Migration Advisory Committee

Identifying skilled occupations where migration can sensibly help to fill labour shortages

Methods of investigation and next steps for the Committee's first Shortage Occupation List

February 2008

The Migration Advisory Committee

Chair

Professor David Metcalf CBE

Members

Dr Diane Coyle

Dr Martin Ruhs

Professor Jonathan Wadsworth

Professor Rob Wilson

Sector Skills Development Agency representative

Professor Mike Campbell OBE

Government Observer

Paula Higson

The Secretariat

Vanna Aldin

Anne Ball

Cordella Dawson

Anna Downs

Stephen Earl

Mark Franks (Head of secretariat)

Daniel James

Andrew Watton

Contents

Annexes:

Summary

- The Migration Advisory Committee is a newly established non-departmental public body set up to provide transparent, independent and evidence-based advice to Government on where skilled labour market shortages exist that can sensibly be filled by migration.
- Our initial task is to produce shortage occupation lists for the UK, and Scotland only, by June 2008 for use alongside the launch of Tier 2 of the new Points Based System for migration. These lists will comprise skilled occupations where, in our view, there are shortages that can sensibly be filled by enabling employers to recruit migrants from outside the European Economic Area (EAA). We will publish the recommended lists in June 2008.
- To produce the lists, we will use a hybrid method that combines the consistency and comprehensiveness of a "top-down" approach with the fine-grained detail and contextualisation of a "bottom-up" method.
- Our approach will be firstly, to consider whether individual occupations or categories of jobs are sufficiently **"skilled"** for the shortage occupation list. Then we will assess whether there is a **"shortage"** of labour within each skilled occupation. Finally, we will consider whether it is **"sensible"** for migrant labour from outside the EEA to be used to fill a skilled shortage, given that employment of migrant labour may only be one of a number of possible responses to labour shortage.
- National labour market data will provide the basis for the top-down analysis. We will interrogate these data for indicators of whether an occupation satisfies the skilled, shortage and sensible criteria.
- When thinking about whether an occupation is **skilled**, we plan to look at indicators including qualifications held by people within that occupation and average earnings (see section 2 for a more comprehensive list of the indicators of skill).
- When considering whether an occupation is experiencing **shortage** we will look at data on indicators including earnings, vacancies and unemployment, and skill survey data (see section 3).
- When considering whether it is **sensible** to fill a shortage with non-EEA migrant labour, the indicators we will examine will include efforts that are being made to fill the shortage by other means, including up-skilling the UK workforce and attempts to recruit from within the EEA (see section 4).

- In carrying out this analysis, there are various data-related and practical limitations. Limitations include: a limited degree of disaggregation that is possible within the key data sources, time lags in the data, and a lack of counterfactual. We also need to consider what weightings, hierarchies and cut-off points to use when looking at each of the indicators.
- Particularly due to the limitations of top-down analysis, bottom-up micro-level analysis and information relating to specific groups of jobs and sectors, will also be essential to our work. This will come from localised analysis of individual sectors. We are keen to take evidence from the Sector Skills Councils and are looking to develop strong links with the new Commission for Employment and Skills which comes into operation in April this year.
- We will also make visits to each region of England, along with Scotland, Wales and Northern Ireland, before we publish the recommended shortage occupation list in June 2008. This will include visits to employers that have specific plans for identifying and recruiting skilled labour, or where a skilled labour shortage has become evident or is asserted.
- We are also setting up a formal stakeholder panel comprising national level employer and employee representatives, and will bring together a wider group of stakeholders, including regional and sector representatives, to create a stakeholder forum.
- Through this report, we are also issuing a **call for evidence**. This will enable the Committee to take comments from individual experts, employers, and other interested parties (see section 7).

Introduction

The Migration Advisory Committee is a newly established non-departmental public body set up to provide transparent, independent and evidence-based advice to Government on where shortages of skilled labour exist that can sensibly be filled by migration.

In 2006, following an extensive public consultation, the Border and Immigration Agency published proposals[1] to modernise and strengthen the UK's immigration system by introducing a new Points Based System (PBS).

Alongside the implementation of the new system, the Government has requested that we, the Migration Advisory Committee, report on where there are gaps in the current data required by us in relation to skilled labour shortages, how those data gaps should be filled, and how we propose to report on shortage occupations in the meantime. This report is our response to that request. The content represents the independent view of the Committee and not necessarily that of the Government.

Our initial task is to produce shortage occupation lists for the UK, and Scotland only, by June 2008, for use alongside the launch of Tier 2 of the PBS. These lists will comprise occupations where, in our view, there are shortages in skilled occupations that can sensibly be filled by enabling employers to recruit migrants. We will publish recommended lists in June 2008.

The Government has also stated that it may, from time to time, ask us to advise on other matters relating to migration.

The first meeting of the Migration Advisory Committee was on 7 December 2007, and there have been subsequent meetings on 25 January 2008 and 15 February 2008.

In this report, we set out our initial thoughts on the methodology we will use to identify skilled occupations and labour shortages in those occupations, and the steps we will undertake to determine which shortage occupations can be sensibly filled by migrants. It follows on from our first report "Preliminary Comments on Data and Methodology" published in January 2008 and available on the Committee's website[2].

1. Home Office (2006), "A Points-Based System: Making Migration Work for Britain" http://press.homeoffice.gov.uk/press-releases/points-based-migration

2. See: http://www.bia.homeoffice.gov.uk/sitecontent/documents/aboutus/workingwithus/mac/macreports/

1.1 The Points Based System

The new Points Based System (PBS) will set the criteria under which nationals of countries outside the European Economic Area (EEA) come to the UK to work, train or study. The system consists of five tiers. Each tier represents a route by which suitably qualified persons may come to work in the UK.

- Tier 1 is comprised of highly skilled individuals who can contribute to growth and productivity;
- Tier 2 is comprised of skilled workers with a job offer to fill gaps in the UK labour force;
- Tier 3 is comprised of low skilled workers to fill specific temporary labour shortages;
- Tier 4 is comprised of students; and
- Tier 5 is comprised of persons coming to the UK to satisfy primarily non-economic objectives, such as those coming on youth mobility schemes and temporary workers.

Tier 1 will be the first part of the points system to be implemented. In February 2008, the Government published the rules for highly skilled foreign workers applying to come to the UK. The regulations will come into force on 29 February 2008 when any highly skilled foreign nationals currently working in Britain who want to extend their stay will need to apply under the new system. In April, the new system will begin to be rolled out overseas when anyone from India who wants to work in the UK as a highly skilled migrant will need to apply under PBS. By the summer the new highly skilled system will operate worldwide.

We expect that Tier 2 will be introduced during the second half of 2008. Although final details are yet to be announced[3], **Box 1.1** summarises a possible form of Tier 2. Under Tier 2, applicants would need to have a job offer from an employer who is licensed by the Border and Immigration Agency as an approved sponsor. We also currently expect that employers who wish to bring migrants in under Tier 2 of the PBS will need to ensure that, amongst other criteria, the job is at the National Vocational Qualification (NVQ) skill level 3 or above within the National Qualifications Framework[4]. There will also be an English language requirement[5].

The required points for entry under Tier 2 can be obtained if a job is either in an occupation that has been identified as a shortage by the Government on the advice of the Migration Advisory Committee, or an Intra-Company Transfer, or the salary is above a certain threshold. In circumstances other than those, the required points must be obtained based on the job and characteristics of the migrant, such as skills and salary requirements. The post also needs to have passed a Resident Labour Market Test to demonstrate that the migrant is not displacing a worker in the UK labour market and that the job cannot be filled from within the EEA.

3. We expect the Government to publish a Statement of Intent for Tier 2 in March 2008.

4. The National Qualifications Framework sets out the levels against which a qualification can be recognised in England, Wales and Northern Ireland. Within the framework National Vocational Qualification (NVQ) level 3 is “equivalent” to an A level qualification.

5. Border and Immigration Agency (2007), “Points Based System: Procedure for Inclusion on the List of Approved English Language Tests” http://www.ind.homeoffice.gov.uk/sitecontent/documents/managingourborders/pbsdocs/

Box 1.1: Description of possible Tier 2

Final details to be announced by the Home Office

Initial criteria

- NVQ level 3 and above level job
- English at level B2 on the Council of Europe's Common European Framework of Reference for Languages (CEFR)
- Need 50 points

Direct routes to full 50 points

- Shortage occupation (MAC recommends)
- Intra-Company Transfers (6+ months experience at employer, paid at UK going rate)
- Pay above certain threshold (level tbc)

Alternative routes to 50 points

• Resident Labour Market Test passed	30 points
• NVQ3 / BSc / MSc / PhD	5 / 10 / 10 / 15 points
• Annual pay £k 17-20 / 20-22 / 22-24 / 24-40	5 / 10 / 15 / 20 points

1.2 Conceptual framework

In thinking about occupations we will, where possible, work with the Standard Occupational Classification 2000 (SOC), which is designed as a classification applicable to all paid jobs performed by economically active persons in the UK. In some cases we will need to look beyond what SOC 2000 refers to as "occupations" and instead look at more specific job titles. Occupation and sector classifications are discussed in more detail in **Annex A** to this report.

There are three major sets of conceptual issues that we are organising our activities around. First, as we expect employers will only be able to employ migrant labour under Tier 2 when the job in question is at NVQ level 3 or above, we will need to consider what constitutes a **"skilled"** occupation.

Once the occupations with the right level of skill for the shortage occupation lists are identified, we will assess whether there is a **"shortage"** of labour with the appropriate skills in the current labour supply.

Finally, we will consider whether it is **"sensible"** for migrant labour from outside the EEA to be used to fill a skilled shortage, keeping in mind that the employment of migrant labour may only be one of a number of possible responses to labour shortages.

Although this report aims to ensure that our approach to the shortage occupation list is as clear and transparent as possible, the issues are undeniably complex, and we will refine our approach between now and June as we gather evidence and talk to employers, employees and other stakeholders.

To produce the list, we will use a hybrid method that combines the consistency and comprehensiveness of a "top-down" approach with the fine-grained detail and contextualisation of a "bottom-up" method. To identify which occupations are skilled, and which of those are experiencing shortage, we will look at national (i.e. UK-wide) labour market data. But, it is unlikely that all skilled occupations with significant shortages of labour can be identified from top-down sources alone. Bottom-up micro-level analysis relating to particular categories of jobs and sectors will also be central to our work. This will come from localised analysis of individual sectors and, crucially, will be informed by engagement with a wide variety of stakeholders and a series of regional visits.

We believe that a key source of bottom-up evidence is the Sector Skills Councils (SSCs). The Skills for Business network consists of 25 SSCs, covering 89 per cent of the UK workforce. Each SSC is an employer-led, independent organisation that covers a specific sector across the UK[6].

1.3 Report structure

Section 2 of this report sets out in more detail our initial thoughts on how we are planning to identify "skilled" occupations. Section 3 discusses the indicators we are likely to consider to identify "shortages" of skilled labour. Section 4 considers how to identify whether it is "sensible" to fill identified shortages with migrant labour. Section 5 outlines national data sources and qualitative evidence. In section 6 we discuss the practical difficulties and data limitations.

We conclude, in section 7, by setting out the next steps we plan to take in order to produce the shortage occupation list by June 2008. We also issue a call for evidence, where we set out specific areas where we will be happy to receive input into our work. There are annexes on: Sectors and Occupations; identifying qualifications at NVQ level 3 and above; occupations and share of qualified employees; skill shortage data indicators; and the potential content of our June report.

6. Visit www.skillsforbusiness.biz for more information on the Sector Skills Councils.

Concepts: Skills

2.1 Context

The Committee needs to examine which occupations or job titles are "skilled", requiring a skill level at NVQ level 3+. If an occupation or job title is classified as skilled at that level, it can then be evaluated under the "shortage" and "sensible" headings.

Stage one of this exercise is, therefore, to set out possible indicators and criteria for defining an occupation "skilled". The unit of observation will normally be the 4 digit, or unit group, occupation level but this can, as explained below, be supplemented with evidence at a more disaggregated job title level. A description of the Standard Occupational Classification (SOC) is provided in **Annex A**[7].

Skills can be defined as "what you are able to do": the capacity or ability to undertake a job. They may be accredited via qualifications or non-accredited. They may be acquired on the job through experience and training and development activity, or off the job. Such skills may be job specific, such as professional and technical skills related to the object of the job, or skills may be transferable generic skills, such as the ability to communicate and literacy and numeracy standards.

The Skills Taskforce[8] reported that skill is "the ability to perform a task to a pre-defined standard of competence, but also connotes a dimension of increasing ability. Skills therefore go hand in hand with knowledge." However, there is no universally agreed measure of skill. Qualifications are often used as a proxy for skills, but this proxy has its limitations as it ignores the skills gained informally such as, for example, through on-the-job training and acquisition of generic skills.

Before discussing the indicators we will use, it is worth noting that when the Office for National Statistics categorises occupations in SOC 2000 it uses the type of work that is performed in the job, including the skill level of that job. SOC 2000 is based on two factors. The first is the job, which is the kind of work performed, defined as a set of tasks or duties to be carried out by one person. The second factor is skill, which is the ability to carry out the tasks and duties in a competent manner.

7. In common with the international standard SOC 2000 utilise four levels of aggregation within the classification. These are termed major groups, sub groups, minor groups and unit groups. In the SOC 2000 these are represented numerically by one, two, three or four digits.

8. Learning and Skills Council (2005), Skills in England 2004: Volume 1, http://readingroom.lsc.gov.uk/lsc/2005/research/commissioned/skills-in-england-2004-vol-1.pdf

Skill, in turn, depends on two further factors. First, it depends on skill level or the complexity of the tasks and duties performed. Second, it depends on the skill specialisation or the field of knowledge required for competent conduct of sets of tasks. SOC 2000 has four skill levels based on the time required to become fully competent, the time taken to gain the necessary formal or work-based training, and the experience required.

In section 2.2 we set out the key skills indicators we have identified in our preliminary review and discussions. In section 2.3 we discuss some of the theoretical and practical issues with using these indicators. This section includes a brief explanation of what is meant by an NVQ level 3+ qualification, with further information provided in **Annex B**. The methods of gathering evidence are outlined in section 2.4. Data from the Labour Force Survey are presented in this section: a table of the figures for each 4 digit occupation is given in **Annex C**.

