

Skilled

Shortage

Sensible

Review of Methodology

Migration Advisory Committee Report

March 2010



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Migration Advisory Committee and secretariat

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Chapter 1

Introduction

1.1 The Migration Advisory Committee

1.1 The Migration Advisory Committee (MAC) was set up by the Government in 2007 as an independent non-departmental public body to provide evidence-based advice to the Government on where shortages of skilled labour can sensibly be filled by immigration from outside the European Economic Area (EEA). The MAC also advises the Government on other immigration issues from time to time.

1.2 Our work on shortage occupations

1.2 One of our current roles is to recommend the shortage occupation lists for use under Tier 2 of the Points Based System (PBS) for immigration. Our work on the shortage occupation lists is the focus of this report.

1.3 We published our first recommended shortage occupation lists in autumn 2008 (MAC, 2008a) and completed three partial reviews of the lists in spring and autumn 2009 and spring 2010. (MAC, 2009a; 2009b). We have submitted the spring 2010 review with our recommendations to the Government, and will publish it shortly.

1.4 Inclusion of an occupation or job title on our recommended lists requires that it is **skilled**, is suffering from a labour **shortage** and, if the previous two tests are met, that it is **sensible** to fill the shortage using labour from outside the EEA.

1.5 We use a hybrid method to assess occupations and jobs titles against these tests, combining the consistency and comprehensiveness of a top-down approach, using national-level data, with the fine-grained detail and contextualisation of a bottom-up method. Top-down evidence comes from national-level data sources. Bottom-up evidence comes from our examination of individual occupations and job titles. This is informed by engagement with, and evidence from, a variety of stakeholders.

1.6 In the autumn 2008 report, we recommended that we should regularly review the lists, with a partial review of some occupations and job titles every six months and a full review of the whole labour market at least every two years. We also provided a comprehensive description of the approach and methodology we developed and used to justify the inclusion of occupations and job titles on the lists. We committed to carry out further research which would allow us to evaluate and update this methodology in time for the full review of the whole labour market, the first of which is planned for autumn 2010.

1.7 A General Election is to be held in the UK by June 2010 and we have considered the implications for this report. The Government could, at any time, cease to request that we recommend the shortage occupation lists.

However, we believe it is both appropriate and important for us to consider how effective the shortage occupation lists have been in meeting the Government's current objectives, which is what this paper aims to do. This will also ensure that we are well positioned to proceed with an autumn 2010 review, should the Government request this. We make no presumption regarding either the objectives of the Government in the future, or whether they will see the continuation of our shortage occupation work as necessary to support those objectives.

1.3 Aim and scope of this report

1.8 The underlying aim of the recommendations we have made over the past two years is that the shortage occupation route under Tier 2 of the PBS operates as effectively as possible in helping to ensure that the PBS, and relevant wider Government policy, achieves its objectives. This, in turn, requires that the methodology we use to make our recommendations is robust. Therefore, this report assesses the methodology we have used to define and identify labour shortages in skilled occupations and whether it is sensible to fill these shortages by employing non-EEA immigrants. There are several areas of the current methodology that merit close consideration, including:

- how the shortage occupation lists function within immigration policy and relates to the Government's current objectives;
- the overall top-down approach and the specific methodologies developed for each of the three tests (skill, shortage and sensible);
- the nature of the bottom-up evidence assembled, and the process for collecting and analysing this; and
- the dovetailing of the top-down data with the bottom-up evidence.

1.9 With regard to the top-down approach, this report considers various issues in terms of how we measure skilled, shortage and sensible.

1.10 We consider various issues in relation to the bottom-up evidence such as the appropriateness of the current approach based on job titles within occupations, and whether we should take into account future skill needs and 'growth sectors' targeted by the Government's industrial policy.

1.11 In our autumn 2008 report, we identified some areas for further research. We commissioned an ongoing programme of research in order to improve the methodology used to assess occupations and job titles against our three tests of skilled, shortage and sensible. Some of these research projects have been completed and the final reports are now available on our website alongside this report. Others will be completed in the coming months and final reports will be published on our website as they become available. Details on each of these projects are provided in the relevant chapters of this report.

1.12 This report does not review any occupations or job titles or make any recommendations to the Government. Any occupations or job titles discussed in this report are included for illustrative purposes only.

1.13 It also does not review in detail the case for retaining the three tests of skilled, shortage and sensible in themselves. We are content that, given our current remit, these three tests remain the most appropriate way to determine which occupations and job titles should be recommended for inclusion on, or removal from, the shortage occupation lists.

1.14 We are also content with the principle of retaining an overall hybrid approach. We believe that any labour market analysis we are able to carry out at the occupational level needs to be complemented by more fine-grained detailed information provided by our bottom-up approach, and vice versa.

1.15 This report does not consider wider policy issues in relation to immigration other than where they have relevance to our methodology.

1.4 Structure of this paper

1.16 Chapter 2 provides the context for this report and highlights relevant developments in relation to policy and the economy. Chapter 3 briefly rehearses our current methodology as set out for the first time in MAC (2008a).

1.17 Chapters 4 to 6 present, in turn, our thinking around each of the current three tests of skilled, shortage and sensible. They discuss how each of the tests have been used so far, and outline options for amending or updating the indicators used under each test.

1.18 Skilled is covered in Chapter 4. We have one research project underway that will improve our understanding of the methodology used to identify skilled occupations. It is yet to be completed at the time of writing this report. In addition, the Standard Occupation Classification (SOC), which is a fundamental element of our skilled methodology, is in the process of being updated. We review our top-down skilled methodology in light of this fact, but any changes to it would be held over until the new SOC 2010 classification is adopted in the main labour market surveys that we use. Chapter 5 presents our review of the 12 shortage indicators we have used to date and discusses some potential improvements to the way in which we could combine them to identify shortages at the occupational level. Chapter 6 covers our sensible test and considers whether our approach could be refined to take into account the latest developments that impact on our consideration of this issue.

1.19 Other issues that cut across the three tests are discussed in Chapter 7. Conclusions and next steps are summarised in Chapter 8.

1.5 Stakeholder engagement

1.20 Although this report is not a consultation document, we always welcome constructive comment on our methodology and how it might be improved, including at the events that MAC members regularly host to update stakeholders on our work.

Chapter 2

Context

2.1 Introduction

2.1 This chapter outlines various factors that have impacted on this review of our methodology. We do not discuss our response to, or view on, most of these issues in this chapter as this is done in subsequent chapters of this report. First, we set out the economic context to this report and the implications for our work. Next, we outline the policy context in relation to skills, immigration and the shortage occupation lists. We then discuss the international conference that we hosted in September 2009, which brought together international immigration experts and policymakers to share their respective experiences of points based systems around the world. Finally, we comment on our ongoing engagement with stakeholders and our research programme, both of which have played a central role in informing this report.

2.2 Economic developments

2.2 Although the UK economy exhibited modest positive growth in the fourth quarter of 2009, the labour market and economy remain disturbed as a result of the economic downturn. The UK economy was in recession for six consecutive quarters from the second quarter of 2008. Over this period, UK gross domestic product (GDP) contracted by 5.9 per cent (Office for National Statistics (ONS), 2009). Compared to the first quarter of 2008, the working age employment rate in the last quarter of 2009 was down 2.5 percentage points, at 72.4 per cent, and the unemployment rate was up 2.6 percentage points, at 7.8 per cent (ONS, 2008 and 2010). Although this rate of unemployment is lower than after previous recessions in the 1980s and 1990s, the effects of this recession on the labour market have been considerable.

2.3 It would be incorrect to assume that this recession has caused all labour shortages to disappear. It is valid to ask, however, whether the number of shortage occupations should be expected to decline in a recession, and to what extent.

2.4 In our first review of the shortage occupation lists (MAC, 2009a) we identified four types of labour shortage. First, cyclical skill shortages, for example some shortages in engineering and construction occupations, have declined substantially during the economic downturn. Second, structural shortages, such as some medical consultant and geology specialists, represent a lack of necessary skills among the existing UK workforce. Such shortages have often persisted throughout the economic downturn.

2.5 Third, labour shortages caused by constraints on public spending, which prevent public sector employers offering higher wages, or better training, to fill skill shortages. Demand for such services is not responsive to changes in economic conditions, and so shortages have remained in many areas throughout the downturn.

2.6 Finally, some shortages arise because the UK is in competition to attract the most talented individuals in the world in a particular profession. The scarcity of the 'very best' in some occupations, such as ballet dancers, remains throughout an economic downturn.

2.3 Policy context

2.7 Our policy advice on immigration aims to help the Government achieve its stated objectives with regard to immigration, the labour market, skills and the economy. The Government's policy objectives are represented formally in its Public Service Agreements (PSAs), which were set out in the Comprehensive Spending Review (HM Treasury, 2007). We consider the PSAs that are most relevant to economic immigration in more detail in Chapter 6. It is important that, when evaluating our methodology, we consider the Government's policy objectives alongside its vision of how the UK will emerge from the recession to secure long-term economic prosperity. Below we discuss the recent policy developments and announcements that are relevant to this review of our methodology.

Immigration policy

2.8 The points based system (PBS) for immigration, introduced in 2008, comprises five tiers:

- **Tier 1:** Highly skilled individuals to contribute to growth and productivity;
- **Tier 2:** Skilled workers with a job offer to fill gaps in UK labour force;
- **Tier 3:** Limited numbers of low skilled workers needed to fill specific temporary labour shortages;
- **Tier 4:** Students;
- **Tier 5:** Youth mobility and temporary workers: people allowed to work in the UK for a limited period of time to satisfy primarily non-economic objectives.

2.9 Tiers 1, 2, 4 and 5 are all in operation. Tier 3 is currently suspended. To qualify for approval under each tier, individuals must earn a given number of points corresponding to requirements such as education and qualifications, current or prospective earnings, and maintenance.

2.10 Requirements, and their associated points, vary by tier and the entry route through which the immigrant is applying. The system is designed to be flexible as the requirements and points can be changed by the Government at any time.

2.11 Tier 2 is for skilled immigrants only. A successful applicant must be coming to fill a job at National Qualification Framework (NQF) level 3, or

equivalent, or above and be paid at least the appropriate rate that would be paid to a skilled resident worker doing similar work.

2.12 In addition, a successful applicant must gain the sufficient number of points to enter under Tier 2. Points are awarded for different requirements and the overall pass mark is currently set at 70 points. Table 2.1 summarises the requirements and the corresponding points allocated. The table shows that an immigrant applying to enter through the shortage occupation route, with which this report is concerned, gains the required 50 points in section A.

Table 2.1: PBS Tier 2: routes, points and requirements						
Section	Routes:		Requirements: Qualifications (or equivalents)		Requirements: Prospective Earnings (£)	
A (50 points needed)	Offer of job in shortage occupation	50	No qualifications	0	17,000 - 19,999	5
	Offer of job that passes RLMT	30	GCE A-level	5	20,000 - 21,999	10
	Intra-Company Transfer	30	Bachelors or Masters	10	22,000 - 23,999	15
	Switching from a Post-Study category	30	PhD	15	24,000 +	20
B	Maintenance requirement (mandatory)					10
C	Competence in English (mandatory)					10
Notes: This table will be revised in April 2010. Prospective earnings are before tax, and can be adjusted periodically to reflect inflation and/or labour market requirements. Allowances will be taken into consideration in calculation of salary. Source: UK Border Agency, 2008						

Recent changes to the PBS

2.13 The flexibility of the PBS enables immigration policy to be adjusted in response to the prevailing economic circumstances. In response to the economic downturn, in April 2009 the Home Secretary introduced three changes to the PBS that made the UK more selective towards economic immigrants from outside the European Economic Area (EEA) coming to work in the UK. These changes were:

- to strengthen the Resident Labour Market Test (RLMT) under Tier 2 so that employers must advertise all jobs to resident workers through Jobcentre Plus before they can recruit a non-EEA immigrant;
- to use the shortage occupation lists to trigger skills reviews that focus on upskilling resident workers for these occupations; and

- to tighten the qualifications and earnings criteria for highly skilled migrants entering the UK under Tier 1 (General) so that immigrants have at least a master's degree and a previous salary of £20,000.¹

2.14 The Home Secretary also commissioned the MAC to analyse Tiers 1 and 2 in detail. We did so in MAC (2009c) and MAC (2009d). In March this year the Government responded to the recommendations we made in those reports and from April 2010 a new points table for Tier 2 will replace that described in Table 2.1. On the issue of the recession, we concluded that the PBS acts as an automatic stabiliser and should not require regular ongoing adjustment in response to the economic cycle. Nonetheless, the relevance of the April 2009 changes to this report is twofold: first, it demonstrates a commitment on the part of the Government to protect UK workers during the economic downturn; second, the commitment to carry out skill reviews illustrates a desire on the part of the Government to ensure that the inclusion of an occupation on the shortage lists provides a trigger, rather than a disincentive, to upskill UK workers in that occupation. The Government's view is reinforced by the discussion of skills policy below.

The effect of skilled migration on sending countries

2.15 Skilled workers are a valuable commodity and the countries from which they emigrate are often keen to retain them. However, sending countries are in competition with prospective receiving countries that wish to attract immigrants with desirable or required skills.

2.16 The effects of skilled migration on sending countries were considered in *International challenges, international solutions: managing the movement of people and goods* (UK Border Agency (UKBA)/Foreign & Commonwealth Office (FCO), 2010). This paper explained how developing countries can receive benefit from skilled workers who move abroad, "*in the form of remittances, trade and investment links, capital and new skills brought back home by returning migrants*". The Government has been working with the other EU Member States to more closely align migration and development policy and to ensure that migration policy operates in the best interests of the EU, developing countries and the migrants themselves.

Skills policy

2.17 In *New Industry, New Jobs* (HM Government, 2009b) the Government outlined the importance of improving the skills of the UK workforce to enable the UK to meet the future demands on its economy. The report stated that there should be "*a continued focus on ensuring that our economy is driven by high levels of skills and creativity*."

¹ In our recent review of Tier 1 of the PBS we recommended that the qualifications requirement was lowered to a bachelor's degree, on the condition that the earnings requirement was simultaneously increased. Full details of our recommendations for Tier 1 can be found in MAC (2009d).

2.18 HM Government (2009b) highlighted the importance of developing a skills system that will allow the UK to respond to both current demands by employers and future skill needs. Demographic change will put increasing pressure on the care, hospitality and leisure sectors, for example, and it is important that the UK workforce is equipped to respond to the growth in demand for skilled workers in these sectors.

2.19 Future skill needs will also be driven by technological change and the growth of new industries. Three recent reports: HM Government (2009b); *Building Britain's Future* (HM Government, 2009a); and *Going for Growth: Our Future Prosperity* (Department for Business, Innovation and Skills (BIS), 2010), identified world-leading capabilities in the 'network' industries of the future as crucial for the long-term prosperity of the UK economy. These industries include low carbon, biotechnology, life sciences, nuclear energy, digital technology, advanced manufacturing and financial services.

2.20 BIS (2010) built on the approach set out in *New Industry, New Jobs*, arguing that the UK requires sophisticated skills, world class infrastructure and high levels of knowledge and innovation to excel in the modern economy. It outlined the importance of supporting individuals in acquiring and applying the knowledge and skills necessary to enable them to find employment and build the industries of the future.

2.21 A National Strategic Skills Audit, published for the first time in UK Commission for Employment and Skills (UKCES) (2010), will be undertaken every year to help ensure that the UK is equipped with the skills necessary for the future economy. This audit is overseen by the UKCES, which consults with businesses to assist the Government in filling skills gaps and inform skills policy.

2.22 *Skills for Growth: The National Skills Strategy* (BIS, 2009) described the Government's planned investment in skills as a vital part of the UK's economic recovery. This report outlined the recent progress that the UK has made in upskilling its workforce. However, it argued that the UK has lagged behind its international competitors in recent years in terms of skills and is not catching up fast enough in spite of this progress.

2.23 BIS (2009) therefore proposed new priorities or approaches in six key areas:

- to promote the skills that matter for economic prosperity in modern Britain;
- to expand the advanced apprenticeship system for young adults;
- to ensure the skills system responds to employer demand, while ensuring that key sectors for growth and employment are better supported through the skills system;
- to further empower adults to equip themselves with the necessary skills for future jobs;

- to raise recognition among businesses of the value of investing in workforce skills; and
- to further improve the quality of further education and training provision.

2.24 In a speech on immigration in November 2009, the Prime Minister acknowledged the benefit to UK businesses of being able to recruit skilled workers from abroad when vacancies cannot be filled by domestic workers. He recognised that: immigrant workers have filled key skill gaps in both the public and private sectors; they have boosted employment and growth in the UK economy; they supply new talents and perspectives to UK businesses; and that scarce or specialist skills held by immigrants will remain essential to the continued success of the UK in the global economy.

2.25 The Prime Minister outlined the Government's plan to continue to use the PBS to target immigration towards skill shortages, but also said that the Government plans to build on the National Skills Strategy and aims to stimulate rising levels of skills, wages and employment among the UK labour force as the UK moves out of the recession. It is the Government's aim that in the future domestic workers will be able to meet employers' skill needs to a greater extent than at present, thus reducing the need for employers to recruit skilled workers from abroad.

2.26 Specifically, the Prime Minister asked the MAC to work with UKCES to develop a strategy so that some occupations could be removed from the shortage occupation lists. He requested that the MAC and UKCES consult employers, training providers and other agencies to develop a sensible timetable for the removal of occupations.

2.27 At the time of publication of its report *Ambition 2020: World Class Skills and Jobs for the UK* (UKCES, 2009a), UKCES estimated that 2 million additional jobs will be created in the UK by 2020, and that most of these jobs will require high levels of skill. However, UKCES (2009a) found that:

- the UK is falling short of its skills ambitions to be in the top eight countries globally for skills by 2020;
- the international skills gap between the UK and the top countries is widening rather than closing; and
- the UK will meet its own target of 40 per cent qualified to NVQ level 4 or above; however, projections still rank the UK only tenth internationally for high level skills in 2020.

2.28 UKCES (2009a) defined skill shortages as occurrences where *“organisations cannot recruit sufficient people who are appropriately qualified, skilled or experienced to fill the vacancies they have”*. Skill gaps were defined as occurrences where *“members of the existing workforce in an organisation are seen to have lower skills than are necessary to meet current business needs”*. Skill gaps, therefore, refer to the skill deficiencies of those already

employed within an occupation, whereas skill shortages refer to the skill deficiencies of the potential workforce.

2.29 UKCES (2009a) argued that skill shortage vacancies in the UK are actually quite low, at around 170,000; however these are more significant problems in small businesses, in some key occupations, and in a number of sectors and localities. Skill gaps, however, were measured to be more significant, amounting to an estimated 1.8 million employees in the UK.

2.30 In order for the UK to meet its skills ambitions and to succeed in the future global economy, UKCES (2009a) argued that both employees and employers need to be better educated in the benefits of investing in skills. In order to build an internationally competitive economy, the skills system will need to encourage the development of high performance businesses. These businesses will provide a platform for, as well as lead to, the further creation of a more highly skilled workforce in the UK.

2.31 Overall, recent policy developments and pronouncements on skills clearly highlight the importance of investing in the existing UK labour force to ensure the competitiveness of the UK in the long term. The Government has identified the upskilling of domestic workers and a decreasing dependency on skilled migrant labour as a critical step to leading the UK out of the recession and ensuring its long term prosperity in the global economy.

2.32 It is clear, however, that it will take time for the UK to successfully address its skill shortage issues. The resident workforce cannot be instantly upskilled, regardless of the intensity of efforts to train the existing labour force or the levels of available funding. New labour demands will also emerge as the structure of the economy evolves. Therefore, for the foreseeable future there will still be some skilled labour shortages that may sensibly be filled using immigration, and therefore potential value in retaining a shortage occupation lists. The next section considers the shortage occupation lists in more detail.

2.4 Home Affairs Committee view of the shortage occupation lists

2.33 The House of Commons Home Affairs Committee (HAC) commented on the shortage occupation lists in its report *Managing Migration: The Points Based System* (HAC, 2009). We briefly set out some of the points it made here. We agree with some of the conclusions of the HAC report, and disagree with others. We return to some of the issues raised here in later chapters.

2.34 The report said that, where genuine shortages exist that cannot be filled from within the UK and EEA labour force, it is justifiable to use short-term immigration of non-EEA nationals alongside longer-term investment in the retraining of the domestic workforce. However, HAC (2009) argued that, because job vacancies in the UK reduced by a third as a result of the economic downturn, and given the current economic climate, employers should seek to recruit from within the UK labour force wherever possible.

According to HAC (2009), the availability of skilled migrant labour may reduce the incentive for firms to invest in training the domestic workforce, and this investment should be given priority.

