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Michael J. Handel

Labor Shortages: What Is the Problem?

The COVID-19 pandemic produced widespread disruption in labor markets in the United States and elsewhere. In the U.S., an abrupt and unprecedented economic shut-down was followed by fiscal stimulus payments to households, surging consumer demand, worker withdrawal from the labor market due to safety concerns and family responsibilities resulting from childcare and school closures, and high quit rates (Gittleman, 2022). Many employers, particularly in retail, food service, and hospitality and leisure, experienced unusual difficulties maintaining normal staffing levels. The problem of labor shortages became a common subject of discussion (e.g. Bhattarai and Penman, 2023; Society for Human Resource Management, n. d.; U.S. Chamber of Commerce, 2024).

Given the level of recent concern, it seems appropriate to consider both general issues surrounding the concept of labor shortages and the specific circumstances of the post-COVID-19 labor market. This article considers the question, *What is the problem?* in a double sense. It discusses the definition, measurement and drivers of labor shortages, which are subject to considerable debate, but also questions whether all shortages, including the current one, should be considered problems at all.

Labor shortages: What are they and is there a shortage currently?

There is no official, generally accepted or standard definition of a labor shortage, and the term is not widely used within labor economics. A reasonable definition is “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” (Barnow et al., 2013). These conditions are anomalous for most of economics, which assumes disequilibria are temporary and more or less easily resolved through

changes in prices and quantities, like a commodity market. When prices rise, shortages vanish because supply grows and some buyers withdraw.

Empirical evidence of persistent disequilibria might include a simultaneous rise in wages and employment or job vacancies, suggesting growth in labor demand is outpacing growth in supply. Alternatively, an increasing number of hard-to-fill vacancies or increasing average duration of vacancies might be used to measure shortages. However, determining whether a shortage exists would require drawing a line separating ordinary labor market tightness from shortage conditions. In addition, much discussion regarding labor shortages relates to specific kinds of jobs, which would require data on job vacancies by occupation, which are rare. In practice, much of the evidence for labor shortages relies on overall job vacancy data.

In the U.S., job vacancies, as well as hires, resignations and layoffs, are tracked by the monthly Job Openings and Labor Turnover Survey (JOLTS) conducted by the U.S. Bureau of Labor Statistics beginning in December 2000. This survey samples approximately 21,000 establishments from a sampling frame of 11 million establishments covering all employers except farm-related and private household sectors. JOLTS collects information on industry, establishment size and region, but not occupation, so it can only measure the general state of the labor market – not specific shortages. The reference period for the number of vacancies is the last business day of the month and a vacancy is defined as an open position that can start within 30 days for which the employer is actively recruiting outside the establishment using help wanted ads, Internet posts, signs, word of mouth or other outreach.¹ “These data serve as demand-side indicators of labor shortages at the national level...The availability of unfilled jobs—the job openings [vacancy] rate—is an important measure of the tightness of job markets, parallel to existing measures of unemployment” (U.S. Bureau of Labor Statistics, 2022).

Figure 1 shows the vacancy rate from December 2000 to January 2024. JOLTS calculates the vacancy rate based on the number of vacancies divided by the total employment plus the number of vacancies, that is $\frac{\text{vacancies}}{(\text{employment} + \text{vacancies})} * 100$. Prior to 2018, the vacancy rate fluctuated within a narrow band of 2%-4%, drifted up somewhat in 2018-19, and shot up at an unprecedented rate from 4.5% in Decem-

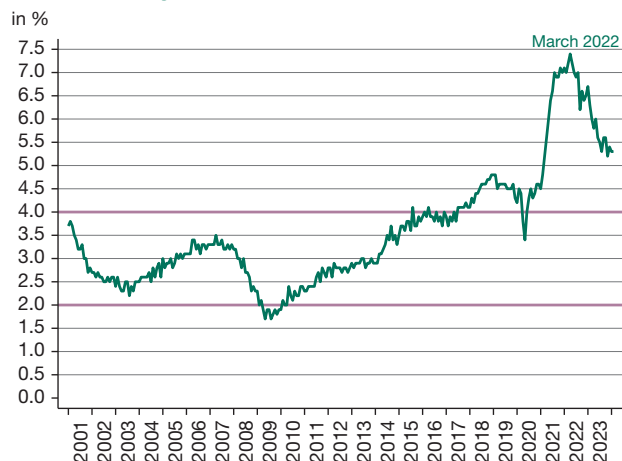
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¹ <https://www.bls.gov/jlt/jltdef.htm>.

