



## Chapter 6

# Supply Challenges in U.S. Labor Markets

Despite the enormous disruption of the COVID-19 pandemic, U.S. labor markets remained tight throughout 2022. For much of the last year, there were two job openings for every unemployed person—an unprecedented gap between labor demand and supply that has shifted the balance of power between workers and businesses. The resulting surge in hiring empowered many workers to change jobs and careers, with many job switchers experiencing substantial wage gains. Workplace organizing increased, with union representation petitions rising sharply in 2022, as workers sought to use their increased leverage to negotiate better working conditions.

It is tempting to assume that today's hiring challenges are primarily due to the lingering effects of the pandemic. However, tight labor markets predated the pandemic, and demographic trends indicate that labor supply challenges are likely to remain, even as the pandemic recedes. The baby boom generation is aging out of the labor force, and there are not enough younger workers to replace them. This tightening of the supply of labor due to population aging is a principal cause of current hiring challenges, constraining the economy's capacity for growth by slowing the rate at which businesses can expand hiring. Unless efforts are undertaken to mitigate the impact of demographic change—by drawing more adults into the labor market and/or increasing immigration flows—the labor supply is likely to be constrained for the foreseeable future.

This chapter examines both short- and long-run challenges for the U.S. labor supply. In the short run, some lingering effects of the pandemic remain, principally in the form of heightened labor market exits of older workers.

Immigration inflows, which were falling before the pandemic began, fell steeply when the U.S. borders closed and are just starting to recover. Chief among the long-run challenges are demographic trends, particularly population aging, but also falling labor force participation among prime-age adults. The chapter concludes with a description of several options to boost the U.S. labor supply; it also takes a closer look at labor markets experiencing especially acute labor shortfalls to see how macroeconomic forces are affecting specific industries.

## **Labor Supply Fundamentals**

What determines the supply of labor? Simply put, individuals who are able to work decide whether to join the labor force, and if they do, how many hours they will work. Individuals can also decide to leave the labor force—to retire, to seek further schooling, or to care for small children. The aggregate labor supply of a nation is the sum of these individual choices. The aggregate labor supply is also a function of the size of the working-age population, which depends on fertility choices of earlier generations as well as immigration flows.

In the simple framework used in economics textbooks to model the labor supply decision, employment is a choice between earning a wage and the alternative uses of that time (e.g., household tasks, childcare, leisure). Households also require a steady source of income to pay for necessary goods and services. This very simple model ignores many important variables that go into the labor supply decision, such as the psychological and social rewards of work and the nonmonetary aspects of particular jobs. Yet this simple model does allow economists to make useful predictions of how individual decisions are affected by more easily observed factors, such as changing wages and the availability of other household income.

Chief among these inferences is that individuals who cannot meet essential consumption needs without working are highly likely to participate in the labor market. This suggests that individuals without a source of pre-existing wealth or nonwage income are more likely to seek formal employment. A second implication is that individuals are more likely to enter the labor market when wages are high, when nonparticipation becomes more costly in lost earnings. This model also predicts that participation will fall when wages decline, for example, due to negative labor demand shocks. As discussed later in the chapter, many economists believe that declining

relative wages for non-college-educated workers are chiefly responsible for men's declining participation in recent decades.

### ***Trends in U.S. Labor Market Participation***

The labor force participation rate (LFPR) is defined as the share of the population age 16 years and above who are working or who are actively seeking employment (BLS 2022). The labor force participation rate is an important measure of labor market potential and health (box 6-1). Nonparticipation in paid activity is not necessarily a source of concern—many nonparticipants are retirees, students, or parents with young children, many of whom do not desire formal employment. However, low participation rates can indicate an untapped potential labor supply, which includes individuals on the sidelines who would enter the labor market if attractive opportunities were available or obstacles to formal employment were removed.

As shown in figure 6-1, labor force participation rose markedly in the second half of the last century, from 59.6 to 67.1 percent between 1968 and 2000. This growth in participation was due to the increased labor market activity of women—facilitated by changing societal norms, access to birth

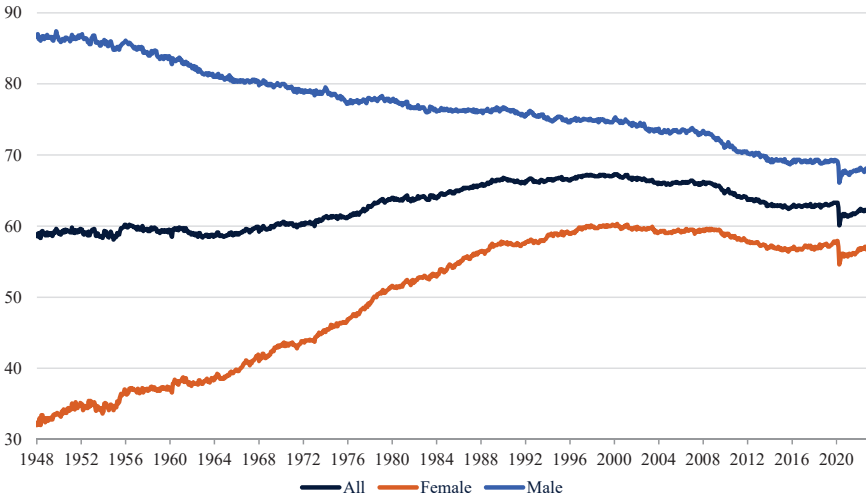
#### **Box 6-1. Labor Supply Terminology**

Discussions about the labor supply can be confusing, given that the term “labor supply” is sometimes used to indicate the aggregate labor supply and at other times refers to labor force participation. In this chapter, we distinguish which term we are using as follows:

- *Labor supply* typically refers to the aggregate labor supply, which is a function of the adult population (age 16 years and above), as well as the share of the adult population that participates in the labor market. However, analyses of the labor supply often take population trends as given and focus on the labor supply decisions of individuals, which are reflected in the labor force participation rate and the employment rate, as defined next here.
- *The labor force participation rate (LFPR)* is the share of the non-institutionalized adult population participating in the labor market; this includes people who are currently working or who are seeking employment.
- *The employment-to-population ratio, or the employment rate*, is the share of the noninstitutionalized adult population that is employed. It is a participation measure similar to the LFPR but does not include unemployed people in the numerator.

**Figure 6-1. U.S. Labor Force Participation Rate, 1948-2022**

*Participation rate, in percent, age 16 years and above*



Sources: Bureau of Labor Statistics; CEA calculations.

Note: Data are seasonally adjusted. Rate is for age 16 years and above.

control, and improved education and labor market opportunities—with large gains especially among married women (e.g., Blau and Kahn 2007; Goldin and Katz 2002; Black and Juhn 2000). The increase in women’s participation was more than enough to offset the decline in participation among men since the 1950s. As a result of more women entering the labor market and favorable demographic trends (the baby boom generation swelled the ranks of the workforce during this period), the U.S. labor supply grew steadily until 2000.

Labor force participation in the United States began to decline after 2000 due to both supply and demand factors. The U.S. economy experienced two demand shocks during this period: the dot-com crash, which ended the economic expansion of the 1990s; and the global financial crisis, which began in 2007. Women’s participation growth also leveled off and began to decline after 2000. But the most significant factor pushing down participation in recent years has been the aging of the workforce, with the oldest baby boomers entering their retirement years at the beginning of the global financial crisis.