2.35 HAC (2009) argued that the shortage occupation lists should only be used to fill short-term or cyclical skill shortages and criticised the inclusion of occupations that are experiencing long-term structural shortages. They also argued that exceptional international talents, such as ballet dancers, were only included on the shortage occupation lists because of the poor design of the PBS. A better designed PBS, it argued, would be able to recognise the skills required in this occupation through the points criteria.

2.36 Three different types of labour shortage were discerned in HAC (2009). The first category is shortages arising because highly specialist skills are not available in the resident workforce. This category has some overlap with our categorisation of 'global talent' shortages. The second category is shortages caused by unattractive wages or labour market conditions. This shows similarities to what we describe as shortages caused by constraints on public spending. The final category is shortages due to insufficient investment in skills: this is broadly analogous to our classification of structural shortages.

2.37 HAC (2009) questioned whether a six-monthly review of the shortage occupation lists truly reflected the current skills and jobs shortages in the UK. They argued that more frequent reviews are required to reflect the changing needs of the UK labour market, particularly when considering the fast-changing economic circumstances experienced in the UK over the last twelve months.

2.5 MAC International Conference

2.38 In September 2009 we hosted an international conference to bring together policymakers and experts from a range of countries to discuss their comparative labour immigration policy experiences with a particular focus on the role and optimal design of points based systems. The conference was attended by leading academics and senior policymakers from Australia, Canada, the United States and countries within the EEA. The knowledge and experiences shared at the conference have played an important role in informing this assessment of our methodology.

2.39 The UK PBS was first introduced in 2008. We were told that Australia and Canada have had points based systems in place for over thirty years. Experience in Australia and Canada suggests that points based systems have been beneficial to the economy, the existing workforce and the individual immigrants in these countries. Points based systems led to improved outcomes for immigrants, allowed for diverse immigration beyond family reunification and directly supported labour force growth in the face of demographic ageing.

2.40 We were told that Canada uses its shortage occupation list as part of the Federal Skilled Worker Program, a points-tested route to permanent residency. If prospective immigrants do not have an offer of arranged

employment or have not already been living in Canada legally for one year, they can still be eligible for the Federal Skilled Worker Program if they have had, within the last ten years, at least one year of paid experience in an occupation on the shortage occupation list.

2.41 We were told that Australia included a Migration Occupation in Demand List (MODL) in its points based system, similar in some respects to the shortage occupation lists used in the UK. The Australian points based system is designed so that most points are awarded to those who are young, highly skilled and proficient in English. However, extra points were available for those who are skilled in occupations that are in shortage in Australia and listed on the MODL. Australian studies showed that immigrants coming through the MODL route were observed to have better than average outcomes.

2.42 More recently, after a review of the MODL, the Australian Government announced in February 2010 that it was being revoked with immediate effect and would be replaced by a more targeted Skilled Occupations List (SOL). It is expected that the SOL will better meet the needs of Australia's labour market. The Critical Skills List, which was an interim measure adopted whilst the MODL was being reviewed, is also being revoked. This new SOL is expected to be announced by the end of April 2010 and will come into effect during mid-2010. The list will be compiled by Skills Australia, a statutory body set up by the Australian Government to provide expert and independent advice on matters relating to Australia's current, emerging and future workforce skills and workforce development needs. These changes to Australia's managed migration system are designed to put more focus on those professions and trades that are of highest value to the Australian economy.

2.43 At the international conference we were told that the United States does not operate a points based system or a shortage occupation list. However, the Third Preference EB-3 visa, the permanent worker visa for professionals and skilled workers, requires 'labor certification' from the U.S. Department of Labor. This certification verifies that there are insufficient available, qualified and willing U.S. workers to fill the position being offered at the prevailing wage. It is therefore similar, at least in part, to the RLMT used in Tier 2 of the PBS in the UK.

2.44 The effects of the recession on international migrant flows were also discussed at the conference. Migration flows were found to have fallen as a result of the economic downturn, although the extent of this decrease varies between sectors and between occupations. Skilled immigrants have remained an important resource for employers in care for the elderly and other key public sector services. The dependence on immigrant labour was argued to be a symptom of other employment issues, such as inadequate training of the domestic workforce and constraints on public sector spending.

2.6 Stakeholder engagement

2.45 As explained in Chapter 1, the purpose of this review is to assess whether the shortage occupation lists route under Tier 2 of the PBS have operated as effectively as possible in helping to ensure that the PBS, and relevant wider Government policy, achieves its objectives. This, in turn, requires that the methodology we use to develop our recommendations is robust. We also wish our decisions to be as transparent as possible.

2.46 Notwithstanding any changes to our methodology that could be borne out of this report, the bottom-up evidence we receive from employers, industry bodies and other key stakeholders will, for as long as we continue to work on the shortage occupation lists, continue to form an integral part of our analysis. This evidence enables us to examine individual occupations and job titles with a degree of focus that is not possible through top-down analysis alone. Since the MAC's inception, both the quantity and quality of our engagement with stakeholders has grown substantially, and it is our hope that this will continue in future.

2.47 Many Sector Skills Councils (SSCs) make a key contribution to our bottom-up evidence. Each SSC aims to increase training opportunities and skills to improve business productivity and performance and consequently reduce skills gaps and shortages in its respective sector. It is therefore imperative that we have strong and open links with each SSC to help the Government to achieve its skills objectives.

2.48 We see SSCs as crucial to our work, both in terms of providing granular labour market information (LMI) and helping us to assess claims of shortage made by other sectoral and occupational stakeholders.

2.49 UKCES (2009b) outlined a common framework approach for all SSCs to adopt when collecting LMI. This will ensure that definitions and classifications are used consistently across the various SSCs, allowing for more valid comparison of performance between sectors. UKCES (2009b) requires SSCs to collect sectoral-level data on the drivers of skills demand, the current skill needs and the anticipated demand for skills in future. Furthermore, SSCs will be required to provide LMI for all countries of the UK, identifying any key differences across countries and regions and highlighting where specific skills issues are particularly manifest. Although the primary focus is on occupations rather than sectors, we believe this LMI has the potential to be very useful in informing any recommended shortage occupation lists we may compile in the future.

2.7 Research programme

2.50 In addition to providing policy advice to Government, we run a research programme that has been specifically designed to enrich our understanding and improve the development of our methodology, in particular around the indicators we use under each of the three Ss: skilled, shortage and sensible.

The majority of our research projects are commissioned to experienced external bodies, although some projects are conducted in-house.

2.51 Individual research projects and their specific influence on this assessment of our methodology will be discussed in more detail in later chapters. Examples of the research projects that we have commissioned include:

- a theoretical review of skill shortages and skill needs;
- a review of the MAC skilled shortage methodology;
- an assessment of whether it is possible to estimate potential labour shortage and labour supply in the EEA; and
- an assessment of the feasibility of firms altering their production techniques as an alternative to employing immigrant labour.

2.52 We design and commission our research projects independently. Whilst we may use the findings of our research programme to improve the robustness of any recommendations we make to Government, our policy recommendations do not stem directly from the findings of any individual research project.

2.53 We give consideration to all of the recommendations concerning methods of investigation that emerge from our research programme. Where research recommends changes to our methodology, we consider the operational feasibility of implementing such changes. Where research suggests little or no change to our methodology, we take this as potential indication that our current methodology is effective.

2.8 Conclusions

2.54 This review of our methodology has been informed and guided by several factors. Recent literature and policy developments have identified investment in the skills of the UK labour force as a key contributor to the long-term prosperity of the UK economy as it moves out of recession. We aim to work with the relevant bodies to ensure that the UK achieves its skills objectives and has a workforce that is suitably equipped to meet the demands of the modern global economy. We believe that sensibly constructed shortage occupation lists can make an important contribution to achieving these aims.

2.55 We continue to draw upon a variety of information sources to ensure that our methodology enables us to provide the Government with robust, evidence-based recommendations. We have benefited from the expert knowledge and experience that was shared at the international conference and from the recommendations made through our research programme. Stakeholder engagement continues to play an integral part in shaping our recommendations to the Government. In particular, it is essential that we continue to develop the key strategic relationships we have built with the UKCES and the SSCs.

2.56 Throughout the remaining chapters of this report we return to many of the issues outlined above. We begin by outlining the current methodology that is used to compile our recommended shortage occupation lists, before assessing each area in turn in more detail.

Chapter 3

Current methodology

3.1 Introduction

3.1 In this chapter we provide a summary of the methodology used to compile the MAC's recommended shortage occupation lists. More detailed descriptions of our methodology are available in MAC (2008a, 2009a and 2009b).

3.2 First, we set out our conceptual approach, which combines top-down analysis with bottom-up evidence, and describe the types of evidence we have received and analysed to date. We also discuss how occupations and job titles are analysed using the 4-digit Standard Occupation Classification (SOC) codes where these are relevant, and how this is done where SOC codes are less relevant. Next, we summarise our approach in terms of our skilled, shortage and sensible tests and introduce the indicators used under each of these. Finally, we conclude by discussing the areas of our methodology that we review in the remaining chapters of this report.

3.2 The hybrid approach

3.3 To produce the shortage occupation lists we assess occupations and job titles against our three tests of skilled, shortage and sensible using a hybrid method. This combines the consistency and comprehensiveness of a 'top-down' approach, using national data, with a more granulated 'bottom-up' approach that uses evidence submitted to us by our stakeholders. We refer to the process of considering the top-down and bottom-up evidence in combination as 'dovetailing', and this process is key in determining the final recommended shortage occupation lists.

3.4 We base our analysis on the most recent official Standard Occupational Classification for the UK, SOC 2000, which uses four levels of aggregation. SOC 2000 is due to be replaced by a revised classification, SOC 2010, at some point during mid-2010. This revision could have considerable impacts on our work; we discuss these in more detail in Chapter 4. References to SOC in this report are to SOC 2000 unless otherwise stated.

3.5 The 'unit group' (4-digit) level, which is the SOC level most relevant to our work, breaks down the labour market into 353 occupations. It is the most detailed and disaggregated occupational breakdown available for our top-down analysis. However, some labour markets operate at and, therefore, some actual labour shortages also occur at the more detailed sub-occupational or job title level. Consequently, both individual job titles and whole occupations may be recommended for inclusion on the shortage occupation lists. In referring to job titles here we mean those job titles that are more specific than the SOC coding system provides for. National-level data are not available for individual job titles, meaning that bottom-up evidence is of particular importance in these cases.

3.6 Currently only one complete 4-digit SOC occupation, chemical engineers, is included on the shortage occupation list. The remainder of the list consists of individual job titles within a 4-digit SOC occupation. In some of these cases the top-down evidence is nonetheless still highly relevant; in others it is less so, as discussed further below.

Top-down

3.7 For the top-down approach we analyse the most timely and relevant national labour market data available to us. We carry out this data analysis in-house and also commission external research.

3.8 The data sources used for our top-down analysis are the Labour Force Survey (LFS), the Annual Survey of Hours and Earnings (ASHE), the National Employers Skills Survey (NESS) and Jobcentre Plus (JCP) claimant count unemployment and vacancy data. In MAC (2008b) we set out in more detail the potential data sources available to us.

Bottom-up

3.9 Bottom-up evidence comes from closer examination of individual occupations and job titles. Crucially, this is informed by engagement with, and evidence provided by, a wide variety of stakeholders. To date this has included face-to-face meetings, workshops set up to inform our work, written submissions of evidence and visits to workplaces. We have produced a guide² for submitting evidence and we work closely with those responding to our call for evidence to ensure, as far as possible, that the evidence is submitted in line with the methodological approach we have set out.

3.10 In preparing our most recent shortage report (MAC, 2009b), which reviewed only a limited number of occupations and job titles, we met with over 40 industry bodies, unions and employers and received over 70 submissions of evidence. Our stakeholder engagement would be considerably larger for a review of the entire labour market. In 2009 we also began a series of regional stakeholder forum events to better access evidence in relation to our work and specifically to reach out to our stakeholders at a regional level. We have so far held events in Edinburgh, Belfast, Cardiff, Newcastle, Plymouth, Birmingham, Leeds and Cambridge. These events have been attended by over 180 organisations. We also endeavour to combine these events with visits to individual employers, industry bodies, and trade unions.

Dovetailing

3.11 Clearly it is most helpful when the top-down and bottom-up data on any particular occupation or job title point to the same conclusion. However, there are reasons why this will not always be the case.

² Available at: <http://www.ukba.homeoffice.gov.uk/aboutus/workingwithus/indbodies/mac>

3.12 On some occasions, the top-down and bottom-up data will point to conflicting conclusions because evidence relates to different levels of disaggregation. There may be a shortage of workers with specific skills within an occupation (for example, a shortage of secondary school teachers who can teach science or mathematics) but not in the broader occupational group as a whole (for instance, no shortage of secondary school teachers in general). If the bottom-up evidence relates to a more specific job title than the top-down evidence then, even when the two sets of evidence point in different directions, they are not necessarily inconsistent with each other.

3.13 In addition, the usefulness of different indicators will sometimes vary between the top-down and bottom-up approaches. For instance, it may be difficult to obtain robust information on earnings growth within an occupation from sectoral or occupational bodies, whereas national-level data can provide this. In contrast, it is difficult to measure the level of on-the-job training in some occupations using national-level data, whereas stakeholder evidence can provide us with this information. These factors limit the extent to which we can corroborate top-down and bottom-up data against each other.

3.14 Broadly speaking, we look for indicators of skilled, shortage and sensible in both the top-down and bottom-up evidence before making recommendations about the shortage list. However, our approach distinguishes between cases where top-down data are highly relevant and where they are less so. Crudely, it can be categorised as follows:

- in cases where the top-down data are highly relevant, generally because the asserted shortage relates to the whole of the broad 4-digit occupation or a large part of it, we include occupations or relevant job titles on our recommended shortage occupation lists if, overall, there is a combination of good top-down and good bottom-up evidence;
- if the top-down data are not highly relevant, generally because the assertion of shortage relates to a narrow category within the relevant SOC, we include the relevant job title on the lists if there is sufficient bottom-up evidence.

3.15 We do not include occupations on the shortage occupation lists where bottom-up evidence:

- does not satisfy our criteria, in that the evidence indicates either that the occupation is not skilled, or is not in shortage, or that it is not sensible to fill a shortage through immigration, or any combination of these; or
- is non-existent, partial or not relevant, making it impossible to form a conclusion.

3.16 We have to use a degree of judgment in weighing 'strong' top-down evidence against 'weak' bottom-up evidence, or vice versa. Where we make such judgments, we set them out explicitly in our reports.

3.17 We discuss the issues surrounding the dovetailing of top-down and bottom-up evidence in more detail in Chapter 7.

3.3 Skilled, Shortage, Sensible

3.18 As previously mentioned, our approach to drawing up the recommended shortage occupation lists for the UK and Scotland assesses an occupation or job title against our three tests:

- first, we consider whether individual occupations or job titles are sufficiently **skilled** to be included on the shortage occupation lists;
- second, we consider whether there is a **shortage** of labour within each skilled occupation or job; and
- finally, we consider whether it is **sensible** for immigrant labour from outside the EEA to be used to fill these shortages.

3.19 The remainder of this section describes each of these tests in turn, introducing the indicators that we use. Further details on the indicators for each test, including the thresholds and sources of data, are presented in Chapters 4, 5 and 6.

Skilled

3.20 There is no unique, objectively defined measure of skill. Our methodology examines factors that indicate whether an occupation is skilled to at least National Qualifications Framework (NQF) level 3. This follows from the requirement that individual jobs under Tier 2 of the Point Based System (PBS) need to be skilled to at least NQF level 3.

3.21 There are five main indicators that we believe are relevant to assessing skill:

- the skill level defined in the SOC hierarchy;
- formal qualifications;
- earnings;
- on the job training or experience required to carry out the job; and
- the level of innate ability required.

3.22 For our top-down analysis, the first three of these indicators can be measured using national-level data. In MAC (2008a) we set out how an occupation is considered as skilled if it passes the relevant threshold for at least two of the three top-down indicators.

3.23 In considering the bottom-up evidence, we take into account information on earnings and qualifications relating to specific job titles within

an occupation. We also take into account the last two factors, on the job training or experience and innate ability, which we believe indicate skill in an occupation, but which cannot be measured using national-level data.

3.24 Our methodology for determining whether an occupation is skilled is discussed in more detail in Chapter 4.

Shortage

3.25 As with skill, there is no single universal or infallible definition or measure of 'labour shortage'. Various approaches are used across different countries. Therefore, we examine a range of indicators in our top-down shortage analysis. It is crucial that this analysis is contextualised by background information and knowledge of the labour market, so we also pay careful attention to the bottom-up evidence on shortage.

3.26 To fully understand the concept of demand and supply, and therefore labour shortage, it is necessary to look at various price indicators (wages), as well as quantities (vacancies, employment and unemployment). In MAC (2008a) we identified a total of 12 indicators of shortage for our top-down analysis. These indicators, and details on the data available to measure them, are set out in more detail in Chapter 5.

3.27 The 12 top-down indicators fall into four broad categories:

- **employer-based** indicators (e.g. reports of shortage);
- **price-based** indicators (e.g. earnings growth);
- **volume-based** indicators (e.g. employment or unemployment); and
- **other indicators of imbalance** based on administrative data (e.g. vacancy duration or vacancy/unemployment ratios).

3.28 When examining the bottom-up evidence of shortage we look at similar indicators to those used in the top-down analysis. For example, we look for signs that wages are increasing, vacancy levels are rising and vacancies are taking a long time to fill.

3.29 Our methodology for determining whether an occupation exhibits labour shortages is discussed in more detail in Chapter 5.

Sensible

3.30 The concept of sensible can be interpreted in many different ways but the definition needs to be consistent with the underlying policy objectives. In some cases, Government objectives or policies may relate to particular sectors or occupations.

3.31 We consider the issue of sensible on a case-by-case basis with reference to four questions:

- What are **the alternatives to employing immigrants in response to perceived staff shortages**? Are these alternatives feasible, and have employers explored them fully? If not, what are the actual or perceived obstacles?
- How would bringing in immigrants relate to **skills acquisition** of the UK workforce? Are there enough UK resident workers in training/education to fill shortages? Will bringing in immigrants reduce employers' incentives to invest in training and upskilling of UK workers?
- How will the employment of immigrants affect **investment, innovation and productivity growth**? Is there a particular case for employing immigrants to support and maintain the UK's international competitiveness in certain sectors?
- How will our decision affect **the wider UK labour market and economy**? How, if at all, will access to immigrant labour affect employment opportunities and conditions for the UK workforce?

3.32 There are a number of issues, discussed in MAC (2009b) and explored further in Chapter 6 of this report, which surround the question of sensible: for example, the trade-off between eliminating essential labour shortages in the short term and maintaining the incentives to invest in training and upskilling UK workers in the long term. Our approach to such difficult issues has been to attempt to make our decisions in a balanced and consistent manner, to be transparent about the judgements we have made, and to use our recommendations as a challenge to employers and sector bodies to deliver improved upskilling of the resident labour force and to seek alternatives to non-EEA immigration.

3.33 In practice, interpretation of particular indicators of sensible is often specific to occupations. We, therefore, rely heavily on bottom-up evidence when assessing the question of sensible. However, there are a limited number of numerical indicators available that might provide context to the bottom-up evidence. In fact, some of the top-down indicators of shortage also double-up as indicators of sensible.

3.34 Our additional top-down indicators to assess whether it is sensible to use non-EEA immigration to fill labour shortages in a skilled occupation are:

- the proportion of employees in the occupation born outside the EEA; and
- the proportion of the workforce who have received job-related training in the last 13 weeks.

3.35 The use of top-down indicators to test whether the use of immigrants to fill labour shortages is sensible is explored in more depth in Chapter 6.

3.4 Reviewing the methodology

3.36 This chapter has outlined the approach we use to compile our recommended shortage occupation lists. Overall, we are content that this approach is working well. We believe that assessing occupations against our tests for skilled, shortage and sensible in turn remains the most appropriate way to determine whether an occupation should be recommended for inclusion on, or removal from, the shortage occupation lists. Furthermore, this is consistent with the Government's requirement that jobs under Tier 2 of the PBS are skilled and with our terms of reference, which state that we are to advise on *"specific sectors and occupations in the labour market where shortages exist which can be sensibly filled by migration"*.

3.37 We also believe that our hybrid approach of combining top-down and bottom-up evidence should be retained as it ensures that our recommendations to the Government are as robust as possible. The bottom-up evidence collected through our engagement with stakeholders facilitates a level of detailed consideration that cannot be achieved through top-down analysis alone.

