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BULLETIN

Projections of Occupations and Qualifications

Background

This *Bulletin* summarises a major report* prepared by the Institute for Employment Research (IER) in collaboration with Cambridge Econometrics (CE) for the DfEE. The projections are part of a larger programme of work founded by DfEE which supported the National Skills Task Force (STF). This programme also involves a series of Sectoral Dialogue events, which provided a forum for the National Training Organisations to debate issues relating to skills. The projections were intendeded to provide a key input into these events by providing useful intelligence to all those with an interest in labour markets. The projections are based on the use of a *multi-sectoral, regional macroeconomic model*, combined with *occupational* and *qualifications* modules. Note that, given the limitations of data and in the methods of analysis they can support, such projections can only be broadly indicative of the likely evolution of the employment structure. The main projection period covered is *1998* to *2009*.

Macroeconomic Context

The macroeconomic scenario underlying the projections is one of continuing steady growth, with only moderate rates of inflation. *Gross Domestic Product (GDP)* and *Gross Value Added (GVA)* are projected to display long-term growth rates of approximately 2.5 per cent per annum.

Inflation, the sterling exchange rate and public expenditure

Continued low inflation among the major OECD countries is expected. After a short-term correction to the current low level of the euro and the high level of sterling, a stable value for sterling against the euro and the US dollar is assumed. The outlook for inflation is therefore one of modest rates of increase in prices and wages.

The projections are based on a modest acceleration in public expenditure growth and a small further reduction in the main rate of income tax. The government is expected to be able to do this without major increases in public borrowing.

General labour market prospects

The key features of the projections as far as the labour market is concerned are as follows:

- the *long-term rate of employment growth* is expected to lie in the range 0.5-1.0 per cent per annum;
- between 1998 and 2009 there are expected to be 2.3 million *additional jobs*;
- just over two-thirds 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 economic activity rate reaching 80 per cent by 2009;
- the level of *unemployment* is expected to remain stable at relatively low levels compared with recent historical experience. However, although for most people unemployment will be a transitory experience, a minority will continue to suffer long duration unemployment.

Projections of output by sector

The prospects for key sectors to 2009 are as follows:

- *mining, electricity, gas and water* are expected to display the weakest growth;

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* *Projections of Occupations and Qualifications 1999/2000*, Sheffield, Department for Education and Employment, 142pp; www.skillsbase.dfee.gov.uk

- *manufacturing* output growth is forecast to average 2.5 per cent per annum – underpinned by high growth in technology and R&D-related industries, while textiles, clothing & leather and metals are weaker performers;
- *transport & communications* output is forecast to grow by 4 per cent per annum – with communications displaying the strongest growth of any services apart from computing;
- *financial & business services* are expected to grow by up to 4 per cent per annum over the longer term;
- *public services* output is forecast to grow by 1.5-2.0 per cent per annum.

Industrial Employment Prospects

Employment prospects to 2009 are intimately linked to output growth but also depend on how rapidly productivity rises in each sector.

- The *primary* sector (including *agriculture, mining* and *utilities*) is expected to continue to experience significant job losses until 2004, but losses are projected to slow thereafter;
- long-term decline in employment in *manufacturing* is expected to continue; with a loss of almost 700 thousand jobs between 1998 and 2009:
  - ◇ *engineering* is the largest contributor to job loss, as employment declines by over 300 thousand jobs;
  - ◇ *metals & mineral products* and *textiles* display the largest percentage job losses, with approximately one third of jobs being lost over the period to 2009;
- *construction* is projected to experience little change between 1998 and 2009;
- employment in the distribution and transport sector is expected to increase by 740 thousand
- jobs between 1998 and 2009 – with most of the growth accounted for by jobs in distribution, hotels & catering;
- employment in *business & miscellaneous services* is forecast to increase by almost 1.9 million by 2009, with all industry groups within the sector contributing to growth:
  - ◇ a 50 per cent increase in jobs is projected in *professional services*;
  - ◇ a 50 per cent increase in jobs is projected in *professional services*;
- despite a projected increase in jobs in *non-marketed* services, the share of all jobs in this sector is forecast to fall slightly between 1998 and 2009:
  - ◇ all of the projected employment growth is accounted for by health & education services; while
  - ◇ public administration & defence is forecast to see small declines in employment.

Changing Patterns of Employment by Status and Gender

Changes in the industrial composition of employment have significant implications for various other aspects of employment structure. In particular:

- the decline of employment in manufacturing and primary sectors over the last few decades has resulted in the loss of many full-time jobs, traditionally held by men;
- the growth of jobs in the service sector has created more opportunities for women, particularly those willing to work part-time.

Female employment is expected to grow by 1.6 million over the period to 2009, while male employment is projected to increase by slightly less than half this amount.