### ***Why Worry About Slower Labor Supply Growth?***

Declining labor force participation and slowing U.S. population growth mean that there is a dwindling supply of workers. A principal reason to be concerned about slower labor supply growth is that it implies slower economic growth (for further discussion, see chapter 1 of this *Report*). The

growth of economic output is determined by labor supply growth, capital investments, and productivity growth—all else being equal, if the labor supply's growth slows, so too does economic growth. As labor market participation declines with age, an aging population also reduces the fraction of active workers in the population, thereby putting downward pressure on output per capita if not accompanied by capital investments or increases in productivity. Strong per capita economic growth was a primary driver of rising living standards over the last century; the aging population could have a negative impact on improvements in U.S. living standards in the future.

Although demographic change is relatively easy to forecast, it is more difficult to account for changes in technology and productivity that may dampen the impact of the aging population on future economic growth. Cutler and others (1990) posit that labor scarcity could spur labor-saving technological innovation that would offset the impact of demographic change on output growth. Most studies have concluded that the relationship between

### **Box 6-2. Work and Leisure in the United States and Europe**

John Maynard Keynes famously predicted that within two generations workers would work only 15 hours a week. For today's Americans, that is simply not the case, despite living in a vastly richer country than Keynes experienced in the early 1900s. After decades of decline, the length of the typical American workweek began increasing in the 1970s, despite widespread expectations that productivity growth would lead to more leisure time for workers. Schor (1993) highlighted the plight of the “overworked American” in an influential book on work and leisure in the United States. She determined that a weakened labor movement and the erosion of workers' power were largely responsible for setbacks in converting productivity gains into a shorter workweek for workers.

Americans in the labor market now work longer hours, have less sick leave, and take fewer vacations than those in other wealthy nations. In 1960, hours of work and labor market participation rates were similar in the United States and Europe. But by 2000, there was a large gap in the work effort of the typical person in the United States compared with their counterparts in Europe. While the typical American works as many hours a year as they did in the 1970s, Europeans generally work much less, working fewer hours and weeks throughout the year. As suggested by Schor, differences in labor regulation and unionization appear to be the dominant factors explaining differences in annual hours worked per year between the United States and Europe (Alesina, Glaeser, and Sacerdote 2005).

### Box 6-3. Deaths of Despair in the United States

For white Americans between age 45 and 54, average life expectancy is no longer increasing; in fact, it even declined for several years, a pattern not previously seen outside pandemics or wars. This occurred during a period when Black Americans saw gains in life expectancy, narrowing the enduring gap in outcomes between these two groups. Increases in mortality rates among whites are largely accounted for by higher rates of suicide, opioid overdoses, and alcohol abuse (Case and Deaton 2015). The term “deaths of despair” was coined by Case and Deaton (2020) in their influential book, which documents the impact of declining economic opportunity on the health and well-being of working-class society in the United States. They explain that these deaths of despair primarily affect white Americans without a four-year college degree, living in areas of the country that have a very low share of the working-age population employed.

While economists usually frame employment as a choice between paid work and alternative uses of time, Case and Deaton’s (2020) work highlights the importance of good jobs in providing meaning, structure, and purpose to a community. They write: “Destroy work and, in the end, working-class life cannot survive. It is the loss of meaning, of dignity, of pride, and of self-respect that comes with the loss of marriage and of community that brings on despair, not just or even primarily the loss of money.” Their research shows how the diminished economic prospects of white working-class Americans constitute not only an economic crisis but also a public health crisis.

Recent papers have challenged the notion that growing deaths of despair are a phenomenon unique to economically disadvantaged whites; deaths from suicide, drug use, and alcohol use have risen even more among Indigenous persons living in the United States (Friedman et al. 2023). Among Indigenous persons, local economic conditions have a heterogeneous effect on deaths by suicide and drug use, suggesting that improvements in economic conditions alone may not be enough to reduce deaths of despair (Akee et al. 2022).

an aging population and output is negative (e.g., Gagnon, Johannsen, and Lopez-Salido 2021; Maestas, Mullen, and Powell 2022; and Sheiner 2014). However, Acemoglu and Restrepo (2020) find that the impact on technological change dominates, and that an older workforce increases economic growth. Eggertsson, Lancastre, and Summers (2019) similarly find that population aging can increase growth due to increased national savings that accrue as populations age, driving down interest rates. However, as interest rates approach zero and cannot fall further, this mechanism is disrupted, and

they find that the impact of aging on growth becomes negative. Overall, the evidence suggests that aging populations slow per capita economic growth, but the economy's potential to adapt to the tightening of labor supply in ways that spur productivity cannot be discounted.

From an individual perspective, the fact that fewer people are engaged in paid labor market activity is not necessarily negative and could simply reflect personal choices. By way of example, John Maynard Keynes famously predicted in 1930 that technological progress would increase living standards so much that his grandchildren would work just 15 hours a week, devoting the rest of their time to leisure (Keynes 2010; orig. pub. 1930). As noted in box 6-2, this prediction did not come to pass for workers in the United States. But evidence suggests that many nonparticipants, if not otherwise engaged in schooling or caring for young children, are not happier than those who work. Prime-age men who are out of the labor force report low levels of emotional well-being, and derive little meaning from how they spend their time (Krueger 2017). They are also less likely to be married and much more likely to be living in poverty. Localities where employment rates have fallen the most have also seen a sharper rise in opioid deaths and suicides (see box 6-3), suggesting significant community stress in these areas.

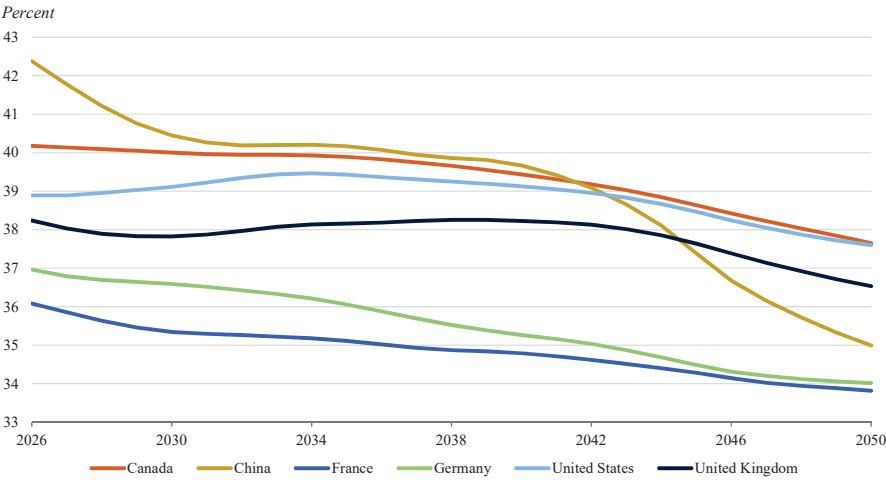
## Causes of U.S. Labor Supply Challenges

Slowing population growth and declining labor force participation are significant headwinds for U.S. labor supply. If these trends persist, and offsetting increases in productivity or capital intensity fail to materialize, there will not be enough workers to meet long-run demand. Because understanding the causes of current labor supply challenges is necessary to craft effective policy solutions, this section provides an overview of the dominant factors driving slower growth of U.S. labor supply since 2000.