3.38 However, in this review we wish to determine whether it is possible for changes to be made to the methodology underlying this approach at each step of our skilled, shortage and sensible testing that could make any future recommendations to the Government even more robust. This discussion of potential improvements to the existing framework forms the basis of the remaining chapters of this report.

3.39 We critically assess our approach to the skilled, shortage and sensible tests in Chapters 4, 5 and 6 respectively, summarising the external research we have commissioned where this is appropriate. We then present, in Chapter 7, many of the cross-cutting issues that we have encountered in developing the shortage occupation lists. Chapter 8 summarises our findings and concludes.

Chapter 4

Skilled

4.1 Introduction

4.1 This chapter discusses our approach for determining whether an occupation or job title is classified as skilled for the purpose of making our recommendations on the shortage occupation list.

4.2 First, we discuss the concept of skill. We then outline our top-down and bottom-up methodology for defining skilled occupations, building on the discussion in Chapter 3. Next, we discuss the research we have commissioned and the methodological issues we are considering, before finally concluding by summarising the key points from this chapter.

4.3 As discussed in Chapter 3, the forthcoming revision of the Standard Occupational Classification (SOC) codes could have a considerable impact on the list of skilled occupations that we use, not least because the SOC classification itself forms the basis for one of our three top-down indicators of skill. In addition, we are currently awaiting the findings of a research project we have commissioned, 'Defining and measuring skill at the occupational and job level', that will assess and suggest improvements to our skilled methodology. For these reasons we do not draw firm conclusions relating to the methodology for identifying skilled occupations.

4.2 Concepts

4.4 The shortage occupation list operates under Tier 2 of the Points Based System (PBS), which is restricted to jobs skilled to National Qualifications Framework (NQF) level 3 or above. We understand that the UK Border Agency (UKBA) also uses our skilled list to help identify skilled occupations for Tier 2 of the PBS more generally, rather than solely in relation to shortage occupations. It is essential, therefore, that we only recommend occupations for inclusion on the shortage occupation list that are skilled to level 3.

4.5 There is no uniquely defined objective measure of skill. However, as discussed in MAC (2008a) there is a growing academic literature examining how best to define different sets of skills and how best to measure them. Wilson *et al.* (2003) argue that two broad approaches to skill have emerged from the literature: skills can be defined by either the attributes of individuals who do the jobs or by the jobs themselves. Even within these two approaches there is still considerable scope for disagreement as to what exactly constitutes skill.

4.6 As set out in the Leitch Review of Skills (2006), skills can take a wide variety of forms; from basic skills, such as literacy and numeracy, to generic skills, such as team working and communications, or skills that are specific to a particular job or occupation. Most occupations will use a mix of different skills and at varying levels of ability.

4.7 Anderson and Ruhs (2008) point out that skill can be credentialised through academic, vocational and professional qualifications. However, there are limits to the extent these measures can guide assessments of skill, as formal qualifications are often not regarded, in practice, as a useful indicator of the skill requirements of jobs in many sectors. The existence of sufficient numbers of people with the right qualifications does not prevent recruitment difficulties and, furthermore, employers often place more emphasis on experience rather than qualifications themselves.

4.8 What are commonly referred to as 'soft' skills, such as problem solving and team working, may be important in performing a particular job, but may not be captured through formal qualifications. These competencies are often very valuable to employers and easily transferable across occupations, but are very difficult to measure.

4.9 The Government has tasked us with identifying the occupations, not the individuals, that we believe to be skilled. Therefore, for the purpose of our remit, it is primarily the attributes of the occupations and individual job titles that we consider when compiling our skilled occupation lists. Nevertheless, examining the attributes of individuals who typically do a particular job, such as their qualifications, can help us to do this.

4.3 Methodology

4.10 This section outlines the methodology used to compile our skilled occupation list. In deciding whether to define an occupation as skilled we carry out top-down data analysis and consider the bottom-up evidence we receive from stakeholders. We then 'dovetail' these two information sources to reach a decision as to whether to regard a particular occupation or job title as skilled.

4.11 The top-down analysis of skilled occupations has not been updated since its construction in our first shortage report (MAC, 2008b). This is because the skills required for particular occupations will evolve slowly over a much longer period of time than, say, shortages in those occupations, which are likely to change more rapidly due to the dynamic nature of the labour market. Nonetheless, the final list of skilled occupations and job titles used in our recommended shortage occupation list has evolved over time through the bottom-up evidence received by our stakeholders.

Top-down analysis

4.12 We identified five indicators in MAC (2008a) which we have used to determine whether an occupation is skilled. Three of these indicators are assessed using top-down analysis, whereas the other two are assessed solely on the basis of the bottom-up evidence we receive from our stakeholders. In this section we provide some further details behind the three top-down indicators and the associated threshold values that we used to determine the occupations we regard as skilled from the top-down analysis.

4.13 The three top-down indicators of skill and their associated threshold values are:

- **Formal qualifications:** currently we require that 50 per cent or more of the workforce within an occupation are qualified to NQF level 3 or above. This was measured using the Labour Force Survey (LFS) covering the eight quarters of 2006 and 2007.
- **Earnings:** currently median hourly earnings for all employees within an occupation need to be £10 per hour or more. This is measured using the 2007 Annual Survey of Hours and Earnings (ASHE).
- **The skill levels defined in the Standard Occupational Classification hierarchy:** The 4-digit SOC hierarchy classifies all occupations into one of four skill levels. For our purposes, an occupation needs to be classified at skill level 3 or 4 (the highest skill levels) in SOC 2000 by the Office for National Statistics (ONS). Level 3 applies to occupations that normally require skills, experience or knowledge usually associated with a period of post-compulsory education but not at degree level. Level 4 relates to the so-called 'professional' occupations and managerial positions that normally require a degree or equivalent period of relevant work experience.

4.14 The thresholds of 50 per cent qualified and £10 per hour for these first two indicators were established through rigorous analysis of the available data and are presented in MAC (2008a).

4.15 Broadly speaking, our methodology for choosing these thresholds was based on a process of calibrating the indicators with a well researched pre-existing list of graduate occupations defined by Elias and Purcell (2004). In their study, they classified a total of 148 occupations as 'graduate' level out of a total of 353 4-digit SOC occupations. The Elias and Purcell work provides a useful independent benchmark with which to corroborate our indicators. It uses evidence of changes over time in qualifications in the workforce and survey evidence, albeit at graduate level rather than at or above NQF level 3. Full details are provided in MAC (2008a).

4.16 Looking at the graduate occupations identified by Elias and Purcell (2004) provided upper-bound estimates of thresholds for our pay and qualification indicators because, for instance, it seems implausible that median pay in a typical level 3 occupation would be higher than median pay in a typical graduate occupation. These upper bounds were £10.83 per hour and 50.4 per cent qualified to NVQ level 3 or above. Next came the question of how we would determine appropriate thresholds for occupations at or above NQF level 3.

4.17 In considering this, we took into account the following:

- the median pay per hour for all employees was approximately £10.14;
- approximately 50 per cent of the workforce and 45 per cent of the working age population had level 3+ or equivalent qualifications.

4.18 Our chosen thresholds were round numbers, both for simplicity and because our analysis showed that the resulting classifications were not sensitive to small changes in the threshold for a particular indicator. The earnings threshold chosen was median hourly earnings for all employees of at least £10. The qualifications threshold chosen was that at least 50 per cent of the workforce was qualified to NQF level 3 or above.

4.19 Our third top-down indicator of skill used the four-tier skill level defined in the SOC hierarchy. The threshold was set at SOC level 3 or above, as these occupations typically required a period of post-compulsory education, either formally or through significant work experience. This maps well to NQF level 3.

4.20 For some occupations, the top-down data were not sufficiently reliable to say for sure whether the indicator met the threshold. We therefore included some additional checks to ensure occupations were not classified as unskilled solely because data was missing or unreliable.

4.21 The skilled occupation list was then compiled by taking occupations that passed at least two out of the three top-down indicators of skill described above, comprising 192 skilled occupations out of a total of 353 occupations defined at 4-digit SOC level.

Bottom-up evidence and dovetailing

4.22 We request evidence for skill regardless of whether an occupation is included on the top-down list of skilled occupations, though in practice we have found bottom-up evidence generally corroborates the top-down list. This list is then supplemented with additional job titles from within less skilled occupations, based on bottom-up evidence. This dovetailing approach helps to ensure that our decisions about which occupations and job titles to classify as skilled are based on the most comprehensive picture of the labour market available.

4.23 For our bottom-up evidence, we ask our stakeholders to submit evidence on formal qualifications and earnings within the relevant occupation or job. We also request evidence pertaining to our other two indicators:

- on the job training or experience required to carry out the job; and
- the level of innate ability required.

4.24 Where an occupation is initially classified as unskilled from our top-down analysis, we consider the evidence provided by stakeholders with respect to these indicators particularly carefully.

4.25 For example, in the case of the occupation chefs and cooks (SOC 5434) the top-down evidence indicated that, on aggregate, the occupation did not meet the thresholds set for our skilled indicators. However, for our autumn 2008 and autumn 2009 reviews we received substantial evidence that a segment of those working as chefs require a sufficiently high combination of on-the-job training and innate ability to be regarded as skilled to level 3 or above. We were told that preparing food often requires having specific knowledge and experience of the ingredients, often combined with knowledge of regions and cooking practices. These skills are not always reflected in formal qualifications.

4.26 On the basis of evidence received, further statistical analysis and our visits to various employers we recommended that 30 per cent of the chef occupation should be considered skilled. We assess whether a job is in the skilled segment using criteria for earnings and experience; these are listed in Table 4.1, which provides details of job titles we have classified as skilled despite the broader occupation being classified as unskilled.

4.27 Similarly, the occupation care assistants and home carers (SOC 6115) did not pass any of the top-down skill indicators in our spring 2009 review. However, we listened to stakeholders who told us that there were some senior care workers who, although not necessarily qualified to NQF level 3, were working at that level. We were told that senior care workers often had to operate with additional higher responsibilities, such as front-line supervision and monitoring of care workers and care assistants and being in charge of a shift of workers. As such we classified the job title of Senior Care Worker as skilled. Again this required that certain criteria be met, as listed in Table 4.1.

Table 4.1: Job titles that are regarded as skilled within broader 4-digit occupations that are not classified as skilled, in the recommended UK shortage occupation list for Tier 2 of the Points Based System, September 2009

Job titles included on the shortage occupation list	Skill level requirement	Related occupation and SOC code (see notes 1 & 2)
Skilled meat boner and skilled meat trimmer	The individual is earning at least £9.00 per hour.	Butchers, meat cutters (5431)
Skilled chef	The individual is earning at least £8.45 per hour after deductions for accommodation, meals etc. Also three years' relevant experience.	Chefs, cooks (5434)
Skilled senior care worker	The individual is earning at least £7.80 per hour after deductions for accommodation and meals etc, and has a relevant NQF level 2 qualification, two years relevant experience, and will have supervisory responsibilities, OR there is a requirement for senior care worker to be qualified at NQF level 3 or above (currently only the case in Scotland and Wales).	Care assistants and home carers (6115)
Skilled work rider	Must be documentary evidence that individual has at least three years' relevant paid experience (with work responsibilities covering those acquired in a level 3 NVQ in Horse Care and Management or Racehorse Care and Management) and the trainer should have submitted a registration form to the British Horseracing Authority for the individual.	Animal care occupations n.e.c. (6139)
Skilled sheep shearer	Individual must hold British Wool Marketing Board bronze medal (or equivalent) or above.	Fishing and agriculture related occupations n.e.c. (9119)
<p>Notes:</p> <p>(1) n.e.c. stands for 'not elsewhere classified';</p> <p>(2) for official job descriptions relating to four digit occupations in SOC 2000, see www.statistics.gov.uk/methods_quality/ns_sec/downloads/SOC2000_Vol1_V5.pdf.</p>		

4.28 We often use wages to define a skilled segment of an occupation. The general approach we use is to determine the proportion of the workforce in the occupation qualified to at least NQF level 3. We then determine a

threshold from the corresponding percentile of the wage distribution (in the case of senior care workers, after allowing for other skill criteria used).

4.29 Our approach allows for changes in earnings over time. In 2008 the skill threshold for chefs was £8.15, which we up-rated using the Annual Earnings Index to reflect annual earnings growth between 2008 and 2009, yielding a rounded final benchmark of £8.45 per hour in our autumn 2009 report (MAC, 2009b).

4.30 Over time the quality of the evidence we have received has improved. Stakeholders have a better understanding of the work we do and the evidence we require. We have also developed a better understanding of the issues and problems associated with the various occupations we have reviewed, which has enabled us to refine some of our definitions of what constitutes a skilled job over time, whilst remaining within the broad framework that we initially set out in MAC (2008a). As such we do not identify any significant issues with our gathering of bottom-up evidence for our skilled criterion in this report.

4.4 Options for amending our approach

4.31 To assess our top-down methodology for defining skilled occupations, and to help identify any improvements that could be made, we have commissioned a research project to Frontier Economics that will report on 'defining and measuring skill at the occupational and job level'.

4.32 This project is composed of three parts: a review of the literature on definitions and concepts of skill; a review of indicators and benchmarks of skill; and a quantitative analysis of our indicators and possible alternative indicators that could be incorporated into a future methodology for defining skill.

4.33 The main focus of the work is on quantitative indicators and how any improvements can be made to our methodology. This could potentially include new quantitative measures of the qualitative indicators we use (on-the-job training and innate ability) and the identification of further qualitative indicators to assist in gathering bottom-up evidence. Other areas that will be covered by this work include:

- exploring international indicators and other benchmarks and how these could be translated to be used in the UK;
- exploring international data sources, such as the US O*NET which includes richer information on interpersonal and soft skills, and whether these map across to UK occupational classifications;
- examining the extent to which the British Skills Survey (BSS) can be utilised to help define occupation level skill;
- analysis of how our thresholds for the skill indicators evolve over time with updated data, and in what circumstances occupations are likely to become skilled according to our definition.

4.5 Issues

4.34 As mentioned at the beginning of this chapter, we do not believe it would be sensible to make any changes to the methodology for identifying skilled occupations until it has been possible to fully consider the findings of our research programme and, particularly, the impacts of SOC 2010. Consequently, we do not set out any changes to the skilled methodology in this report.

4.35 Nevertheless, in this section we outline some of the issues that we would need to consider before making any amendments to the skilled methodology in future. Here we discuss the potential impact of SOC 2010 on our skilled methodology, before also considering the issues surrounding any future update to the thresholds for our skilled indicators.

SOC 2010

4.36 The Standard Occupational Classification, like any statistical classification, is subject to periodic revision to ensure it reflects the current labour market. The ONS is preparing to publish the revised SOC 2010 this year; an exact publication date has not yet been announced, but it is expected to be around mid-2010. Eventually this new classification will replace SOC 2000 in all major national datasets. It is currently unknown when the updates to most of these datasets will occur, but we anticipate that the LFS may be updated in January 2011 and ASHE data will first incorporate the new classification in 2011 or 2012. This change raises some issues.

4.37 First, some of the occupations of interest to us may cease to exist in their current form. They might be expanded, split up into smaller component parts, or allocated across a number of occupations.

4.38 Second, our top-down indicators based on qualifications and earnings rely on collating historical data. For example, to calculate the proportion qualified to NQF level 3 or above by occupation we use the last eight quarters of the LFS in order to construct a sufficiently large dataset to carry out reliable analysis. Once SOC 2010 has been adopted by the LFS and ASHE, we will need to establish how best to combine datasets based on the two different SOC classifications.

4.39 Third, the SOC revision is likely to have a direct impact on our methodology for defining skilled, because we use the SOC hierarchy as one of our three top-down indicators of skill. Consequently, the introduction of SOC 2010 may potentially directly alter the list of occupations that are classified as skilled according to our top-down methodology.

4.40 We will continue to liaise with the ONS regarding the timescales involved in the switchover to SOC 2010. We will make a subsequent announcement of when we will switch over to using SOC 2010 in our analysis.

Updating the thresholds

4.41 It is important that the top-down analysis for the skilled occupation list is periodically updated with new data to ensure it reflects longer-term changes in the labour market. As discussed earlier, our analysis will also have to incorporate the new occupational classifications once SOC 2010 has been released by the ONS. Updating the data raises several important questions for our methodology:

- To what extent should the thresholds for our indicators change over time? In one sense, if an occupation is deemed skilled in 2008 by a particular threshold, it should not suddenly become unskilled if the threshold increases in 2010. On the other hand, factors such as inflation will mean that the threshold values will move over time.
- In what circumstances are occupations likely to move from being unskilled to skilled, and vice versa, according to our definitions of skill?

4.42 The above are areas that our commissioned research project will report on.

4.43 Our current earnings threshold of £10 per hour is based on the earnings of all employees in 2007. Given the nature of immigration, and the requirement under Tier 2 of the PBS that an employee works at least 30 hours per week, we are likely in the future to conclude that the skilled benchmark should be based on the earnings of full-time employees only.

4.6 Conclusion

4.44 In this chapter we have explained how we use both top-down and bottom-up evidence to determine whether an occupation should be defined as skilled. We make this decision through a combination of top-down data analysis and consideration of the bottom-up evidence we receive from our stakeholders. We are content that our methodology is working well and do not believe immediate changes to it are necessary. That said, the introduction of SOC 2010 later this year will impact on our methodology and the resulting skilled occupation list. We consider it would be sensible to wait until the effects of SOC 2010 can be fully analysed before changes are made to the methodology for identifying skilled occupations. We will therefore continue to use the skilled occupation list first outlined in MAC (2008a) for the time being.

4.45 Of course, the fact that we consider our overall methodology to be working well does not mean that aspects of it cannot be improved. We have commissioned a research project to investigate how we can best define and measure skill for the purposes of our remit. The recommendations that emerge from these findings, together with any necessary response to the revision of the SOC classification, will inform any future review of the skilled methodology.

Chapter 5

Shortage

5.1 Introduction

5.1 This chapter assesses our current approach to identifying whether a shortage of labour exists in skilled occupations or job titles for the recommended shortage occupation list.

5.2 First, we outline some of the key concepts underlying our definition of shortage. We then discuss our top-down analysis to identify shortages of skilled labour in national data. Next, we explore the current methodology for defining top-down and bottom-up shortage and review the dovetailing approach, which combines the two types of evidence. We then discuss potential improvements to our top-down approach. We conclude by summarising the improvements we may make to our shortage methodology should we be asked by the Government to review the shortage occupation list in future and highlight areas where we plan to undertake further analysis.

5.2 Concepts

5.3 In MAC (2008a) we discussed the theory of labour shortage, drawing a distinction between 'static' and 'dynamic' concepts of shortage.

5.4 A lay definition of a 'static' shortage is that demand for labour exceeds supply at the current wage and labour market conditions. If we assume that the labour market, and particularly the wage, is flexible, these 'static' labour shortages are only a short-term phenomenon: when the wage is below the equilibrium level, market pressure should increase the wage, helping to raise labour supply and reduce labour demand, thus restoring equilibrium in the labour market.

5.5 In practice, various factors may limit the speed at which labour markets can adjust, leading to longer-term disequilibrium and so-called 'dynamic' labour shortages. There are a number of potential reasons why 'dynamic' shortages may occur which are discussed in more depth in MAC (2008a). For instance, wages may be sticky and not move freely up and down with changes in labour demand and supply. This may happen more often in the public sector than in the private sector. Furthermore, it may take time for employees to acquire the skills the market needs, and the availability of state benefits may affect incentives to work.

5.6 In advance of our first recommended shortage occupation list (MAC, 2008a) we commissioned York Consulting to review the literature on defining and measuring skills shortages (York, 2008). This review informed our conceptual approach to the shortage test and the types of indicators we chose for our top-down analysis. We discuss these indicators in more detail in the next section.

5.7 To further our understanding of the concepts of skill shortages, and to build on York (2008), we commissioned WM Enterprise to carry out a forthcoming theoretical review of skill shortages and skill needs (WME, 2010) in partnership with the UK Commission for Employment and Skills (UKCES). This research investigated the reasons why labour shortages exist and how they can be identified using top-down indicators.

5.8 WME (2010) found that, in practical terms, it is necessary to think of skill shortages as operating within boundaries. The most obvious set of boundaries is occupations. It argued that if all individuals and jobs were homogenous there would be no skill shortages. It concluded that the existence of skill shortages can largely be understood in terms of the unwillingness or inability of individuals and employers to switch between different occupations, locations and industries. Furthermore it extended this point by explaining skill shortages in terms of individuals' unwillingness or inability to substitute between employment and non-employment, and employers' unwillingness or inability to substitute between labour and other factors of production. *“Essentially, and almost by definition, if arbitrage was infinite then there would be no (micro-economic) skill shortages”* (WME, 2010).

