95 F95F9S Forecast., ReplacementDemands.xls, (SectorsRD).

Note: 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, 2002-2012



Source: CE/IER estimates, MDM95 C31F9S 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 (as detailed in the Annex). 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/or the individual Sector Skills Councils. The results should be regarded as indicative of general trends for sectoral groups as specified in Annex A, rather than precise forecasts of what will happen, and should be used in conjunction with a variety of other sources of LMI. The projections relate to the sectoral definitions as identified in the description of the industry at the top of the relevant section of the chapter. They are not necessarily co-terminus with Sector Skills Council definitions.

A much more detailed analysis is available in the extended Volume Three: Sectoral Report.

Following this introduction there are 25 sub-sections, one for each industry group. This reflects the fact that a few of the 27 SSDA Sector Matrix Industries[1] have had to be aggregated together in order to obtain robust estimates. This applies to *Mining and quarrying* and *Utilities* and to *Wood and paper* and *Printing and publishing.*

For each of the 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;
- 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 are based on output divided by employment. Output per head is a fairly crude but widely used measure. Alternatives include output per person hour and total factor productivity. The latter attempts to measure all factor inputs, not just labour. The measures used here will be 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.

[1]See Table A.3. in the Annex and www.ssdamatrix.org.uk

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 the 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 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

6.1.1 Description of the Industry

INDUSTRY 1: AGRICULTURE
SIC92 headings: 01,02, 05

Arable faming, 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 (% 2002):	1.5	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	443,000	29,336,000
Share of total employment (% 2002):	1.5	100
Gender split (male:female) (% 2002):	77 : 23	53:47
Part-time share (% 2002):	15	27
Self-employment share (% 2002):	42	12

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

6.1.2 Industry Commentary

Agriculture continues to face difficulties following the BSE and foot-and-mouth crises which exacerbated an already deteriorating situation. The downward trend in farm incomes has only been reversed for dairy farmers according to DEFRA statistics, and employment is forecast to fall further still. Diversification activities into leisure and tourism have proved successful for some farmers, but not others, especially those in remote locations, and, in any event, all such activities were severely affected by the foot-and-mouth epidemic in 2001-2002.

The Common Agriculture Policy (CAP) continues to be widely criticised for failing to meet its twin objectives of securing farm incomes and reasonably priced food for the EU. Farm incomes have collapsed, and large food surpluses have not been accompanied by falling prices. Despite representing a decreasing share of the EU's budget, the CAP still represents almost half of the budget, and around 35% of farmers' incomes are pure subsidies from the EU. The Fischler CAP reform proposals were rejected in January 2003 and substantive reform of the CAP is now unlikely in the immediate future. This is particularly significant in light of the expansion of the EU by the accession of eight former CEE countries in 2004. Undoubtedly, this expansion will mount severe pressure on the CAP budget.

Further liberalisation of world farming trade has been hampered by the failure at the WTO meeting in March 2003 to agree a suitable framework. Current systems of protectionism by the EU and US have important consequences for producers in less developed countries according to the World Bank, which fail to penetrate major export markets due to these barriers, and also face subsidised imports from developed countries in their home markets.

Future concerns for the industry include the prospects for GM crops, currently undergoing a major review in the UK by the Agriculture and Environment Biotechnology Commission. Legislation will be needed to determine locus of responsibility in the event of cross-pollination, if the current strict controls on any GM planting are lifted.

The further decimation of the UK fishing industry is set to continue following the near halving of the cod quota, and the decision to restrict fishing to 15 days per month. Some environmentalists have suggested that this will still be insufficient to prevent the collapse of the stocks, especially given the difficulty in enforcing the quotas. Given that the UK has around 50% of the cod quota, the UK fleet will be particularly hard hit, especially in Scotland where much of the fleet is based. This will also have knock-on effects for the local coastal communities.

Recent government initiatives, including the Strategy for Sustainable Farming and Food (December 2002), recognise both the plight of the industry and its importance, especially in rural areas. They have suggested a number of reforms which attempt to be win-win in supporting both farmers' incomes and the environment.

But, in general, the prospects for the industry are for a continued decline in employment, although not at the same rates experienced in the 1980s and 1990s. This will be coupled with continued modest increases in output driven by further gains in productivity in an increasingly competitive global market.

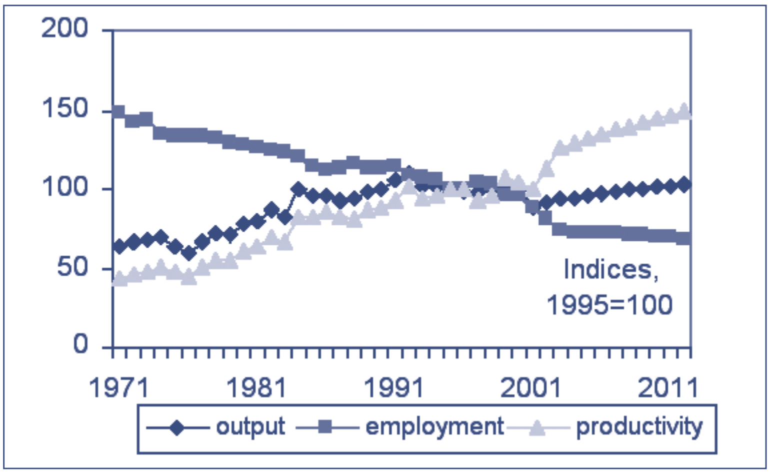
6.1.3 Productivity and Output Trends

Table 6.1.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	-2.4	-1.3	1.5	0.7
Employment (% pa)	-0.6	-5.1	-2.3	-1.0
(000s pa)	-17	-132	-49	-19
Productivity (% pa)	-1.8	4.0	3.9	1.7

Source: 6725output.xls

Figure 6.1.1: Output, Productivity and Employment, Agriculture



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output levels have been hit by the problems of BSE and foot-and-mouth.
- Productivity has continued to show a strong upward trend, despite some short-term blips. This has been driven by technological change and 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.

6.1.4 Employment by Status and Gender

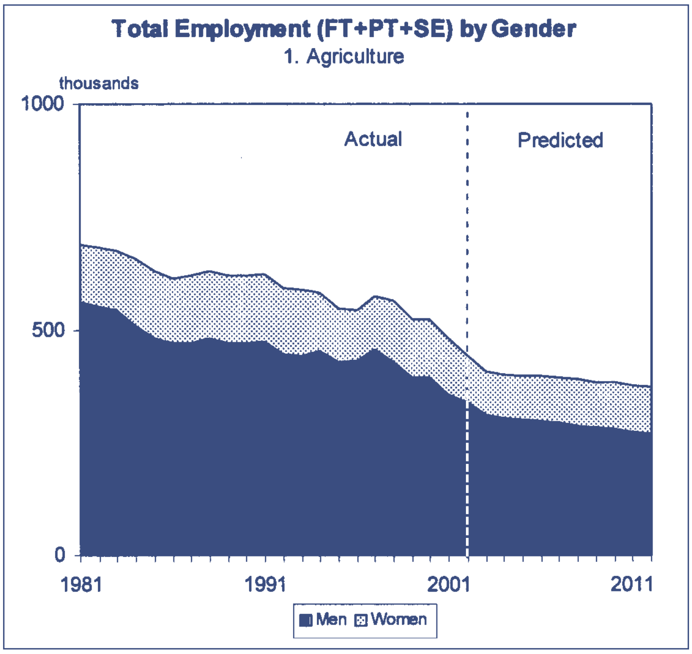
Employment in this industry is predominately male. Self-employment is very significant, accounting for almost half of all male jobs. Both males and the self-employed are expected to see their employment shares decline over the next decade.

Table 6.1.2: Employment Levels by Gender and Status, Agriculture

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	2002-07			000s
Male employment	153	(34.5)	33	(7.4)	154	(34.9)	340	(76.8)	-138	229	-105	-15
Female employment	41	(9.2)	32	(7.3)	30	(6.8)	103	(23.2)	119	335	-3	451
Total employment	**193**	**(43.7)**	**65**	**(14.7)**	**184**	**(41.7)**	**443**	**(100)**	**-19**	**564**	**-109**	**436**
2007									2007-12			
Male employment	140	(35.6)	29	(7.4)	124	(31.4)	293	(74.4)	87	278	-73	29
Female employment	43	(11)	38	(9.6)	20	(5)	101	(25.6)	213	374	7	593
Total employment	**184**	**(46.6)**	**67**	**(17)**	**143**	**(36.4)**	**394**	**(100)**	**299**	**652**	**-66**	**886**
2012									2002-12			
Male employment	137	(36.6)	28	(7.4)	104	(27.8)	270	(71.8)	-52	507	-178	278
Female employment	49	(13)	45	(11.9)	12	(3.3)	106	(28.2)	332	709	4	1,044
Total employment	**186**	**(49.6)**	**73**	**(19.3)**	**117**	**(31.1)**	**375**	**(100)**	**280**	**1,216**	**-174**	**1,322**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

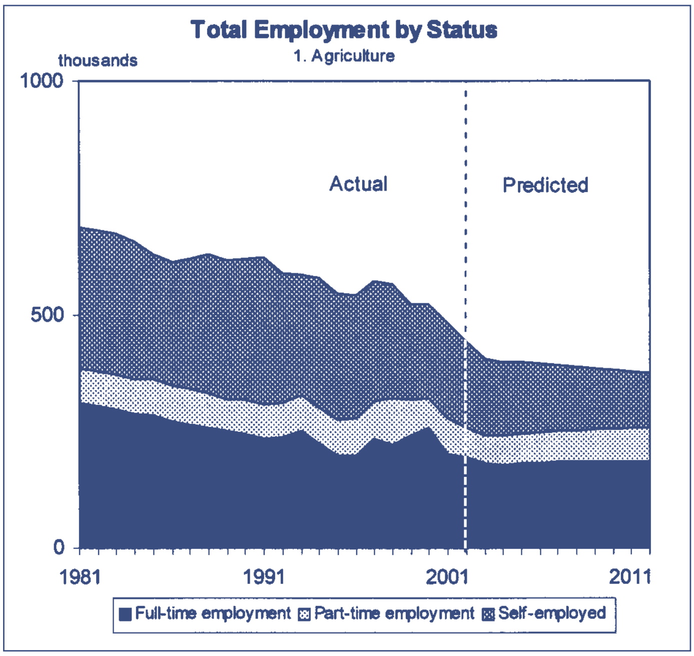
Figure 6.1.2: Changing Patterns of Sectoral Employment by Gender



- Male employment has fallen much faster than that for females. This is projected to continue.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

Figure 6.1.3: Changing Patterns of Sectoral Employment by Status



- Self-employment has been the main casualty of rapidly declining employment. This trend is projected to be maintained.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

6.1.5 Projections of Employment by Occupation

Key aspects of occupational structure

Three occupations dominate employment (see Table 6.1.3):

- managers (including proprietors);
- 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 and future

- These three occupations, along with transport and machine operatives have borne the brunt of job decline.
- These patterns are projected to continue, with skilled trades and elementary occupations experiencing significant job losses.

Small increases are expected for personal service occupations, reflecting the increasing emphasis on tourism and leisure as opposed to traditional activities.

Replacement demands

- 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 demands and declining expansion demand tend to cancel out for many occupations. The largest net requirement projected is for skilled trades occupations and for personal service occupations, the latter reflecting 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.							2002-2012	
Employment Levels (000)	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	68	61	31	27	27	-4	12	8
2. Professional Occupations	5	6	3	3	3	0	1	1
3. Associate Professional and Technical Occupations	8	9	6	6	7	0	3	3
4. Administrative, Clerical and Secretarial Occupations	21	22	10	10	9	-1	5	4
5. Skilled Trades Occupations	263	228	161	144	140	-22	56	34
6. Personal Service Occupations	29	27	32	36	43	11	11	23
7. Sales and Customer Service Occupations	4	4	3	3	3	0	1	2
8. Transport and Machine Operatives	58	51	30	25	22	-7	11	4
9. Elementary Occupations	226	183	166	139	120	-44	53	9
Total	682	592	443	394	375	-67	154	86

						2002-2012 Percentage Changes		
Percentage Shares.	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	10.0	10.4	7.0	6.9	7.1	-14	40	26
2. Professional Occupations	0.7	0.9	0.8	0.8	0.9	2	32	34
3. Associate Professional and Technical Occupations	1.1	1.5	1.5	1.6	1.8	5	39	44
4. Administrative, Clerical and Secretarial Occupations	3.1	3.8	2.3	2.4	2.4	-11	49	38
5. Skilled Trades Occupations	38.5	38.4	36.4	36.5	37.2	-14	35	21
6. Personal Service Occupations	4.3	4.6	7.3	9.1	11.6	35	35	70
7. Sales and Customer Service Occupations	0.6	0.7	0.7	0.8	0.9	12	41	53
8. Transport and Machine Operatives	8.5	8.7	6.7	6.3	6.0	-24	36	12
9. Elementary Occupations	33.1	30.9	37.4	35.4	32.1	-27	32	5
Total	**100**	**100**	**100**	**100**	**100**	-15	35	20

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.1.4: Changing Composition of Employment by Occupation, 1982-2012

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.x.4)

6.2 MINING & UTILITIES

6.2.1 Description of the Industry

INDUSTRY 2: MINING & UTILITIES
SIC92 headings: 10, 11, 12, 13, 14, 40.1,40.2, 40.3, & 41

Deep coal mines and opencast coal working. Over 70% 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 and thorium. Metal ores and their preparation; quarrying of stone, sand and clay; production of salt, other mining and quarrying not elsewhere specified.

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.

INDUSTRY PROFILE

	Total	Mining & Quarrying	Utilities	All industries
Share of UK output (% 2002):	2.9	0.4	2.4	100
Exposure to international trade:	high	high	medium	average
Concentration (market share of largest employers):	medium	medium	medium	average
Total employment (2002):	218,000	77,000	140,000	29,336,000
Share of total employment (% 2002)	0.7	0.3	0.5	100
Gender split (male:female) (% 2002):	71:29	85:15	63:37	53:47
Part-time share (% 2002):	8	3	11	27
Self-employment share (% 2002):	5	6	4	12

Source: CE/IER estimates, MDM95 C31F9S Forecast, 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 following the announced closure of the Selby complex in Yorkshire are likely. 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.

Utilities

The ageing nuclear capacity is set to see closures over the next decade, with all the remaining Magnox reactors planned to close by 2010. Financially, the nuclear industry is still heavily dependent on government assistance. BNFL, the state-owned nuclear fuel processor, has benefited from the transfer of waste liabilities to another state-funded agency. British Energy, the private sector nuclear power company which accounts for about a quarter of the UK's generating capacity, has required large scale loans but is still reporting heavy losses, and may be close to insolvency. Moreover, such government support may contravene EU competition regulations. Other private generating companies are also facing severe financial pressures due to the low prices in the wholesale electricity market under the new pricing arrangements, and considerable excess capacity in the industry.

Radical reform of the pricing of electricity in March 2001 has led to wholesale prices falling by between 25% and 40% since the late 1990s, and wholesale prices are now close to variable costs (although retail prices have not fallen significantly). Previously, under the pool system, prices were well above the costs of generation. The change in pricing formula, plus the costs of servicing their debts, have placed the electricity generating companies under considerable pressure. This contributed to TXU, one of the UK's largest suppliers, going into administration in late 2002.

Renewables will need to increase significantly if the government is to meet its ambitious targets for CO2 emission reductions by 2050. Despite various support programmes and schemes for developing renewables, the considerable excess capacity in the electricity market and the low wholesale prices mean that there is little incentive for suppliers to diversify in significant ways.

The market for gas in the UK is now completely liberalised. Ofgem, the industry regulator, removed all price limits on sales to final consumers in early 2002, since it now considers that there is sufficient competition in the market for gas. The fall in real gas prices in recent years has benefited the consumer as well as industry and commerce more widely.

The water industry faces a period of considerable challenge under a strict pricing regime, together with new environmental regulations and drinking water quality controls. Since privatisation in 1989 the industry has made considerable efficiency gains, but further substantive gains are only likely to come through economies of scale from mergers and acquisitions. Some attempts at diversification into waste management and electricity supply have also been made.

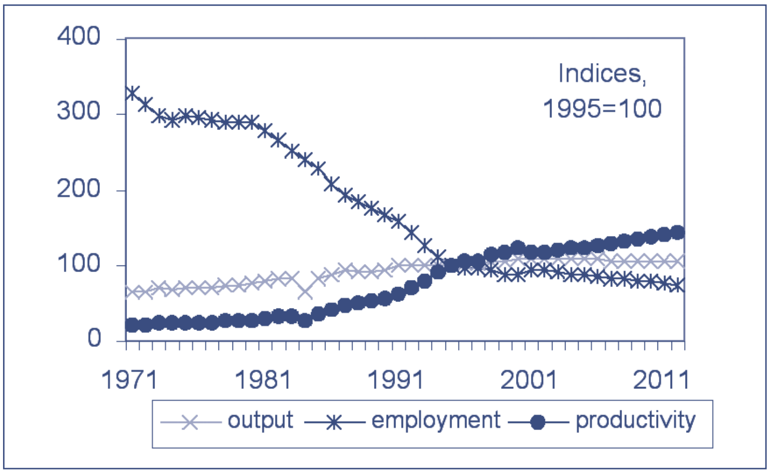
At present, many water and sewerage companies are heavily indebted. Given the requirement for greater capital expenditures to meet quality standards, the costs of financing this investment are likely to be high given the unwillingness of investors to commit further funds and the problems of equity financing in the current stock market environment.

6.2.3 Productivity and Output Trends

Table 6.2.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	0.9	0.9	-0.1	0.0
Employment (% pa)	-7.4	-1.1	-2.1	-2.1
(000s pa)	-107	-12	-22	-20
Productivity (% pa)	8.9	2.0	2.0	2.1

Figure 6.2.1: Output, Productivity and Employment, Mining & Utilities



Source: CE/IER estimates, MDM95 C31F9S Forecast, 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 be static over the next decade.
- Productivity levels have risen steadily and further gains 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

Figure 6.2.1a: Output, Productivity and Employment, Mining & Quarrying

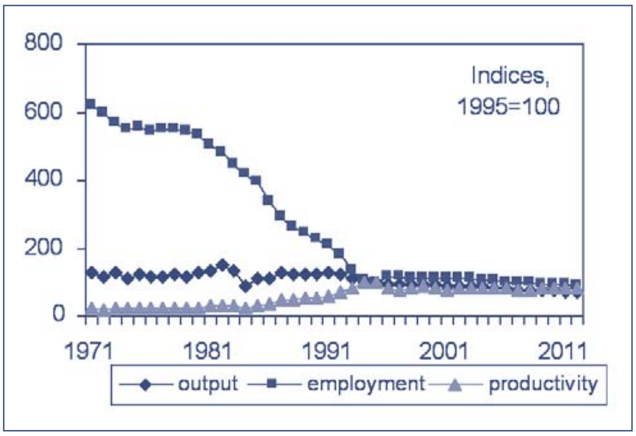
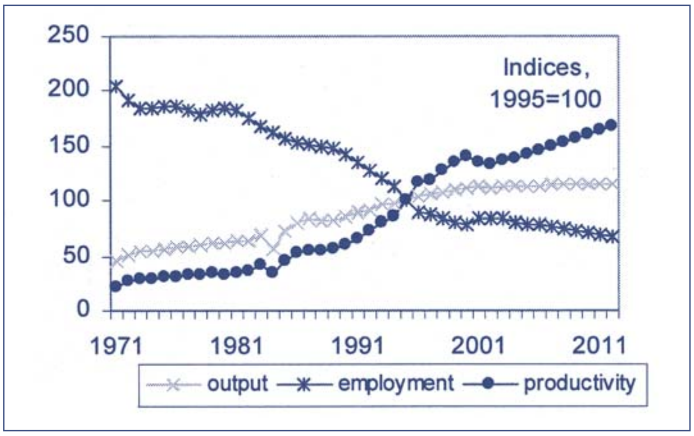


Figure 6.2.1b: Output, Productivity and Employment, Utilities



- 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.

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

Indicator	1992-97	1997-2002	2002-07	2007-12
2. Mining and 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 C31F9S Forecast, 6725Output.xls (Figures for 27 extras).

6.2.4 Employment by Status and Gender

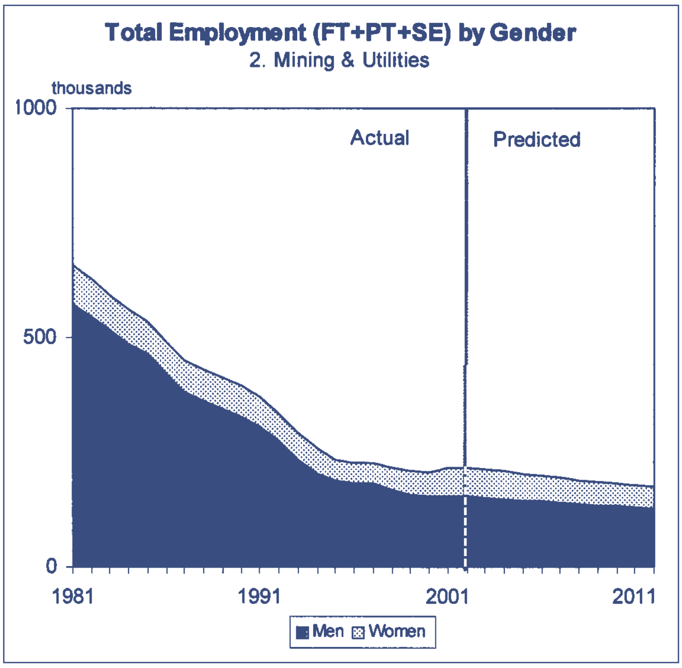
Again these industries are predominantly a source of jobs for males. Self-employment accounts for only around 1 in 20 jobs, but this is increasing. Part-time workers account for a growing share of total employment, especially in the utilities industries.

Table 6.2.2: Employment Levels by Gender and Status, Mining & Utilities

Employment Status Employment by Gender	FT	% shares	PT	% shares	SE	% shares	Total 000s	% shares	Changes in Employment Status FT	PT	SE	Total
2002									**2002-07**			**000s**
Male employment	142	(65.6)	4	(2)	8	(3.7)	155	(71.3)	-14	0	0	-14
Female employment	46	(21.4)	14	(6.5)	2	(0.8)	62	(28.7)	-7	-1	0	-8
Total employment	**189**	**(87)**	**18**	**(8.5)**	**10**	**(4.6)**	**217**	**(100)**	**-20**	**-1**	**0**	**-22**
2007									**2007-12**			
Male employment	129	(66)	4	(2)	8	(4.1)	141	(72.1)	-12	0	0	-13
Female employment	39	(20.2)	13	(6.7)	2	(0.9)	54	(27.9)	-6	-1	0	-7
Total employment	**168**	**(86.2)**	**17**	**(8.8)**	**10**	**(5)**	**195**	**(100)**	**-19**	**-1**	**0**	**-20**
2012									**2002-12**			
Male employment	116	(66.4)	4	(2.1)	8	(4.5)	128	(73)	-26	-1	0	-27
Female employment	33	(18.8)	12	(7.1)	2	(1.1)	47	(27)	-13	-2	0	-15
Total employment	**149**	**(85.2)**	**16**	**(9.2)**	**10**	**(5.6)**	**175**	**(100)**	**-39**	**-2**	**0**	**-42**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

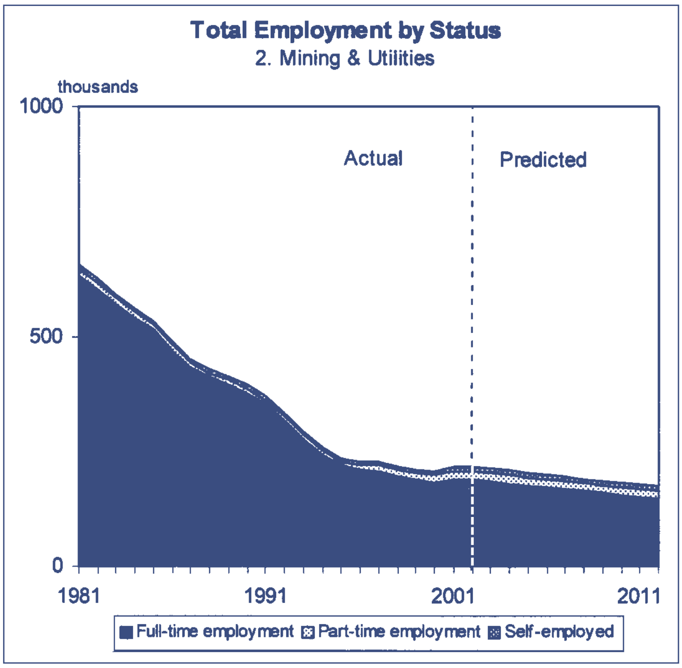
Figure 6.2.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Fig 6.X.3 and Fig 6.X.2).

- Male jobs have borne the brunt of job losses.

Figure 6.2.3: Changing Patterns of Sectoral Employment by Status



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Fig 6.X.3 and Fig 6.X.2)

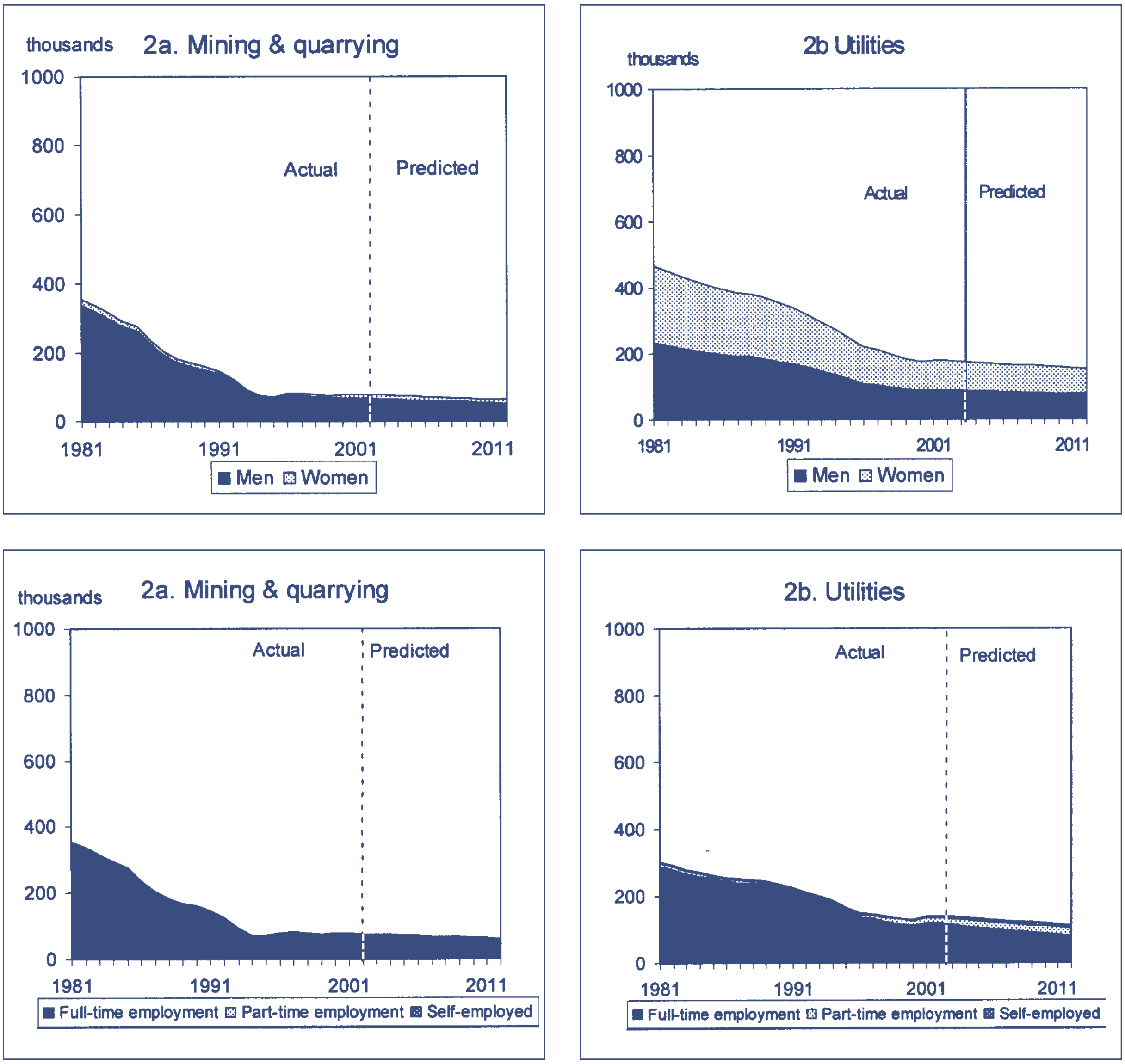
- Self-employment and part-time shares have grown but remain quite tiny, accounting for around 10,000 and 20,000 jobs respectively.

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.

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

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



Source: CE/IER estimates, MDM95 C31F9S Forecast, 27xUK.xls (Fig 6.X.3 & 2).

6.2.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Administrative, clerical and secretarial and skilled trades have typically each accounted for around 20% of total employment, although the share of the latter has been in steady decline.
- Managerial, professional and associate professionals currently each account for about 10% of all jobs.
- Transport and machine operatives and elementary occupations together account for around 25%.

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.

Replacement demands

- The pattern of replacement demands is very different from that for expansion demand. A projected decline of over 40,000 becomes a net requirement of a similar order of magnitude.
- The most significant category in absolute terms is administrative, clerical and secretarial.
- A number of other occupational groups have rapid increases in percentage terms, including personal service and sales and customer service occupations. These have projected growth of over 50% of current employment levels over the decade.
- Managerial, professional and associate professional groups are all projected to require replacements amounting to 25-35% of current employment levels.

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

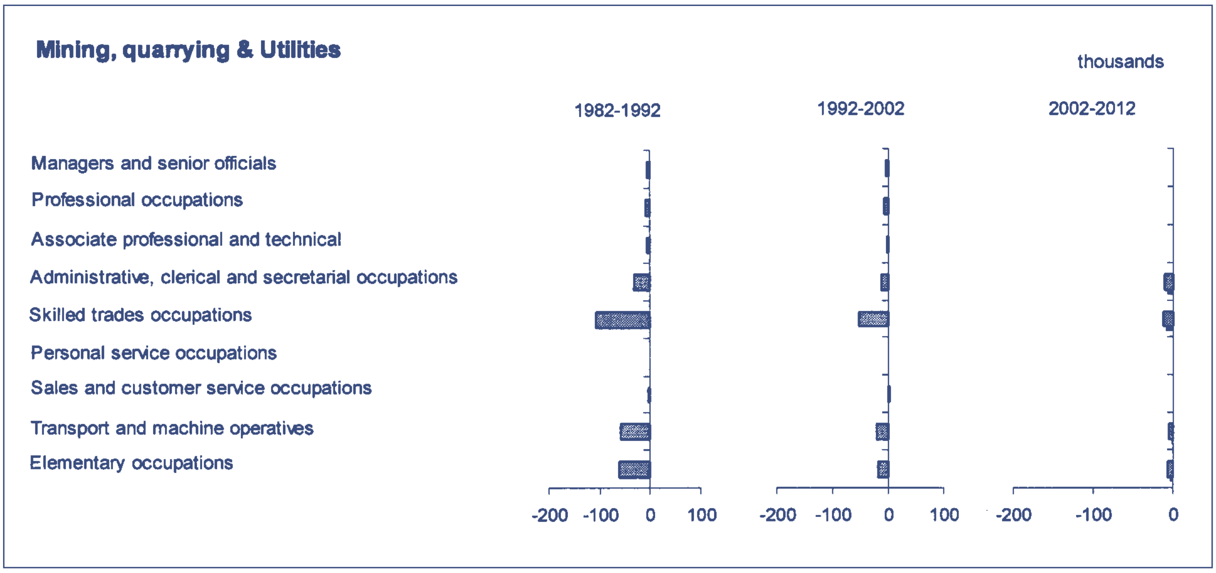
United Kingdom: Mining & utilities

Employment Levels (000)	1982	1992	2002	2007	2012	Net Change (2002-2012)	Replacement Demands (2002-2012)	Total Requirement (2002-2012)
1. Managers and Senior Officials	35	28	23	22	22	-2	9	7
2. Professional Occupations	40	30	22	22	21	-2	7	5
3. Associate Professional and Technical Occupations	31	23	20	19	19	-1	7	7
4. Administrative, Clerical and Secretarial Occupations	85	53	40	33	28	-7	18	12
5. Skilled Trades Occupations	203	96	43	36	30	-18	18	1
6. Personal Service Occupations	7	4	5	4	4	1	2	3
7. Sales and Customer Service Occupations	13	9	12	12	11	1	5	7
8. Transport and Machine Operatives	107	47	27	25	22	-7	10	2
9. Elementary Occupations	106	44	26	22	18	-8	9	1
Total	626	335	217	195	175	-42	86	44

Percentage Shares	1982	1992	2002	2007	2012	2002-2012 Percentage Changes: Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	6	8	10	11	12	-8	39	30
2. Professional Occupations	6	9	10	11	12	-8	32	24
3. Associate Professional and Technical Occupations	5	7	9	10	11	-4	38	33
4. Administrative, Clerical and Secretarial Occupations	14	16	18	17	16	-17	47	30
5. Skilled Trades Occupations	32	29	20	18	17	-41	42	1
6. Personal Service Occupations	1	1	2	2	2	14	38	52
7. Sales and Customer Service Occupations	2	3	5	6	6	11	46	57
8. Transport and Machine Operatives	17	14	13	13	13	-26	35	9
9. Elementary Occupations	17	13	12	11	10	-30	34	4
Total	**100**	**100**	**100**	**100**	**100**	-19	39	20

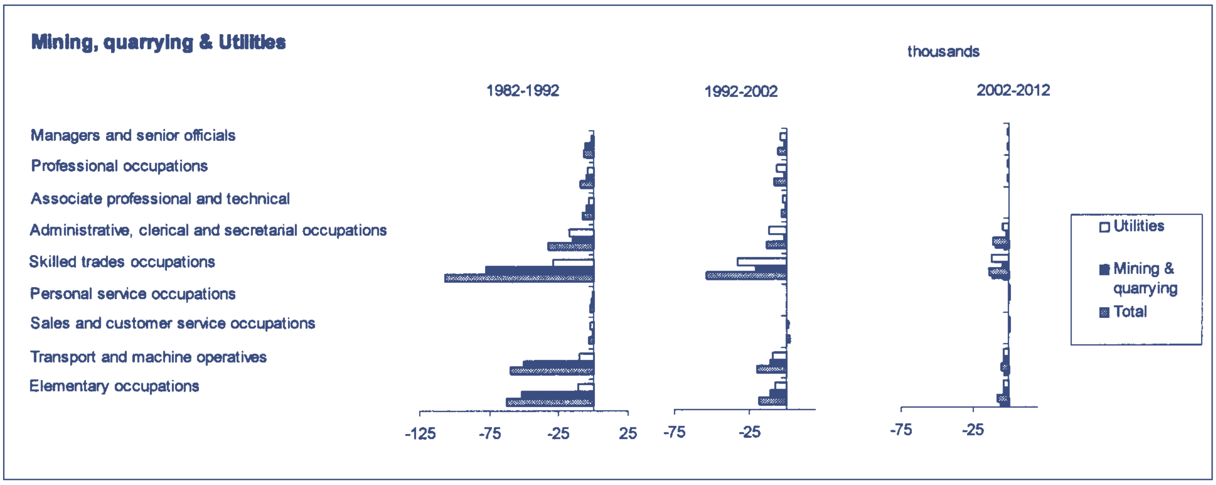
Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.2.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

Figure 6.2.4a: Changing Composition of Employment by Occupation, in Component industries, 1982-2012

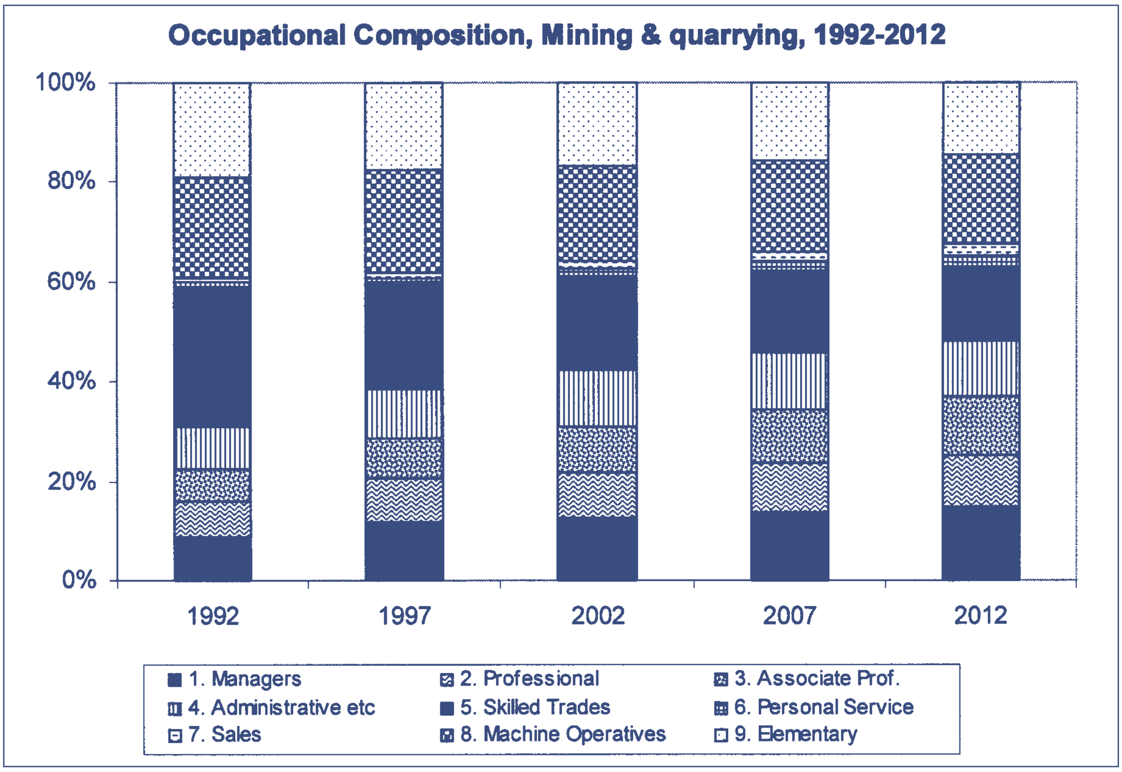


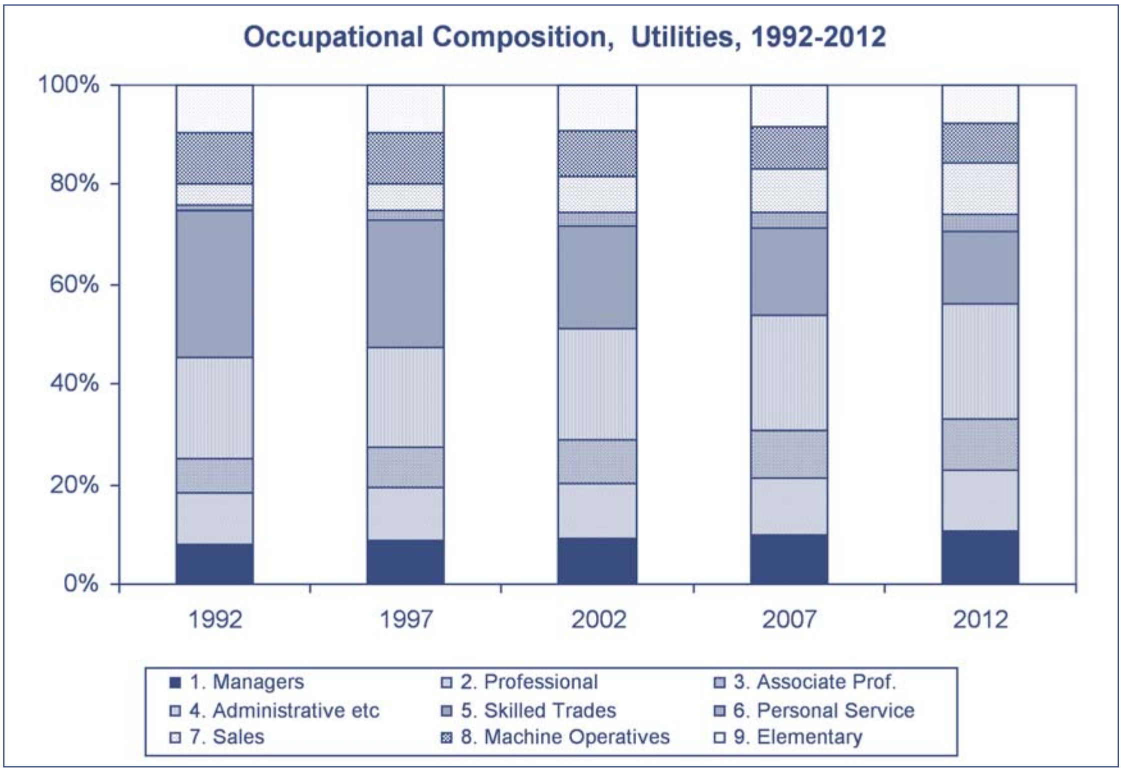
Source: CE/IER estimates, MDM95 C31F9S Forecast, 27xUK.xls (Figure 6.X.4b).

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 6.2.4 a 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.
- Administrative and clerical occupations are projected to make up an increasing share of employment, as well as managerial and professional groups.
- 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, 1982-2012





Source: CE/IER estimates, MDM95 C31F9S Forecast, 27xUK.xls (Figure 6.X.11).

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 (% 2002):	2.5	100
Exposure to international trade:	high	average
Concentration (market share of largest employers):	medium	average
Total employment (2002):	482,000	29,336,000
Share of total employment (%2002):	1.6	100
Gender split (male:female) (% 2002):	66 : 34	53:47
Part-time share (% 2002):	12	27
Self-employment share (% 2002):	3	12

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

6.3.2 Industry Commentary

Following a period of mergers and consolidation among producers, the food industry is now dominated by the competition to supply the large supermarket chains. Internationally, the industry is struggling to regain confidence following a series of problems such as e-coli, BSE and foot-and-mouth. This weak export performance is coupled with stronger import demand. However, the home industry is being helped considerably by the continued strong growth in the demand for chilled (rather than frozen) ready-meals. Further mergers, for example in the dairy sector, look set to increase concentration, and the industry is still very much in a state of transition.

The UK drinks industry is highly concentrated, and is dominated by the large global multinationals. Around 70% of soft drinks are made by PepsiCo and Coco-Cola, while 85% of beer drunk in the UK is brewed by just four companies. As with food, the move is towards even greater concentration – Scottish and Newcastle's recent merger with the cider manufacturer Bulmer being the latest in a long line. This is already resulting in further job losses as restructuring continues.