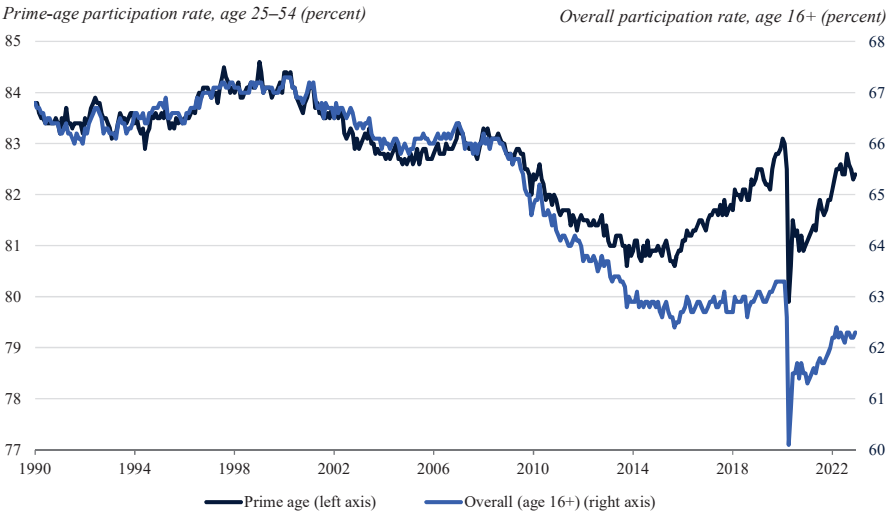
### *Demographic Trends*

Demographic trends are the principal cause of near-term U.S. labor supply challenges. Over the next decade, the share of the population in their prime working years (between age 25 and 54) will decline in the United States and in many other countries, as shown in figure 6-2. These demographic trends are the result of a sharp decline in fertility rates between 1960 and the late 1970s, with fertility remaining at or below replacement rates for the last several decades. Additionally, life expectancy in the United States has also not kept pace with that of other wealthy nations, and was decreasing for some groups even before the COVID-19 pandemic (see box 6-3). Due to low fertility rates, the vast majority of near-term working-age population

**Figure 6-2. Percentage of Total Projected Population That Is Prime Age, 2026–50**



**Figure 6-3. Prime-Age versus Overall Labor Force Participation, 1990–2022**



growth will be accounted for by immigrants and their descendants born in the United States (Blau and Mackie 2017).

The tightening of labor supply conditions due to these demographic trends was well under way before the pandemic, as can be seen in figure 6-3. Between 1990 and 2008, prime-age and overall labor force participation moved more or less in tandem. Starting in 2009, however, the two categories began to diverge, as baby boomers began to enter their early



retirement years. Increases in the participation rate among older workers and slack labor demand conditions in the years after the financial crisis dampened but did not completely offset the initial effect of retirements on the labor supply (Aaronson et al. 2014; Abraham and Kearney 2020). As labor demand recovered and labor markets tightened in the years preceding the COVID-19 pandemic, many workers left the sidelines and entered the labor market in response, easing concerns about the labor supply. Then the pandemic arrived, and COVID-19—a virus that is particularly dangerous for older members of the workforce—sped up many of the forces reshaping the labor market. In December 2022, the prime-age LFPR was just shy of its prepandemic peak, but overall participation had fallen by a full percentage point, due primarily to population aging and the increase in the propensity of older workers to retire during the pandemic.

### *Declining Labor Market Participation Among Men*

In addition to population aging, another cause of slowing labor supply growth is the decline in participation among men, particularly those without a college degree. The participation rate for U.S. men in their prime-age working years peaked in the 1950s and has been falling in earnest since the mid-1960s. This decline is sharper than in other advanced economies. Prime-age men in the United States and the United Kingdom had similar rates of participation in the 1980s and 1990s, but the participation of men in the United States continued to fall after 2000, while the United Kingdom's participation rates remained relatively flat. This trend has particularly significant implications for economic growth, because individuals are at their most productive in their prime-age working years.

The underlying causes of declining male participation have been the subject of much scholarly interest but still remain an open debate. This very large body of research is summarized here to explain the potential causes of declining male participation and to illuminate potential policies to counteract the ongoing decline.

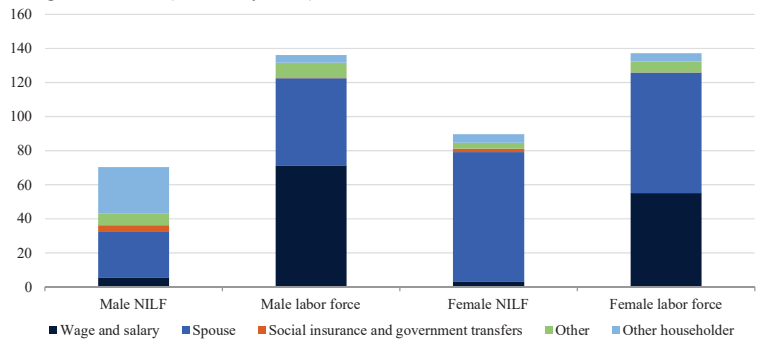
*Spousal income for heterosexual men.* Increases in married women's labor supply could reduce male labor force participation by reducing the cost of nonparticipation and increasing responsibilities at home, such as childrearing and senior care. However, the evidence suggests that this is *not* a significant factor driving down male participation. Men with working wives and men with children have had the smallest declines in participation among all men (Juhn and Potter 2006; CEA 2016). As discussed in more detail in box 6-4, nonparticipating men are more likely than other groups to rely on income from other family members, usually parents. It is plausible that changing trends in household formation, such as more adults living with their parents, will reduce male participation. However, the causality may go

**Box 6-4. On What Income Do Jobless Men Live?**

How do men between the age of 25 and 54 who do not work fund food, shelter, and other necessities? Figure 6-i documents sources of income for prime-age men who were not in the labor force in 2022. For comparison purposes, we also provide the composition of household income for men in the labor force and for women. A primary source of income for nonparticipating men is other household members, principally parents. In contrast, income provided by other household members accounts for only a small share of income for other groups. Spousal income available to nonparticipants is smaller than it is for men in the labor force, in part reflecting lower marriage rates. Government transfer income, particularly disability insurance, is a key source of income for some nonparticipating men, although, as can be seen in figure 6-i, it accounts for a relatively small share of income for nonparticipants as a group.

**Figure 6-i. Sources of Annual Income for Prime-Age Workers by Sex and Labor Force Status, 2022**

*Average annual income (thousands of dollars)*



Sources: Bureau of Labor Statistics; CEA calculations.  
Note: NILF = not in the labor force.

in the other direction: these trends themselves may be an outcome of higher housing costs and fewer labor market opportunities for young workers (Fry, Passel, and Cohn 2020; Matsudaira 2015).

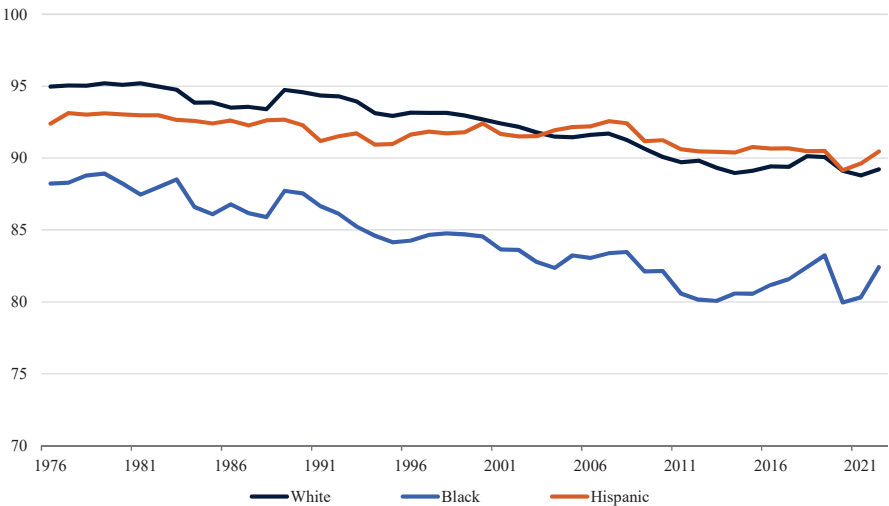
*Disability insurance.* Social Security Disability Insurance (SSDI) is another candidate for a supply-side explanation of declines in male labor force participation rates. SSDI receipts increased for several decades before peaking in 2010, after which their incidence fell (CBPP 2021). A substantial body of research indicates that the availability of SSDI benefits lowers participation for workers who are on the margin of eligibility (e.g., Bound 1989; Autor and Duggan 2003; Maestas, Mullen, and Strand 2013; and