Figure 1
US monthly jobs opening rate, December 2000-January 2024



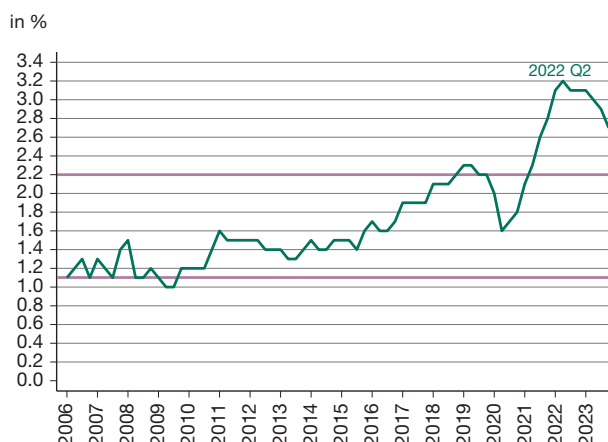
Source: U.S. Bureau of Labor Statistics.

ber 2020 to a record 7.4% in March 2022. After some softening, the rate declined relatively consistently beginning in December 2022, reaching 5.3% in January 2024. There is no question that the post-COVID-19 trajectory looks very different from previous cycles; the rate has remained elevated relative to historical norms for three years now.

Interestingly, Figure 2 shows that the job vacancy rate for the euro area, measured quarterly, followed a similar pattern as the U.S., though both the pre-COVID-19 range (1.1%-2.2%) and the post-COVID-19 peak (3.2%) in the second quarter of 2022 are significantly lower than the corresponding figures for the United States. The consistently higher vacancy rate in the U.S. relative to the EU has been noted previously, though the reasons for it are unclear (Bauer, 2015). Figure 3 shows the vacancy rate in the United Kingdom also fluctuated within a narrow range similar to the euro area for 20 years (1.6%-2.8%) before rising sharply to over 4% in May 2022 and falling subsequently.

Although the levels differ across regions, the shapes of the trends are remarkably similar, including the timing of the peaks around the first or second quarter of 2022 and the subsequent downward trend, which has yet to reach pre-pandemic levels. Even though many European countries helped workers stay in their jobs through wage subsidies, in contrast to the U.S. offering enhanced unemployment benefits to the jobless, there may be some common force that caused vacancies to rise sharply in all three regions, which, nevertheless, has been diminishing for the past two years. Public concerns over labor

Figure 2
Euro area quarterly job vacancy rate, 2006 Q1-2023 Q4



Note: Euro area 20 (fixed composition).

Source: ECB Data Portal.

shortages find support in the unprecedented and sharp rise in vacancy rates in all three regions, but this indication of acute shortage has been reversing in all of them, as well.

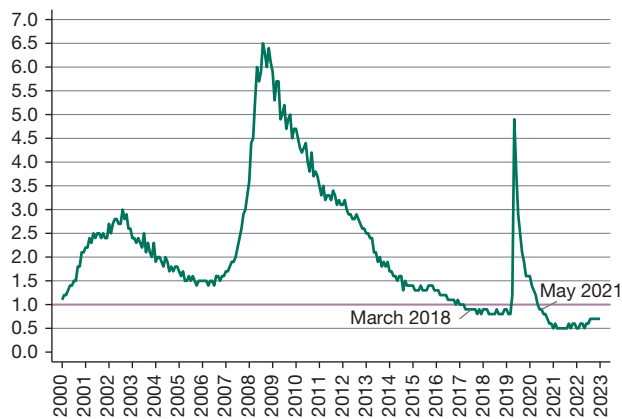
This view must be qualified somewhat, at least for the United States, in light of trends in the number of unemployed persons per job opening shown in Figure 4. This measure gives a general sense of the number of available workers per vacancy, though the potential entry into the labor market of persons not currently looking for work means that it is not an exact measure of labor availabil-

Figure 3
UK job vacancies ratio per 100 employee jobs, May 2001-December 2023



Source: UK Office for National Statistics.