5.9 WME (2010) also found that imperfect information may be a reason for skill shortages: employers may not know about suitably skilled workers that are available in the labour market. Similarly, suitably skilled employees do not have perfect information about the available job opportunities in shortage occupations. Given the range of factors inhibiting good decision making and market clearing in the labour market, WME (2010) concluded that *“it may be a surprise that skills shortages are not more widespread”*, noting that many commentators and researchers have indeed been impressed by how few skill shortages there appear to be in the labour market.

5.10 Static and dynamic shortages can manifest themselves in terms of four broad categories of labour shortage, as outlined in Chapter 2. A cyclical shortage may occur when demand for skilled labour is less than supply at the prevailing wage at a particular point in the economic cycle. This can occur where wages or the supply of suitably skilled labour cannot keep pace with growth in labour demand due to labour market frictions such as 'sticky wages'. A cyclical labour shortage may therefore persist even though wages are observed to be increasing. Such shortages will most likely occur during periods of economic growth, and decline or disappear during an economic downturn. Indeed, we might expect the inverse to occur during a downturn with downward pay inflexibility causing unemployment to increase.

5.11 Structural shortages may exist where some kind of failure in the labour market means that occupational or sectoral supply does not match demand for reasons unrelated to the economic cycle. In some cases sufficient numbers of skilled people may not be available to satisfy the labour demand within an occupation at the prevailing wage level. In these circumstances, the domestic supply of and/or demand for labour is inflexible, or even fixed in the short term. Wage adjustments should, in the long-term, influence the number

of domestic workers who obtain the relevant skills. But the market may remain in disequilibrium for some years as this adjustment takes place.

5.12 A third category of shortage is where constraints on public sector spending may prevent wages from rising in response to a shortage of labour. Such constraints may mean that in the event of a mismatch between supply and demand, market forces cannot bring the labour market back into equilibrium. This type of shortage can exist alongside and reinforce structural shortage.

5.13 In cases where there is a global market for talent, the ability to increase labour supply in response to labour shortage may be severely limited. This is similar to structural shortage, in the sense that there is a shortage of skilled labour that exists independently of the economic cycle. It differs from structural shortage in that the cause of the shortage is primarily due to a lack of individuals with the required 'innate' ability rather than historically low pay or a lack of trained individuals. In some global labour markets the demand for the 'very best' may outstrip the supply of the most talented labour. Because of the inherent lack of sufficiently skilled individuals, labour markets may remain in a state of disequilibrium where demand exceeds supply in the long term.

5.14 As discussed in Chapter 2, the Home Affairs Committee (HAC) report *Managing Migration: the Points Based System* (HAC, 2009) outlined an alternative categorisation of the types of labour shortage. These were:

- highly specialist skills not available in the resident workforce;
- shortages due to unattractive wages or conditions; and
- shortages due to insufficient investment in skills.

5.15 This categorisation is not too dissimilar to our own. The first type of shortage identified by HAC (2009) occurs because the highly specialist, and often country-specific, skills that migrants possess cannot be found within the UK or European Economic Area (EEA) labour force. HAC (2009) illustrated this point using the examples of international performers and also of Chinese lawyers who have specialist knowledge of Chinese law that is not possessed by their British counterparts. This type of shortage shares some characteristics with our categorisation of 'global talent' shortages, as the specialist skills possessed by international workers cannot necessarily be found within or learnt by the domestic workforce.

5.16 The second type of shortage in HAC (2009), which occurs due to unattractive wages or conditions, bears many similarities to what we refer to as shortages caused by public spending constraints. Domestic workers may not be prepared to do demanding and often difficult jobs, such as care for the elderly, at the prevailing wage. Yet wages cannot be increased to the equilibrium level due to the restrictions on public spending.

5.17 The third type of shortage outlined in HAC (2009), insufficient investment in skills, is similar to our classification of structural shortages.

Indeed, structural shortages are often caused by a lack of investment in the skills of the existing workforce. Given time to allow the resident workforce to be sufficiently trained, structural shortages can be alleviated by investment in training and skills acquisition.

5.18 HAC (2009) did not categorise cyclical shortages separately. Thus, it is implied that cyclical shortages are captured by and included within one or more of the three types of shortage it did identify. Assuming our interpretation is correct, we agree with HAC (2009) that different types of shortage can exist in combination. HAC (2009) argued that it is these short-term or cyclical shortages that the shortage occupation list should be seeking to address. We do not find this argument convincing. It is not practical to try to micro-manage the economy in response to short term skill shortages which are often quite ephemeral. What is feasible is to identify where there is evidence of sustained problems which might be alleviated by use of immigrant labour. Indeed, an external review of our methodology conducted by Frontier Economics (FE, 2010) recommends that we should place less, not more, emphasis on short term indicators (further details on this review are provided later in this chapter).

5.19 The shortage of highly skilled ballet dancers that we have previously identified is an example of a 'global talent' shortage and is likely to be neither cyclical nor short term. HAC (2009) argued that this occupation should not be included on the shortage occupation list. According to HAC (2009), this occupation is only included to compensate for the poor design of other areas of the Points Based System (PBS) that do not allow ballet dancers' skills to be recognised through the points criteria. The HAC report also questioned whether the shortage occupation lists can operate as a short-term, flexible resource whilst simultaneously catering for longer term, chronic labour shortages. We believe that it would not be practical for the PBS to award points for the types of skills possessed by top ballet dancers, and disagree with the HAC's view that the shortage occupation list cannot accommodate both short-term and longer-term shortages although, as stated above, we do not believe it should be focused on very short-term shortages.

5.20 In addition, our methodology for recommending whether occupations are included on, or removed from, the shortage occupation list has been developed with the current design of the PBS in mind. Each occupation is assessed separately against our three tests for skilled, shortage and sensible. The test for sensible incorporates consideration of the nature of the shortage and its likely duration. If the design of the PBS was amended such that new types of skills were recognised, or that a clear distinction was required between short-term and long-term shortage, that would have implications for our shortage occupation methodology, but such issues are beyond the scope of this review. As the PBS stands at the present, we are content that our recommended shortage occupation lists are able to accommodate various types of labour shortage simultaneously without compromising their effectiveness in helping to alleviate particular shortages.

5.21 In reviewing potential indicators of shortage, WME (2010) confirmed that wage pressure, unfilled vacancies and increased overtime working may all indicate that there is a labour shortage within an occupation. The research acknowledged that data on these top-down indicators are not always perfect, nor are they always widely available.

5.22 Overall, WME (2010) found there to be no single ‘correct’ measure of skill shortage and no theoretical benchmark. This concurs with our own viewpoint, first outlined in MAC (2008a). In any future work we will continue to use a variety of shortage indicators. Specific indicators are discussed later in this chapter.

Future skill needs

5.23 At present, our shortage test is focussed on establishing whether there is a current shortage in an occupation. The rationale for the shortage occupation route within Tier 2 of the Points Based System (PBS) is to ease the application process for jobs where there is a shortage to enable employers to alleviate skill shortages more quickly.

5.24 We use the term ‘future skill needs’ to refer to areas where there is reasonable expectation of rising demands for labour in a particular occupation or job title which is very likely to occur in the near future. This could occur for a number of reasons, including, significant replacement needs as the current workforce reaches retirement age, the seasonal nature of certain jobs or large planned investments requiring significant labour inputs. As discussed in Chapter 2, active industrial policy by the Government may also play a key part in driving future skill needs.

5.25 There are two main questions for us in considering the place of skill needs within our methodology:

- Are there suitable indicators of future skill needs for our top-down analysis? and
- What kind of evidence can, and should, stakeholders provide, and at what level of detail, to show that an occupation or job title will experience a significant increase in demand in the near future beyond what can be met by the anticipated supply of labour in the UK?

5.26 Regarding the first question, indicators of future skill needs from current labour market data are problematic. Our top-down indicators are generally ‘backward looking’, in that they provide a picture of the labour market in the recent past.

5.27 Forecasting future labour demand is possible (see, for example, Wilson *et al.*, 2009) but the estimates available are generally at a much more aggregated level than we use in our analysis for the shortage occupation lists and are subject to considerable uncertainty. Therefore we have not been able

to identify any top-down indicators of future skill needs that could be used to directly inform our recommendations.

5.28 As discussed in Chapter 2, Sector Skills Councils (SSCs) are required to collect sectoral-level data on the drivers of skills demand, the current skill needs and the anticipated demand for skills in future. In particular, the SSCs have been charged with undertaking regular assessments of the skill needs of the employers that they represent. This includes anticipating how these requirements might change in the future. They have gone about tackling this in many different ways, some more qualitative than quantitative. In general the information produced to date is more useful in terms of addressing the question of sensible (discussed further in Chapter 6) rather than providing suitable top-down level indicators of future skill needs. However, we will continue examine the latest information provided by SSCs and how this can be best incorporated into our shortage methodology.

5.29 Regarding the second question, skill needs anticipated to occur in the future are by their very nature uncertain. As such the burden of proof would need to be strong. At present we use a range of labour market indicators to guide stakeholders when providing bottom-up evidence to us. However, these may not readily apply to future skill needs. Bottom-up evidence about future demand is often anecdotal and may be dependant on assumptions which are themselves subject to uncertainty.

5.30 Skills policy in the UK aims to ensure that future skill needs are planned for and that provisions are made to accommodate for them. As such, immigration should be seen as a last resort to meeting future skills needs. Furthermore, the Resident Labour Market Test (RLMT) route, an alternative to the shortage occupation route, within Tier 2 of the PBS already helps employers to adapt to future skill needs as it provides the ability to recruit from outside the EEA, subject to the post being advertised in the UK labour market for a period of four weeks and the candidate meeting minimum entry criteria. Therefore, employers will need to present a robust and strong case for placing an occupation or job title on the shortage occupation list on the basis of future skill needs alone.

5.31 To date, not all stakeholders have engaged with these issues as actively as we would like. We attempted to convene a meeting, hosted jointly with the Confederation of British Industry (CBI), of major employers in the nuclear and green energy and advanced manufacturing sectors, to discuss future skill needs and migration. The event had to be postponed due to a lack of interest. If these sectors expect us to consider them in relation to the shortage occupation lists in future years, they will need to substantially raise their efforts to engage with us and to provide evidence.

5.32 In a number of instances we have received evidence that shortages are anticipated in the future. We have considered this, particularly when there is strong evidence that a shortage will emerge before we review the occupation again. For high integrity pipe welders, for example, we said *'we are mindful that there is currently no shortage of HIP welders. But due to the*

seasonality of the work, there is likely to be a shortage before we come to review the occupation again' (MAC, 2009b).

5.33 In summary, on the basis of the current research available and the findings of studies we have commissioned in this area, we have not been able to identify any suitably robust indicators of future skill needs at the 4-digit Standard Occupational Classification (SOC) level to inform our top-down analysis. However, we believe our current methodology is flexible enough to take into account bottom-up forecasts of future skill needs where the evidence is sufficiently robust. This could supplement evidence of current shortage or, in exceptional circumstances, substitute for it. We are content to continue to receive such evidence and will give further consideration over the coming months to what quality criteria we might apply to such projections.

5.3 Methodology

5.34 We begin this section by outlining the current methodology for the top-down analysis for identifying shortages of labour using national data in occupations we classified as skilled. We then provide a summary of how we gather bottom-up evidence relating to shortage and outline our approach to dovetailing the top-down and bottom-up evidence.

Top-down analysis

5.35 As explained in Chapter 3, we use twelve indicators to identify labour shortages. These indicators cover four broad categories: employer based indicators, price-based indicators, volume based indicators and indicators of imbalance. In MAC (2008a) we identified a set of potential indicators of shortage under these four broad categories which were assessed against the following criteria, which we keep in mind when assessing potential improvements to our methodology:

- **validity:** is the indicator measuring the right thing?
- **robustness:** specifically is the sample size sufficient, as a larger sample size will give more accurate estimates for the population?
- **distribution of observations:** for example, if there are likely to be outliers at the upper end of distribution, there are statistical reasons why it might be better to use medians rather than means as a measure of average; and
- **other data limitations:** for example, it is likely to be the case that vacancies for some occupations are not advertised through Jobcentre Plus, which may bias these data.

5.36 The twelve indicators of shortage and details on the data available to estimate them are set out in Table 5.1.

Table 5.1: The indicators of shortage currently used by the MAC

Indicator	Source	Frequency
Employer-based indicators		
E1 Per cent skill shortage vacancies/ all vacancies	NESS	Bi-annually
E2 Per cent skill shortage vacancies/ hard to fill vacancies	NESS	Bi-annually
E3 Per cent skill shortage vacancies/ employment by occupation	NESS and LFS	Bi-annually
Price-based indicators		
P1 Per cent change in median hourly pay for all employees	ASHE	Annually
P2 Per cent change in mean hourly pay for all employees	ASHE	Annually
P3 Return to an occupation, given NVQ3, controlling for region and age	LFS	Quarterly
Volume-based indicators		
V1 Per cent change in unemployed by sought occupation	JCP	Monthly
V2 Per cent change in employment	LFS	Quarterly
V3 Per cent change in median hours worked for full-time employees	ASHE	Annually
V4 Absolute change in proportion of workers in occupation less than 1 year	LFS	Quarterly
Indicators of imbalance based on administrative data		
I1 Absolute change in median vacancy duration	JCP	Monthly
I2 Stock of vacancies/ unemployed by sought occupation	JCP	Monthly
Notes: We have used Claimant Count as our measure of unemployment in the indicators above. ASHE is the Annual Survey of Hours and Earnings, JCP is Jobcentre Plus, LFS the Labour Force Survey and NESS the National Employer Skills Survey. Source: MAC (2008a)		

5.37 Having selected a set of twelve indicators in MAC (2008a), we then had to decide on a threshold to determine whether an occupation is in shortage for each indicator. Unfortunately there is no straightforward way of identifying what the right threshold should be for each indicator.

5.38 After detailed consideration in MAC (2008a), we decided that our first choice of threshold would be the 'median plus 50 per cent of the median'. For

indicators where this rule did not appear appropriate given the distribution of data for occupations, the top quartile was used. It was decided that, as set out in our autumn 2008 review, an occupation must be greater than the threshold value to pass a particular indicator³.

5.39 If an occupation passes the threshold for at least 50 per cent of available indicators we regard it as a strong top-down indication of potential labour shortage. However, an occupation or job title is only considered to be in shortage once the bottom-up evidence we receive has also been thoroughly reviewed and corroborated with the top-down assessment.

Bottom-up evidence and dovetailing

5.40 We assess the bottom-up evidence of shortage by examining similar indicators to those used in the top-down analysis. For example, we look for signs that:

- employers recognise that the reason vacancies are hard to fill is a shortage of skilled labour (employer-based indicators);
- wages are increasing more than average (price-based indicators);
- vacancy levels or rates are rising (indicators of imbalance);
- vacancies are taking longer to fill than in most other occupations (indicators of imbalance); and
- employers are having to use coping strategies to deal with shortages, such as staff working overtime and early promotions (indirect indicators).

5.41 As presented in Chapter 3, dovetailing the top-down analysis with the bottom-up evidence is a fundamental component of our methodology. This is partially because the top-down indicators do not, in themselves, provide unassailable evidence of shortage, or a lack thereof.

5.42 Furthermore, for some of the 4-digit occupations it may be the case that only some job titles within the occupation are in shortage and this may be what is driving the top-down indicators of shortage. Alternatively, it may be that the top-down evidence is showing no indication of shortage, but certain jobs within the occupation are, in fact, experiencing shortage. In order to determine whether this is the case it is essential to supplement the top-down analysis with the bottom-up evidence we receive from stakeholders.

5.43 The rest of the chapter is devoted to considering options available for improving the methodology underpinning the top-down analysis. Issues in

³ The only exception is indicator V1, the annual percentage change in unemployment, where to indicate shortage this indicator must be less than the threshold value.

relation to the bottom-up evidence and the dovetailing process in general are addressed in Chapter 7.

5.4 Options for amending our approach

5.44 We commissioned Frontier Economics to undertake a review of our current methodology to identify skilled labour shortages. Their report ‘Refining the top-down methodology to identify shortages in skilled occupations’ (FE, 2010), published alongside this review, provides an in-depth critical examination and a number of insightful recommendations for improving our methodology. WME (2010) also considered an indicator-based approach, but in less specific detail, as the main focus of that project was on broader conceptual issues.

5.45 This section provides an overview of some of the key issues with our top-down methodology that were highlighted in FE (2010) and that have emerged over the course of our work. Here we present a number of the recommendations put forward in their report. The key issues discussed fall under four main headings which are described below in turn:

- our data sources;
- our indicators;
- setting thresholds for our indicators; and
- aggregating our indicators.

Our data sources

5.46 We currently use four national data sources (highlighted earlier in Table 5.1): Jobcentre Plus (JCP) data, the Labour Force Survey (LFS), the Annual Survey of Hours and Earnings (ASHE) and the National Employers Skill Survey (NESS). The timeliness and coverage of each data source varies considerably.

5.47 JCP data are often available at monthly intervals, making it our most up to date labour market measure. JCP data are available for England, Scotland and Wales but not for Northern Ireland.

5.48 LFS data are quarterly and available to use approximately six weeks after the end of a particular quarter. As such, the data used in a particular shortage report will often lag behind the labour market by several months. The LFS covers the whole of the UK.

5.49 ASHE data are only provided annually meaning that, in the case of our spring and autumn 2009 reports, we had to rely on data from 2008. The ASHE covers the whole of the UK.

5.50 FE (2010) considered whether the ASHE or LFS was a better source of information for our pay indicators. These indicators measure changes in mean

and median pay. Their analysis looked at the volatility of pay data for occupations over a five year period and concluded that, due to a larger sample size, the ASHE was a more robust source of data for these measures. As a result we will continue to use the ASHE for our pay indicators.

5.51 The NESS survey is conducted bi-annually. The NESS dataset is potentially one of the most valuable datasets available to us as it asks employers directly where they think there are shortages of skills and skilled labour. The gap between survey periods means that information the NESS can provide becomes quickly outdated. For example, in our autumn 2009 review we decided not to use this source as the latest information available referred to 2007. A further issue with the NESS survey is that it only covers England. There are also skills surveys for Wales, Northern Ireland and Scotland; however, due to differences in their timing and methodology, we have not been able to combine them with the NESS for our work.

5.52 A skills survey that covered the whole of the UK with a consistent methodology to enable direct comparisons across countries would be extremely valuable to the work of the MAC. In addition, increasing the frequency so that the NESS is carried out at least annually would further benefit the evidence base available to us and other labour market analysts. We believe that careful consideration should be given to making these improvements to NESS.

5.53 FE (2010) examined the coverage of occupations by our data sources. In particular, it considered how best to measure the number of vacancies by occupation. Vacancy levels feature in four of our twelve indicators. It examined the three main sources of vacancy data available in the UK:

- Administrative data from JCP: this is currently used for our indicator measuring the vacancy to unemployment ratio.
- The ONS vacancy survey: a monthly survey of current vacancies being externally advertised by businesses operating in the UK.
- NESS: this survey is currently used for our employer-based indicators which measure skill shortage vacancies (SSVs) as a proportion of total vacancies, hard-to-fill vacancies (HtFVs) and total employment.

5.54 FE (2010) concluded that administrative data from JCP are limited and likely to be biased in their coverage of certain occupations, as more highly skilled occupations are less likely to be advertised through this medium. NESS is currently the most reliable source of data on vacancies in the UK at an occupational level. However, the seasonality of vacancies makes the limited period of fieldwork a concern as, presently, the survey is carried out between June and July. The ONS vacancy survey cannot be disaggregated by 4-digit SOC occupations and therefore cannot be incorporated into our top-down methodology.

5.55 WME (2010) also considered alternative sources of data on vacancies and identified the use of online recruitment websites as a potential source of information, particularly for more skilled occupations, for use in conjunction with JCP data. We are currently considering this option and how we might incorporate the use of this information in a robust manner to inform our methodology. However, there are a number of potential shortcomings with such data sources. There are a large number and wide variety of recruitment websites in the market; capturing only a segment of these may bias the results for some occupations. The data available may also be unreliable, for example due to duplication of vacancy advertisements, or because they cannot easily be mapped to the SOC classification.

5.56 We have sought to find additional and better sources of information with which to inform our indicators. However, aside from the above, we are yet to find any more suitable alternatives. This is consistent with the FE (2010) findings.

Our indicators

5.57 WME (2010) found that the range of top-down indicators we use to determine whether a labour shortage exists corresponds to the set of indicators that one would expect to use and, furthermore, that our indicators are broadly in line with the kind of indicators adopted by other countries for carrying out similar analysis.