Gelber, Moore, and Strand 2017). However, SSDI receipts do not appear to be an important determinant of declining male participation rates. From 1967 until 2014, prime-age male participation fell 7.5 percentage points, while the share of prime-age men who received SSDI benefits increased by 2 percentage points (CEA 2016). Moreover, this 2-percentage-point rise in the SSDI take-up rate among prime-age men should not be interpreted as having caused lower participation, given that many of the men receiving SSDI benefits would likely not have participated due to their disabilities. An analysis conducted by the CEA finds that, under reasonable assumptions, holding SSDI receipts constant for prime-age men during the 1967–2014 period would only have eliminated between 0.3 and 0.5 percentage point of the observed reduction in prime-age men’s participation (CEA 2016).

*Rising incarceration rates.* As shown in figure 6-4, Black men have a lower labor force participation rate in the United States than Hispanic or white men, and participation among Black men has been falling more steeply than that of other groups. A steep rise in incarceration rates beginning in the 1980s is a potential culprit in the declining employment prospects of Black men, who face a much higher risk of incarceration than white men. Because standard labor market statistics exclude institutionalized populations, they understate the impact of rising incarceration rates on employment among Black men. Doleac (2016) shows that accounting for the incarcerated population lowered the employment rate (i.e., the percentage of the population

**Figure 6-4. Prime-Age Male Labor Force Participation, by Race, 1976–2022**

Participation rate, age 25–54 (percent)



Sources: Bureau of Labor Statistics; CEA calculations.  
Note: “Prime age” is 25–54 years. Data are annual averages.

that is employed) of Black men in 2014 by about 4 percentage points, with only a minimal impact on white men's employment.

Incarceration is also likely to have a negative impact on employment after release—an effect that would be reflected in official statistics. Formerly incarcerated people face a number of barriers to formal employment: limited labor market experiences while incarcerated, laws preventing them from being employed in certain jobs, and employer practices that discourage hiring those with criminal records. *Résumé-audit* studies have found that an applicant's criminal record is a significant barrier to finding employment (Pager 2003). Mueller-Smith (2015) finds that for individuals with a previous formal labor market attachment, incarceration decreases the probability of subsequent employment, especially for those serving longer terms. Some recent papers using administrative data have not found strong evidence of significant scarring effects on postincarceration earnings and employment (Garin et al. 2022; Looney and Turner 2018). However, this empirical result is a consequence of poor labor market opportunities preceding incarceration; formerly incarcerated persons are disproportionately drawn from neighborhoods in extreme economic distress. A reasonable interpretation of these findings is that while incarceration likely does have an impact on future employment and earnings, many of the challenges that formerly incarcerated persons face in the labor market start long before their incarceration begins.

Abraham and Kearney (2020) use estimates of the formerly incarcerated population and Mueller-Smith's (2015) estimates of scarring effects to roughly calculate the impact of rising incarceration rates on declines in the overall employment rate. They estimate that rising incarceration accounted for a decline of 0.12 percentage point in the employment-to-population ratio between 1999 and 2018, a period when the ratio declined 3.8 percentage points. Though admittedly a rough estimate, their calculations suggest that rising incarceration accounts for a small part of observed declines in overall employment. However, rising incarceration disproportionately affects Black communities, so incarceration's role in driving down participation among Black men is likely much larger.

*Geographic mismatches.* Labor force participation varies dramatically across the United States, with striking gaps even among prime-age adults (Nunn, Parsons, and Shambaugh 2019). Migration flows within the United States were quite high in the mid-20th century. Those picking up stakes generally moved to where they could find work, and migration flows redirected population on net from low-income to high-income regions (Blanchard and Katz 1992). However, since 1980, internal migration has declined, and moves have become less likely to reallocate population to more prosperous parts of the country (Ganong and Shoag 2017). Reduced internal migration may be a result of increased housing costs and/or increased licensing costs

for certain occupations and industries (Hsieh and Moretti 2019; Johnson and Kleiner 2020).

Declines in labor migration may have exacerbated declining labor force participation, with workers increasingly exiting the labor market instead of migrating in response to regional shocks (Dao, Furceri, and Loungani 2017). This change has been evident in manufacturing employment declines since 2000; unlike previous downturns, those who lost jobs have been less likely to migrate to other regions and more likely to exit the labor force (Autor, Dorn, and Hanson 2021; Charles, Hurst, and Schwartz 2018). However, some economists have argued that declining mobility is an appropriate response to improved information about distant labor markets reflecting rational expectations about potential employment success in those locations (Kaplan and Schulhofer-Wohl 2017) and to declines in urban premiums for non-college-educated workers (Autor 2019).

The extent to which declining geographic mobility has exacerbated declining labor force participation remains an open question. The fact that out-migration responses to regional downturns have declined suggests that it does play a role, but the importance of this role cannot be fully ascertained with the evidence. However, the reduction in domestic migration to areas with better economic opportunities is well established in the literature. This indicates that policies designed to pull workers into the labor market will have limited success unless they can also improve job opportunities in regions where participation is currently low.

*Demand factors: import competition and technological change.* The labor supply model outlined earlier in the chapter posits another theory for declining participation: wages. In the model, adverse demand shocks can have a negative impact on an individual's decision to participate through wages alone. The steepest declines in participation since the 1970s have been among men without a four-year degree; these men have also experienced declines in wages throughout much of this period. It is reasonable to wonder, therefore, if declines in labor demand can account for declines in participation, particularly among men without a four-year degree.

Why would demand for labor have fallen disproportionately for men without a college degree? Possible causes include globalization and technological change. These dual forces are thought to be key drivers of “job polarization”—a term used to describe the relative growth of high- and low-skill jobs and the disappearance of middle-skill opportunities (Acemoglu and Autor 2010; Autor and Dorn 2013). Middle-skill jobs generally include tasks that are most vulnerable to automation and offshoring—making it difficult to distinguish the relative impact of each factor on employment. Job losses during the two recessions preceding the COVID-19 pandemic were concentrated among middle-skill jobs, and workers who lost those jobs

tended to exit the labor market rather than take lower-paying work (Foote and Ryan 2015).

A number of papers have linked declines in U.S. manufacturing employment to increased import competition from China (e.g., Autor, Dorn, and Hanson 2013; Autor et al. 2014; Pierce and Schott 2016; and Acemoglu et al. 2015). Increased imports from China reduced demand for domestically produced manufacturing goods, which reduced demand for U.S. manufacturing workers, who are disproportionately less-educated men. More recent research by Bloom and others (2019) suggests that the negative impact of the “China shock” on U.S. manufacturing employment was sizable between 2000 and 2007 but has not exacerbated manufacturing declines in more recent years. However, increased import competition is not the only cause of manufacturing employment declines; automation has also increased. Looking specifically at the role of robots in employment declines, Acemoglu and Restrepo (2020) estimate that each robot displaces about 5.6 workers. Using this estimate, Abraham and Kearney (2020) tentatively conclude that increases in the stock of robots between 1999 and 2018 resulted in the loss of 1.1 million jobs during this period.