2.2 Key indicators

We have identified a range of potential indicator categories that may help us in the task of identifying skilled occupations. These are: previous research on the link between SOC and skills; formal qualifications; earnings; level of experience; on the job training; and innate ability.

Some of the indicators can be analysed via our top-down approach. For example, earnings or the fraction of the stock holding NVQ level 3+ qualifications can be analysed by use of UK-wide data sources. Others, such as on the job training or innate ability, will require evidence from bottom-up information. In the coming months we will need to consider whether the top-down indicators can be arranged in a hierarchy or weighted.

The **link between SOC and skills** has been extensively analysed by Elias and McKnight[9] who conclude that: "occupation-based measures can incorporate information on the whole range of skills necessary to perform a job and appear to side-step problems of over-qualification or under-qualification of the workforce". This latter point is important. The occupation reflects the inherent skills required. Bar staff come low down in this hierarchy, yet 45 per cent of bar staff are in fact qualified at NVQ level 3+[10]. This may reflect, for example, students working part time in this occupation.

Regarding our next category of indicators, **formal qualifications,** the expected skill threshold for the PBS Tier 2 is that a job must be of NVQ level 3+ to be qualified for consideration of labour shortage. This suggests two possible key indicators relating to the labour force stock and inflow:

- stock of NVQ level 3+ qualifications[11]: a "4 digit" or "unit group" occupation is considered "skilled" if a particular proportion of its workforce have NVQ level 3+ qualifications. The method of deciding on the right proportion which, for instance, could be 50 per cent, 67 per cent or 75 per cent, is set out in the next section; and

9. P. Elias and A. McKnight (2001) "Skill measurement in official statistics: recent developments in UK and rest of Europe", *Oxford Economic Papers*, 3, 508-540

10. Qualification data in this section comes from the Labour Force Survey; see Annex C.

11. See Annex B for more information.

- entry-level qualification at equivalent to NVQ level 3+: if the occupation normally requires its recruits to have qualifications at NVQ level 3+ this suggests it is skilled, as defined by Tier 2. While this is sufficient, it may not be necessary. Many employers prefer to take on less qualified employees and train them on-the-job. This can probably only be determined by bottom up evidence.

The next category, **earnings**, is likely to be, on average, an excellent proxy for skill. A rational employer would not pay an employee more than the value of their productive output. Equally, an employee would not accept less, because he or she would be able to secure a higher wage with a different employer. Assuming that skills are associated with productivity, they will therefore also be associated with earnings. Another reason for this is that the labour market should provide, on average, a compensating wage differential as a return on the investment in education and training. So skilled jobs usually pay more than unskilled jobs.

The above will not always be true: an unpleasant or dangerous unskilled job may attract a compensating differential and thus yield relatively high pay. Conversely, some skilled jobs may pay relatively less because of non-monetary compensations. However, skills and high relative earnings normally go together. Analogously with qualifications, we could define an occupation as skilled if the average earnings in the occupation are a particular per cent above the median or mean for all UK jobs. The appropriate cut-off point is discussed below.

The other possible indicators have more difficult measurement issues associated with them. Any assessment of them would need to be based primarily on bottom-up or qualitative evidence:

- **on the job training or experience**: this may result in the job or occupation being skilled at NVQ level 3+ even in cases where many job holders do not have formal qualifications. For example, consider occupation 5231, motor mechanics. Only 40 per cent have formal NVQ level 3+ qualifications. Presumably, large fractions of the remainder have acquired the requisite skills via on-the-job training; and
- **innate ability**: some occupations require innate ability. This, for many of us, implies skills even though many in the occupation are formally unqualified. Consider occupation 3414, dancers and choreographers. Only 30 per cent in this occupation have formal qualifications at NVQ level 3+. Does that render it “less skilled”? In practice, this is likely to be difficult to assess.

2.3 Discussion of indicators

Here we explain why we have chosen the indicators listed above and discuss the occupations that would be defined as “skilled” using each of the categories of indicators above that are most amenable to top-down analysis.

Regarding the SOC indicator, within SOC 2000 four skill levels are broadly defined, and based on the criteria set out in section 2.2. Elias and McKnight describe their skill levels as follows:

- the first skill level equates with the competence associated with a good general education, usually acquired by the time a person completes his/her compulsory education and is signalled via a satisfactory set of school-leaving examination

grades. Competent performance of jobs classified at this level will also involve knowledge of appropriate health and safety regulations and may require short periods of work-related training. Examples of occupations defined at the first skill level include postal workers, hotel porters, cleaners and catering assistants;

- the second skill level covers a large group of occupations, all of which require the first knowledge provided via a good general education as for occupations at the first skill level, but which typically have a longer period of work-related training or work experience. Occupations classified at this level include machine operations, driving, caring occupations, retailing, and clerical and secretarial occupations;
- the third skill level applies to occupations that normally require a body of knowledge associated with a period of post-compulsory education but not to degree level. A number of technical occupations fall into this category, as do a variety of trades and proprietors of small businesses. In the latter case, educational qualifications at sub-degree level or a lengthy period of vocational training may not be a prerequisite for competent performance of tasks, but a significant period of work experience is typical; and
- the fourth skill level relates to what are often termed "professional" occupations and managerial positions in corporate enterprises or national/local government. Occupations at this level normally require a degree or equivalent period of relevant work experience.

One possible approach would be to simply define an occupation as skilled if it fell into the fourth or third skill levels described above. This would cover the major (1 digit) groups of managers and senior officials, professional occupations, associate professional and technical occupations, and skilled trade occupations.

As Elias and McKnight put it:

> "*At the aggregate level, where perhaps only three or four categories of skill may be defined, occupational classifications appear to provide a robust method for the measurement and analysis of skill . . . [but] analysis of detailed occupational categories should be undertaken with great care*".[12]

This latter point is crucial for us. This classification has two major limitations from the MAC's point of view. First, it does not explicitly distinguish between NVQ level 3+ skills and others; second, it does not provide the level of disaggregation that we need.

Elias and Purcell[13] provide, from our viewpoint, a more realistic alternative if we are to use SOC 2000 as an indicator for skilled occupations. They have identified the 4 digit unit group occupations that are "graduate" occupations. There are four categories of such occupations: traditional; modern; new; and niche. Such graduate occupations comprise 148 out of the 353 unit groups (42 per cent). All, except six of the 148, are in the highest three major groups, namely managers and senior officials, professional occupations, associate professional and technical occupations.

12. P. Elias and A. McKnight (2001) "Skill measurement in official statistics: recent developments in UK and rest of Europe", *Oxford Economic Papers*, 3, 508-540

13. P. Elias and K. Purcell (2004) "SOC(HE): A classification of occupations for studying the graduate labour market", Research Paper 6, Warwick Institute of Employment Research

Although we may want to cross-check against other indicators, this research probably provides a robust list of graduate occupations that we can regard as "skilled" for our purposes. Assuming that is correct, the main task left in terms of determining skilled occupations is to analyse the other 205 occupations to determine which of them are also skilled at NVQ level 3+. Possible indicators for this exercise include the percentage of the labour force qualified at NVQ level 3+ and earnings. These are discussed immediately below.

Consider the percentage of the labour force qualified at NVQ level 3+. There is an established ranking of qualifications used in the Labour Force Survey (LFS). It covers 47[14] categories ranging from higher degree through to no qualifications. All qualifications above 2 A-levels or equivalent score as NVQ level 3+. **Annex B** shows how people are categorised as being qualified at NVQ level 3+.

There is a minor issue concerning trade apprenticeships. These are the highest qualification for 5 per cent of the UK working age population. However, the LFS gives little information on what level each apprenticeship is at. The LFS does not classify trade apprenticeships as being equivalent to any NVQ level, possibly because there is so much variety between each trade apprenticeship. The ordering of the qualification levels by the LFS suggests that on average they are between NVQ level 2 and 3. All such trade apprenticeships are therefore excluded when calculating the stock of people with NVQ level 3+ qualifications in **table 2.1**. Nevertheless, it would be possible to look at take-up of apprenticeships within occupations as a supplementary indicator for qualifications not included here because of low proportions at NVQ level 3+.

The Labour Force Survey[15] estimates that a little below half the working age population (43.5 per cent) is qualified to NVQ level 3+, see Annex B. The question we have to ask is: what percentage of people with NVQ level 3+ qualifications within a 4 digit occupation are required for it to score as skilled?

One possibility is to take the 43.5 per cent for the UK working population figure and apply it at 4 digit occupation level. But, this may be too low a threshold. Many of the people with NVQ level 3+ qualifications work in 4 digit occupations which most would describe as unskilled (see for instance, our earlier bar staff example).

Therefore if not 43.5 per cent, what should the level be? One method of approaching this decision is to look at the distribution of the percentages with NVQ level 3+ across the 353 four digit occupations. With a normal distribution[16] we would probably require a lower threshold than with a uniform distribution[17]. In practice, the distribution approximates to uniform.

14. Office National Statistics (2007), " LFS User Guide – Volume 3: Details of LFS Variables 2007", pp. 291 http://www.statistics.gov.uk/downloads/theme_labour/LFSUG_Vol3.pdf

15. This observation is from pooled data from April 2006 to the latest available, March 2007. There are approximately 286,000 observations of employed and self-employed people of working age (16-59/64).

16. A data distribution which, when plotted, appears bell shaped, is symmetrical about the mean and has the most probable scores concentrated around the mean. Progressively less likely scores occur further away from the mean.

17. A data distribution where the probability of any individual event occurring is equal to that of every other one. When plotted, this distribution appears flat.

We estimated that 163 out of 353 (46 per cent) of occupations have half or more of their workforce qualified at NVQ level 3+. The distribution for these 163 is set out in Table 2.1. Given this relatively uniform distribution, one possibility might be to choose the half way point as the skilled occupation threshold, those 4 digit occupations where 75 per cent or more of their population have NVQ level 3+ score as "skilled". This would cover 77 occupations, just under a quarter of all 353 occupations. Unsurprisingly there is significant overlap here with the Elias and Purcell research discussed earlier. Only one of the 77 occupations, dispensing opticians, is not classed as "graduate" occupations by Elias and Purcell.

Table 2.1 Estimated distribution of occupations with half or more of their workforce qualified at NVQ level 3+

% of workforce qualified at NVQ level 3+	Number of occupations	% of all occupations	Number of people in these occupations	% of total employment covered by these occupations
50 – 59.9	35	9.9	2,336,485	8.6
60 – 69.9	37	10.5	2,960,925	10.8
70 – 79.9	32	9.1	2,141,048	7.7
80 – 89.9	32	9.1	1,528,287	5.5
90 – 100	27	7.7	2,473,846	9.3
Total	**163**	**46.3**	**11,440,591**	**41.9**

Source: Labour Force Survey

* The above uses pooled data from January 2007 to December 2007.
* There are 283,069 observations from the working age population.
* The working age population includes men aged 16-64 and women aged 16-59.
* Note that the LFS population estimates are slightly less than the ONS UK population estimates as certain groups of people are not included in the survey, for example the prison population.
* % of all occupations is calculated by column 2/ 353, where 353 is the number of total occupations.
* By an occupation in this table we are referring to one of the 353 4 digit occupations from SOC 2000
* The last column uses LFS estimates that approximately 27,28,764 people are employed in the 353 occupations.

The proportion of the work force with no qualifications has steadily fallen over time. Does this indicate that more jobs have become "skilled"? To a degree this may be true, although we need to be alert to the possibility that some jobs may have a large proportion of individuals qualified to NVQ level 3+ even though the job does not strictly require such qualifications. Sometimes the reverse, insufficient individuals with the requisite qualifications, may hold too. The latter case may qualify as a shortage, which are discussed further in section 3.

One way that we could try to measure on-the-job training and experience is using the LFS data on training. The LFS asks whether respondents have 'taken part in any education or training connected to your job' in the four weeks prior to the survey, and if yes, whether this led to a qualification or not. Therefore the flow of non-certified learning within a four week window could be identified for different occupations. This would give us an indicator of amount of on-the-job uncertified training that certain occupations required. We could then classify an occupation as skilled at NVQ level 3+ if it had a sufficiently high non-certified learning rate (although how high is 'sufficiently high' of

course would be an arbitrary decision). However, a limitation of this variable is that it would not give us information on the total stock of non-certified skills, without further assumptions, and non-certified learning still excludes the impact of pure on-the-job experience on skills.

Regarding the next category of indicators, earnings, it is possible to define "skilled" occupations using a procedure similar to that set out for qualifications. This means:

- taking the mean or median UK earnings of all employees;
- calculating the mean or median for each 4 digit occupation;
- looking at the distribution of these means or medians across the 353 occupations; and
- choosing an appropriate threshold of mean or median earnings such that a "reasonable" number of occupations, perhaps half, score as skilled.

2.4 Methods of gathering evidence

Top-down evidence can in principle be produced using national data sources, such as the Labour Force Survey, Annual Survey of Hours and Earnings (ASHE) and the ONS Standard Occupation Classification. Once we have established that an occupation scores as skilled, it is proposed that all job titles falling within that 4 digit occupation are automatically considered as skilled. For example occupation 2121, civil engineers, has 83 per cent of its population qualified at NVQ level 3+[18]. Within civil engineering there are arrays of job titles, all of which then score as skilled. This is necessary because national data such as LFS, ASHE cannot be disaggregated below 4 digit level.

Jobs requiring innate ability or where on the job training can substitute for formal qualifications will often require bottom up evidence to score as skilled. Consider occupation 5434, cooks and chefs. Only 26 per cent of its population is qualified at NVQ level 3+. According to our suggested criteria, it would not score as skilled. However, it is possible that bottom up evidence that we receive may convince us that, for instance, some chefs are skilled. In such a case, this subset of 5434 would score as skilled. Essentially, this more disaggregated job title approach allows a job to be considered as skilled even if it is within a 4 digit occupation, which top down methods have suggested are not sufficiently skilled. However, in such 'second bite of the cherry' cases, a convincing case will need to be made.

In principle we could make this symmetric and use such bottom up evidence to delete particular subsets from 4 digit occupations defined as skilled. Whilst we are minded to count all job titles within the 4 digit occupation as skilled once the 4 digit occupation has scored as skilled, we do not completely rule out excluding specific jobs within those occupations if the evidence is available to do so.

We propose to examine all 4 digit occupations to determine whether they count as skilled under tier 2 criteria. It is plausible that for some highly skilled occupations an individual would normally enter under Tier 1 or via the earnings threshold rule of Tier 2. Therefore, a case could be made for excluding such occupations from our deliberations. But we believe, on balance, it is sensible for the MAC to analyse all 353 4 digit occupations rather than second-guess those for which employers and migrants may prefer alternative entry routes.

