

Chapter 10

Occupational labour shortages: Underlying concepts and their role in US migration policy

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There are many factors that can be taken into account in migration policy, such as family reunification, increasing the nation's stock of human capital, increasing gross domestic product, and alleviating occupational labour shortages. This chapter examines the concept of occupational labour shortages and describes how occupation-based immigration policy in the United States currently is structured and proposals that have been considered to improve how occupational labour shortages are measured and used in immigration policy. The chapter first explains the economic concept of occupational labour shortages and describes the reasons why shortages might arise. Next, the chapter discusses how occupational labour shortages can be recognised. This is followed by a summary of findings from an analysis of whether there are shortages for four occupations in the United States, and the conclusions from the study. The second part of the chapter deals with occupation-based immigration in the United States. The current US system for permanent and temporary labor is described, and current and past proposals for improving the system are discussed.

10.1. Introduction

There are many factors that a country can take into account in its migration policy, such as family reunification, increasing the nation's stock of human capital, increasing gross domestic product, and alleviating occupational labour shortages. Nations vary in how much emphasis they place on various goals and in how the goals are reflected in actual migration policy. This chapter examines the concept of occupational labour shortages and describes how occupation-based immigration policy in the United States currently is structured and proposals that have been considered to improve how occupational labour shortages are measured and used in immigration policy.

This chapter first explains the economic concept of occupational labour shortages and describes the reasons why shortages might arise (Section 10.2). Next, the chapter discusses how occupational labour shortages can be recognised. This is followed by a summary of findings from case studies of whether there are shortages for four occupations in the United States, special education teachers, pharmacists, physical therapists, and home care workers; the chapter then draws conclusions from the four case studies. Section 10.3 deals with occupation-based immigration in the United States. The current US system for permanent and temporary labour is described, and current and past proposals for improving the system are described and assessed. Section 10.4 provides conclusions.

10.2. Occupational labour shortages in theory and practice

The term “labour shortage” has no universally agreed upon definition. It sometimes refers to a shortfall in the total number of individuals in the labour force and sometimes denotes the possible mismatch between workers and jobs in the economy. We define an occupational labour shortage as a sustained market disequilibrium between supply and demand in which the quantity of workers demanded exceeds the supply available and willing to work at the prevailing wage and working conditions at a particular place and point in time. In general, the quantity of labour workers are willing to provide is an increasing function of the wages (i.e., price) they can obtain, and the relationship between the amount that workers are willing to provide at various prices, with other factors held constant, is referred to as the labour supply curve.

Figure 10.1 shows a typical upward-sloping supply curve for labour. As the wage rate is increased, more workers are willing to enter a particular occupation and current workers are generally willing to provide more labour. In Figure 10.1, the amount of labour that employers wish to hire at alternative prices is indicated by the downward-sloping demand curve. The point labelled E in Figure 10.1 is the market equilibrium point. If the wage is equal to W_E , then the quantity of labour that workers are willing to supply at that wage (Q_E) is exactly equal to the quantity of labour that employers will wish to hire. The market is in equilibrium because the quantity supplied is equal to the quantity demanded. If, for some reason, the prevailing wage rate in the market is W_0 rather than W_E , then the quantity of labour that workers are willing to supply is equal to Q_S – the point on the supply curve corresponding to W_0 . Employers, however, would like to hire Q_D at that wage rate. The difference between the amount of labour that employers wish to hire and the amount that workers are willing to provide ($Q_D - Q_S$) is the amount of the shortage.

Unfortunately, identifying a shortage is not easy. Just as the concept of “full employment” does not mean zero unemployment, a labour market is likely to have some

vacancies in equilibrium; thus, the question is when are there excess vacancies that signify a shortage? Likewise, markets do not adjust instantaneously to shocks, so how long must a market have excess vacancies before it is considered to have a shortage? Drawing the line between a shortage and a tight labour market is not easy. Finally, in the United States, the Bureau of Labour Statistics does not publish data on vacancies by occupation, so even if there was agreement on what constitutes a shortage, the data needed to identify shortages does not exist.