Many economists believe that demand factors are the principal cause of declining male labor force participation. In their comprehensive review and meta-analysis of recent research on declining overall employment rates, Abraham and Kearney (2020, 636) state that “our review of the evidence leads us to conclude that, among the factors whose effects we are able to quantify, labor demand factors are the most important drivers of the secular decline in employment over the 1999 to 2018 period.” However, their estimates indicate that almost half the fall in employment rates during this period is unexplained after accounting for changes in demand. The CEA (2016) also concluded that low wages were the primary driver of male participation declines, with smaller roles for supply factors.

A seeming puzzle with regard to the view that declining wages are driving participation declines is that real wages for lower-skilled men rebounded in the 1990s and the 2010s, periods when the participation of men continued to fall. One possibility, suggested by Wu (2022), is that it is not absolute but relative declines in wages that reduce participation. Widening inequality means that relative wages for men without a four-year degree have declined steadily for many decades, reducing their status, marriage prospects, and job satisfaction. Wu finds that changes in relative wages account for almost half the growth in labor force exits among noncollege men between 1980 and 2019. In a related paper, Binder and Bound (2019) argue that supply and demand factors are likely not additive but interactive, with negative demand shocks for noncollege men leading to less stable employment and lowering marriage rates, in turn leading to changes in household formation that reduce the male labor supply. Together, these papers suggest that demand factors

and rising inequality may together have a negative impact on participation by lowering the relative gain in status attainable through work.

*Summary of the evidence on the declining male LFPR.* Despite significant scholarly interest in the decline of male labor force participation, questions remain. The evidence suggests that demand factors have played an important role, with globalization and automation reducing employment and wages, particularly for men without college degrees. However, a sizable participation gap remains unexplained by changes in labor demand. Supply factors, such as increasing incarceration and disability insurance, have also exacerbated the decline, although the impact of these factors has been small. An open question for research is how changes in gender roles and household formation—particularly declining marriage rates and more adults living with their parents—interact with demand factors and have exacerbated declines in participation.

Despite the incomplete nature of the evidence on participation declines, the extensive research literature does point to policy measures that could boost participation among men. In particular—given the importance of demand factors and rising inequality in driving down participation—efforts to improve wages and working conditions for men without a four-year degree would likely draw more of them into the labor market. Several policy options to boost participation by addressing these factors are discussed in greater detail later in the chapter.

### ***Female Labor Force Participation: The United States Falls Behind***

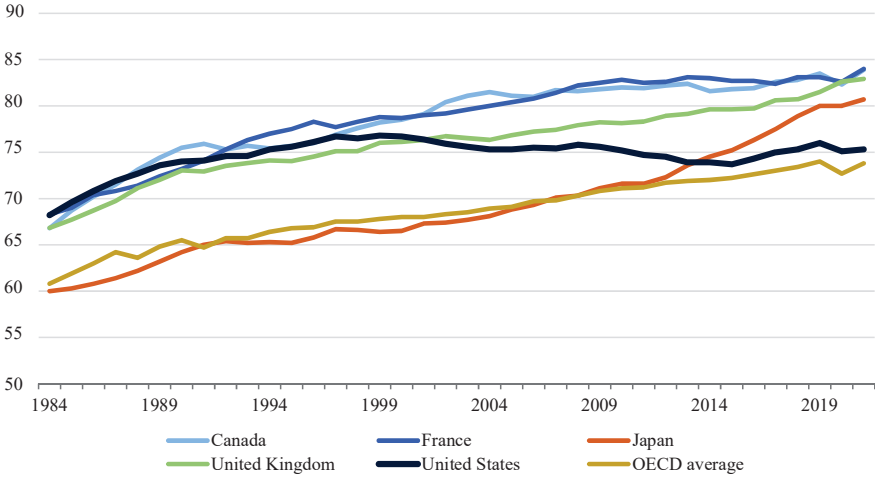
Despite declining labor force participation among men, the U.S. labor supply grew for much of the last century, largely due to the growing participation of women. The many social and economic factors driving the growth of female participation in the last century are the subject of a large body of literature, a review of which is beyond the scope of this chapter. What is more relevant for current labor supply challenges is that the growth in women's participation in the United States leveled off in the 1990s and began to decline. This stagnation did not occur in other advanced economies, where female participation continued to grow. As shown in figure 6-5, female participation levels and trends in the United States were similar to those in Canada and the United Kingdom until about 1995. Female participation continued to grow in these two countries after 1995, unlike in the United States. By 2015, U.S. female participation rates were below those for women in Japan, who were far less likely to work than women in the United States as recently as 2005.

Most of literature on declining female participation since 2000 has focused on factors affecting the *maternal* labor supply. When discussing why U.S. female participation has fallen behind that of other countries, a frequent observation is that the United States lacks publicly provided childcare



**Figure 6-5. Prime-Age Female Labor Force Participation, 1984–2021**

*Participation rate, age 25–54, selected OECD countries (percent)*



Source: Organization for Economic Cooperation and Development.

Note: "Prime age" is 25 to 54 years.

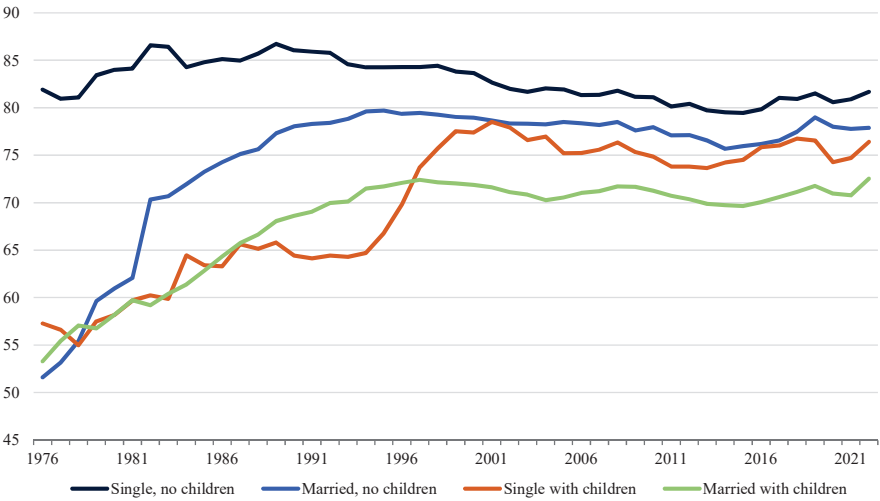
and paid family and medical leave policies, which are common in most advanced economies. The United States spent only \$2,600 on care and early education per child under 6 years of age in 2017, compared with the EU average of \$5,500 (OECD 2019). In consequence, childcare in the United States consumes a significant portion of family budgets, with care costing up to one-third of the average earnings of a single mother (Ziliak 2014). Most of the empirical evidence indicates that publicly provided care options for young children boost the maternal labor supply (e.g., Gelbach 2002; Baker, Gruber, and Milligan 2008; and Haeck, Lefebvre, and Merrigan 2015), as discussed in the next section on policy options. Chapter 4 of this *Report* also discusses more broadly the social and economic benefits of greater public support for early care and education.