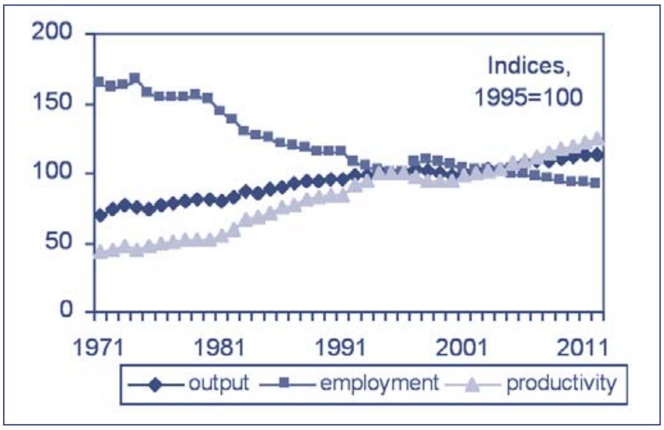
The cigarette and tobacco market in the UK is dominated by Gallaher and Imperial Tobacco which have an 80% market share. While BAT manufactures cigarettes in the UK, almost all of its output is sold abroad. Cigarette smuggling to avoid tobacco duty continues to be a major problem. The recent ban on tobacco advertising, which will become global in 2006, is not predicted to have much effect on sales, at least in the short-term. Output, employment and productivity are predicted to remain flat in the short-to medium-term.

6.3.3 Productivity and Output Trends

Table 6.3.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	1.0	-0.3	1.3	0.9
Employment (% pa)	-0.2	-1.1	-0.9	-1.2
(000s pa)	-4	-26	-20	-27
Productivity (% pa)	1.1	0.8	2.2	2.1

Figure 6.3.1: Output, Productivity and Employment, Food, Drink & Tobacco



Source: CE/IER estimates, MDM95 C31F9S 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 five years or so. Some recovery is expected over the next decade.
- Productivity growth is expected to pick up, following further rationalisation and implementation of technological improvements.
- As a consequence, employment levels are expected to continue their downward trend.

6.3.4 Employment by Status and Gender

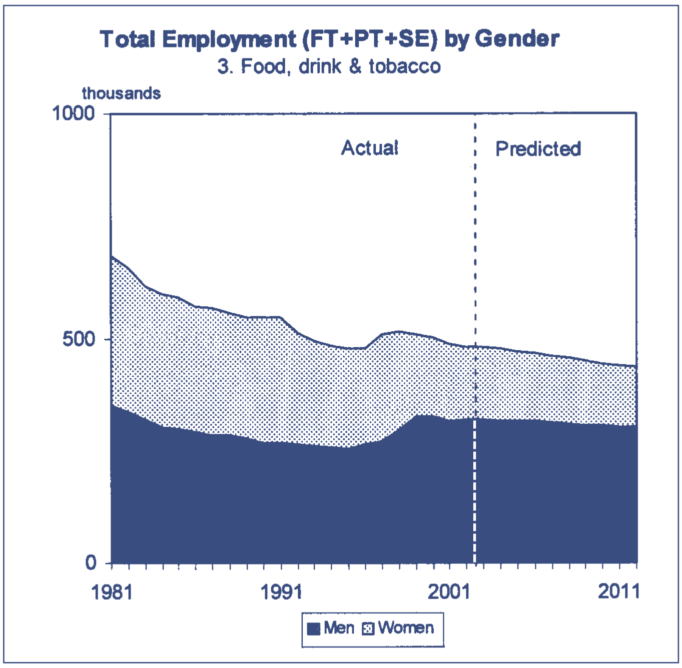
The food, drink and tobacco industry employs quite a large number of females, who account for around a third of all jobs. Part-time employment currently accounts for just over 1 in 10 jobs, being more important for women. Self-employment is relatively insignificant.

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**
2002		**% shares**		**% shares**		**% shares**	**000s**	**% shares**	**2002-07**			**000s**
Male employment	293	(60.9)	15	(3.2)	9	(1.9)	318	(66)	-3	0	-3	-6
Female employment	119	(24.7)	41	(8.6)	4	(0.8)	164	(34)	-7	-6	-2	-14
Total employment	**412**	**(85.6)**	**57**	**(11.8)**	**13**	**(2.6)**	**482**	**(100)**	**-11**	**-5**	**-4**	**-20**
2007									**2007-12**			
Male employment	290	(62.8)	16	(3.4)	6	(1.3)	312	(67.6)	-9	0	-3	-11
Female employment	112	(24.2)	36	(7.8)	2	(0.4)	150	(32.4)	-9	-5	-1	-16
Total employment	**402**	**(87)**	**52**	**(11.2)**	**8**	**(1.8)**	**462**	**(100)**	**-17**	**-5**	**-4**	**-27**
2012									**2002-12**			
Male employment	282	(64.7)	16	(3.7)	3	(0.8)	301	(69.2)	-12	1	-6	-17
Female employment	103	(23.7)	30	(7)	1	(0.2)	134	(30.8)	-16	-11	-3	-30
Total employment	**385**	**(88.4)**	**47**	**(10.7)**	**4**	**(0.9)**	**435**	**(100)**	**-28**	**-10**	**-9**	**-47**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

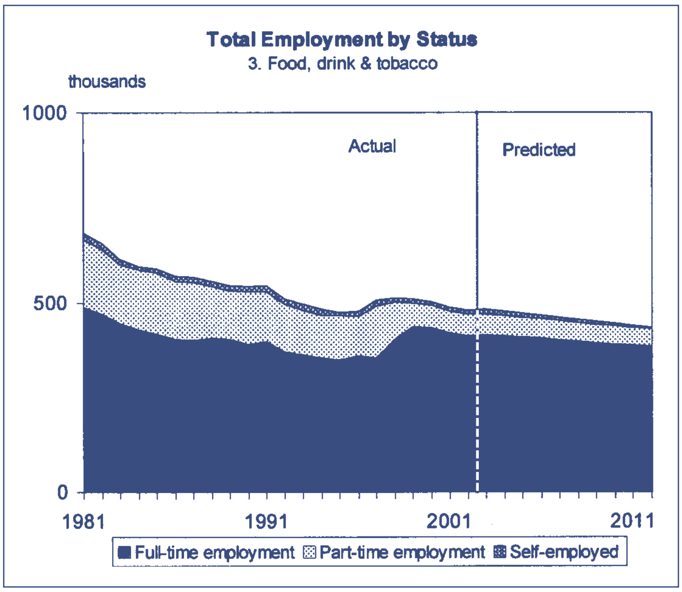
Figure 6.3.2: Changing Patterns of Sectoral Employment by Gender



- Employment levels have stabilised in recent years. A slight decline is anticipated, with males increasing their share slightly.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.3.3: Changing Patterns of Sectoral Employment by Status



- The share of full-time employment is projected to rise, reflecting structural change within the industry.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

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 and machine operatives and elementary occupation groups.
- Small increases are projected for most other occupations other than the administrative, clerical and secretarial category.

Replacement demands

- The overall decline in employment levels projected for the industry over the next decade (of around 10%) is more than offset by replacement demands.
- In total, these amount to almost 200,000 jobs, with a net total requirement of around 150,000.
- Transport and machine operators, skilled trades and elementary occupations are the main areas where new recruits will be needed, but between 40 and 50% of the current workforce will need to be recruited in many other white collar occupations as well.

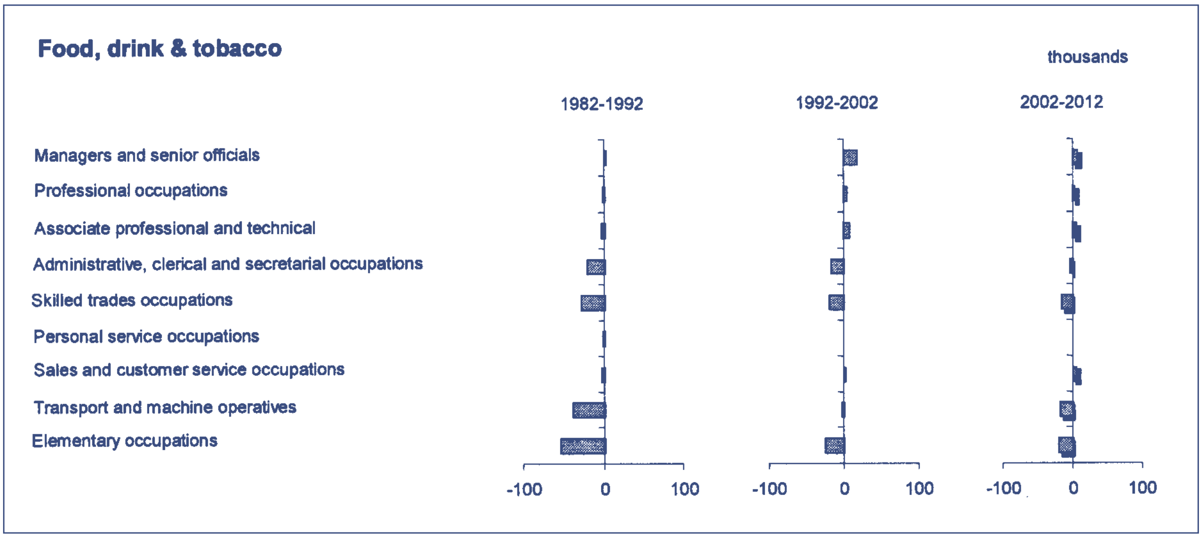
Table 6.3.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Food, Drink & Tobacco						2002-2012		
Employment Levels (000)	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	38	41	58	60	63	5	23	28
2. Professional Occupations	15	14	17	18	19	2	6	7
3. Associate Professional and Technical Occupations	33	31	39	41	42	3	16	19
4. Administrative, Clerical and Secretarial Occupations	77	57	41	38	36	-5	19	15
5. Skilled Trades Occupations	117	91	72	65	56	-16	29	13
6. Personal Service Occupations	4	3	3	3	3	0	1	1
7. Sales and Customer Service Occupations	35	33	35	38	39	3	14	17
8. Transport and Machine Operatives	174	135	134	126	114	-19	53	34
9. Elementary Occupations	161	108	84	74	63	-21	34	13
Total	655	512	482	462	435	-47	194	148

						2002-2012 Percentage Changes		
Percentage Shares	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	5.8	8.0	12.0	13.1	14.5	9	39	48
2. Professional Occupations	2.3	2.7	3.6	3.9	4.4	11	32	43
3. Associate Professional and Technical Occupations	5.0	6.1	8.0	8.8	9.7	9	41	49
4. Administrative, Clerical and Secretarial Occupations	11.8	11.2	8.4	8.2	8.3	-12	47	36
5. Skilled Trades Occupations	17.9	17.7	14.9	14.1	12.8	-22	41	18
6. Personal Service Occupations	0.6	0.6	0.6	0.7	0.8	9	37	46
7. Sales and Customer Service Occupations	5.4	6.4	7.4	8.1	8.9	9	38	47
8. Transport and Machine Operatives	26.5	26.4	27.7	27.2	26.3	-14	40	26
9. Elementary Occupations	24.6	21.1	17.3	15.9	14.4	-25	40	15
Total	**100**	**100**	**100**	**100**	**100**	-10	40	31

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.3.4: Changing Composition of Employment by Occupation, 1982-2012



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

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 (% 2002):	0.70	100
Exposure to international trade:	high	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	247,000	29,336,000
Share of total employment (% 2002):	0.8	100
Gender split (male:female) (% 2002):	48 : 52	53:47
Part-time share (% 2002):	11	27
Self-employment share (% 2002):	12	12

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

6.4.2 Industry Commentary

The textile and clothing industry in the UK has been in fairly continual decline, in the face of strong competition from low wage countries and a highly price-sensitive market. The domestic situation is mirrored in declining export volumes too. 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 MBOs 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. The decision by Marks and Spencers in 1999 to end its policy of favouring goods produced in Britain has severely affected the few remaining large domestic producers. The only areas in the industry exempt from decline are (low volume) niche markets in high quality products such as specialised knitwear and sportswear.

As a result of this overseas competition, the prospects for the industry look bleak. Output and employment are set to fall further still.

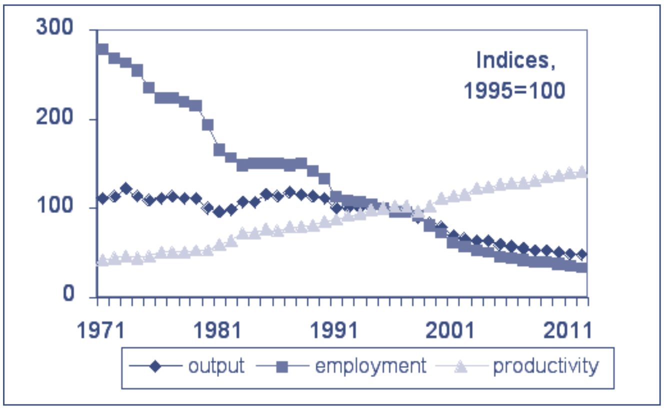
6.4.3 Productivity and Output Trends

Table 6.4.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	-0.4	-7.9	-3.3	-2.9
Employment (% pa)	-2.6	-10.0	-5.7	-4.7
(000s pa)	-59	-170	-63	-39
Productivity (% pa)	2.2	2.3	2.5	1.9

Source: 6725output.xls

Figure 6.4.1: Output, Productivity and Employment, Textiles & Clothing



Source: CE/IER estimates, MDM95 C31F9S Forecast,6725output.xls (Figure 6.x.1)

- Output levels in this industry have taken a battering in the face of stiff foreign competition and increasing import penetration.
- Further decline is anticipated, with rates of loss of around 3% per annum.
- Productivity levels have steadily increased over the past 30 years and this pattern is expected to continue, with growth of over 2% per annum.
- In combination, these trends result in a continued rapid decline in employment averaging around 5% per annum and accounting for the loss of over 100,000 jobs over the next decade.

6.4.4 Employment by Status and Gender

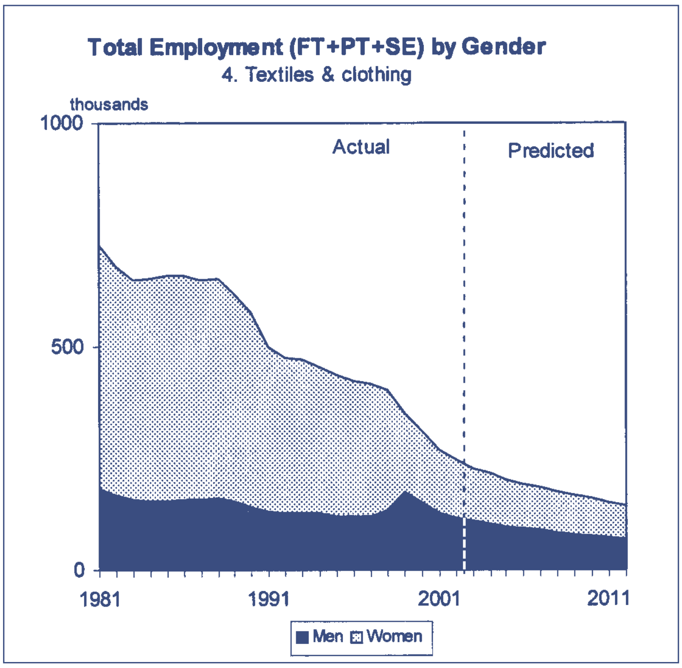
Women have traditionally been in the majority in this industry. However, this pattern has been changing and females now account for only just over half the total. Both self-employment and part-time employment have been relatively unimportant but both now account for over 1 in 10 jobs. The shares of part-time workers are projected to increase slightly over the next decade.

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

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	103	(41.7)	5	(2)	10	(4.2)	118	(47.9)	-26	-1	-3	-30
Female employment	87	(35.3)	22	(8.7)	20	(8.1)	129	(52.1)	-23	-4	-5	-32
Total employment	**190**	**(77)**	**26**	**(10.7)**	**30**	**(12.3)**	**247**	**(100)**	**-49**	**-6**	**-8**	**-63**
2007									**2007-12**			
Male employment	77	(41.6)	4	(2)	8	(4.2)	88	(47.7)	-16	-1	-2	-19
Female employment	64	(34.9)	17	(9.4)	15	(8.1)	97	(52.3)	-15	-3	-3	-21
Total employment	**141**	**(76.5)**	**21**	**(11.3)**	**23**	**(12.2)**	**185**	**(100)**	**-31**	**-4**	**-5**	**-39**
2012									**2002-12**			
Male employment	60	(41.6)	3	(1.9)	6	(4.2)	69	(47.8)	-43	-2	-4	-49
Female employment	50	(34.2)	14	(10)	12	(8.1)	76	(52.2)	-38	-7	-8	-53
Total employment	**110**	**(75.8)**	**17**	**(11.9)**	**18**	**(12.3)**	**145**	**(100)**	**-80**	**-9**	**-13**	**-102**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

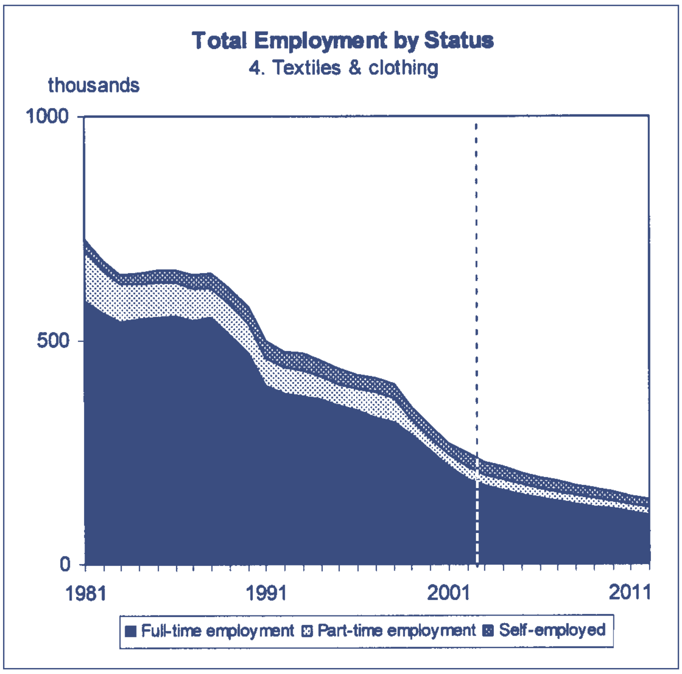
Figure 6.4.2: Changing Patterns of Sectoral Employment by Gender



- Sharply declining employment levels have hit females hardest. This trend is projected to continue.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.4.3: Changing Patterns of Sectoral Employment by Status



- The main job losses have been for full-time workers.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

6.4.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Until quite recently operatives accounted for almost half of all jobs. By 2002 this had fallen to below 40%.
- Skilled trades and elementary occupations have been the other main type of job, but their shares have also been declining.
- Managers have seen the fastest increase in employment shares over the past decade.

Future changes

- Declines are projected for all occupations,
- The main job losses occur amongst the machine operatives group, with the loss of a further 50,000 jobs.

Replacement demands

- Replacement demands will largely offset these projected declines.
- The largest level of replacement demand will arise amongst machine operatives, but significant changes will occur in many other occupations.
- On average around 40% 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: Food, Textiles & Clothing

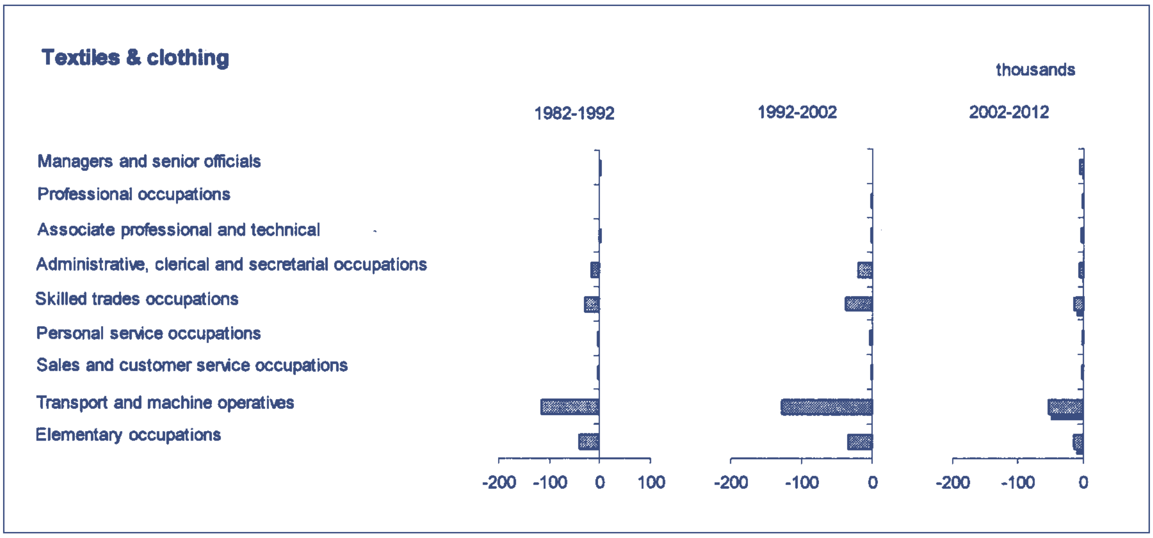
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change (2002-2012)	Replacement Demands (2002-2012)	Total Requirement (2002-2012)
1. Managers and Senior Officials	34	36	36	32	29	-9	14	5
2. Professional Occupations	9	8	7	6	6	-2	2	1
3. Associate Professional and Technical Occupations	20	21	20	17	16	-3	8	5
4. Administrative, Clerical and Secretarial Occupations	56	38	17	13	11	-5	8	3
5. Skilled Trades Occupations	99	68	31	23	17	-15	13	-2
6. Personal Service Occupations	12	10	7	6	5	-1	3	2
7. Sales and Customer Service Occupations	10	8	6	5	4	-1	3	2
8. Transport and Machine Operatives	335	221	92	59	39	-52	40	-11
9. Elementary Occupations	106	66	33	24	18	-15	14	-1
Total	681	477	247	185	145	-102	104	2

2002-2012 Percentage Changes

Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	5	8	14	17	20	-25	40	14
2. Professional Occupations	1	2	3	3	4	-23	33	10
3. Associate Professional and Technical Occupations	3	5	8	9	11	-17	40	23
4. Administrative, Clerical and Secretarial Occupations	8	8	7	7	7	-31	48	17
5. Skilled Trades Occupations	15	14	13	13	12	-49	41	-8
6. Personal Service Occupations	2	2	3	4	3	-8	39	31
7. Sales and Customer Service Occupations	2	2	2	3	3	-14	45	31
8. Transport and Machine Operatives	49	46	37	32	27	-56	44	-12
9. Elementary Occupations	16	14	13	13	13	-45	42	-3
Total	**100**	**100**	**100**	**100**	**100**	-41	42	1

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.4.4: Changing Composition of Employment by Occupation, 1982-2012



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

6.5 WOOD, PAPER, PRINTING & PUBLISHING

6.5.1 Description of the Industry

**INDUSTRY 5: WOOD, PAPER, PRINTING & PUBLISHING
SIC92 headings 20, 21, 22**

Sawmilling and planing of wood; manufacture of veneer sheets, plywood, laminboard, 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, paper and paperboard including bags, containers, sanitary goods, stationery, wallpaper and other articles of paper nes.

Printing and publishing of books, newspapers, periodicals and miscellaneous products; reproduction of recorded media including records, CDs, tapes, videos and computer media.

INDUSTRY PROFILE

	Total	Wood & paper	Printing & Publishing	All industries
Share of UK output (% 2002):	2.5	0.7	1.8	100
Exposure to international trade:	moderate	moderate	moderate	average
Concentration (market share of largest employers):	low	low	low	average
Total employment (2002):	581,000	192,000	389,000	29,336,000
Share of total employment (% 2002)	1.9	0.6	1.3	100
Gender split (male:female) (% 2002):	65:35	66:34	64:36	53:47
Part-time share (% 2002):	15	22	11	27
Self-employment share (% 2002):	10	17	6	12

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

6.5.2 Industry Commentary

Wood & wood products

The Wood industry is fairly cyclical and vulnerable to exchange rate movements and international competition. While demand remains buoyant due to demand from the construction industry, import competition remains high. Overall profitability is falling in the industry, and problems associated with poor road infrastructure for shipping to an increasingly limited number of sawmills mean that transport costs are an increasing share of costs. Despite the incentives for its use as a renewable/sustainable energy resource, no substantial generation projects have yet come on stream. The prospects are for continued growth in imports, and a large trade imbalance for the industry.

The market for paper and board remains sluggish in the EU (although this has recovered somewhat in the US). The market price has fallen by around 40% since 2000, in part because of lower demand due to Producer Responsibility Obligations which are levied according to the weight of packaging used. Price competition remains strong given the excess capacity in the industry.

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. Academic and professional publishing, which accounts for around one quarter of the market by value but only 7% by volume, has not experienced this price competition however. In general, book publishing remains a strong sector.

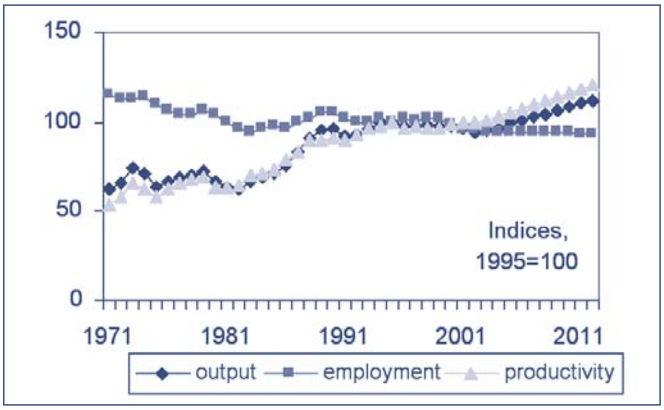
Newsprint prices continue to be squeezed. The tabloids have been engaged in a price war, with varying success for different titles, while prices have generally risen in the broadsheet segment. Magazines' circulation figures are increasing although advertising revenues remain poor. Overall, the prospects look good for continued growth in this industry, although this will come through increased productivity on slightly falling employment.

6.5.3 Productivity and Output Trends

Table 6.5.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	1.1	-0.7	1.7	1.7
Employment (% pa)	0.2	-1.1	-0.2	-0.1
(000s pa)	6	-33	-6	-3
Productivity (% pa)	0.9	0.4	2.0	1.9

Figure 6.5.1: Output, Productivity and Employment, Wood, Paper, Printing & Publishing



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output trends for this group of industries have been somewhat erratic, with declines over the past five years.
- Some recovery is anticipated but at below – average rates for manufacturing as a whole.
- Productivity growth has also slowed recently. This is expected to pick up over the next decade.
- Together these result in a situation of ‘jobless growth’ with slight declines in employment.

Productivity in component industries

Figure 6.5.1a: Output, Productivity and Employment, Wood & paper

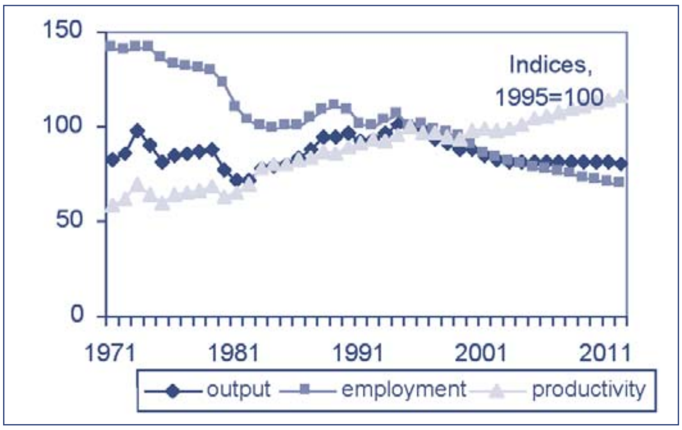
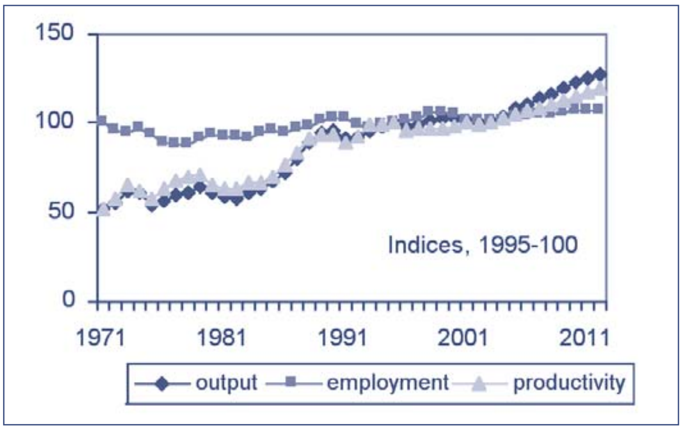


Figure 6.5.1b: Output, Productivity and Employment, Printing & Publishing



- Productivity growth has risen slowly but steadily over the past few decades in both parts of the industry and this is expected to continue.
- Output levels have been much more buoyant in the printing and publishing industries than in wood and paper. This is expected to continue to be the case over the next decade.
- As a consequence, employment prospects are rather more optimistic in the printing and publishing industries, although even here only very modest growth is anticipated.

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

Indicator	1992-97	1997-2002	2002-07	2007-12
15 & 16 Wood & paper				
Output (% pa)	0.1	-2.7	-0.1	-0.2
Employment (% pa)	-0.4	-3.0	-1.9	-1.7
(000s)	-5	-32	-18	-14
Productivity (% pa)	0.5	0.3	1.9	1.5
17 Publishing & printing				
Output (% pa)	1.6	0.2	2.5	2.4
Employment (% pa)	0.5	-0.1	0.6	0.5
(000s)	10	-2	11	11
Productivity (% pa)	1.0	0.3	1.9	1.9

Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725Output.xls (Figures for 27 extras).

6.5.4 Employment by Status and Gender

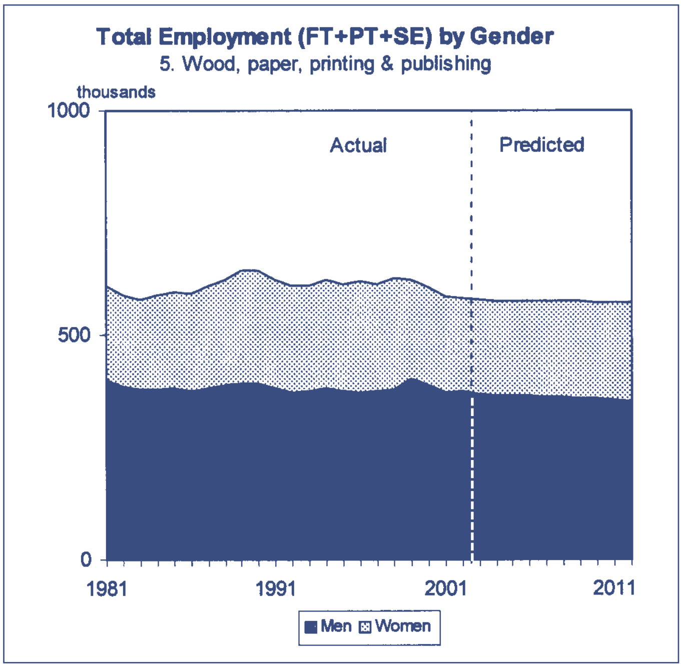
Women account for just over a third of all jobs in this industry group. Part-time working is of growing significance, currently accounting for almost 15% of total employment. Self-employment accounts for around 1 in 10 jobs.

Table 6.5.2: Employment Levels by Gender and Status, Wood, Paper, Printing & Publishing

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	2002-07			000s
Male employment	300	(51.6)	31	(5.3)	44	(7.6)	375	(64.5)	-17	10	-5	-12
Female employment	140	(24.1)	55	(9.4)	11	(2)	206	(35.5)	4	6	-5	5
Total employment	**440**	**(75.7)**	**86**	**(14.8)**	**56**	**(9.6)**	**581**	**(100)**	**-12**	**16**	**-10**	**-6**
2007									**2007-12**			
Male employment	284	(49.3)	41	(7.1)	39	(6.8)	363	(63.2)	-15	10	-5	-10
Female employment	144	(25)	61	(10.6)	6	(1.1)	212	(36.8)	4	6	-4	7
Total employment	**427**	**(74.4)**	**102**	**(17.8)**	**45**	**(7.9)**	**575**	**(100)**	**-11**	**16**	**-9**	**-4**
2012									**2002-12**			
Male employment	269	(47)	51	(8.9)	34	(5.9)	353	(61.8)	-31	20	-10	-22
Female employment	148	(25.9)	68	(11.8)	3	(0.5)	218	(38.2)	8	13	-9	12
Total employment	**417**	**(72.9)**	**118**	**(20.7)**	**37**	**(6.4)**	**571**	**(100)**	**-23**	**32**	**-19**	**-10**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

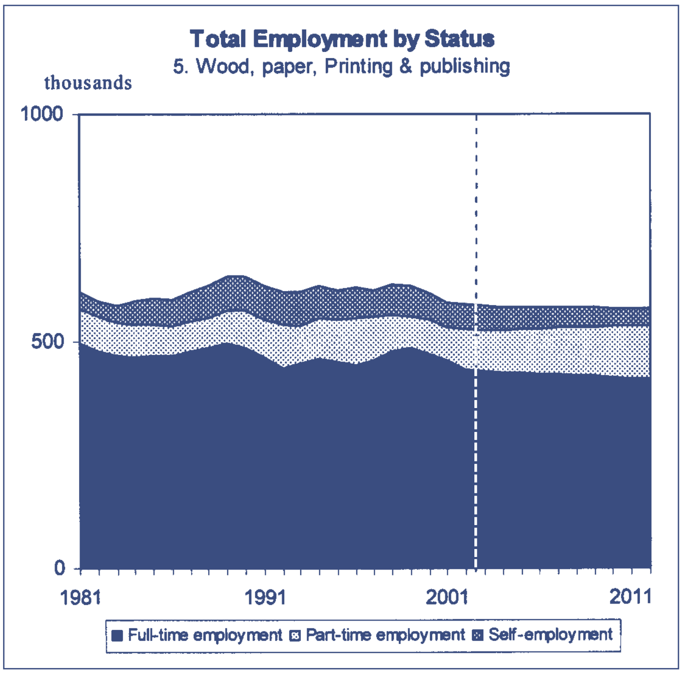
Figure 6.5.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Females have gradually increased their share of a fairly stable employment level.

Figure 6.5.3: 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).

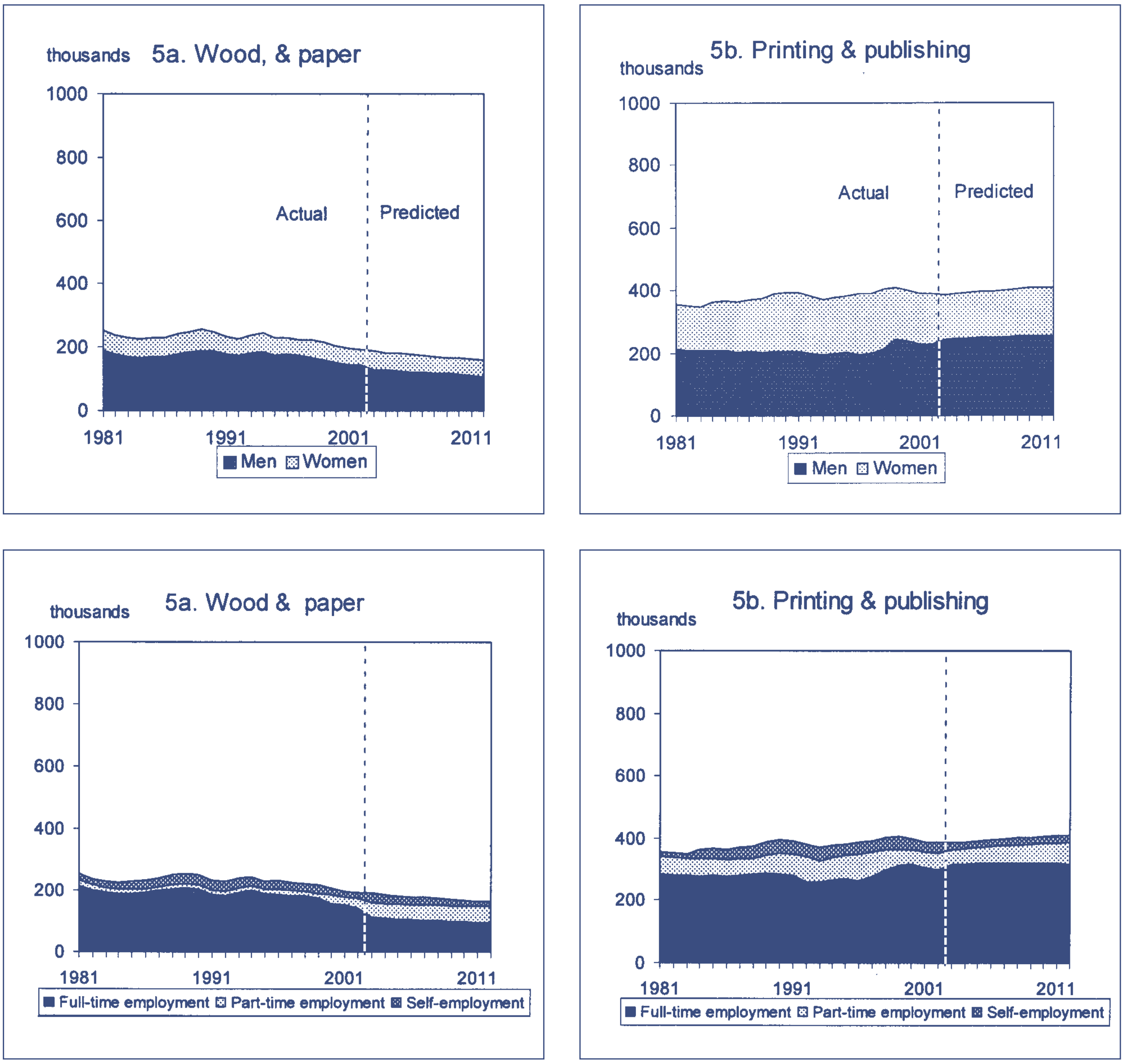
- Self-employment has declined in recent years and this is projected to continue. Part-time working is expected to become more important.

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.

- Wood and paper is rather more male dominated, although the female share of employment is increasing slightly.
- Full-time employment is the norm in both parts of the industry group but part-time employment is projected to become more important in both parts of the industry.

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



Source: CE/IER estimates, MDM95 C31F9S Forecast, 27xUK.xls (Figure 6.X.3 & 2).

6.5.5 Projections of Employment by Occupation

Key aspects of occupational structure

- The occupational structure of this group of industries is quite diverse.
- Managers, associate professionals and administrative and clerical workers each account for around 10-15% of employment.
- Skilled trades and transport and machine operatives each account for almost 20% of employment.

Future changes

- The prospects for the next decade are mixed.
- Substantial growth is projected for managers and senior officials and associate professional and technical occupations.
- These gains are offset by job losses for skilled trades, transport and machine operatives and elementary occupations.
- These patterns reflect the impact of technological change and the restructuring of the industry group.

Replacement demands

- Total requirements amount to over 200,000, despite a slight decline in expansion demand.
- The largest growth areas are for managers and for associate professionals, each with requirements of around 50,000 over the decade.
- Quite rapid rates of increase are also apparent for many other occupations including professionals, personal service and sales occupations.

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

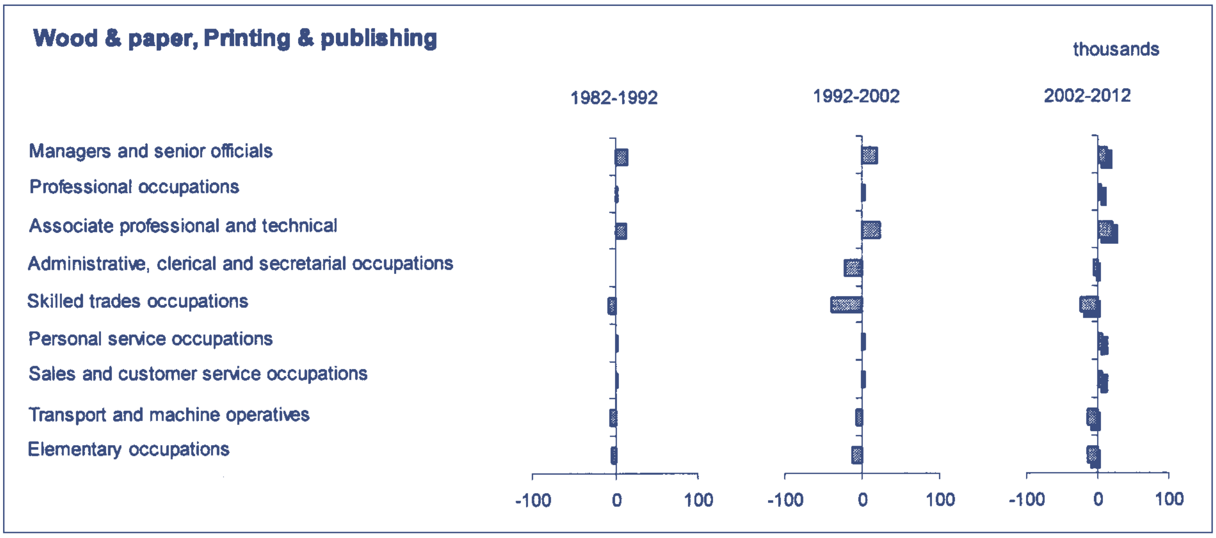
United Kingdom: Wood, Paper, Printing & Publishing

Employment Levels (000)	1982	1992	2002	2007	2012	2002-2012 Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	49	64	83	89	96	12	34	46
2. Professional Occupations	15	18	22	24	26	4	7	11
3. Associate Professional and Technical Occupation	54	67	90	101	111	22	36	58
4. Administrative, Clerical and Secretarial Occupations	91	93	71	67	64	-6	34	27
5. Skilled Trades Occupations	158	150	112	100	88	-24	42	18
6. Personal Service Occupations	9	11	15	18	21	5	6	12
7. Sales and Customer Service Occupations	15	18	23	25	28	5	10	15
8. Transport and Machine Operatives	115	109	101	94	86	-15	38	24
9. Elementary Occupations	83	78	65	58	51	-14	25	11
Total	589	609	581	575	571	-10	232	222

Percentage Shares	1982	1992	2002	2007	2012	2002-2012 Percentage Changes: Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	8	11	14	15	17	14	40	54
2. Professional Occupations	3	3	4	4	5	19	33	53
3. Associate Professional and Technical Occupations	9	11	16	18	19	25	40	65
4. Administrative, Clerical and Secretarial Occupations	15	15	12	12	11	-9	48	39
5. Skilled Trades Occupations	27	25	19	17	15	-21	38	16
6. Personal Service Occupations	1	2	3	3	4	34	39	73
7. Sales and Customer Service Occupations	2	3	4	4	5	23	45	68
8. Transport and Machine Operatives	19	18	17	16	15	-15	39	24
9. Elementary Occupations	14	13	11	10	9	-21	38	17
Total	**100**	**100**	**100**	**100**	**100**	-2	40	38

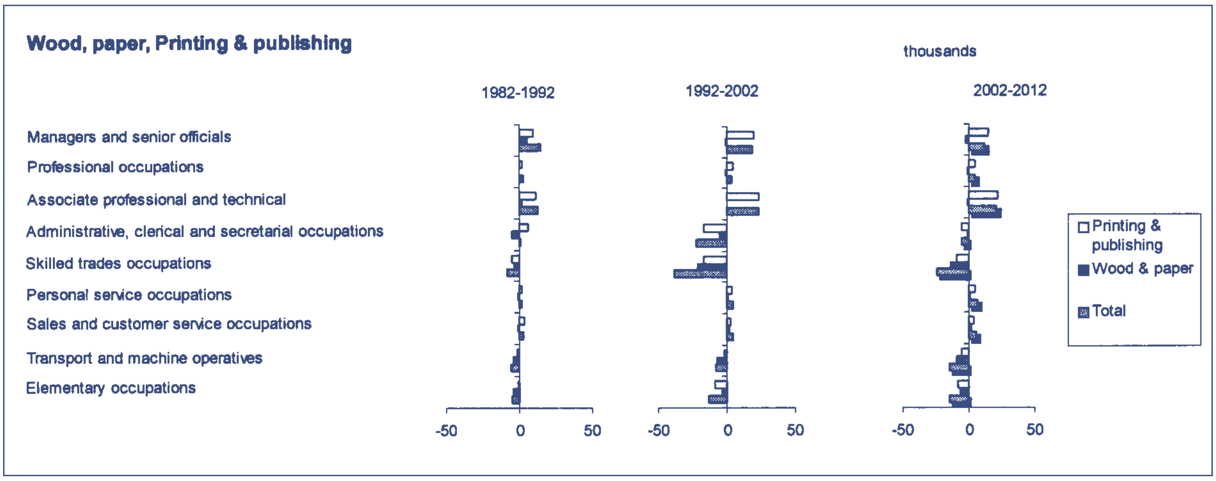
Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.5.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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



Source: CE/IER estimates, MDM95 C31F9S Forecast, 27xUK.xls (Figure 6.X.4b).