Economists and other analysts have proposed alternative definitions of occupational shortages. Early studies by Arrow and Capron (1959) and Blank and Stigler (1957) defined shortages as situations where demand for labour increases faster than supply can grow – a situation sometimes observed in the market for engineers during economic booms; the Arrow-Capron and Blank–Stigler concepts of an occupational labour shortage are illustrated in Figure 10.2. Although rapid increases in demand can lead to labour shortages, there are other potential causes as well. As the baby-boomers reach retirement age, some occupations may experience rapid drops in labour supply, and if sufficient workers do not enter the occupation to replace them, a shortage may result. Shortages can also result when there are long periods required for employers or workers to become aware of or make adjustments to changes in supply or demand. For example, it takes many years to train physicians, so even when an increase in demand becomes apparent, there is no way for the supply to increase quickly. Finally, shortages can result when the labour market does not operate freely. Examples include where the wage is set by a third party, such as often occurs for health occupations, or when supply is limited by entry restrictions. Regulation of prices and wages is of particular interest in some US labour markets, such as health care.

Figure 10.1. Illustration of a labour shortage



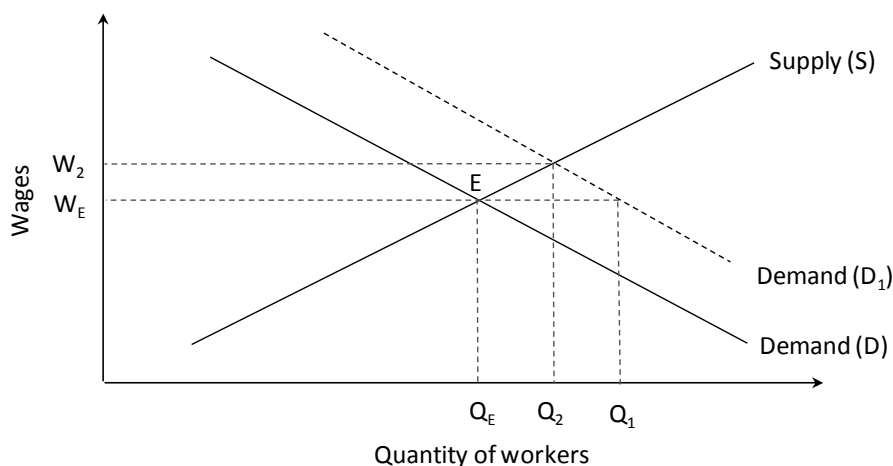
Source: Author's own work.

Although most prices are determined competitively by markets in the United States, the price of labour or the price of the final product is regulated in some industries. For example, cities generally regulate the price that taxi drivers can charge. In such instances, the supply curve is truncated at the regulated price. This situation is illustrated in Figure 10.3. The wage rate is restricted to be no higher than W_M , so the supply curve at higher wages is indicated by a dashed line. The labour that will be

supplied at that wage is Q_S . At that wage, however, the demand is for Q_D workers, so there is a shortage of $Q_D - Q_S$ workers. An example of this type of shortage during some periods is the US Government's market for entry-level Ph.D. economists. The federal government traditionally hires entry-level economists at the GS-12 pay level, and agencies are generally not permitted to pay a higher wage rate. Sometimes the market wage for entry-level economists is higher, so there is sometimes a shortage of entry-level Ph.D. economists in government agencies.

More commonly, the government regulates the prices of products and services rather than labour. In industries where labour comprises a relatively small share of the product's price, such as in the generation of electric power, product price regulation is not likely to cause a labour shortage. In very labour-intensive industries, however, output price regulation can be tantamount to regulating the price of labour. Examples include the health care industry in general and the home care industry in particular. A large share of the US health industry is financed by the Medicare and Medicaid programmes. In the case of Medicare, the federal government limits the reimbursements that providers can obtain for treating covered elderly patients. State governments provide similar regulation under Medicaid programmes for the poor. By restricting the charges that providers can make, the providers face limits on what they can pay workers and still cover their costs.