5.58 FE (2010) looked at the behaviour of our indicators over time, examining the extent to which information carried in an indicator reflects actual changes in the labour market relative to 'noise' in the data. It also assessed the volatility of the indicators over time.

5.59 For our indicator measuring year-on-year changes in median vacancy duration by occupation, we currently use monthly JCP data and compare the most recent month's data with that for the same month a year before. FE (2010) highlighted that monthly vacancy duration data can be volatile and, for many occupations, exhibit seasonal patterns. Therefore, results can vary substantially depending on the month used. To overcome this they recommend using a 12-month average, in other words comparing the average vacancy duration over the most recent 12 months against the same measure a year earlier. Although this approach may be less responsive to short-term trends, it is more likely to identify occupations that persistently take a longer time to fill.

5.60 For our pay indicators, FE (2010) tested whether each was correlated with their values in previous years, known as 'autocorrelation'. A high positive autocorrelation means that if an occupation is ranked high for an indicator in one year it is also ranked high the following year. Similarly, a high negative autocorrelation means that a high ranking one year is followed by a low ranking the following year or vice versa. It may be undesirable to use indicators that exhibit negative autocorrelation, as this means that an occupation in the top rankings one year is unlikely to be there the following year, making the shortage analysis highly sensitive to the period in question.

FE (2010) found that two of our current pay indicators, those measuring annual percentage changes in median and mean pay, exhibited a degree of negative autocorrelation over time. To address this issue FE (2010) recommended that these percentage changes in pay indicators be measured over a longer timescale of two or three years.

5.61 For our indicator measuring changes in the total paid hours worked FE (2010) again identified a degree of negative autocorrelation. In order to better distinguish between short-term imbalances where the markets adjust quickly and longer-term imbalances, which may indicate more persistent shortages, FE (2010) again recommended that a longer time period of two or three years be used.

5.62 FE (2010) also examined the regression specification used for our indicator that estimates the relative wage premium for an occupation after controlling for various characteristics amongst workers. This is an indicator of 'equilibrium shortage', potentially identifying whether identically qualified individuals in one occupation are being paid more than their counterparts in another.

5.63 In the specification adopted in MAC (2008), the characteristics controlled for included Government Office Region and age (including squared and cubic terms). The regression was also run on workers whose highest qualification was equivalent to National Vocational Qualification (NVQ) level 3. FE (2010) highlighted two main areas of improvement: the first is to increase the number of controls for individual characteristics; the second is to increase the sample to include individuals qualified to NVQ level 3 and above. The full details of the recommended specification are presented in their report.

5.64 In summary, to refine our current set of indicators FE (2010) made the following recommendations:

- a. averaging the median vacancy duration over 12 months to reduce volatility and remove seasonal patterns for indicator I1;
- b. using a three year timescale to calculate the percentage change in median pay for indicator P1;
- c. using a three year timescale to calculate the percentage change in mean pay for indicator P2;
- d. using an alternative regression specification to determine the relative wage premium of an occupation which takes into account more individual characteristics for indicator P3; and
- e. using a three year timescale to calculate the percentage change in hours worked for full time employees for indicator V3.

5.65 We considered each of these recommendations in great detail, examining not only the analysis conducted in FE (2010) but also looking at the

potential impact these recommendations would have on our top-down shortage analysis.

5.66 To test the sensitivity of each recommendation, we used data from our spring 2009 report. These were the data available to Frontier Economics for their report and for consistency we conducted our own analysis on the same data. A summary of our results is presented in Box 5.1.

5.67 For recommendation (a), we found there was no impact on the total number of occupations passing at least 50 per cent of available indicators. However, several occupations were replaced on the list. Theoretically speaking, monthly data will exhibit a degree of seasonality and it makes sense to wish to minimise the risks around this by smoothing the data series. We therefore intend to adopt this recommendation in our future methodology for analysing shortages.

5.68 For recommendation (b), there was a more significant impact on the total number of occupations passing at least 50 per cent of available indicators. The risk of using a longer time horizon to examine changes in pay is that the indicator may not pick up short term changes. Although this indicator exhibits a degree of negative autocorrelation, we may wish to pick up these shorter term fluctuations in pay to reflect shorter term responses to shortage.

5.69 We also considered the issue of duplication between indicators and that examining changes in median and mean pay often tell us the same thing. We are therefore giving consideration to replacing indicator P2 with a measure of the percentage change in median pay over a three year period. This would render recommendation (c) obsolete.

5.70 In the case of recommendation (d), we accept the concerns raised in FE (2010), and as a result will undertake further research and analysis in order to test the most appropriate regression specification.

5.71 For recommendation (e), the impact of using a three year timescale on the number of occupations passing at least 50 per cent of indicators was minimal. Furthermore, we examined the correlation between the annual change measure and measure over three years and found there to be a high degree of correlation. Using data from our spring 2009 report, we found the correlation coefficient of occupation rankings for these measures to be 84 per cent. In order to minimise the risks presented in FE (2010) and recognising that the high degree of correlation between the two measures means that we lose relatively little information on recent hours worked, we plan to adopt this recommendation in our future methodology for analysing shortages.

5.72 Finally, FE (2010) did not identify any new indicators that could be used in addition to our current set. In MAC (2008a) we initially considered over 70 potential top-down indicators of shortage before refining our current set to twelve. Since then we also have not identified any additional indicators of both current shortage nor future skill needs that we are able to incorporate into our top-down methodology at this time.

5.73 In addition to our set of indicators of the UK labour market, we also examined whether additional indicators might be available outside the UK looking at the broader labour market situation in the whole European Economic Area (EEA). The Economist Intelligence Unit (EIU) was commissioned to assess this. We discuss the EIU review in more detail when we address the question of sensible in Chapter 6.

5.74 We will continue to explore possible additions to our set of indicators as our work progresses in the future.

Box 5.1: Summary of sensitivity analysis

To test the sensitivity of recommendation (a) to (e) presented in FE (2010), we define two scenarios:

- the **'base scenario'** refers to the current MAC methodology; and
- the **'alternative scenario'** where one of the recommendations listed above are applied to the current MAC methodology.

The table below presents a summary of the sensitivity analysis by showing changes to the number of occupations passing 50 per cent or more of available indicators using data from our spring 2009 report. Also shown is the total employment in these occupations.

Table showing the number of occupations passing 50 per cent or more of available indicators under the base and alternative scenarios

		Recommendation					
		Base	(a)	(b)	(c)	(d)	(e)
Pass in base and alternative	No. of occupations	15	11	9	13	13	14
	<i>Total employment</i>	493,320	305,667	359,345	450,688	460,759	441,754
Pass in base, but not alternative	No. of occupations		4	6	2	2	1
	<i>Total employment</i>		187,652	133,974	42,632	32,561	51,566
Pass in alternative, but not base	No. of occupations		4	2	1	1	0
	<i>Total employment</i>		65,382	19,785	14,025	3,558	0
Pass in alternative	No. of occupations		15	11	14	14	14
	<i>Total employment</i>		371,049	379,130	464,713	464,317	441,754

Source: MAC analysis; employment estimates from the Labour Force Survey 2007Q4 to 2008Q3

Setting thresholds for our indicators

5.75 In carrying out our reviews of the shortage occupation list, the thresholds for each of the twelve shortage indicators are calibrated based on the latest data for that period. Thus a new set of threshold values is calculated for each review.

5.76 Setting the threshold for each indicator raises the question of whether it is more appropriate to select a 'relative' or 'absolute' threshold.

5.77 A relative threshold is one based on either targeting a specific proportion of the distribution, therefore identifying occupations that exhibit properties of shortage relative to their counterparts, or ranking occupations

according to their indicator values. Either type of relative approach will always identify some occupations as being in shortage regardless of the labour market conditions.

5.78 An absolute threshold, on the other hand, requires an objective assessment of what constitutes shortage for each indicator. The resulting threshold would therefore only identify occupations that pass this definition of shortage. It is theoretically appealing to strive for an absolute threshold, because it allows the number of occupations passing a threshold to vary with the labour market conditions. However, there is no universal objective definition of what this value should be for any indicator.

5.79 For our first shortage report, MAC (2008), we decided to use the 'median plus 50 per cent' as a basis for choosing the threshold value for each indicator. For a given period, it works towards being an 'absolute' threshold as it does not automatically identify occupations to be in shortage. However, the threshold becomes very dependent on the magnitude of the value of the median. For example:

- if the median is close to zero, then the 'median plus 50 per cent' will also be close to zero even if the spread of the distribution is very large;
- it is possible for the 'median plus 50 per cent' to far exceed the maximum value of the distribution.

5.80 Therefore, in cases where we decided that the 'median plus 50 per cent' was not appropriate for the distribution of data for a particular indicator, we used the top quartile to set the threshold. However, this threshold will always select 25 per cent of occupations as being in shortage for that indicator and, therefore, is a 'relative' indicator of shortage for a given period.

5.81 In most cases, whichever threshold method we used for a particular indicator in our autumn 2008 review we retained for subsequent reviews. However, in our spring 2009 report, the median for indicator V1 (annual percentage change in unemployment) became greater than zero, and thus the 'median plus 50 per cent' was also greater than zero. This indicator is unique in that to indicate shortage, the theory suggests unemployment should have fallen for a sought occupation. Therefore, we placed an upper bound of zero for this indicator for our spring and autumn 2009 reports.

5.82 The threshold rules and values used in each of our three shortage reports to date are listed in Table 5.2.

Table 5.2: The thresholds for the 12 indicators of shortage used since autumn 2008

			Autumn 2008		Spring 2009		Autumn 2009	
Indicator			Threshold	Value	Threshold	Value	Threshold	Value
Price-based indicators	P1	Annual percentage change of median hourly pay for all employees	Median + 50%	4.800	Median + 50%	4.950	Median + 50%	4.950
	P2	Annual percentage change of mean hourly pay for all employees	Median + 50%	5.175	Median + 50%	5.100	Median + 50%	5.100
	P3	Return to occupation, given NQF 3, with age and region controls	Median + 50%	1.521	Median + 50%	1.431	Median + 50%	1.616
Indicators of Imbalance	I1	Absolute change in median vacancy duration	Top quartile	5.700	Top quartile	3.600	Top quartile	0.050
	I2	Live unfilled vacancies/unemployed by sought occupation	Top quartile	0.713	Top quartile	0.669	Top quartile	0.362
Volume-based Indicators	V1	Annual percentage change in unemployment by sought occupation	Median + 50%	-22.05	Exception	0.000	Exception	0.000
	V2	Annual percentage change in employment estimates	Top quartile	9.050	Top quartile	9.889	Top quartile	10.351
	V3	Annual percentage change of median total paid hours, for full time employees	Top quartile	0.300	Top quartile	0.800	Top quartile	0.800
	V4	Absolute change in proportion working with employer for less than 1 year	Median + 50%	0.007	Median + 50%	0.000	Median + 50%	-0.010
Employer-based perceptions	E1	SSVs as a percentage of all vacancies	Median + 50%	37.835	Median + 50%	37.835		
	E2	SSVs as a percentage of hard-to-fill vacancies	Top quartile	98.198	Top quartile	98.198		
	E3	SSVs as a percentage of total employment	Median + 50%	0.300	Median + 50%	0.300		

Notes: The threshold values in red indicate where the threshold has decreased since its autumn 2008 value and in green where it has increased. Indicators E1 to E3 were not used in our autumn 2009 report (MAC, 2009b) as the latest NESS data available were from 2007. We believed that because the labour market had changed too significantly over this period, it was not suitable to refer to data from 2007. Source: MAC (2008a), MAC (2009a) and MAC (2009b)

5.83 A consequence of calculating the threshold values each period is that the distribution of data for each indicator changes over time, meaning the threshold values for each of the indicators to also change.

5.84 Since our first report, MAC (2008a), the economy has experienced a significant recession which has had significant effects on the UK labour market. This has led to large changes in the underlying data and,

consequently, to the thresholds for the shortage indicators. This raises two key questions:

- whether the choice of threshold decision rule made for autumn 2008 is still appropriate for the latest data; and
- whether the thresholds should be benchmarked to a particular period to capture changes in the economic cycle.

5.85 Regarding the second of these points, FE (2010) examined whether our indicators were robust in the face of changes in the economic cycle, in other words whether they exhibit any automatic stabiliser properties. Consistent with both theoretical and empirical observations, indicators with an automatic stabiliser property should identify more occupations in shortage during a boom and fewer during a recession. Although the ‘median plus 50 per cent’ rule should potentially have some automatic stabiliser properties, FE (2010) found that, using the example of the percentage change in pay indicators, no such properties were exhibited over time. This is largely because any changes in the median, in response to the changes in economic conditions, will also affect the median plus 50 per cent of the median. Similarly, indicators using the top quartile will capture the top 25 per cent of occupations regardless of the economic conditions.

5.86 As a result, FE (2010) recommended considering linking thresholds to a pro-cyclical macroeconomic indicator, such as GDP growth, or an aggregated vacancy-unemployment ratio.

5.87 The remainder of this section discusses the rationale for benchmarking our indicators against a particular point in the economic cycle and presents a method for doing so. Finally, we describe some of the complications around benchmarking that we are currently considering in developing our final approach.

5.88 Some indicators, such as our pay indicators which measure median and mean pay, have shifted only marginally over time, whereas other indicators, such as the percentage change in unemployment, have shifted dramatically implying that different indicators have reacted differently to changes in the economic cycle. Furthermore, some indicators will respond more closely to cyclical skill shortages, reflected by changes in the economic cycle, and others will follow more closely to other types of shortage, which are likely to persist more consistently in the longer term.

5.89 The option for benchmarking that we consider here is to fix the threshold for an indicator to its value in a particular period in the economic cycle. Therefore if the distribution of occupations for an indicator shifts downwards in response to changes in economic conditions then fewer occupations are identified as in shortage, and vice versa. Benchmarking provides a method of setting an ‘absolute’ threshold for each indicator over time and, as a result, provides them with an ‘automatic stabiliser’ property. This is illustrated in Box 5.2.

Box 5.2: Benchmarking the shortage indicators

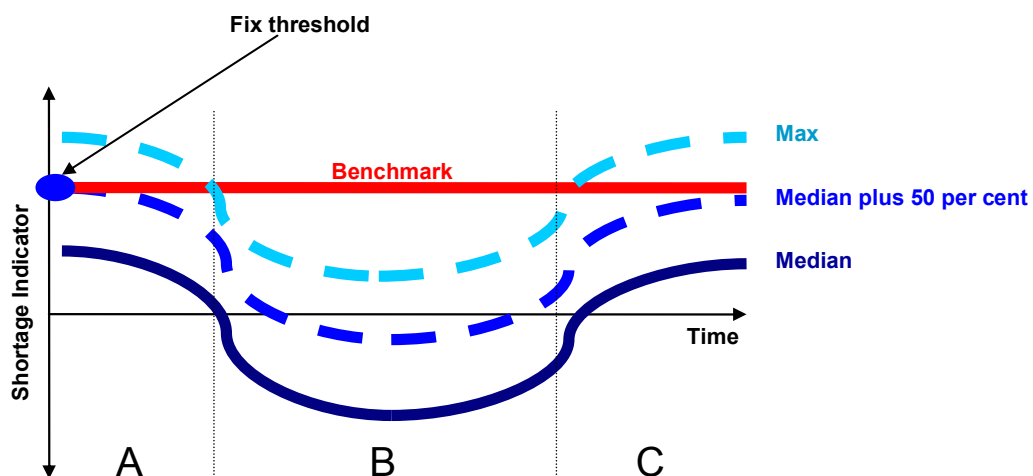
The diagram below demonstrates how fixing the threshold for an indicator to a particular value gives it an 'automatic stabiliser' property over time.

The diagram shows a stylised example of the distribution of an indicator over time. Periods A and C are times of economic growth and period B recession.

Under the current methodology, as the median changes with the economic cycle so too does the 'median plus 50 per cent' threshold. The number of occupations identified in shortage is illustrated by the distribution captured between the median plus 50 per cent (dotted dark blue line) and the occupation with the highest value in the distribution (dotted light blue line). In period B a positive number of occupations are also identified in shortage as the threshold moves with the median of the indicator.

Under the proposed benchmarking approach, we fix the threshold to a period in the economic cycle. For illustrative purposes, we fix this threshold to the value in period A. The number of occupations identified in shortage is now shown by the distribution above the red benchmark line and below the occupation with the highest value (dotted light blue line). Again, in periods A and C a positive number of occupations are identified in shortage. However, in period B no occupations are identified as in shortage. Therefore benchmarking provides the indicator with an 'automatic stabiliser' property over time. The same occurs if the top quartile is used as the threshold for an indicator instead.

Diagram showing a stylised example of the distribution of occupations for an indicator over time



5.90 There are three key reasons why we may wish to benchmark our thresholds and thus set an absolute value for each indicator over time:

- It provides our indicators with an 'automatic stabiliser' property by allowing them to respond to changes in the economic climate.

- It is consistent with our classification of different types of shortage: fixing the threshold value should only affect indicators that respond more closely to cyclical skill shortages. Those indicators tracking other types of shortage are less volatile over time and will be less affected by a fixed threshold value.
- It removes the necessity to calculate revised threshold values for each period. This means we do not have to repeatedly reconsider whether it is more appropriate to use the 'median plus 50 per cent' rule or the top quartile as the distributions change over time.

5.91 However, there are two issues that arise when considering this benchmarking approach:

- the first is whether our pay indicators should be measuring changes in real rather than nominal pay over time; and
- the second is around what values and what point in time should be used to fix the thresholds under the benchmark approach.

5.92 Regarding the first issue, our current methodology uses indicators which examine nominal changes in pay. Although these indicators examine growth in pay (percentage change) there is a risk that during periods of high inflation or deflation the distribution of occupations could shift in such a way to over or under-identify occupations in shortage if the threshold is fixed over time. For our pay indicators we wish to identify changes in pay relating to employer responses to shortage only and thus there is a rationale for examining real wage changes to take inflationary pressures into account.

5.93 There are a number of measures of inflation that could potentially be used to deflate our pay indicators, such as the consumer price index (CPI) and retail price index (RPI). It may also be possible to use a measure of average earnings to index our pay indicators.

5.94 Regarding the second issue, we will undertake further research into which is the most appropriate period to fix the threshold values. It is also important that consideration is paid to the overall impact of adopting a benchmarking approach alongside the options for improving individual indicators discussed earlier in this chapter.

5.95 We will continue to research options for refining the proposed method for benchmarking outlined in this chapter and further consider precisely what changes can and should be put in place in any further review of the recommended shortage occupation list that we carry out in future.

Aggregating our indicators

5.96 FE (2010) also looked more broadly at ways to refine our methodology for combining our twelve shortage indicators. Our current methodology operates by assessing, for each occupation, whether or not an indicator is above the given threshold. If above, we give a score of one to that occupation and, if below, a score of zero. These scores are then summed for each available indicator.

5.97 FE (2010) highlighted two main areas of concern:

- whether we should weight our twelve indicators; and
- whether the ‘knife edge’ approach when aggregating our twelve indicators is appropriate.

5.98 Regarding the first of these concerns, our current methodology applies equal weight to each of our twelve top-down indicators. In contrast, FE (2010) considered whether it was more appropriate to weight each indicator based on its data reliability and conceptual relevance.

5.99 FE (2010) also recommended not using JCP data for 60 occupations where JCP usage is particularly low, since JCP data are unlikely to be particularly representative of that occupation as a whole. This would involve applying a weight of zero to this indicator for those 60 occupations.

5.100 A limitation to the weighting approach is that a degree of subjectivity is required to select the appropriate weights, particularly in assessing the conceptual relevance of each indicator. There is also the issue of whether weightings would need to be adjusted over time to reflect changes in the data availability. As such, we do not currently intend to adopt a weighting system in the immediate future.

5.101 Regarding the second area of concern, FE (2010) identified that our current approach has a ‘knife edge’ property, namely that, moving from below to above a threshold has a large effect and that moving from a marginal pass to an extreme pass has no effect. It follows from this that an occupation that passes on one indicator but fails by a large margin on all the others will demonstrate greater shortage than an occupation that narrowly fails all indicators without actually passing any.

5.102 Frontier Economics recommended using a ‘percentile score’ approach that awards each occupation a percentile score for each indicator based on its position in the distribution and aggregates these together to produce a final score. In practice this would be done by first ranking occupations for each indicator, and dividing this ranking by the total number of occupations for which data are available. Such an approach gives a percentile score for each occupation for each indicator. The percentile scores for each indicator are then summed to calculate an aggregated percentile score for each occupation. This is then divided by the total number of available indicators to

obtain the total score for an occupation. An occupation would score 100 per cent if it had the highest value for all indicators.