Part-time employment is expected to account for almost half the increase in total employment although there is some recovery in the number of full-time jobs.

The share of *self-employment* is expected to decline over the next decade. This is primarily attributable to changes in the construction sector, and in transport & distribution. The overall numbers of self-employed are expected to rise slightly.

Changes in Occupational Structure

The projections use the new SOC 2000 occupational classification which will be the standard system for all official data, including the 2001 Census of Population.

Projections to 2009

Underlying trends, which have been apparent over the previous two decades, are expected to continue, with significant increases in employment over the period from 1998 to 2009 expected for:

- *managers & senior officials* ñ almost 300 thousand jobs: within this group employment growth is expected to be particularly strong for *corporate administrators*: most notably, *specialist managers* working in private commercial organisations;
- *professional occupations* – almost 900 thousand jobs: all sub-groups are projected to have employment increases, but the highest growth is expected for *business & public service professionals* – particularly *financial specialists*;
- associate *professional & technical occupations* – over 800 thousand jobs: most sub-groups are expected to see strong employment growth, with especially strong growth for associate professionals working in *computers* and for those in *business & finance*;

- *personal service occupations* – almost 470 thousand jobs: women are the main beneficiaries – most of the very high growth in this group is focused on *caring personal services occupations* – particularly those associated with healthcare and childcare;

Smaller increases of around 190 thousand jobs are projected for the sales occupations groump.

Declining employment levels are projected for:

- *administrative, clerical & secretarial occupations* – where the impact of IT leads to the cessation of previously strong growth and the loss of about 30 thousand jobs.
- *skilled trades occupations* – about 270 thousand jobs: almost all occupations are projected to have declining employment over the decade, with largest job losses in *skilled metal & electrical trades*;
- *process, plant & machine operatives* – some 30 thousand jobs: here the most significant employment reductions are expected for *plant & machine operators* who work in factories and on construction sites;
- *elementary occupations* – around 60 thousand jobs: this final SOC 2000 major group is expected to see job reduction concentrated primarily in those unskilled occupations which are linked to the primary & manufacturing sectors of the economy.

Replacement Demand

Definitions

The projections described above relate to *expansion demand* arising from net growth (or decline) in occupational employment. Estimates of expansion demand provide a useful indication of likely ‘gainers’ and ‘losers’ from employment change.

However, employers will need to *replace* those workers who leave – due to retirement, career moves, mortality or related reasons. Replacement demand can easily outweigh any changes resulting from expected employment decline.

Measuring replacement demand

It is possible to identify three components of replacement demand:

- *losses due to retirement and mortality* – which require positive replacement;
- *net occupational mobility* – outward mobility adds to replacement demand, while inward mobility reduces replacement demand;
- *net migration* – outward migration adds to replacement demand, while inward migration reduces replacement demand.

Total replacement demand is the sum of these components.

The extent of replacement demand

For all occupations together, replacement demand in total is about five times larger than expansion demand. Between 1998 and 2009 there is expected to be a net requirement of about 13.5 million job openings. This includes some job openings created by people transferring from one occupation to another (some of which will be filled by similar means). However retirements are the principle component in this estimate.

Expansion and replacement demand – exemplar patterns by occupational group

Two broad groups of occupations with different patterns of expansion and replacement demand are identifiable. For some groups, positive replacement demand outweighs negative expansion demand. This applies for example, to:

- managers & proprietors in agriculture and in service industries, secretarial & related occupations and skilled metal & electrical trades;

For many others expected retirements will add to expansion demand to create high 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, administrative and clerical workers, caring personal services, sales and elementary clerical and service workers.

Projections of the Demand for and Supply of Qualifications

New models have been developed for projecting the demand for and supply of qualifications:

- The, so called, *demand model* links the employment of qualified people to projections of occupational change. It focuses on qualification penetration rates for NVQ levels 4 and 5.
- Projections of the *supply* of qualifications are based on extrapolations of proportions of people obtaining qualifications by level and discipline applied to demographic projections from the Office of National Statistics. The resulting flow of newly qualified entrants is translated into a measure of overall supply via a simple stock flow model and assumptions about activity rates.

Recent trends

The *demand* for qualified persons has risen rapidly since the 1970s. There have been two key drivers:

- shifts in occupational structure have favoured those groups employing large proportions of qualified people (especially those employing high proportions of those with higher level qualifications),

- shares of employment of those holding formal qualifications (especially higher level qualifications) have risen within all occupations; these are referred to as *qualification penetration rates.*

Total *supply* has risen equally rapidly. The key driving force has been increasing proportions of young people staying on in full-time education and obtaining formal qualifications as well as greater educational participation by mature adults.