[18] See Annex C for qualification data from the Labour Force Survey.

Chapter 3

Concepts: Shortages

3.1 Context

Although the term "skill shortage" is widely used by economists and employers, there is no universal definition or measure. According to the US Bureau of Labour Statistics[19] "no single empirical measure of occupational shortages exists, nor does it appear that one can easily be developed". According to Zaidi and Cohen[20] "there are no objective measures or direct indications of skill shortages". Bosworth[21] describes measuring skill shortage as "a 'notoriously difficult' task" and says that "there is no one 'best way' to do it". Many other experts have highlighted difficulties in measuring shortage[22].

A lay definition of shortage is that demand exceeds supply at the current wage and conditions. **Box 3.1** provides basic economic descriptions of static and dynamic labour shortages, where there is a mismatch between supply and demand, or a lack of "equilibrium" in the labour market. The box helps to illustrate why economists emphasise that to fully understand the concept of demand and supply it is necessary to look at price and wage signals.

As with determining whether or not an occupation is skilled, our approach to identifying shortage will again be to examine a series of signals or indicators. In this case we will look for signs that the labour market for a particular occupation is either not in equilibrium, or moving towards it.

Potential indicators are discussed in section 3.2, followed by a discussion of the indicators in section 3.3. Data sources are discussed in section 3.4.

19. Veneri, CM, (1999) 'Can occupational labour shortages be identified using available data?' *Monthly Labour Review*, pp15-21.

20. Zaidi, M.A & and Cohen, M.S. (2003) *Globalisation, Skill Shortages and Surpluses in the New Economy*, 13th World Congress of the International Industrial Relations Association, Berlin.

21. Bosworth, D. (1993) Skill Shortages in Britain. *Scottish Journal of Political Economy* 40 (3), 241-271; OECD (2003).

22. See for example: OECD Employment Outlook, OECD Publishing, Paris; Alpert, A. & Auyer, J. (2003), 'Evaluating the BLS 1988-2000 employment projections', *Monthly Labour Review*, October; Arrow, K & Capron, W (1959) 'Dynamic shortage and price rises: The engineer-scientist case' *Quarterly Journal of Economics*, vol.73, pp292-308.

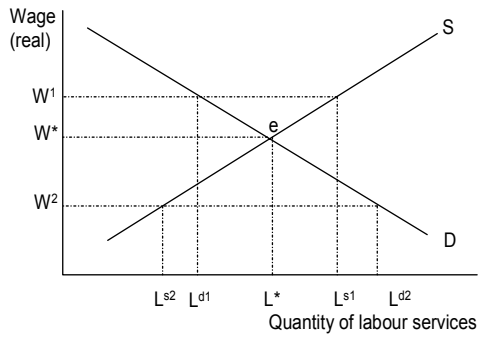
Box 3.1: Economic definition of a shortage: Demand and supply curves

A ***static shortage*** occurs when demand exceeds supply at a given wage. For example at wage W^2 in the left-hand chart, demand is L^{d2} whereas Supply is L^{s2}. The difference L^{d2} minus L^{s2} is a measure of the shortfall, or unfilled vacancies.

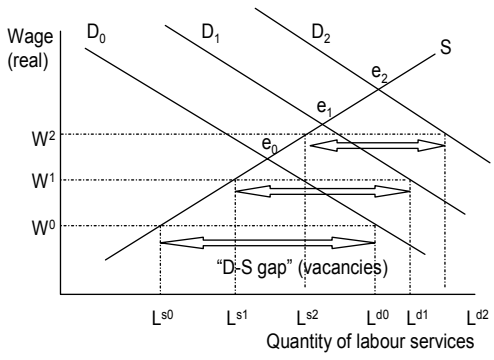
This is only a short term problem if markets operate efficiently. If the real wage (W) increases, this encourages supply and reduces demand. At point e, with the market clearing wage W*, demand and supply are in balance, with L* level of labour services being both demanded and supplied. Putting aside complications such as hours worked, L* is basically the observed level of Employment (E).

Conversely, at wage level W^1, there would be a surplus, with L^{s1} supplied compared with demand at level L^{d1}.

Static shortages



Dynamic shortages



A classic study by Arrow and Capron [23] in 1959 emphasised that labour markets are not static. ***Dynamic shortages*** shift over time, and the study highlighted various factors which limit the speed with which labour markets can adjust.

The second chart illustrates that if the demand curve is shifting outwards, perhaps because of rising demand for the relevant goods and services, the equilibrium point gradually moves up the supply curve (from e_0 to e_1 and then e_2). The level of labour services supplied and any shortfall between demand and supply will depend on the wage and whether or not this keeps pace.

In the example, the wage rises from W^0 to W^2, and the level of labour services supplied increases from L^0 to L^2, whilst the demand curve is shifting outwards, this would reduce the gap between supply and demand but not remove it. If the demand curve was not shifting outwards, equilibrium would be reached. It is therefore perfectly possible to envisage a situation where both the rate of the wage increase is slowing and the gap between supply and demand falling, but yet a shortage still exists.

23. Arrow, K & Capron, W (1959) "Dynamic shortage and price rises: The engineer-scientist case" *Quarterly Journal of Economics*, vol.73, pp292-308.

3.2 Key indicators

We plan to look at four basic sets of indicators. These are earnings, indicators of imbalance, indirect indicators and employer perceptions of shortage. These are discussed below.

The first set of indicators relates to **earnings**:

- where occupations have relatively rapidly rising earnings this may indicate that demand for employees with those skills is not being fully met;
- high earnings returns and high rates of return to qualifications in certain occupations may indicate a shortage of skilled labour in that occupation[24].

We will also consider **indicators of imbalance** in the labour market:

- vacancy level, rates, durations and changes over time, together with the proportions of establishments affected by these, can indicate a shortage of labour;
- low or falling unemployment rates among the relevant workforce can be a useful indicator of skill shortages and related labour market pressure; and
- vacancy to unemployment (V/U) ratios can indicate employer demands relative to potential labour supply.

Our interest in **indirect indicators** reflects the fact that employers can respond to shortages in various ways in addition to those discussed above. The following list illustrates some possible responses[25]:

- rising or falling levels of employment in an occupation may indicate changed demand for, or supply of, employees with those skills;
- increasing overtime or an increase in its prevalence;
- increased recruitment efforts, including recruiting more widely (from a wider geographical region or increased efforts to recruit from previously untapped sources, including temporary workers);
- increased attractiveness of overall employment packages (better working conditions, bonuses, pension schemes, flexible working);
- reduced standards, including when hiring workers or offering earlier promotions to the existing workforce;
- altering production methods to reduce the need for the skill in short supply (including substitution of less skilled workers or capital equipment);
- more contracting out of work or outsourcing to other countries;
- increased level of training and training expenditure;
- rising *or* falling staff turnover;
- evidence of mismatch between supply and demand, including age profile of the workforce and expected or actual retirements; and
- price rise in product/service markets which in turn may reflect increased staff costs.

[24] Rates of return take account of the cost of obtaining a qualification as well as the benefits, but this requires cost information and may be a larger piece of work.

[25] This list is partially drawn from Richardson, S. (2007) *What is a skill shortage?* National Centre for Vocational Education Research. ISBN 978 1 921170379, web edition.

A fourth method of identifying shortages of skilled labour is to examine **employer perceptions of shortage**. The National Employers Skills Survey (NESS) gathers evidence on both recruitment difficulties and inadequate skills among the existing workforce.

The choice of indicators discussed above is based on preliminary review and discussion of the indicators by the Committee, as well as a partial assessment of previous research focusing on the question of labour shortages. We will need to consider carefully the theoretical and practical issues in the definition and measurement of labour shortage, skill shortages and skill gaps. We plan to take evidence on, and conduct further research in, this area between now and June.

3.3 Discussion of indicators

Here we discuss the above indicators further. Box 3.1 showed that, in a market operating freely, the response to imbalance between demand and supply of labour is the adjustment of wage. In the case of a shortage, market pressure should increase the wage, helping to raise supply and reduce demand, thus restoring equilibrium.

However, even in a labour market that is moving towards a new equilibrium, signals can be distorted. Labour markets do not always clear in the manner that the simple textbook model suggests. For instance, wages may be "sticky" and not move freely up and down with changes in labour demand and supply. This might happen more often in the public sector than in the private sector. Further, it may take time for employees to acquire the skills the market needs and the availability of state benefits may affect incentives to work.

Box 3.1 also highlights the need to look at a range of indicators. In the second chart, we observe rising employment and rising real wages but declining vacancies. If the situation were to go into reverse, we could observe falling wages but increasing vacancies. This depends upon the relative pace of movement of the supply and demand curves.

Box 3.2 sets out in more detail why indicators of imbalance should be considered alongside earnings. It highlights the need to focus on relative levels of vacancies and unemployment, as well as earnings. We might expect a situation of labour shortage to be characterised by high, or rising, vacancy levels or low, or falling, unemployment of people previously employed in the relevant occupation.

The box also illustrates how demand movements can sometimes result in complex cobweb patterns of adjustment, with wages and supply and demand numbers fluctuating before reaching a balance, emphasising the need to treat earnings data with caution.

The mere presence of unfilled vacancies does not necessarily indicate a shortage that needs to be addressed through market intervention. A large number of vacancies in an occupation might simply indicate a high turnover within that occupation. As illustrated in Boxes 3.2 and 3.3, some vacancies and unemployment will exist even where the labour market is in equilibrium, due to natural friction in the labour market.

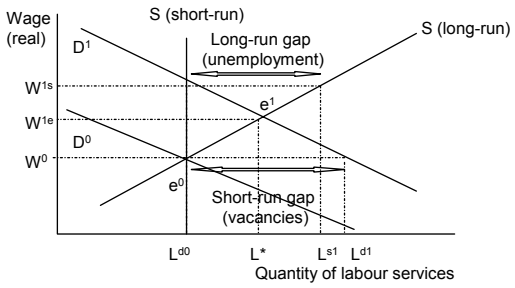
Labour market frictions arise from: imperfect information about jobs or workers; imperfect mobility of workers or firms; differences in the skills of workers and those required by firms; differences in the locations of workers and firms; and the externalities that can ensue from a large number of workers or firms searching at the same time[26].

Boxes 3.2 and 3.3 illustrate that looking at vacancy to unemployment (V/U) ratios can also help us gauge the extent of shortages. Box 3.3 also illustrates that the time taken to fill vacancies can be independent of earnings, under certain assumptions, hence emphasising the need not to rely on earnings as a sole indicator of shortage. More generally, earnings cannot necessarily be expected to fully adjust to a situation where there are no vacancies. Measures in the third category, indirect indicators, are united by the fact that they require particularly careful interpretation before being viewed as an indicator of shortage. For instance, even if changes in staff turnover relate to labour shortages, causality could run in either direction. Price rises in product markets may reflect increased costs, but they may also reflect changes in quality or the cost of other inputs. Numerous other examples could be cited.

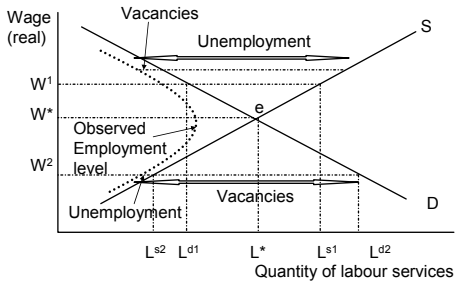
[26] See Petrongolo B. and Pissarides C. (2001) "Looking into the Black Box: A Survey for the Matching Function", *Journal of Economic Literature* XXXIX, June, 390-431 for a summary.

Box 3.2: Imbalances in the labour market

Short and long run supply



Employment set by the short side of the market



One of the characteristics of the labour market for skills is that supply can be quite inelastic in the short term. It may take months or years to train and educate new entrants. This is illustrated by the vertical short-term supply curve S in the left-hand chart.

If the market was initially in equilibrium at the point where the long run supply curve crosses the demand curve D^0, the wage W^0 ensures a balance between supply and demand. If the demand curve then shifts out to D^1 as the result of an external shock, the market will no longer be in equilibrium. At the initial market clearing wage W^0 there will now be a large gap between demand at L^{d1} and short term supply, fixed at level L^{d0}. This will be reflected in unfilled vacancies.

Assuming wages adjust upwards, in the longer term supply will expand until, eventually, a new equilibrium is reached at e^1. However it is quite possible that wages may overshoot. To restore balance between supply and demand in the short-run a wage of W^{1s} is required. But if wages rise to that level this will encourage a long-run supply of L^{s1}. This would be reflected in an excess of supply over demand, resulting in unemployment until wages adjust to W^{1e}.

Whilst wages and employment are adjusting towards a new equilibrium, at any point in time there is always some "churn" in the labour market, with a few temporarily unfilled vacancies and some people temporarily unemployed. This is represented in the right-hand chart by the dotted curve. The gap between this curve and the supply schedule measures this "frictional" unemployment (U), while the gap between the dotted curve and the demand schedule measures frictional vacancies (V). The total numbers of vacancies and unemployment include the supply-demand gap as well. These data can be plotted against one another to derive the well-know Beveridge curve which shows an inverse relationship between U and V.

Box 3.3: Frictions in the labour market

If labour market frictions are substantial, then it may take some time to match a vacancy to the right worker. Firms have to spend time and money searching for the right candidate. Workers need to expend time and money finding a suitable vacancy to apply for.

A simple algebraic way to summarise the outcome of the search process by workers and firms is the matching function. This relates the number of matches, M, formed at any time to the number of vacancies, V, and the number of workers looking for a job. U denotes "unemployed", although it could include employed job seekers and the economically inactive.

$$M=m(V,U) \qquad (1)$$

Assuming that a doubling in the size of the labour market, (doubling the number of vacancies and doubling the number of job seekers) would lead to a doubling of matches, then this matching function is said to exhibit constant returns to scale. As a result, multiplying all inputs by a constant will always multiply the number of matches by the same constant. This means that (1) can be divided by U to give:

$$h = \frac{M}{U} = m\left(\frac{V}{U},1\right) \qquad (2)$$

This hiring rate from unemployment (h) is the probability that any unemployed worker will find a job in any period. This depends only on the ratio of vacancies to unemployment. The V/U ratio is said to be a measure of labour market tightness. Equation (2) says that the unemployed find it easier to get jobs when the labour market is tight, meaning that there are relatively more vacancies compared to the available supply of workers.