5.103 A feature of such a method is that the distribution of percentile scores for each indicator is approximately uniform. This means that, with the exception of tied values, each occupation should have a unique percentile score between 0 and 100 per cent. In turn, the distribution of the total score will be approximately normal with a mean and median of 50 per cent: a property of summing a number of uniformly distributed variables.

5.104 To fully consider this approach we examined the impact of applying this method to data from our spring 2009 report. We compared the correlation between the proportion of available indicators passed using our current methodology with the total scores calculated using the percentile score approach. Consistent with FE (2010), we found that the correlation between the percentile scores and percentage of available indicators passed using our current 'knife edge' methodology was high.

5.105 The immediate disadvantage of such an approach is that the total score is only a measure of relative shortage between occupations. It thus requires another measure in order to set the final threshold to identify which occupations are in shortage. It is not obvious what this threshold should be, and any value chosen would probably be somewhat arbitrary.

5.106 Furthermore, any fixed threshold would exhibit no automatic stabiliser properties as the distribution of total scores under the percentile approach would remain fixed over time. FE (2010) suggested looking into benchmarking any final threshold to some macroeconomic variable (or combination of variables). However, this raises further issues around how exactly the threshold should move and which would be the most appropriate variables to use. For these reasons we plan to retain our current methodology for aggregating our indicators for the time being.

5.5 Conclusions

5.107 Our definition of shortage has not changed. Our shortage test will continue to focus on establishing whether there is a current shortage in an occupation. We have not identified, so far, any suitable robust indicators of future skill needs at the 4-digit SOC level to inform our top-down analysis. However, we believe that the methodology is still flexible enough to take into account bottom-up forecasts of future skill needs, and we will be content to continue to receive such evidence.

5.108 The main amendments we plan to introduce in the shortage methodology are related to the top-down shortage indicators. The Frontier Economics research project to evaluate our shortage indicators produced some valid recommendations which we have carefully considered and tested. We will adopt three recommendations around improving individual top-down indicators. These are:

- averaging median vacancy duration data over 12 months for indicator I1;
- using a measure of the three year percentage change in median pay; and
- using a three year timescale for the percentage change in hours worked for full time employees for indicator V3.

5.109 We will consider various options for benchmarking the thresholds for our twelve shortage indicators, with a view to presenting our further findings in our next shortage report, should the Government ask us to review the shortage occupation list in future. Furthermore, we will also look at an alternative regression specification for the relative wage premium indicator.

5.110 We have carefully considered Frontier Economics' recommendation to weight the indicators but have decided not to adopt it, notably due to the difficulty in selecting non-arbitrary weights. Furthermore, whilst we have decided to retain the 'knife-edge' approach in our methodology for the time being, we will keep the 'percentile score' approach under review.

Chapter 6

Sensible

6.1 Introduction

6.1 This chapter deals with the approach used to determine whether it is sensible to fill skilled labour shortages via immigration from outside the European Economic Area (EEA). As with the skilled and shortage tests, we initiated a programme of work to consider how the concept and measurement of sensible could be refined following our first recommended shortage occupation lists published in MAC (2008a).

6.2 The concept of sensible is, in some ways, more complex than that of skilled or shortage, as greater judgement is needed and the issues tend to be more context-specific in nature. In this chapter we therefore pay close attention to our definition of sensible and the criteria we have adopted.

6.3 First, we discuss concepts, in particular how we define sensible in relation to Government objectives and the tensions involved. Next, we set out our current methodology. We then examine potential options for amending our methodology, based on recent developments and research we have commissioned. Finally we discuss some issues in relation to ensuring consistency between our decisions about particular occupations.

6.2 Concepts

6.4 The question of whether it is sensible to fill shortages via immigration from outside the EEA is dependent on the perspective taken. For example, the interests of employers may differ from those of existing workers in a particular sector; and the interests of the economy as a whole may differ from either of these. Also, what is sensible in the short term may not be when taking a longer-term view, and vice versa. Clearly, any definition that attempts to balance competing interests may not completely satisfy all of those interests all of the time.

6.5 Because the definition and application of the concept necessarily requires a degree of judgement, we have tried to ensure that decisions regarding specific occupations are made as openly and transparently as possible according to clear and specific criteria. There is not always one unassailably correct answer to the question of what constitutes a sensible response to labour shortages in particular occupations at particular points in time, which is why open and transparent debate with stakeholders is critical.

6.6 Below, we set out how we define sensible in relation to various Government objectives, before examining how we balance objectives and some of the tensions that exist within this definition.

Government objectives

6.7 Our current approach principally defines sensible with respect to Government objectives. We cannot definitively state what these will be in the future but we consider how our approach accords with current objectives. Public Service Agreements (PSAs) represent the Government's formal statement of policy objectives. The PSAs have remained unchanged since the last Comprehensive Spending Review (HM Treasury, 2007), except that an additional overarching objective reflecting the economic downturn was set in Budget 2009. This overarching objective does not add any new PSAs, but it grouped some of the PSAs related to the economy together: see Box 6.1.

Box 6.1: Overarching objective for PSAs announced in Budget 2009

“Help people and businesses come through the downturn sooner and stronger, supporting long-term economic growth and prosperity.”

PSA 1: Raise the productivity of the UK economy.

PSA 2: Improve the skills of the population, on the way to ensuring a world-class skills base by 2020.

PSA 3: Ensure controlled, fair migration that protects the public and contributes to economic growth.

PSA 4: Promote world class science and innovation in the UK.

PSA 5: Deliver reliable and efficient transport networks that support economic growth.

PSA 6: Deliver the conditions for business success in the UK.

PSA 7: Improve the economic performance of all English regions and reduce the gap in economic growth rates between regions.

PSA 8: Maximise employment opportunity for all.

PSA 20: Improve long term housing supply and affordability.

Source: HM Treasury (2010)

6.8 Other PSAs (see HM Treasury, 2009), from ‘reducing poverty in poorer countries’ to ‘improving educational attainment’ and ‘ensuring better care for all’, may also have a bearing on our definition. We define sensible with respect to the objectives set out in the PSAs, acknowledging that our interpretation of the objectives may need to be periodically rebalanced. There may be tensions or conflicts between them and between what is right in the short term and longer-term. These issues are discussed briefly below.

Rebalancing objectives

6.9 The priority the Government attaches to different objectives, particularly where they are in conflict, may have a bearing on our definition of sensible. Such priorities may shift over time and be revealed through new

policies and changes to existing policy. In considering our framework we have taken into account some recent developments, outlined earlier in Chapter 2.

6.10 First, economic conditions have had an impact. The new overarching PSA in Budget 2009 and the tightening of the Points Based System (PBS) in April 2009 emphasise the Government's desire to avoid displacement of UK resident workers during the economic downturn.

6.11 Second, the National Skills Strategy (Department for Business Innovation and Skills (BIS), 2009) and associated policy statements discussed in Chapter 2 placed further emphasis on upskilling the resident workforce. It requested that the UK Commission for Employment and Skills (UKCES) takes account of the MAC's analysis of shortages in gathering evidence about priority areas of the English⁴ skills system. Equally, the Commission's National Strategic Skills Audit (UKCES, 2010) will inform our understanding of priority areas for upskilling.

6.12 Third, following *New Industry New Jobs* (HM Government, 2009b), for industry sectors identified by the Government as key areas of future growth and skill needs there may be particular considerations. Alongside equipping the resident workforce with skills, immigration may have a role in sectors that are the focus of industrial activism, for example, where particular expertise is needed that cannot currently be sourced within the UK. Such issues may play an important role in our considerations if we review occupations in sectors identified as part of industrial strategy.

6.13 The MAC has given consideration to each of these developments, and this has been reflected in some of our activities and recommendations. In terms of the recession, we have removed some occupations that had previously been subject to cyclical shortage, in areas such as construction and engineering, from our recommended shortage occupation lists in spring and autumn 2009. Regarding the need to upskill the UK population, in our autumn 2009 review some job titles failed our sensible test because we were concerned about the potential impacts on UK skill acquisition resulting from their inclusion on the shortage occupation list. We have also liaised with BIS, the Prime Minister's Delivery Unit, and the UKCES to consider how dependence on migration in particular occupations may be reduced, as requested in the Prime Minister's speech in November 2009. On the issue of industrial activism, we are giving consideration to the implications for our sensible methodology, as discussed later on in this chapter.

6.14 Finally, the link between UK immigration policy and development policy was also highlighted in Chapter 2. For reasons discussed later in this chapter we have not, to date, incorporated development considerations into our recommendations for the shortage occupation list.

⁴ Skills are a devolved matter and the National Skills Strategy related only to England.

Tensions between objectives

6.15 Many objectives will complement each other. For example, improving skills is likely to be complementary to raising productivity. But there may sometimes be trade-offs between objectives which need to be balanced. For instance, recruitment of immigrants may be needed to support objectives of improving the quality of public services such as health and social care. But at the same time, use of lower wage immigrant labour in the public sector may hinder the objective of raising the productivity of the UK economy, which requires a level playing field for the public and private sectors, wherever possible.

6.16 Because public services are the focus of a number of Government objectives, such tensions may arise in relation to public sector (or publicly funded) occupations more than others. We have, in the past, received evidence from Government departments arguing that certain key public sector workers such as some teachers and healthcare workers should be included on the shortage occupation lists. These instances demonstrate that the Government attaches weight to the need to ensure sufficient labour is available to deliver high quality public services. But we need to consider these Government objectives alongside others, such as upskilling UK resident workers and maximising employment opportunity for all.

Tensions between the long and the short run

6.17 As well as balancing different policy objectives, we also need to account for differences between what is desirable in the long run and in the short run. For example, it may be sensible to bring in immigrants in the short term to avoid widespread business failure in a particular sector. But, in the long run, continued use of immigration to fill shortages may not be desirable if it reduces the incentives for UK resident workers to enter the occupation (for example, if immigration means pay does not have to adjust to reflect shortages) or for employers to upskill resident workers.

6.18 We have explicitly linked the short-term demand for labour with the objective of longer-term upskilling of the resident workforce by requiring employers to demonstrate that access to migrant labour is complemented by efforts to recruit and train resident workers, as discussed in the next section. In some cases, for example skilled chefs (MAC, 2009b), we have stated that an occupation can remain on the shortage list only if actions are taken to improve provision of training to the existing workforce. However, it is legitimate to ask whether our approach, as currently designed, is likely to strike the correct balance.

6.3 Methodology

6.19 Our methodology for assessing whether it is sensible to use immigration to fill shortages in skilled occupations is primarily based on reviewing bottom-up evidence against a set of criteria. In MAC (2008a) we set out a framework, organised under four headings:

- alternatives to immigration;
- skills acquisition;
- innovation, productivity and competitiveness; and
- wider economic and labour market effects.

6.20 Below we explain the types of context-specific evidence we look for within each of these four groups of criteria. We then outline the top-down indicators we use.

Alternatives to immigration

6.21 Our first group of criteria relates to alternatives to immigration. Immigration from outside the EEA is only one of a number of potential responses to labour shortages and the existence of a shortage does not necessarily constitute an automatic case for immigration.

6.22 Alternatives may include increasing efforts to recruit from within the UK and rest of the EEA, improving employee reward packages, and increasing hours for existing employees. They may also include longer-term strategies such as switching to less labour-intensive production methods (for example through mechanisation), off-shoring, or changing the output mix (i.e. the types of goods and services produced). The set of feasible policy responses to labour shortage may vary across sectors and occupations and also over time. Box 6.2 shows our current criteria with respect to alternatives to immigration.

Box 6.2: Sensible criteria: alternatives to immigration

Key criteria for 'sensible'	What change might indicate 'sensible'?	Possible indicators	
		Bottom-up examples	Available top-down indicators
Alternatives to employing immigrants:			
What feasible alternatives to immigration have been considered? Are there obstacles for employers in pursuing alternatives to migration?			
Recruitment efforts	High or increased spending and investment in recruitment	Spending on advertising, using different channels Using different labour pools, e.g. unemployed, part-time workers, EEA workers	% share of non-British EEA workers
Attractiveness of employment package	Increased incentives for the current workforce to remain in occupation and for new recruits to enter the labour market	Holiday allowances, bonuses, other benefits	% change in earnings
Increased working hours	Increased working hours of current workforce	–	% change in working hours
Capital substitution	Increased investment in technology to make production less labour- or skill-intensive	Installing labour-saving machinery	–
Changing production methods	Changed production methods to make production less labour- or skill-intensive	Restructuring the production line	–
Outsourcing or offshoring	Increased use of contracting in or of overseas sites	Evidence that employers are doing this	–
Current use of immigrants	High use of immigrants may mean it is difficult to respond to shortage in other ways, but may also mean employers are not doing enough to up-skill UK resident workers	Current use of immigrants	% non-EEA immigrants in occupation

Source: MAC (2008a)

6.23 Alternatives may not be necessarily more desirable than filling shortages via immigration in every instance. For example, off-shoring certain production processes could negatively impact on the UK labour market in the short run. In addition, some of the indicators need careful interpretation as different results may indicate sensible depending on circumstance. For example, a large share of EEA labour in an occupation could be interpreted in two ways: it might suggest that the alternative of recruiting from within the EEA is exhausted, but could equally mean that there is a significant stock of EEA immigrants that are skilled for the job and willing to move to the UK in

response to shortage. The same is true with respect to the current use of non-EEA immigrants.

6.24 There may also be ‘system effects’ which constrain the choices open to employers and workers with respect to some of these alternatives in the short term. Anderson and Ruhs (2008) highlight path dependence, whereby employers’ and workers’ initial choices, perhaps under different economic and/or regulatory conditions, impact on the relative viability of certain options in the future. For example, capital substitution may not be possible where other businesses involved in a sector’s supply chain have not developed, or cannot develop, products that are amenable to more capital intensive processes. At a meat-boning plant we visited in Northern Ireland, a more mechanised process would not be compatible with the variability in the size of cattle that are farmed in the locality. Current use of immigrants may be one factor that contributes to such circumstances.

6.25 There are several potential top-down indicators that are relevant to the ‘alternatives to immigration’ criterion, as set out in Box 6.2. However, the interpretation of these indicators is context-specific. We have tried to be pragmatic and sensitive to circumstances in particular sectors, while ensuring that immigration is only used where other sensible options are exhausted.

Skills acquisition

6.26 Training the existing workforce is another alternative to immigration, but we consider it as a separate group of criteria due to the importance we place on the development of human capital within our definition of sensible. In MAC (2008a), we argued that, although there is no systematic evidence that use of immigrants reduces investment in training, there is a logical case that a ready supply of immigrant labour could reduce the incentives for employers to upskill the resident workforce. If employers are making little effort to train UK resident labour in response to shortages, we are unlikely to consider it sensible to fill shortages via immigration. Low levels of job-related training may, therefore, indicate it is not sensible to fill those shortages via immigration.

6.27 Upskilling may also take place outside the workplace. We look to employers (alongside Government, industry bodies and Sector Skills Councils (SSCs)) to support and engage with training provided outside the workplace, including the development of qualifications and vocational training programmes such as apprenticeships.

6.28 Box 6.3 sets out the criteria we adopted in relation to skills acquisition. Data on the proportion of employees who received training within an occupation are available from the Labour Force Survey (LFS), but the precise indicator available from the LFS is rather crude as it does not specify the type, quality, length or relevance of training received.

Box 6.3: Sensible criteria: skills acquisition

Key criteria for 'sensible'	What change might indicate 'sensible'?	Possible indicators	
		Bottom-up examples	Available top-down indicators
Skills acquisition: What efforts have been, or could be, made to train and up-skill the UK resident workforce?			
Training	High or increased investment in training of current and future UK workforce	Employers working with schools/ universities New training programmes, apprenticeships	% of employees receiving training
Training length	A long training period would make it harder to respond quickly to shortage through training	Evidence of length of training required to become fully proficient	–
Availability of training or qualifications	If training for an occupation is not readily available this may increase the need for immigrants, but it may also indicate inadequate efforts by employers to ensure that qualifications are provided	Evidence that employers are working with their Sector Skills Council to develop qualifications	–

Source: MAC (2008a)

6.29 However, if an occupation requires a long period of training, or there are long lead-in times to making qualifications available, these options may not meet skill shortages in the short term. In such cases, it may be sensible that immigration is used to fill shortages in the short term, but only if it does not negatively impact on the training of existing workforce or progress in increasing the availability of qualifications. This 'twin-track' approach, combining migration with investment in skills, was supported by the Home Affairs Committee (2009) in its report on the PBS:

"It seems that where genuine shortages exist—for a range of reasons—which cannot be filled from within the UK or EEA labour force, a combination of short-term migration of non-EEA nationals with longer-term investment in the retraining of the British population is justified."

Innovation, productivity and competitiveness

6.30 Our third group of criteria includes some of the potential benefits or spill-over effects resulting from skilled labour immigration over and above filling shortages. For example, immigrants may bring new ideas or skills that complement existing workers, increasing innovation and productivity. Firms may also recruit immigrants because of specific knowledge or know-how they have: for example, experience that improves UK-based firms' ability to market

their products in overseas markets. There may also be economic benefits arising from immigration in terms of the competitiveness of UK-based businesses, particularly where they are competing in global markets for talented workers. Criteria are set out in Box 6.4.

Box 6.4: Sensible criteria: innovation, productivity and competitiveness

Key criteria for 'sensible'	What change might indicate 'sensible'?	Possible indicators	
		Bottom-up examples	Available top-down indicators
Productivity, innovation and international competitiveness:			
What impacts will access to immigrant labour have on productivity, innovation and international competitiveness of an industry?			
Productivity	Decreased productivity may indicate that it is sensible to bring in immigrants, but low productivity could imply scope to substitute labour with capital	Higher wastage Slower production process Reduced quality product Evidence of 'low skills equilibrium' of labour-intensive production	–
Innovation	Risk of reduced innovation in a sector where immigration is a source of innovation may indicate that it is sensible to bring in immigrants	Emerging technologies overseas	–
Competitiveness	Employment of immigrants may support international competitiveness of certain sectors through their skills and innovation, but it would not be sensible to bring in immigrants to maintain competitiveness only because of their willingness to accept lower pay	Sector requires highest levels of skills Immigrants bring different skills/innovation	–

Source: MAC (2008a)

6.31 For certain niche occupations, it may be critical to the success of the industry that UK employers are able to access a global pool of talented workers. Ballet dancers are an example where we concluded it is sensible to fill shortages via immigration for this reason. Such cases will be at the very upper end of skill levels within an occupation and it is essential to demonstrate that this does not impact upon those in (or looking to enter) the occupation in the UK. In some instances, conflicts may arise between different sets of criteria. To the extent that increased competitiveness is achieved through lower pay rather than increased output, there is a potential tension between this criterion and potential impacts on wages, discussed below under wider economic and labour market effects.

Wider economic and labour market effects

6.32 As set out in Box 6.5, some wider economic and labour market factors, such as adverse impacts on employment of UK resident workers, may mean immigration is not sensible. Other factors, such as prevention of business failure, or securing the delivery of key public services, may work in the opposite direction.

Box 6.5: Sensible criteria: wider economic and labour market effects			
Key criteria for 'sensible'	What change might indicate 'sensible'?	Possible indicators	
		Bottom-up examples	Available top-down indicators
Wider economic and labour market effects:			
What wider effects will access to immigrant labour have on the wider UK economy and labour market?			
Impacts on wages and employment rates	No adverse impact on wages, employment conditions and/or employment levels	Steady or rising wages and employment conditions	% change in unemployment/inactive % change in wages
Business failure	Higher numbers of businesses failing may indicate that shortages cannot be filled, but there may be other causes and it may also be a natural market correction	Closure of businesses Reduced profits	–
Public service impacts	It may be sensible to bring in immigrants if public services are jeopardised, but in the longer term it would not be sensible for public services to rely on cheap immigrant labour	Reduced quality of public services Insufficient or reduced availability of public services (e.g. increased waiting times)	–
Other regulatory and economic context	Other reasons outside the control of employers that make it difficult or impossible to pursue alternatives	–	–
Source: MAC (2008a)			

6.33 Although there is a growing literature on the subject (see MAC, 2009a; 2009b), given the difficulty in establishing the impact of immigration on the labour market and economic indicators generally, robust empirical evidence at the occupational level is unlikely to be obtainable. As with other numerical indicators discussed above, the top-down indicators we currently use are relatively crude and their interpretation is context-specific. Nevertheless, observed downward pressure on wages and employment may indicate that shortages are unlikely to persist into the future, unless there are particular regulatory or economic conditions that are directly responsible.