However, there is no strong evidence tying childcare costs facing families to declines in female participation since 2000. Declines in participation among women are broad-based and are actually steepest among single women without children, whose participation declined by 7 percentage points between 1989 and 2016 (see figure 6-6). In many ways, female participation trends after 2000 resemble those of men in the United States, who also had declining participation relative to other advanced economies during this period. While the factors driving declining participation among men have been the subject of much research, much less attention has focused on declines in women's participation—with a few notable exceptions, such as Black, Schanzenbach, and Breitwieser (2017) and Abraham and Kearney (2020). Although research has been understandably focused on the role of



**Figure 6-6. Prime-Age Female Labor Force Participation Rate, 1976–2022**

Participation rate, age 25–54 (percent)



Sources: Bureau of Labor Statistics; CEA calculations.  
Note: “Prime age” is 25–54 years. Data are annual averages.

care in boosting the maternal labor supply, the factors driving declining participation among women without children are also worthy of further investigation.

### *The COVID-19 Pandemic’s Lingering Effects on the Labor Supply*

The forces constraining the supply of workers at the onset of the COVID-19 pandemic were amplified as countries attempted to mitigate the spread of the virus. Retirements among baby boomers, already fueling hiring challenges in many industries, spiked as older workers faced new and potentially severe health risks at work. Some employers encouraged workers to take early retirement in order to slash workforces in the face of reduced demand. Immigration bans and closed borders halted the flow of foreign-born workers who were critical for many industries, particularly food services and agriculture. The pandemic also disrupted the availability of childcare and in-person school, making it difficult for many parents to return to work.

Prime-age participation has mostly rebounded from the pandemic (see box 6-5), and recent efforts to clear the backlog of applicants have returned immigration flows to prepandemic levels. But the lingering effects on the labor supply remain, principally lower participation rates among older workers. While retirements have increased in previous downturns (Gorodnichenko, Song, and Stolyarov 2013; Coile and Levine 2011), the pandemic-induced recession had a particularly severe impact. Quarterly retirement rates increased by 5 percentage points at the start of the pandemic,

### Box 6-5. The Missing Prime-Age Workers

Early during the COVID-19 pandemic, declines in prime-age labor market participation were primarily due to pandemic-related disruptions. Layoffs, illness, and care responsibilities pushed many participants out of the labor market (Garcia and Cowan 2022; Goda and Soltas 2022; Cajner and others 2020). As businesses and schools reopened, and vaccines were rolled out, prime-age participation rebounded quickly (Forsythe, Kahn, Lange, and Wiczer 2022; Hansen, Sabia, and Schaller 2022). Individuals with disabilities actually increased their participation relative to prepandemic levels, likely due to increased telework and remote work practices adopted during the pandemic (Ne’eman and Maestas 2022). Yet despite tight labor markets and steadily rising wages, growth in prime-age participation slowed markedly in the latter half of 2022; at the end of the year, it remained 0.6 percentage point below the level in February 2020. As policymakers had hoped that continued prime-age participation growth would ease ongoing inflationary pressures, concern about these missing workers grew. But why prime-age participation remained below prepandemic levels three years after the start of the pandemic cannot be easily ascertained.

One possibility is that the level of participation at the end of the last expansion was an exception and not the rule. The last expansion pulled many workers into the labor market, and the continued growth in participation between 2016 and 2019 surprised many economists. It may be that participation rates were well above the trend at the end of the long expansion that preceded the pandemic (Barkin 2022).

Another possibility is that participation will keep growing as long as the current expansion continues. That participation decisions can respond to favorable economic conditions with a lag is suggested by Cajner, Coglianese, and Montes (2021), who find that participation declines after a negative shock can last up to four years, with nonparticipants who return to school or shift to care responsibilities during the downturn accounting for much of the lagged response. If households adapted to the pandemic in ways that can take a while to unwind, it may be that more prime-age workers will return to the labor market over time.

a much larger spike in the retirement rate than occurred during the financial crisis (McEntarfer 2022). Unlike previous downturns, the pandemic-induced growth in retirements appears largely unrelated to local economic conditions, suggesting that the retirement surge may have been primarily driven by COVID-19 health concerns (Coile and Zhang 2022). A recent paper suggests that the increase in housing wealth during the pandemic may have

also played an important role, with more retirements among older workers in housing markets with stronger price growth (Favilukis and Li 2023).

As of the end of 2022, the growth in the retired share of the U.S. population accounted for nearly all the shortfall in labor force participation relative to prepandemic levels. In a recent paper looking at the surge in retirements during the pandemic, Montes, Smith, and Dajon (2022) estimate that almost half the retirements since the start of the pandemic have been “excess” retirements that would likely have not occurred in absence of the pandemic. They find particularly sharp increases in retirements among workers over 65, among whites, and among those with a four-year degree. Given the advanced age of most excess retirees, it seems unlikely that a large proportion will return to the labor force. The authors also find that flows into retirement remained elevated almost three years after the start of the pandemic. They conclude that it may take some time for retirement behavior to return to prepandemic norms.

## **Options to Boost the U.S. Labor Supply**

As detailed in this chapter, the United States faces long-run headwinds for its labor supply that may have an impact on future economic growth. This section discusses policy options for boosting the U.S. labor supply. Although the focus here is on broad-based measures, labor supply challenges are often unique to specific markets, and policy solutions to increase the labor supply in general may be insufficient to remedy supply issues in specific occupations and industries. To highlight this fact, this section also discusses the supply challenges facing two particular labor markets, medical care (box 6-6) and local public education (box 6-7) in greater detail.

### ***Increasing Immigration***

Increasing immigration to the United States is frequently cited as a way to mitigate the consequences of the aging population. Immigration increases potential output by increasing the size of the labor force; because new immigrants are typically working age, it also lessens the effect of the aging population on per capita economic growth. Immigrants also make other important contributions to the U.S. economy. For example, given that they often have fewer long-standing family and social ties, they are more mobile than workers born in the country and are more responsive to local economic conditions (Basso and Peri 2020). Skilled immigrants have been found to boost innovation and technological change, which is an added contribution to overall economic growth (Bernstein et al. 2022; Hunt and Gauthier-Loiselle 2010). Overall, research also suggests that the effects of newly arrived immigrants on the wages and employment of the

### **Box 6-6. A Critical Shortfall of Nurses and Physicians**

Demographic shifts that began before the COVID-19 pandemic had already started to manifest in a noticeable reduction in the supply of health care providers. Researchers have documented the effect of the aging of the U.S. population on the supply of nurses and physicians in certain specialties such as primary care and psychiatry, along with geographic misallocation affecting rural areas (Buerhous, Auerbach, and Staiger 2017; Petterson et al. 2012; Satiani et al. 2018; Ricketts 2005). Given that the youngest members of the baby boom generation are just reaching retirement age, the aging of the population will continue to affect the availability of health care providers for the foreseeable future by simultaneously reducing the supply of providers and increasing demand for health care.

Compounding these predictable shifts, the pandemic exerted a historic shock on the health care workforce, exacerbating existing challenges. Unprecedented rises in the demand for health care overwhelmed providers. Many left their jobs to protect themselves and their families from catching the virus, to care for their young children and elderly parents, and to focus on their physical and emotional health and lessen burnout (Galvin 2021). These actions increased the burden for providers who remained in the system.

Swift, short-term solutions were implemented to stabilize the supply of critical health care workers. Hospitals utilized travel nurses to fill short-term increases in demand (Gottlieb and Zenilman 2020). The wages of these traveling nurse positions were set significantly higher than those of other nurses, which resulted in many nurses being willing to move to areas of the country with the greatest short-term need. Through provider payment incentive modifications, access to telehealth services was expanded for many Americans. Many States also relaxed their scope-of-practice restrictions, allowing for greater utilization of nurse practitioners and physicians' assistants (Volk et al. 2021).