Similarly (1) can be divided by V to give the rate at which firms fill vacancies (q):

$$q = \frac{M}{V} = m\left(1,\frac{U}{V}\right) \qquad (3)$$

So firms find it easier to fill vacancies the higher the ratio of potential supply to the total number of vacancies (in this case the labour market is said to be slack). Since the average duration of a vacancy depends on the rate at which it is filled, then the duration of a vacancy also depends on the V/U ratio

Box 3.3: Frictions in the labour market *(continued)*

This contrasting effect of the V/U ratio (a high V/U ratio making things easier for workers and harder for firms and vice versa for a low V/U ratio) means that there are externalities in the labour market that wage adjustments will not solve. There is always the possibility that in any period some vacancies will not be filled (with probability 1-q) and some probability, 1-h, that workers will not get jobs. Since in this simple model these probabilities are independent of the wage on offer, this makes the V/U ratio important in any analysis of how long it takes to fill vacancies. When a firm's hiring rate also depends on the relative wages it offers, the influence of the V/U ratio on hiring remains.

$$M_i = m\left(\frac{W_i}{W}, \frac{U}{V}\right)V_i \qquad (4)$$

We do not intend to fully dismiss these indirect indicators but, particularly when looking at the top-down data, they may be most useful as supplementary evidence for occupations where other indicators of shortage, or a lack of it, already exist. For instance, information on staff turnover may be useful when looking at vacancy rates.

The basis for the final set of indicators, employer perceptions of shortage, is self-evident, in that employers are in a strong position to assess their own labour needs.

Nevertheless, there are a number of reasons why skills surveys need to be regarded with caution. Employers, as Green, Machin, & Wilkinson[27] show, interpret shortage in a variety of ways and do not act consistently when dealing with an environment they characterise as one of shortage. This partially relates to the use of different definitions and typologies. Hogarth and Wilson[28] provided a typology of skills deficiencies, as set out in **table 3.1**.

Table 3.1 Typologies of skills deficiencies

Recruitment problems • Hard to fill vacancies • Skill shortage vacancies (skill related hard-to-fill vacancies	**External problem:** firms, for a number of reasons, cannot recruit the type of employees they are looking for.
Skill gaps	**Internal problems:** employers perceive that their current employees do not possess the skill required to meet the business objectives
Latent skill gaps	**Internal problems**: employers do not perceive their need for skills
Unreported skill gaps	**Internal problems:** employers choose not to report their skill needs

[27] Green, F. Machin, S. & Wilkinson, D. (1998) 'The meaning and determinants of skill shortages' *Oxford Bulletin of Economics and Statistics*, Vol. 60, pp 167-185.

[28] Hogarth, T. and R. Wilson (2001). 'Skills Matter: A synthesis of research on the extent, causes and implications of skill deficiencies'. DfES Report SMS1. ISBN 1 84185 583 9.

Employers may have an incentive to exaggerate the problem of shortage in order to make the case for easy access to the skills they want without having to make the jobs more attractive for their workers, such as through increased wages or working conditions. A converse of 'latent skill gaps' may also exist where employers perceive the requirement for skills of a particular job title or role as being higher than is actually necessary.

Furthermore, employer surveys are essentially asking for opinions which are subjective and the quality of responses will depend on who is asked and how. Considerable effort has, however, been put into improving the quality of such information in the NESS.

On balance, we regard skill survey evidence as potentially important to our work. However, as with the other indicators discussed in this section, care needs to be taken when interpreting the findings.

3.4 Methods of gathering evidence

Of the national data sources described in section 5 of this report, the Labour Force Survey, the Annual Survey of Hours and Earnings, the ONS Vacancy Survey, the Job Centre Plus NOMIS database, NESS (along with similar surveys that cover Scotland, Wales and Northern Ireland[29]) and other business surveys will be important.

Bottom-up evidence and better contextualized data related to specific jobs or sub-group of jobs will also be essential to help us identify labour shortage that may not appear when looking at national indicators.

We have invited the Sector Skill Councils and the Sector Advisory Panels to provide bottom-up evidence for skilled occupations in their sector that may be experiencing shortage. This can include qualitative as well as quantitative material providing evidence on all the indicators we have listed. In particular SSCs and other occupational groups may hold better data than is available at the national level on:

- retirement patterns, problems of an ageing workforce;
- availability of trained workers;
- where lack of skilled labour is affecting productivity; and
- the extent to which employers are being forced to use alternatives to migrant labour and the consequences of that.

Our stakeholder engagement plans, including the creation of a formal panel and visits to regions of the UK, will provide a further crucial source of bottom-up evidence. Some of our research plans, particularly the review of concepts and definitions around skill shortage and the review of the NESS data discussed later on, will also assist us in analysing shortage issues.

[29] Comparability between these regional versions and the national NESS may be an issue.

Concepts: Sensible

4.1 Context

If a significant shortage of labour in a skilled occupation or job category is identified, we then need to consider whether it is sensible to fill that shortage with migrant workers. This section sets out our early thoughts on how to define "sensible" and how to make use of this definition in producing shortage occupation lists.

It is obvious but worth emphasising at the outset that "sensible" can be interpreted in many different ways based on a wide range of considerations. Clearly, any definition of the concept critically depends on the underlying policy objectives, which are determined by Government and not by this Committee. It is thus necessary to start from an understanding of the key relevant policy objectives. In October 2007, the Government announced 30 new Public Service Agreements (PSAs)[30] which included:

- raise the productivity of the UK economy;
- improve the skills of the population, on the way to achieving a world class skills base by 2020;
- ensure controlled, fair migration that protects the public and contributes to economic growth (the MAC's role in this PSA and its measurement is discussed further in Annex A);
- deliver the conditions for business success in the UK;
- improve the economic performance of all English regions and reduce the gap in economic growth rates between regions;
- maximise employment opportunity for all (this is underpinned by performance indicators relating to increasing the employment rate and reducing dependence on work-related benefits); and
- other potentially relevant objectives around improving opportunities for young people, reducing poverty and developing stronger communities and a better way of life.

30. http://www.hm-treasury.gov.uk/pbr_csr/prb_csr07_index.cfm

Inevitably, it might be necessary to prioritise amongst policy objectives in some cases, and this requires judgement.

Also, in order to assess whether migrants may sensibly fill gaps in the labour market, we will need to define "migrant". The United Nations use standard definitions[31] of "short-term" and "long-term" migrant, where the distinction is drawn according to length of stay in the host country, but there is no universally applied definition. As well as length of time in the host country, migrants can be defined and classified in a number of ways including in terms of their country of birth, nationality and reason for being in the host country.

We have decided to work with whatever definitions of migrant are appropriate to the issue but, for the purposes of Tier 2 of the Points Based System, we will normally be considering migrants who are born outside the EEA, are not UK nationals, and are coming to the UK with the likelihood that they will take up paid employment.

4.2 Key indicators

When deciding whether it is sensible to fill identified shortages of skilled labour through migration, we will consider the availability of alternatives to migrant labour, the link to the skills base and skills acquisition of the existing workforce, and the broader labour market and economic effects.

Regarding the availability of **alternatives to migrant labour**, potential indicators include the feasibility of the following options:

- raising wages and improving employment conditions to attract local workers;
- changing the production process to make it less labour intensive;
- off-shoring; and
- switching production towards less labour-intensive outputs.

Relevant considerations include the timescale over which these adjustments could occur, and the impact on productivity, profitability and levels of output.

The following are potential indicators of link to the **skills base and skills acquisition** of the existing workforce:

- the efforts employers have made or could make to pursue alternatives to migration in response to perceived labour shortages, especially efforts to recruit British and other workers from within the EU or to retrain the existing workforce;
- the incentives for employers to consider and pursue alternatives to migration, either positive (e.g. move into higher-value added sectors) or negative (e.g. failure to invest in training and up-skilling of domestic workforce); and
- whether and how quickly existing or planned policy initiatives (such as training programmes) are likely to contribute to filling the vacancies.

[31] For more detail on the UN definition see: http://unstats.un.org/unsd/publication/SeriesM/Series M_58rev1E.pdf

Broader **labour market and economic effects** might include the following:

- the presence and nature of a significant and identifiable impacts on the broader labour market, notably non-migrant employment and productivity (related to the issue of complementarity and substitution of migrant labour discussed in the literature[32]); and
- the presence and nature of significant and identifiable broader macroeconomic effects, such as fiscal impacts including effects on the supply of and demand for public services.

4.3 Discussion of indicators

To decide whether it is sensible to fill shortages with migrant workers requires an understanding of the alternatives to migration for responding to shortages, and of the reasons why an employer might choose to employ migrant labour in the first place.

Employers could respond in several ways to a shortage of labour. They could increase wages or improve working conditions to attract more local workers who are either inactive, unemployed, or employed in other sectors. This is likely to have consequences for the level of employment, prices and/or profitability of their business. They could change the production process to make it less labour intensive, or relocate to countries where labour costs are lower. Alternatively, they could switch to production of products and services that are less labour intensive, or where workers with the appropriate skills are available.

Not all of these options will be available to all employers at all times. For instance, most of the work in construction and hospitality cannot be off-shored. Employers, and their incentives to choose between the different options, will vary but many will have a number of choices available. We will need to consider carefully whether and in what occupations the choices of individual employers to recruit migrant workers rather than choose one of the alternatives, can be considered "sensible" in terms of meeting the policy objectives for the economy as a whole.

For example, to achieve the objective of training and up-skilling more of the workers already resident in the UK, it is important to ask whether and how use of migrant labour affects employers' incentives to invest in the training of local workers. Clearly, if there is a significant inverse relationship, the "twin-track" strategy advocated by many employers, migration in the short run, and skill development of British workers in the long run, is unlikely to work. In principle, we will consider whether migration designed to address short term shortages may have the unintended consequence of dampening the incentive for non-migrant workers to acquire skills or reduce the opportunities for them to do so. It is important to emphasise, however, that this is an open empirical question which will require further research.

[32] For discussion of complementarity and substitutability see C Dustmann and A Glitz, 2005, *Immigration, Jobs and Wages: Theory, Evidence and Opinion*, Centre for Research and Analysis of Migration (CreAM) and Centre for Economic Policy Research (CEPR).

At the same time, when deciding how to fill skilled labour shortages sensibly with non-EAA migrants, we need to be aware of the potential labour supply within the EAA, and where in the UK investment in training and skills development is occurring so that shortages will be reduced in the short, medium and long run. Otherwise oversupply of certain skills may occur.

We will also need to consider the case for facilitating migration to help provide certain products and services at relatively low cost. For example, certain public sector providers with limited budgets, the NHS and social care sector for example, may not be able to raise wages significantly to attract more local workers. Or alternatively, they may be able to attract more workers at the expense of the supply of workers available to the private sector, especially in parts of the UK which already have a relatively large public sector workforce. A range of public sector activities, including local councils, currently draw on migrant labour to deliver their services. Reducing access to migrant labour and encouraging higher wages to attract local workers may be possible but would result in higher costs and thus higher taxes.

Finally, whether it is sensible to use migrant workers to fill shortages in specific occupations also depends on the broader impacts of migration on the UK economy. This includes: public finance and public services; the output gap and monetary policy; and the employment opportunities and relative incomes of current UK residents. These wider economic and fiscal impacts of migration, which are also empirical questions, are still subject to considerable uncertainty and debate. An inquiry by the Economic Affairs Committee of the House of Lords is currently analysing these issues.

4.4 Methods of gathering evidence

The indicators relating to the alternatives to migration will be primarily based on evidence obtained from bottom-up methods. These will include consultations with: employers; Sector Skills Councils; institutions responsible for identification of UK skills and their development (such as the Sector Skills Development Agency, Commission for Employment and Skills, and the Learning and Skills Council); and discussions with, and research by, independent experts in key sectors and occupations. The review of the micro-level nature and determinants of employer demand for migrant labour described in section 7 will also inform our thinking in this area. Where possible, top-down methods will also be used, for example to assess how occupational shortages can be expected to react to increases in wages.

The consideration of wider economic impacts will, for now, rely on existing research and analysis. In the longer term, we may decide to consider further research into the economic impacts of migration on the UK.

Above all, defining what is sensible will be a question of making a judgement which balances different interests and considerations. When policy objectives are conflicting, as they might be if it were found that using migration to fill temporary shortages discouraged local skill development, there is no single way of defining what is sensible unless there is a clear and unambiguous hierarchy of policy objectives, which in practice tends not to be the case. We will need to use the indicators described above flexibly, depending on circumstances, and will in those circumstances set out clearly what the conflicting issues have been and how we reached our judgement.

Data and evidence

In this section we discuss the process for gathering both top-down and bottom-up evidence. The availability of national data sources for identification of labour shortages was discussed in detail in our January report, but some of the key points are summarised here.

Section 5.1 summarises some of the main national-level data sources that we will use. We outline the methods we will be using to collect bottom-up data in section 5.2. The approach that will be taken to drawing up the shortage occupation list for Scotland is discussed in section 5.3.

5.1 Top-down and quantitative sources

For data on employment and the labour market, the main source of information in the UK is the **Labour Force Survey**[33]. This is a quarterly household survey (approx. 53,000 households) and the data can be broken down by characteristics such as current occupation, sector, employment status, and qualifications in addition to demographic characteristics such as age, gender and nationality.

The **Annual Survey of Hours and Earnings**[34] is a key source of data on levels, distribution and make-up of earnings and paid hours for employees within industries, occupations and regions. It is a 1% sample of employees, the pay reference week is in April and the survey is normally published in November. ASHE can also be broken down by region, occupation, industry, and age groups.

The **British Household Panel Survey**[35] is an annual survey, consisting of a nationally representative sample of about 5,500 households initially recruited in 1991. Reweighted and extended over time to allow for sample attrition, it provides information on job duration, promotion opportunities, overtime working and training.

33. Visit http://www.statistics.gov.uk/STATBASE/Source.asp?vlnk=358&More=Y for more information.

34. Visit http://www.statistics.gov.uk/STATBASE/Product.asp?vlnk=13101

35. Visit http://www.iser.exxes.ac.uk/ulsc/bhps/ for more information.

A potentially useful supplementary source is the **Bank of England Agents National Summary**[36] which draws on information obtained from interviews with business contacts across the regions. With regard to recruitment difficulties, an aggregate score is presented. The published data are not broken down by sector or occupation, but themes for particular occupations are reported in the text of the national summary.