Figure 10.2. Illustration of Blank-Stigler and Arrow-Capron shortages



Source: Author's own work.

In the absence of vacancy measures, shortages can only be identified by employer actions to obtain additional labour: If a shortage exists, we would expect employers to undertake one or more of the following actions. The first thing we would expect to see is that employers would increase their recruiting efforts. Specifically, we would expect employers to take one or more of the following actions to expand recruiting:

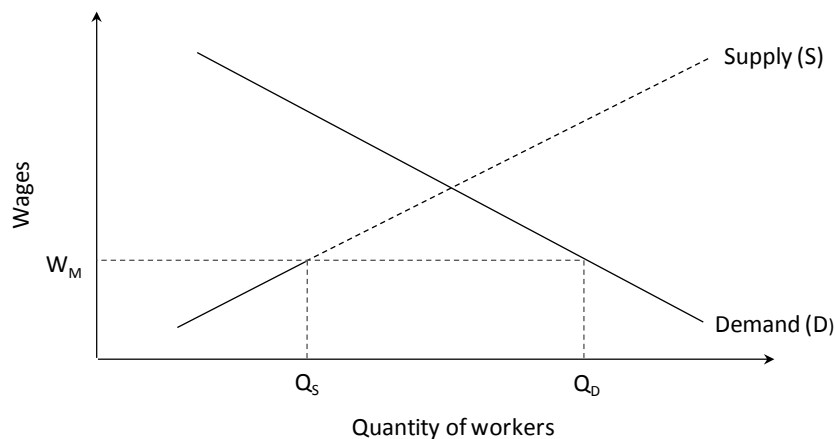
- increase advertising in usual outlets
- advertise in other media
- expand the recruiting area, possibly including other countries
- use public or private employment agencies

- pay bonuses to employees who bring in workers.

Other actions employers might take to eliminate a shortage include:

- increase use of overtime
- reduce minimum qualifications for the job
- restructure work to use fewer of “shortage” occupations
- substitute machinery and equipment for labour
- train workers for the jobs
- improve working conditions
- offer bonuses to new workers
- offer stock options to workers
- improve pay and fringe benefits
- contract out work
- turn down work.

Figure 10.3. Illustration of labour shortage arising from restrictions on wages



Source: Author’s own work.

These options are not always available; for example, reducing the minimum qualifications is not feasible for a licensed occupation. Some of the actions can be undertaken quickly, such as increasing the use of overtime, but others, such as substituting capital for labour, might require several years to implement. Some of the options, such as use of overtime, are easy to reverse, but others, such as increasing pay and benefits, are likely to be hard to reverse. In conducting the case studies described below, we did not expect employers to undertake all the actions described above, but if there was a shortage, we expected employers to take some of these actions to alleviate the shortage.

We decided not to use a quantitative measure to define a shortage for our study because there is no simple way to aggregate the signs of a shortage, but others have

developed specific measures, particularly for use in immigration policy. These measures are discussed later in the chapter.

We conducted case studies of four occupations where we had seen press reports of shortages or where we found evidence of shortages in previous research: home care workers, pharmacists, physical therapists, and special education teachers. Identifying occupational labour shortages in the absence of vacancy data is challenging. In our case studies, we relied on interviews with employers, worker organisations such as unions, and academics and other researchers who studied the occupation, as well as analysis of data published by the Bureau of Labour Statistics, the Department of Education, and trade associations. In looking at published data, we expected that if there was a shortage, wages in the occupation should generally rise relative to occupations with similar requirements; exceptions to this expectation include situations where the wages are not market determined (such as many health care occupations) and if the comparison occupations are also experiencing a tight labour market. In the interviews with employers and trade associations, we looked for evidence that employers were undertaking some of the actions described above to deal with shortages. Interviews with worker associations and unions provide some balance, as employers sometimes claim there is a shortage, and workers counter that they are unwilling to use the extant workforce efficiently.