Figure 4
Number of unemployed per job opening, seasonally adjusted, December 2000–December 2023



Source: U.S. Bureau of Labor Statistics.

ity. Nevertheless, the ratio rarely fell below 1.0 and averaged 2.1 unemployed workers per vacancy over the entire 23-year period. However, the ratio fell below 1.0 from March 2018 to February 2020 and from May 2021 to December 2023. For most months between December 2021 and April 2023, the ratio was 0.5, meaning the number of unemployed job seekers was only one-half the number of job vacancies, which is unprecedented. This could be interpreted as indicating that the United States labor market has been in shortage for five of the past six years. However, the economy has not experienced notable strain despite what would normally be considered a disturbing scarcity of jobseekers relative to the number of vacancies.

Distinguishing among labor shortages

The vacancy rate and the number of unemployed per vacancy are useful indicators of the general state of the labor market. But discussions of labor shortages cover several, often related issues that are useful to distinguish in more detail.

The most important distinction is between shortages associated with very low overall unemployment rates and shortages less related to general labor market conditions, some of which seem chronic.

Related to this distinction is the contrast between labor shortages for less skilled jobs having low barriers to entry and shortages relating to jobs with long preparation times (tertiary education, apprenticeships) or other barriers to entry (e.g. certifications, licensing, remote location). Related to the previous point, shortages for

less skilled jobs generally emerge when overall unemployment is very low, while shortage issues for jobs with long training times are tied less closely to the business cycle.

Within this latter group are particular jobs that seem to be subject to consistent complaints regarding labor availability across time and space, such as skilled trades, information technology (IT) jobs and healthcare. Indeed, among the top twenty shortage occupations reported by the European Employment Services (EURES), 60% were in skilled trades, 15% were healthcare professionals, and 10% were software professionals, and these occupations tend to be reported relatively consistently over time and across countries as facing shortages (European Labour Authority, 2023, 20–26). For the IT and healthcare sectors, which are growing robustly, demand is a moving target that chronically races ahead of supply. Other occupations might appear more idiosyncratically and experience one or more episodes of shortage, rather than be subject to such persistent concerns.

Finally, there is a need to consider employer claims critically outside of the recent anomalous labor market situation. A survey sponsored by a manufacturing trade association (2011) found 74% of firms agreed that a lack of skilled production workers had had a “significant negative impact on [their] company’s ability to expand operations or improve productivity.” However, a more rigorous research survey (2012–13) testing these claims found only 16.1% of respondents, mostly plant managers, agreed that “lack of access to skilled workers is a major obstacle to increasing financial success” (Osterman and Weaver, 2014). Indeed, wages for manufacturing production workers had not increased prior to this time, even for those with the highest training, as one would expect if there were a genuine shortage (Osterman and Weaver, 2014). Analysts might doubt the existence or depth of a labor shortage if employers say they cannot find workers but have not tried raising wages to attract more workers or if they complain of a skill shortage but offer poor working conditions or cite poor work motivation when pressed to identify specific skills in short supply.

Shortages relatively independent of the business cycle

Reported shortages that are relatively independent of the business cycle exhibit certain patterns. Roughly speaking, some mainly reflect the nature of the industry, employer or job, while others mainly reflect worker characteristics. A third group reflects systemic characteristics more clearly related to policy and institutions.

Employer-side issues

As noted above, the most frequently reported shortages relate to IT, skilled trades and healthcare. To some extent, this reflects strong *expansion demand*. Demand for IT workers has tended to increase rapidly and in a sustained fashion. The demand for healthcare professionals has been even more consistent over time, though perhaps less rapid. The demand for construction trades workers has often increased sharply during building cycles, but also has a more chronic aspect independent of cycles, partly for reasons discussed below.

The IT sector experiences an unusually rapid rate of skill obsolescence as technologies, products and strategies evolve, such that current workers do not necessarily satisfy current needs. There is demand for younger, more recently trained workers in preference to some members of the current workforce. Firms or sectors may face a continuous recruitment cycle, replacing workers with obsolete skills with recent graduates on an ongoing basis. This *substitution demand* means that even firms that are not increasing the overall size of their workforce find themselves searching for new hires among a relatively small group of highly specialized workers. It would not be surprising for firms seeking developers of artificial intelligence (AI) models to complain of shortages, though it is possible that rising compensation is performing its equilibrating function in this case.

If jobs require *long education and training times* (tertiary education, apprenticeships), this can produce lags in labor supply responses to shortages, as may occur in the cases of STEM jobs, healthcare and skilled trades.² This may partly account for reports of skilled trades shortages outside of construction booms and outside the construction industry itself, such as shortages of machinists and other metal workers in manufacturing.