The **National Employers Skills Survey**[37] is a survey of around 75,000 employers in England, conducted every two years, which provides information on skill-shortage vacancies, skills gaps and workforce development activity. The 2007 survey has recently been completed and results should be available to feed into our analysis for the June report.

Skill surveys are also periodically carried out for Scotland, Northern Ireland and Wales. Futureskills Scotland produces a report **Skills in Scotland**[38], which is similar in coverage to the NESS survey but based on around 6,000 Scottish employers. Likewise for Northern Ireland, there is the **Skills Monitoring Survey**[39] based on over 4,000 employers and for Wales, Futureskills Wales carries out the **Sector Skills Survey**[40] of over 6,000 employers.

For other data on vacancies, the **ONS Vacancy Survey** provides estimates of the stock of job vacancies across the UK economy. It is a monthly survey, based on a sample of about 6,000 enterprises and analysis of the quarterly series is available by industry but not by occupation.

Jobcentre Plus provides an additional source of vacancy data, with analysis of vacancies by local area, occupation and duration of vacancies possible, as well as by industry.

Business surveys may also provide a useful source of information. Surveys include the Employment Trends Survey and the Quarterly Industrial Trend Survey produced by the Confederation of British Industry. There is also the Quarterly Economic Survey from the British Chambers of Commerce. However, none of these surveys provide data at the occupational level.

We will carry out in-house analysis of the top-down evidence, but will also commission research from independent experts (see section 7 for outlines of these projects). Particularly relevant in the top-down context is the project to investigate the theoretical and practical issues in the identifying and measuring skills, labour shortages, and skills shortages. The project will also review what information the NESS can provide on detailed skill deficiencies facing the economy.

Many of the data sources will be particularly useful for analysing labour shortage, and **Annex D** to this report provides more detail of the specific indicators we might use.

36. For more information on the Bank of England's Agents' Summary of Business Conditions see: http://www.bankofengland.co.uk/publications/agentssummary/index.htm#scores

37. The latest 2005 National Employers Skills Survey can be found at: http://research.lsc.gov.uk/LSC+Research/published/ness/ness2005.htm

38. Skills in Scotland 2006 can be found at: http://www.futureskillsscotland.ord.uk/web/site/home/Reports/WhatEmployersThink/Report_Skills_in_Scotland_2006.asp

39. For example see the 2005 Northern Ireland Skills Monitoring Survey: http://www.delni.gov.uk/4334.pdf

40. For an example see the Future Skills Wales 2005 Sector Skills Survey: http://www.learningobservatory.com/uploads/publications/436.pdf

5.2 Bottom-up and qualitative sources

There are a number of steps we plan to take to obtain more fine-grained and better contextualised data and evidence than national level data can often provide. Sector Skills Councils are a crucial source of evidence and we will be looking to work closely with the SSCs that wish to bring evidence to us.

In the recent past, updates to the shortage occupation list, such as inclusion of additional occupations or deletions of currently listed occupations, were based on submissions of evidence presented to the Border and Immigration Agency from key sector stakeholders. In principle, any organisation was free to contact the Border and Immigration Agency to present a case for changes to the shortage occupation list at any time, although for some sectors there were Sector Advisory Panels formed of key stakeholder representatives. The evidence often consisted of analysis of current supply and current and expected demand for specific skilled labour.

We intend to corroborate the information gained from national sources by inviting SSCs to provide evidence on their sectors using the framework described in sections 2, 3 and 4. We will also take evidence from the Sector Advisory Panels, if appropriate, although we are content to take evidence from those sectors not covered by these panels.

We are also working closely with the Sector Skills Development Agency (SSDA), including through SSDA representation on the Committee, and will look to develop strong links with the new Commission for Employment and Skills when it comes into operation in April this year.

In addition, consultation with employers, their representative bodies, unions and employees will be an essential contribution to the bottom-up evidence. We will listen carefully to what we are told in order to inform and improve our research and findings.

One way we will consult employers is through making visits to each region of England, along with Scotland, Wales and Northern Ireland before we publish the recommended shortage occupation list in June 2008, to ensure that we have the opportunity to understand the role migrants play in the labour market. This is expected to include visits to projects, employers or local authorities that have specific plans for identifying and recruiting skilled labour, or to sectors and firms where a skilled labour shortage has become evident or is asserted.

We have elected to follow the Regional Development Agencies' structure for English regions, which is:

North East
North West
Yorkshire
East Midlands
West Midlands
East of England
London
South West and
South East

As set out in the terms establishing the Committee, we are setting up a formal Stakeholder Panel comprising national level employer and employee representatives from the following organisations: the Confederation of British Industry, Trades Union Congress, British Chamber of Commerce, and the National Health Service. The panel is in the process of being appointed.

In addition to the Panel we will bring together a wider group of stakeholders, including regional and sector representatives as a broad sounding board. This group will meet on a less frequent basis, perhaps once or twice a year.

We will also be planning events to consult with a wider variety of stakeholders from time to time. Details of these activities will appear on our website in due course.

We are also commissioning bottom-up analysis from independent experts, as discussed in section 7. Of particular relevance in the bottom-up context are: the review on the processes and outcomes of the current work permit system; and the review of the micro-level nature and determinants of employer demand for migrant labour and the alternatives to migration for responding to labour shortages in key sectors of the UK economy.

5.3 The Scotland List

The Committee has decided that the Scotland list will be an additions list to the UK one, in that all occupations on the UK list will also be placed on the Scotland one. The starting point for the Scotland list will be the UK list, ensuring a consistent methodology.

Where additional top-down analysis for Scotland is possible we will carry that out and we will draw on available Scotland-wide data sources. Nonetheless, because of Scotland's smaller population, data limitations at the UK level tend to be exacerbated at the Scottish level, and so bottom-up evidence will be crucial in this context.

If we expect an occupation is not going to be placed on the UK list, but a shortage in Scotland is being asserted, we will want to examine the specific issues that occupation faces in Scotland in relation to "skilled", "shortage" and "sensible" that do not apply in the overall UK context. As part of this, we will examine what efforts are being made to recruit people from elsewhere in the UK and the reasons why those efforts are not proving successful.

Limitations

The approach to identifying shortages of skilled labour that could sensibly be filled by migration is not a straightforward one. There are considerable conceptual difficulties and data limitations to overcome. This section discusses some general data-related and practical issues that we will need to be mindful of.

6.1 Data limitations

Although there are a variety of existing data sources that we can make use of, none of them are specifically designed for our purpose. As a result, there are several important limitations that need to be borne in mind.

There is a general data limitation around the issue of **disaggregation**:

- national data are normally available only up to the 3 or 4 digit occupational level. This is often not the level at which employers think about shortages. For instance, occupation 2123 in SOC 2000 is electrical engineer. Electricity linesperson, one occupation where there has been asserted to be a shortage in the past, is a subset of that; and
- even when the national data can theoretically be disaggregated to the appropriate level, sample sizes may be inadequate to guarantee reliable results, particularly when cross-tabulation by variables such as occupation or country of birth is attempted.

A second issue is **time lags**:

- even if the labour market adjusts in response to skill shortage in the manner that economic theory predicts, it may not do so instantaneously;
- there can be significant delays between the collection of data and that data being available for analysis or published; and
- the data are only collected periodically, which can compound the problem.

When determining whether or not an occupation scores as “skilled”, the stock qualified or the earnings structure would not normally alter to a great degree from year to year. Therefore, the time lag issue is likely to be of most concern when thinking about “shortage” and “sensible”.

A further data issue is **lack of counterfactual**. In some sectors and occupations it will prove difficult to assess the feasibility and costs of the alternatives to recruiting migrants from non-EEA areas when responding to labour shortages. It is also difficult to assess the counterfactual outcome *post hoc* for migration which has recently occurred.

Some specific examples of where data-related limitations are as follows:

- the 2007 ASHE relates to April, but data were not published until November that year. Just prior to the publication of the ASHE data for 2007, the most recent data available would have been for April 2006, which represents a maximum lag of about 18 months for that particular survey. This is not atypical for a major national survey;
- although employers surveys are a natural source for indication of labour shortages there are several limitations with this type of survey. They are usually carried out quite infrequently, they are a snapshot and therefore these surveys do not capture the dynamics of the labour market, and they are dependent on employers' perceptions and opinions. In addition, these surveys are rarely available for detailed occupations, and the typical sample size is a concern for statistical reliability; and
- there is evidence on the impact of migration on the wider economy and labour market, such as earnings, employment, economic growth and net fiscal contribution; however there is little analysis of impacts at the occupation or sector level. This is probably due to limitations of data available and difficulty in assessing the counterfactual.

We also need to consider the EEA labour market when considering "sensible" and "shortage", and there are likely to be data limitations in some cases.

6.2 Practical limitations

Where the conceptual approach is clear, and data are available, practical judgements still need to be made. We will need to consider whether and how to apply **weightings, hierarchies and cut-off points** when looking at indicators:

- many of the quantitative indicators discussed in this report may require the use of cut-off points or thresholds. For example, what proportion of employees qualified to NVQ level 3+ makes an occupation skilled, and what level of relative wage growth is likely to indicate a shortage of skilled labour?
- how do we regard indicators that seem to contradict each other, by pointing in opposite directions?
- how do we dovetail the top-down and bottom-up, and qualitative and quantitative evidence in order to reach final conclusions?
- how do we decide between conflicting policy objectives in determining which shortages might sensibly be filled by migration?

The data-related and practical issues above emphasise the need to carefully examine the bottom-up evidence. The research projects we are commissioning and our call for evidence will help us to address some of these issues for the June report, and we will also develop a research strategy for the longer term. Further detail is provided in section 7.

Next steps

7.1 The Committee's work plan and timetable

The next deliverable on our work plan is to publish, in June this year, our recommended shortage occupation lists for UK and Scotland only (Tier 2 skilled employment). These lists comprise occupations where, in our view, there are shortages in skilled occupations which can sensibly be filled by enabling employers to recruit migrants. We will clearly specify occupations so as to be easily understood by employers, prospective migrants and those operating the immigration system.

A list of the potential issues that we will cover in the June report are set out in **Annex E** to this report.

In the longer term the Government will agree an annual work plan, which will set out what we will deliver and by when.

7.2 Evidence gathering

We will carry out "top-down" data analysis and take forward a series of "bottom-up" activities to engage with stakeholders and understand what is happening at ground level, as set out previously in this report.

The previous sections have highlighted key issues that come with creating a skilled occupation shortage list. One of the ways we will seek to address some of these issues is by carrying out and commissioning our own short-term research to inform our June report. Areas we plan to cover include:

- an overview of theoretical and practical issues in the conceptualization and measurement of labour shortages, skills shortages and skills. This project will help us identify the key issues and develop a pragmatic and flexible, but robust, approach to thinking about these issues;
- a review of what information the NESS can provide on detailed skill deficiencies facing the economy. The NESS is the only survey in England that attempts to identify skill-shortage vacancies by occupation and by sector. Fieldwork for the 2007 survey has recently been completed;

- a review of the current work permit system, including flows of migrants through the current work permit system and how employers use the system;
- a conceptual and empirical review of the micro-level nature and determinants of employer demand for migrant labour and the alternatives to migration for responding to labour shortages in key sectors of the UK economy. This will inform the development of a theoretical framework for the Committee's bottom-up approach; and
- analysis of national labour market data concentrating on the Labour Force Survey and the Annual Survey of Hours and Earnings. This will inform us as to how we can use this national level data and highlight any limitations that we need to be aware of.

There may be other areas in which we may need to commission research to inform us further. Between now and June we will decide on the research that will be undertaken over the longer term. These latter projects are not expected to be completed in time to inform the June report but will inform future recommended changes to the shortage occupation list. We will hold events and consultations to ensure that the academic community and other stakeholders have the opportunity to feed in views on our methodological approach and longer-term research strategy.

7.3 Call for evidence

To consult with as many stakeholders as possible, we are issuing a call for evidence. This will enable the Committee to take comments from individual experts, employers, and other interested parties.

Respondents are asked to provide their:

- name;
- address (and email address if you wish);
- contact number;
- name, sector and approximate size of organisation (if applicable); and
- position (if applicable).

In addition, respondents should specify if they:

- do not wish for their response to be made public; or
- do not wish for the fact that they have made a response to be made public; or
- do not wish for either their response or the fact that they have made a response to be made public.

If no preference is expressed, we will assume that submissions and their contents can be published, in part or in full, and attributed to individuals or organisations.

Our questions are set out in **Box 7.1**. When responding to one or more of questions 1-5, respondents are asked to provide supporting evidence as necessary.

So that we can consider the relevant evidence in advance of our publication of the shortage occupation list in June 2008, **responses are requested in writing by 25th April 2008**. Correspondence details are given in section 7.4.

Box 7.1: Questions for call for evidence

Q1: Skilled occupations (see section 2)

1a) Do you agree with our proposed indicators of whether an occupation is skilled to NVQ level 3 or above?

1b) If not, which alternative or additional indicators should we be considering?

1c) What evidence might we use for this?

Q2: Shortage occupations (see section 3)

2a) Do you agree with our proposed indicators of whether skilled occupations are experiencing a shortage labour?

2b) If not, are there alternative indicators we should be considering?

2c) What evidence might we use for this?

Q3: Sensibly filling vacancies (see section 4)

3a) Do you agree with our proposed indicators of whether it would be sensible to fill a shortage of skilled labour by non-EEA migrants?

3b) If not, which alternative indicators should we be considering?

3c) What evidence might we use for this?

Q4: Specific occupations or job titles

4a) According to our current criteria, do you wish to nominate specific occupations or job titles as suffering from a shortage of skilled labour that might sensibly be filled by non-EEA migrants when PBS Tier 2 is launched in Autumn 2008? Please specify occupations or job titles according to the SOC2000 classification (see note below).

4b) How does the occupation or job title you are suggesting satisfy each of our criteria in relation to "skilled", "shortage" and "sensible"?

Q5: Government policies and other influencing factors

5a) Which specific Government policies or other factors do you think influence the availability of skilled labour in occupations where non-EEA migrants might otherwise sensibly fill shortages in the labour market?

5b) How large and what type of effect is this likely to be?

5c) On what timescale is it expected to be experienced?

5d) Which sectors and occupations do you consider are affected, and to what extent?