Changes in occupational structure within component industries

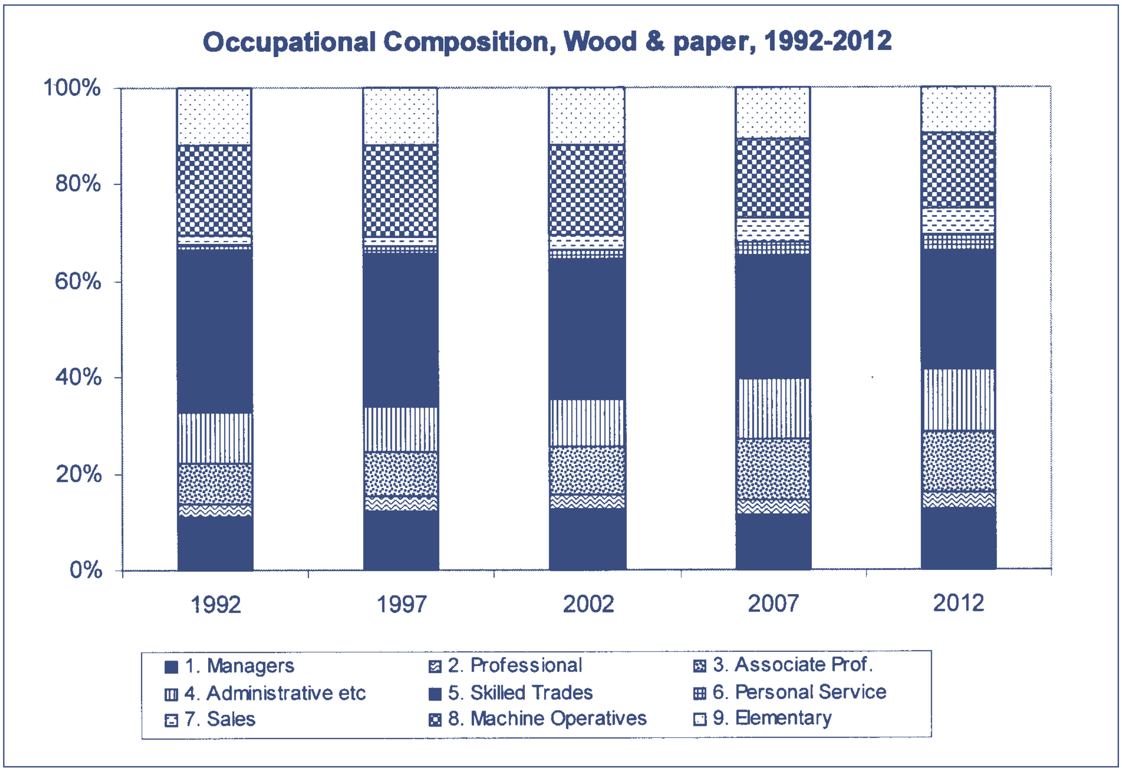
The main differences in occupational employment structure and the changes observed over recent years and projected for the next decade are illustrated in Figures 6.5.4a and b.

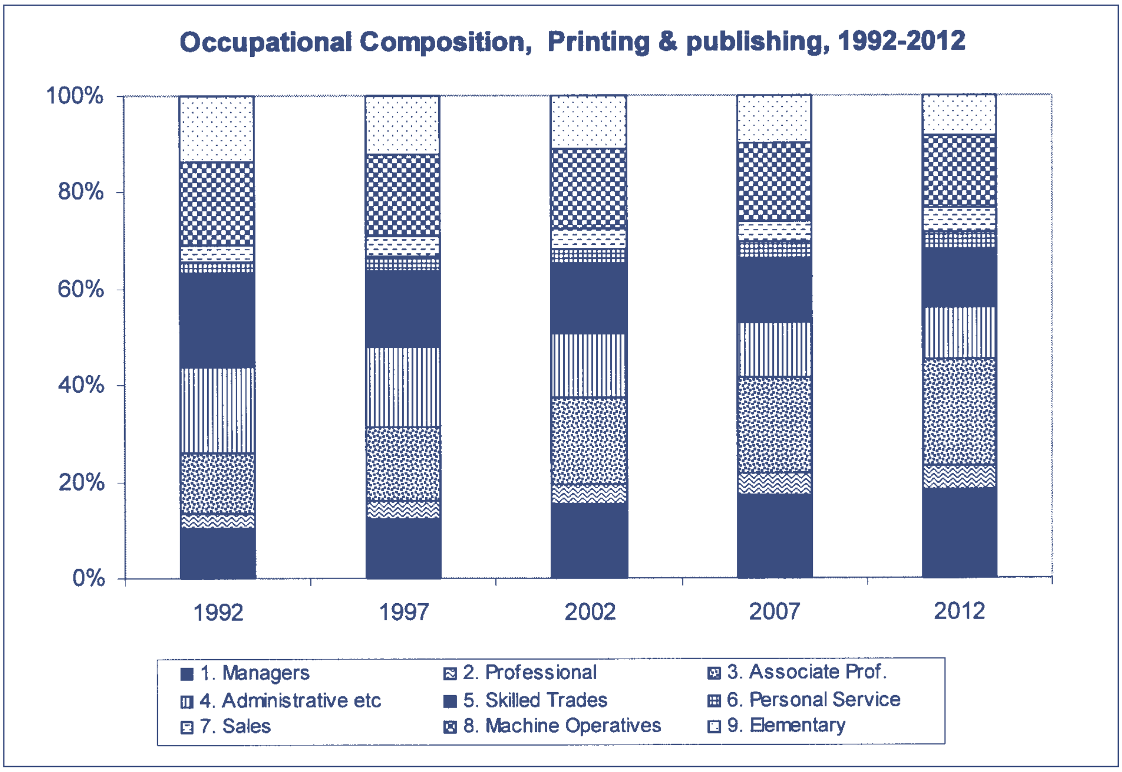
Figure 6.5.4a focuses on net changes and also compares the components directly with the industry group as a whole. Figure 6.5.4b compares the occupational structures of the two component industries, as well as showing how these have changed and are expected to change over the next decade.

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 and 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 and publishing, and job losses amongst skilled trades, machine operatives and elementary occupations in wood and paper.

Figure 6.5.4b: Structure of Employment by Occupation, in Component Industries, 1982-2012





Source: CE/IER estimates, MDM95 C31F9S Forecast, 27xUK.xls (Figure 6.X.11).

6.6 CHEMICALS AND OTHER NON-METALLIC MINERAL PRODUCTS

6.6.1 Description of the Industry

INDUSTRY 6: CHEMICALS AND OTHER NON-METALLIC MINERAL PRODUCTS
SIC92 headings: 23, 24, 25, 26

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.

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.

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	4.3	100
Exposure to international trade:	high	average
Concentration (market share of largest employers):	low	average
Total employment (000s 2002):	637,000	29,336,000
Share of total employment: (% 2002)	2.1	100
Gender split (male:female) (% 2002):	77 : 23	53:47
Part-time share (% 2002):	5	27
Self-employment share (% 2002):	4	12

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, and 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 healthcare 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.

Merger activity among the dominant chemicals companies has 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. It has been difficult to pass on price increases, and employment in the sector is set to fall further.

There has been a steady decline in the demand for petrol as more vehicles are switched to diesel and thus a fall in refinery capacity to meet this demand.

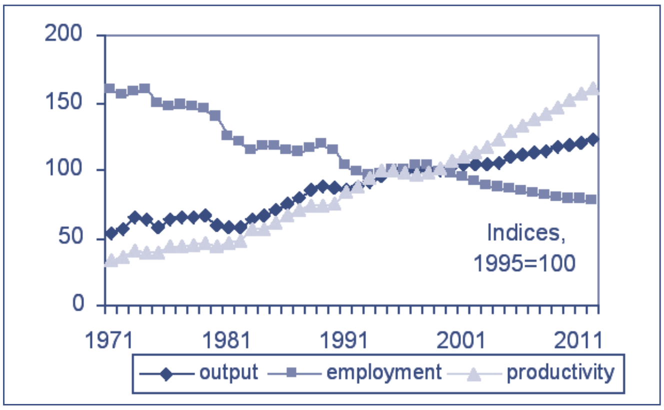
Most of the output of the rubber industry is in the form of tyres for motor vehicles which was previously very labour intensive but now is becoming more technologically advanced with consequent improvements in productivity. The remainder of the sector produces plastics and comprises specialised SMEs.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

6.6.3 Productivity and Output Trends

Table 6.6.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	2.6	0.8	1.8	1.6
Employment (% pa)	0.6	-2.3	-2.1	-1.5
(000s pa)	23	-77	-63	-42
Productivity (% pa)	1.9	3.1	3.9	3.1

Figure 6.6.1: Output, Productivity and Employment, Chemicals



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725Output.xls (Figure 6.X.1)

- The chemicals industry has experienced above-average growth rates for much of the past 20 years but this pace has slowed most recently.
- Some recovery is projected, with growth rates of around 1.5% per annum.
- Productivity growth also slowed in the early 1990s but has picked up again subsequently. This is projected to be maintained.
- Employment falls as a consequence, job losses reaching around 100,000 over the next 10 years.

6.6.4 Employment by Status and Gender

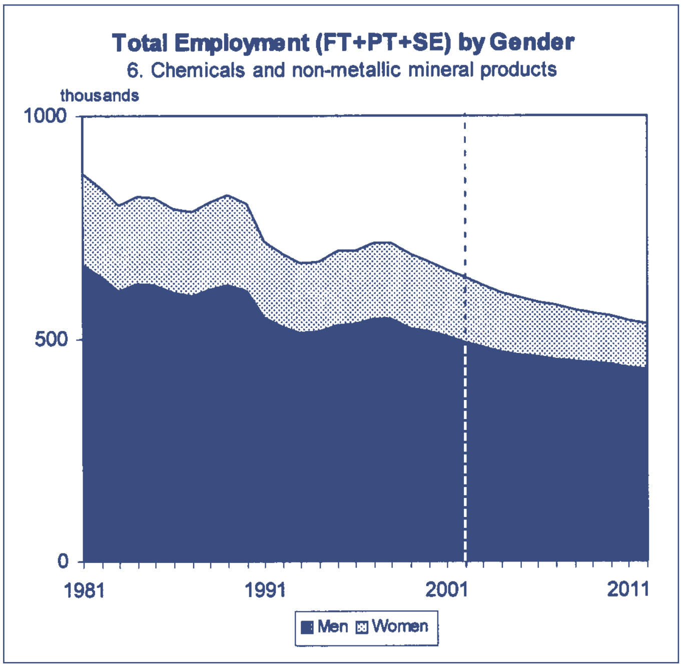
The chemicals industry is very much dominated by male employment. Currently men account for almost 80% of jobs. Most jobs are full-time and self-employment is relatively small.

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

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	462	(72.4)	7	(1.1)	22	(3.5)	491	(77)	-33	4	-8	-36
Female employment	116	(18.2)	24	(3.7)	7	(1)	146	(23)	-22	-4	0	-27
Total employment	**578**	**(90.7)**	**31**	**(4.8)**	**29**	**(4.5)**	**637**	**(100)**	**-55**	**0**	**-8**	**-63**
2007									**2007-12**			
Male employment	429	(74.7)	11	(1.9)	14	(2.5)	454	(79.2)	-21	4	-6	-23
Female employment	94	(16.3)	20	(3.4)	6	(1.1)	120	(20.8)	-17	-3	0	-19
Total employment	**522**	**(91)**	**31**	**(5.4)**	**21**	**(3.6)**	**574**	**(100)**	**-38**	**1**	**-5**	**-42**
2012									**2002-12**			
Male employment	408	(76.7)	15	(2.8)	9	(1.6)	431	(81.1)	-54	8	-14	-60
Female employment	77	(14.4)	17	(3.2)	7	(1.3)	100	(18.9)	-39	-7	0	-46
Total employment	**484**	**(91.1)**	**32**	**(6)**	**15**	**(2.9)**	**531**	**(100)**	**-93**	**1**	**-13**	**-106**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

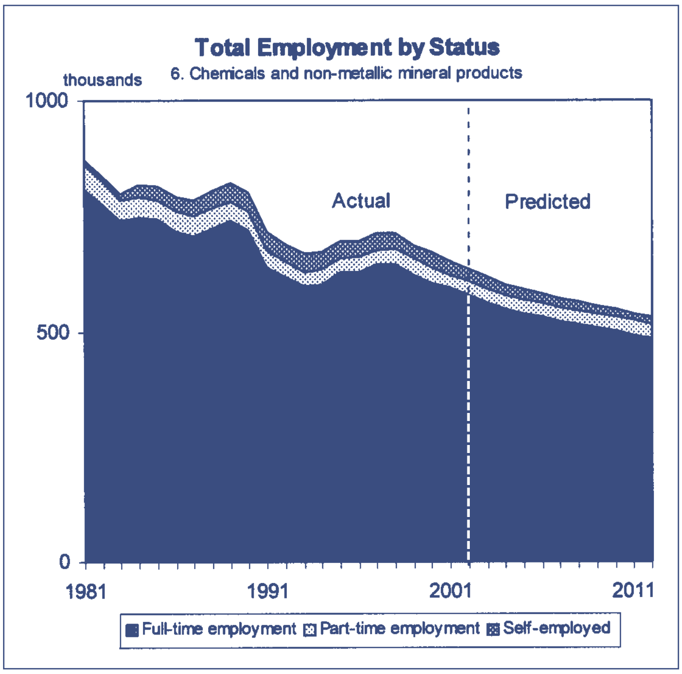
Figure 6.6.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Males have gradually increased their share of a declining number of jobs.

Figure 6.6.3: 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).

- 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 and machine operatives and elementary occupations. The former account for around a quarter of all jobs, the latter for just under 1 in 5.
- 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 and secretarial occupations, skilled trades, transport and machine operatives and elementary occupations.
- Managerial, professional and associate professional occupations are expected to increase their employment shares, but the increase in employment levels is only expected to be very modest.

Replacement demands

- A projected decline of employment of over 100,000 for the industry is in marked contrast to the estimated replacement demands of almost a quarter of a million.
- This translates into significant net requirements for a number of occupations including managers, associate professional and technical and process, plant and machine operatives.

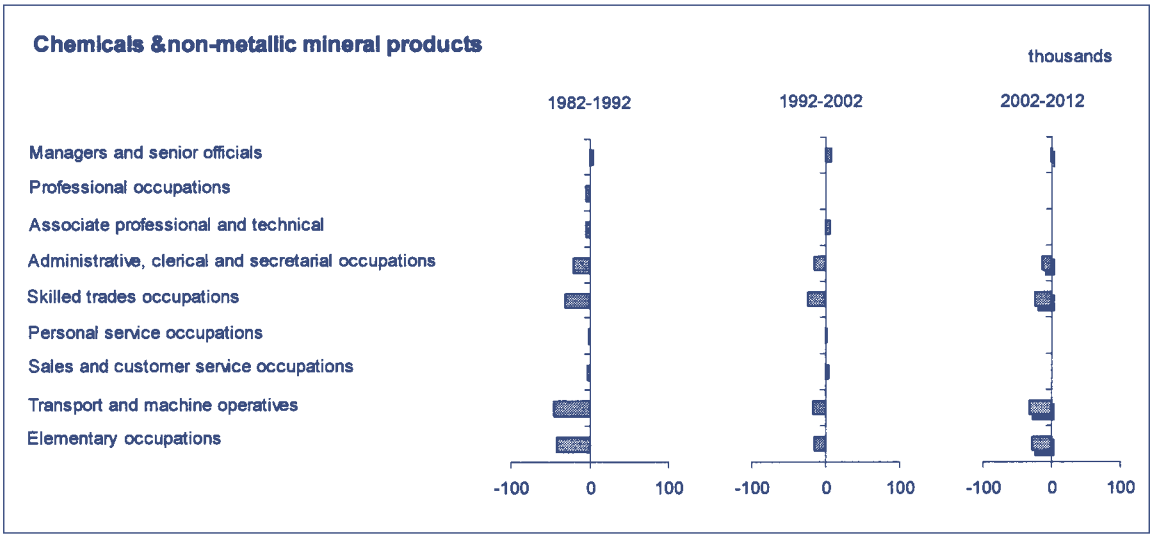
Table 6.6.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Chemicals and Other Non-Metallic Mineral Products						2002-2012		
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	70	74	82	81	81	-1	31	30
2. Professional Occupations	48	45	45	45	46	0	14	14
3. Associate Professional and Technical Occupations	65	61	67	65	66	-1	25	24
4. Administrative, Clerical and Secretarial Occupations	86	66	51	41	36	-15	24	9
5. Skilled Trades Occupations	154	123	98	84	72	-26	39	14
6. Personal Service Occupations	10	9	12	11	12	0	4	4
7. Sales and Customer Service Occupations	13	11	14	13	13	0	6	6
8. Transport and Machine Operatives	223	177	159	140	126	-33	60	27
9. Elementary Occupations	168	126	110	93	81	-30	38	9
Total	836	691	637	574	531	-106	242	136

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	8	11	13	14	15	-2	38	36
2. Professional Occupations	6	6	7	8	9	0	31	31
3. Associate Professional and Technical Occupations	8	9	10	11	12	-1	38	37
4. Administrative, Clerical and Secretarial Occupations	10	10	8	7	7	-29	47	18
5. Skilled Trades Occupations	18	18	15	15	14	-26	40	14
6. Personal Service Occupations	1	1	2	2	2	-2	35	32
7. Sales and Customer Service Occupations	2	2	2	2	3	-3	43	40
8. Transport and Machine Operatives	27	26	25	24	24	-21	38	17
9. Elementary Occupations	20	18	17	16	15	-27	35	8
Total	**100**	**100**	**100**	**100**	**100**	-17	38	21

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.6.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.x.4).

6.7 METALS & METAL GOODS

6.7.1 Description of the Industry

INDUSTRY 7: METALS & METAL GOODS
SIC92 headings: 27, 28

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, roads 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.

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	1.9	100
Exposure to international trade:	high	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	497,000	29,336,000
Share of total employment (% 2002):	1.6	100
Gender split (male:female) (% 2002):	77 : 23	53:47
Part-time share (% 2002):	5	27
Self-employment share (% 2002):	4	12

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

6.7.2 Industry Commentary

Steel production in the EU has now been consolidated in three major producers which together account for around two-thirds of output. Demand is expected to remain strong and removal of surplus capacity will mean that prices remain solid. Unprecedented demand, from China in particular, partly compensates for relatively flat demand throughout the EU. 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.

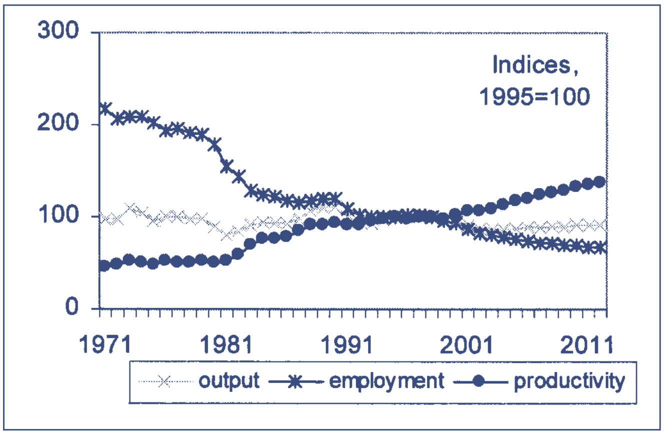
Similar restructuring is taking place in the metal goods sector. Faced with a shrinking market associated with the general decline in manufacturing, the sector is attempting to move into high quality niche products, and to move production to low cost areas in eastern Europe and Asia.

6.7.3 Productivity and Output Trends

Table 6.7.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	1.1	-2.7	0.3	0.3
Employment (% pa)	-0.4	-4.0	-2.7	-1.5
(000s pa)	-11	-112	-63	-32
Productivity (% pa)	1.5	1.3	3.1	1.9

Figure 6.7.1: Output, Productivity and Employment, Metals & Metal Goods



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725Output.xls (Figure 6.X.1)

- The time series of output for this group of industries has been erratic. The problems faced by the steel industry, in particular, have played an important role here.
- Prospects are for little or no growth over the next decade.
- Productivity levels are projected to pick up after a recent pause.
- Employment is therefore projected to continue its steady downward trends, with the loss of around 2,000 jobs.

6.7.4 Employment by Status and Gender

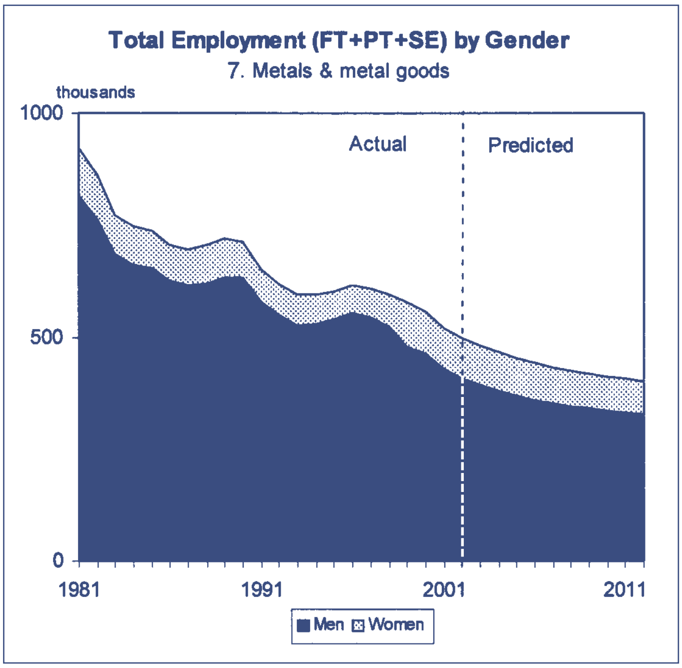
This is another industry group dominated by male employment. Over 4 in 5 jobs are currently held by men. Self-employment is relatively small, accounting for just 1 in 20 jobs. Part-time jobs currently account for around 10% of all jobs.

Table 6.7.2: Employment Levels by Gender and Status, Metals & Metal Goods

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	362	(72.9)	14	(2.9)	30	(6.1)	407	(81.9)	-50	6	-10	-53
Female employment	53	(10.7)	32	(6.4)	5	(1)	90	(18.1)	-12	2	0	-10
Total employment	**416**	**(83.6)**	**46**	**(9.3)**	**35**	**(7.1)**	**497**	**(100)**	**-62**	**8**	**-10**	**-63**
2007									**2007-12**			
Male employment	313	(72.1)	21	(4.7)	21	(4.7)	354	(81.6)	-26	6	-7	-27
Female employment	41	(9.5)	34	(7.8)	5	(1.1)	80	(18.4)	-8	2	0	-6
Total employment	**354**	**(81.6)**	**54**	**(12.5)**	**25**	**(5.9)**	**434**	**(100)**	**-34**	**8**	**-7**	**-32**
2012									**2002-12**			
Male employment	287	(71.5)	26	(6.6)	14	(3.4)	327	(81.5)	-75	12	-16	-79
Female employment	33	(8.2)	36	(9)	5	(1.3)	74	(18.5)	-20	4	0	-16
Total employment	**320**	**(79.7)**	**63**	**(15.6)**	**19**	**(4.7)**	**402**	**(100)**	**-95**	**16**	**-16**	**-95**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

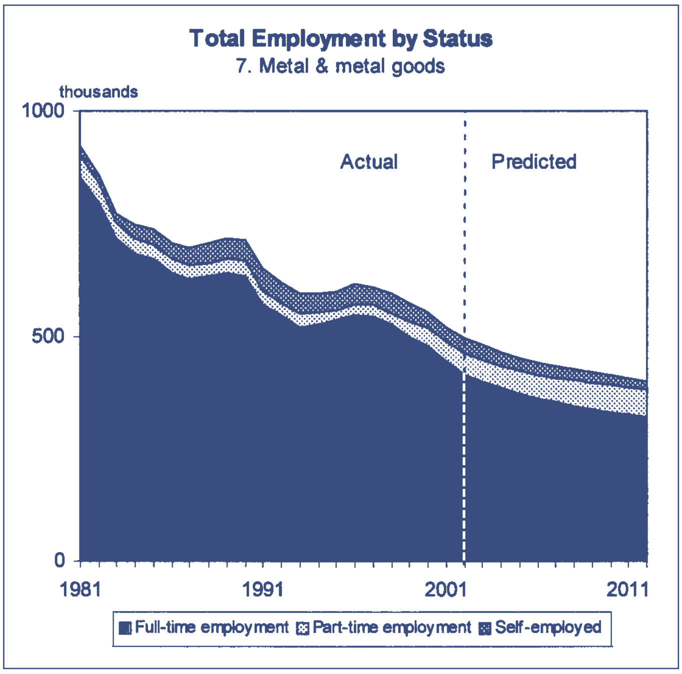
Figure 6.7.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Males are expected to bear the brunt of the expected future job losses.

Figure 6.7.3: 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).

- Full-time jobs are the main area of decline, while part-time working is expected to increase in importance.

6.7.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Skilled trades used to account for well over a third of all jobs but this has declined significantly over the past two decades.
- Machine operatives and elementary occupations are also important.

Future changes

- Job losses are expected to be concentrated in skilled trades and, to a lesser extent, amongst transport and machine operatives and elementary occupations.
- Rising employment shares are projected for managers and senior officials and, to a lesser extent, professional and associate professional occupations.

Replacement demands

- As in a number of other manufacturing industries, although job losses are expected to be quite severe, there will be significant needs to replace members of the existing workforce.
- Replacement demands are most significant for skilled trades and amongst transport and machine operatives, offsetting large projected declines in expansion demand.
- Total requirements are around 30% or more of the 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

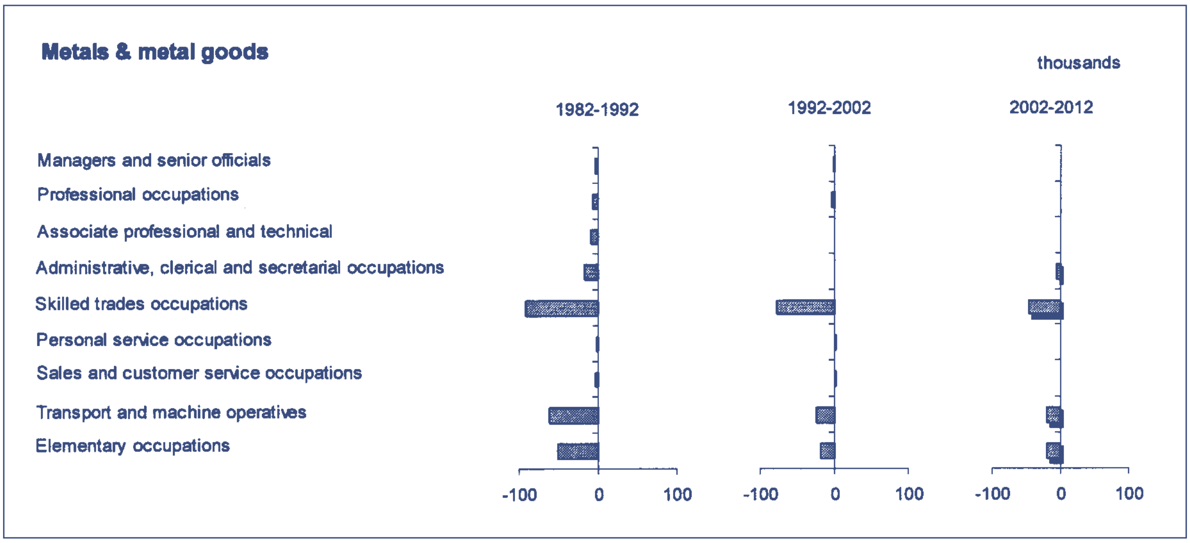
United Kingdom: Metals & Metal goods

Employment Levels (000)	1982	1992	2002	2007	2012	2002-2012 Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	66	63	60	58	59	-1	23	22
2. Professional Occupations	36	29	26	25	25	0	8	8
3. Associate Professional and Technical Occupations	42	35	35	33	34	-1	13	12
4. Administrative, Clerical and Secretarial Occupations	51	34	34	30	28	-6	16	10
5. Skilled Trades Occupations	312	221	144	117	98	-46	63	16
6. Personal Service Occupations	7	5	6	5	6	0	2	2
7. Sales and Customer Service Occupations	7	5	8	8	9	1	3	4
8. Transport and Machine Operatives	193	132	107	93	86	-21	41	19
9. Elementary Occupations	147	96	77	66	57	-20	26	6
Total	860	620	497	434	402	-95	195	100

Percentage Shares	1982	1992	2002	2007	2012	2002-2012 Percentage Changes: Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	8	10	12	13	15	-2	38	36
2. Professional Occupations	4	5	5	6	6	-2	31	30
3. Associate Professional and Technical Occupations	5	6	7	8	8	-2	37	36
4. Administrative, Clerical and Secretarial Occupations	6	5	7	7	7	-18	48	29
5. Skilled Trades Occupations	36	36	29	27	24	-32	43	11
6. Personal Service Occupations	1	1	1	1	2	-4	34	30
7. Sales and Customer Service Occupations	1	1	2	2	2	10	44	54
8. Transport and Machine Operatives	22	21	22	21	21	-20	38	18
9. Elementary Occupations	17	16	16	15	14	-26	34	8
Total	**100**	**100**	**100**	**100**	**100**	-19	39	20

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.7.4: Changing Composition of Employment by Occupation, 1982-2012



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

6.8 ENGINEERING

6.8.1 Description of the Industry

INDUSTRY 8: ENGINEERING
SIC92 headings: 29, 30, 32, 31, 33

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.

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	4.1	100
Exposure to international trade:	high	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	800,000	29,336,000
Share of total employment (% 2002):	2.7	100
Gender split (male:female) (% 2002):	76 : 24	53:47
Part-time share (% 2002):	5	27
Self-employment share (% 2002):	5	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 and, more recently, SARS. Overall, the prospects for the sector, especially in terms of employment, are poor.

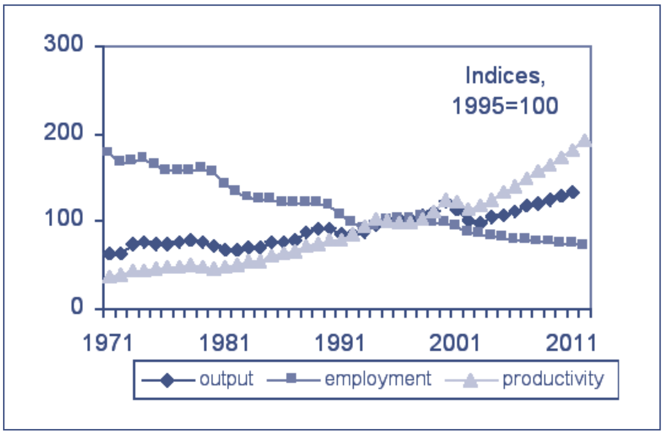
Rapid technological change throughout the 1990s led to strong growth in the electronics and electrical engineering sectors, but this trend has slowed somewhat after the millennium. The take-up of 3G mobile phones has been weaker than anticipated, and performance generally remains weak. There is a global 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, and UK employment in the sector is therefore expected to fall further in the years ahead.

6.8.3 Productivity and Output Trends

Table 6.8.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	4.0	-0.4	3.1	3.5
Employment (% pa)	0.8	-3.1	-2.3	-1.6
(000s pa)	39	-137	-87	-57
Productivity (% pa)	3.1	2.8	5.5	5.2

Figure 6.8.1: Output, Productivity and Employment, Engineering



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725Output.xls (Figure 6.X.1)

- Output levels in engineering have followed a somewhat irregular but positive trend over the past few decades.
- Following a recession during the late 1990s a quite rapid recovery is projected, with growth rates of 3-3.5% per annum.
- Productivity levels are expected to increase at even more rapid rates of 5-5.5% per annum.
- The inevitable complications for employment are for further job losses, continuing the long-term trend.
- Almost 150,000 jobs are expected to go over the next 10 years.

6.8 Employment by Status and Gender

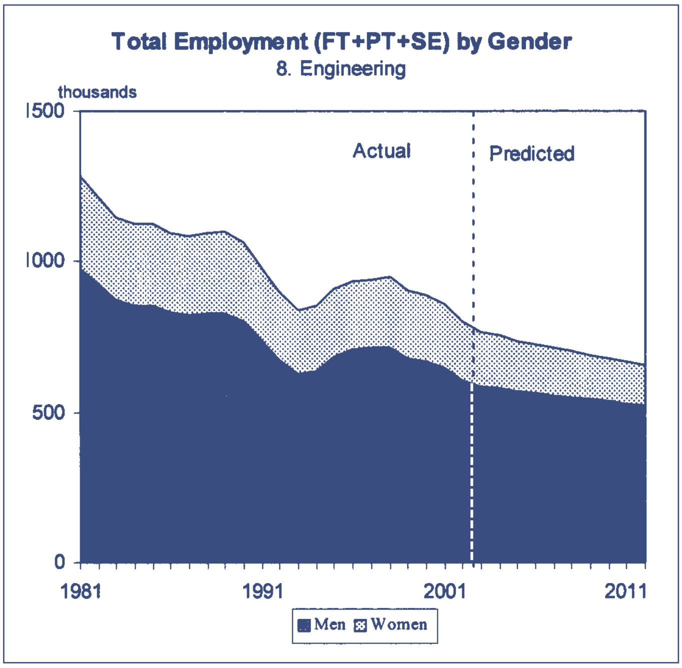
Engineering is another industry where employment is predominantly male. Females account for fewer than 1 in 4 jobs. Most jobs are full-time. Self-employment accounts for fewer than 1 in 20 jobs.

Table 6.8.2: Employment Levels by Gender and Status, Engineering

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		**% shares**		**% shares**		**% shares**	**000s**	**% shares**	**2002-07**			**000s**
Male employment	563	(70.3)	13	(1.6)	32	(3.9)	607	(75.9)	-39	-2	-10	-50
Female employment	157	(19.6)	30	(3.7)	7	(0.8)	193	(24.1)	-29	-4	-4	-37
Total employment	**720**	**(89.9)**	**43**	**(5.3)**	**38**	**(4.8)**	**800**	**(100)**	**-68**	**-6**	**-13**	**-87**
2007									**2007-12**			
Male employment	524	(73.5)	11	(1.6)	22	(3.1)	557	(78.1)	-25	-1	-7	-33
Female employment	127	(17.9)	25	(3.5)	3	(0.4)	156	(21.9)	-21	-2	-1	-24
Total employment	**652**	**(91.4)**	**36**	**(5.1)**	**25**	**(3.5)**	**713**	**(100)**	**-46**	**-3**	**-8**	**-57**
2012									**2002-12**			
Male employment	500	(76.1)	10	(1.5)	15	(2.2)	524	(79.9)	-63	-3	-17	-83
Female employment	106	(16.1)	24	(3.6)	3	(0.4)	132	(20.1)	-51	-6	-4	-61
Total employment	**606**	**(92.2)**	**34**	**(5.1)**	**17**	**(2.6)**	**656**	**(100)**	**-114**	**-9**	**-21**	**-144**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

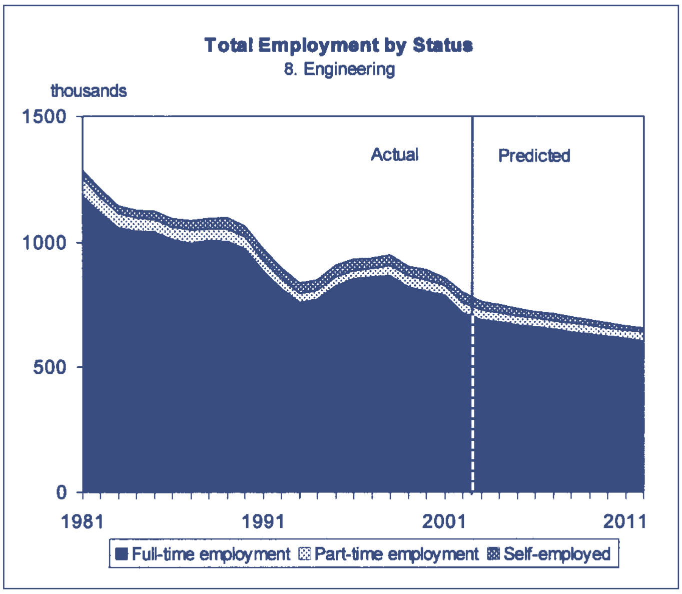
Figure 6.8.2: Changing Patterns of Sectoral Employment by Gender



- Males are expected to account for an even higher share of employment, reaching almost 80% of the total by 2012.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.8.3: Changing Patterns of Sectoral Employment by Status



- The industry will continue to be a source of predominantly full-time jobs.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

6.8.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Skilled trades still accounted for around 1 in 5 jobs by the turn of the century, down from much higher levels.
- Machine operatives account for a somewhat small share of the total.
- Managerial, professional and associate professional occupations together accounted for almost 40% of employment by 2002; a share which has increased steadily over the past two decades.

Future changes

- 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.

Replacement demands

- Substantial replacement demands are estimated for many of the occupations in this industry.
- The largest increases are for skilled trades and amongst transport and machine operatives.
- However there are also significant replacement needs for all the managerial, professional and associate professional groups, as well as administrative and clerical and elementary occupations.

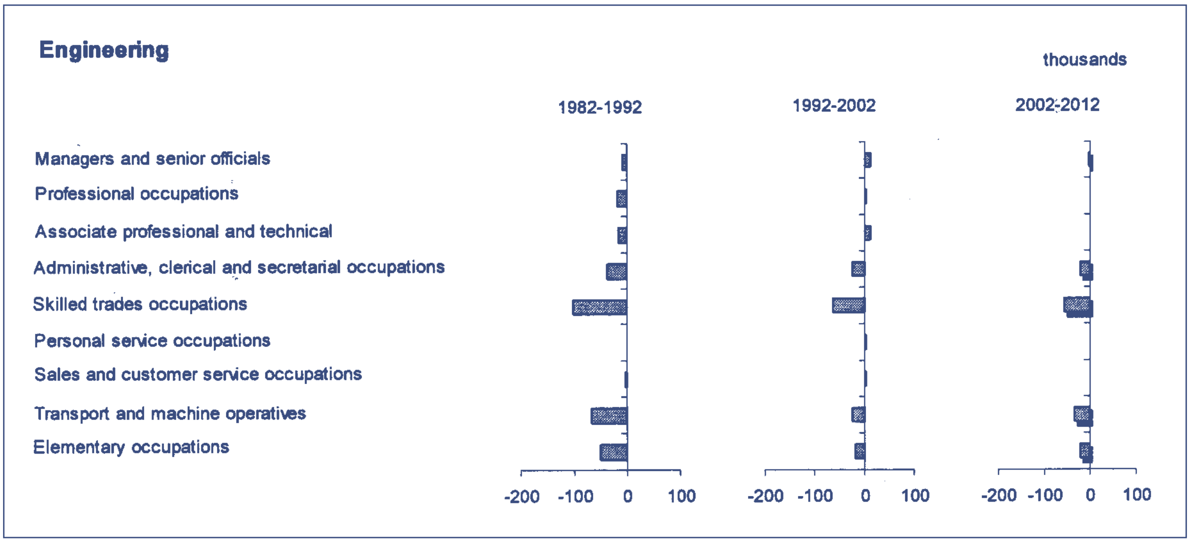
Table 6.8.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Engineering								2002-2012
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	115	107	120	118	117	-4	46	42
2. Professional Occupations	99	79	82	80	80	-2	26	24
3. Associate Professional and Technical Occupations	105	87	99	98	98	-1	36	34
4. Administrative, Clerical and Secretarial Occupations	136	97	73	58	50	-23	35	12
5. Skilled Trades Occupations	345	244	180	147	122	-57	78	21
6. Personal Service Occupations	9	8	11	10	10	-1	4	3
7. Sales and Customer Service Occupations	17	13	16	16	16	-1	7	7
8. Transport and Machine Operatives	232	164	139	118	105	-34	54	20
9. Elementary Occupations	152	100	80	67	58	-22	29	7
Total	1,211	899	800	713	656	-144	316	172

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	9	12	15	16	18	-3	38	35
2. Professional Occupations	8	9	10	11	12	-2	31	29
3. Associate Professional and Technical Occupations5	9	10	12	14	15	-1	36	3
4. Administrative, Clerical and Secretarial Occupations	11	11	9	8	8	-31	48	16
5. Skilled Trades Occupations	28	27	22	21	19	-32	44	12
6. Personal Service Occupations	1	1	1	1	2	-8	38	30
7. Sales and Customer Service Occupations	1	1	2	2	2	-3	44	41
8. Transport and Machine Operatives	19	18	17	17	16	-24	39	15
9. Elementary Occupations	13	11	10	9	9	-27	37	9
Total	**100**	**100**	**100**	**100**	**100**	-18	39	21

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.8.4: Changing Composition of Employment by Occupation, 1982-2012



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

6.9 TRANSPORT EQUIPMENT

6.9.1 Description of the Industry

INDUSTRY 9: TRANSPORT EQUIPMENT
SIC92 headings: 34, 35

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.