Projected demand for qualifications

Assuming a continuation of longer-term historical trends over the 1980s and 1990s, an additional 2 million jobs for highly qualified persons (NVQ levels 4 and 5) are expected over the period from 1998 to 2009. However, there is some uncertainty about this and a range of possible outcomes is presented.

Projected supply of qualifications

The supply of qualifications is projected to increase rapidly, as the recent increases in educational participation rates fuel an increase in the stock of economically active individuals qualified at degree level or above (NVQ levels 4 and 5) by 2.2 million between 1998 and 2009.

Comparing the demand and supply of qualifications

A simplistic comparison of supply and demand based on a continuation of trends suggests that most people qualified at higher levels will find suitable employment.

However, it seems likely that many more highly qualified individuals will have to find jobs outside the 'traditional' areas of graduate employment, many of which are now approaching saturation point in terms of graduate penetration rates.

Persons qualified at higher levels are expected to find employment in many non-traditional jobs. This may often be at the expense of less well qualified people who may be displaced into less attractive jobs.

The Changing Demand for Key/Generic Skills

Defining key/generic skills

Key or Generic skills are general skills which are transferable across different occupations. They encompass basic communication, numeracy, information technology (IT) skills, the ability to work with others, problem solving, improving own learning and performance, reasoning skills for work planning and work process management skills.

Additionally, so-called *softer skills* are often cited in the context of generic skills. These include team leadership, negotiation, facilitation and social skills.

Measuring generic skills

It is difficult to measure skills – particularly generic skills. While there is a linkage between occupational status and skills, neither qualification nor job status is a reliable measure of skill use in the workplace.

Three broad approaches can be adopted to relate skills to specific occupations:

1) use professional job analysts to identify precisely what skills are needed to carry out particular tasks;

2) ask employees what skills they need to carry out their existing job; and

3) obtain information from employers.

Each of these methods has advantages and limitations. The present analysis is based on the use of the second approach.

The Skills Survey

The *Skills Survey*[1] was a specially commissioned survey focusing on skills in the British workforce. It was conducted in 1997 and covers a representative sample of almost 2,500 individuals in work aged 20-60 years. Individuals were asked to report how important 36 generic skill activities were in their present job context.

Many skill activities are highly correlated. Hence the 36 activities were reduced into 8 key skill components:

1. verbal
2. manual
3. problem-solving and checking
4. numerical
5. planning
6. client communication
7. horizontal communication
8. professional communication

A further set of more specific skills were also distinguished:

9. computing
10. autonomy
11. variety
12. organised teamwork.

1 Ashton, D., B. Davies, A. Felstead and F. Green (1999). *Work Skills in Britain*. Centre for Skills, Knowledge and Organisational performance: Oxford/Warwick Universities

Projecting skill requirements

Projections of skill requirements were derived using:

- projections of employment change by occupation
- information on the relative importance of generic skills within each occupation from the Skills Survey.

Expected changes in occupational structure suggest between 1998 and 2009 suggest that there will be small increases in most skill requirements, apart from manual skills. Moreover, an analysis of changing skill needs within occupations suggests a strong increase in the need for many generic skills.

Regional Trends

Much (although not all) of the analysis described above has also been conducted at a regional level, with results for each of the new RDA areas as well as Scotland, Wales and Northern Ireland. The key features as far as the regions are concerned are as follows.

Overall prospects for the regions

Strongest *GDP* growth in the medium and long term is expected in southern England – most notably in the South East, the East and the South West. This is due to strong output growth in services (accompanied by strong employment growth), but also good prospects for output growth in manufacturing.

Labour supply in the regions

Over the period from 1998 to 2009 the *labour force* is expected to grow in all regions. In most cases this increase is a function of an increase in the population of working age and an increase in the economic activity rate amongst the population of working age. There are regional variations in *economic activity rates*. London and the South East display amongst the highest rates, and Wales and the North East amongst the lowest rates.

All regions are projected to see a continuation of the much lower rates of unemployment observed in recent years compared to the experience of the 1990s. No further regional convergence in unemployment rates is expected.

Changes in employment status by gender

Although all regions are projected to witness a growth in employment between 1998 and 2009, the patterns of employment change by status by gender vary between regions.

Growth in full-time employment is the largest contributor to projected employment increase in the South East, East, South West, East Midlands, West Midlands, Yorkshire & the Humber and the North West. In London, Wales, Scotland and Northern Ireland, part-time employment is the main contributor to aggregate employment increase.

Sectoral prospects by region

Across *all industries* projected annual employment growth per annum over the period from 1998 to 2009 ranges from 1.3 per cent per annum in the South West to 0.3 per cent per annum in the North East, compared with an increase across the UK of 0.7 per cent per annum. The South West, South East and Northern Ireland display higher growth rates than the UK average. The East and West Midlands display the next highest growth rates.