Note:

For a list and description of occupations at the 1 to 4 digit level, see *Standard Occupational Classification 2000: Volume 21 Structure and descriptions of unit groups*, Office for National Statistics (2000), ISBN 0 11 621388 4 http://www.statistics.gov.uk/methods_quality/ns_sec/downloads/SOC2000_Vol1_V5.pdf.

For a complete list of job titles see *Standard Occupational Classification 2000: Volume 2 The coding index*, Office for National Statistics (2000), ISBN 0 11 621389 2 http://www.statistics.gov.uk/methods_quality/ns_sec/downloads/SOC2000_Vol2_V6.pdf

7.4 Further information and correspondence

For more information about the Migration Advisory Committee see:
http://www.bia.homeoffice.gov.uk/aboutus/workingwithus/indbodies/mac/

If you wish to contact us with any comments or questions about this report, or to respond to the call for evidence, please write to us at:

Migration Advisory Committee, 6th Floor, Advance House,
15 Wellesley Road, Croydon, CR0 2AG

Alternatively email us at mac@homeoffice.gsi.gov.uk.
Our telephone contact number is 020 8604 6027.

Sectors and Occupations

A.1 Classifications

The need to identify occupations in the labour market where shortages exist requires that we form and communicate a clear and consistent view of what "occupation" means in this context. As described in section 2.2 we plan, where feasible, to work with the Standard Occupational Classification 2000 (SOC 2000), which is designed as a classification applicable to all paid jobs performed by economically active persons in the UK. SOC 2000 utilises four levels of aggregation within the classification. These are:

- major groups: 9 in total,
- sub-major groups: 25 in total,
- minor groups: 81 in total,
- unit groups: 353 in total.

At a more detailed level than occupation, defined as a set of tasks or duties to be carried out by one person, the notion of a job represents a basic element in the employment relationship. Jobs are recognised primarily by the associated job title. Via an elaborate coding index and through the application of rules designed to cope with ambiguous information, 26,000 job titles are coded to the most detailed level of occupation classification, the 353 unit groups.

The major group structure is a set of broad occupational categories which are designed to bring together unit groups which are similar in terms of the qualifications, training, skills and experience commonly associated with the competent performance of the work task. Nevertheless, even at unit group level there will be considerable divergence in skill levels across some occupations. **Box A.1** presents an example of occupation with the related job titles.

Box A.1: An occupation with related qualifications and job titles

Major Group 6. Personal Service Occupations

Sub-major group: **61** Caring Personal Service Occupations

Minor group: **611** Healthcare and related personal services

Unit group: **6111** Nursing Auxiliaries and assistants

Typical entry route and associated qualifications: there are no formal academic requirements. NVQs / SVQs in Care are available at Level 2 and 3.

Related job titles for unit group 6111: Assistant Nurse, Nursing assistant, Nursing auxiliary, Occupational therapy helper, Operating department assistant, Phlebotomist, Physiotherapy helper, Ward assistant, Ward orderly.

Although we will work within the SOC 2000 classification as far as possible, we will need to consider some jobs at a more specific level of detail than the unit group level. This will be consistent with previous practice in this area. For instance, the July 2007 Border and Immigration Agency shortage occupation list included the occupations "Overhead Electricity Linesworker" and "CAA Licensed Aircraft Engineer", which are at a more detailed level of aggregation than the SOC 2000 classification provides.

Due to the manner in which occupational data are collected, analysed and organised, in some cases it may be necessary or desirable to look at labour market data according to sector as well as occupation. A Standard Industrial Classification (SIC) exists which classifies business establishments by the type of economic activity they are engaged in. SIC, in common with SOC, has a pyramid structure consisting of several levels of specificity.

A.2 Skills in SOC

When the Office for National Statistics categorises occupations in the Standard Occupation Classification (SOC) it uses the type of work that is performed in the job. The resulting categories are often used as a proxy for skill. There are some 26,000 job titles. Via an elaborate coding index and through the application of rules designed to cope with ambiguous information, job titles are coded to the most detailed level of occupation classification, the 353 "4 digit" unit groups.

The UK 2000 SOC, in line with international standards, (ISOC-88) is based on two factors. The first is the job: the kind of work performed, defined as a set of tasks or duties to be carried out by one person. The second factor is skill, which is the ability to carry out the tasks and duties in a competent manner.

Skill, in turn, depends on two factors. First, it depends on skill level, the complexity of the tasks and duties performed. Second, it depends on the skill specialisation in the field of knowledge required for competent conduct of sets of tasks. SOC 2000 has four skill levels based on the time required to become fully competent, the time taken to gain the necessary formal or work-based training, and the experience required.

A.3 Public Service Agreement Number 3

In 2007 the Government set a new Public Service Agreement (PSA number 3): "Ensure controlled, fair migration that protects the public and contributes to economic growth" to cover the Comprehensive Spending Review period from 2008 to 2011[41]. Our primary purpose in defining shortage occupations is to recommend a shortage list for use alongside the launch of Tier 2 of the Points Based System in late 2008. Also one of the underlying performance indicators for PSA number 3 is "By the effective management of migration reduce the vacancy rate in shortage occupations".

For performance indicator purposes it is expected that shortage occupations will need to be defined according to the 81 SOC 2000 minor groups (3 digit level). We therefore, need to produce a supplementary shortage list at that level. However, as the supplementary shortage list will be an aggregated list of the previous one, it will not be the shortage list recommended for use alongside the launch of Tier 2 of the PBS which, as set out above, is likely to need to focus on at least the 4 digit level.

41. http://www.hm-treasury.gov.uk/media/6/4/pbr_csr07_psa3.pdf

Annex B

Identifying qualifications at NVQ level 3 and above

Table B.1: Estimated number of the working age population in the UK who are qualified to NVQ level 3 and above in 2007.

Highest level Qualification /trade apprenticeship that a person has.	Estimated population who are qualified at a level lower than NVQ level 3+ (rounded to nearest 1,000)	Estimated population who are qualified at NVQ level 3+ (rounded to nearest 1,000)	Estimated totals rounded to nearest 1,000)
(1) Higher degree	0	2,222,000	2,222,000
(2) NVQ level 5	0	65,000	65,000
(3) First degree/foundation degree	0	4,544,000	4,544,000
(4) Other degree	0	398,000	398,000
(5) NVQ level 4	0	243,000	243,000
(6) Diploma in higher education	0	509,000	509,000
(7) HNC/HND/BTEC higher etc	0	1,391,000	1,391,000
(8) Teaching – further education	0	75,000	75,000
(9) Teaching – secondary education	0	54,000	54,000
(10) Teaching – primary education	0	76,000	76,000
(11) Teaching – foundation stage	0	13,000	13,000
(12) Teaching – level not stated	0	27,000	27,000
(13) Nursing etc	0	546,000	546,000
(14) RSA higher diploma	0	21,000	21,000
(15) Other higher education below degree	0	203,000	203,000
(16) NVQ level 3	0	1,289,000	1,289,000
(17) Advanced Welsh Baccalaureate	0	0	0

Highest level Qualification /trade apprenticeship that a person has. *(continued)*	Estimated population who are qualified at a level lower than NVQ level 3+ (rounded to nearest 1,000)	Estimated population who are qualified at NVQ level 3+ (rounded to nearest 1,000)	Estimated totals rounded to nearest 1,000)
(18) International Baccalaureate	0	28,000	28,000
(19) GNVQ/GSVQ advanced	0	193,000	193,000
(20) A-level or equivalent	574,000	2,294,000	2,867,000
(21) RSA advanced diploma	0	22,000	22,000
(22) OND/ONC/BTEC/SCOTVEC National etc	0	629,000	629,000
(23) City & Guilds Advanced Craft/Part 1	0	901,000	901,000
(24) Scottish 6 year certificate/CSYS	13,000	0	13,000
(25) SCE higher or equivalent	122,000	235,000	357,000
(26) Access qualifications	0	34,000	34,000
(27) AS-level or equivalent	195,000	140,000	335,000
(28) Trade apprenticeship	1,776,000	0	1,776,000
(29) NVQ level 2 or equivalent	1,353,000	0	1,353,000
(30) GNVQ/GSVQ intermediate	170,000	0	170,000
(31) RSA diploma	38,000	0	38,000
(32) City & Guilds Craft/Part 2	263,000	0	263,000
(33) BTEC/SCOTVEC First or General diploma etc	89,000	0	89,000
(34) O-level, GCSE grade A*-C or equivalent	6,334,000	0	6,334,000
(35) NVQ level 1 or equivalent	192,000	0	192,000
(36) GNVQ/GSVQ foundation level	21,000	0	21,000
(37) CSE below grade 1, GCSE below grade C	1,100,000	0	1,100,000
(38) BTEC/SCOTVEC First or General certificate	10,000	0	10,000
(39) SCOTVEC modules	9,000	0	9,000
(40) RSA other	130,000	0	130,000
(41) City & Guilds foundation/Part 1	76,000	0	76,000
(42) YT/YTP certificate	17,000	0	17,000
(43) Key skills qualification	34,000	0	34,000
(44) Basic skills qualification	109,000	0	109,000

Highest level Qualification /trade apprenticeship that a person has. *(continued)*	Estimated population who are qualified at a level lower than NVQ level 3+ (rounded to nearest 1,000)	Estimated population who are qualified at NVQ level 3+ (rounded to nearest 1,000)	Estimated totals rounded to nearest 1,000)
(45) Entry level qualification	15,000	0	15,000
(46) Other qualification	2,910,000	0	2,910,000
(47) No qualifications	4,747,000	0	4,747,000
(48) Don't know	272,000	0	272,000
Total	**20,568,000**	**16,151,000**	**36,719,000**

Source: Labour Force Survey.

* The above uses pooled data from January 2007 to December 2007.

* There are 283,069 observations from the working age population.

* The working age population includes men aged 16-64 and women aged 16-59.

* Note that the LFS population estimates are slightly less than the ONS UK population estimates as certain groups of people are not included in the survey, for example the prison population.

Box B.1: How we determine whether a person is at NVQ level 3+

To calculate whether a person has NVQ level 3 or above, we have used the LEVQUAL variable. This variable identifies the qualifications a person holds classified as NVQ level 3 and above according to their answers to specific questions in the LFS questionnaire. Below describes how this is determined.

- HIQUAL5 – If respondents answer YES to any of the options between 16-19 and 21-23 they automatically are classified as NVQL3.
- HIQUAL5 – If respondents answer YES to option 20 they are then directed to NUMAL, if they answer that they have more than one A level or equivalent then again they are classified as NVQ L3.
- NUMAL – If the respondent only has one A Level or equivalent then they are directed to the NUMAS question. If they answer that they have 2 A-S levels or more (to this question) then these are also classified as NVQ L3.
- NUMAL – If the respondent has only 1 A-S Level then they are directed to the ADVHST question. In this case they need to have more than one Advanced higher qualification in order to be classified as NVQ L3 or equivalent.

In summary the LEVQUAL variable will include:

- HIQUAL5 - options 16-19 and 21-23
- HIQUAL5 - options 20, 25, 26, 27 (depending on them meeting the certain criteria set out above).

Occupations and share of qualified employees

Table C.1: Estimated share of people in each 4 digit SOC occupation with NVQ level 3 and above in 2007

Occupation (SOC 2000 4-digit codes)	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
3223 speech and language therapists	0.991	0.009	14,000	113
2322 social science researchers	0.981	0.013	14,000	105
2314 secondary eductn teaching prfsnals	0.979	0.003	379,000	3013
2212 psychologists	0.978	0.011	23,000	184
2315 prim & nurs eductn teaching profs	0.972	0.003	358,000	2879
3212 midwives	0.97	0.01	37,000	298
2312 further educ teaching prfsnals	0.969	0.006	115,000	923
2311 higher educ teaching prfsnals	0.962	0.006	116,000	900
3214 medical radiographers	0.961	0.014	25,000	203
2313 educ officers,school inspectrs	0.96	0.014	25,000	200
2214 ophthalmic opticians	0.951	0.021	13,000	102
2411 solic & lawyers, judges & coroners	0.947	0.007	154,000	1124
2431 architects	0.946	0.012	50,000	372
2211 medical practitioners	0.94	0.006	184,000	1423

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
3221 physiotherapists	0.938	0.015	32,000	258
1181 hospital and health service mngers	0.935	0.011	68,000	539
2213 pharmacists & pharmacologists	0.935	0.014	40,000	308
2112 bio scientists and biochemists	0.935	0.01	85,000	650
3222 occupational therapists	0.931	0.016	31,000	246
2321 scientific researchers	0.925	0.026	14,000	106
2432 town planners	0.924	0.02	22,000	170
2216 veterinarians	0.921	0.025	15,000	114
3211 nurses	0.92	0.004	500,000	4064
2316 spec needs educ teaching profs	0.92	0.012	65,000	535
1111 senior officials in national gov	0.918	0.03	11,000	85
2113 physts, geologists & meteorologist	0.91	0.026	16,000	122
2126 design and development engineers	0.907	0.013	67,000	515
2111 chemists	0.897	0.024	22,000	165
2434 chartrd surveyors (not qntity surv	0.888	0.016	51,000	383
1137 research and development managers	0.886	0.015	58,000	438
2442 social workers	0.884	0.012	91,000	731
3551 conservat & environ protection off	0.882	0.026	20,000	152
2433 quantity surveyors	0.882	0.021	32,000	245
2215 dental practitioners	0.879	0.022	27,000	214
2443 probation officers	0.879	0.034	11,000	91
2421 chartered and certified accountant	0.877	0.01	148,000	1134
2329 researchers n.e.c.	0.872	0.018	47,000	344
1212 natural environ & cons managers	0.865	0.056	4,000	37