Although these short-term solutions helped during the crisis, improvements in the education and training of health care providers will be required to maintain an adequate supply and distribution of providers in the long run. There are currently too few nurse educators to meet the demand. There are also too few nursing clinical placement spots to provide clinical experience for nursing students. Poor working conditions in many hospitals led to high turnover in the nursing profession well before the pandemic; improvements in patient-to-nurse staffing ratios and management practices would reduce turnover and improve patient outcomes (Vahey et al. 2004; Aiken et al. 2022). For physicians, there is an insufficient number of residency slots. Increasing funding for medical residency programs will also likely be needed to boost the supply of physicians (GAO 2021).

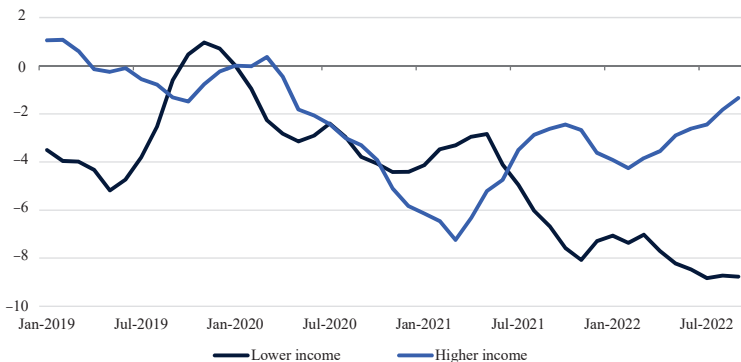
### Box 6-7. Staffing Challenges in K-12 Education

Between February 2020 and October 2022, employment in local education fell by almost 300,000 workers, about 3.5 percent of this workforce. According to survey results from a nationally representative sample of public schools, 53 percent indicated that they were entering the 2022–23 academic year understaffed. Among those schools, respondents reported that their highest need areas were special education teachers (65 percent) and transportation staff (59 percent) (U.S. Department of Education 2022). Declines in education employment since the COVID-19 pandemic have not been broad-based but in fact have been concentrated in lower-income communities, as shown in figure 6-ii.

Understanding the cause of these shortfalls is complicated, as there is no single education labor market (Goldhaber et al. 2015). Additionally, the lack of adequate data makes it difficult to identify areas experiencing difficulties in hiring (Nguyen, Lam, and Bruno 2022). Staffing challenges have long plagued schools that serve high proportions of students living in poverty and who belong to minority groups, and hiring challenges are more pronounced in specialty teaching areas such as special education, English language learning, and high school science, technology, engineering, and mathematics (Boyd et al. 2005; Cowan et al. 2016; Murnane and Steele 2007). Qualified teachers are not evenly distributed across schools and students, with poor, Black, and Hispanic students being much more likely to experience novice teachers (James and Wyckoff 2022).

**Figure 6-ii. Percent Change in Teacher Employment, 2019–22**

*Change in the 12-month rolling average of employment relative to January 2020*



Sources: Current Population Survey; CEA calculations.

Note: Teacher employment is limited to government employees and includes preschool and kindergarten teachers, elementary and middle school teachers, secondary school teachers, special education teachers, tutors, and other teachers and instructors. "Lower income" refers to employment among those living in the half of core-based statistical areas (CBSAs) with the highest share of households with total household income under \$50,000. "Higher income" refers to employment among those living in the half of CBSAs with the lowest share of households with total income under \$50,000.

When properly diagnosed, policy remedies emerge for areas with particular teacher and school staffing needs. Addressing these localized challenges requires targeted efforts, such as incentives to serve in hard-to-staff schools and high-need areas, and innovation and flexibility about alternative pathways into the profession and licensure reciprocity (Dee and Goldhaber 2017). The keys to addressing teacher and staffing challenges are facilitating mobility into these local labor markets and encouraging retention in high-need positions once they are filled. Some of these measures, such as relaxing licensing requirements, have also contributed to meeting long-term goals such as creating a more diverse teacher workforce (Bacher-Hicks, Chi, and Orellana 2021).

domestic population are quantitatively very small, and that the fiscal effects of immigration are generally positive. For example, as new immigrants tend to be working age, they pay taxes without incurring the fiscal costs of youth and early education (for a comprehensive review of the fiscal and economic impact of immigration, see Blau and Mackie 2017).

There is also a potential pool of laborers already residing in the United States without legal authorization to work and/or a path to citizenship. Legal permanent residence would expand the employment opportunities for a significant portion of this population. As such, immigration reform that provides a path to citizenship for the estimated 11 million undocumented individuals would help to increase the labor supply (Migration Policy Institute 2022). Additional immigration reforms could include removing per-country caps on employment, expanding diversity lottery visas, and expanding the J-1 exchange visa program, which would bring additional faculty, scientists, and students to the United States for training and sharing knowledge and methods.

### ***Drawing More Adults into the Labor Market***

Labor force participation among working-age adults in the United States is falling, and it is now lower than that in other developed nations. A likely culprit is the lack of public sector support for workers and families in the United States relative to other wealthy countries. Policies directed at improving the labor market prospects of nonparticipants and removing obstacles to their employment could increase participation among prime-age adults. This subsection outlines several policy options for drawing more adults into the labor market.

*Improving care options.* Public spending on childcare and senior care in the United States is very low relative to that in other advanced economies.

The United States is also one of the few countries that has no guaranteed paid family and medical leave. In the absence of public support, the economic burden of caring for family members falls chiefly on women, whose labor market participation and lifetime earnings fall in consequence. Given women's low participation rates relative to men, policies that reduce their care burden are a promising avenue for increasing participation and reducing gender disparities.

The preponderance of empirical evidence suggests that childcare and preschool programs have a positive impact on maternal labor force participation (e.g., [Bauernschuster and Schlotter 2015](#); [Morrissey 2016](#); and [Wikle and Wilson 2022](#)). Some of the evidence arises from research on a policy change in Quebec, which introduced highly subsidized universal childcare in the late 1990s. These subsidies led to a very large increase in the use of care and a sizable and long-lasting impact on mothers' participation ([Baker, Gruber, and Milligan 2008](#); [Haeck, Lefebvre, and Merrigan 2015](#)). [Morrissey \(2017\)](#) evaluates a range of studies and concludes that a 10 percent reduction in the cost of childcare would likely increase maternal participation in the range of 0.5 to 2.5 percent. Paid family and medical leave can also help workers stay connected to their jobs while addressing family-related needs, maintaining good job matches, and boosting long-term attachment to the labor market ([Baum and Ruhm 2016](#); [Anand, Dague, and Wagner 2021](#)). [Blau and Kahn \(2013\)](#) estimate that nearly one-third of the gap in U.S. women's participation relative to that in other developed countries can be explained by the relative lack of such family-friendly policies.

*Criminal justice reform and removing barriers to reentry.* The United States incarcerates people at a higher rate than any other country in the world ([World Prison Brief 2021](#)). Reducing the punitiveness of the criminal justice system in the United States would reduce the large fiscal burden of its current system and the collateral damage of incarceration on affected communities. It would also increase the labor supply by reducing both the incarcerated population and the scarring effects of incarceration on employment. In recent decades, several States have experimented with criminal justice reforms aimed at reducing incarceration rates, with noteworthy success. For example, California introduced changes to sentencing for less serious offenses and lessened punitive measures for technical parole violations, changes that caused a sharp decline in incarceration ([Lofstrom and Raphael 2013](#)). A series of reforms in New York to divert drug offenders to treatment facilities and to relax mandatory minimum sentencing practices have also sharply reduced incarceration rates in that State ([Greene and Mauer 2010](#)). In both States, these periods of reduction in incarceration generally coincided with declining crime rates.