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	1.9	100
Exposure to international trade:	high	average
Concentration (market share of largest employers):	medium	average
Total employment (2002):	388,000	29,336,000
Share of total employment (%2002):	1.3	100
Gender split (male:female) (% 2002):	82:18	53:47
Part-time share (% 2002):	2	27
Self-employment share (% 2002):	3	12

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). However, further improvements in productivity will exacerbate the world-wide over-capacity and further dent profitability. Many large global car manufacturers posted a loss in 2002, and those based in the EU look set to transfer production to eastern European countries following enlargement in 2004, since labour costs are much lower there.

Demand for new cars in the UK remains strong – over 2.5 million new cars are registered each year (and almost a quarter of these are diesel fuelled). This contrasts with other EU countries where new car markets are in decline. Production in the UK is around 1.6 million cars in 2002, around two thirds for the export market, mainly elsewhere in the EU. Despite this apparently strong demand, with the exception of the Japanese producers, volume car producers are making losses. The decisions in 2002 by Ford and GM to end production at Dagenham and Luton respectively are attempts to cut excess capacity and to restore profitability.

The decline in employment 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.

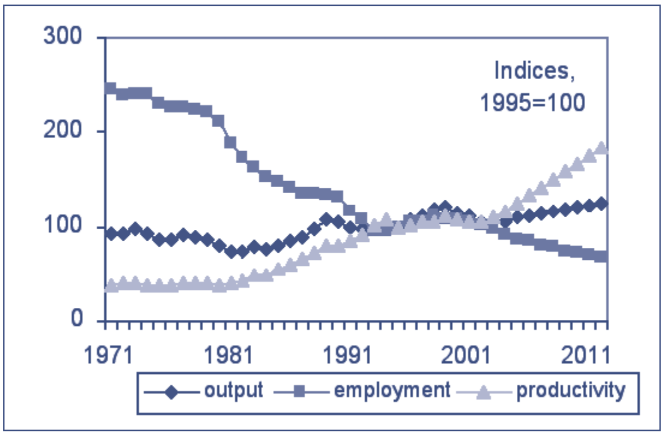
Geopolitical unrest is having a severe impact on the commercial aerospace sector post 9/11, although the defence sub-sector is helping to ameliorate this weak performance. Shipping is increasingly dominated by Far Eastern manufacturers, especially in Japan and South Korea. Major rail replacement projects will also lead to some growth.

6.9.3 Productivity and Output Trends

Table 6.9.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	2.8	-1.0	1.5	1.6
Employment (% pa)	-0.6	-0.9	-4.3	-3.6
(000s pa)	-12	-18	-77	-52
Productivity (% pa)	3.4	-0.1	6.1	5.4

Figure 6.9.1: Output, Productivity and Employment, Transport Equipment



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725Output.xls (Figure 6.X.1)

- Output levels have been in the doldrums over the past few years due to uncertainties about rail and air transport as well as the trials and tribulations of the UK motor industry. Some modest recovery is expected over the next decade.
- Productivity growth is projected to accelerate as producers innovate and respond to intense international competition.
- Employment consequently is projected to fall quite sharply, with well over 100,000 jobs lost between 2002 and 2012.

6.9.4 Employment by Status and Gender

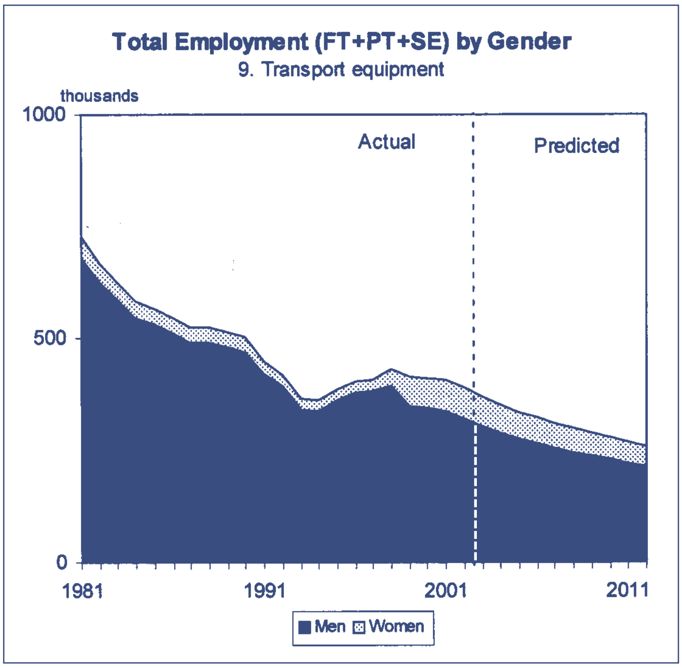
As in engineering, employment in the transport equipment industry is predominantly male. Part-time employment is insignificant. Self-employment is also tiny but increasing in importance.

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**
2002		**% shares**		**% shares**		**% shares**	**000s**	**% shares**	**2002-07**			**000s**
Male employment	306	(78.7)	2	(0.5)	12	(3)	319	(82.1)	-63	-1	0	-63
Female employment	62	(15.8)	7	(1.8)	1	(0.2)	69	(17.9)	-13	-1	0	-14
Total employment	**367**	**(94.5)**	**9**	**(2.3)**	**12**	**(3.2)**	**388**	**(100)**	**-75**	**-2**	**0**	**-7**
2007									**2007-12**			
Male employment	243	(78.1)	1	(0.4)	12	(3.7)	256	(82.2)	-42	0	0	-42
Female employment	49	(15.7)	5	(1.8)	1	(0.3)	55	(17.8)	-10	0	0	-10
Total employment	**292**	**(93.8)**	**7**	**(2.2)**	**13**	**(4)**	**311**	**(100)**	**-52**	**-1**	**0**	**-52**
2012									**2002-12**			
Male employment	201	(77.6)	1	(0.4)	12	(4.6)	214	(82.6)	-104	-1	0	-105
Female employment	39	(15.1)	5	(2)	1	(0.4)	45	(17.4)	-23	-2	0	-24
Total employment	**240**	**(92.6)**	**6**	**(2.4)**	**13**	**(5)**	**259**	**(100)**	**-127**	**-3**	**0**	**-129**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

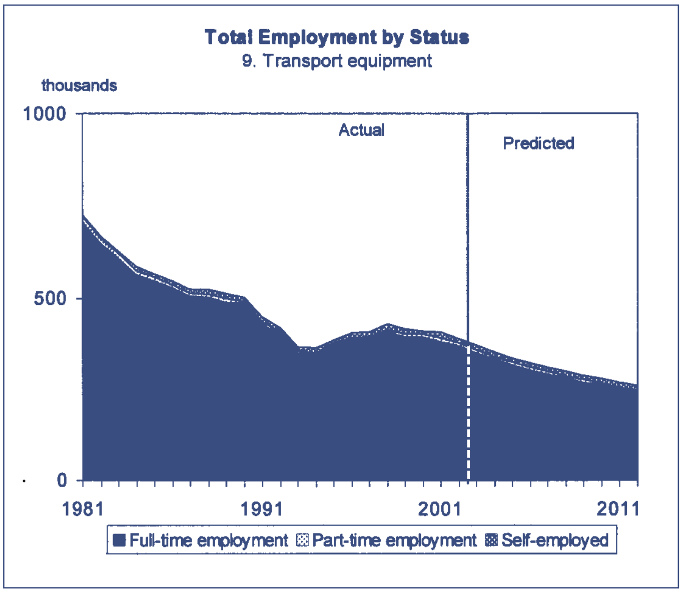
Figure 6.9.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Males are projected to continue to maintain their share of a rapidly declining total employment level.

Figure 6.9.3: 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).

- Full-time jobs will remain the norm in this industry, with part-time employment and self-employment remaining fairly 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 around 25% of the total in 2002.

Future changes

- 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, but their employment levels all fall slightly.

Replacement demands

- Replacement demands are significant for many occupations in this industry, but these are insufficient to do much more than offset the rapid projected decline in employment levels.
- In absolute terms the largest elements of replacement demand are for skilled trades occupations (basically cancelling out the 50,000 projected decline in expansion demand) and a need for around 30,000 operatives (which barely cancels out the projected decline due to structural changes).

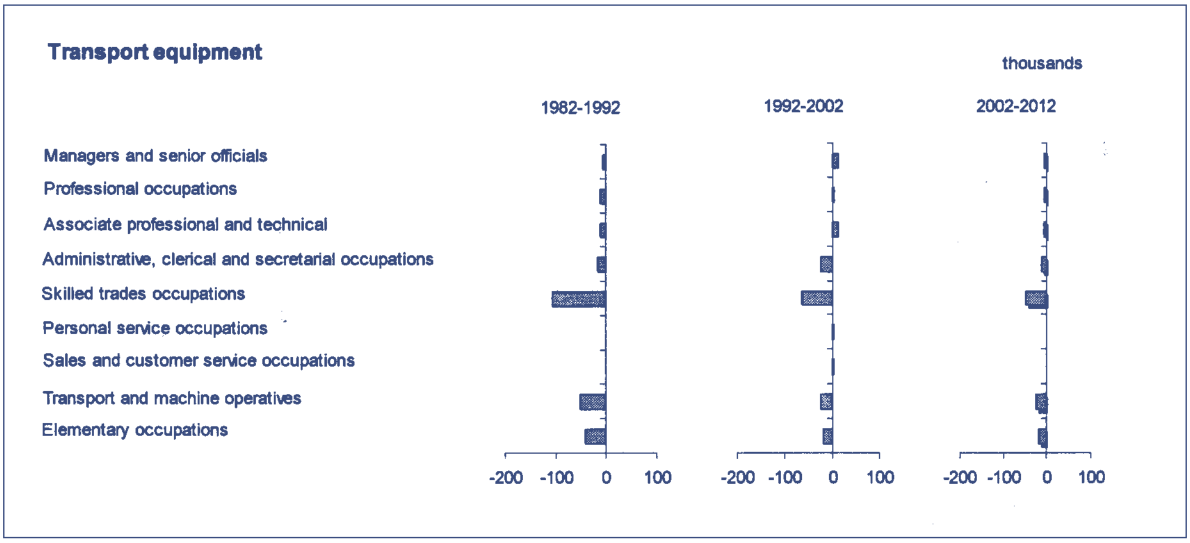
Table 6.9.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Transport Equipment						2002-2012		
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	39	32	35	30	27	-7	13	6
2. Professional Occupations	43	32	30	26	22	-7	9	2
3. Associate Professional and Technical Occupations	39	28	33	29	27	-7	12	6
4. Administrative, Clerical and Secretarial Occupations	39	22	36	28	22	-14	17	3
5. Skilled Trades Occupations	262	155	112	82	62	-50	48	-2
6. Personal Service Occupations	4	3	4	4	4	0	1	1
7. Sales and Customer Service Occupations	4	3	6	6	5	-1	3	2
8. Transport and Machine Operatives	137	86	80	64	55	-25	29	4
9. Elementary Occupations	99	57	53	42	35	-19	19	0
Total	664	419	388	311	259	-129	151	22

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	6	8	9	10	11	-21	38	16
2. Professional Occupations	6	8	8	8	9	-24	31	7
3. Associate Professional and Technical Occupations	6	7	8	9	10	-20	37	17
4. Administrative, Clerical and Secretarial Occupations	6	5	9	9	9	-38	47	10
5. Skilled Trades Occupations	39	37	29	26	24	-45	43	-2
6. Personal Service Occupations	1	1	1	1	1	-8	33	25
7. Sales and Customer Service Occupations	1	1	2	2	2	-11	44	33
8. Transport and Machine Operatives	21	21	21	21	21	-31	37	5
9. Elementary Occupations	15	14	14	14	13	-35	35	0
Total	**100**	**100**	**100**	**100**	**100**	-33	39	6

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.9.4: Changing Composition of Employment by Occupation, 1982-2012



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

6.10 MANUFACTURING & RECYCLING

6.10.1 Description of the Industry

INDUSTRY 10: MANUFACTURING & RECYCLING
SIC92 headings: 36, 37

Manufacture and upholstery of furniture (incl. chairs and seats, office and shop furniture, fitted kitchens, other furniture and mattresses). Manufacturing nes 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).

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	0.7	100
Exposure to international trade:	moderate	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	234,000	29,336,000
Share of total employment (%2002):	0.8	100
Gender split (male:female) (% 2002):	73:27	53:47
Part-time share (% 2002):	12	27
Self-employment share (% 2002):	12	12

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.

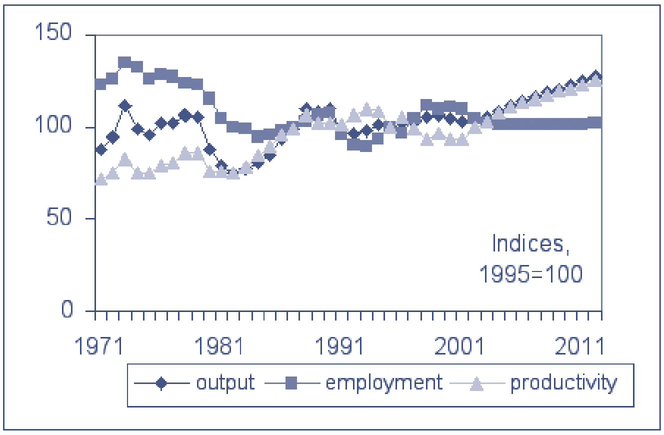
The EU directives on recycling are based on the 'polluter pays' principle. Increased requirements for the proportion of components recycled for the car industry and the electronics industry will imply new investment in recycling equipment. Estimates indicate that the short-term cost of such equipment will be covered in the longer-term.

6.10.3 Productivity and Output Trends

Table 6.10.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	1.5	0.1	2.1	1.8
Employment (% pa)	2.9	0.0	-0.6	0.1
(000s pa)	31	0	-7	2
Productivity (% pa)	-1.4	0.2	2.8	1.7

Figure 6.10.1: Output, Productivity and Employment, Manufacturing & Recycling



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Long-term trends in this group of industries are quite difficult to discern. Following a recent downturn, things are expected to pick up, with recycling doing especially well.
- Productivity growth is also expected to accelerate.
- This growth is therefore jobless, with little change in employment levels.

6.10.4 Employment by Status and Gender

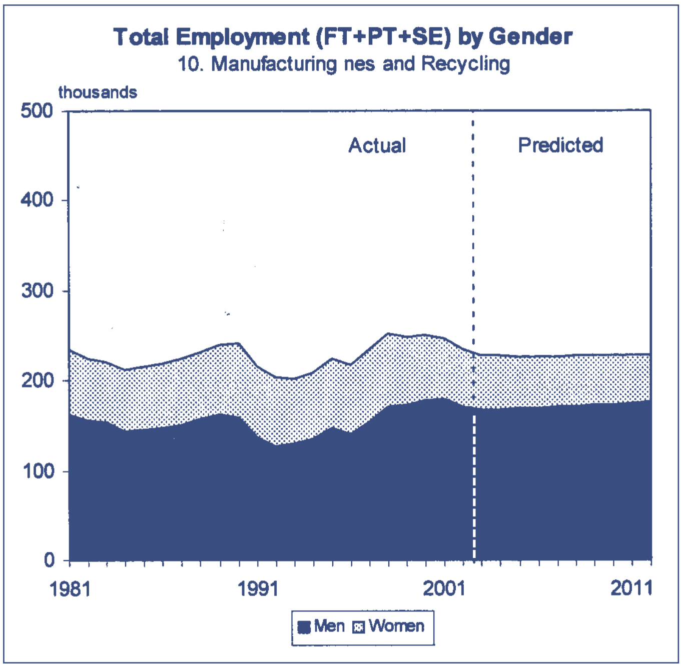
Females account for just over a quarter of jobs in this industry. Part-time employment is quite important, with around 10% of jobs falling into this category, Self-employment accounts for a similar share.

Table 6.10.2: Employment Levels by Gender and Status, Manufacturing & Recycling

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	134	(57)	14	(5.9)	23	(9.9)	171	(72.9)	-3	2	1	1
Female employment	45	(19.2)	14	(6)	5	(2)	64	(27.1)	-6	2	-4	-8
Total employment	**178**	**(76.2)**	**28**	**(11.9)**	**28**	**(11.9)**	**234**	**(100)**	**-8**	**4**	**-3**	**-7**
2007									**2007-12**			
Male employment	131	(57.7)	16	(7.2)	24	(10.6)	171	(75.5)	0	3	1	4
Female employment	39	(17.3)	16	(6.9)	1	(0.3)	56	(24.5)	-4	2	0	-3
Total employment	**170**	**(75)**	**32**	**(14.1)**	**25**	**(10.9)**	**227**	**(100)**	**-4**	**5**	**1**	**2**
2012									**2002-12**			
Male employment	131	(57.4)	19	(8.3)	25	(11.1)	176	(76.9)	-2	5	2	5
Female employment	35	(15.2)	18	(7.7)	0	(0.2)	53	(23.1)	-10	4	-4	-11
Total employment	**166**	**(72.7)**	**37**	**(16)**	**26**	**(11.3)**	**229**	**(100)**	**-12**	**9**	**-2**	**-6**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

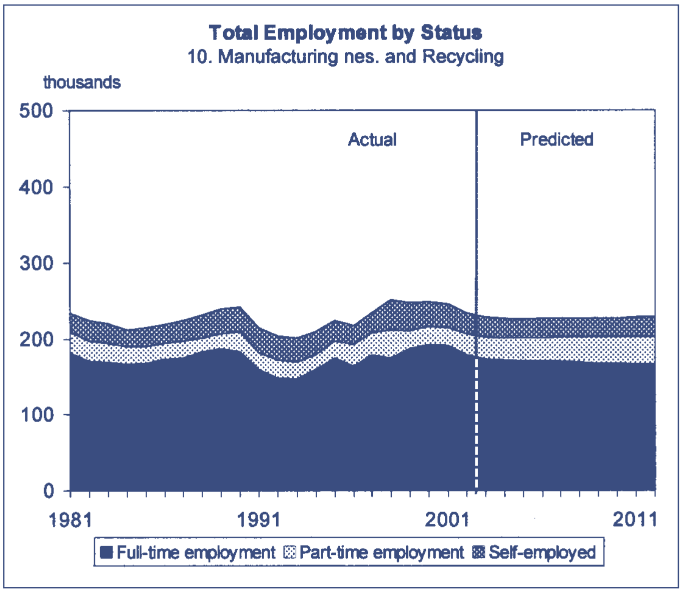
Figure 6.10.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Males are expected to maintain, if not increase, their share of a stable employment level.

Figure 6.10.3: 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).

- Part-time employment is projected to account for an increasing share of total employment.

6.10.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Skilled trades and 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 under 1 in 5 jobs in 2002.

Future changes

- In the context of a fairly stable employment picture overall, slight declines are projected for the manual occupations, while the white collar groups continue to increase their employment shares.

Replacement demands

- Overall employment levels in this industry are projected to remain stable, with no dramatic shifts in occupational structure.
- Patterns of replacement demand and total requirements therefore mirror the current patterns of employment, with the largest increase being for managers, skilled trades and transport and machine operatives.

Table 6.10.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Manufacturing & Recycling

Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
								2002-2012
1. Managers and Senior Officials	17	19	29	31	35	5	12	17
2. Professional Occupations	5	5	7	7	8	2	2	4
3. Associate Professional and Technical Occupations	9	10	16	17	19	3	6	9
4. Administrative, Clerical and Secretarial Occupations	21	21	18	16	17	-2	9	7
5. Skilled Trades Occupations	77	64	75	73	72	-3	27	24
6. Personal Service Occupations	1	1	2	2	3	0	1	1
7. Sales and Customer Service Occupations	3	3	5	5	6	1	2	3
8. Transport and Machine Operatives	62	54	55	49	47	-8	22	13
9. Elementary Occupations	30	26	28	25	23	-4	10	6
Total	224	203	234	227	229	-6	90	85

Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
						2002-2012 Percentage Changes		
1. Managers and Senior Officials	7	9	13	14	15	17	39	56
2. Professional Occupations	2	2	3	3	4	23	32	55
3. Associate Professional and Technical Occupations	4	5	7	7	8	19	40	59
4. Administrative, Clerical and Secretarial Occupations	9	10	8	7	7	-9	48	39
5. Skilled Trades Occupations	34	31	32	32	31	-4	36	32
6. Personal Service Occupations	1	1	1	1	1	18	35	53
7. Sales and Customer Service Occupations	1	2	2	2	3	20	44	64
8. Transport and Machine Operatives	27	27	23	22	20	-15	40	24
9. Elementary Occupations	14	13	12	11	10	-15	37	22
Total	**100**	**100**	**100**	**100**	**100**	-2	39	36

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.10.4: Changing Composition of Employment by Occupation, 1982-2012

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

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 (% 2002):	5.5	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	1,854,000	29,336,000
Share of total employment (% 2002):	6.2	100
Gender split (male:female) (% 2002):	90:10	53:47
Part-time share (% 2002):	5	27
Self-employment share (% 2002):	39	12

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

6.11.2 Industry Commentary

Greater consolidation, in what is a traditionally fragmented industry, is being driven by three factors. First, there is the trend towards Private Finance Initiative (PFI) schemes and greater private sector participation in large infrastructure projects more generally. Second, as a result of further EU liberalisation for government projects, there is more competition from abroad. Finally, a growth in brown-field site redevelopment which involves a mix of residential (especially flats) and commercial property requires greater financial resources and thus larger companies.

Skill shortages are a continuing 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 the age structure of the current workforce.

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 part of the decade. This was accompanied by new private commercial work mainly in retail and entertainment, and continued strong demand for housing. However, there was a wide regional variation – weakest in the south east and strongest in the south west.

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 in Iraq. Domestically, the major housebuilders 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 next year or so.

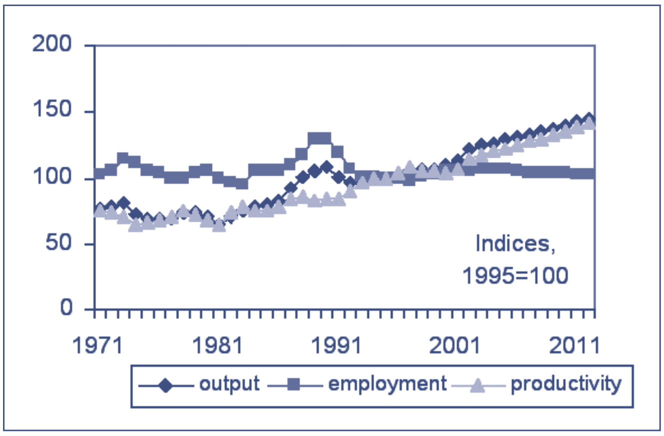
Output will therefore continue to rise, but acute skill shortages will probably imply little growth in employment. Instead, some analysts predict a further growth in factory prefabrication which greatly reduces construction time, and can ensure a high quality of build.

6.11.3 Productivity and Output Trends

Table 6.11.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	1.8	2.8	1.8	1.8
Employment (% pa)	-1.8	1.7	-0.4	-0.3
(000s pa)	-160	149	-34	-25
Productivity (% pa)	3.6	1.1	2.1	2.1

Figure 6.11.1: Output, Productivity and Employment, Construction



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- The construction industry is notoriously cyclical. Recent history has been of fairly steady output growth. This is projected to continue, albeit at somewhat more modest rates of just under 2% per annum.
- Productivity has exhibited less erratic patterns. A steady increase of just over 2% per annum is projected.
- As a consequence, employment levels are projected to fall very slightly.

6.11.4 Employment by Status and Gender

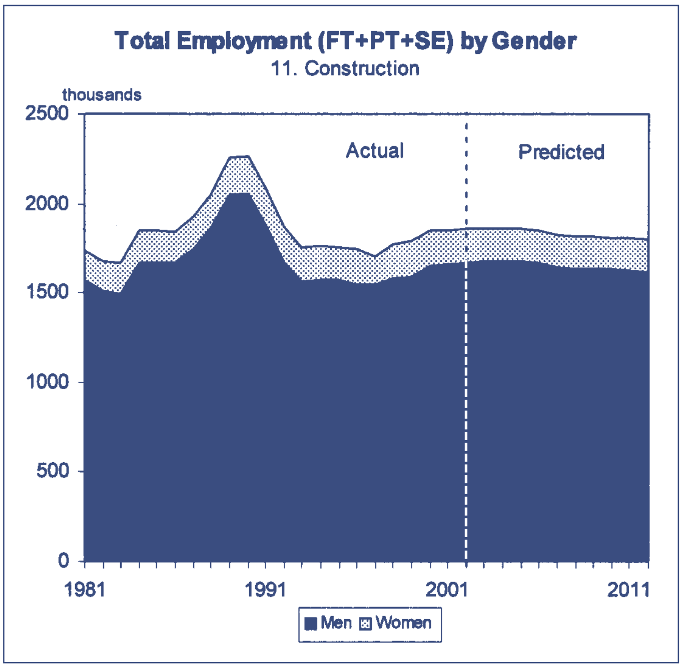
Construction is the most male dominated of all the industries featured here. Females account for fewer than 1 in 10 of all jobs. Self-employment is still very important, accounting for almost 40% of the total in 2002. This follows a sharp downturn after the tightening up of Inland Revenue regulations on self-employment status. Part-time employment remains much less important than full-time work.

Table 6.11.2: Employment Levels by Gender and Status, Construction

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	2002-07			000s
Male employment	940	(50.7)	25	(1.3)	706	(38.1)	1,671	(90.1)	-23	0	-8	-31
Female employment	90	(4.9)	71	(3.8)	22	(1.2)	184	(9.9)	-2	-1	0	-3
Total employment	**1,030**	**(55.6)**	**96**	**(5.2)**	**728**	**(39.3)**	**1,854**	**(100)**	**-26**	**-1**	**-8**	**-34**
2007									**2007-12**			
Male employment	916	(50.3)	25	(1.4)	699	(38.4)	1,640	(90.1)	-16	0	-6	-23
Female employment	88	(4.8)	70	(3.9)	22	(1.2)	180	(9.9)	-2	-1	0	-2
Total employment	**1,004**	**(55.2)**	**95**	**(5.2)**	**721**	**(39.6)**	**1,820**	**(100)**	**-18**	**-1**	**-6**	**-25**
2012									**2002-12**			
Male employment	900	(50.1)	25	(1.4)	692	(38.6)	1,617	(90.1)	-40	0	-14	-54
Female employment	86	(4.8)	70	(3.9)	22	(1.2)	178	(9.9)	-4	-1	0	-6
Total employment	**986**	**(54.9)**	**94**	**(5.2)**	**714**	**(39.8)**	**1,795**	**(100)**	**-44**	**-2**	**-14**	**-59**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

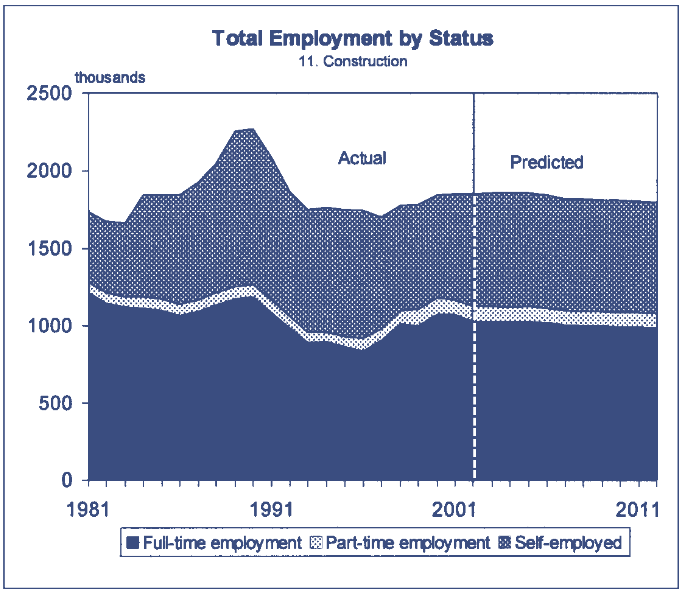
Figure 6.11.2: Changing Patterns of Sectoral Employment by Gender



- Males are expected to maintain their predominant share of employment in this industry.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.11.3: Changing Patterns of Sectoral Employment by Status



- Self-employment is expected to stabilise its share of total employment. This share is expected to remain at its current level, as the effects of recent restructuring peter out.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

6.11.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Even by 2002, skilled trades still accounted for almost half of all jobs in the industry.
- Transport and machine operatives, elementary occupations and managers are the other important groups, each accounting for around 11-13% of total employment.

Future changes

- Skilled trades are expected to see a continuation of the trend decline in their employment share. As a consequence, there is a decline of around 90,000 jobs projected.
- Job losses are also projected for administrative, clerical and secretarial occupations and elementary occupations.
- These are offset to some degree by increases for managerial, professional and associate professional and technical occupations.

Replacement demands

- Although the 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.
- By far the largest component of this is for skilled trades. Replacement demands are estimated at over 300,000, more than offsetting a projected expansion demand decline of 90,000.
- Significant replacement demands are projected for many other groups as well, including managers, professionals and associate professional and technical occupations, as well as transport and machine operatives.
- Some of the faster **rates** of increase in total requirements are for sales and personal service occupations, although these remain one of the smallest occupational categories in the industry.

6.11.6 Alternative Construction Forecasts

- More detailed tailored forecasts are available from Construction Skills, which have been agreed with the 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 Construction Skills and its partners in planning training provision. The Construction Skills forecasts are available from: **www.citb.co.uk/research**

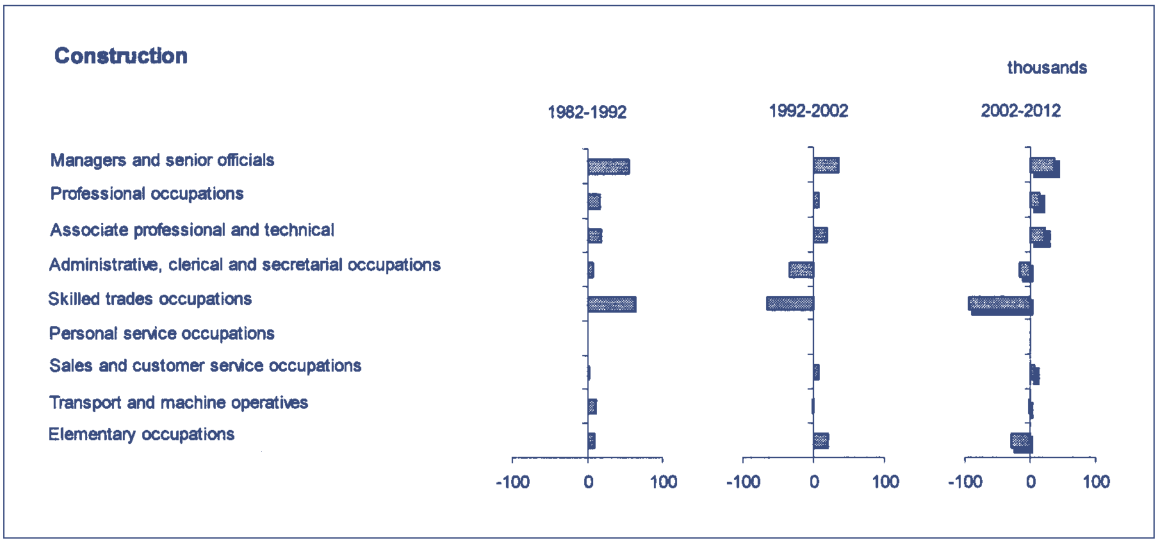
Table 6.11.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Construction								2002-2012
Employment Levels (000)	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	128	183	219	236	257	32	84	116
2. Professional Occupations	66	82	89	95	103	15	28	43
3. Associate Professional and Technical Occupations	50	69	88	99	110	21	32	54
4. Administrative, Clerical and Secretarial Occupations	150	159	126	116	110	-20	60	39
5. Skilled Trades Occupations	868	932	866	818	772	-88	317	229
6. Personal Service Occupations	6	7	7	7	8	1	2	3
7. Sales and Customer Service Occupations	12	15	22	25	27	5	10	14
8. Transport and Machine Operatives	185	197	195	194	194	2	67	70
9. Elementary Occupations	212	222	242	230	214	-26	73	47
Total	1,676	1,866	1,854	1,820	1,795	-59	674	615

						2002-2012 Percentage Changes		
Percentage Shares	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	8	10	12	13	14	14	38	52
2. Professional Occupations	4	4	5	5	6	17	32	49
3. Associate Professional and Technical Occupations	3	4	5	5	6	24	37	61
4. Administrative, Clerical and Secretarial Occupations	9	9	7	6	6	-16	48	31
5. Skilled Trades Occupations	52	50	47	45	43	-10	37	27
6. Personal Service Occupations	0	0	0	0	0	8	30	37
7. Sales and Customer Service Occupations	1	1	1	1	2	21	44	65
8. Transport and Machine Operatives	11	11	11	11	11	1	35	36
9. Elementary Occupations	13	12	13	13	12	-11	30	19
Total	**100**	**100**	**100**	**100**	**100**	-3	36	33

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.11.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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 (% 2002):	1.9	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	664,000	29,336,000
Share of total employment (% 2002):	2.2	100
Gender split (male:female) (% 2002):	60:40	53:47
Part-time share (% 2002):	23	27
Self-employment share (% 2002):	22	12

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

6.12.2 Industry Commentary

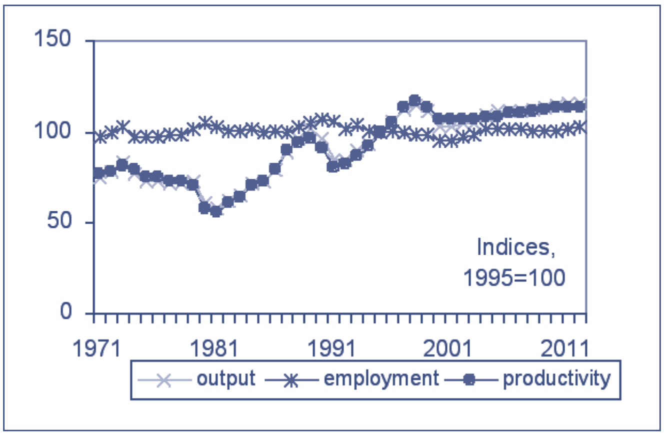
Record new car registrations in 2002 look set to be surpassed in 2003, as dealers continue to offer large discounts on new vehicles. Petrol sales are extremely competitive, and petrol outlets have had to diversify in order to survive. Despite these efforts, the number of petrol retailers has dropped by around one third in the last decade, a trend exacerbated by the increase in petrol retailing by the large supermarket chains.

6.12.3 Productivity and Output Trends

Table 6.12.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	5.9	-1.5	1.4	0.7
Employment (% pa)	-0.6	-0.3	0.7	0.2
(000s pa)	-19	-9	23	7
Productivity (% pa)	6.5	-1.3	0.7	0.5

Figure 6.12.1: Output, Productivity and Employment, Sale & Maintenance of MVs



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Following rapid growth to the first half of the last decade, output levels fell over the past five years.
- This is projected to be reversed over the next decade, but growth rates are modest at below 0.5% per annum.
- Productivity growth also slowed rapidly in the last five years. Some growth is projected to 2012.
- Employment levels are expected to remain fairly static.

6.12.4 Employment by Status and Gender

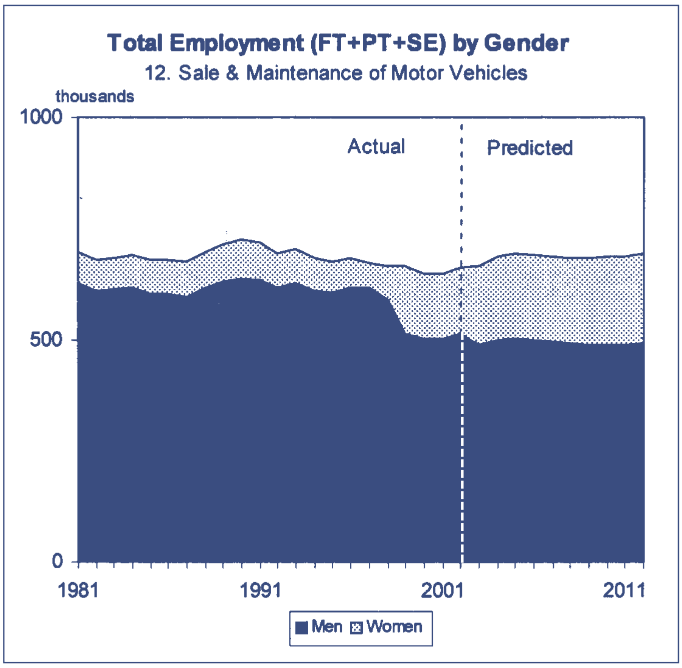
Women currently account for around 2 in 10 of the jobs in this industry. The historical picture is somewhat hazy, the official statistics presenting a somewhat erratic pattern. Self-employment is important, accounting for around 12% of all jobs. Part-time working accounts for a similar share.

Table 6.12.2: Employment Levels by Gender and Status, Sale & Maintenance of MVs

Employment Status Employment by Gender	FT	% shares	PT	% shares	SE	% shares	Total 000s	% shares	Changes in Employment Status FT	PT	SE	Total
2002									**2002-07**			**000s**
Male employment	411	(61.9)	28	(4.2)	74	(11.2)	513	(77.3)	-4	-1	-14	-18
Female employment	89	(13.4)	53	(7.9)	9	(1.3)	150	(22.7)	37	5	-1	41
Total employment	**500**	**(75.3)**	**81**	**(12.1)**	**83**	**(12.5)**	**664**	**(100)**	**33**	**4**	**-15**	**23**
2007									**2007-12**			
Male employment	407	(59.3)	27	(4)	61	(8.9)	495	(72.1)	7	0	-12	-4
Female employment	126	(18.4)	58	(8.4)	8	(1.1)	192	(27.9)	10	4	-3	11
Total employment	**533**	**(77.6)**	**85**	**(12.4)**	**69**	**(10)**	**687**	**(100)**	**18**	**4**	**-15**	**7**
2012									**2002-12**			
Male employment	414	(59.7)	28	(4)	49	(7)	491	(70.7)	3	0	-26	-23
Female employment	137	(19.7)	61	(8.8)	5	(0.7)	203	(29.3)	48	9	-4	53
Total employment	**551**	**(79.4)**	**89**	**(12.8)**	**54**	**(7.8)**	**694**	**(100)**	**51**	**8**	**-29**	**3**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

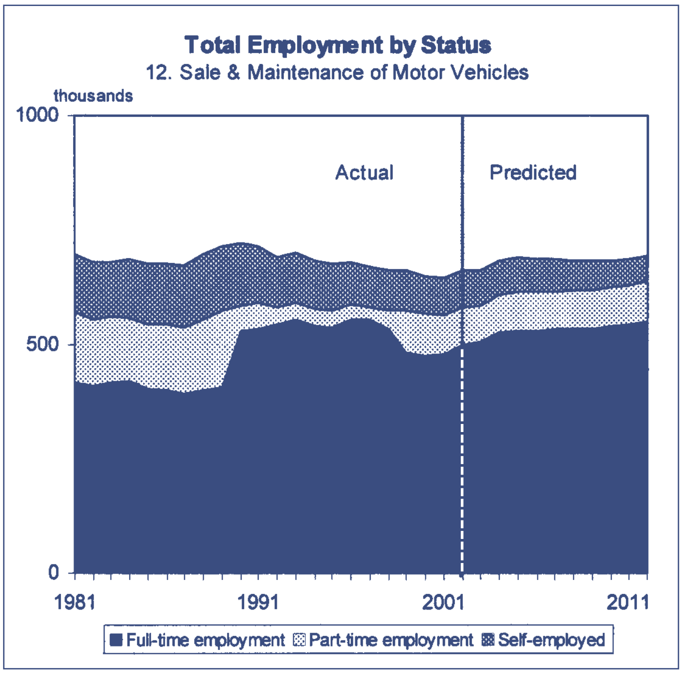
Figure 6.12.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Following a period when females increased their employment share substantially, the most recent experience has seen a reversal in this trend. This more recent pattern is projected to continue for the next decade.

Figure 6.12.3: 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).

- Self-employment shares are expected to continue the recent downward trend.
- Part-time working is projected to maintain a fairly constant share of total employment.

6.12.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Skilled trades used to account for a fifth of all jobs in this industry, but this has declined sharply over the past two decades.
- Managers (with a 22% share) and sales and customer service occupations (at 24%) are now the main occupations.

Future changes

- Some further modest job losses are projected for skilled trades, but the main losses are for administrative, clerical and secretarial occupations. This reflects the impact of ICT on such work.
- Job gains are projected for operatives and many of the other white collar occupations, but these are all of a modest magnitude.