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
3123 building inspectors	0.865	0.056	4,000	37
2452 archivists and curators	0.862	0.045	8,000	58
1113 senior officials in local gov	0.855	0.025	24,000	200
2423 mngmnt cons, actuar, econs & statn	0.853	0.01	171,000	1281
2125 chemical engineers	0.853	0.041	9,000	75
1182 pharmacy managers	0.851	0.052	6,000	47
2319 teaching professionals n.e.c.	0.845	0.011	138,000	1084
2124 electronics engineers	0.843	0.023	33,000	254
1184 social services managers	0.841	0.02	43,000	346
3431 journalists, newsppr & period eds	0.834	0.019	54,000	380
2444 clergy	0.833	0.022	38,000	299
2422 management accountants	0.832	0.016	75,000	566
1134 advertising & public rel managers	0.832	0.019	52,000	382
2121 civil engineers	0.828	0.016	76,000	574
2451 librarians	0.825	0.025	32,000	234
3121 archt technols & town plan technic	0.819	0.027	28,000	204
3416 arts officrs, prdcers and director	0.819	0.028	29,000	193
1185 residential and day care managers	0.818	0.02	47,000	380
1112 directors & chief execs of maj org	0.814	0.021	47,000	344
3229 therapists n.e.c.	0.805	0.019	52,000	416
3412 authors, writers	0.8	0.021	50,000	365
3411 artists	0.794	0.028	28,000	204
1141 quality assurance managers	0.794	0.02	49,000	389
3421 graphic designers	0.793	0.016	92,000	656
3432 broadcasting associate prfssnals	0.793	0.025	39,000	271

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
2132 software professionals	0.79	0.009	305,000	2234
2419 legal professionals n.e.c.	0.789	0.039	15,000	109
3422 product, clothing & related dsgner	0.785	0.021	52,000	377
1135 pers training & ind rel mngers	0.782	0.013	140,000	1089
3216 dispensing opticians	0.78	0.065	5,000	41
2131 it strategy and planning prfsnals	0.778	0.013	140,000	1039
3215 chiropodists	0.778	0.046	10,000	81
3433 public relations officers	0.778	0.027	31,000	230
1136 info & communication technol mnger	0.776	0.009	287,000	2167
3535 taxation experts	0.77	0.03	25,000	191
2122 mechanical engineers	0.76	0.018	76,000	588
1171 officers in armed forces	0.758	0.03	27,000	207
3564 car. advis & voction guidnce spcil	0.745	0.03	27,000	212
1172 police officers (inspectrs & above	0.741	0.041	15,000	116
3565 inspcts fact, utils & trdng stndrd	0.735	0.044	13,000	102
3568 environmental health officers	0.734	0.046	12,000	94
2129 engineering professionals n.e.c.	0.734	0.018	81,000	628
1114 sen. officials spec interest orgs	0.732	0.035	20,000	164
2123 electrical engineers	0.729	0.022	52,000	395
3213 paramedics	0.721	0.038	17,000	136
2317 registrs & sen admins ed establish	0.716	0.028	33,000	268
3543 marketing associate professionals	0.713	0.015	125,000	902
3562 personnel & ind relations offs	0.712	0.014	146,000	1099
1133 purchasing managers	0.711	0.026	38,000	301

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
1222 conference and exhibition managers	0.708	0.046	13,000	96
3566 statutory examiners	0.707	0.042	15,000	116
3539 business & related assoc profs nec	0.705	0.015	127,000	946
3231 youth and community workers	0.705	0.017	87,000	685
2441 public service administrative prof	0.7	0.028	34,000	273
3415 musicians	0.695	0.031	32,000	226
3122 draughtspersons	0.695	0.026	41,000	321
3232 housing and welfare officers	0.694	0.014	146,000	1165
2128 planning and qlty control engineer	0.694	0.03	31,000	242
1131 financial managers & chartered sec	0.691	0.011	219,000	1677
1173 snr officers fire, amb, prson et a	0.683	0.042	16,000	123
3512 aircraft pilots and flight enginrs	0.683	0.039	19,000	142
3563 vocatn & indust trainrs & instrctr	0.68	0.014	138,000	1073
1219 mngr anml hsbndry, frst, fish nec.	0.678	0.049	11,000	90
1132 marketing and sales managers	0.677	0.008	491,000	3791
3319 protective servcs assoc prfsnls ne	0.677	0.032	29,000	220
3114 build & civil eng technicians	0.677	0.034	24,000	186
3434 photo. & audio-visual equip operat	0.675	0.023	58,000	424
1123 managers in mining and energy	0.675	0.043	14,000	120
3567 occupl hygnists & health sfty offs	0.674	0.026	40,000	319
3520 legal associate professionals	0.668	0.025	49,000	367

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
2127 production and process engineers	0.668	0.03	31,000	247
3111 laboratory technicians	0.667	0.022	61,000	471
3532 brokers	0.655	0.024	57,000	400
3531 estimators, valuers and assessors	0.654	0.022	63,000	486
3132 it user support technicians	0.653	0.024	52,000	378
1226 travel agency managers	0.652	0.059	8,000	66
3561 public serv associate professional	0.652	0.02	73,000	580
4114 officers non-gov organisations	0.65	0.024	49,000	380
3534 fin. & invest. analyst & advisers	0.645	0.013	175,000	1265
1151 financial institution managers	0.643	0.014	157,000	1,191
3537 financial and accounting techs	0.638	0.034	26,000	199
1231 property, housing and land manager	0.636	0.018	97,000	744
3113 engineering technicians	0.633	0.021	67,000	515
1121 prod. works & maintenance managers	0.631	0.009	373,000	2928
3112 electrical & electronic technician	0.628	0.031	33,000	242
6131 veterinary nurses and assistants	0.623	0.047	14,000	106
4111 civil service executive officers	0.621	0.021	69,000	543
3131 it operations technicians	0.619	0.017	114,000	858
3536 importers, exporters	0.611	0.066	7,000	54
4135 library assistants & clerks	0.607	0.027	43,000	338
1122 managers in construction	0.598	0.011	238,000	1856
1142 customer care managers	0.597	0.019	83,000	643
4137 market research interviewers	0.595	0.045	16,000	121

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
3218 medical and dental technicians	0.594	0.032	30,000	234
1183 healthcare practice managers	0.592	0.04	19,000	152
6123 playgroup leaders & assistants	0.59	0.025	50,000	402
1239 mngers and prop. in other srvcs ne	0.59	0.013	177,000	1355
1225 leisure and sports managers	0.589	0.026	48,000	372
3449 sports and fitness occupations nec	0.578	0.054	11,000	83
3442 sports coaches, instruc & official	0.577	0.026	49,000	362
1221 hotel and accommodation managers	0.577	0.025	47,000	381
6114 houseprnts and residential wardens	0.575	0.031	31,000	254
6121 nursery nurses	0.574	0.014	152,000	1176
3511 air traffic controllers	0.571	0.066	7,000	56
3552 countryside and park rangers	0.568	0.081	5,000	37
3541 buyers and purchasing officers	0.565	0.023	58,000	446
5245 comp engineer, installn & maintnce	0.563	0.03	37,000	268
3443 fitness instructors	0.553	0.036	26,000	190
1152 office managers	0.551	0.011	254,000	1989
6222 beauticians and related occupation	0.547	0.024	55,000	419
3115 quality assurance technicians	0.546	0.038	23,000	174
3413 actors, entertainers	0.543	0.036	27,000	188
6113 dental nurses	0.541	0.029	38,000	294
3119 science & eng technicians n.e.c.	0.534	0.028	43,000	328
3312 police offcrs (sergeant and below)	0.531	0.014	168,000	1302

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
4142 communication operators	0.531	0.031	33,000	254
6124 educal assistants	0.53	0.009	407,000	3288
1174 security managers	0.522	0.047	14,000	115
3544 estate agents, auctioneers	0.52	0.033	30,000	225
5494 musicl instrument makers and tuner	0.52	0.1	4,000	25
3533 insurance underwriters	0.517	0.035	26,000	207
3513 ship and hovercraft officers	0.517	0.046	16,000	116
1235 recyc and refuse disposal managers	0.513	0.057	10,000	76
5224 prec instrument makers & repairers	0.507	0.042	18,000	144
5249 elec & electronic engineer n.e.c.	0.506	0.019	88,000	668
3313 fire serv off (leading off & below	0.497	0.029	37,000	290
6214 air travel assistants	0.496	0.031	36,000	262
4132 pensions and insurance clrks	0.493	0.021	74,000	558
1233 hairdrs & beauty slon mngr & props	0.489	0.037	22,000	178
6111 nursing auxiliaries and assistants	0.488	0.013	199,000	1575
7211 call centre agents & operators	0.488	0.018	98,000	733
7125 merchandisers and window dressers	0.487	0.04	20,000	156
1211 farm managers	0.485	0.043	17,000	136
5233 auto electricians	0.483	0.066	7,000	58
4113 local gov clerical offs & assists	0.474	0.013	188,000	1485
4112 civil serv admin offcrs and assist	0.472	0.012	205,000	1,636
5496 floral arrangers, florists	0.471	0.046	15,000	119
3217 pharmaceutical dispensers	0.465	0.032	31,000	243
3542 sales representatives	0.464	0.013	205,000	1570

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
4122 accnts wages clerk, bookkeeper	0.462	0.008	504,000	3,914
4121 credit controllers	0.46	0.028	40,000	311
5241 electricians, electrical fitters	0.459	0.012	244,000	1855
4214 company secretaries	0.457	0.028	39,000	315
3311 ncos and other ranks	0.455	0.025	51,000	387
5222 tool mkrs, tool fters & markers-ou	0.454	0.042	18,000	141
6212 travel agents	0.453	0.031	34,000	256
4136 database assistants & clerks	0.449	0.023	60,000	452
9225 bar staff	0.445	0.013	189,000	1363
5223 mtl working prod & maintnce fitter	0.445	0.012	221,000	1,727
3441 sports players	0.438	0.051	14,000	96
4131 filng & othr recrds assists & clrk	0.434	0.015	145,000	1127
7212 customer care occupations	0.434	0.01	298,000	2,242
7121 collector salsprsns and cred agent	0.431	0.046	15,000	116
9242 traffic wardens	0.429	0.108	3,000	21
5211 smiths and forge workers	0.426	0.072	6,000	47
5414 tailors and dressmakers	0.426	0.072	6,000	47
6211 sports and leisure assistants	0.424	0.025	53,000	382
1163 retail and wholesale managers	0.422	0.009	386,000	2975
5493 pattern makers (moulds)	0.421	0.113	2,000	19
6122 childminders and rel occupations	0.416	0.016	124,000	977
7129 sales related occupations n.e.c.	0.416	0.018	101,000	757
6219 leisure & travel serv occuptns nec	0.415	0.054	11,000	82
5231 motor mechanics, auto engineers	0.405	0.013	198,000	1502

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
5314 plumb, hea & ventilating engineers	0.404	0.013	191,000	1,452
3414 dancers and choreographers	0.4	0.077	6,000	40
5244 tv, video and audio engineers	0.4	0.069	7,000	50
6213 travel and tour guides	0.4	0.057	10,000	75
5119 agricult and fishing trades n.e.c.	0.398	0.034	27,000	211
5242 telecommunications engineers	0.398	0.026	46,000	344
4150 general office assistants or clerk	0.394	0.007	612,000	4756
1161 transport and distribution manager	0.388	0.02	81,000	624
4123 counter clerks	0.386	0.013	180,000	1402
8136 clothing cutters	0.385	0.135	2,000	13
9249 elementary security occupation nec	0.385	0.041	20,000	143
1223 restaurant and catering managers	0.382	0.015	145,000	1104
4211 medical secretaries	0.382	0.021	66,000	536
5315 carpenters and joiners	0.381	0.011	271,000	2087
4213 school secretaries	0.38	0.022	57,000	466
5214 mtl plate wrkrs, shipwrig, riveter	0.377	0.055	10,000	77
5492 furntre mkr, other crft woodworker	0.377	0.027	44,000	326
1162 storage and warehouse managers	0.375	0.02	75,000	578
8138 routine laboratory testers	0.372	0.052	11,000	86
5112 horticultural trades	0.371	0.04	18,000	143
8124 energy plant operatives	0.371	0.061	8,000	62
1224 publicans & managrs licensed prmse	0.371	0.026	45,000	342

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
5421 orignters, compositors & print prep	0.37	0.071	6,000	46
7113 telephone salespersons	0.36	0.025	50,000	375
1234 shopkprs, wholesale & retail dealr	0.359	0.015	130,000	1019
4215 personal assists & othr secretarie	0.356	0.01	296,000	2,355
3314 prison serv off (below princ off)	0.356	0.028	39,000	303
4134 transport and distribution clerks	0.355	0.022	63,000	465
9112 forestry workers	0.347	0.068	6,000	49
8126 water and sewerage plant operative	0.343	0.058	9,000	67
5495 goldsmth, slvrsmth, prec stone wrk	0.342	0.054	10,000	76
5422 printers	0.342	0.03	34,000	257
7122 debt, rent and other cash collectr	0.34	0.027	42,000	315
6139 animal care occupations n.e.c.	0.337	0.029	35,000	273
5499 hand craft occupations n.e.c.	0.333	0.048	13,000	96
6115 care assistants and home carers	0.33	0.007	601,000	4800
5232 vehicle body builders and repairer	0.327	0.032	28,000	217
8133 routine inspectors and testers	0.326	0.02	73,000	567
9224 waiters, waitresses	0.321	0.012	200,000	1507
5113 gardeners and grounds(wo) men	0.319	0.014	153,000	1,174
5216 pipe fitters	0.316	0.053	10,000	76
5411 weavers and knitters	0.313	0.116	2,000	16
4141 telephonists	0.312	0.033	27,000	202
6112 amb staff (excluding paramedics)	0.308	0.045	14,000	107

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
6215 rail travel assistants	0.304	0.043	16,000	115
5215 welding trades	0.304	0.018	84,000	657
5423 bookbinders and print finishers	0.303	0.039	19,000	142
5319 construction trades n.e.c.	0.3	0.011	216,000	1647
7111 sales and retail assistants	0.296	0.005	1,210,000	9,229
5111 farmers	0.295	0.018	72,000	647
4212 legal secretaries	0.294	0.021	60,000	462
4133 stock control clerks	0.293	0.016	111,000	850
8217 seafrer (m navy), brge, lght, boat	0.292	0.066	6,000	48
4216 receptionists	0.292	0.011	212,000	1670
5221 metal mach setter & setter-operato	0.289	0.02	64,000	505
9226 leisure and theme park attendants	0.286	0.039	18,000	133
1232 garage managers and proprietors	0.285	0.027	35,000	284
4217 typists	0.284	0.046	12,000	95
8215 driving instructors	0.283	0.027	35,000	283
5312 bricklayers, masons	0.281	0.016	97,000	748
9229 elmntry persnal servcs occup n.e.c	0.281	0.037	19,000	146
5491 glss & cermic mkr, decortr, finshr	0.276	0.041	15,000	116
5413 leather and related trades	0.273	0.078	4,000	33
9119 fishng & agric reltd occupatns nec	0.268	0.033	23,000	183
9219 elementary office occupatns n.e.c.	0.266	0.025	40,000	316
9245 car park attendants	0.264	0.052	10,000	72
5434 chefs, cooks	0.26	0.01	235,000	1764
5213 sheet metal workers	0.258	0.032	25,000	190