High incarceration rates have also created a large population of formerly incarcerated individuals who face significant barriers to reentry.



Removing barriers to employment for the formerly incarcerated would likely improve their employment prospects after release. One such reform, undertaken by several States in recent years, is to remove occupational licensing barriers for people with arrest and conviction records. In many States, a prior arrest or conviction, no matter how long ago, can prevent one from becoming a licensed barber or cosmetologist, a drug counselor, or a firefighter (Rodriguez and Avery 2016). Noting that information about prior arrests or incarceration decades after the event in question is of limited information value to employers, Piehl (2016) advocates reforms that would set a time limit on information about past convictions for employment background checks.

*Expanding the Earned Income Tax Credit.* The Earned Income Tax Credit (EITC) is a large government program that raises the after-tax return to work for low- and moderate-income households, particularly those with dependent children. As one factor depressing labor market participation is stagnating wages for non-college educated workers, the EITC can create additional incentives for participation by increasing the returns to work. A large body of research has shown that the EITC increased the labor supply of low-income mothers, a group it principally targeted (e.g., Bastian 2020; Eissa and Liebman 1996; and Meyer and Rosenbaum 2001). However, the maximum credit for families with two or fewer children has remained flat in real terms for many decades (Hoynes, Rothstein, and Ruffini 2017). Increasing the generosity of the current credits and/or expanding the EITC to provide more incentives to low-wage workers without dependent children would likely boost participation.

*Regional economic development.* Efforts to improve the economic performance of a particular region usually (but not always) target areas that have experienced downturns, with the intent of helping its residents. While not explicitly intended to increase participation, improving economic opportunities in declining areas would likely improve participation in areas with low employment rates by boosting local labor demand.

Regional economic development strategies can take many forms. A common form is that of enterprise zones, which provide tax incentives and sometimes exemptions from regulations, with the intent of spurring business investment and growth. Evidence on the effectiveness of enterprise zones in improving employment opportunities is mixed, and uncertainty remains about which policies work, how they work, and for whom they work (e.g., Neumark and Kolko 2010; Neumark and Simpson 2015; and Ham et al. 2011). However, evidence on the effectiveness of regional economic development programs involving infrastructure expenditures and investments in higher education and research is more promising. Kline and Moretti (2014) find positive long-run effects of the Tennessee Valley Authority, which



administers an ambitious regional development plan, on manufacturing employment and income in the targeted region.

The Economic Development Administration (EDA) also encourages economic development in regional clusters, with notable successes, including Milwaukee's water cluster and St. Louis's agricultural technology initiatives (Feldman 2022). An expansion of these efforts was included in the 2021 American Rescue Plan, which funded EDA's Build Back Better Regional Challenge, ultimately awarding 21 coalitions the resources to develop emerging regional industry clusters. The recent CHIPS and Science Act also has an explicitly place-based approach to boosting innovation and commercial activity, and it authorizes the establishment of the new Regional Technology and Innovation Hub Program at EDA to reduce geographic disparities and promote the growth of technology clusters in underrepresented and promising regions.

Other regional economic development strategies include workforce development programs that aim to train people in new and emerging industries and occupations. These programs provide skill upgrading and certification programs for displaced workers and others who would otherwise be unable to access (at reasonable costs) the training required for employment in these industries or occupations.

*Nonmonetary incentives and job quality.* As noted previously in this chapter, the classic labor supply model frames work as an exchange of effort for monetary compensation. Implicit in this framing is the notion that money alone motivates participation in the labor market. But the evidence suggests that workers care about nonpecuniary aspects of work—such as the meaningfulness of the employer mission, social interaction, greater scheduling flexibilities, and self-direction (Cassar and Meier 2018; Nikolova and Cnossen 2020; Clark 2015). Preferences for nonpecuniary amenities vary across workers, with women and nonwhites tending to value job quality attributes more than white men (Katz, Congdon, and Shakesprere 2022). These preferences can shape lifetime earnings in significant ways. For example, Wiswall and Zafar (2017) find that a quarter of the early career wage gaps for women can be explained by a higher preference among women for jobs with greater flexibility and stability.

Job attributes vary widely across the working population. A national survey of working conditions in the American workplace found that men without a college degree, women, and younger workers generally experience substantially worse working conditions. Specifically, they tend to have less control over their work schedule, experience more verbal abuse and harassment, and have greater exposure to safety hazards (Maestas et al. 2017). Data on preferences indicate that, unsurprisingly, workers prefer work to have more “good job” aspects and fewer “worse job” aspects. This evidence has led many to speculate that improvements in job quality that

would improve worker welfare could also potentially increase labor market participation. Some aspects of job quality can be improved through policies such as mandated sick leave or changes to scheduling practices. But many job quality attributes will remain the outcome of business decisions made by employers.

*Improving workers' bargaining power.* As indicated previously in this chapter, stagnating wages and rising inequality are key drivers of declines in labor force participation. Though many of the factors responsible for demand declines are global, inequality has risen more in the United States than in other advanced economies. This is at least partially due to declining worker power, particularly declines in unionization (Grossman and Oberfield 2022; Stansbury and Summers 2020). Worker power enables workers to negotiate with employers for better pay, safe conditions, predictable working hours, and other aspects of the work environment. Unions have historically been an important force in increasing workers' leverage.

Despite the recent upswing in petitions for union elections, union density in the United States continues to decline, from about one-third of the private sector workforce in 1950 to just over 6 percent today. The consequences of unions' decline for workers include lower wages (e.g., Card 1996), including for nonunionized workers in the same sector (Farber 2005). Union density may also be tied to trends in income inequality, with U.S. inequality rising as union density has fallen (Farber et al. 2021). In short, as unionization has fallen, workers' incomes have stagnated relative to output growth.

Globalization, technological change, and employer concentration are commonly cited as key factors driving declining unionization. However, many economists have pointed out that these factors do not fully explain why unionization in nontradable goods sectors has fallen at a similar rate, or why unionization is lower in the United States than in other Western countries (Levy and Temin 2007; Schmitt and Mitukiewicz 2012). More likely reasons for declining worker power are institutional changes within the United States—particularly the expansion of right-to-work States, greater employer opposition to organizing efforts, and decreased enforcement of labor laws.

The Biden-Harris Administration supports the Protecting the Right to Organize Act, or PRO Act, which would help restore that stated policy of the National Labor Relations Act, to “encourag[e] the practice and procedure of collective bargaining and [protect] the exercise by workers of full freedom of association, self-organization, and designation of representatives of their own choosing, for the purpose of negotiating the terms and conditions of their employment or other mutual aid or protection” by making it easier for workers to unionize by preventing companies from holding mandatory antiunion meetings and by imposing penalties on employers that retaliate

against organizers ([White House 2021](#)). The Administration has also taken significant steps to improve workers' leverage, appointing former union officials to the National Labor Relations Board, increasing funding to allow the Board to pursue its statutory remit, establishing a task force to promote labor organizing, and adding prevailing wage and apprenticeship requirements to the recent CHIPS and Science Act and Inflation Reduction Act.

## Conclusion

The United States faces a large shortfall in its labor supply as it continues to recover from the COVID-19 pandemic. This shortfall is not merely a lingering effect of the pandemic but is also due to long-run demographic trends and declines in labor market participation by adults. Without increased immigration and/or efforts to draw more adults into the labor market, the labor supply is likely to be constrained for the foreseeable future. The shrinking share of adults in the workforce and the Nation's aging population may have a negative impact on its living standards through slower economic growth. More proactive policies to increase the labor supply—such as higher public spending on childcare, increasing immigration, and improving workers' bargaining power—are needed to counteract these demographic trends.