Replacement demands

- Although only a modest increase in total employment is projected, there will be substantial replacement demands to be met in this industry.
- The largest element is for sales and customer care occupations, followed by the managerial category.
- Even those occupations projected to decline in importance will have significant needs to replace existing workers. On average 40% 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

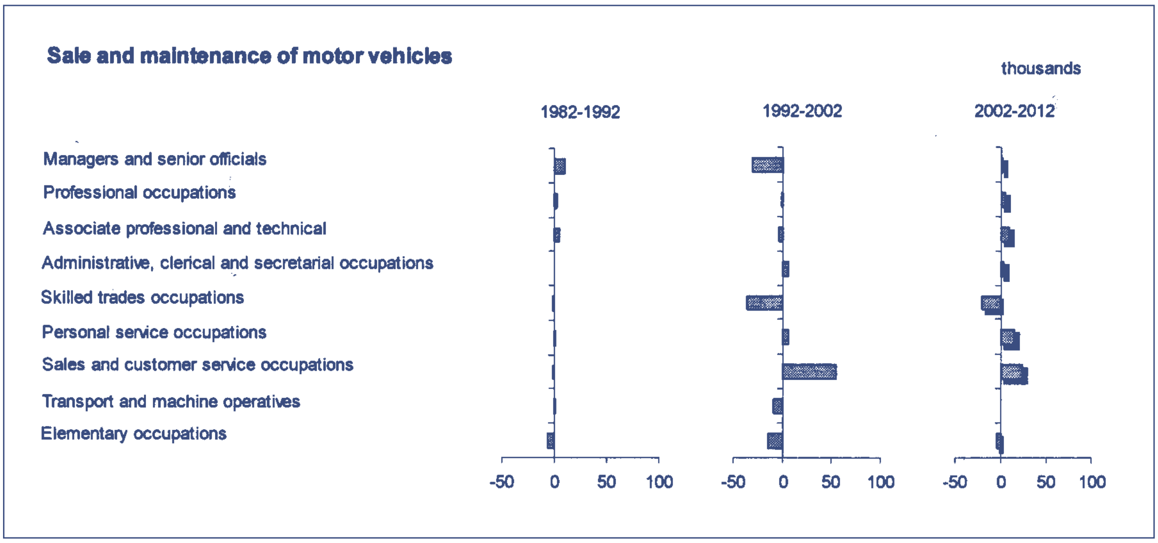
United Kingdom: Sale & Maintenance of MVs

Employment Levels (000)	1982	1992	2002	2007	2012	Net Change (2002-2012)	Replacement Demands (2002-2012)	Total Requirement (2002-2012)
1. Managers and Senior Officials	168	179	148	149	149	7	52	59
2. Professional Occupations	17	19	19	21	23	5	5	10
3. Associate Professional and Technical Occupations	51	57	53	59	62	9	20	29
4. Administrative, Clerical and Secretarial Occupations	31	31	36	40	39	-10	22	13
5. Skilled Trades Occupations	139	138	102	91	81	-2	34	32
6. Personal Service Occupations	18	19	25	33	40	7	12	19
7. Sales and Customer Service Occupations	106	104	160	176	183	4	87	91
8. Transport and Machine Operatives	73	74	64	64	65	11	17	27
9. Elementary Occupations	77	71	57	56	52	0	18	18
Total	680	692	664	687	694	30	266	296

Percentage Shares	1982	1992	2002	2007	2012	Net Change (2002-2012 Percentage Changes)	Replacement Demands (2002-2012 Percentage Changes)	Total Requirement (2002-2012 Percentage Changes)
1. Managers and Senior Officials	25	26	22	22	21	5	39	44
2. Professional Occupations	2	3	3	3	3	32	33	64
3. Associate Professional and Technical Occupations	8	8	8	9	9	18	41	59
4. Administrative, Clerical and Secretarial Occupations	5	4	5	6	6	-22	49	27
5. Skilled Trades Occupations	20	20	15	13	12	-3	45	42
6. Personal Service Occupations	3	3	4	5	6	23	38	61
7. Sales and Customer Service Occupations	16	15	24	26	26	2	38	40
8. Transport and Machine Operatives	11	11	10	9	9	25	38	63
9. Elementary Occupations	11	10	9	8	8	0	42	42
Total	**100**	**100**	**100**	**100**	**100**	5	40	45

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.12.4: Changing Composition of Employment by Occupation, 1982-2012



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

6.13 WHOLESALE DISTRIBUTION NES

6.13.1 Description of the Industry

INDUSTRY 13: WHOLESALE DISTRIBUTION nes
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 (% 2002):	5.07	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (000s 2002):	1,286	29,336,000
Share of total employment: (% 2002)	4.2	100
Gender split (male:female) (% 2002):	78:22	53:47
Part-time share (% 2002):	6	27
Self-employment share (% 2002):	7	12

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

6.13.2 Industry Commentary

Since the mid 1990s, vertical integration has blurred the distinction between retailing and distribution, as large retailers established their own distribution networks and increasingly brought direct from producers. The supermarkets are a good example of this trend as are the DIY stores and so called 'factory outlets'. Internet trading is also of growing importance for this industry.

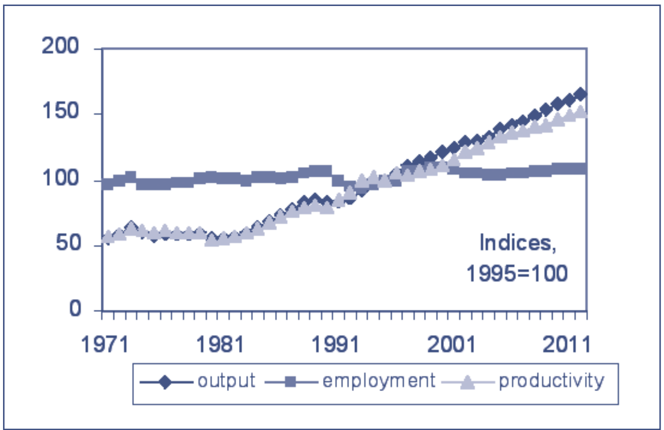
DIY stores have continued to expand, despite signs that the housing market may have reached a peak. This has tended to offset job losses elsewhere in the industry as restructuring and adoption of new technologies take effect.

6.13.3 Productivity and Output Trends

Table 6.13.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	5.2	3.0	2.5	2.7
Employment (% pa)	2.4	-0.4	0.0	0.6
(000s pa)	149	-26	2	40
Productivity (% pa)	2.7	3.4	2.5	2.1

Figure 6.13.1: Output, Productivity and Employment, Wholesale Distribution



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output levels have grown rapidly in recent years.
- Some slowdown is anticipated, but growth rates remain a healthy 2.5% per annum.
- Productivity has also grown steadily in recent years and this pattern is expected to continue.
- The result is 'jobless' growth with only a few additional jobs by 2012 expected.

6.13.4 Employment by Status and Gender

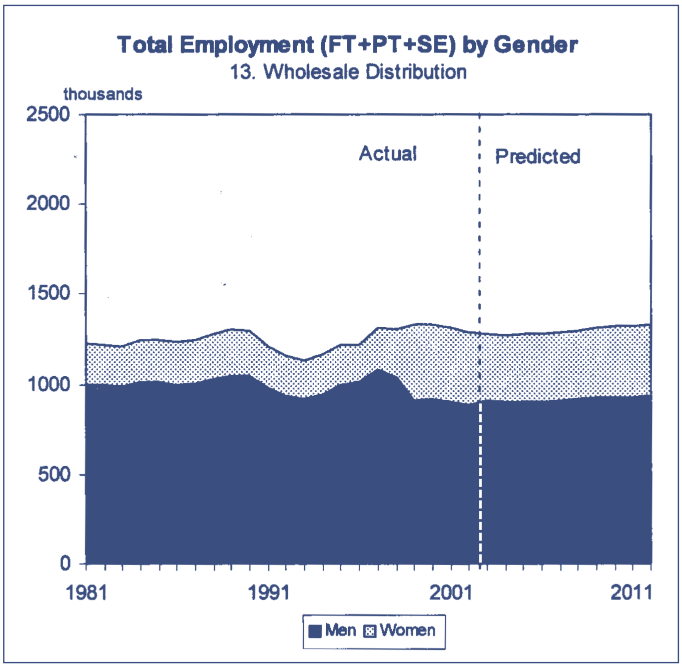
Men predominate in this industry, accounting for just under 7 out of every 10 jobs. The great majority of employment is full-time. Part-time employment and self-employment each account for around 12% of total employment.

Table 6.13.2: Employment Levels by Gender and Status, Wholesale Distribution

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	709	(55.1)	45	(3.5)	131	(10.2)	885	(68.8)	27	13	-17	23
Female employment	277	(21.5)	101	(7.9)	23	(1.8)	401	(31.2)	-19	6	-7	-21
Total employment	**986**	**(76.7)**	**146**	**(11.4)**	**154**	**(12)**	**1,286**	**(100)**	**7**	**18**	**-23**	**2**
2007									**2007-12**			
Male employment	735	(57.1)	58	(4.5)	115	(8.9)	908	(70.5)	29	13	-17	25
Female employment	257	(20)	107	(8.3)	16	(1.2)	380	(29.5)	12	9	-5	16
Total employment	**993**	**(77.1)**	**165**	**(12.8)**	**131**	**(10.2)**	**1,288**	**(100)**	**41**	**22**	**-22**	**40**
2012									**2002-12**			
Male employment	764	(57.5)	71	(5.4)	98	(7.3)	933	(70.2)	55	26	-34	48
Female employment	269	(20.3)	116	(8.7)	11	(0.8)	396	(29.8)	-7	14	-12	-5
Total employment	**1,033**	**(77.8)**	**187**	**(14.1)**	**109**	**(8.2)**	**1,329**	**(100)**	**48**	**40**	**-45**	**43**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

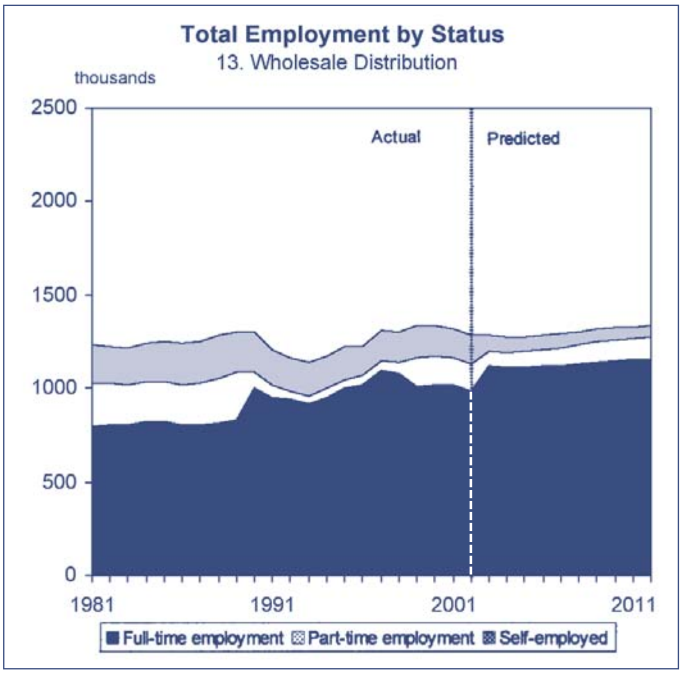
Figure 6.13.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Females are projected to increase their share of total employment.

Figure 6.13.3: 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 historical data on part-time employment based on official sources look implausible over the period 1989-1998.
- There appears to be an offsetting error in other parts of retailing.
- A slight increase in the share of part-timers in this wholesale distribution is projected, based on recent trends.

6.13.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Managers and senior officials and sales and customer service occupations each accounted for over 1 in 5 jobs in 2002. Skilled trades occupations was the next largest group with around 14% of all jobs.

Future changes

- The skilled trades group is projected to become less important in the future.
- In most other respects occupational structure is expected to remain stable over the next decade.

Replacement demand

- Replacement demands for this industry are almost half a million over the next 10 years.
- Managers and sales occupations, together with skilled trades occupations, each account for around 100,000.
- However, there are substantial needs across all occupational groups.

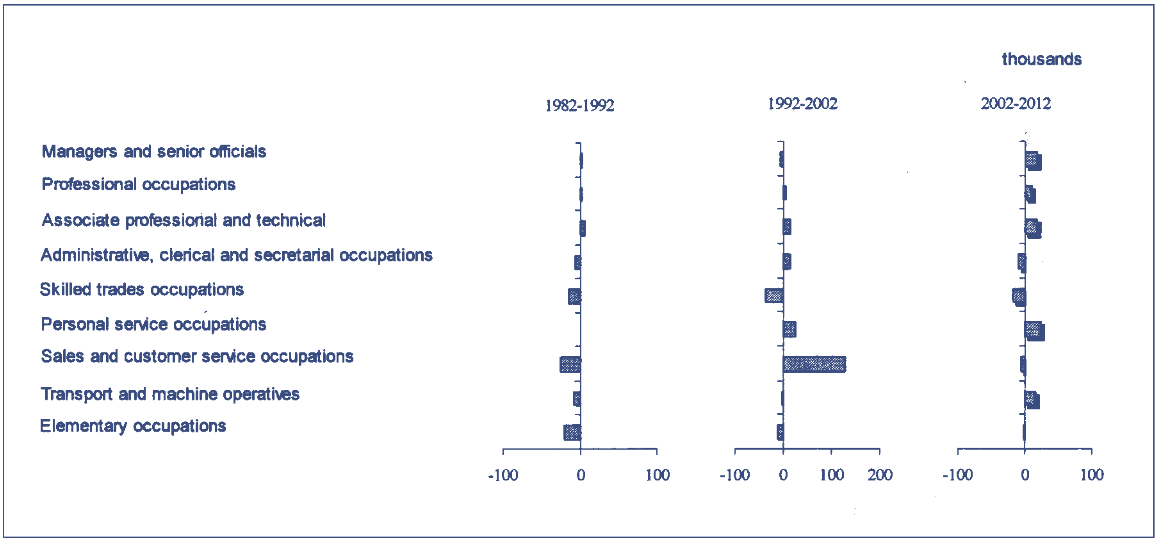
Table 6.13.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Wholesale distribution nes								2002-2012
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	281	284	277	279	285	1	108	109
2. Professional Occupations	29	31	36	39	43	7	12	19
3. Associate Professional and Technical Occupations	89	94	107	112	120	13	43	56
4. Administrative, Clerical and Secretarial Occupations	78	72	87	76	73	-1	36	35
5. Skilled Trades Occupations	230	215	178	164	150	-47	92	45
6. Personal Service Occupations	33	34	59	66	79	29	19	48
7. Sales and Customer Service Occupations	223	197	324	339	366	62	95	157
8. Transport and Machine Operatives	123	115	111	113	116	-6	47	41
9. Elementary Occupations	138	119	107	101	96	-16	45	29
Total	1,224	1,162	1,286	1,288	1,329	43	497	540

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	23	24	22	22	21	1	37	37
2. Professional Occupations	2	3	3	3	3	17	31	49
3. Associate Professional and Technical Occupations	7	8	8	9	9	12	39	51
4. Administrative, Clerical and Secretarial Occupations	6	6	7	6	5	-1	47	46
5. Skilled Trades Occupations	19	19	14	13	11	-23	45	22
6. Personal Service Occupations	3	3	5	5	6	55	35	90
7. Sales and Customer Service Occupations	18	17	25	26	28	24	37	61
8. Transport and Machine Operatives	10	10	9	9	9	-5	36	31
9. Elementary Occupations	11	10	8	8	7	-13	37	24
Total	**100**	**100**	**100**	**100**	**100**	3	39	42

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.13.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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 (% 2002):	6.5	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	3,052,000	29,336,000
Share of total employment (% 2002):	10.1	100
Gender split (male:female) (% 2002):	37:63	53:47
Part-time share (% 2002):	54	27
Self-employment share (% 2002):	9	12

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, for example, and the seasonal sales have seen greater discounts available. Consumers are increasingly aware of this price competition, through advertising and their use of the internet, and this enables them to compare prices quickly and directly. Retail capacity continues to increase and there is evidence of excess space. Some previous growth areas such as mobile phone retailing have collapsed as consumers need less support now they are 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 in the near future.

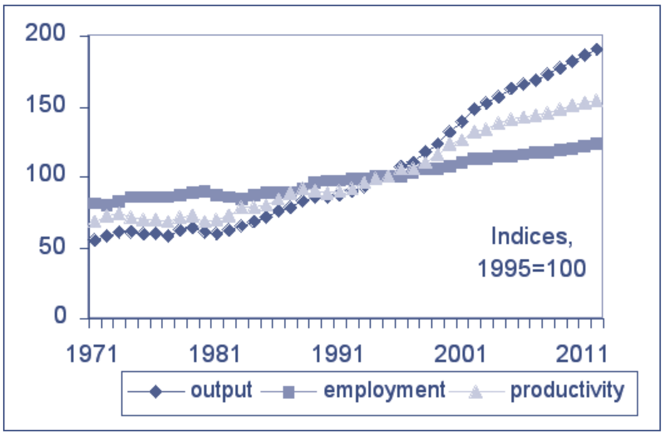
The most significant change in the next decade will be the growth of e-commerce. While currently accounting for only a tiny fraction of total sales, in certain segments it is already exceedingly important. A good example is budget air travel. Further growth seems likely as broadband becomes more widespread.

6.14.3 Productivity and Output Trends

Table 6.14.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	4.3	6.1	2.6	2.5
Employment (% pa)	1.1	1.7	0.7	1.0
(000s pa)	149	252	115	165
Productivity (% pa)	3.1	4.3	1.8	1.5

Figure 6.14.1: Output, Productivity and Employment, Retailing



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output has been on a rapidly rising trend for many years. This has slowed very recently and the prospects for the next decade are expected to continue at the more moderate rate of around 2.5% per annum.
- The profile for productivity is similar, with a slowing down of growth over the next decade.
- Employment has risen steadily for many years. This trend is expected to continue, with some 270,000 extra jobs over the next decade.

6.14.4 Employment by Status and Gender

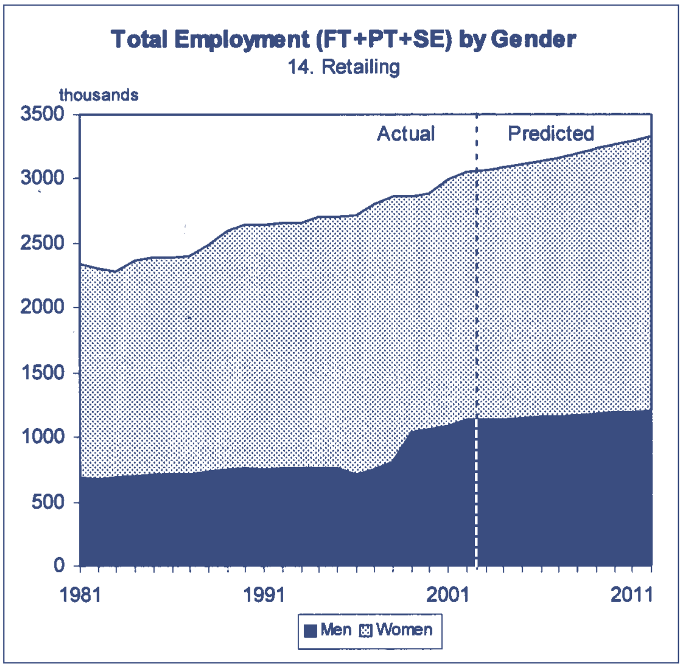
Females account for almost 2 in 3 jobs in this industry. Over half the jobs are part-time. Self-employment accounts for a relatively small and declining share.

Table 6.14.2: Employment Levels by Gender and Status, Retailing

Employment Status Employment by Gender	FT	% shares	PT	% shares	SE	% shares	Total 000s	% shares	Changes in Employment Status FT	PT	SE	Total 000s
2002									**2002-07**			
Male employment	599	(19.6)	381	(12.5)	150	(4.9)	1,129	(37)	2	54	-25	31
Female employment	557	(18.2)	1,254	(41.1)	112	(3.7)	1,922	(63)	9	106	-31	84
Total employment	**1,155**	**(37.9)**	**1,634**	**(53.6)**	**262**	**(8.6)**	**3,052**	**(100)**	**11**	**160**	**-56**	**115**
2007									**2007-12**			
Male employment	601	(19)	435	(13.7)	125	(4)	1,161	(36.6)	9	64	-26	48
Female employment	566	(17.9)	1,360	(42.9)	81	(2.6)	2,006	(63.4)	17	134	-33	117
Total employment	**1,166**	**(36.8)**	**1,794**	**(56.7)**	**206**	**(6.5)**	**3,167**	**(100)**	**26**	**198**	**-59**	**165**
2012									**2002-12**			
Male employment	610	(18.3)	499	(15)	100	(3)	1,208	(36.3)	11	118	-50	79
Female employment	582	(17.5)	1,493	(44.8)	48	(1.4)	2,124	(63.7)	26	240	-64	201
Total employment	**1,192**	**(35.8)**	**1,992**	**(59.8)**	**148**	**(4.4)**	**3,332**	**(100)**	**37**	**358**	**-114**	**280**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

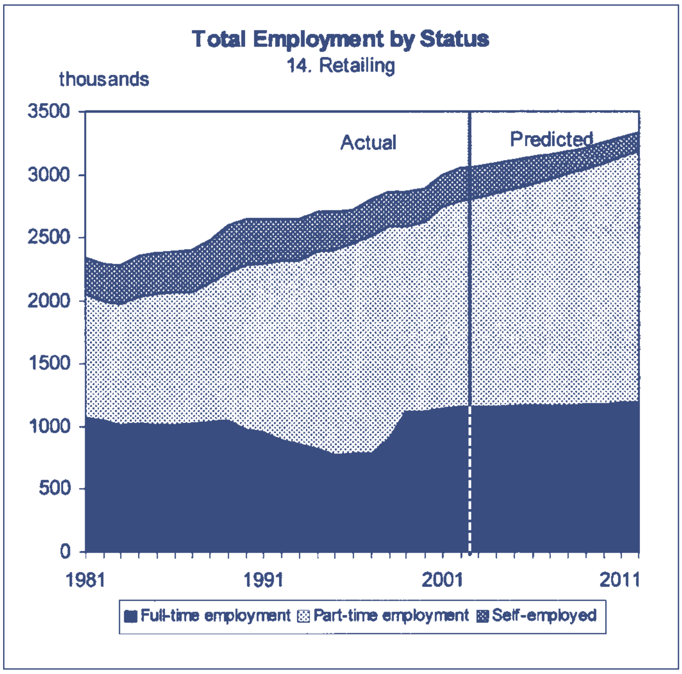
Figure 6.14.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- The already large share of females is projected to be maintained.

Figure 6.14.3: 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).

- Part-time employment is projected to continue its upward trend, increasing its share from 54 to 60% over the next decade.
- 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 and customer service occupations are by far the most significant group, accounting for well over 1 in every 3 jobs in 2002.
- Managers and senior officials, together with administrative, clerical and secretarial occupations, skilled trades and elementary occupations, make up the other main areas of employment.

Future changes

- Sales and customer service occupations are expected to be the main beneficiaries of projected employment growth.
- Other occupations which are expected to increase their employment shares and benefit from above-average growth include managers and senior officials, associate professional and technical occupations and personal service occupations.
- Only elementary occupations are projected to experience significant job losses.

Replacement demand

- The quarter of a million expansion demand projected between 2002 and 2012 is dwarfed by replacement demands which are five times as large.
- Sales and customer service occupations alone will need almost half a million people to replace those leaving the workforce.
- Most other occupations are also projected to have very substantial total requirements.

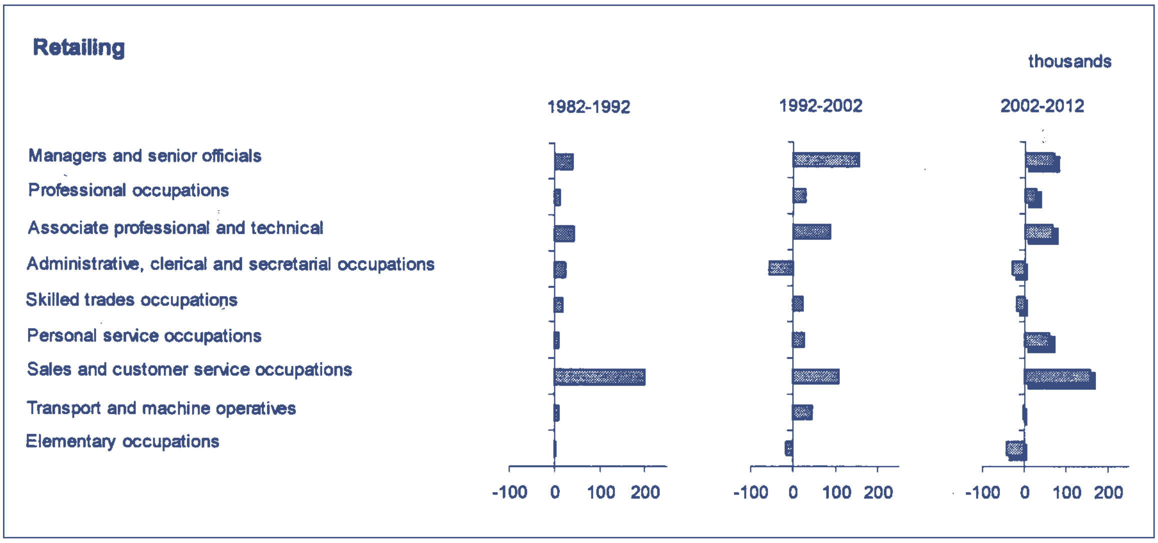
Table 6.14.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Retailing								2002-2012
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	308	347	500	528	569	69	210	279
2. Professional Occupations	35	47	77	88	103	24	26	51
3. Associate Professional and Technical Occupations	113	154	242	274	310	69	101	170
4. Administrative, Clerical and Secretarial Occupations	363	387	331	313	303	-26	165	139
5. Skilled Trades Occupations	218	235	258	252	236	-23	103	80
6. Personal Service Occupations	45	54	80	94	143	64	32	97
7. Sales and Customer Service Occupations	811	1,011	1,121	1,193	1,280	159	460	619
8. Transport and Machine Operatives	133	140	185	181	180	-5	73	68
9. Elementary Occupations	274	276	258	244	207	-51	124	73
Total	2,300	2,651	3,052	3,167	3,332	280	1294	1575

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	13	13	16	17	17	14	42	56
2. Professional Occupations	2	2	3	3	3	32	34	66
3. Associate Professional and Technical Occupations	5	6	8	9	9	28	42	70
4. Administrative, Clerical and Secretarial Occupations	16	15	11	10	9	-8	50	42
5. Skilled Trades Occupations	9	9	8	8	7	-9	40	31
6. Personal Service Occupations	2	2	3	3	4	80	40	120
7. Sales and Customer Service Occupations	35	38	37	38	38	14	41	55
8. Transport and Machine Operatives	6	5	6	6	5	-3	39	36
9. Elementary Occupations	12	10	8	8	6	-19	48	28
Total	**100**	**100**	**100**	**100**	**100**	9	42	52

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.14.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

6.15 HOTELS & CATERING

6.15.1 Description of the Industry

INDUSTRY 15: HOTELS & CATERING
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 (% 2002):	2.4	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	medium	average
Total employment (2002):	1,860,000	29,336,000
Share of total employment (% 2002):	6.2	100
Gender split (male:female) (% 2002):	41:59	53:47
Part-time share (% 2002):	54	27
Self-employment share (% 2002):	7	12

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

6.15.2 Industry Commentary

The sector is extremely vulnerable to fluctuations in the tourism industry, and recent national and global events such as foot-and-mouth and the aftermath of 9/11 have had significant effects on the sector. London in particular has been hard hit, especially at the luxury end of the market, although budget hotels continue to do well.

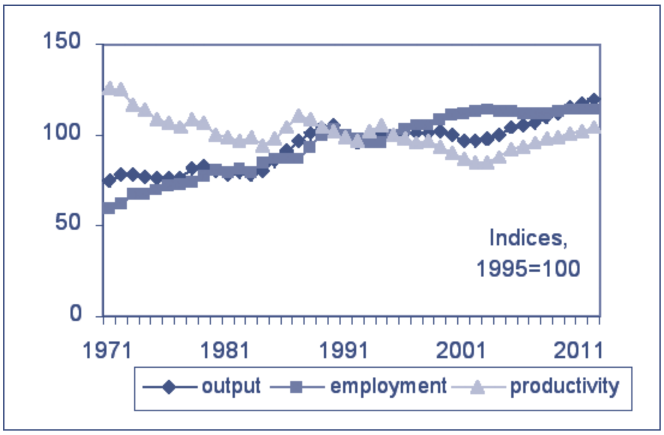
The fast food and café sector continues to experience net growth, and employment in the sector is forecast to grow in the coming years as the industry recovers from a series of catastrophic events.

6.15.3 Productivity and Output Trends

Table 6.15.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	1.2	-0.9	2.0	2.3
Employment (% pa)	1.5	1.4	-0.3	0.5
(000s pa)	121	129	-31	46
Productivity (% pa)	-0.3	-2.4	2.4	1.8

Figure 6.15.1: Output, Productivity and Employment, Hotels & Catering



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output trends have been flat in this industry for many years. Recent events have further depressed output levels. Some recovery is now expected and this is projected to continue over the medium-term.
- Productivity levels have fallen steadily over the past decade, but this is expected to be reversed over the next 10 years.
- Employment levels are expected to show little change, with declines in the short-term being offset by increases in the second half of the decade.

6.15.4 Employment by Status and Gender

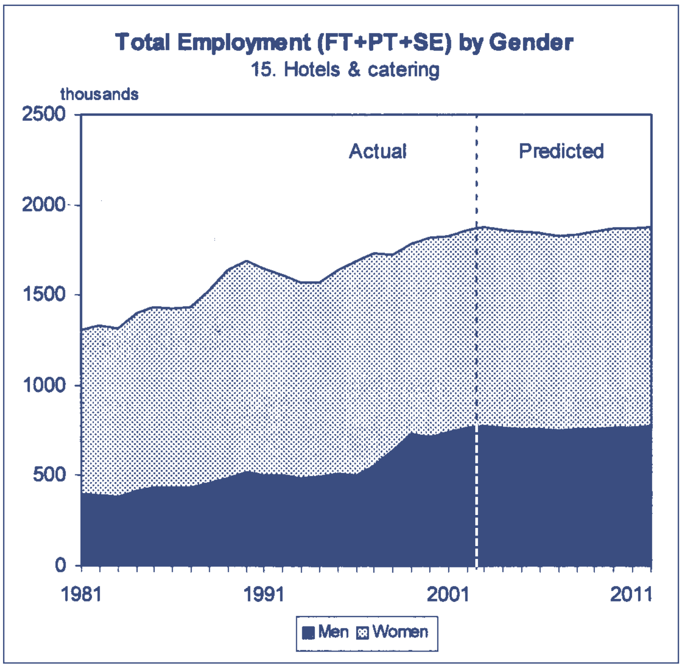
Females account for the majority of employment in the industry. Well over half the jobs in the industry are part-time. Self-employment accounts for only a relatively small share of employment (1 in 20 jobs).

Table 6.15.2: Employment Levels by Gender and Status, Hotels & Catering

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		**% shares**		**% shares**		**% shares**	**000s**	**% shares**	**2002-07**			**000s**
Male employment	381	(20.5)	320	(17.2)	67	(3.6)	768	(41.3)	-8	-5	-1	-14
Female employment	357	(19.2)	679	(36.5)	57	(3.1)	1,093	(58.7)	-7	-9	-1	-17
Total employment	**738**	**(39.7)**	**999**	**(53.7)**	**124**	**(6.6)**	**1,860**	**(100)**	**-15**	**-14**	**-2**	**-31**
2007									**2007-12**			
Male employment	373	(20.4)	315	(17.2)	66	(3.6)	754	(41.2)	9	8	2	19
Female employment	351	(19.2)	669	(36.6)	56	(3.1)	1,076	(58.8)	9	17	1	27
Total employment	**724**	**(39.6)**	**984**	**(53.8)**	**122**	**(6.6)**	**1,830**	**(100)**	**18**	**25**	**3**	**46**
2012									**2002-12**			
Male employment	382	(20.4)	323	(17.2)	67	(3.6)	773	(41.2)	1	3	1	5
Female employment	359	(19.2)	686	(36.6)	57	(3.1)	1,103	(58.8)	2	8	0	10
Total employment	**742**	**(39.5)**	**1,009**	**(53.8)**	**125**	**(6.6)**	**1,876**	**(100)**	**3**	**11**	**1**	**15**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

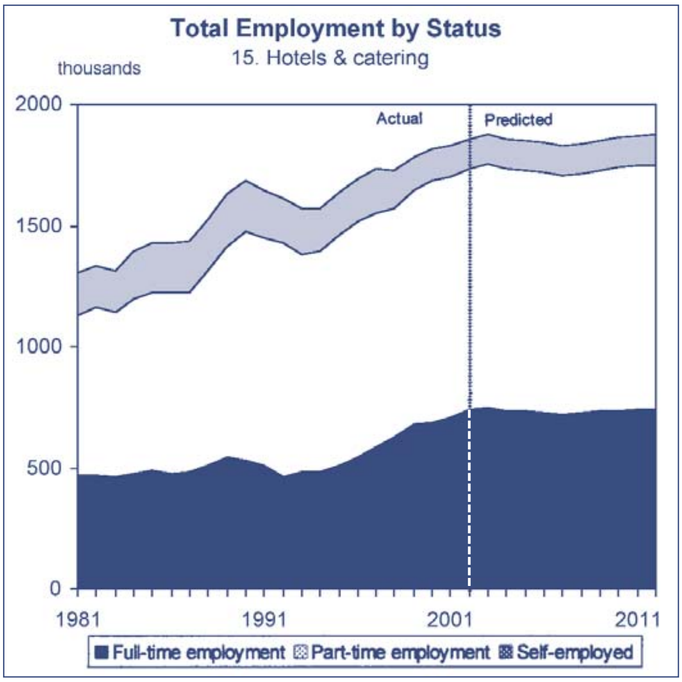
Figure 6.15.2: Changing Patterns of Sectoral Employment by Gender



- Gender shares of employment are expected to remain stable.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.15.3: Changing Patterns of Sectoral Employment by Status



- Self-employment shares are projected to level off after a period of long-term decline.
- Both full-time and part-time employees are expected to maintain their employment shares.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

6.15.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Two groups dominate employment in this sector: managers and senior officials and elementary occupations. They each account for around 30% of employment.
- Skilled trades account for a further 1 in 10 jobs.

Future changes

- These patterns are expected to remain broadly unchanged.
- Previous upward trends in the share of the managers' group are projected to cease.
- The historical pattern of declining shares for elementary occupations is, however, predicted to continue, the main beneficiaries of this restructuring being personal service occupations.

Replacement demands

- Although little change is expected in total employment for this industry, replacement demands will be very significant.
- Over the next 10 years almost a million people will be needed to replace existing personnel.
- By far the largest increases are in the managerial and elementary groups. These present very different challenges in terms of education and training needs.
- Most 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

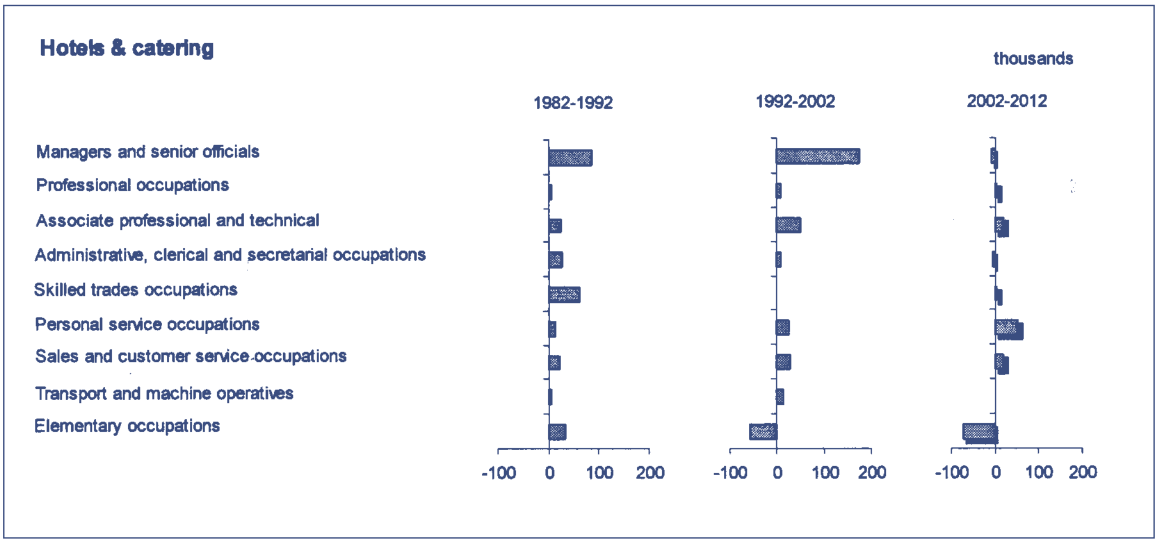
United Kingdom: Hotels & catering

Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	2002-2012 Total Requirement
1. Managers and Senior Officials	300	385	559	540	551	17	235	252
2. Professional Occupations	9	14	23	24	27	4	8	12
3. Associate Professional and Technical Occupations	32	56	106	112	125	21	45	66
4. Administrative, Clerical and Secretarial Occupations	90	118	127	120	123	-8	61	53
5. Skilled Trades Occupations	148	209	209	216	213	4	84	87
6. Personal Service Occupations	36	49	74	80	128	42	29	71
7. Sales and Customer Service Occupations	46	67	95	101	115	15	39	54
8. Transport and Machine Operatives	20	26	39	38	40	4	15	20
9. Elementary Occupations	653	686	628	598	555	-83	330	246
Total	1,334	1,611	1,860	1,830	1,876	15	846	862

						2002-2012 Percentage Changes		
Percentage Shares	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	22	24	30	29	29	3	42	45
2. Professional Occupations	1	1	1	1	1	17	36	53
3. Associate Professional and Technical Occupations	2	3	6	6	7	19	43	62
4. Administrative, Clerical and Secretarial Occupations	7	7	7	7	7	-6	49	42
5. Skilled Trades Occupations	11	13	11	12	11	2	40	42
6. Personal Service Occupations	3	3	4	4	7	57	40	96
7. Sales and Customer Service Occupations	3	4	5	6	6	16	42	58
8. Transport and Machine Operatives	2	2	2	2	2	11	39	51
9. Elementary Occupations	49	43	34	33	30	-13	53	39
Total	**100**	**100**	**100**	**100**	**100**	1	45	46

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.15.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

6.16 TRANSPORT & STORAGE

6.16.1 Description of the Industry

INDUSTRY 16: TRANSPORT & STORAGE
SIC92 headings: 60.1, 60.2, 60.3, 61, 62, 63

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.

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	5.3	100
Exposure to international trade:	high	average
Concentration (market share of largest employers):	medium	average
Total employment (2002):	1,261,000	29,336,000
Share of total emloyment (% 2002):	4.2	100
Gender split (male:female) (% 2002):	72:28	53:47
Part-time share (% 2002):	12	27
Self-employment share (% 2002):	18	12

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 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) has announced reduced enhancement 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. All in all, the choices ahead are between increased public spending, or a reduced rail network and fewer services. Some reductions in services are already planned.

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.

The shipping freight sector remains very competitive, with capacity increasing faster than volumes as the new generation of large container ships comes on stream.

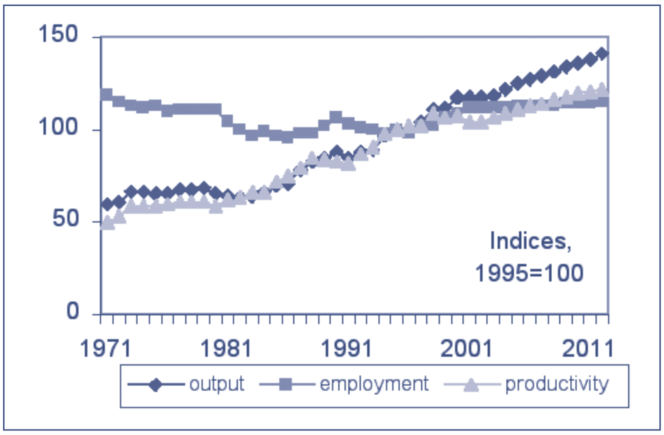
Air transport has been severely affected by the events of 9/11, and airlines have cut capacity and staff in the aftermath, simply in order to survive. The conflict in Iraq further dented the industry’s prospects. Coupled with the emergence of budget airlines which are capturing an increasing market share, the traditional carriers are set to consolidate their operations in the years ahead.

6.16.3 Productivity and Output Trends

Table 6.16.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	3.6	2.4	1.9	1.7
Employment (% pa)	0.3	1.8	0.2	0.3
(000s pa)	15	109	11	22
Productivity (% pa)	3.3	0.6	1.7	1.4

Figure 6.16.1: Output, Productivity and Employment, Transport & Storage



Source: CE/IER estimates, MDM95 C31F9S 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 just under 2% per annum.
- Productivity growth has also risen rapidly, although recent events have resulted in a much slower rate of increase. Growth is expected to pick up to around 1.5% per annum over the next decade.
- As a consequence, only very modest increases in employment are projected.

6.16.4 Employment by Status and Gender

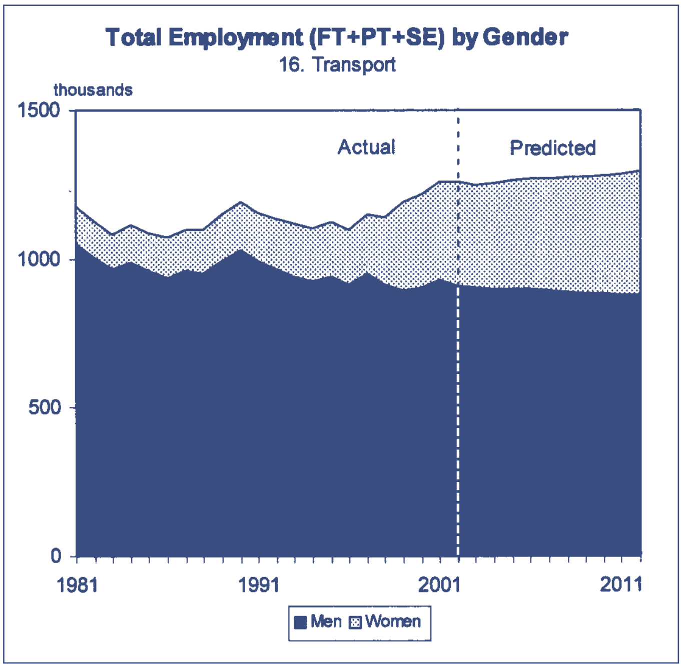
Women currently account for fewer than 3 in every 10 jobs in this industry. Part-time employment remains modest compared to many other service industries. Self-employment is very significant, especially in the road transport sector. In total, this accounts for almost 1 in 5 of all jobs.

Table 6.16.2: Employment Levels by Gender and Status, Transport & Storage

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
		% shares		% shares		% shares	000s	% shares				
2002									**2002-07**			**000s**
Male employment	650	(51.6)	59	(4.7)	202	(16)	911	(72.3)	-24	12	-8	-20
Female employment	229	(18.2)	94	(7.5)	26	(2.1)	349	(27.7)	15	11	5	31
Total employment	**879**	**(69.8)**	**153**	**(12.2)**	**228**	**(18.1)**	**1,261**	**(100)**	**-9**	**24**	**-3**	**11**
2007									**2007-12**			
Male employment	626	(49.2)	71	(5.6)	194	(15.3)	891	(70.1)	-25	14	-1	-13
Female employment	244	(19.2)	106	(8.3)	31	(2.4)	381	(29.9)	19	11	5	34
Total employment	**870**	**(68.4)**	**177**	**(13.9)**	**225**	**(17.7)**	**1,272**	**(100)**	**-7**	**25**	**4**	**22**
2012									**2002-12**			
Male employment	601	(46.4)	85	(6.6)	193	(14.9)	879	(67.9)	-50	26	-9	-33
Female employment	263	(20.3)	117	(9)	36	(2.8)	415	(32.1)	34	22	10	66
Total employment	**863**	**(66.7)**	**202**	**(15.6)**	**229**	**(17.7)**	**1,294**	**(100)**	**-16**	**48**	**1**	**33**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

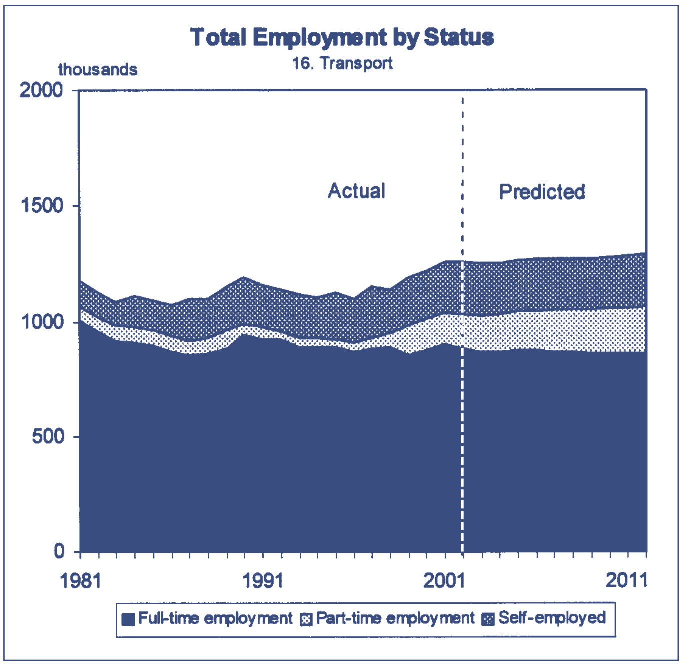
Figure 6.16.2: Changing Patterns of Sectoral Employment by Gender



- Women are expected to increase their share of employment, approaching a third of the total.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.16.3: Changing Patterns of Sectoral Employment by Status



- Self-employment will continue to be important in some parts of the industry. The share in part-time employment will increase slightly, continuing recent trends.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

6.16.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Transport drivers and machine operatives are the largest occupational group in this industry, still accounting for over a quarter of all jobs in 2002.
- Other occupations such as administrative, clerical and secretarial and elementary occupations are also important, although the latter has been declining.