Perhaps in large part because the US economy was experiencing the worst recession since the Great Depression when we conducted our research, we did not find shortages in any of the four occupations. Even industry representatives, who often complained of shortages in our previous studies of home care workers and special education teachers, made no claims of a current shortage. Industry representatives indicated that there were shortages of pharmacists in the recent past when grocery stores began adding pharmacy sections and pharmacies extended their hours dramatically; however, as it became increasingly difficult to fill positions there was upward pressure on wages, and the demand for pharmacists declined. The labour market for home care workers is tight, but there was no evidence of widespread inability of people in need of such services to obtain them. Because home care is a relatively low-skill occupation with a short training period, one might not expect labour shortages, but in our prior work we found that government regulations on reimbursement for Medicare and Medicaid patients often led to difficulty in recruiting and retaining workers. Finally, our study of the market for physical therapists indicates that the market is very tight, but because of the severe recession, a shortage was not observed.

Several key conclusions emerge from the study in addition to the conclusion that there are no current shortages in the occupations studied:

Measuring occupational shortages is difficult

There are a number of reasons why it is difficult to determine if a shortage is present. First, the best indication of a shortage is an increase in the number and duration of vacancies, but in the United States occupational vacancy data are not available for most occupations. Second, there is no precise dividing line between a tight labour market and a shortage. Third, the Standard Occupational Classification (SOC) system used in the United States measures occupations too coarsely for measuring shortages; for example, all computer programmers are included in a single occupation, but employers want programmers with specific skills such as Java or HTML. Finally, using interviews to assess the presence of a shortage is imprecise.

For policy purposes, it is important to go beyond the economic definition of a shortage

Sometimes labour markets do not provide the socially optimal number of workers in an occupation. This is particularly the case when the labour market is highly regulated by government. If rates of pay are set at a low level, the labour market will clear in an economic sense, but there may be what Arrow and Capron (1959) called a “social demand shortage”, that is, the market produces less than what society would like.

Paradoxically, many occupations with persistently tight labour markets have recently increased or are considering increasing entry requirement

Pharmacists recently began requiring that entrants hold a doctorate degree, and the American Physical Therapy Association is striving to have all new physical therapists enter the labour market with a doctorate, and some have advocated that the minimum education for registered nurses be increased to a bachelor’s degree. Although there may well be good reasons for increasing the educational requirements, the extra costs of increasing qualifications could exacerbate tight labour markets, as we observed in our case study of pharmacists.

Because of the importance of gathering good data on shortages, consideration should be given to improving data on job vacancies and the detail of occupational measurement

Occupational labour market information is crucial for activities including career guidance and immigration decisions. The lack of adequate vacancy data and measuring occupations at too high a level make it difficult to sort out the situation for specific occupations. Because increased government funding is currently difficult, collaboration with industries to alleviate these problems should be explored.

10.3. Using occupational shortage data for immigration and temporary visas

Occupational shortage data can play an important role in the determination of which occupations are good candidates for admitting temporary or permanent foreign labour to fill vacancies. In this section, we describe the approach used in the United States to assess the availability of US workers for jobs that employers wish to fill with immigrant or migrant workers, the approach developed for the United States Department of Labour by Malcolm Cohen, and the potential for changes in the system.

It is important to keep in mind that US immigration policy is based primarily on family reunification, with only a minority of permanent admittances based on employment needs of employers. As shown in Table 10.1, in fiscal year 2012, only 144 000 of the 1 032 000 granted permanent legal admissions, about 14%, were admitted through employment-based preferences (Monger and Yankay, 2013).

Table 10.1. Legal United States permanent resident flow by major category of admission for 2012

Category of admission	Number	Percentage of total
Family-sponsored immigrants	681 000	66.0
Employment-based preferences	144 000	14.0
Priority workers	39 000	3.8
Professionals with advanced degrees	51 000	4.9
Skilled workers, professionals, and unskilled workers	39 000	3.8
Special immigrants	8 000	0.8
Investors	7 000	0.6
Diversity programmes	40 000	3.9
Refugees and asylees	151 000	14.6
Parolees	1 000	0.1
Other	15 000	1.5
Total	1031 000	100.0

Source: Monger, R. and J. Yankay (2012), “US Legal Permanent Residents: 2012”, US Department of Homeland Security, Office of Immigration Statistics, Washington, DC.