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
9222 hotel porters	0.258	0.056	9,000	62
3514 train drivers	0.256	0.04	16,000	121
7112 retail cashiers/check-out operator	0.251	0.01	232,000	1783
6221 hairdressers, barbers	0.245	0.012	156,000	1,222
6291 undertakers and mortuary assistant	0.243	0.051	9,000	70
7123 rounds(wo)men and van salesperson	0.241	0.033	21,000	166
8114 chem and related process operative	0.24	0.023	43,000	338
8125 metal working machine operatives	0.24	0.018	72,000	562
9259 elementary sales occupations nec.	0.233	0.021	50,000	387
9251 shelf fillers	0.226	0.013	134,000	1013
5323 painters and decorators	0.219	0.013	144,000	1,080
8149 construction operatives n.e.c.	0.219	0.015	97,000	743
9241 security guards and rel occupation	0.218	0.012	176,000	1262
8117 mtl mkng & treating procss operatv	0.217	0.034	18,000	143
9111 farm workers	0.217	0.022	43,000	350
5243 lines repairers and cable jointers	0.216	0.037	16,000	125
9141 stevadores, dockers and slingers	0.215	0.051	8,000	65
8219 transport operatives n.e.c.	0.214	0.033	21,000	159
5432 bakers, flour confectioners	0.213	0.028	27,000	207
9211 post wrkr, mail sort, msngr, couri	0.213	0.01	204,000	1556
6232 caretakers	0.212	0.018	68,000	532
5412 upholsterers	0.211	0.031	22,000	175

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
9133 printing machine minders and assis	0.206	0.031	22,000	170
8129 plant and machine operatives n.e.c	0.203	0.024	37,000	281
5234 vehicle spray painters	0.203	0.035	17,000	133
5311 steel erectors	0.192	0.039	14,000	104
5321 plasterers	0.182	0.019	56,000	428
8213 bus and coach drivers	0.18	0.013	118,000	896
8143 rail constructn & maintnce oprtive	0.179	0.051	8,000	56
8141 scaffolders, stagers, riggers	0.176	0.023	36,000	267
9223 kitchen and catering assistants	0.174	0.007	368,000	2839
8212 van drivers	0.173	0.01	189,000	1,433
8214 taxi, cab drivers and chauffeurs	0.171	0.01	178,000	1,361
8132 assemblers (veh and metal goods)	0.165	0.019	50,000	382
8216 rail transport operatives	0.165	0.038	13,000	97
8121 paper and wood machine operatives	0.159	0.019	46,000	372
9129 lab oth const trades n.e.c.	0.156	0.022	38,000	282
9149 oth good hndlng & storage occup ne	0.154	0.007	366,000	2765
8142 road construction operatives	0.152	0.025	26,000	198
9231 window cleaners	0.152	0.024	27,000	217
8131 assemblers (electrical products)	0.147	0.02	41,000	326
5419 text, garment & related trades nec	0.146	0.055	6,000	41
7124 mrkt and street traders and assist	0.143	0.035	13,000	98
9244 school mid-day assistants	0.143	0.014	73,000	600

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
8112 glass and ceramics process oprties	0.141	0.039	10,000	78
9239 elementary cleaning occupns nec.	0.141	0.036	13,000	92
6292 pest control officers	0.139	0.058	5,000	36
9121 labrers build & woodworking trades	0.136	0.009	196,000	1452
5316 glaziers, window fabric and fitter	0.134	0.018	47,000	358
8123 quarry workers and related oprtive	0.128	0.034	12,000	94
9243 school crossing patrol attendants	0.127	0.039	9,000	71
8119 process operatives n.e.c.	0.126	0.023	27,000	214
8116 plastics process operatives	0.125	0.017	50,000	393
5424 screen printers	0.122	0.051	5,000	41
8111 food, drink & tobac process operat	0.121	0.009	160,000	1246
9139 labrs process & plant opertns nec.	0.119	0.013	85,000	648
8139 assemblers and routine oprtves nec	0.119	0.016	51,000	412
5313 roofers, roof tilers and slaters	0.117	0.016	55,000	401
5322 floorers and wall tilers	0.116	0.018	45,000	328
8211 heavy goods vehicle drivers	0.115	0.007	298,000	2369
5433 fishmongers, poultry dressers	0.115	0.036	10,000	78
8229 mobile machine drivers & operative	0.112	0.015	54,000	439
8122 coal mine operatives	0.111	0.074	2,000	18
9235 refuse and salvage occupations	0.111	0.019	35,000	261
8221 crane drivers	0.109	0.031	13,000	101
9131 labourers in foundries	0.107	0.058	4,000	28
8115 rubber process operatives	0.106	0.038	8,000	66

Occupation (SOC 2000 4-digit codes) *(continued)*	Estimated share of people in each occupation with NVQ level 3+	Standard error	Estimated number of working age UK population in this occupation (rounded to nearest 1,000)	Sample number observations in this occupation
8218 air transport operatives	0.102	0.028	16,000	118
9221 hospital porters	0.097	0.025	19,000	145
6231 housekprs and related occupations	0.095	0.015	51,000	402
8134 weighers, graders, sorters	0.091	0.029	13,000	99
8135 tyre, exhaust and windscrn fitters	0.091	0.029	14,000	99
9234 launderers, dry cleaners, pressers	0.085	0.017	36,000	281
9134 packers, bottlers, canners, filler	0.082	0.009	111,000	883
9233 cleaners, domestics	0.081	0.004	506,000	4024
5431 butchers, meat cutters	0.078	0.018	28,000	218
8137 sewing machinists	0.078	0.017	30,000	243
8113 textile process operatives	0.065	0.022	15,000	124
9132 indust cleaning process occupation	0.064	0.019	20,000	157
8222 fork-lift truck drivers	0.059	0.009	98,000	744
5212 moulders, core makers, die casters	0.037	0.036	3,000	27
9232 road sweepers	0.036	0.018	14,000	110
8223 agricultural machinery drivers	0.014	0.014	10,000	72
8118 electroplaters	0	0	5,000	39
Totals (where applicable)			**27,279,000**	**210,447**

Source: Labour Force Survey.

* The above uses pooled data from January 2007 to December 2007.
* There are 283,069 observations from the working age population.
* The working age population includes men aged 16-64 and women aged 16-59.
* Note that the LFS population estimates are slightly less than the ONS UK population estimates as certain groups of people are not included in the survey, for example the prison population.
* The standard error is the standard deviation of the sampling distribution of the mean. The standard deviation is a measure of dispersion within a set of data, calculated from the square root of the variance, to give a value in the same range as raw scores. The standard deviation is the spread of scores around the mean of the sample.
* Please note that the standard errors are based on the assumption of a random sample.

Revised tables of indicators and potential data sources

Some key shortage data sources and partial commentary

Indicators	Sources	Comments
High proportion of **skill shortage vacancies** as identified by employers.	National Employers Skills Survey (NESS), available annually up until 2005. Full results for 2007 to be published shortly. Futureskills Scotland Report: "Skills in Scotland 2006". Skills Monitoring Survey in Northern Ireland, every few years. Sector Skills Survey by Futureskills Wales, every two years. Agents national Summary Scores from the Bank of England[42].	A survey of around 75,000 employers in England, provides information on skill-shortage vacancies, skills gaps and workforce development activity. In order to obtain information at regional and local levels, "employers" were defined as establishments rather than enterprises, therefore some enterprises may be represented by more than one of their sites. It also offers a definition of Hard-to-fill Vacancies and Skills shortage vacancies. The occupation breakdown is mostly confined to 3 digit SOC and above. The Scotland, Northern Ireland and Wales reports have similar methodologies to NESS, but smaller sample sizes. The Agents national summary draws on information obtained from business contacts. The details of these interviews are summarised in Agents' scores and in the written report. With regard to recruitment difficulties, only an aggregate score is routinely available. This is not broken down by occupations. However, the national summary sometimes draws out themes in relation to particular occupations.
Rapid **growth in relative earnings** in an occupation in the recent past.	Annual Survey of Hours and Earnings (ASHE), available annually. Labour Force Survey (LFS), available quarterly.	ASHE, because it is larger, is the preferred source for detailed analysis of pay at disaggregated 4 digit occupational level. More frequently updated.

[42] For more information on the Bank of England's Agents' Summary of Business Conditions see: http://www.bankofengland.co.uk/publications/agentssummary/index.htm#scores

Indicators	Sources	Comments
A **high earnings return to NVQ level 3+** (or equivalent) qualifications[43] or **rate of return**.	LFS can provide earnings and qualifications data.	The LFS provides qualifications in terms of NVQ equivalent levels. This is an important source for linking earnings to qualifications because there are no qualifications data in ASHE.
High or increasing **vacancies** in an occupation distinguished by levels, rates, duration, and numbers of establishment affected.	ONS Vacancy Survey[44], available monthly. Jobcentre Plus data (available through Nomis) Business surveys (e.g. British Chamber of Commerce Quarterly Economic Survey; CBI Quarterly Industrial Trends Survey; CBI Employment Trends survey)	Vacancy Survey, based on a sample of about 6,000 enterprises. Results are comparable over time and offer a comprehensive estimate of all job vacancies (not only those notified to Jobcentre Plus). Quarterly analysis is available by broad industry sector[45] (except agriculture, forestry and fishing[46]) and by size of business. However, no occupational, regional, or other detailed breakdown is available. Jobcentre Plus vacancies on Nomis may not provide comprehensive measures relating to all vacancies in the economy. However the proportion of vacancies, which are notified by employers, can be broken down over time, according to the occupation and industry of the vacancies and by geographical area. The occupations are broken down to 4 digits SOC and therefore this data are potentially very useful. A key limitation with these surveys in terms of our remit is that they do not provide an occupational breakdown.
A higher or increasing **vacancy rate**: Ratio of vacancies to employment, unemployment or number of economically active.	Jobcentre Plus data, LFS	There are a number of different possible normalisations of vacancy data depending on an appropriate definition of potential labour supply, such as V/E, V/U or V/(E+U). If the vacancy rate is very different depending on whether V/E or V/U is used this could suggest that there are people with the required skills who are not matched with available jobs.
Low **unemployment** rate among people previously in particular occupations.	Jobcentre Plus data, LFS	Both the LFS and Jobcentre Plus provide data on the previous occupation of the unemployed and economically inactive. Jobcentre Plus also on the occupations the unemployed are looking to work in. However it is important to note that the unemployment rate may be low because people previously in an occupation have dropped out of the labour force.

43. National Vocational Qualification (NVQ) level 3 "equivalent" is equivalent to 2 A levels.
44. Vacancy Survey data are not available by detailed occupation.
45. Industries are coded according to the 1992 Standard Industrial Classification (SIC 1992).
46. According to ONS, this is because of disproportionate additional costs involved in measuring vacancies in these sectors and apparently in this broad industry group there are mostly no vacancies.

Indicators	Sources	Comments
Evidence of **skill supply and demand**, including age profile of workforce and retirements etc.	Bottom-up analysis of specific sectors, possibly including data from employers *Working Futures* and related top-down projections.[47]	Will draw on some of the other data sources outlined in this table, but also on data from individual employers and sectors in some cases.
Widespread **overtime working** or an increase in its prevalence. A relatively large **number of hours worked** in an occupation or an increase in average hours worked.	LFS ASHE British Household Panel Survey (BHPS)	LFS provides data on usual and actual hours of work. It also asks why a person is working more hours than usual. ASHE provides paid hours of work. BHPS provides number of hours worked as paid overtime.
Widespread or earlier **promotions**.	BHPS	The BHPS collects information on whether a respondent thinks there are promotion opportunities in their current job. Sample size may limit the usefulness of this data.
Changes in **staff turnover**.	LFS ASHE BHPS	LFS contains information on the length of time a person has been with their employer and length of time continuously employed and reason last job left (so includes redundancy information). ASHE contains data on whether a person has been with their employer for less than twelve months but there is no information on whether prior to this they were employed, unemployed or inactive. BHPS provides information on length of time with employer.
Evidence of widespread **outsourcing** to other countries.	Bottom-up data	Data likely to be limited in availability and difficult to interpret.
High or increased levels of **training** and training expenditure	LFS BHPS	LFS contains relevant information on training including expenditure, duration and incidence, but not type. BHPS also provides some data on incidence of training.
An increase in the attractiveness of **overall employment packages** for an occupation.	BHPS	Generally, national data sources only provide limited data on overall employment packages, but the BHPS provides some data on pension schemes.

47. See for example http://www.ssda.ord.uk/ssda/default.aspx?page=28 and http://www.futureskillsscoeland.org.uk/web/site/home/reports/TellMeAboutIntro.asp

Indicators	Sources	Comments
Reason for **leaving last job**/ reason for looking for new job.	LFS	The LFS data includes the reason for leaving the previous job if this happened in the previous 3 months. The LFS also has data on the reason for looking for a new job. We could look at this information by previous occupation. However, due to the way these questions are worded in the LFS questionnaire there are doubts on the relevance and use of the data for our purpose.
	BHPS	BHPS also provides data on the reason a person left their previous job.

Potential content of June report

UK labour market and migration in context

- Recent tends in migration and the UK labour market

The current system

- Structure and operation of the current or “old” system
- Current shortage list

The new system

- Tiers 1-5
- Design and operation of Tier 2
- Broader policy context

Top-down approach

- Approach to top-down analysis of national data
- Decision rules and cut-off points in the analysis
- Responses to call for evidence/ research

Bottom-up approach

- Sectoral and stakeholder engagement
- Regional visits
- Research

Issues

- Defining occupations and jobs
- Defining “skills”, “shortage” and “sensible”
- Approach to Scotland list
- Dovetailing top-down and bottom-up

Results

- Top-down derivation of “skilled”, “shortage” and “sensible” occupations
- Discussion of specific sectors and occupations
- The UK shortage occupation list
- The Scotland shortage occupation list
- Regional issues

Next steps

- Timetable for Tier 2
- Plans for revision of shortage lists
- Future work of the Committee

Published by the Migration Advisory Committee, March 2008. 286788.