6.34 Public services are one area where it may be sensible to bring in immigrants in the short term when, for example, fiscal constraints mean it is difficult to raise wages. However, in the longer term, it is important that availability of immigrant workers is not used to effectively provide a subsidy to the public sector. Additionally, it is important to bear in mind that efficient distribution of limited public sector pay budgets is economically important: pay differentials between the public and private sectors, or lack of pay differentials within public sector occupations in different areas of the country, may be a driver of shortage. Wolf (2010) illustrates some of the effects of standardised pay across regions in public services. In areas with high living costs, public services such as schools may experience substantial difficulties with recruitment and retention, while in areas with lower average wages, the same jobs may be considered relatively well paid and thus attractive.

6.35 We believe that, in the longer term, public services should respond to shortages in the same way as other sectors in increasing relative pay and considering other alternatives to immigration. But we recognise that in the short term it may be sensible to use immigration as part of a broader strategy alongside measures to address pay levels, regional disparities, and training of UK workers.

Top-down indicators

6.36 The approach set out in MAC (2008a) assumes that many of the criteria within our framework for sensible are difficult to interpret out of context. We therefore consider sensible on a case-by-case basis, using top-down data to contextualise the bottom-up evidence, rather than produce a top-down assessment of occupations where it is sensible to fill shortages via immigration in isolation.

6.37 We currently use relatively few top-down indicators against our framework. Some indicators of shortage in Boxes 6.2 and 6.5 double up as indicators of sensible: earnings growth; the change in the stock of unemployed workers; and the change in working hours. Two further indicators solely applicable to the sensible test were identified, both based on the LFS:

- the proportion of employees in an occupation born outside the EEA; and
- the proportion of the workforce who have received job-related training in the last 13 weeks.

6.38 In MAC (2008a) we said that we intended to interpret these indicators using indicative thresholds based on the same approach as for the shortage indicators: the median plus 50 per cent. In practice, we have used these indicators more flexibly, to contextualise and corroborate bottom-up evidence rather than make a 'top-down' assessment.

6.4 Options for amending our approach

6.39 In reassessing our approach to sensible, we could redefine our criteria, add or remove some criteria or groups of criteria, or weight or prioritise some criteria more strongly than others. Three considerations, discussed in turn in this section, inform our reassessment:

- First, are these criteria still consistent with our definition of sensible, given recent policy developments and our experience in using them over the past 18 months?
- Second, is there empirical evidence about the importance of any incentives or behaviour implied by these indicators? We commissioned research projects to assess some of these issues empirically, which inform our assessment.
- Third, and more pragmatically, can we realistically expect to obtain evidence on all the indicators? This is informed by our experience in gathering top-down and bottom-up evidence.

6.40 Finally, this section also considers our current top-down approach, and whether a greater role for top-down evidence is appropriate.

Our criteria for, and definition of, sensible

6.41 For the most part we believe that our framework of criteria remains consistent with Government objectives, as expressed in the PSAs, which have themselves not undergone fundamental change since our first recommended shortage occupation lists in 2008. The Government has accepted all of our recommended shortage occupation lists (albeit with the addition of social workers to the November 2008 shortage occupation list), which does not indicate any significant divergence between our decisions and the Government's priorities. Nevertheless, it is worth reflecting on the issue of industrial activism, and the related issue of future skill needs. We also briefly discuss the link between the shortage occupation list and the Government's objectives in terms of policy that affects developing countries. The issue of public sector pay and labour shortages is also discussed.

6.42 The identification by the Government of industry sectors driving future innovation, or those that will be important to the UK's international competitiveness may inform our assessment about whether it is sensible to fill anticipated future skill needs via immigration. For example, immigration may play a role alongside training of resident workers if significant future investment, leading to demand for workers, is likely to outpace the supply of training in the short term. Strategic skill needs identified through the UKCES' National Strategic Skills Audit (UKCES, 2010) will be a useful indicator in this respect.

6.43 There would also need to be a firm commitment to long-term investment in developing the UK workforce in a particular occupation or associated sector. This relates to the discussion in Chapter 5 of future skill

needs, where we set out a requirement for robust evidence to be available to support any claims of such shortage in particular occupations. The ability of employers, the Government and other stakeholders to plan and invest in advance of anticipated future skill needs means that many short-run issues ought to be resolved without recourse to immigration via the shortage occupation list.

6.44 Our criteria to determine whether it is sensible to fill future skill needs in strategically important sectors with immigration would, therefore, essentially be the same as those we use with respect to a current shortage, but with a stronger focus on long run impacts.

6.45 In terms of developing countries, our current approach to evidence gathering and data analysis means that we are not in a position to systematically analyse whether the placing of occupations on the shortage list would help or hinder the Government's development policy objectives. It is also likely that, in most cases, amending the shortage occupation route is not the best mechanism for achieving development goals.

6.46 If clear evidence of a particular development concern is presented to us (for instance, if the UK was sourcing nurses disproportionately from a particular country and this was having a clear impact on the availability of medical staff in that country) we may wish to highlight this alongside any future recommendations that we make. However, it is unlikely that we will generally include development policy as part of our sensible test for specific occupations. Nonetheless, the Government would, as now, be able to take such factors into account when considering our recommendations.

6.47 In the case of public services, as explained in the previous section, our methodology already, attempts to strike a balance between the need to deliver key services and to pay sufficiently high wages to attract workers into these professions. In addition, we will consider whether evidence of the extent to which available funds are distributed in an economically efficient way across the UK should be an explicit additional measure against our public service impacts criterion. The key question here is whether such issues are already covered by our shortage test, which requires evidence of a national labour shortage.

6.48 Finally, we are commissioning some research into developing a framework for assessing the costs and benefits of immigration which may yield some further insights into the nature and scale of trade-offs related to labour immigration. This research is one of a number of longer-term research projects and will feed into our thinking on the question of sensible in the future.

Using empirical evidence to refine our framework

6.49 There are good theoretical bases, as well as normative reasons, for the inclusions of each of the criteria within our framework for assessing sensible. However, there is less empirical evidence about the relative importance of such criteria and the extent to which they apply across all occupations in the

labour market. For example, we are not aware of empirical studies that show that immigration reduces incentives to upskill. If these incentives were known to be large or widespread, while spill-over effects (such as increased productivity of resident workers) were known to be small by comparison, we might be better placed to weight criteria within our framework.

6.50 We initiated two projects that inform this aspect of the review of our methodology. SQW Consulting carried out a survey of employers regarding their use of immigrant labour and issues relating to our criteria for sensible. The results of the survey are published alongside this report (SQW, 2010). This work is ongoing and will be supplemented by case-studies following up on key issues. We also conducted some in-house research using LFS data looking at the shares of immigrants in occupations and sectors over time, and what factors might influence these (Aldin *et al.*, 2010).

6.51 The survey results (SQW, 2010) provide an indication of the ways in which firms tend to respond to skill shortages. The question in Table 6.1 addresses the alternatives employers have actually used in response to skill shortages. It is perhaps reassuring that, of the firms that had experienced such shortages, that most of the alternatives to immigration we have identified are cited more frequently than recruitment from outside the EEA. Only around 1 in 10 firms cited recruitment of skilled non-EEA immigrants as an action they have taken in response to skills shortages.

Table 6.1: Firms' responses to skills shortages: survey results		
Q: What did your site do to overcome the skills shortage?	Number	Per cent
Increase recruitment activity in the UK or within the European Economic Area	68	42
Increase training given to existing workforce	43	27
Redefine existing jobs or modify hours worked for existing staff (Includes, part-time staff moving to full-time, temporary staff to permanent, etc)	36	23
Increase salaries to attract/retain staff	26	16
Increase attractiveness of employment package (includes, annual leave, flexible working, use of company car, etc)	26	16
Recruitment of skilled workers born outside the European Economic Area	16	10
Make better use of or invest in additional capital equipment/IT to help existing staff	9	5
Change work methods so less staff effort is required	7	5
Outsource activities to other countries	1	0
Other	43	27
Note: This question applied to all those who reported they had experienced a skills shortage in the last 5 years, 27 per cent of the survey sample. The survey of 720 firms was conducted during the summer of 2009. Respondents may choose more than one of the options Source: SQW (2010)		

6.52 The survey results suggest that firms are much less likely to consider some of the longer-term strategies such as changing production techniques, substituting labour for capital and off-shoring as viable options in response to skill shortages. We recognise that not all alternatives will be available to all

firms at all times and that the characteristics of some sectors may mean some of these alternatives are not feasible (it makes no sense to consider off-shoring social work, for example). Nonetheless, firms in some sectors had considered investment in capital or changing work methods for addressing labour shortage, although they still ranked low among the options considered.

6.53 Another survey question on the benefits of employing non-EEA labour addresses criteria under the heading of innovation, productivity and competitiveness. Improved access to knowledge and skills was most frequently cited, and ability to communicate with the customer base was also frequently cited. But interpreting these responses is not straightforward and these issues will be investigated further through the case studies.

6.54 The survey results therefore indicate which alternatives are more likely to be used by employers in response to shortages in the labour market. But these do not tell us about what is *desirable* in response to shortage. In order to refine our framework we need to understand how these factors relate to firms' use of immigrant labour. The survey research revealed that firms already employing non-EEA immigrants were more likely to use immigration as a response to skill shortages, potentially indicating a degree of 'path dependence' (meaning that the initial choice to hire immigrants makes this option more desirable for employers in the future) in terms of employers' incentives.

6.55 Both SQW (2010) and (Aldin *et al.*, 2010) looked for relationships between the use of immigrants and criteria relevant to our framework for sensible. The former survey examined these at the firm level, while the latter study did so at the sector level. Boxes 6.6 and 6.7 provide two examples of the relationships tested in these studies. Neither study found associations between use of migrant labour and, for example, lower pay or levels of training. That does not rule out the possibility that some sectors or firms employing migrants pay lower wages, or invest less in training workers. But it does mean that such effects are not consistently observed in the labour market as a whole. We were not able to test all of our criteria for sensible in this way, but for those criteria we could test, the results were similar.

Box 6.6: Testing the relationships between upskilling and use of immigrant labour at the firm level

At the firm level, the survey of employers we commissioned (SQW, 2010) found no strong or significant relationships between employment of non-EEA immigrants and measures taken in relation to skills acquisition, controlling for sector, skill level and firm size. Pearson correlation coefficients and significance p -values (a measure of statistical reliability of the results) are shown below.

- i) Use of non-EEA workers and maintenance of a training budget
Correlation: 0.038 Significance (p value): 0.601

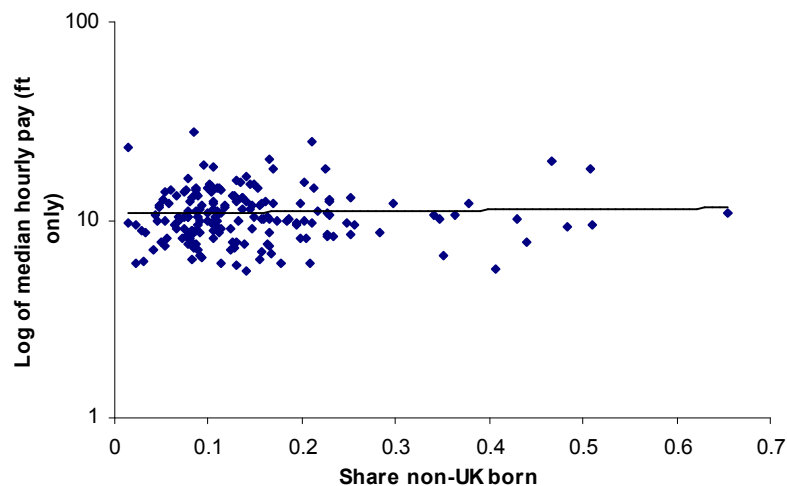
- ii) Use of non-EEA workers and proportion of workforce trained in last 12 months
Correlation: 0.050 Significance (p value): 0.283

A weak but statistically significant correlation (0.13) was found between immigration and staff turnover, controlling for sector, skill level and firm size, but it is difficult to interpret this in relation to our criteria for sensible without knowing in which direction causality runs: namely whether immigration is used in response to increased staff turnover, or plays a role in increasing or reinforcing it.

Note: For Pearson correlation coefficients, 0 indicates variables are completely uncorrelated, 1 indicates they are perfectly correlated. Significant relationships (those where we are 95 per cent confident that the observed relationship in fact exists) require a p value of 0.05 or lower. Source: SQW (2010)

Box 6.7: Testing the relationships between wages and use of immigrant labour at the sector level

At the sector level, we examined whether there was a relationship between use of immigrant labour and both levels and changes in pay by sector. We allowed for the fact that the relationship may be different at different ends of the distribution (a hypothesis following Dustmann *et al.*, 2008). No clear relationship was found between wages and the use of immigrant labour across different sectors (and occupations).



Source: Aldin *et al.* (2010)

6.56 Neither piece of research suggests there is a robust basis for applying our criteria for sensible in a top-down approach, nor any basis for prioritising those criteria in terms of whether they influence employers' use of immigrants.

What evidence can we realistically expect?

6.57 Evidence submitted by employers has varied in the extent to which all of our criteria have been adequately addressed. We want bottom-up evidence to address all criteria within our framework, but there may be good reasons why some factors are more relevant than others.

6.58 In practice, with the exception of a small number of occupations, employers and other stakeholders tend to understand and be able to produce practical examples in relation to recruitment efforts, wage incentives, use of EEA labour and training and upskilling. But evidence is often weaker in relation to off-shoring, changing production methods, effects of immigration on innovation, productivity and competitiveness and wider economic effects. We gave consideration to whether the criteria on which employers are able to provide evidence should be prioritised or weighted in light of this.

6.59 However, the idiosyncratic nature of particular occupations means prioritising criteria is difficult. International competitiveness was an important consideration in relation to ballet dancers, but not at all for healthcare occupations. Similarly, pay was an important consideration when we reviewed care workers and veterinary nurses, but for different reasons. In the former case low pay was a result of limited budgets, while in the latter, there appeared to be a result of a mismatch between earnings expectations of trained graduates and actual pay.

6.60 To better our understanding of some of our criteria where evidence is typically weaker, we commissioned some case-study research that examines the relationship between changing production techniques, skill and output mixes and immigration. The study focuses on the UK agriculture and food processing sectors because, although a majority of jobs may be below NQF level 3, it forms a 'best case' scenario as anecdotal evidence from overseas suggests that such changes may be relatively feasible in these sectors. This will help us assess whether our evidence base can be improved with respect to longer-term alternatives to immigration such as changing production methods, skills or output mix.

6.61 In summary, our criteria for sensible vary widely in their applicability. All have an important normative role in our framework, and at present we see little empirical or pragmatic basis for prioritising the evidence we seek from employers.

Top-down indicators

6.62 In addition to the options discussed above for amending the criteria assessed via the bottom-up approach, we considered some options for amending our top-down approach, including whether:

- our current indicators used solely for assessing sensible (use of immigrants and training of the workforce) are appropriate and could be improved;
- we should consider any additional indicators; and
- there is any basis for combining indicators into a ‘top-down’ assessment?

6.63 One of our indicators, the **proportion of non-EEA immigrants** in an occupation, may indicate the extent to which an occupation is at risk of over-dependence on immigrant labour. But it is clear that the interpretation could run in both directions: a high share of non-EEA immigrants may imply that employers are not considering other alternatives, but it could also mean that other alternatives are not feasible in the short term.

6.64 We chose to look at the share of immigrants in the workforce within occupations. However, other measures of ‘immigrant use’ produce quite different results (Aldin *et al.*, 2010). In some occupations, there may be a historically high share of immigrants, but relatively low inflows presently. For others, stocks of immigrants may have been rather low, but firms have made increasing use of immigrant labour. Looking at flows as well as stocks may therefore provide a more rounded picture of immigrant use.

6.65 We have already included management information from the PBS in our previous reports which shows the jobs into which immigrants are being recruited under Tier 2. These data also show the occupations that are making most use of the shortage occupation list and other Tier 2 routes. Such data is useful as it provides up-to-date information on employers’ current demand for immigrants to the extent that this is being met via the shortage route and other Tier 2 routes. There is little information on flows by occupation from other sources. Measures of flow derived from changes to LFS estimates of stocks would not be reliable at the 4-digit level. We will continue to request PBS management information and consider these alongside our indicator of stocks.

6.66 The second top-down indicator of sensible, **job-related training undertaken in the last 13 weeks**, is also derived from the LFS. We interpret low levels of reported training to mean that employers may not be making sufficient efforts to upskill and it may not be sensible to place an occupation on the shortage list on the basis that immigration could further disincentivise upskilling.

6.67 However, contexts vary and the simple proportion of employees in receipt of training is a crude way to assess appropriate levels of training in particular occupations. Our research shows no association between this indicator and the stock of immigrants (Aldin *et al.*, 2010). This may indicate that such disincentives may not operate across all occupations at all times. Alternatively, the indicator may simply be too crude a measure of training to allow us to assess the associated effect on incentives. We are minded to

continue to use this indicator in a contextual manner, aware of the potential limitations.

6.68 One area in which we felt **additional indicators** may be available was in assessing the potential EEA labour supply. The principle of community preference, reflected in our framework for sensible, means that EEA immigrants should be considered before recruiting third country nationals. We commissioned the Economist Intelligence Unit (EIU) to assess whether appropriate top-down measures of EEA labour supply are available (EIU, 2010). They examined data sources in selected countries, finding that while data are available in many countries with respect to indicators of labour supply (although there is considerable country-to-country variation), they are generally not at an appropriate level of disaggregation (equivalent to 4-digit SOC) across the whole of Europe. Looking at stocks of EEA workers in occupations in the UK also only provides a partial picture. On balance we do not believe suitable top-down data exist to make an accurate assessment of the supply of EEA labour. The full EIU report is published on our website alongside this paper.

6.69 We have not identified any further top-down indicators from UK data sources which cover other criteria in our framework.

6.70 Finally, we considered the feasibility of a **top-down assessment of sensible**. At present we use top-down indicators to contextualise bottom-up evidence rather than produce a 'top-down' assessment of sensible in their own right, as with skill and shortage. We would only look seek to make such a top-down assessment if there was a clear relationship across the labour market between the incentives we wish to avoid or promote and the use of immigration across the labour market.

6.71 At both sector and firm level, we did not find that levels of immigration are associated across the labour market with criteria that we tested (SQW, 2010; Aldin *et al.*, 2010). This does not rule out the possibility of undesirable effects or incentives in particular occupations, but it does suggest the situations in which these occur are likely to be idiosyncratic and difficult to predict in advance. We are, therefore, minded to continue assessing whether it is sensible to fill skill shortages in individual occupations on a case-by-case basis. In this context, identifying threshold values would be of limited use in interpreting top-down indicators of sensible.

6.5 Issues

6.72 So far, our analysis of sensible has relied largely on bottom-up evidence from employers, unions, SSCs and other stakeholders with an interest in the occupation under review. We also utilise experts and research in understanding contexts in particular sectors. For example, we commissioned a number of sector papers to inform our decision-making for our first shortage report (see Anderson and Ruhs, 2008 for an overview). A key issue is how we ensure consistency in our assessments (i.e. similar

weights of evidence) across occupations in the context of a range of different criteria and perhaps partial information from bottom-up sources.

6.73 Our assessments of particular occupations have involved some difficult and finely balanced decisions and led us into some important debates around particular occupations and sectors. For some sectors these discussions have brought in a wide range of considerations. Our review of skilled chefs in MAC (2009b), for example, raised some difficult issues such as illegal working in the ethnic cuisine sector and a historic gender gap in terms of employment rates for individuals of certain nationalities, which we reflected in our report. With such a range of issues, consistency is inevitably a matter of judgement rather than a mechanistic comparison between decisions made about different occupations.

6.74 We gave consideration to whether a narrower range of criteria would aid future assessments of sensible, with a view to improving consistency of bottom-up evidence. However, we felt this would be at the expense of richer information which we have found very helpful in making decisions about whether shortages may sensibly be filled with immigration.

6.75 Ensuring consistency across occupations is also difficult, particularly when information from employers and other stakeholders may be partial. For example, some employers may themselves decide that it is not sensible to fill shortages via immigration and these employers will therefore be less likely to be represented in the evidence we receive. We seek to corroborate what we are told with a variety of organisations and employers in different parts of the country, but the extent to which this is possible is often limited when we are considering very specific job titles.

6.76 One way of further corroborating what we are told by employers would be by more formally requiring a view from the SSCs. We could share employer evidence we have received with them on a formal basis and officially seek their expert view before we recommend an occupation for the shortage occupation list. This would operate in addition to the current process whereby we receive evidence direct from many SSCs. As described earlier in this report, one function of SSCs is to gather evidence and intelligence on skill shortage and we will continue to work with them to apply this evidence to our assessments of occupations. We discuss this further in Chapter 7.