Future changes

- Changes in occupation structure will favour white collar groups such as managers, professionals and associate professionals.
- There are also increases for personal service occupations and sales and customer service occupations.
- Significant job losses are projected for skilled trades and elementary occupations.

Replacement demands

- 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.
- In total, replacement demands over the next 10 years are estimated at around half a million. The largest figures are for transport and machine operatives, administrative, clerical and secretarial occupations and managers and senior officials. In each case, replacement demands amount to around 100,000 people over the next 10 years.
- In all other occupations, a substantial proportion of the current workforce will need to be replaced over the next decade, typically these average around 40%.

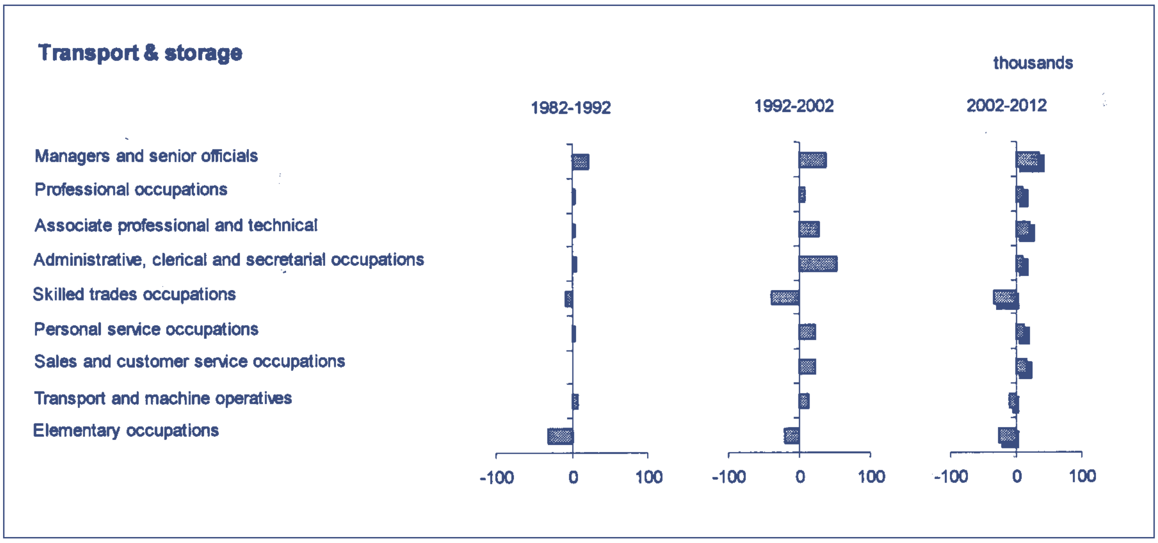
Table 6.16.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Transport & Storage								2002-2012
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	73	96	134	150	169	35	54	89
2. Professional Occupations	40	44	51	57	62	10	16	27
3. Associate Professional and Technical Occupations	69	74	102	114	123	21	40	60
4. Administrative, Clerical and Secretarial Occupations	145	151	204	205	214	11	96	107
5. Skilled Trades Occupations	179	170	131	112	96	-35	58	23
6. Personal Service Occupations	28	32	54	59	68	13	20	33
7. Sales and Customer Service Occupations	15	16	39	47	55	18	17	35
8. Transport and Machine Operatives	334	342	356	347	345	-13	131	118
9. Elementary Occupations	242	211	190	180	163	-27	70	43
Total	1,123	1,137	1,261	1,272	1,294	33	502	535

						2002-2012 Percentage Changes		
Percentage Shares	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	6	8	11	12	13	26	40	66
2. Professional Occupations	4	4	4	4	5	20	32	53
3. Associate Professional and Technical Occupations	6	7	8	9	9	20	39	59
4. Administrative, Clerical and Secretarial Occupations	13	13	16	16	17	5	47	52
5. Skilled Trades Occupations	16	15	10	9	7	-27	44	18
6. Personal Service Occupations	2	3	4	5	5	24	37	61
7. Sales and Customer Service Occupations	1	1	3	4	4	47	44	91
8. Transport and Machine Operatives	30	30	28	27	27	-4	37	33
9. Elementary Occupations	22	19	15	14	13	-14	37	22
Total	**100**	**100**	**100**	**100**	**100**	3	40	42

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.16.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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 (% 2002):	5.1	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	high	average
Total employment (2002):	547,000	29,336,000
Share of total employment (% 2002):	1.8	100
Gender split (male:female) (% 2002):	73:27	53:47
Part-time share (% 2002):	16	27
Self-employment share (% 2002):	2	12

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

6.17.2 Industry Commentary

The strong growth witnessed in this sector in the late 1990s, due to liberalisation of fixed-line telecommunication networks and the adoption of mobile telephony, has come to an end. The roll-out of broadband has been slower than expected, in part because many of the firms that intended to take part in the expansion are heavily indebted. A similar fate has befallen the mobile telephony companies who were successful in bidding £22bn for the UK 3G licences, but are faced with uncertainty about the take-up of 3G services amongst their customers. Price controls for cross-network calling have also been imposed.

The slowdown in the sector post-2000 has been driven by near saturation in the mobile telephone sector, and the steep falls in equity values reducing financing of any expansion. Retrenchment created a climate that positively discouraged investment in new ICT equipment, and uncertainly over the conflict with Iraq further exacerbated this.

Despite this, output is forecast to grow rapidly over the next decade, although employment will show little or no growth.

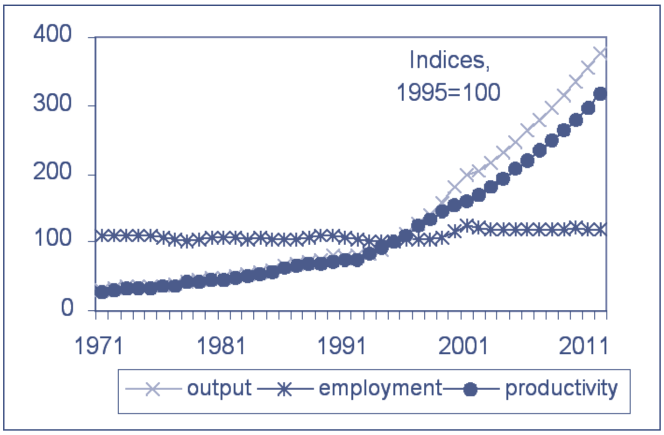
Employment is dominated by the postal and related services component of the industry as opposed to the telecommunications side. The Royal Mail is currently experiencing large losses and plans to restructure its operations. This could result in even greater job losses than projected here.

6.17.3 Productivity and Output Trends

Table 6.17.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	10.3	9.6	6.5	6.3
Employment (% pa)	-0.2	3.2	-0.3	0.0
(000s pa)	-5	80	-9	0
Productivity (% pa)	10.6	6.2	6.8	6.3

Figure 6.17.1: Output, Productivity and Employment, Communications



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output trends in this industry have followed an almost exponential growth path. Some slowdown is anticipated over the next 10 years, but with rates of increase of over 6% per annum, it remains one of the, fastest growing sectors.
- Productivity has also followed a very rapidly rising trend. This is expected to continue over the next decade at a similar pace to the growth in output.
- Consequently the industry is expected to continue its recent pattern of 'jobless' growth, with little or no change in employment levels.

6.17.4 Employment by Status and Gender

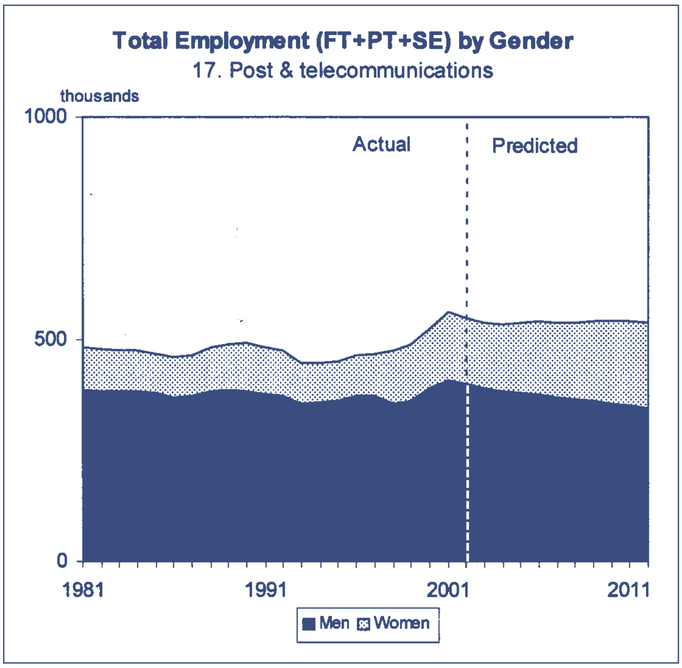
Females currently account for about a quarter of all jobs but this has been rising. Part-time employment is quite important, representing about 16% of all jobs. Self-employment remains trivial by comparison.

Table 6.17.2: Employment Levels by Gender and Status, Communications

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	349	(63.8)	46	(8.4)	6	(1.1)	401	(73.3)	-24	-8	0	-31
Female employment	99	(18.1)	42	(7.6)	6	(1)	146	(26.7)	26	-5	1	23
Total employment	**448**	**(81.9)**	**88**	**(16.1)**	**11**	**(2.1)**	**547**	**(100)**	**3**	**-12**	**1**	**-9**
2007									**2007-12**			
Male employment	325	(60.4)	38	(7.1)	6	(1.1)	369	(68.7)	-18	-7	0	-25
Female employment	125	(23.3)	37	(6.9)	6	(1.2)	169	(31.3)	28	-4	1	25
Total employment	**450**	**(83.7)**	**76**	**(14)**	**12**	**(2.3)**	**538**	**(100)**	**10**	**-11**	**1**	**0**
2012									**2002-12**			
Male employment	307	(57.1)	32	(5.9)	6	(1.1)	345	(64.1)	-42	-14	0	-56
Female employment	153	(28.4)	33	(6.1)	7	(1.4)	193	(35.9)	54	-9	2	47
Total employment	**460**	**(85.5)**	**65**	**(12.1)**	**13**	**(2.5)**	**538**	**(100)**	**12**	**-23**	**2**	**-9**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

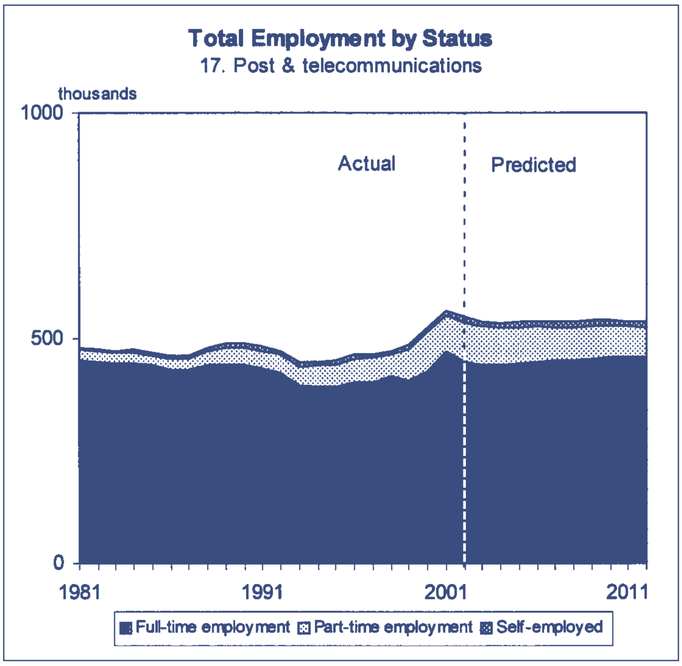
Figure 6.17.2: Changing Patterns of Sectoral Employment by Gender



- Females are expected to increase their share of a static employment total, reaching over a third of the total by 2012.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.17.3: Changing Patterns of Sectoral Employment by Status



- Part-time employment is not expected to increasein importance. Self-employment will remain insignificant.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

6.17.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Currently employment is concentrated in four main occupations:
  - administrative, clerical and secretarial;
  - skilled trades;
  - transport and machine operatives;
  - elementary occupations.
- This reflects the dominance of the postal and deliveries side of the industry as opposed to telecommunications.
- All but the first of these have seen their employment shares decline in recent years.

Future changes

- Sharp reductions in employment in the last three occupations are projected as the industry is restructured.
- These are offset by job gains in the administrative, clerical and secretarial category (perhaps surprisingly, but continuing recent trends) as well as for managerial, and sales and customer service occupations.

Replacement demand

- Although little change is expected in total employment, there will be significant replacement needs to be met.
- These are concentrated in the four occupations highlighted previously.
- The total requirements paint a somewhat different picture, with the highest rates of increase for some of the newly emerging occupations such as the sales and customer service group.

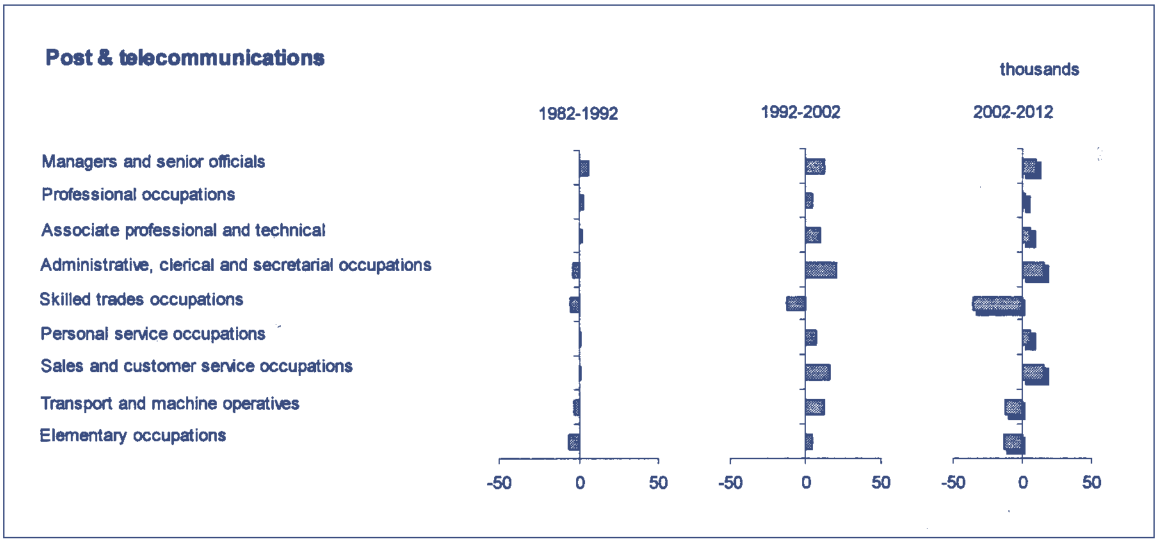
Table 6.17.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Communications								2002-2012
Employment Levels (000)	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	20	27	39	43	49	10	16	25
2. Professional Occupations	15	18	23	24	25	2	7	9
3. Associate Professional and Technical Occupations	19	21	31	33	36	6	12	18
4. Administrative, Clerical and Secretarial Occupations	97	94	114	120	129	16	52	68
5. Skilled Trades Occupations	120	114	102	83	67	-35	47	12
6. Personal Service Occupations	8	9	16	18	22	6	5	11
7. Sales and Customer Service Occupations	13	14	30	36	45	15	13	28
8. Transport and Machine Operatives	103	101	113	105	100	-13	41	27
9. Elementary Occupations	81	75	79	75	66	-14	30	17
Total	477	472	547	538	538	-9	223	214

						2002-2012 Percentage Changes		
Percentage Shares	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	4	6	7	8	9	24	40	64
2. Professional Occupations	3	4	4	4	5	7	32	39
3. Associate Professional and Technical Occupations	4	4	6	6	7	18	40	59
4. Administrative, Clerical and Secretarial Occupations	20	20	21	22	24	14	46	60
5. Skilled Trades Occupations	25	24	19	15	12	-35	46	11
6. Personal Service Occupations	2	2	3	3	4	38	33	71
7. Sales and Customer Service Occupations	3	3	5	7	8	49	42	91
8. Transport and Machine Operatives	22	21	21	20	19	-12	36	24
9. Elementary Occupations	17	16	14	14	12	-17	38	21
Total	**100**	**100**	**100**	**100**	**100**	-2	41	39

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.17.4: Changing Composition of Employment by Occupation, 1981-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

6.18 BANKING & INSURANCE

6.18.1 Description of the Industry

INDUSTRY 18: BANKING & INSURANCE
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 (% 2002):	8.0	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	high	average
Total employment (2002):	1,146,000	29,336,000
Share of total employment (% 2002):	3.8	100
Gender split (male:female) (% 2002):	47:53	53:47
Part-time share (% 2002):	19	27
Self-employment share (% 2002):	13	12

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

6.18.2 Industry Commentary

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 less successful due to cultural barriers. Profitability in UK banking is still good, and, with Spain, is the highest in the EU, despite increasing provision for bad debts being made, due to the slowdown in economic activity and rising consumer debt. However, investment banking reported lower activity of late, due to lower merger and acquisition activity, and this is resulting in some job losses in the city. However, banking growth is still expected to be strong in the immediate future.

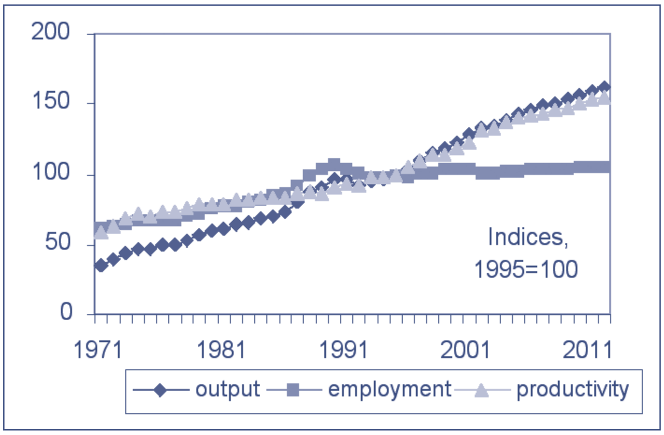
The insurance industry is now subject to greater scrutiny and regulation following a series of high profile failures. This is not without costs for the industry, and coupled with a weak equity market, life assurers continue to reduce policy returns, and performance in the sector is likely to continue to be poor. Similarly, pension funds are performing poorly. Output growth is expected to be in line with the overall growth of the economy.

6.18.3 Productivity and Output Trends

Table 6.18.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	3.6	3.9	2.2	1.9
Employment (% pa)	-0.1	0.2	0.4	0.3
(000s pa)	-4	11	22	20
Productivity (% pa)	3.7	3.7	1.8	1.5

Table 6.18.1: Output, Productivity and Employment, Banking & Insurance



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output in this industry has been on a strongly positive trend for many years, with just a brief slowdown in the early 1990s. Recent years have seen 3.5% per annum growth.
- This pace is projected to moderate slightly over the next decade with increases of around 2% per annum expected.
- Productivity has followed a similar path to output and, again, is projected to slow somewhat over the next 10 years.
- Employment is expected to remain flat, with little change by 2012.

6.18.4 Employment by Status and Gender

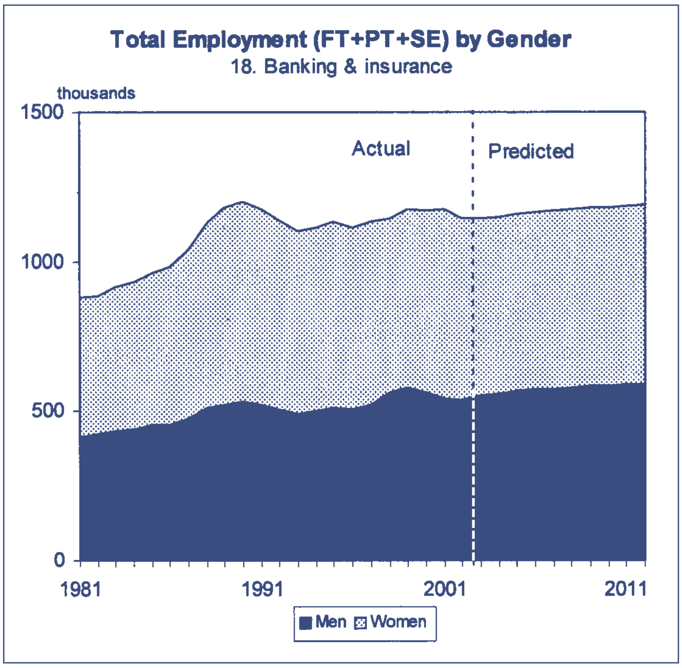
Employment in this industry is fairly evenly divided between males and females, although more of the men are self-employed, while more of the women work part-time. In total, part-time working accounts for over 15% of all jobs. Self-employment is currently rather less significant.

Table 6.18.2: Employment Levels by Gender and Status, Banking & Insurance

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	439	(38.3)	36	(3.2)	63	(5.5)	538	(46.9)	18	2	18	38
Female employment	419	(36.6)	149	(13)	40	(3.5)	608	(53.1)	-22	-4	10	-16
Total employment	**858**	**(74.9)**	**185**	**(16.2)**	**103**	**(8.9)**	**1,146**	**(100)**	**-4**	**-2**	**28**	**22**
2007									**2007-12**			
Male employment	457	(39.1)	38	(3.2)	81	(6.9)	576	(49.3)	8	2	6	16
Female employment	397	(34)	145	(12.4)	50	(4.3)	592	(50.7)	-7	4	7	3
Total employment	**854**	**(73.1)**	**183**	**(15.6)**	**131**	**(11.2)**	**1,168**	**(100)**	**0**	**6**	**13**	**20**
2012									**2002-12**			
Male employment	464	(39.1)	40	(3.4)	87	(7.4)	592	(49.8)	26	4	24	54
Female employment	390	(32.8)	149	(12.6)	57	(4.8)	595	(50.2)	-29	0	17	-12
Total employment	**854**	**(72)**	**189**	**(15.9)**	**144**	**(12.1)**	**1,187**	**(100)**	**-4**	**4**	**41**	**42**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

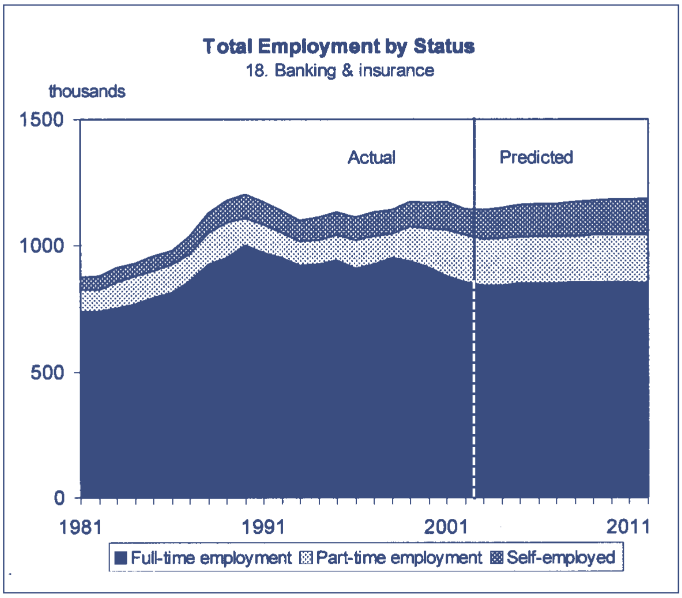
Figure 6.18.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- The mix between males and females is not expected to change substantially.

Figure 6.18.3: 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).

- A slight increase in self-employment is projected, continuing the recent trend.
- 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 2002 administrative, clerical and secretarial workers accounted for almost 1 in every 2 jobs in this industry.
- Managerial and associate professional and technical occupations were also significant, each accounting for around 1 in 8 jobs.

Future changes

- Recent declines in the share of the administrative, clerical and secretarial category are projected to continue. By 2012 this will account for just over 40% of the total.
- These job losses will be offset by small increases elsewhere for the managerial and associate professional categories and also for sales and customer service occupations.

Replacement demands

- Total replacement demands for the industry are more than 10 times the modest scale of expansion demand.
- Replacement demands are dominated by the administrative, clerical and secretarial groups which, although in decline, will account for 50% of all replacement needs.
- The other occupational groups already highlighted make up most of the balance of around a quarter of a million replacements that will be needed between 2002 and 2012.

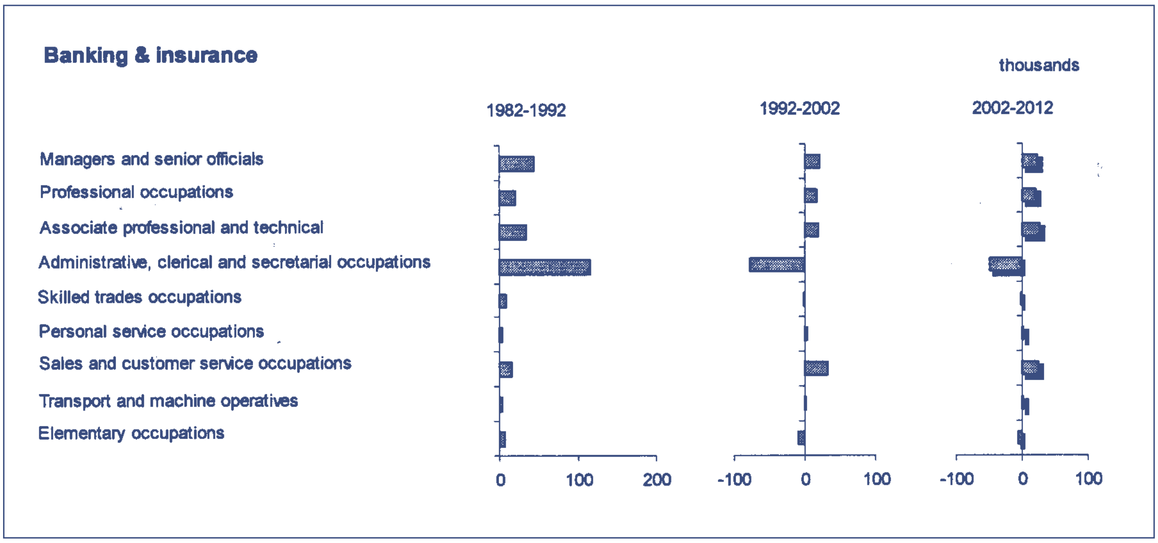
Table 6.18.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Banking & Insurance						2002-2012		
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	103	147	168	181	191	21	67	88
2. Professional Occupations	43	65	82	92	101	15	26	41
3. Associate Professional and Technical Occupations	84	118	137	150	163	27	56	83
4. Administrative, Clerical and Secretarial Occupations	491	607	531	505	482	-43	246	203
5. Skilled Trades Occupations	29	37	35	37	34	-1	15	13
6. Personal Service Occupations	11	14	18	15	21	3	7	10
7. Sales and Customer Service Occupations	48	64	96	108	121	28	43	71
8. Transport and Machine Operatives	17	21	23	24	25	1	9	11
9. Elementary Occupations	56	64	55	54	50	-8	26	17
Total	884	1,138	1,146	1,168	1,187	42	494	536

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	12	13	15	16	16	12	40	52
2. Professional Occupations	5	6	7	8	9	19	33	52
3. Associate Professional and Technical Occupations	10	10	12	13	14	19	41	60
4. Administrative, Clerical and Secretarial Occupations	56	53	46	43	41	-8	47	39
5. Skilled Trades Occupations	3	3	3	3	3	-4	39	35
6. Personal Service Occupations	1	1	2	1	2	14	36	50
7. Sales and Customer Service Occupations	5	6	8	9	10	29	45	74
8. Transport and Machine Operatives	2	2	2	2	2	4	38	42
9. Elementary Occupations	6	6	5	5	4	-15	46	31
Total	**100**	**100**	**100**	**100**	**100**	4	43	47

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.18.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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 (% 2002):	4.9	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	734,000	29,336,000
Share of total employment (% 2002):	2.4	100
Gender split (male:female) (% 2002):	56:44	53:47
Part-time share (% 2002):	25	27
Self-employment share (% 2002):	20	12

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

6.19.2 Industry Commentary

While the residential housing market continues to exhibit a strong performance, although perhaps flattening out in 2003, this is in direct contrast to the commercial property market, which continues in the doldrums. London, and central London especially, is particularly badly affected as firms retrench given the poor stock market performance and uncertainty connected with the conflict in Iraq.

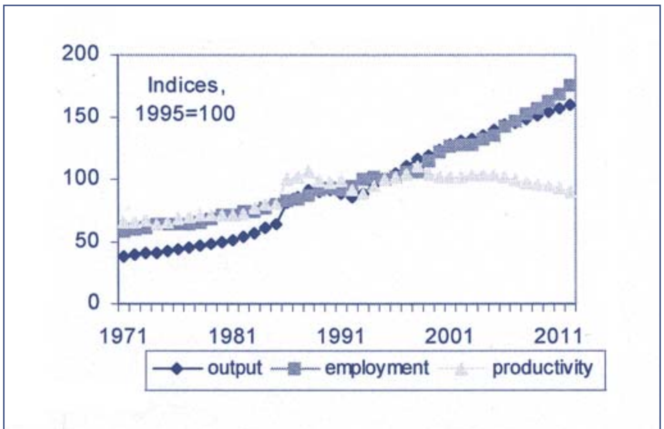
Plant and machinery rental has been affected by the general slowdown in economic activity since 2000. However, the buoyant construction sector in the last year or so has led to some recovery in this sector more recently.

6.19.3 Productivity and Output Trends

Table 6.19.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	5.2	3.3	2.3	1.8
Employment (% pa)	2.4	3.8	2.8	3.7
(000s pa)	69	125	107	167
Productivity (% pa)	2.7	-0.5	-0.4	-1.8

Figure 6.19.1: Output, Productivity and Employment, Professional Services



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Following a period of little or no growth during the late 1980s and early 1990s, output picked up and grew rapidly over the last 10 years.
- Although the pace of growth is expected to slow, further increases of around 2% per annum are projected.
- Productivity (as measured by output per head) followed a similar pattern until the late 1990s but has since fallen. This has reflected the much greater use of part-time workers.
- Employment has risen steadily since the early 1990s and this trend is expected to continue, with a growth of over a quarter of a million jobs between 2002 and 2012. Over 40% of this is for part-timers.

6.19.4 Employment by Status and Gender

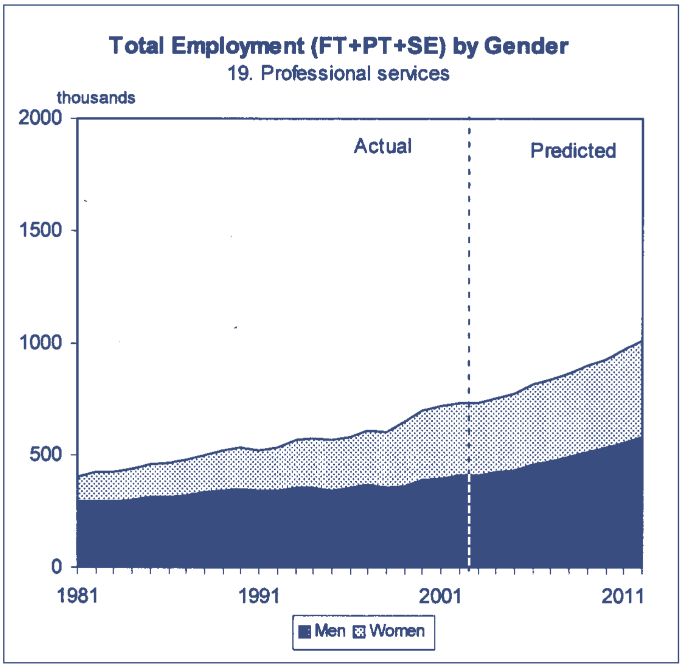
Males account for just over half the jobs in this industry. Part-time workers account for 1 in every 5 jobs. They are predominantly held by females. Self-employment accounts for around 1 in 10 jobs, but in this case males predominate.

Table 6.19.2: Employment Levels by Gender and Status, Prof. services

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
		% shares		% shares		% shares	000s	% shares				
2002									**2002-07**			**000s**
Male employment	305	(41.6)	34	(4.6)	73	(9.9)	412	(56.2)	35	33	-2	65
Female employment	188	(25.6)	110	(15)	24	(3.3)	321	(43.8)	22	18	2	42
Total employment	**493**	**(67.2)**	**144**	**(19.6)**	**97**	**(13.2)**	**734**	**(100)**	**57**	**51**	**0**	**107**
2007									**2007-12**			
Male employment	340	(40.5)	67	(7.9)	71	(8.4)	477	(56.8)	81	25	0	105
Female employment	209	(24.9)	128	(15.2)	26	(3.1)	363	(43.2)	54	4	3	61
Total employment	**550**	**(65.4)**	**194**	**(23.1)**	**97**	**(11.5)**	**841**	**(100)**	**135**	**29**	**3**	**167**
2012									**2002-12**			
Male employment	421	(41.8)	91	(9)	71	(7)	583	(57.9)	115	57	-2	171
Female employment	264	(26.2)	132	(13.1)	29	(2.8)	424	(42.1)	76	22	5	103
Total employment	**685**	**(68)**	**223**	**(22.1)**	**100**	**(9.9)**	**1,007**	**(100)**	**192**	**79**	**3**	**274**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

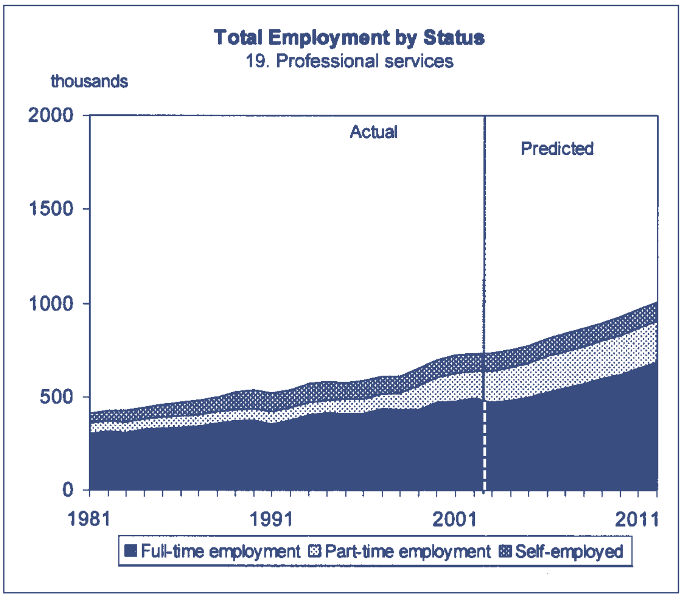
Figure 6.19.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Females are projected to increase their share of the total number of jobs in this industry.

Figure 6.19.3: 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).

- Part-time employment is expected to increase in importance, but the share of self-employment falls.

6.19.5 Projections of Employment by Occupation

Key aspects of occupational employment structure

- Again four groups dominate employment:
  - managers and senior officials;
  - professional occupations;
  - association professional and technical occupations;
  - administrative, clerical and 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 four occupations will all see employment growth.
- Personal service occupations are also expected to see a significant increase in both their share of total employment and the absolute number of jobs.

Replacement demands

- Substantial expansion demands of just under 300,000 additional jobs by 2012 are reinforced by equally large replacement demands.
- These affect all occupations, but are especially important for the four occupations highlighted previously and the personal service occupations group.

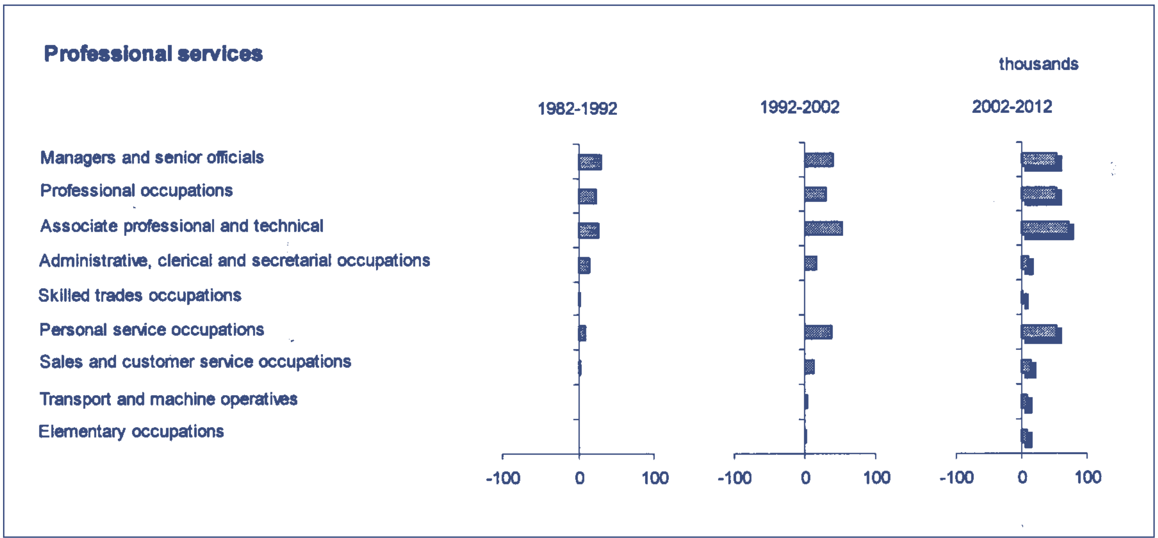
Table 6.19.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Prof. services						2002-2012		
Employment Levels (000)	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	70	101	141	159	194	42	59	101
2. Professional Occupations	67	91	121	141	174	31	37	68
3. Associate Professional and Technical Occupations	73	99	152	179	223	66	60	126
4. Administrative, Clerical and Secretarial Occupations	97	112	129	134	139	36	63	98
5. Skilled Trades Occupations	30	33	33	34	35	-1	14	13
6. Personal Service Occupations	15	25	62	85	116	68	25	93
7. Sales and Customer Service Occupations	10	12	25	32	40	21	12	33
8. Transport and Machine Operatives	22	23	26	30	34	5	11	16
9. Elementary Occupations	40	41	43	47	52	6	21	27
Total	424	539	734	841	1,007	274	302	575

						2002-2012 Percentage Changes		
Percentage Shares	**1982**	**1992**	**2002**	**2007**	**2012**	**Net Change**	**Replacement Demands**	**Total Requirement**
1. Managers and Senior Officials	17	19	19	19	19	29	42	72
2. Professional Occupations	16	17	17	17	17	27	32	60
3. Associate Professional and Technical Occupations	17	18	21	21	22	44	40	84
4. Administrative, Clerical and Secretarial Occupations	23	21	18	16	14	27	48	75
5. Skilled Trades Occupations	7	6	4	4	3	-3	41	39
6. Personal Service Occupations	4	5	8	10	11	108	40	148
7. Sales and Customer Service Occupations	2	2	3	4	4	80	44	124
8. Transport and Machine Operatives	5	4	4	4	3	18	38	56
9. Elementary Occupations	9	8	6	6	5	13	45	58
Total	**100**	**100**	**100**	**100**	**100**	37	41	78

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.19.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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 non-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 (% 2002):	2.5	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	medium	average
Total employment (2002):	548,000	29,336,000
Share of total employment (% 2002):	1.8	100
Gender split (male:female) (% 2002):	62:38	53:47
Part-time share (% 2002):	14	27
Self-employment share (% 2002):	8	12

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

6.20.2 Industry Commentary

Rapid growth in this sector in the 1990s was 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. Liberalisation of telecommunications in the EU also contributed, and the Y2000 issue boosted the demand for product upgrades and services. 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% of the world market.

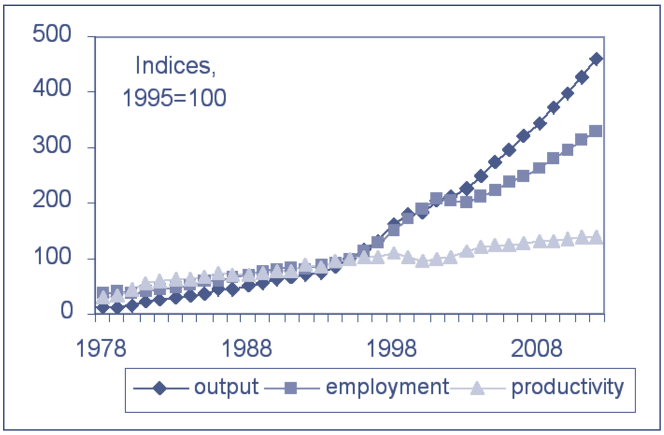
Future large-scale government projects in health, judiciary and customs and excise will provide some support to the industry in the near future, but its prospects are heavily dependent on the timing of the business cycle and the adoption of new mobile ICT applications.

6.20.3 Productivity and Output Trends

Table 6.20.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	13.4	9.8	8.6	7.6
Employment (% pa)	9.8	9.7	3.9	5.8
(000s pa)	129	203	117	218
Productivity (% pa)	3.3	0.1	4.5	1.6

Figure 6.20.1: Output, Productivity and Employment, Computing Services



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 in recent years, with growth over the past 10 years or so of over 10% per annum.
- This is expected to only moderate very slightly (following a slight hiccup since the dot.com bubble burst). Very rapid increases of the order of 8% per annum are projected.
- Productivity has followed an equally impressive trend (as measured by output per person employed), although this has slowed more substantially over the last few years, partly reflecting a large increase in the use of part-time workers.
- Following a brief pause, employment growth is projected to pick up again, reaching over 5% per annum and resulting in over 300,000 extra jobs by 2012.