Although this chapter will focus primarily on the permanent admissions, the United States also has several employment-based temporary visa programmes with interesting features.¹ The H-1B programme allows foreign workers who are specialty workers or fashion models to work in the United States for three years, with possible renewal of an additional three years. The Department of Labour states that “A specialty occupation requires the theoretical and practical application of a body of specialised knowledge and a bachelor’s degree or the equivalent in the specific specialty (e.g. sciences, medicine, health care, education, biotechnology, and business specialties, etc.).”² The number of visas permitted under the H-1B programme is currently set at 65 000 annually, but in some previous years over twice as many visas were authorised. Demand by employers for the H-1B visas greatly exceeds the annual cap, so a lottery is held each year. In the fiscal year 2013, the US Department of Labour processed 442 254 requests for 909 465 positions for the 65 000 slots available for the H-1B programme;³ however the number of positions applied for is likely an overstatement as there is no penalty for not filling all approved positions. The top seven occupations for the requested H-1B visas were all IT related.

Temporary visas are also available for agricultural (H-2A) and non-agricultural (H-2B) openings that employers believe cannot be filled with American workers. The H-2B programme currently has a statutory cap of 66 000 workers annually (www.uscis.gov/working-united-states/temporary-workers/h-2b-non-agricultural-workers/cap-count-h-2b-nonimmigrants retrieved January 25, 2014). In the fiscal year 2013, employers requested certification for 98 000 positions, and 82 000 positions were certified; the surplus of requests over certifications does not imply excess demand, as requests can be turned down for many reasons having nothing to do with demand. As shown in Table 10.2, the requests for H-2B visas were generally for low-skill jobs such as landscape workers, amusement and recreation attendants, and waiters and waitresses. The H-2A programme does not include an annual cap; in the fiscal year 2013, 98 813 positions were certified.

Table 10.2. Top-10 occupations certified for H-2B temporary non-agricultural visas, fiscal year 2013

Occupation	Number of positions certified
Landscaping and groundskeeping workers	31 287
Forest and conservation workers	9 573
Amusement and recreation attendants	5 788
Maids and housekeeping cleaners	5 626
Meat, poultry, and fish cutters and trimmers	3 051
Construction labourers	2 106
Nonfarm animal caretakers	1 639
Waiters and waitresses	1 566
Coaches and scouts	1 553
Fishers and related fishing workers	1 282

Source: US Department of Labour, Office of Foreign Labour Certification. Retrieved from www.foreignlaborcert.doleta.gov/performance/cfm, January 25, 2014.

Employers who would like to hire permanent workers or temporary workers from abroad must submit the vacancy data and information about the applicant they wish to hire to the US Department of Labour’s Office of Foreign Labour Certification to receive certification that the positions meet the federal requirements under the appropriate visa programme. The employer is required to recruit domestic workers for the position and be prepared to demonstrate that adequate recruiting was conducted and that no qualified domestic workers were available for the position; recruiting requirements are explained in the Code of Federal Regulations.⁴ Furthermore, employers are required to pay at least the “prevailing wage” for the position to assure that domestic workers are not adversely affected by the employment of a foreign worker. In general, the prevailing wage is the mean wage of the occupation in the relevant labour market or the wage called for in a collective bargaining agreement. Recruiting requirements are much less specific when filing for H1-B workers.

When applying for permanent visas, employers can bypass the review by the Department of Labour’s Office of Foreign Labour Certification for occupations that are on the Department of Labour’s Schedule A. For many years, the only two occupations that have been on Schedule A are physical therapists and registered nurses. For all other occupations a review is required to assure that the employer has searched adequately for a domestic worker before offering the position to a foreigner.