6.6 Conclusions

6.77 Our definition of sensible has not fundamentally changed, in principle or practice, since our first recommended shortage occupation lists. Our approach has been flexible enough that we have already placed considerable emphasis on avoiding displacement and supporting skills acquisition of UK resident workers: priorities the Government has stressed since we published our first recommended shortage occupation lists.

6.78 Taking account of future skill needs, particularly with reference to industrial policy objectives for particular occupations, may be appropriate in certain circumstances. Our shortage test can examine whether future skill

needs are likely to emerge, and our sensible test can consider whether there are alternatives to non-EEA immigration as a response to those needs. Longer-term considerations, for example investment in training programmes and qualifications, will necessarily play a strong role in decisions about whether future skill needs may sensibly be filled via immigration.

6.79 We have found little evidence to support prioritising our criteria. The factors involved in the issues we consider for sensible tend to be idiosyncratic and there is considerable variation in their relevance across occupations. For these reasons, we are minded to continue to assess sensible on a case-by-case basis, taking into account the circumstances in particular occupations that we are reviewing, for as long as we continue our reviews of the shortage occupation list.

6.80 Top-down data have played less of a role in assessing sensible because data are only available against some of the criteria we are interested in. Looking at flows as well as stocks may provide a more rounded picture of immigrant use within occupations from the top-down data. Research did not find appropriate indicators of EEA labour supply, and we identified no further indicators from UK data sources. Setting thresholds for indicators, as we do with shortage, is likely to be of limited value in the case of sensible.

6.81 The question of sensible is ultimately defined by objectives, rather than aggregate labour market signals. So even if criteria do not apply to all occupations at all times, it seems right to continue to ask about the issues that concern us, but retain flexibility to assess what may be feasible in particular circumstances. One way of corroborating what we are told may be to more formally require the views of SSCs against our criteria for sensible. Open and transparent debate of the issues with particular sectors also remains essential.

Chapter 7

Cross-cutting issues

7.1 Introduction

7.1 This chapter discusses some issues that cut across all three tests in our methodology. First we discuss how we ensure consistency when dovetailing the evidence. We then consider the responsiveness of the process for updating the shortage occupation lists, before briefly outlining issues relating to Scotland and other regions of the UK.

7.2 Dovetailing and ensuring consistency

7.2 Here we consider some issues relating to how we ensure consistency when we dovetail the evidence to arrive at our decision to recommend an occupation or job title for inclusion on the shortage occupation list. Issues that are specific to each of the skilled, shortage and sensible tests are dealt with in previous chapters; here we consider those that cut across all three tests.

7.3 A number of factors that vary between the occupations and job titles we are considering may affect how we dovetail the evidence to reach a decision. We consider three of these in this section:

- the extent to which the job under review aligns with an occupation-based classification;
- the level of granularity with which we specify the occupation or job title under review; and
- the amount and types of evidence, for example stakeholder submissions, that we utilise.

Occupational basis for our analysis

7.4 The shortage occupation lists were defined by the Government as being based on occupations and jobs, rather than sectors. Our analysis has reflected this definition. However, an occupational approach is suited to some parts of the economy more than others. Some stakeholders have argued that certain shortages are not easy to identify by occupation, and that a sectoral approach may be better for certain parts of the labour market. We have not conducted full analysis at sectoral level. However, we have remained flexible by grouping particular job titles according to the industry sector in which a shortage has been identified. In MAC (2009b), for example, we concluded that there was sufficient evidence of a shortage for a number of engineering job titles within the electricity generation industry and distribution industry only.

7.5 It is clear that the concept of occupations works for a significant portion of the labour market: we have not encountered definitional problems with specifying jobs such as ‘teacher’ or ‘work rider’ for example. As part of this

review we have therefore considered some of the advantages and disadvantages of taking a sectoral approach *alongside* an occupational one.

7.6 In some instances, shortages which are limited to a specific industry sector may occur in one or more occupation. This could be because demand is for certain sector-specific skills and knowledge which are not easily transferable from other industry sectors. Particularly for highly specialised posts, industry knowledge may be an important attribute upon which employers base hiring decisions. Defining single job titles in shortage is simply a question of granularity and achieving the right occupational and sectoral split. But there may be a case for considering more general sectoral information when considering a number of job titles within a specific industry sector.

7.7 Since we rely on stakeholders to provide bottom-up evidence, so long as there is consensus about the right sector/occupational definition to use there are relatively few problems with assessing occupations in a particular industry sector only. Problems may arise, however, if there is not consensus and, especially, if occupational and sector-based evidence point in different directions.

7.8 Further difficulties would arise if we were to add sector-based analysis to our top-down methodology. First, it is not technically feasible to reliably estimate our indicators using a sector-occupation matrix without resorting to very aggregated classifications (that would look at, for example, 'Science and engineering professionals in electricity, gas and water supply industries'). This level of aggregation would not provide us with the detailed level of information we require. Using occupation and sector-based indicators separately is complicated because it is unclear how conflicting results might be resolved. There may also be cases for which the sector classification is unhelpful. Overall, any approach that attempts to reconcile two definitions will reduce comparability between occupations.

7.9 We believe it is right that the shortage occupation list is developed primarily using occupation-based analysis. Where there is consensus among stakeholders that a job title may be best defined with reference to a particular sector, and the job title is so specific that top-down evidence will be of limited relevance, it may be useful to define a shortage with reference to a specific sector. Consideration of sector-based information may, therefore, be desirable in a limited range of circumstances, where bottom-up evidence clearly supports this.

Level of granularity

7.10 We may consider an entire 4-digit occupation, as defined in the Standard Occupational Classification (SOC), for inclusion on the Shortage Occupation Lists, or we may only consider a specific job title within a 4-digit occupation. The 'unit group' (4 digit) level, which is the level most relevant to our work, breaks down the labour market into 353 occupations and is the most detailed occupational breakdown available. However, actual labour shortages also occur at the sub-occupational or job title level. Where we refer

to job titles, we mean those job titles that are more specific in their nature than the SOC 4-digit classification allows.

7.11 We have now completed three reviews of the shortage occupation lists since our first recommendations in September 2008. In that time, the evidence we have received has become more detailed and our knowledge of particular occupations has also improved. Thus, some shortages which were once specified as a whole 4-digit occupation have become more tightly defined, in response to the evidence we have received. However, we recognise that more granular classifications have implications for the relevance of the top-down analysis when corroborating bottom-up evidence we receive.

7.12 It is important that the trade-offs in terms of increased granularity against our ability to statistically corroborate claims being made are correctly balanced. Working at a more aggregated level increases the relevance of top-down evidence, and makes decisions less reliant on evidence from a small number of stakeholders. On the other hand, specifying jobs at a more disaggregated level reduces the possibility of inadvertently facilitating recruitment of immigrants in jobs that are not appropriate for inclusion on the shortage occupation list.

7.13 Risks resulting from reduced weight being given to national level data could be partially mitigated by increasing the use of 'local' datasets, which contain more granular data for specific occupations. We have utilised information from local datasets for a number of occupations. The health sector is a case in point, where very detailed data that the Workforce Review Team collects from NHS information systems has enabled robust analysis of very specific job titles.

7.14 We seek to expand the use of local datasets and hope to work with the relevant Sector Skills Councils in identifying these and obtaining results from their analysis. E-skills UK, the Sector Skills Council for information and communication technology industries, has developed a methodology to identify skill shortages using private data sources which contain information at a far more disaggregated level of detail than national level data sources (see Box 7.1).

Box 7.1: E-skills UK analysis of skills shortages for the Information Technology, Communications and Electronics (ITCE) sector panel

E-skills UK developed a methodology for identifying skill shortages for the ITCE sector panel, which made recommendations to Work Permits UK prior to the MAC's role in developing the shortage occupation lists. The sector panel and supporting analysis has continued to feed in to our process.

One source that E-skills UK utilise is data on job advertisements in the press and on the internet which are collated by Salary Services Ltd. These data allow analysis at a more granular level than the Standard Occupational Classification. For the information technology sector, the Salary Services data breaks down by:

- 56 occupational categories for (in comparison to 9 4-digit SOC codes that are relevant to this sector) ;
- around 250 technical skills; and
- permanent and contract positions.

These data enable the identification of occupation and skill combinations such as *'Database Administrator/Analyst'* with *'SQL Server'* skills.

A reliability check is incorporated into the E-skills UK methodology to ensure reliability at this level of disaggregation: the method requires increases in demand indicators in two successive quarters. If occupation and skill combinations pass these tests, the data are compared with more aggregated demand and supply indicators from national level data sources.

7.15 The availability of such data will vary according to sector and occupational requirements. In some parts of the labour market recruitment activity will be less centralised or not captured by information systems to the extent that it is in the healthcare and information technology sectors. The information technology sector is perhaps a special case, where information technology skills are often linked to names or brands of systems or software. More detailed breakdowns of occupation and skills may be far more difficult to define in other sectors of the labour market. Where such data do not exist, we consider how appropriate it is to define job titles to a very high degree of specificity.

Amount and type of evidence available

7.16 A final consideration is how we ensure consistency in dovetailing evidence that varies in both amount and type. Our current approach strikes a balance that permits a fair degree of flexibility. For example, we may receive evidence from just a few employers in some occupations, but many in others. The level of proof we require is higher when evidence derives from fewer sources. In other instances we look at very narrow job titles, where top-down data are much less relevant, as well as large occupations where such information plays a much stronger role. Again, the level of proof we require

from bottom-up evidence is higher when top-down data are less relevant to the occupation or job title in question.

7.17 The inverse of this flexibility is that the decisions will be made on different combinations and balances of criteria, and it is more difficult to directly compare the outcomes to assess consistency. One option is to be more prescriptive, for example, in specifying the precise evidence and data that we expect to receive before we place an occupation on the list. Or we could be less flexible in accepting evidence which cannot be corroborated by top-down data.

7.18 A further option is to seek the views of Sector Skills Councils (SSCs) more formally as a double-check, particularly where we are relying more on the bottom-up evidence. As discussed earlier in this report, SSCs collect a variety of labour market intelligence and have ongoing contact with a range of employers in their sector, so are well placed to give a view across each of the skilled, shortage and sensible tests. SSCs have a role in relation to upskilling, so they may assist in relation to the sensible test. We already seek SSCs' input in relation to occupations we are reviewing but a more formal role, including the sharing of evidence we receive from employers, may act as a useful 'challenge' function within our analysis. We plan to explore this on a case-by-case basis with key SSCs, with a view to giving at least some of them a more formal role in providing, evaluating and corroborating evidence over time.

7.3 Responsiveness and timing

7.19 The responsiveness of the shortage occupation lists is an issue we have noted from the outset. The House of Commons Home Affairs Committee (HAC, 2009) and some other stakeholders argue that six-monthly reviews of the shortage occupation lists are insufficiently frequent to reflect short-term shortages, which they say should be the focus of the shortage occupation lists. We take a different view for three reasons.

7.20 First, it may not be sensible to fill very short-term shortages via immigration at all. International experience (as voiced at our International Conference in September 2009) suggests that immigration may be a questionable response to very short-term shortages because other labour market responses may yet alleviate a shortage and immigrants arriving into shortage occupations often put down permanent roots in the host country. Second, other immigration policies may be preferable to the shortage occupation list to address ephemeral shortages: the Resident Labour Market Test route is, by design, more responsive. Third, there are also practical obstacles to making shortage occupation lists responsive to very short-term labour shortages, which we discuss further below.

7.21 Two factors determine the responsiveness of the shortage occupation list. The first is the frequency with which the analysis is updated. The second is lags in the top-down data that inform our analysis. We have control over the former, but very little over the latter.

7.22 We consider it very important that the shortage occupation list is updated regularly in order to respond to the prevailing economic circumstances. At the same time, however, we think it is sensible that there are suitable intervals between each review of the list to provide certainty for employers, training institutions and prospective immigrants and to allow time for new evidence to become available.

7.23 With respect to bottom-up evidence, there is a trade-off between regular updates which allow emerging and short-term shortages to be reflected, and the need to allow sufficient time for stakeholders to gather and submit evidence. Top-down indicators may in theory be updated more regularly than every six months, but in practice the benefits of doing so may be slim. Indicators based on the Annual Survey of Hours and Earnings, for example would not change. Indicators based on the Labour Force Survey can be updated quarterly, but, because we currently aggregate the data across four quarters, three quarters of the data used to calculate the indicator would remain the same. Using longer periods to calculate our indicators, as discussed in chapter 5, would further reduce the rationale for updating the top-down analysis more regularly.

7.24 We have remained open to reviewing occupations outside of the normal timetable if evidence is strong enough to warrant it. So far this has not occurred. We believe that six-monthly updates, with full reviews of the shortage occupation lists every two years, represent a reasonable compromise between responsiveness and maintaining an open and fair process, but also remain open to accommodating urgent needs or changes in labour market conditions.

7.4 Scotland and other UK countries and regions

Scotland

7.25 We are required to recommend shortage occupation lists for the UK and for Scotland. We regard the UK list as, by definition, applying to the UK as a whole, which implied that the Scotland list would consist of additions to the UK list.

7.26 For the Scotland list, many of the issues around the concepts, process for gathering evidence and how we use bottom-up evidence are the same as the UK list, although we have made particular efforts to engage with Scottish stakeholders in relation to the list. We do not provide full details of those efforts here, but further information is available in our previous reports on the recommended shortage occupation lists for the UK and Scotland.

7.27 Our current methodology has not used top-down data to analyse shortages in Scotland. We have reported economy-wide indicators and the results of the Scottish Employers Skills Survey conducted by Futureskills Scotland, but these have a limited bearing on decisions about particular occupations. We are not able to make use of indicators at a detailed occupational level because they would be insufficiently reliable at the level of disaggregation that we require.

7.28 One option for the top-down analysis could be to use indicators at a more aggregated level. However, the top-down data would only be relevant if we received evidence of shortages from the bottom-up for large occupational groups as well as specific job titles. So far, this has not been the case. Therefore, while a more aggregated top-down approach may be technically possible, the results would not generally be relevant.

Other UK countries and regions

7.29 We do not consider shortages that are specific to other countries and regions of the UK to be within our remit. As we set out in MAC (2008a), even if regional shortages are identified, it is unlikely to be sensible to fill such shortages with immigration from outside the EEA. Attracting staff from other parts of the UK is likely to be a more desirable alternative with reference to our criteria for sensible. A special case is where an occupation is largely concentrated in one part of the UK, and therefore a regional shortage may also constitute a national shortage.

7.30 Nevertheless, we have received evidence on regional shortages on a number of occasions, and it is clear that such shortages can have a real impact. Shortages in particular regions are perhaps more common in public sector occupations. Pay structures are often defined nationally, making it hard for employers to use wages to respond to shortages. The fact that certain public sector jobs may be less mobile (schools and hospitals need to be located in certain areas regardless of labour supply) may compound this.

7.31 We are clear that our current remit does not permit us to recommend occupations for the shortage occupation list on the basis of a solely regional shortage. But this is an important area and we are commissioning research to analyse alternatives to immigration as a solution to sub-national and regional labour shortages. Among other things, this research will examine the role that intra-UK migration and pay differentials play, or could play, in preventing shortages at the regional or local level.

Chapter 8

Conclusions and next steps

8.1 Overview

8.1 In this report we have outlined our thinking on the methodology we have so far used to compile our recommended shortage occupation lists. This report does not completely finalise a new methodology to be adopted for any future reviews of the shortage occupation list that the Government may ask us to undertake, but it does provide an indication of the issues we are actively considering.

8.2 This report has been influenced by recent economic and policy developments, as well as by information we received from policy experts and academics participating in our international conference in September 2009. Furthermore, our thinking, and any subsequent reviews of our methodology, will continue to be influenced by the evidence we receive from stakeholders and the findings of our research programme.

8.3 We have considered the general framework we use for considering whether to recommend occupations for inclusion on, or removal from, the shortage occupation list, utilising our tests for skilled, shortage and sensible each in turn. We have reviewed the methodology used to assess occupations against each of these three tests.

8.4 A very overarching conclusion we have drawn from this exercise is that our conceptual approach, combining top-down analysis with bottom-up evidence at each stage of our skilled, shortage and sensible testing, provides a suitable framework for identifying labour shortages in skilled occupations that can be sensibly be filled in by non-EEA immigrants. It has highlighted that any labour market analysis at the occupational level needs to be complemented by more fine-grained detailed information provided by the bottom-up evidence.

8.5 We are also content that, given our current remit, the three tests of skilled, shortage and sensible remain the most appropriate way to determine which occupations and job titles should be recommended for inclusion on, or removal from, the shortage occupation list.

8.6 Third, we believe that the use of an indicator-based approach to all three tests remains valid. Neither our research nor evidence and opinion received from stakeholders suggests that there is a single reliable and universal measure of either skilled, shortage or sensible.

8.7 Nevertheless, we have identified a variety of issues within the detailed methodology we have been using. We summarise below our main conclusions under each of the three tests.

Skilled

8.8 Overall, we are content that the methodology we use to define skilled occupations works well and we do not, at this stage, intend changing our method for this test. However, we are aware that the upcoming revision of the Standard Occupational Classification (SOC) later this year, SOC 2010, will have an impact on our methodology and any updated skilled occupation list. Furthermore, we have commissioned a research project on defining skill which is currently being undertaken which will influence our thinking around this area of our methodology. Once the implications of SOC 2010 and the findings of the research project have been fully realised and considered we may make amendments to our skilled methodology.

Shortage

8.9 The Frontier Economics research project to evaluate our shortage indicators produced some well thought-out recommendations which we have carefully considered and tested (FE, 2010). The project did not identify additional indicators; however, we will adopt three recommendations around the construction of the top-down indicators. These are:

- averaging median vacancy duration data over 12 months;
- using a three year timescale for the percentage change in median pay indicator; and
- using a three year timescale for the percentage change in hours indicator.

8.10 We will consider various options for benchmarking the thresholds for our twelve shortage indicators with a view to presenting our further findings in our next shortage report, should the Government ask us to continue in this work. Furthermore, we will look at an alternative regression specification for the relative wage premium indicator.

8.11 We have carefully considered Frontier Economics' recommendation to weight the indicators, but we have decided not to adopt it for the reasons outlined in Chapter 5, notably due to the difficulty in selecting non-arbitrary weights. Furthermore, whilst we have decided to retain the 'knife-edge' approach in our methodology for the time being, we will keep the percentile score approach under consideration.

Sensible

8.12 We have not set out any major changes to our methodology for defining sensible in this report. The research projects we have commissioned in this area have so far not recommended any changes to our methodology. Moreover, they have found that top-down data are of limited use in this area.

8.13 We are content that our approach to assessing sensible is sufficiently flexible to incorporate the Government's objectives of avoiding worker displacement and supporting the skills acquisition of the resident workforce.

8.14 In assessing whether it is sensible to use skilled immigrants to fill labour shortages, it is essential that our approach remains flexible. The issue of sensible is complex and, consequently, we will continue to assess sensible using our established framework, taking account of the circumstances in particular occupations under review and making the basis for our decisions as explicit and transparent as possible.

8.15 To help the Government to achieve its industrial policy objectives, it may also be desirable to consider future skills shortages within our shortage and sensible tests in future, subject to the receipt of robust bottom-up evidence.

8.2 Stakeholder input

8.16 We are grateful to the stakeholders that have contributed to the evidence base for our recommendations on the shortage occupation lists. Some stakeholders have also provided valuable feedback on our methodology and their views have been considered for this review. Stakeholder evidence in general, and evidence from industry bodies and Sector Skills Councils in particular, will continue to be essential to our work.

8.17 We value feedback on our methodology and welcome comments at any time, including on this report.

8.3 Next steps and future work

8.18 We have recently completed the third partial review of the shortage occupation list, to be published in spring 2010. This was a small review covering the following occupations: fishermen, musician, pharmacists, and engineering technicians.

8.19 If a future work plan in this area is confirmed, we will issue a call for evidence for our autumn 2010 review of the shortage occupation list soon after. This would be a full review of the entire labour market, the first since our initial recommended shortage occupation list in autumn 2008 (MAC, 2008a). Although we keep our methodology under ongoing review and, in particular, there are reasons why we are likely to delay any changes to our skilled methodology beyond autumn 2010, it is our general intention to finalise the review of our shortage methodology in the coming months in time to be used for any autumn 2010 review.

8.20 Many of the issues that we will consider have been outlined in this report. In the coming months we will also receive further findings from our research programme which will undoubtedly guide and influence our thinking further.

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