Spatial isolation may also contribute to shortages, especially when jobs involve skills in high demand elsewhere (e.g. rural health professionals), the local supply is not large enough relative to production volumes, or working conditions are undesirable and demanding (e.g. offshore oil drilling).

Most of the preceding considerations reflect characteristics of jobs that are relatively outside the control of individual employers. Other employer-side issues are more controllable and potentially modified by individual employer actions.

Restrictive hiring standards of various kinds, such as requirements regarding education and prior experience, narrow the effective pool of potential hires. Much debate and research considers the degree to which education requirements reflect functional job demands as opposed to credentialism, signaling or attitudes, social skills and cultural capital (Bills, 2003). Indeed, there is evidence that employers relax education and prior experience requirements somewhat when labor markets tighten, presumably in response to hiring difficulties (Modestino et al., 2016). A number of U.S. state governments and major corporations have dropped formal requirements that applicants have a bachelor's degree for equity reasons and in response to the tighter labor market, but these moves are too recent for their effects to be well understood (Fuller et al., 2022; McCrary-Ruiz-Esparza, 2023; McLean, 2024). Less formal employer criteria, such as gender, ethnic/racial, cultural or other stereotypes regarding ideal job candidates, also narrow the hiring pool but efforts to address significant underrepresentation of women and minorities in IT, other STEM occupations and skilled trades have had limited impact.

Also contributing to perceived shortages are high quit rates in jobs with low pay, poor working conditions and high levels of dissatisfaction, stress and burnout, leading to persistently high levels of *replacement demand*. Jobs in food service, call centers, care work and social assistance, nursing, and long-distance trucking often experience constant churn, such that employers are effectively always looking for workers, potentially reaching the limits of the local labor supply.

Finally, if employers keep *job rewards and job attractiveness unchanged* while hiring difficulties increase, so-called shortages may develop. If pay, working conditions and terms of employment (e.g. scheduling) do not improve, then greater hiring difficulties are a predictable consequence. Employers are reluctant to raise wages because they may reduce profits directly or indirectly through declining sales after prices increase and because they are difficult to reverse if the labor market loosens. They may also affect longstanding internal pay differentials, creating dissatisfaction among long-tenure workers. Thus, employers may prefer to increase recruiting efforts or wait to see if the problem resolves itself. Nevertheless, this reluctance partly explains why labor markets do not equilibrate like commodity markets and disequilibria persist, even as employers continue to complain of shortages.

Worker-side issues

Among worker characteristics contributing to labor shortages, *skill shortages* receive the most attention. Reported

² STEM stands for science, technology, engineering and mathematics.

problems include basic and general skills associated with secondary or tertiary education, more narrow occupation-specific skills (e.g. skilled trades) or highly technical skills associated with STEM occupations. While complaints of skill shortages seem an almost perpetual feature of the employment landscape, the evidence rarely clearly supports these claims (Handel, 2003; Handel, 2005; Weaver and Osterman, 2017).

In certain cases in which skill supplies seem to fall below demand, this may reflect *worker preferences*, such as an aversion to working in skilled trades or manufacturing production jobs, or to studying highly demanding STEM subjects in university. In such cases, rising demand collides with an unenthusiastic workforce. Insofar as gender differences in occupational choice reflect individual preferences or other societal forces independent of employers (e.g. social norms, societal and coworker attitudes), this will also narrow the potential workforce for particular jobs.

Finally, there are *spatial mismatches* between the areas in which employment is expanding and the location of job-seekers that reflect worker resources and preferences. Lower-income workers are particularly affected by limited public transportation in many urban U.S. labor markets and long commutes in non-metropolitan areas, which inhibits effective matching. Likewise, the expense of permanent relocation across long distances and workers' embeddedness in family and local social networks inhibits redistribution of workers across regions with high and low unemployment rates.

From the preceding, one can hypothesize that IT jobs face chronic shortages partly because total demand is rising robustly, skill obsolescence is common, high skill requirements lengthen training times and decrease workforce interest, while broadly held gender attitudes contribute to narrowing potential supply. Healthcare also faces sustained demand growth and long training times, while skilled trades in construction experience bursts of cyclical demand, long training times, and perhaps insufficient workforce interest. This undoubtedly still leaves much unexplained but provides a coherent framework for understanding the issues.

