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# How Do We Know Occupational Labor Shortages Exist?

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of workers during the recent recession, but the resources available, even with the ARRA funding, were insufficient to provide the same level of services throughout the two-year ARRA funding period that the system provided before the recession. Calculations, described in the larger study, estimate that an additional \$8.5 billion, on top of the \$2.03 billion appropriated under ARRA, would have been needed to provide prerecession-level services to the influx of participants into the three programs. A conscious decision was made to spend money on passive policies, such as extending UI benefits, instead of providing additional dollars for more active policies, such as job search assistance and training. Furthermore, the desire to spend the ARRA funds as quickly as possible left fewer resources available later on when the largest numbers of participants were still in the programs. Nonetheless, the system exhibited a capacity to expand services, albeit for a short period of time, and to help people get back to work.

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# How Do We Know Occupational Labor Shortages Exist?

**T**he term *labor shortage* has no universally agreed upon definition. It sometimes refers to a shortfall in the total number of individuals in the labor force, and sometimes denotes the possible mismatch between workers and jobs in the economy. In our recently published book, *Occupational Labor Shortages: Concepts, Causes, Consequences, and Cures*, we define an occupational labor 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. (Please see [www.upjohn.org/Publications/Titles/OccupationalLaborShortages](http://www.upjohn.org/Publications/Titles/OccupationalLaborShortages) for more information about the book.) In general, the quantity of labor that workers are willing to provide is an increasing function of the wages (i.e., price) they can obtain, and the relationship between wages and the amount that workers are willing to provide at various prices, with other factors held constant, is referred to as the labor supply curve.

Figure 1 shows a typical upward-sloping supply curve for labor. As the wage rate is increased, more workers are willing to enter a particular occupation, and current workers are generally willing to provide more labor. In Figure 1, the amount of labor that employers wish to hire at alternative prices is indicated by the downward-sloping demand curve. The point labeled *E* in Figure 1 is the market equilibrium point. If the wage is equal to  $W_E$ , then the quantity of labor that workers are willing to supply at that wage ( $Q_E$ ) is exactly equal to the quantity of labor 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 labor 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 labor 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 labor market is likely to have some vacancies in equilibrium; thus, the question is: When are there

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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 labor market is not easy. The Bureau of Labor 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 do 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 labor increases faster than supply can grow—a condition sometimes observed in the market for engineers during economic booms. Although rapid increases in

demand can lead to labor shortages, there are other potential causes as well. As baby boomers reach retirement age, some occupations may experience swift drops in labor 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 labor 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, such as teacher certification.

In the absence of vacancy measures, shortages can only be identified by employer actions to obtain additional labor. If a shortage exists, the first thing we would expect to see is employers increasing 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
- use public or private employment agencies
- pay bonuses to employees who bring in workers

Employers might take other actions to eliminate a shortage:

- increase use of overtime
- reduce minimum qualifications for the job
- restructure work to use less of “shortage” occupations
- substitute machinery and equipment for labor
- 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

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 labor, 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 the case studies we conducted for our book, 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.

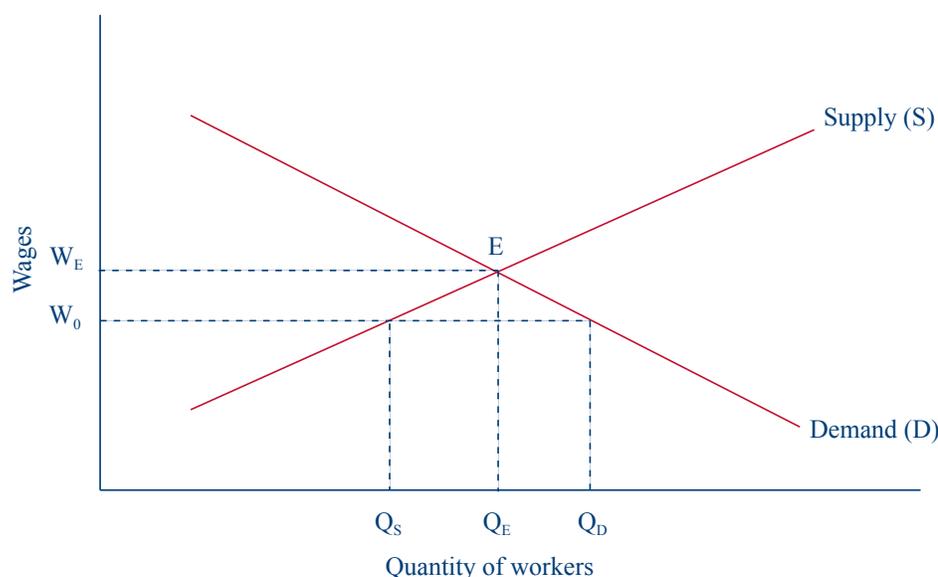
We decided not to use a quantitative measure to define a shortage because there is no simple way to aggregate the signs of a shortage, but others have developed specific measures. Cohen (1990) developed an index for the U.S. Department of Labor for determining a labor shortage based on the following indicators:

- 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

The Migration Advisory Committee in the United Kingdom uses 14 measures related to vacancies, change in salaries, and change in employment as input in determining if there is an occupational shortage that warrants admission of immigrants in a particular occupation (Downs 2009).

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 labor shortages in the absence of vacancy data is challenging. In our case studies, we relied on interviews with employers, worker organizations such as unions, and academics and other researchers who studied the occupation, as well as analysis of data published by the Bureau of Labor Statistics, the Department of Education, and trade associations. In looking at published data, we expected that if there was a

**Figure 1 Illustration of a Labor Shortage**



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 labor 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 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 wages increased and it became increasingly difficult to fill positions, the demand for pharmacists declined. The labor 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 labor 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 our study, in addition to the conclusion

that there are no current shortages in the occupations studied.

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

**Paradoxically, many occupations with persistently tight labor markets have recently increased or are considering increasing entry requirements.** Pharmacists recently began requiring that entrants hold a doctorate degree, the American Physical Therapy Association is striving to have all new physical therapists enter with a doctorate, and some are advocating that the minimum education for registered nurses be increased to a bachelor’s degree. Although there may be good reasons for increasing the educational requirements, the extra costs of gaining qualifications could exacerbate tight labor markets.

**Because of the importance of gathering good information and gathering data on shortages, consideration should be given to improving data on job vacancies and the detail of occupational measurement.** Occupational labor market information is crucial for activities such as career guidance and immigration decisions. The lack of adequate vacancy data and combining occupations at too high of 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.

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