Employers seeking to hire a foreign worker with permanent resident status must file with the US Citizenship and Immigration Services (USCIS) after their Application for Permanent Labour Certification is approved by the Department of Labour. There are restrictions on employment-related visas by employment preference category and by country. The four employer-sponsored preferences are:

- Priority workers, which includes aliens with extraordinary ability in the sciences, arts, education, business, or athletics; outstanding professors and researchers; and multinational executives and managers.
- *Professionals* with advanced degrees or persons with exceptional ability, which includes aliens who, because of their exceptional ability in the sciences, arts, or business, will substantially benefit the national economy, cultural, or educational interests or welfare of the United States; and aliens who are members of professions holding advanced degrees or the equivalent.

- *Professional or skilled workers*, which includes professionals with a baccalaureate degree; aliens capable of performing skilled labour for which qualified workers are not available in the United States; and aliens capable of performing unskilled labour for which qualified workers are not available in the United States.
- *Special immigrants*, which includes religious workers; Panama Canal Company employees, certain physicians, and others.⁵

The fiscal year 2012 limits on employment-related permanent visas are approximately 41 000 for the first three categories and 10 930 for the fourth and fifth categories (Monger and Yonkay, 2013). In addition, there is a limit of 7% of the permanent visas per country.

The current system for reviewing and certifying the need for foreign labour for temporary or permanent job openings is labour intensive. Until the system was revised and special temporary processing offices were opened, there was a backlog of over 300 000 cases, and the certification process often required several years. It is not surprising that the Department of Labour sought to develop measures that could be used to determine if foreign workers are needed based on data that are already available, in effect developing criteria for expanding Schedule A. In an effort to achieve this goal, the US Department of Labour retained Malcolm Cohen twice to develop approaches to use existing data to rank occupations as candidates for admission of foreign labour (Cohen and Schwartz, 1982; Cohen, 1990).⁶ Cohen's approach is somewhat similar to the basic approach used in our research (Barnow et al., 2013). However, the Department of Labour wanted a quantitative ranking system based on regularly available data rather than a system that relied in part on interviews with knowledgeable parties. Cohen identified seven indicators of occupational shortages based on economic theory:

- employment change in the recent past
- occupational unemployment rate in the recent past
- wage change in the recent past
- training required for the occupation
- replacement demand
- projected increase in occupational demand
- immigrants certified in the recent past.⁷

In his 1990 report, Cohen created an index of shortage by developing a seven-point scale for each indicator and summing the score of the seven indicators. Thus, an occupation could receive a score between 1 and 49; in the 1990 study, the occupations with the tightest labour markets were for physical therapists and registered nurses, each of which scored 39. Although both of Cohen's reports were accepted by the Department of Labour, the government has never implemented the type of scheme he developed; this may be due to the fact that the processing backlog that was once several years has been reduced to a few months.

The United Kingdom, on the other hand, has implemented a system that makes use of comprehensive occupational shortage data and feedback from interested parties to identify shortage occupations that are eligible for immigration.⁸ Under this system, the Migration Advisory Committee (MAC), which includes five economists and a representative of the UK Commission for Employment and Skills, makes recommendations to the government about which occupations are experiencing shortages.

The MAC only deals with occupations with highly skilled workers (Tier 1) and skilled workers (Tier 2). To qualify for inclusion on the list, an occupation must be skilled, have a shortage, and be a “sensible” candidate for the list, and these three criteria are applied sequentially. The MAC uses both top-down and bottom-up approaches in its work, relying on labour market data from national surveys and presentations and meetings with stakeholders. Once it is determined whether an occupation uses enough skills to qualify for Tier 1 or Tier 2, an assessment is made on whether the occupation is experiencing a shortage. The MAC uses 12 indicators in four broad categories to determine if there is a shortage (Downs, 2009).

The work done by Cohen and Schwartz (1982) and Cohen (1990) in the United States and by the MAC in the United Kingdom indicates that it is feasible to use labour market data to assist in the process of determining shortages for admission of foreign workers on a temporary or permanent basis. Although Cohen (1990) developed a numerical scale to rank occupations and the MAC approach also includes quantitative components, the flexibility of the MAC approach has the advantage of recognising the lack of a clear measure of a shortage and permitting qualitative data to be used in the process.