The South West is the only region projected to exhibit a more favourable annual average rate of employment change than the UK average in all broad sectors. London and the North West display less favourable employment change than the UK average in all broad sectors.

Reductions in employment are expected in the *primary & utilities and manufacturing* sectors in all regions. In contrast, the *business & miscellaneous services* sector exhibits the highest annual average rates of employment growth. This sector is the main contributor to employment increase in London.

Regional patterns of employment growth in *non-marketed services* to some extent follow patterns of population change.

Occupational prospects by region

With the exception of Wales, all regions are projected to see an increase in employment for *managers & senior officials* between 1998 and 2009.

An increase in employment in *professional occupations* and *associate professional & technical occupations* is projected in all regions. The 'professionalisation' of the employment structure is furthest advanced in London and the southern regions of England.

Administrative, clerical & secretarial occupations are decentralising from 'core' regions, with projected employment losses in London, the South East and East of England. The largest relative gains are projected in the West Midlands, the North West, Yorkshire & the Humber and Scotland.

Employment in *skilled trades occupations* is projected to decline in all regions other than the South West. This dominates job losses for males. The East Midlands and Wales are projected to record the largest relative reductions in employment in skilled trades occupations.

All regions share in the projected increase in employment in personal *service occupations*. The increases are generally large. In the South West, East and East Midlands female employment in this occupational group is expected to more than double between 1998 and 2009. In all regions, much smaller employment increases are projected for *sales occupations*.

There are more pronounced regional differences in employment prospects for *process, plant & machine* *operatives*. The largest relative increases in employment are expected in the South West and Wales, with smaller increases in the East, East Midlands and West Midlands. London records the largest decline in employment for process, plant & machine operatives.

London, the West Midlands, the North East and Northern Ireland are projected to witness the largest relative employment declines in *elementary occupations*. Job losses are also projected for the East Midlands, North West, Yorkshire & the Humber and Wales, while employment increases are expected elsewhere.

Other Work for the National Skills Task Force

The Institute has been especially active in research relating to the programme of the National Skills Task Force. Professor Elias, Professor Robert Lindley and Dr. Rob Wilson were all members of the Academic Support Group for the Task Force at various stages. Major projects were undertaken, partly in collaboration with other organisations, and the Institute has developed the Skillsbase web site for the DFEE. The occupational projections prepared by the Institute were co-ordinated by Dr. Wilson and involved collaboration with Cambridge Econometrics, the principal provider of multi-sectoral projections for the UK. The *Employers' Skill Survey* was co-ordinated by Terence Hogarth and involved the participation of two of the IER's most long-standing Associate Fellows, Professor Derek Bosworth (Univeristy of Manchester Institute of Science and Technology) and Geoff Briscoe (Coventry University). Other organisations were also involved via the contribution of sectoral studies:

Business Strategies, London

City University Business School, London

Employment Studies Research Unit, Bristol

Business School, UWE

Institute for Employment Studies, Brighton

Warwick Manufacturing Group, University of Warwick

The following publications have resulted to date:

Bosworth, D.L., (2000) *Management Skills*. Skills Task Force Research Paper SKT8, DfEE: London

Bosworth, D., Davies, R., Hogarth, T., Wilson, R. and Shury, J. (2000) *Employers Skill Survey: Statistical Report*, DfEE, www.dfee.gov.uk/skillsforce

Brown, A., Green, A., Pitcher, J. and Simm, C. (2000) *Employer Skill Survey: Health and Social Care Report*, DfEE, www.dfee.gov.uk/skillsforce

Davis, C., Hogarth, T., Buckley, T. and Shackleton, R. (2000) *Employers Skill Survey: Engineering Report*, DfEE, www.dfee.gov.uk/skillsforce

Elias, D.P.B. and McKnight, A., (1999) *Monitoring and measuring occupational change: the development of SOC 2000*. Skills Task Force Research Paper SKT24, DfEE: London

Hasluck, C.(1999), Skills Task Force Research Paper 9, *Employment Prospects & Skill Needs in the Banking, Finance & Insurance Sector*, DfEE: London www.dfee.gov.uk/skillsforce

Wilson, R.A. (2000) (ed.), *Projections of Occupations and Qualifications 1999/2000*, Sheffield, Department for Education and Employment, 142pp. [ISBN 1 84185 8]; www.skillsbase.dfee.gov.uk . Copies may be obtained, free of charge, from the IER Promotion and Dissemination Office, University of Warwick, Coventry CV4 7AL; tel. 024 76524127, email: shields@warwick.ac.uk

Copies of the above studies may be obtained from: DfEE Publications, PO Box 5050, Sherwood Park, Annesley, Nottingham NG15 ODJ, Tel: 0845 60 22260, Fax: 0845 60 333 60, Email: dfee@prologistics.co.uk

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