Systemic issues

On a more systemic level, the *efficiency and effectiveness of matching* affect the potential for shortages. Online job boards and employer web postings may have reduced search frictions (Bhullar et al., 2023). However, the ease of discovering and applying for vacancies online also produces a flood of applicants for many openings, leading employers to use automated screening software and gen-

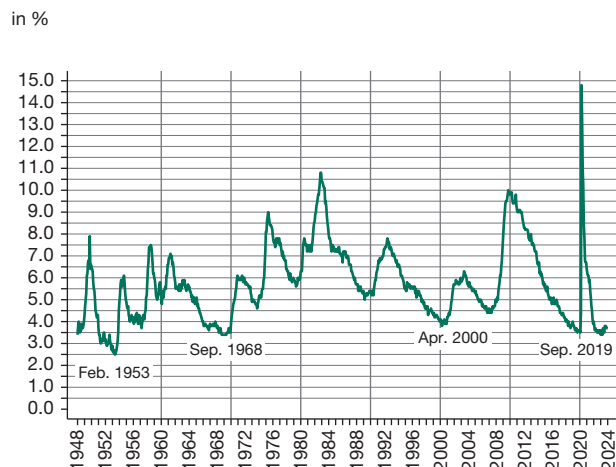
erating concerns regarding algorithmic bias. Even before online job posting became popular, U.S. employers hired relatively few workers from public employment services, viewing this pool as less skilled or less desirable, and private employment agencies account for only somewhat more hires (Eberts and Holzer, 2004, 26).

Weak training systems may be a source of scarce skills. In the U.S., training providers besides employers include community/technical colleges, government agencies, trade schools, nonprofit organizations, unions and various online microcredential and certificate providers. These actors address skill shortages with greater or lesser effectiveness, but represent a loosely organized field rather than a well-defined system. Increasing the quantity and quality of training are longstanding policy goals, but effective government training programs and scalable non-government programs remain scarce. Workers may also have difficulty accessing training due to costs and competing demands from work and family responsibilities. Older workers may be reluctant to make heavy investments in training given the shorter payback period and knowledge of employer reluctance to hire older workers.

Immigration can address shortages, and there are clear cases where immigration restrictions contribute to labor supply problems, such as in Japan, but its role is often controversial. There is ongoing debate as to whether immigrants displace natives, employers actively seek immigrant workers in order to push down labor costs, or immigrants move into jobs that natives are abandoning as unattractive or for which native supply is insufficient. Domestic policy has a strong influence on the total quantity and the occupational profile of immigrants, but global political and economic conditions also affect immigration flows.

Finally, *population aging* means a declining share of the population will be available to satisfy total demand, as retirees not contributing to current production will continue to consume. The shrinking relative size of the workforce may produce generally tight labor markets and problems for labor recruitment as the baby boom generation ages, perhaps leading to increased demand for immigrant labor. Healthcare and related occupations will be most directly affected given the effects of aging on the demand for services. The decline in the share of working-age cohorts could be offset somewhat by raising women's labor force participation (LFP) through better access to child-care and elder care, reversing declines in prime-age male LFP, raising retirement ages, and fostering a greater use of remote work, but the effects would be relatively small compared to the impact of population aging (Goss, 2023).

Figure 5
Monthly unemployment rate, January 1948 - January 2024
in %



Source: U.S. Bureau of Labor Statistics..

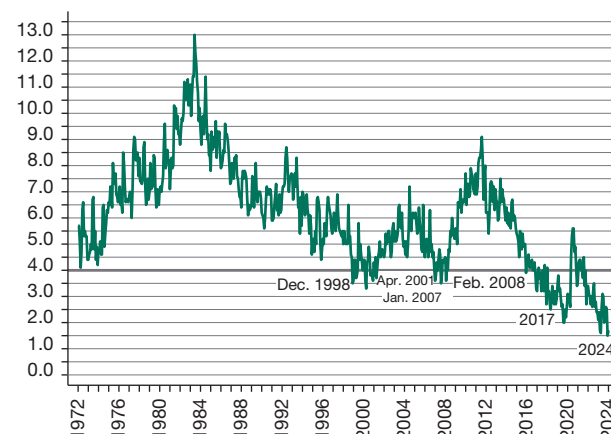
Shortages related to business cycle peaks: What is the problem?

The previous section focused on shortage considerations that are relatively independent of the business cycle. However, the figures in the first section suggest that the large number of unfilled vacancies today might simply reflect a strong economy. The question this raises is why cyclical peaks should be considered a problem.