6.20.4 Employment by Status and Gender

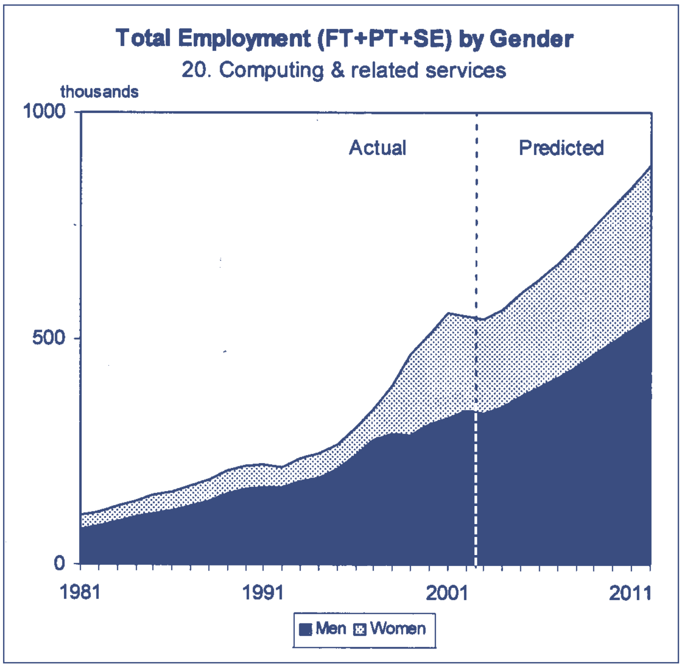
Females currently account for just under 4 out of every 10 jobs in this industry but this has been rising. Part-time employment is also on a rising trend, currently accounting for around 14% of all jobs. Self-employment accounts for around 1 in 10 jobs in 2002.

Table 6.20.2: Employment Levels by Gender and Status, Computing Services

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		**% shares**		**% shares**		**% shares**	**000s**	**% shares**	**2002-07**			**000s**
Male employment	273	(49.9)	25	(4.5)	42	(7.6)	340	(62)	58	5	9	72
Female employment	153	(27.9)	51	(9.3)	4	(0.7)	208	(38)	33	11	1	45
Total employment	**426**	**(77.8)**	**76**	**(13.9)**	**46**	**(8.4)**	**548**	**(100)**	**91**	**16**	**10**	**117**
2007									**2007-12**			
Male employment	332	(49.9)	30	(4.5)	51	(7.6)	412	(62)	108	10	17	135
Female employment	186	(28)	62	(9.3)	5	(0.7)	253	(38)	61	20	2	83
Total employment	**518**	**(77.8)**	**92**	**(13.8)**	**56**	**(8.4)**	**665**	**(100)**	**169**	**30**	**18**	**218**
2012									**2002-12**			
Male employment	440	(49.8)	40	(4.5)	68	(7.6)	547	(62)	167	15	26	207
Female employment	247	(28)	82	(9.3)	7	(0.7)	336	(38)	94	31	2	128
Total employment	**687**	**(77.8)**	**122**	**(13.8)**	**74**	**(8.4)**	**883**	**(100)**	**261**	**46**	**28**	**335**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

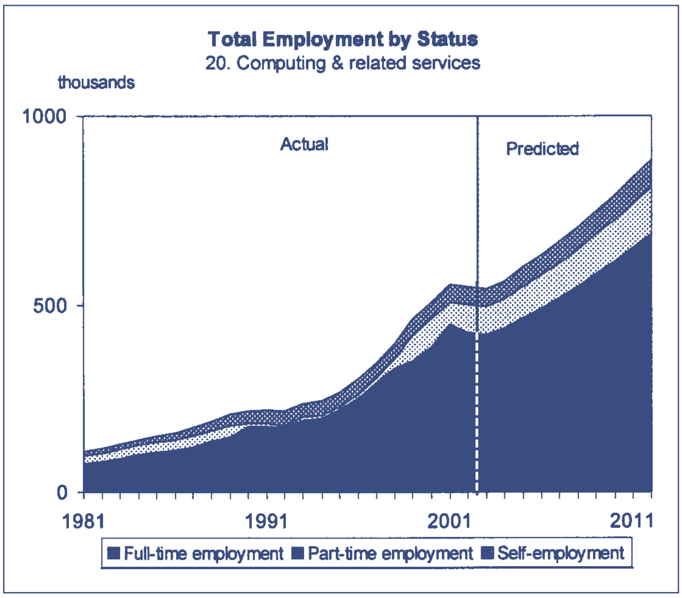
Figure 6.20.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Females are projected to continue to share in the rapid growth of employment in this industry.

Figure 6.20.3: 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).

- Part-time and self-employment shares are projected to be maintained at current levels.

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 are:
  - managers and senior officials;
  - professionals;
  - associate professionals and technical;
  - administrative, clerical and secretarial.

Future changes

- These patterns are expected to remain essentially unchanged over the next 10 years, with employment for all four groups growing substantially.
- Sales and customer service occupations are also projected to benefit and increase their share of the total.

Replacement demands

- Total requirements are almost twice as large as the already significant expansion demand projected.
- These replacement demands are also concentrated in the four main occupations highlighted previously.

Table 6.20.3: Changing Composition of Employment by Occupation and Replacement Demands

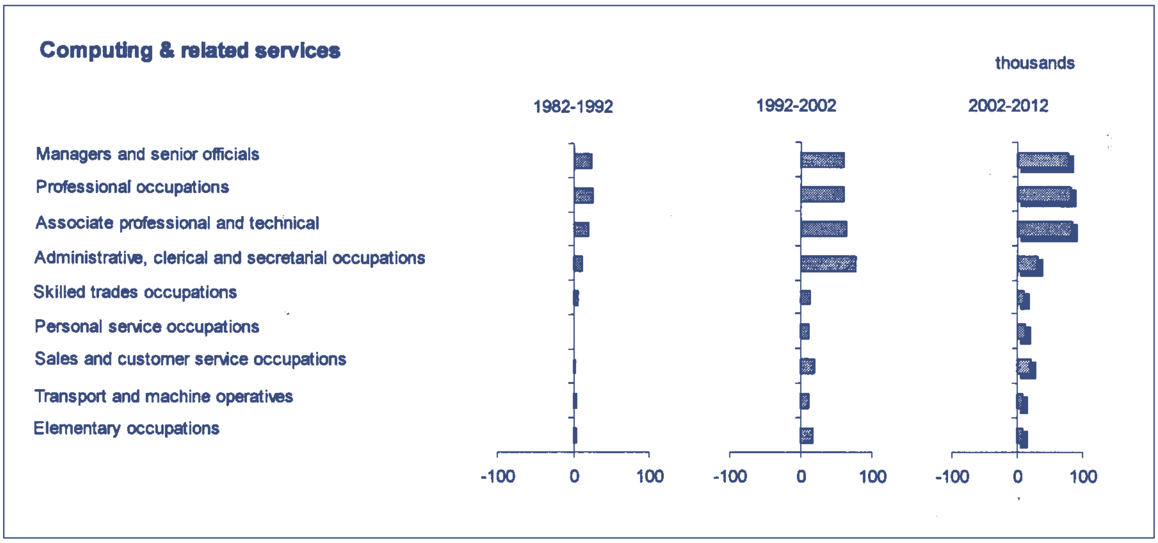
United Kingdom: Computing Services

Employment Levels (000)	1982	1992	2002	2007	2012	Net Change (2002-2012)	Replacement Demands (2002-2012)	Total Requirement (2002-2012)
1. Managers and Senior Officials	19	42	103	130	181	67	41	108
2. Professional Occupations	23	48	109	138	191	59	35	95
3. Associate Professional and Technical Occupations	18	38	102	131	185	80	42	122
4. Administrative, Clerical and Secretarial Occupations	30	42	120	129	151	70	59	130
5. Skilled Trades Occupations	8	15	28	31	38	1	11	12
6. Personal Service Occupations	2	3	14	18	27	16	5	22
7. Sales and Customer Service Occupations	3	5	23	31	44	30	11	40
8. Transport and Machine Operatives	5	9	20	23	29	4	8	12
9. Elementary Occupations	9	14	30	34	39	7	12	19
Total	117	216	548	665	883	335	224	559

Percentage Shares	1982	1992	2002	2007	2012	Net Change (2002-2012 Percentage Changes)	Replacement Demands (2002-2012 Percentage Changes)	Total Requirement (2002-2012 Percentage Changes)
1. Managers and Senior Officials	16	20	19	20	20	66	40	105
2. Professional Occupations	20	22	20	21	22	54	32	87
3. Associate Professional and Technical Occupations	15	17	19	20	21	79	42	120
4. Administrative, Clerical and Secretarial Occupations	26	19	22	19	17	58	49	108
5. Skilled Trades Occupations	7	7	5	5	4	4	38	42
6. Personal Service Occupations	2	2	3	3	3	114	37	151
7. Sales and Customer Service Occupations	2	2	4	5	5	130	46	176
8. Transport and Machine Operatives	5	4	4	3	3	22	39	61
9. Elementary Occupations	8	6	6	5	4	24	40	63
Total	**100**	**100**	**100**	**100**	**100**	61	41	102

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.20.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

6.21 OTHER BUSINESS SERVICES

6.21.1 Description of the Industry

INDUSTRY 21: OTHER BUSINESS SERVICES
SIC92 headings: 74

Other business services including: recruitment agencies; security services; industrial cleaning; photographic, packaging and secretarial services; and other business services nes. Other professional services including: legal, accountancy, tax, market research, other consultancy, architects, engineering services, weather forecasting, surveying; technical testing; advertising.

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	7.7	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	3,252,000	29,336,000
Share of total employment (% 2002):	10.8	100
Gender split (male:female) (% 2002):	54:46	53:47
Part-time share (% 2002):	23	27
Self-employment share (% 2002):	10	12

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 just four 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 last couple of years on which these firms grew rapidly during the 1980s and 1990s, together with the fall 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. Coupled with the fall-out from a series of US financial scandals, the sector has been under increasing pressure, and some restructuring has been required, further inspired by forthcoming greater EU regulation.

Advertising is very sensitive to the economic cycle and thus has struggled somewhat since the turn of the century. This has had knock-on effects on the media that are used, especially newspapers and TV.

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.

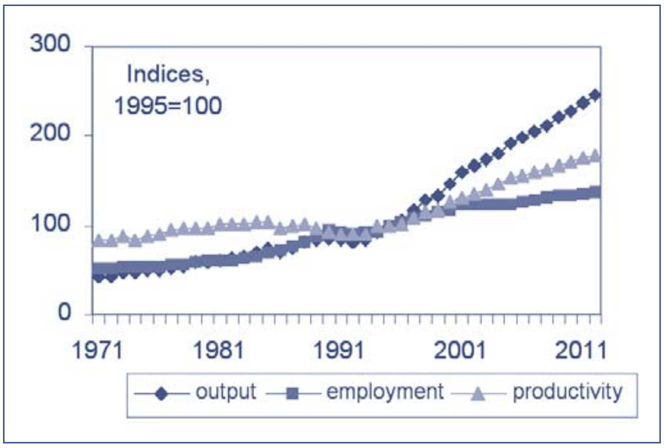
The general economic turndown has affected recruitment and personnel services, which enjoyed good growth in the 1990s given the kinds of labour sought and supplied through such agencies.

6.21.3 Productivity and Output Trends

Table 6.21.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	7.6	7.2	4.1	3.7
Employment (% pa)	3.6	2.6	0.8	1.3
(000s pa)	459	388	130	234
Productivity (% pa)	3.9	4.5	3.3	2.4

Figure 6.21.1: Output, Productivity and Employment, Other Business Services



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- There has been an acceleration in the growth of output recently. This trend is expected to continue, albeit at a somewhat more modest pace.
- Productivity growth has also picked up since the early 1990s although it has faltered recently. Further improvements are projected.
- The much faster growth for output results in significant increases in employment amounting to over a third of a million jobs over the next 10 years.

6.21.4 Employment by Status and Gender

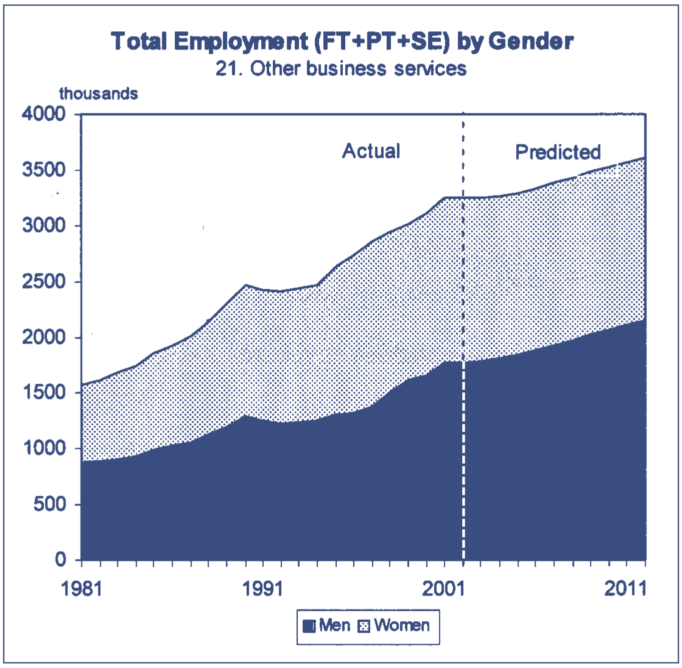
Females currently account for just under half the jobs in this industry, many of them part-time. In total, part-time employment accounts for around 1 in 4 of all jobs. Self-employment is rather less significant, although in total it amounts to over 400 thousand jobs in 2002.

Table 6.21.2: Employment Levels by Gender and Status, Other Business Services

Employment Status Employment by Gender	FT	% shares	PT	% shares	SE	% shares	Total 000s	% shares	Changes in Employment Status FT	PT	SE	Total 000s
2002									**2002-07**			
Male employment	1,213	(37.3)	243	(7.5)	315	(9.7)	1,771	(54.5)	151	17	-15	153
Female employment	784	(24.1)	593	(18.2)	103	(3.2)	1,481	(45.5)	59	-77	-4	-23
Total employment	**1,997**	**(61.4)**	**837**	**(25.7)**	**418**	**(12.8)**	**3,252**	**(100)**	**210**	**-60**	**-20**	**130**
2007									**2007-12**			
Male employment	1,364	(40.3)	261	(7.7)	299	(8.9)	1,924	(56.9)	185	44	-9	220
Female employment	844	(24.9)	516	(15.2)	99	(2.9)	1,458	(43.1)	71	-55	-2	15
Total employment	**2,207**	**(65.3)**	**777**	**(23)**	**398**	**(11.8)**	**3,382**	**(100)**	**256**	**-12**	**-10**	**235**
2012									**2002-12**			
Male employment	1,549	(42.8)	304	(8.4)	291	(8)	2,144	(59.3)	336	61	-24	373
Female employment	915	(25.3)	461	(12.7)	97	(2.7)	1,473	(40.7)	130	-132	-6	-8
Total employment	**2,463**	**(68.1)**	**765**	**(21.2)**	**388**	**(10.7)**	**3,616**	**(100)**	**466**	**-72**	**-30**	**365**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

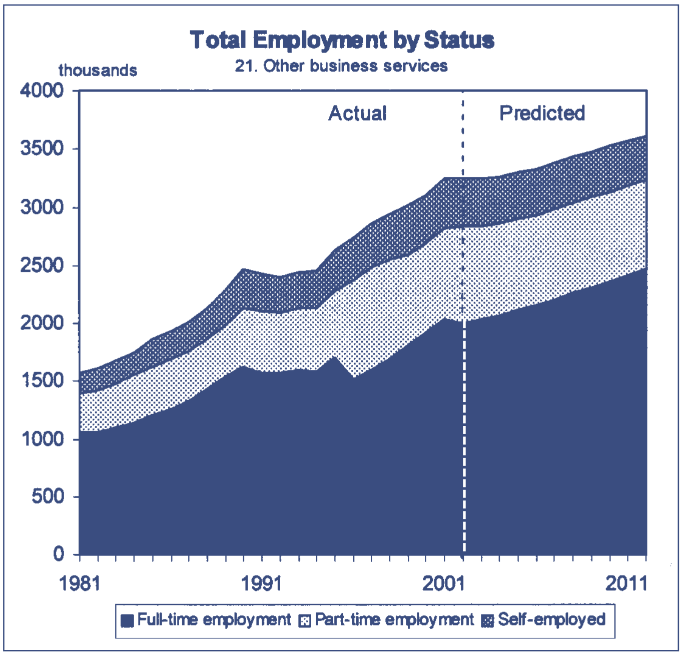
Figure 6.21.2: Changing Patterns of Sectoral Employment by Gender



- The female share of employment in this industry is projected to decrease.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.21.3: Changing Patterns of Sectoral Employment by Status



- Full-time employment will continue to be the most significant component of employment.
- Part-time and self-employment shares are also expected to decline.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

6.21.5 Projections of Employment by Occupation

Key aspects of occupational employment structure

- Four occupations dominate employment in this industry:
  - managers and senior officials;
  - professional occupations;
  - associate professional and technical;
  - administrative, clerical and secretarial.
- In 2002 each accounted for around 15-20% of all employment. However, whereas the first three had been increasing their employment shares, the latter has seen a steady decline.

Future changes

- These recent trends are expected to continue.
- Employment gains will be concentrated in the first three occupational groups (and to a lesser extent in personal service occupations).
- The administrative, clerical and secretarial group will see job losses.

Replacement demands

- In total, replacement demands are four times as large as the expansion demand of over a third of a million extra jobs by 2012.
- Replacement demands are concentrated heavily in all four of the occupations highlighted at the start of this section.
- Total requirements will amount to over 1.7 million over the next 10 years.

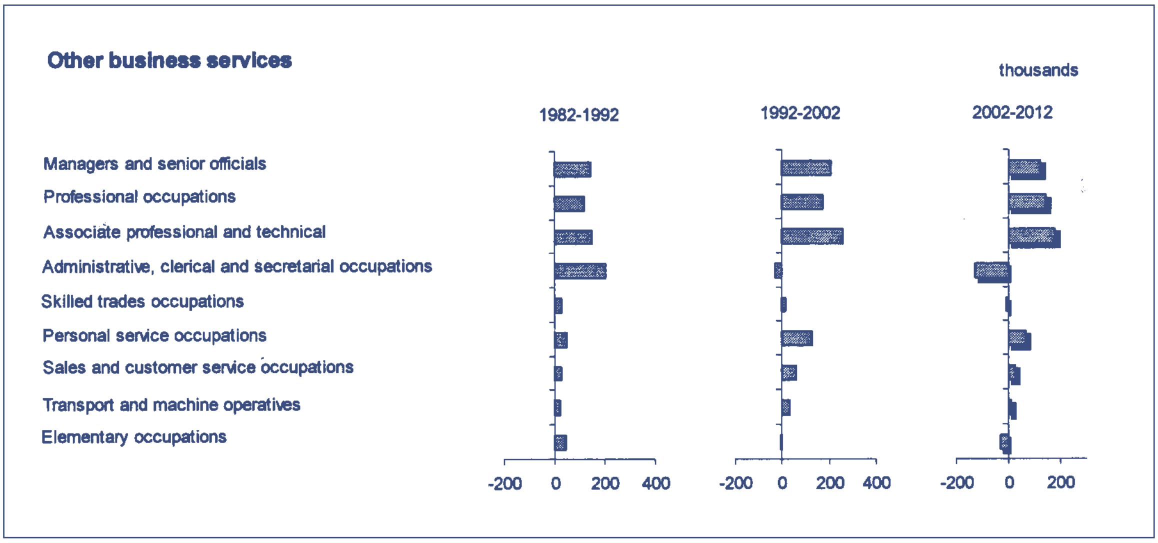
Table 6.21.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Other Business Services								2002-2012
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	225	369	579	632	702	129	236	365
2. Professional Occupations	205	321	497	560	637	149	165	313
3. Associate Professional and Technical Occupations	238	391	652	730	828	176	260	436
4. Administrative, Clerical and Secretarial Occupations	498	704	676	602	549	-124	330	206
5. Skilled Trades Occupations	98	129	145	143	132	-14	59	45
6. Personal Service Occupations	60	110	240	255	304	54	94	148
7. Sales and Customer Service Occupations	43	70	128	140	153	25	57	81
8. Transport and Machine Operatives	72	95	124	125	131	6	47	52
9. Elementary Occupations	173	216	210	194	180	-35	95	59
Total	1,614	2,404	3,252	3,382	3,616	365	1342	1707

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	14	15	18	19	19	22	41	63
2. Professional Occupations	13	13	15	17	18	29	33	62
3. Associate Professional and Technical Occupations	15	16	20	22	23	27	40	67
4. Administrative, Clerical and Secretarial Occupations	31	29	21	18	15	-18	48	30
5. Skilled Trades Occupations	6	5	4	4	4	-10	42	32
6. Personal Service Occupations	4	5	7	8	8	23	39	62
7. Sales and Customer Service 3 Occupations	3	4	4	4	20	45	65	
8. Transport and Machine Operatives	4	4	4	4	4	5	38	43
9. Elementary Occupations	11	9	6	6	5	-17	46	29
Total	**100**	**100**	**100**	**100**	**100**	11	41	52

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.21.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

6.22 PUBLIC ADMINISTRATION

6.22.1 Description of the Industry

INDUSTRY 22: PUBLIC ADMINISTRATION
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 (% 2002):	5.3	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	n/a	average
Total employment (2002):	1,461,000	29,336,000
Share of total employment (% 2002):	4.8	100
Gender split (male:female) (% 2002):	51:49	53:47
Part-time share (% 2002):	17	27
Self-employment share (% 2002):	1	12

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

6.22.2 Industry Commentary

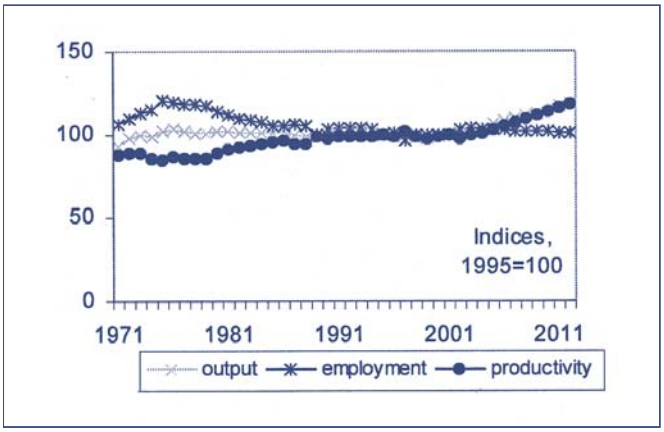
There has been a long-term downward trend in employment in public administration over the last two decades, in part aided by the introduction of new technologies and automation of some areas of service provision, as well as contracting out. Some additional resources for health and education are likely to result in additional employment in these sectors in the short to medium-term, and this will build on recent sharp increases in employment in both central and local government.

6.22.3 Productivity and Output Trends

Table 6.22.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	-1.0	0.6	1.7	1.6
Employment (% pa)	-1.5	1.3	-0.1	-0.3
(000s pa)	-106	88	-11	-20
Productivity (% pa)	0.5	-0.7	1.8	1.9

Figure 6.22.1: Output, Productivity and Employment, Public Administration



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- 'Output' in this industry is essentially measured by total public expenditure on such services. This has been fairly flat, in real terms, in recent years.
- Some 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.
- Trends in productivity have also been flat over recent years. Some acceleration is projected, as policies to modernise and restructure these public services take effect.
- As a result, employment levels are expected to decline slightly from current levels.

6.22.4 Employment by Status and Gender

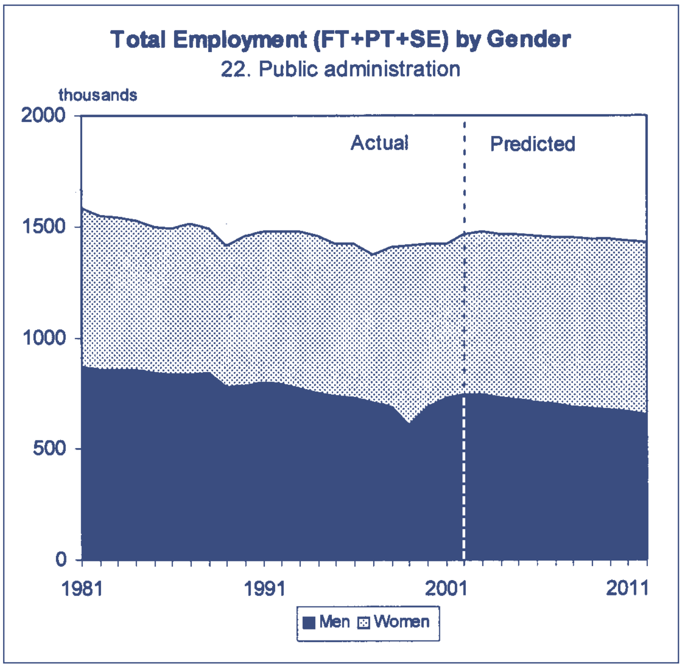
Employment in this industry is divided fairly equally between men and women. However, a much greater proportion of females work part-time. In total, part-timers account for just under 1 in 5 jobs. Self-employment is insignificant.

Table 6.22.2: Employment Levels by Gender and Status, Public Administration

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	2002-07			000s
Male employment	682	(46.7)	53	(3.6)	10	(0.7)	745	(51)	-46	4	0	-42
Female employment	507	(34.7)	201	(13.8)	8	(0.5)	716	(49)	8	22	1	32
Total employment	**1,189**	**(81.4)**	**254**	**(17.4)**	**18**	**(1.2)**	**1,461**	**(100)**	**-38**	**27**	**1**	**-11**
2007									2007-12			
Male employment	635	(43.8)	57	(4)	10	(0.7)	703	(48.4)	-50	4	-1	-46
Female employment	515	(35.5)	223	(15.4)	9	(0.6)	748	(51.6)	4	20	1	26
Total employment	**1,150**	**(79.3)**	**281**	**(19.4)**	**19**	**(1.3)**	**1,450**	**(100)**	**-45**	**24**	**1**	**-20**
2012									2002-12			
Male employment	586	(41)	61	(4.3)	9	(0.6)	656	(45.9)	-96	8	-1	-89
Female employment	519	(36.3)	244	(17.1)	11	(0.7)	774	(54.1)	12	43	3	58
Total employment	**1,105**	**(77.3)**	**305**	**(21.3)**	**20**	**(1.4)**	**1,430**	**(100)**	**-84**	**51**	**2**	**-31**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

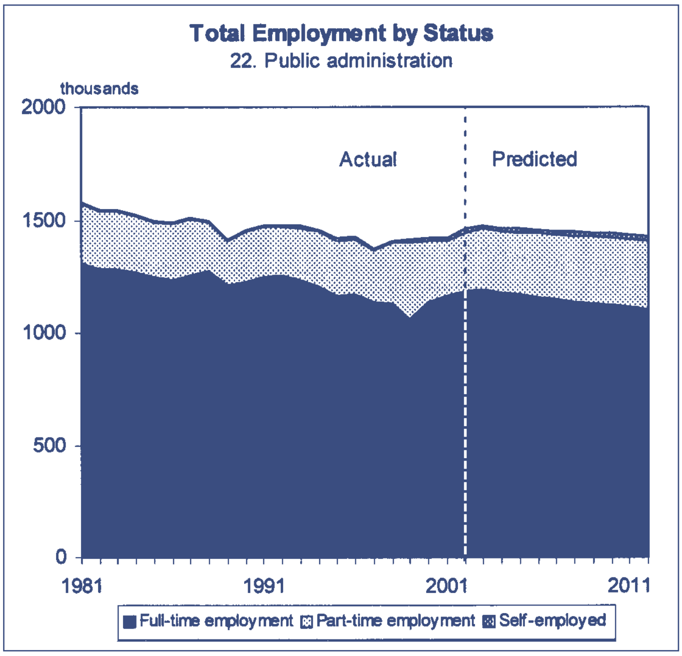
Figure 6.22.2: Changing Patterns of Sectoral Employment by Gender



- Women are expected to continue to increase their share of total employment, mainly in the form of part-time jobs.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

Figure 6.22.3: Changing Patterns of Sectoral Employment by Status



- Part-timers generally will continue to increase their share of total employment.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.3 and Figure 6.X.2).

6.22.5 Projections of Employment by Occupation

Key aspects of occupational employment structure

- The largest occupational group in 2002 was the administrative, clerical and secretarial group, although its share had fallen sharply to below 30% in 2002.
- This group was closely followed by the associate professional and technical group, which accounted for over 20% of all jobs in 2002.
- 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 and secretarial group and for elementary occupations.
- These losses are projected to be offset by increases for the other occupations mentioned above.

Replacement demands

- Despite a slight decline in expansion demand, replacement demand for this industry will be substantial, with well over 600,000 members of the current workforce needing to be replaced by 2012.
- The bulk of these replacement demands is for the associate professional and technical occupations and for administrative, clerical and secretarial occupations.
- However, there will also be significant replacement needs for people in the other occupations highlighted previously.

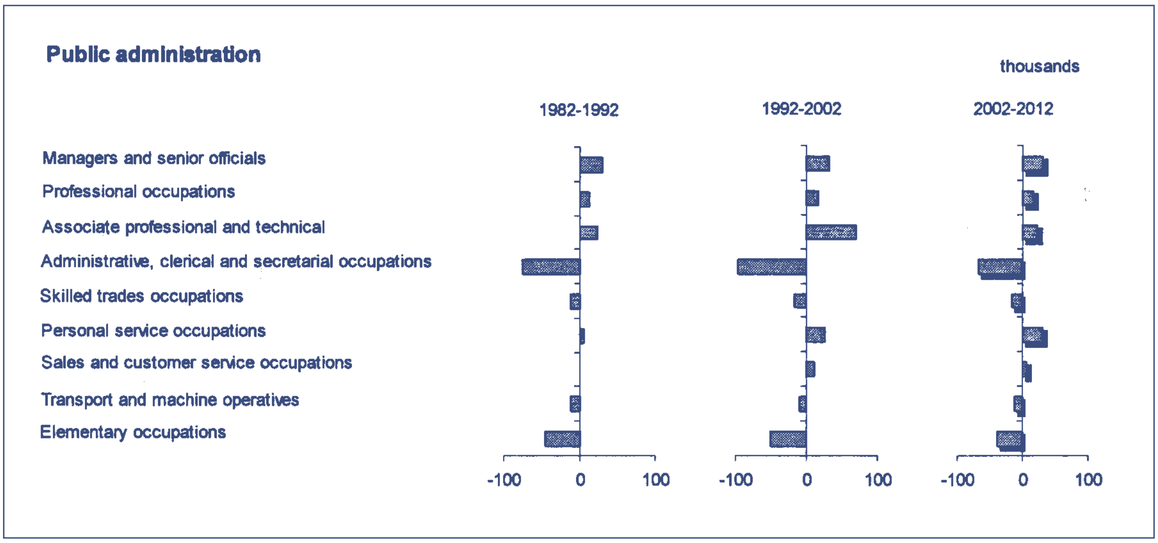
Table 6.22.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Public administration								2002-2012
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	111	142	174	186	205	30	72	102
2. Professional Occupations	134	148	164	175	180	15	55	71
3. Associate Professional and Technical Occupations	235	259	329	343	350	22	155	177
4. Administrative, Clerical and Secretarial Occupations	582	508	411	377	342	-67	193	126
5. Skilled Trades Occupations	81	70	53	44	36	-17	21	4
6. Personal Service Occupations	36	42	69	83	100	31	27	58
7. Sales and Customer Service Occupations	18	18	30	34	36	7	14	21
8. Transport and Machine Operatives	81	69	59	52	47	-13	22	9
9. Elementary Occupations	268	222	172	156	133	-39	74	35
Total	1,547	1,478	1,461	1,450	1,430	-31	634	603

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	7	10	12	13	14	17	42	59
2. Professional Occupations	9	10	11	12	13	9	34	43
3. Associate Professional and Technical Occupations	15	18	23	24	25	7	47	54
4. Administrative, Clerical and Secretarial Occupations	38	34	28	26	24	-16	47	3
5. Skilled Trades Occupations	5	5	4	3	3	-32	40	7
6. Personal Service Occupations	2	3	5	6	7	45	39	84
7. Sales and Customer Service Occupations	1	1	2	2	3	24	47	71
8. Transport and Machine Operatives	5	5	4	4	3	-21	37	16
9. Elementary Occupations	17	15	12	11	9	-23	43	20
Total	**100**	**100**	**100**	**100**	**100**	-2	43	41

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.22.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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 (% 2002):	5.0	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	2,289,000	29,336,000
Share of total employment (% 2002):	7.6	100
Gender split (male:female) (% 2002):	30:70	53:47
Part-time share (% 2002):	44	27
Self-employment share (% 2002):	5	12

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

6.23.2 Industry Commentary

Education has experienced underlying growth in employment since the 1970s, and this has been accelerated by the present government's stated commitment. However, schools are apparently 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 qualified and non-qualified staff.

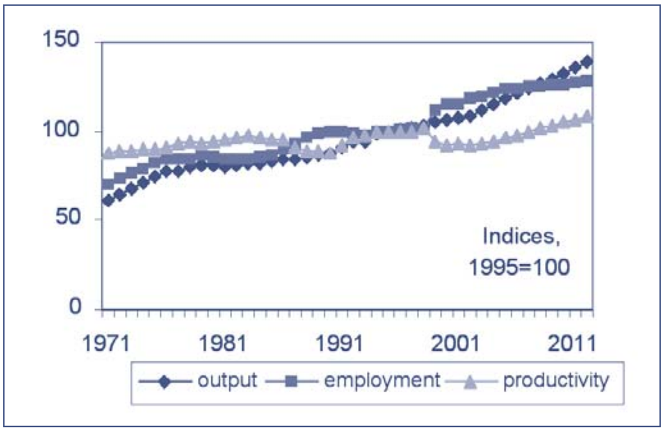
University funding is set to increase significantly over the next three years, and a radical shake-up of student finance has been proposed. While the exact structure of this is still to be finalised, it will be coupled with a range of incentives to promote wider social access to higher education.

6.23.3 Productivity and Output Trends

Table 6.23.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	1.6	1.1	2.8	2.2
Employment (% pa)	0.8	2.9	1.1	0.5
(000s pa)	77	308	132	64
Productivity (% pa)	0.8	-1.8	1.7	1.7

Figure 6.23.1: Output, Productivity and Employment, Education



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output in this industry is measured primarily by public expenditure on educational services. This has increased very strongly in recent years. Given government plans, further substantial growth is expected, reinforced by private sector demand.
- Productivity has also exhibited a positive trend, although this pattern of growth has slackened in recent years. The projections assume that there will be a return to productivity improvements of around 1.5% per annum.
- 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 less rapid productivity gains will result in some 200,000 extra jobs by 2012.

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% of employment.

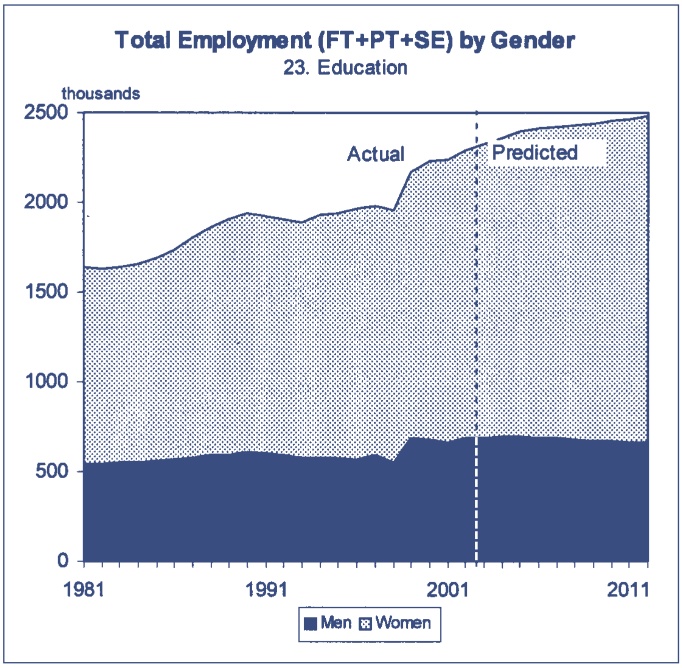
Part-time employment is very important, accounting for almost 1 in 2 jobs. Self-employment is not very important as a share of the total, although it did account for around 100,000 jobs in 2002.

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
2002		% shares		% shares		% shares	000s	% shares	2002-07			000s
Male employment	474	(20.7)	165	(7.2)	52	(2.3)	690	(30.2)	-35	35	-4	-4
Female employment	695	(30.3)	850	(37.1)	54	(2.4)	1,599	(69.8)	41	95	0	136
Total employment	**1,168**	**(51)**	**1,015**	**(44.3)**	**106**	**(4.6)**	**2,289**	**(100)**	**6**	**130**	**-4**	**132**
2007									2007-12			
Male employment	439	(18.1)	199	(8.2)	47	(2)	686	(28.3)	-52	31	-6	-26
Female employment	735	(30.4)	945	(39)	54	(2.2)	1,735	(71.7)	20	71	-2	90
Total employment	**1,174**	**(48.5)**	**1,145**	**(47.3)**	**102**	**(4.2)**	**2,421**	**(100)**	**-31**	**103**	**-8**	**64**
2012									2002-12			
Male employment	388	(15.6)	231	(9.3)	41	(1.7)	660	(26.6)	-86	66	-10	-31
Female employment	756	(30.4)	1,017	(40.9)	52	(2.1)	1,825	(73.4)	61	166	-2	226
Total employment	**1,143**	**(46)**	**1,247**	**(50.2)**	**94**	**(3.8)**	**2,484**	**(100)**	**-25**	**232**	**-12**	**195**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

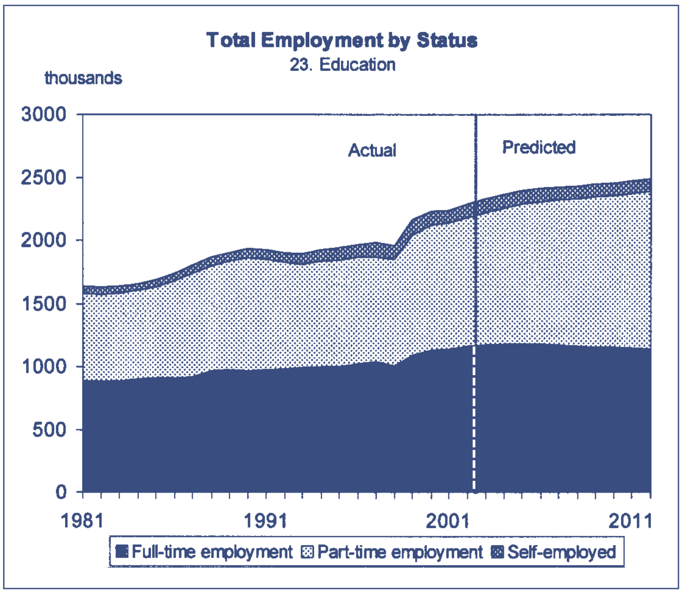
Figure 6.23.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- The share of females is expected to rise. The number of men employed in this industry is projected to decline slightly.

Figure 6.23.3: 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).

- Part-timers will account for all the net increase in the number of jobs available. The number of full-time jobs and those in self-employment are projected to fall.

6.23.5 Projections of Employment by Occupation

Key aspects of occupational structure

- Teachers and lecturers within the professional occupational group account for over 1 in every 2 jobs in the industry.
- They have been increasingly supported by associate professional, personal service and managerial occupations.
- Administrative, clerical and secretarial and elementary occupations have become much less significant.

Future changes

- Recent historical patterns are projected to continue. The professional groups will be the main beneficiary of job growth, with some 200,000 additional jobs.
- Personal service occupations, and to a lesser extent the associate professional and managerial groups, will also benefit.
- Further job losses are expected amongst the administrative, clerical and secretarial and elementary occupations. The latter reflects a continuation of the practice of sub-contracting many tasks such as cleaning and catering previously done 'in-house'.

Replacement demands

- As in most other industries, replacement demands far outweigh the projected expansion demands in this industry. While a net change of around 200,000 is projected, the total requirement is six times this figure.
- Well over half this figure relates to professional occupations.
- Other occupations which will face the need for substantial replacements are associate professional and technical occupations, personal service occupations and elementary occupations.

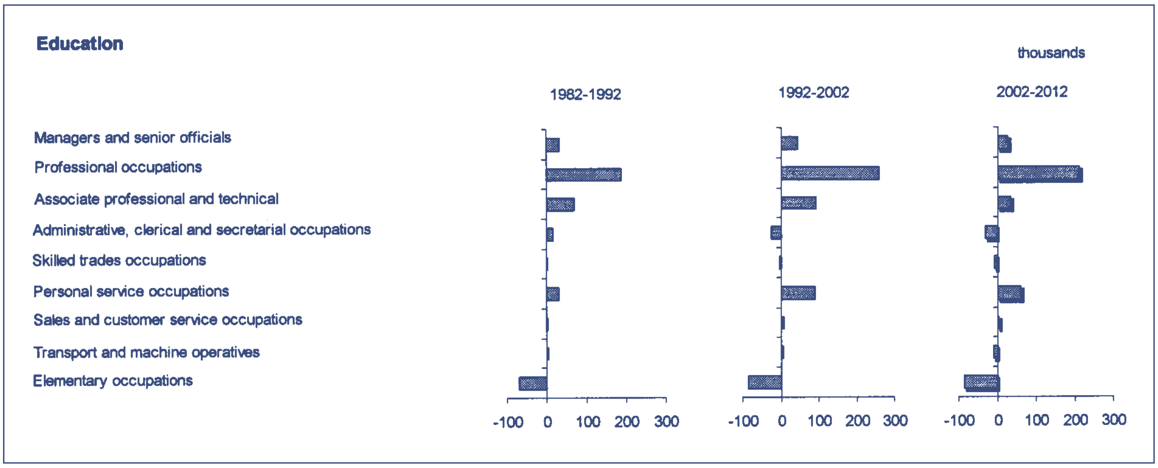
Table 6.23.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Education								2002-2012
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	36	69	114	128	140	26	53	79
2. Professional Occupations	729	919	1,177	1,301	1,384	200	480	680
3. Associate Professional and Technical Occupations	175	243	336	359	366	30	139	169
4. Administrative, Clerical and Secretarial Occupations	145	161	135	122	103	-33	67	35
5. Skilled Trades Occupations	30	31	28	24	19	-9	11	2
6. Personal Service Occupations	96	127	217	250	274	56	86	141
7. Sales and Customer Service Occupations	12	14	22	24	24	2	11	13
8. Transport and Machine Operatives	45	50	55	49	43	-12	21	10
9. Elementary Occupations	360	291	204	163	130	-65	110	45
Total	1,628	1,905	2,289	2,421	2,484	195	979	1174

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	2	4	5	5	6	22	46	68
2. Professional Occupations	45	48	51	54	56	17	41	58
3. Associate Professional and Technical Occupations	11	13	15	15	15	9	41	50
4. Administrative, Clerical and Secretarial Occupations	9	8	6	5	4	-24	50	26
5. Skilled Trades Occupations	2	2	1	1	1	-32	39	7
6. Personal Service Occupations	6	7	9	10	11	26	40	66
7. Sales and Customer Service Occupations	1	1	1	1	1	10	51	60
8. Transport and Machine Operatives	3	3	2	2	2	-21	39	18
9. Elementary Occupations	22	15	9	7	5	-31	53	22
Total	**100**	**100**	**100**	**100**	**100**	9	43	51

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.23.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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 including: hostels/homes for children, the aged, the handicapped, homeless etc.; day care activities; social, counselling, refugee, and similar activities.