Immigration reform is a highly contentious issue in the United States today, but the controversies currently focus more on dealing with the undocumented worker population and border security than the appropriate mix of skill-based visas and family-based visas, the appropriate size of the H-1B visa cap, and how the employment-based system should operate. At the time this chapter was prepared, the US Senate had passed a bill in 2013, the Border Security, Economic Opportunity, and Immigration Modernization Act of 2013, but the House of Representatives has not yet acted, and it is not clear if or when US immigration reform will occur. Because the Senate bill includes some major changes to the employment-based component of immigration policy, it is briefly discussed here. Sumption and Bergeron (2013) analysed the Senate bill and present their best estimates of how immigration is likely to change if the bill is enacted. They note that the Senate bill places more emphasis on employment and skills based immigration and that the introduction of a points system, similar to what is used in some other nations, would likely reduce the waiting time for immigrants from some countries; the points system would also reward workers with US work experience and allow for some skilled workers to initiate the immigration process rather than rely on employers. In addition, the Senate bill would introduce a formal analysis of shortages for the first time, conducted by a new bureau within USCIS that is loosely modelled on the MAC. This analysis would be used to identify shortage occupations that would receive priority for the new low-skilled W visa in the event that they are oversubscribed. The bill would also make it more difficult for employers to hire low-skilled workers in localities where unemployment exceeds 8.5%, and it introduces a formula for adjusting the number of W and H-1B visas over time, depending on various metrics of demand.

10.4. Conclusion

For various reasons, labour markets do not always clear, sometimes resulting in occupational labour shortages. This chapter explores the reasons why occupational labour shortages can occur and identifies ways to ascertain if a shortage exists. Objective labour market information, such as vacancy rates, unemployment rates, and changes in wage rates can be useful in diagnosing shortages, but our research suggests that relying on market signals alone is sometimes misleading. The current US employment-based immigration system is extremely complex and is only partly responsive to market signals.

The US Department of Labour has considered moving to a system for where shortages are determined by formulas based on labour market data, but such a system has never been implemented. The immigration reform bill that recently was passed by the Senate but stalled in the House of Representatives expands employment-based immigration somewhat and includes a points system that rewarded education, skills, and prior employment in the United States. Based on our research on occupational labour shortages, the type of system used in the United Kingdom, which relies more on specific evidence as well as labour market signals, is likely to do a better job of identifying situations where the use of foreign labour is appropriate than the current system used in the United States. It should be kept in mind that immigration policy is at its heart political in nature, so the system adopted in a country must reflect the desires of the population rather than relying only on market signals.

Notes

1. The US immigration and temporary foreign labour system is far too complex to capture in a brief paper. The description below ignores many smaller programmes (such as a separate temporary visa programme for skilled workers from Chile) and special provisions (such as the ones for shepherders).
2. Retrieved from www.foreignlaborcert.doleta.gov/h-1b.cfm on January 25, 2014.
3. Data on all foreign labour certifications were retrieved from www.foreignlaborcert.doleta.gov/performancecdm.cfm on January 25, 2014.
4. The regulations for permanent workers are available at www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=10c56468aa6598a5caff8afa9ddc01dc&ty=HTML&h=L&n=20y3.0.2.1.27&r=PART#20:3.0.2.1.27.4.40.1 retrieved on January 25, 2014.
5. “I am an employer: How do I sponsor an employee for US permanent resident status?”, US Citizenship and Immigration Services, Washington, DC, October 2013.
6. Cohen’s work for the Department of Labour was later published as Cohen (1995).
7. In a presentation made at a symposium held by the Economic Policy Institute in 2009, Cohen indicated that job vacancies would be a good measure if they were available (see http://epi.3cdn.net/85ec6cf493f0f84caf_36m6baufj.pdf, accessed January 22, 2014).
8. The description of the UK system is based on Downs (2009) and a presentation by Martin Ruhs at the symposium held for this project. The Ruhs presentation is available at http://epi.3cdn.net/7329ec8745d286ac32_zbm6b9nzz.pdf (accessed January 22, 2014).

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