Generally speaking, less-advantaged workers face relatively slack employer demand. Tight labor markets disproportionately improve the bargaining power of disadvantaged workers, such as those at the lower end of the education and wage distributions and those belonging to underrepresented groups. In tight labor markets, job opportunities and wages rise, inequality falls, and social inclusion grows. Full employment is a major policy goal that disproportionately benefits the least advantaged at the end of hiring queues. If elevated hiring difficulties in some corners of the labor market are one consequence, they cannot be the primary concern.

Figure 5, showing the U.S. monthly unemployment rate over 76 years (January 1948 to March 2024), illustrates just how favorable recent years have been. For the 23 years between 1948 and 1970, the unemployment rate fell below 4.5% for exactly one-half of all months. The rate did not fall that low for any month in the next 28 years (early 1970-early 1998) or the 10 years between May 2007 and March 2017. Since 1998, nearly two-thirds of the months with unemployment below 4.5% were between 2017 and

Figure 6
Difference between black and white monthly unemployment rates, January 1972 - January 2024
in percentage points



Source: U.S. Bureau of Labor Statistics.

March 2024. Unemployment has been below 4% for 27 of the past 28 months (December 2021-March 2024). The rate fell to 3.4% for two months in early 2023, a level last seen 54 years earlier in May 1969.

The overall strength of the labor market has powered very large improvements for less educated workers. Between January 1992 and January 2024, the average unemployment rate for those not completing secondary school was 8.8%, while the rate for high school graduates was 5.6%, the rate for those with some college was 4.6%, and the rate for those with a bachelor's degree or more averaged only 2.8%. After 2017, aside from the pandemic months (March 2020-October 2021), the gap in unemployment rates between those with at least a bachelor's degree and those with less than high school fell by more than half to 3.4 percentage points. The gap between the university-educated and high school graduates fell to 1.9 percentage points, and the gap between university graduates and those with some college fell to 1.1 percentage points.

The black-white unemployment gap averaged 6.1 percentage points over the 52 years shown in Figure 6. At its height, toward the end of a deep recession (June 1983), the difference was 13 percentage points, when 8.7% of whites were unemployed as opposed to 21.7% of blacks. The second-largest gap, after the Great Recession (August 2011), was over 9.0 percentage points, when rates were 7.9% for whites and 17.0% for blacks. The gap fell below 4.0 percentage points for only 14% of all months in the past 52 years, all during cyclical peaks since 1997. Of these months, 80% occurred after 2015. In December

2023, the black-white unemployment gap narrowed to 1.5 percentage points, the lowest ever recorded by a wide margin.

Yet even during this period of remarkable progress, there were calls in the U.S. Congress to investigate labor shortages (Donovan et al., 2022). Employers may complain about difficulties finding workers and pressures to raise wages, but it must be recognized that this is the market at work. Net welfare improves and inequality declines when more people seeking employment can find jobs and the reserve army of the unemployed contracts. Those at the bottom suffered the most during long periods when labor markets were looser, so it is hard to gainsay their benefiting when the labor market tightens. This situation is one for which we have been waiting a long time.

This is not to say that there are no potential problems when the economy runs closer to capacity. However, one prominent concern, price inflation, has returned to near pre-pandemic levels without a large increase in joblessness, suggesting the tension between full employment and price stability may be less serious than sometimes supposed. Perhaps a more serious objection is that currently high vacancy rates signify foregone output. One could also argue that increasing worker education and training might raise employment and wages more sustainably than a high-pressure economy. The fact that large numbers of less educated workers remain unemployed or have dropped out of the labor market despite the unusually low unemployment rate suggests skill levels and employability need improvement.

Macroeconomic policy is labor and social policy

Nevertheless, the strength of the macroeconomy is critical. Even the most effective training and education, placement services and work incentives will face extraordinary headwinds if jobs are scarce. The costs of high unemployment include long-run pay losses for new workforce entrants and displaced older workers, skill depreciation and early labor market exit – rather than the extension of working life that is a policy objective in most advanced economies. Improving labor market outcomes during boom times through better education and training, enhanced worker bargaining power and more effective matching are all important, but their effects are not as quick and widespread as a high-pressure economy, which also facilitates the other policies. Policy objectives like raising wages at the bottom, reducing inequality and poverty, and promoting social inclusion are all much easier to address when unemployment is very low. Tight labor markets are not a problem, they are part of the solution.

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