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	7.1	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	medium	average
Total employment (2002):	3,038,000	29,336,000
Share of total employment (% 2002):	10.1	100
Gender split (male:female) (% 2002):	19:81	53:47
Part-time share (% 2002):	46	27
Self-employment share (% 2002):	8	12

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.

The sector will undoubtedly expand over the next decade, in part driven by the implementation and upgrade of the NHS information network, including major electronic record and booking systems. Indeed, the Wanless Report suggested that health spending may need to rise to more than 12% of GDP by 2022, although larger efficiency gains may reduce this to 'only' 10%.[1]

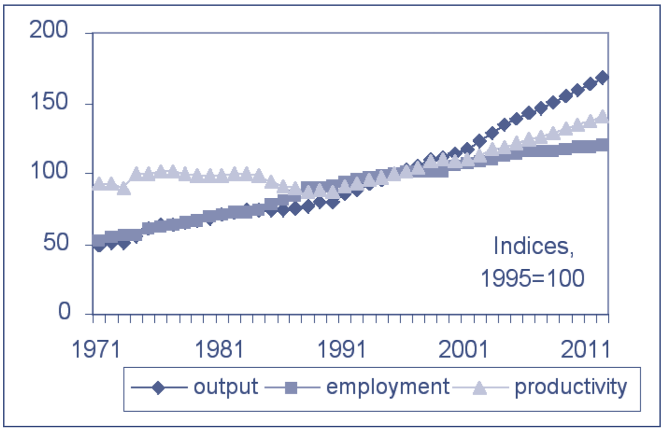
[1] Wanless D. (2002). Securing our Future Health: Taking a Long-term View. Public Enquiry Unit, HM Treasury: London.

6.24.3 Productivity and Output Trends

Table 6.24.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	3.7	3.0	3.5	2.7
Employment (% pa)	1.1	1.5	1.2	0.6
(000s pa)	144	217	183	106
Productivity (% pa)	2.6	1.5	2.3	2.0

Figure 6.24.1: Output, Productivity and Employment, Health & Social Work



Source: CE/IER estimates, MDM95 C31F9S Forecast, 6725output.xls (Figure 6.x.1)

- Output in this industry is measured by (mainly) public expenditure on healthcare. This has risen rapidly in recent years. This pattern of quite rapid growth is projected to continue over the next decade.
- Productivity has also increased quite fast over the last 10 years or so, although before then trends were less clear cut. 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. Despite this, over a quarter of a million additional jobs are projected for this industry.

6.24.4 Employment by Status and Gender

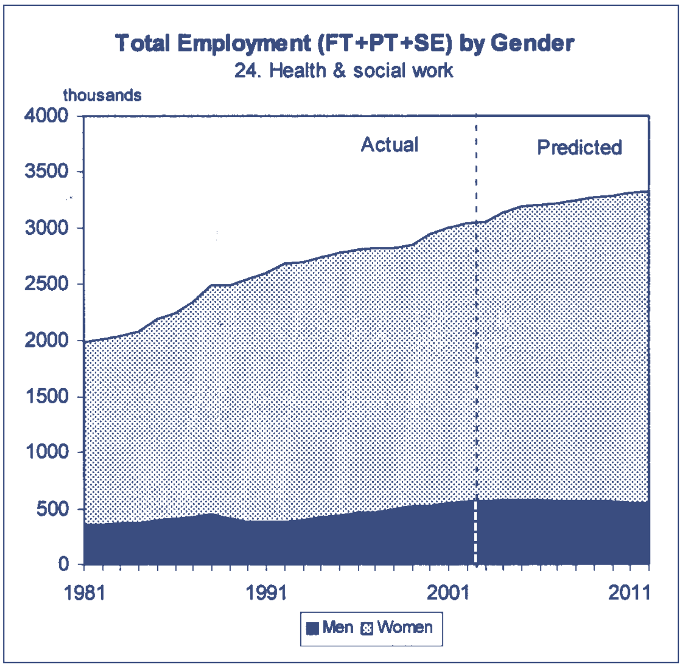
- The health and social work industry employs more females than any other industry. Females account for over 4 in every 5 jobs in the industry.
- Part-time employment is very important. Almost half of all the jobs are part-time.
- Self-employment is much less significant, although a number of key personnel such as GPs fall into this category. In total there were around a quarter of a million self-employed in 2002.

Table 6.24.2: Employment Levels by Gender and Status, Health & Social Work

Employment Status Employment by Gender	FT		PT		SE		Total		Changes in Employment Status FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	355	(11.7)	130	(4.3)	83	(2.7)	567	(18.7)	-18	13	7	1
Female employment	1,050	(34.6)	1,263	(41.6)	158	(5.2)	2,471	(81.3)	36	115	31	182
Total employment	**1,404**	**(46.2)**	**1,392**	**(45.8)**	**241**	**(7.9)**	**3,038**	**(100)**	**18**	**128**	**37**	**183**
2007									**2007-12**			
Male employment	336	(10.4)	142	(4.4)	90	(2.8)	568	(17.6)	-30	10	5	-15
Female employment	1,086	(33.7)	1,378	(42.8)	189	(5.9)	2,653	(82.4)	8	85	28	121
Total employment	**1,422**	**(44.1)**	**1,520**	**(47.2)**	**279**	**(8.6)**	**3,221**	**(100)**	**-22**	**95**	**33**	**106**
2012									**2002-12**			
Male employment	306	(9.2)	152	(4.6)	94	(2.8)	553	(16.6)	-48	23	12	-14
Female employment	1,094	(32.9)	1,463	(44)	217	(6.5)	2,774	(83.4)	44	201	58	303
Total employment	**1,400**	**(42.1)**	**1,616**	**(48.6)**	**311**	**(9.4)**	**3,327**	**(100)**	**-4**	**223**	**70**	**289**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

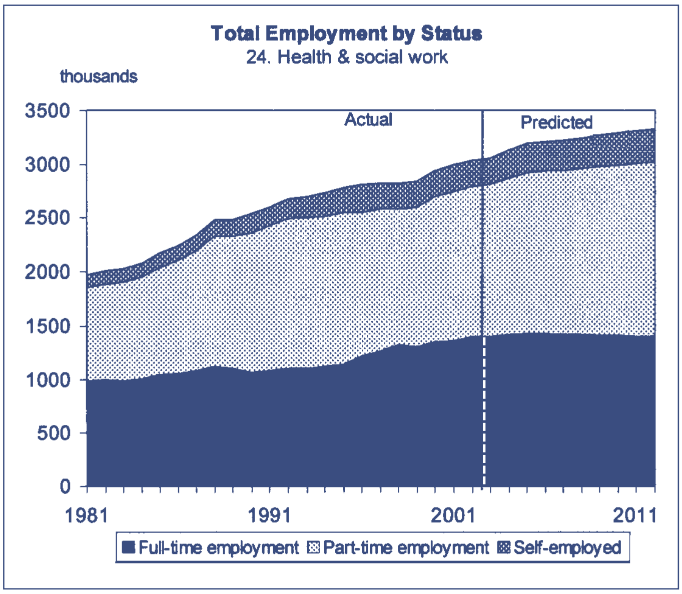
Figure 6.24.2: Changing Patterns of Sectoral Employment by Gender



- The share of males is expected to continue to decline. Females will take all the additional jobs.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

Figure 6.24.3: Changing Patterns of Sectoral Employment by Status



- Both part-time working and self-employment are expected to increase in importance.
- The number of full-time jobs is projected to show little change.

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

6.24.5 Projections of Employment by Occupation

Key aspects of occupational structure

- The occupational structure of this industry has been slowly changing in recent years, with increasing shares for managers (albeit partially offset by declines for administrative, clerical and secretarial occupations) and increases for personal service occupations (offset by declines amongst elementary occupations).
- Doctors, who are classified in the professional group, have seen their shares of employment rise, but nurses and other associate professional and technical occupations have not maintained their employment shares.

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 significant job gains.
- However, the main beneficiaries are expected to be amongst the less skilled, personal service occupations, which alone are projected to gain over a quarter of a million extra jobs by 2012.

Replacement demands

- The quite substantial increase projected for total employment is expected to be reinforced many times over by replacement demands. The expansion demand of just under 300,000 translates into a total requirement of around 1.7 million.
- Two main groups account for this enormous growth: associate professional and technical occupations (which includes qualified nurses), and personal service occupations.
- There are also very large replacement demands for managers and senior officials and for professional occupations.

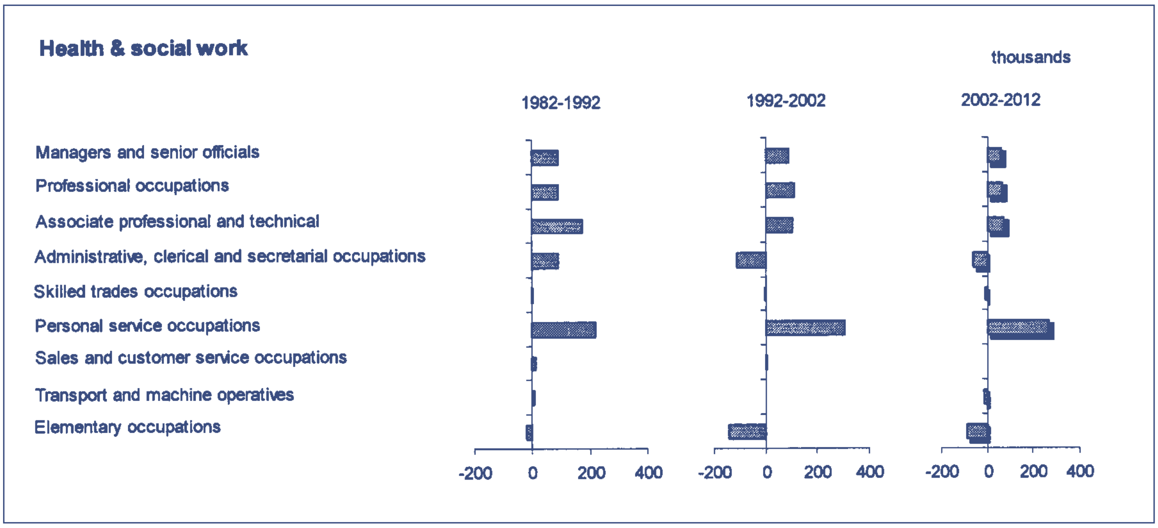
Table 6.24.3: Changing Composition of Employment by Occupation and Replacement Demands

United Kingdom: Health & Social Work								2002-2012
Employment Levels (000)	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	157	250	337	373	397	59	159	218
2. Professional Occupations	179	270	378	417	442	63	136	198
3. Associate Professional and Technical Occupations	586	759	864	916	936	74	441	515
4. Administrative, Clerical and Secretarial Occupations	295	385	271	243	209	-65	135	70
5. Skilled Trades Occupations	54	58	55	52	45	-10	23	12
6. Personal Service Occupations	325	543	852	989	1,122	271	343	614
7. Sales and Customer Service Occupations	24	35	43	46	46	2	21	23
8. Transport and Machine Operatives	48	54	55	49	41	-14	23	8
9. Elementary Occupations	344	323	182	137	90	-91	94	3
Total	2,012	2,677	3,038	3,221	3,327	289	1373	1662

						2002-2012 Percentage Changes		
Percentage Shares	1982	1992	2002	2007	2012	Net Change	Replacement Demands	Total Requirement
1. Managers and Senior Officials	8	9	11	12	12	18	47	64
2. Professional Occupations	9	10	12	13	13	17	36	52
3. Associate Professional and Technical Occupations	29	28	28	28	28	9	51	59
4. Administrative, Clerical and Secretarial Occupations	15	14	9	8	6	-24	50	26
5. Skilled Trades Occupations	3	2	2	2	1	-19	41	22
6. Personal Service Occupations	16	20	28	31	34	32	40	72
7. Sales and Customer Service Occupations	1	1	1	1	1	5	50	54
8. Transport and Machine Operatives	2	2	2	2	1	-26	41	15
9. Elementary Occupations	17	12	6	4	3	-50	52	2
Total	**100**	**100**	**100**	**100**	**100**	10	45	55

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.24.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.x.4).

6.25 WASTE TREATMENT & MISCELLANEOUS SERVICES

6.25.1 Description of the Industry

INDUSTRY 25: WASTE TREATMENT & MISCELLANEOUS SERVICES
SIC92 headings: 90-99

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.

INDUSTRY PROFILE

		All industries
Share of UK output (% 2002):	3.6	100
Exposure to international trade:	low	average
Concentration (market share of largest employers):	low	average
Total employment (2002):	2,023,000	29,336,000
Share of total employment (% 2002)	6.9	100
Gender split (male:female) (% 2002):	49:51	53:47
Part-time share (% 2002):	30	27
Self-employment share (% 2002):	26	12

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.

Waste treatment companies have improved their systems in recent years, and technological innovations such as cleaner incineration, coupled with regulations such as the EU Landfill Directive (and the government's landfill tax), will mean a greater demand for such services in the future. More hazardous waste, such as electrical and radioactive, will also require new facilities given greater regulation on their disposal.

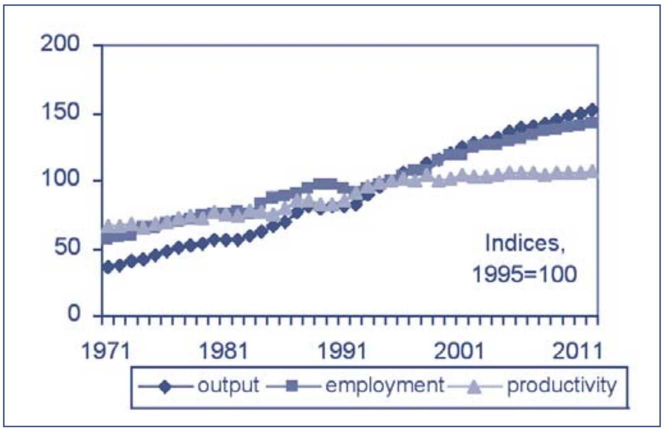
Output and employment is expected to increase in the cultural and sporting sectors over the next decade, fuelled by greater consumer leisure and entertainment spending.

6.25.3 Productivity and Output Trends

Table 6.25.1: Trends in Output, Productivity and Employment Average Change in the Period

Indicator	1992-97	1997-2002	2002-07	2007-12
Gross Output (% pa)	5.3	3.5	2.0	1.6
Employment (% pa)	3.3	3.0	1.4	1.3
(000s pa)	238	248	135	131
Productivity (% pa)	1.9	0.5	0.5	0.3

Figure 6.25.1: Output, Productivity and Employment, Miscellaneous Services



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.
- Productivity growth has also been quite rapid but has slowed over the past five years or so. This pattern 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.
- Consequently, employment is projected to grow substantially, with over a quarter of a million extra jobs over the decade.

6.25.4 Employment by Status and Gender

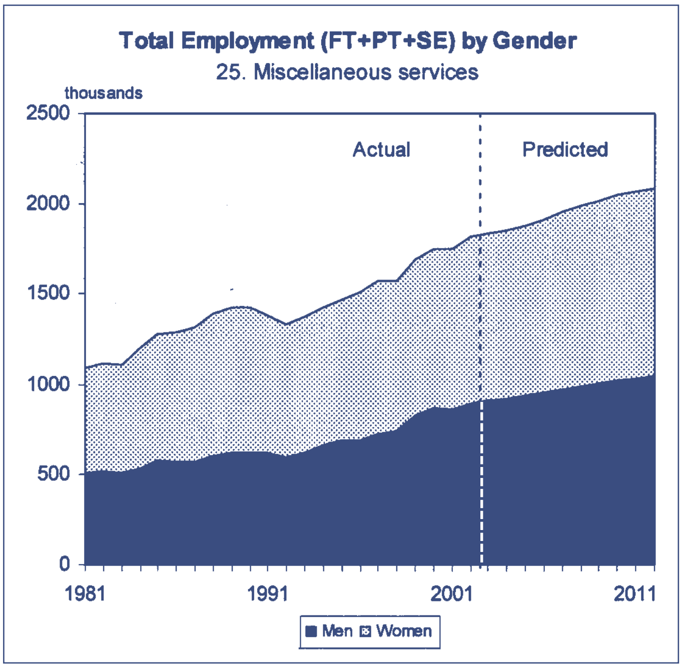
Employment in this industry is evenly divided between men and women. Part-time working is very important, accounting for 1 in 3 jobs in 2002. Self-employment is also very significant, accounting for a quarter of all jobs.

Table 6.25.2: Employment Levels by Gender and Status, Miscellaneous Services

Employment Status									Changes in Employment Status			
Employment by Gender	FT		PT		SE		Total		FT	PT	SE	Total
2002		% shares		% shares		% shares	000s	% shares	**2002-07**			000s
Male employment	468	(25.7)	189	(10.4)	243	(13.4)	900	(49.5)	13	38	22	73
Female employment	328	(18)	363	(20)	228	(12.5)	919	(50.5)	-5	48	20	63
Total employment	**795**	**(43.7)**	**553**	**(30.4)**	**471**	**(25.9)**	**1,819**	**(100)**	**8**	**86**	**42**	**135**
2007									**2007-12**			
Male employment	481	(24.6)	227	(11.6)	265	(13.6)	973	(49.8)	10	41	22	73
Female employment	323	(16.5)	411	(21)	247	(12.7)	982	(50.2)	-11	50	19	58
Total employment	**803**	**(41.1)**	**638**	**(32.7)**	**513**	**(26.2)**	**1,954**	**(100)**	**-1**	**91**	**41**	**131**
2012									**2002-12**			
Male employment	491	(23.5)	268	(12.9)	287	(13.8)	1,046	(50.1)	23	79	44	146
Female employment	312	(15)	461	(22.1)	267	(12.8)	1,040	(49.9)	-15	98	39	121
Total employment	**803**	**(38.5)**	**729**	**(35)**	**554**	**(26.5)**	**2,086**	**(100)**	**7**	**177**	**83**	**267**

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Figure 6.X.2).

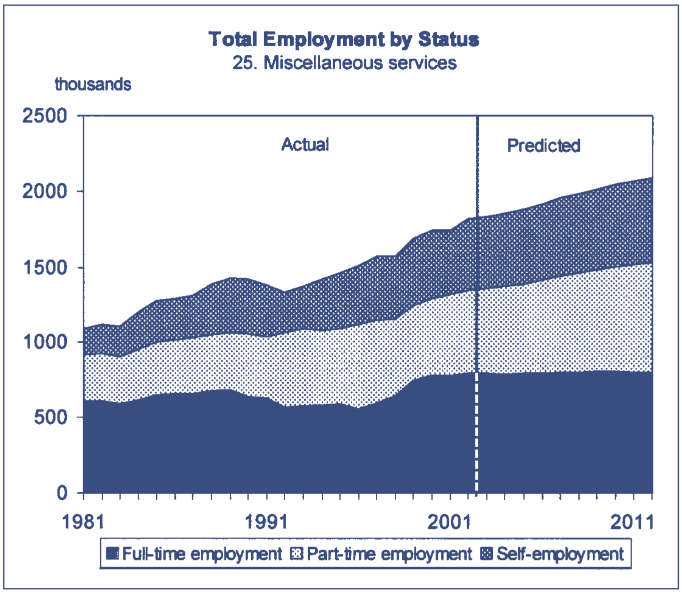
Figure 6.25.2: Changing Patterns of Sectoral Employment by Gender



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls
(Figure 6.X.3 and Figure 6.X.2).

- Men and women are both expected to benefit from the increasing number of jobs in this industry.
- Gender shares remain fixed at around 50:50.

Figure 6.25.3: 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).

- Both part-time working and self employment are expected to become of increasing importance.
- The number of full-time jobs will show little change.

6.25.5 Projections of Employment by Occupation

Key aspects of occupational structure

- The largest occupational group is associate professional and technical occupations. In 2002 this group accounted for 1 in 5 of all jobs.
- Other significant groups are managers, 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 employment increase projected, with over 100,000 extra jobs.
- Most of the other groups mentioned above are also expected to see job growth.
- The exception to this rule is the elementary occupations group, which is projected to see the loss of around 50,000 jobs.
- The only other group to experience job losses is the administrative, clerical and secretarial group, although little change is expected here.

Replacement demands

- Expansion demands are expected to add a further quarter of a million jobs to employment levels in this industry over the next decade. Replacement demands are three times as big.
- The largest replacement demands are projected amongst managers, associate professional, personal service occupations and elementary occupations, each of which registers figures of over 100,000.
- Total requirements are over a million jobs, with the largest number in associate professional and technical occupations, which alone accounts for almost 300,000.

Table 6.25.3: Changing Composition of Employment by Occupation and Replacement Demands

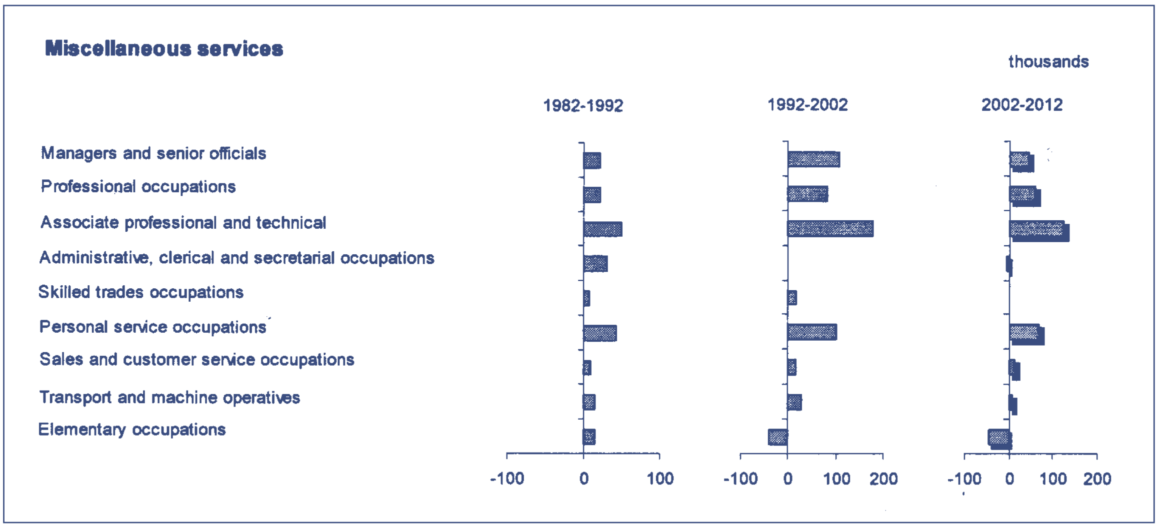
United Kingdom: Miscellaneous Services

Employment Levels (000)	1982	1992	2002	2007	2012	Net Change (2002-2012)	Replacement Demands (2002-2012)	Total Requirement (2002-2012)
1. Managers and Senior Officials	168	190	298	320	343	49	133	182
2. Professional Occupations	95	117	198	224	257	57	66	124
3. Associate Professional and Technical Occupations	169	218	397	460	519	122	168	290
4. Administrative, Clerical and Secretarial Occupations	140	170	169	166	165	-3	81	78
5. Skilled Trades Occupations	66	74	91	92	92	0	35	36
6. Personal Service Occupations	115	159	260	295	330	67	103	170
7. Sales and Customer Service Occupations	23	34	49	56	63	14	21	35
8. Transport and Machine Operatives	84	99	127	129	133	5	49	55
9. Elementary Occupations	257	271	230	213	186	-45	108	64
Total	1,117	1,333	1,819	1,954	2,086	267	765	1032

Percentage Shares	1982	1992	2002	2007	2012	Net Change (2002-2012 Percentage Changes)	Replacement Demands (2002-2012 Percentage Changes)	Total Requirement (2002-2012 Percentage Changes)
1. Managers and Senior Officials	15	14	16	16	16	17	45	61
2. Professional Occupations	9	9	11	11	12	29	33	62
3. Associate Professional and Technical Occupations	15	16	22	24	25	31	42	73
4. Administrative, Clerical and Secretarial Occupations	13	13	9	9	8	-2	47	46
5. Skilled Trades Occupations	6	6	5	5	4	1	39	40
6. Personal Service Occupations	10	12	14	15	16	26	40	65
7. Sales and Customer Service Occupations	2	3	3	3	3	28	43	71
8. Transport and Machine Operatives	8	7	7	7	6	4	39	43
9. Elementary Occupations	23	20	13	11	9	-19	47	28
Total	**100**	**100**	**100**	**100**	**100**	15	42	57

Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (Table 6.x.3).

Figure 6.25.4: Changing Composition of Employment by Occupation, 1982-2012



Source: CE/IER estimates, MDM95 C31F9S Forecast, 25UK.xls (figure 6.x.4).

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.* (2003).

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 multisectoral 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 multisectoral 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 multisectoral 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 1992 Standard Industrial Classification (SIC). 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 1995 price base and the input-output table for 1995 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. (2003).

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 SOC 2000 classification. Projections were developed for the 25 sub-major groups. The approach involves two stages. First, projections of the likely changes in industrial employment by region are made, using the multisectoral 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. The LFS data are used to make an estimate of occupation structure in the base year. This is then 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 in the 1980s and early 1990s.

The present results only incorporate headline data from the Census of Population for 2001. More detailed information will be made available later this year which will enable a reassessment of trends over the past decade. From previous experience, this can result in quite significant changes to the perception of detailed historical developments and therefore future prospects. 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. Industry employment levels are typically projected within ±10% over a 5-10 year horizon. The directions of change are projected correctly in almost 90% 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% over a 5-10 year horizon. The direction of change is correctly projected in about 80% 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.

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.[3]

A.3 Development of New Databases and Procedures

1.4 Data Sources and Methods

Need for a new database

A new employment database has been developed in order to meet the requirements of the present set of projections. These developments fall into three main categories:

- extended sectoral detail, covering all 2-digit SIC 1992 categories;
- revised geographies covering the LLSC areas;
- revised treatment of occupations, including development of SOC 2000 historical data series and projections for the new sectors and local areas described above.

[2]For further discussion see the Technical Report (Wilson *et al.*, 2003).

[3]See Wilson and Briscoe (2002) for further discussion.

This 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

The starting point was existing databases. Historical data on employees in employment for male and female, full-time and part-time and estimates for self-employment, by 49 industries, for all the local authority districts, were available based on information from the ABI. This was expanded using various official data to cover 67 SIC 2-digit categories and all 47 LLSC areas. The results incorporate the latest sectoral employment data from ONS, including the 2001 Annual Business Inquiry.

For economic indicators such as GDP, the total employment estimates by 49 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 49 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 49 industries (SIC92) and the old 22 SOC 1990 sub-major occupational groups for each of the new RDA areas. Details of the occupational groupings are shown in Table A.4, based on the old 1990 SOC.

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 SOC 1990. 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 SOC 2000 basis.
The CoP data were enhanced by use of the Labour Force Survey in order to provide more up to date information on ongoing trends by occupation beyond 1991, providing a firm base year estimate for 2002.

Information from the Census of Population 2001 was used to calibrate the estimates at an aggregate level. More detailed data are expected to become available later this year. Previous experience suggests that the publication of such data usually results in significant revisions to the perception of historical changes, as well as to likely future developments. The present results should be seen in this light. 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.

These matrices were then used to develop projections of occupational employment in selected future years by applying projected occupational shares in each industry to the sectoral forecasts from the macroeconomic model. Details of the basic procedures are given in the *Technical Report.*[4]

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.

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.

[4] See Wilson et al. (2003)

The key components are:

- information on the age and gender structure of occupational employment;
- information on rates of outflows due to 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 available from the ONS, especially data relating to input-output information which is central to MDM. They are classified according to the 1992 Standard Industrial classification (1992 SIC), 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 based on the 1992 SIC. 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.**

Reporting at national (UK) level (Industries)

SSDA/LSC have adopted 27 industrial categories for the *New Employer Skills Survey* and other purposes. These are shown in Table A.3. This compares with the 22 categories adopted in *Skills In England 2002* (as shown in Table A.4).

The 27-fold categorisation 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, manufacturing nes, 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* (UK) report, 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 and quarrying and utilities), 4 (textiles and clothing) and 10 (manufacturing nes) remain small. These are referred to as **Industries.**

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 categorisation 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 SIC 1992 sectors 30-33, with mechanical engineering (SIC 1992, 29) 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 categorisation 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' categorisation used in previous reports produced for DfES. 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		SIC92	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	15.1-15.8	3	3
6.	Drink	15.9	3	3
7.	Tobacco	16	3	3
8.	Textiles	17	4	4
9.	Clothing & leather	18,19	4	4
10.	Wood & wood products	20	5	5 (part)
11.	Paper, printing & publishing	21,22	5	5 (part), 6
12.	Manufactured fuels	23	6	7
13.	Pharmaceuticals	24.4	6	7
14.	Chemicals nes	24 (ex 24.4)	6	7
15.	Rubber & plastics	25	6	7
16.	Non-metallic mineral products	26	6	7
17.	Basic metals	27	7	8
18.	Metal goods	28	7	8
19.	Mechanical engineering	29	8	9
20.	Electronics	30,32	8	9
21.	Electrical engineering	31	8	9
22.	Instruments	33	8	9
23.	Motor vehicles	34	8	10
24.	Aerospace	35.3	9	10
25.	Other transport equipment	35 (ex 35.3)	9	10
26.	Manufacturing nes & recycling	36,37	10	11
27.	Electricity	40.1,40.3	2	12
28.	Gas supply	40.2	2	12
29.	Water supply	41	2	12
30.	Construction	45	11	13
31.	Retailing	52	14	16
32.	Distribution nes	50,51	12, 13	14,15
33.	Hotels & catering	55	15	17
34.	Rail transport	60.1	16	18
35.	Other land transport	60.2,60.3	16	18
36.	Water transport	61	16	18
37.	Air transport	62	16	18
38.	Other transport services	63	16	18
39.	Communications	64	17	19
40.	Banking & finance	65	18	20
41.	Insurance	66	18	20
42.	Professional services	67,73,74.1-74.4	19 (part)	21 (part)
43.	Computing services	72	20	22
44.	Other business services	70,71,74.5-74.8	21 (part)	23 (part)
45.	Public administration & defence	75	22	24
46.	Education	80	23	25
47.	Health & social work	85	24	26
48.	Waste treatment	90	25	27
49.	Other service activities	91-99	25	27
50.	Unallocated			

Table A.2: Detailed Industries (Ind67)

Ind67	Ind67 name[5]	SIC 1992	SAM49 (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	6	3
11	Tobacco	16	7	3
12	Textiles	17	8	4
13	Clothing	18	9	4
14	Leather	19	9	4
15	Wood and wood products	20	10	5
16	Paper and paper products	21	11	5
17	Publishing and printing	22	11	5
18	Manufactured fuels	23	12	6
19	Pharmaceuticals	24.4	13	6
20	Chemicals nes	24 (ex 24.4)	14	6
21	Rubber and plastics	25	15	6
22	Non-metallic mineral products	26	16	6
23	Basic metals	27	17	7
24	Metal goods	28	18	7
25	Mechanical engineering	29	19	8
26	Computers and office machinery	30	20	8
27	Electrical engineering	31	21	8
28	TV and radio	32	20	8
29	Instruments	33	22	8
30	Motor vehicles	34	23	9
31	Aerospace	35.3	24	9
32	Other transport equipment	35 (ex 35.3)	25	9
33	Manufacturing nes	36	26	10
34	Recycling	37	26	10
35	Electricity	40.1, 40.3	27	2
36	Gas supply	40.2	28	2
37	Water supply	41	29	2
38	Construction	45	30	11
39	Sale and maintenance of motor vehicles	50	32	12
40	Distribution nes	51	32	13
41	Retailing nes	52	31	14
42	Hotels and catering	55	33	15
43	Rail transport	60.1	34	16
44	Other land transport	60.2, 60.3	35	16
45	Water transport	61	36	16

[5]They are abbreviated from the full names used by ONS.

Table A.2: Detailed Industries (Ind67) (Continued)

Ind67	Ind67 name[5]	SIC 1992	SAM49 (MDM)	25 industries
46	Air transport	62	37	16
47	Other transport services	63	38	16
48	Post and courier services	64.1	39	17
49	Telecommunications	64.2	39	17
50	Banking and finance	65	40	18
51	Insurance	66	41	18
52	Financial support services	67	42	18
53	Real estate	70	44	19
54	Renting of goods	71	44	19
55	Computing services	72	43	20
56	Research and development	73	42	19
57	Professional services nes	74.1-74.4	42	21
58	Other business services	74.5-74.8	44	21
59	Public administration and defence	75	45	22
60	Education	80	46	23
61	Health and social work	85	47	24
62	Waste disposal	90	48	25
63	Membership organisations	91	49	25
64	Culture and sport	92	49	25
65	Other services	93	49	25
66	Private household	95	49	25
67	Extra-territorial organisations	99	49	25

Table A.3: Classification of 27 SSDA *Sector Matrix* Industries[a]

Industries		SIC92	Total Employment in 2002 (000s)
1.	Agriculture	01-02, 05	443
2.	Mining & quarrying	10-14	77
3.	Food, drink & tobacco	15-16	482
4.	Textiles & clothing	17-19	247
5.	Wood, paper,	20-21	192
6.	Printing & publishing	22	389
7.	Chemicals, & non-metallic mineral products	23-26	637
8.	Metals & metal goods	27-28	497
9.	Engineering	29-33	800
10.	Transport equipment	34-35	388
11.	Manufacturing nes & recycling	36-37	234
12.	Electricity, gas and water	40-41	140
13.	Construction	45	1854
14.	Sale & maintenance of motor vehicles	50	664
15.	Wholesale distribution	51	1286
16.	Retailing	52	3052
17.	Hotels & catering	55	1860
18.	Transport	60-63	1261
19.	Communications	64	547
20.	Banking & insurance	65-67	1146
21	Professional services	70, 71, 73	734
22	Computing & related	72	548
23	Other business services	74	3252
24.	Public administration & defence	75	1461
25.	Education	80	2289
26.	Health & social work	85	3038
27.	Miscellaneous services	90-99	1819

Note: a) As also used in the LSC's new *National Employer Skills Survey*

Table A.4: Classification of 22 Sectors as used in *Skills in England 2002*

Industries		SIC92
1.	Agriculture	01-02,05
2.	Mining & quarrying	10-14
3.	Food, drink & clothing	15-16
4.	Textiles & clothing	17-19
5.	Wood, paper, printing & publishing	20-22
6.	Manufactured fuels	23
7.	Chemicals, plastics, etc.	24-25
8.	Non-metallic mineral products	26
9.	Metals & metal goods	27-28
10.	Engineering	29-33
11.	Transport equipment	34-35
12.	Manufacturing nes & recycling	36-37
13.	Electricity, gas and water	40-41
14.	Construction	45
15.	Distribution	50-52
16.	Hotels & catering	55
17.	Transport	60-63
18.	Communications	64
19.	Banking & insurance	65-66
20	Business services	67, 70-74
21.	Public services	75, 80, 85
22.	Miscellaneous services	90-99

Table A.5: General Classification for Presenting Industries in National Reports

	Industries	SIC92	MDM Industries	Total Employment 2002 (000s)
1.	Agriculture, etc.	01-02, 05	1	443
2.	Mining & quarrying, utilities	10-14,40-41	2,3,4, 27,28,29	217
3.	Food, drink & tobacco	15-16	5,6,7	482
4.	Textiles & clothing	17-19	8,9	247
5.	Wood, paper, printing & publishing	20-22	10,11	581
6.	Chemicals, & non-metallic mineral products	23-26	12,13,14,15	637
7.	Metals & metal goods	27-28	16,17,18	497
8.	Engineering	29-33	19,20,21,22	800
9.	Transport equipment	34-35	23,24,25	388
10.	Manufacturing nes & recycling	36-37	26	234
11.	Construction	45	30	1854
12.	Sale & maintenance of motor vehicles	50	32 (part)	664
13.	Wholesale distribution nes	51	32 (part)	1286
14.	Retailing	52	31	3052
15.	Hotels & catering	55	33	1860
16.	Transport	60-63	34,35,36,37,38	1261
17.	Communications	64	39	547
18.	Banking & insurance	65-67	40,41	1146
19.	Professional services	70, 71,73	42 (part), 44 (part)	734
20.	Computing & related	72	43	548
21.	Other business services	74	42 (part), 44 (part)	3252
22.	Public administration & defence	75	45	1461
23.	Education	80	46	2289
24.	Health & social work	85	47	3038
25.	Miscellaneous services	90-99	48,49,50	1819

Note: a) Most of these sectors are identical to the 27 categories in Table 4. The exceptions are industries 2 and 5, which are aggregates of 2 such categories.

Table A.6: ONS *Sectors:* Industries for which ONS supply data for the Government Office Regions (employees only)

		SIC 1992		SAM49 (MDM)
1	Agriculture hunting, forestry, fishing	(AB)	01 to 05	1
2	Mining & quarrying	(C)	10-14	2-4
3	Manufacturing	(D)	15-37	5-26
4	Electricity gas & water supply	(E)	40/41	27-29
5	Construction	(F)	45	30
6	Personal household goods	(G)	50 to 52	
7	Hotels & restaurants	(H)	55	33
8	Transport storage & communication	(I)	60 to 64	34-39
9	Financial intermediation	(J)	65 to 67	40,41,42(pt)
10	Real estate renting & business activities	(K)	70 to 74	42(pt),43,44
11	Public admin. & defence; compulsory social security	(L)	75	45
12	Education	(M)	80	46
13	Health & social work	(N)	85	47
14	Other community, social & personal service activities; private households organisations & bodies	(O,P,Q)	90 to 99	48-49

Table A.7: *Regional Sectors*

		SIC 1992		SAM49 (MDM)	Broad Sector Group
1	Agriculture, hunting, forestry, fishing[a]	(AB)	01-05	1	1
2	Mining & quarrying[a]	(C)	10-14	2-4	1
	Manufacturing, of which:[b]	(D)	15-37	5-26	2
3	Food drink & tobacco	(DA)	15-16	5-7	2
4	Engineering	(DL+)	29-33	19-22	2
5	Rest of manufacturing	(rest of D)		8-18,23-26	2
6	Electricity, gas & water[a]	(E)	40/41	27-29	1
7	Construction	(F)	45	30	3
8	Retail, distribution	(G)	50-52	31,32	4
9	Hotels & restaurants	(H)	55	33	4
10	Transport, storage & communication	(I)	60-64	34-39	4
11	Banking & insurance	(J)	65-67	40,41	5
12	Other business activities	(K)	70-74	42,43,44	5
13	Public admin. & defence	(L)	75	45	6
14	Education	(M)	80	46	6
15	Health & social work	(N)	85	47	6
16	Other services	(O,P,Q)	90-99	48-49	5

Note: a) Although these categories are shown here, small sample sizes preclude producing some 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 6.

Table A.8: *Broad Sectors* (and Comparison with Industry Groups used in Previous Projections)

Broad Sector	Old Industry Group[a]	MDM Industries
1. Primary and utilities	1. Agriculture	1
	2. Mining etc.	2,3,4
	9. Utilities	27,28,29
2. Manufacturing	3. Food, drink and tobacco	5,6,7
	4. Textiles and clothing	8,9
	5. Chemicals	12,13,14,15
	6. Metals, and mineral products	16,17
	7. Engineering	18-25
	8. Other manufacturing	10,11,26
3. Construction	10. Construction	30
4. Distribution, transport etc.	11. Distribution, hotels etc.	31,32,33
	12. Transport and communication	34-39
5. Business and other services	13. Banking and business services	40,41,44
	14. Professional services	42,43
	15. Other services	48,49
6. Non-marketed services	16. Health and education services	46,47
	17. Public administration and defence	45

Note: a) As used in Wilson (2001).

A.9: Broad Sectors, Sector Matrix Industries[a] and MDM Industries

Broad Sector	25 / 27 industries[b]	MDM Industries
1. Primary and utilities	1. Agriculture, etc.	1
	2. Mining and quarrying	2,3,4
	Utilities[a]	27,28,29
2. Manufacturing	3. Food, drink and tobacco	5,6,7
	4. Textiles and clothing	8,9
	5. Wood, paper	10 (part)
	Printing & publishing[a]	10 (part), 11
	6. Chemicals, non-metallic min. prods.	12,13,14,15
	7. Metals and metal goods	16,17,18
	8. Engineering	19,20,21,22
	9. Transport equipment	23,24,25
	10. Manufacturing nes and recycling	26
3. Construction	11. Construction	30
4. Distribution, transport etc.	12. Sale & maintenance of motors.	32 (part)
	13. Distribution nes	32 (part)
	14. Retailing	31
	15. Hotels & catering	33
	16. Transport and storage	34,35,36,37,38
	17. Communications	39
5. Business and other services	18. Banking and insurance	40,41
	19. Professional services	42 (part),44 (part)
	20. Computing & related activities	43
	21. Other business services	42 (part),44 (part)
	25. Miscellaneous services	48,49,50
6. Non-marketed services	22. Public administration and defence	45
	23. Education services	46
	24. Health and social work	47

Note: a) For further information on the SSDA Sector Matrix go to www.ssdamatrix.org.uk/

b) Aggregation from 27 to 25 industries:
Mining and Utilities are combined to give industry 2
Wood and paper and printing and publishing are combined to give industry 5.

Table A.10: Relationship between Industry (25) and Detailed Industry (67)

Industry		Detailed Industry		SIC1992
1	Agriculture and associated industries	1	Agriculture	01
		2	Forestry	02
		3	Fishing	05
2	Mining and quarrying, utilities	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
		37	Water supply	41
3	Food, drink and tobacco	9	Food	15.1-15.8
		10	Drink	15.9
		11	Tobacco	16
4	Textiles and clothing	12	Textiles	17
		13	Clothing	18
		14	Leather	19
5	Wood, paper, printing and publishing	15	Wood and wood products	20
		16	Paper and paper products	21
		17	Publishing and printing	22
6	Chemicals and non-metallic mineral products	18	Manufactured fuels	23
		19	Pharmaceuticals	24.4
		20	Chemicals nes	24 (ex 24.4)
		21	Rubber and plastics	25
		22	Non-metallic mineral products	26
7	Metals and metal goods	23	Basic metals	27
		24	Metal goods	28
8	Engineering	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	Manufacturing nes and 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 and catering	42	Hotels and catering	55

Table A.10: Relationship between Industry (25) and Detailed Industry (67) (Continued)

Industry		Detailed Industry		SIC1992
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
17	Communications	48	Post and courier services	64.1
		49	Telecommunications	64.2
18	Banking and insurance	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
20	Computing and related activities	55	Computing services	72
21	Other business services	57	Professional services nes	74.1-74.4
		58	Other business services	74.5-74.8
22	Public administration	59	Public administration and defence	75
23	Education	60	Education	80
24	Health	61	Health and social work	85
25	Miscellaneous services	62	Waste disposal	90
		63	Membership organisations	91
		64	Culture and sport	92
		65	Other services	93
		66	Private household	95
		67	Extra-territorial organisations	99

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