Chapter 1

The Benefits of Full Employment

This chapter is dedicated to Dr. William Spriggs and his lifelong efforts to promote economic justice for all. It is hoped that the chapter reflects his view: "Full employment should mean full employment for all; not some." (Spriggs 2015)

This chapter discusses the economic effects of tight labor markets—loosely speaking, when jobs are plentiful relative to searchers—on working families and the macroeconomy. This topic is of great consequence for working Americans, and thus also for the worker-centered policies of the Biden-Harris Administration. The chapter draws attention to three economic periods characterized by tight labor markets: the late 1990s, the late 2010s, and the most recent period, starting in the wake of the COVID-19 pandemic.

The chapter first describes the concept of "full employment," and then considers an economic framework rooted in firm market power, known as monopsony power (Manning 2003). An immediate consequence of this framework is the critical role of tight labor markets in improving workers' bargaining position for higher wages and better jobs. The monopsony framework also helps to lay the foundation for understanding the deep and important benefits of full employment, particularly for groups often left behind when labor markets are slack.

This chapter's central findings also highlight the benefits of full employment for labor market outcomes—such as unemployment, labor force participation, wages, and other measures—across demographic groups that are often economically vulnerable. In particular, the CEA finds that demographic groups (e.g., as determined by education, race, and sex) with higher average

unemployment rates relative to other groups see larger declines in unemployment rates during expansions. Relatedly, groups with lower average labor force participation see relatively larger increases in their participation rates during expansions than do those with higher participation rates. The implication of these results is that strong labor markets lead to a convergence in critical labor market outcomes across groups, a finding echoed by Cajner and others (2017) and Aaronson and others (2019). The converse is also true: economic downturns and slack labor markets are particularly harmful for relatively less advantaged groups.

This chapter also highlights several striking findings related to tight labor markets and traditionally disadvantaged demographic groups. First, racial gaps in labor market outcomes shrink in tight labor markets. In the most recent periods of full employment—just before the COVID-19 pandemic and in the last two years—the unemployment and employment gaps between Black and white men each fell to the lowest level on record. Second, economically vulnerable groups (e.g., the relatively less educated) are more likely to switch jobs when the unemployment rate is low, enabling them to climb the job ladder when jobs are plentiful. Third, workers who face a work-limiting disability are more likely to obtain jobs in particularly strong labor markets. Fourth, wages and earnings tend to be flat during periods of weak or stagnant labor markets but grow when the economy experiences a tight job market, such as in the late 1990s, the late 2010s, and the post-COVID years. Fifth, wages and annual earnings converge during tight labor markets, as previously demonstrated with unemployment and participation rate convergence; the effect appears in a remarkable narrowing of the ratio of wages between the 90th and 10th percentiles and 90th and 50th percentiles since 2015.

Because of the depth of these benefits, the chapter next considers which policy choices can help attain and maintain a full-employment labor market, highlighting two crucial pillars of effective macroeconomic stabilization

policy that can work toward this goal: (1) data-driven monetary policy and (2) temporary fiscal policy. Both can be used to ameliorate negative shocks to economic growth and output gaps. The chapter also considers a potential cost of full employment: higher inflation than would otherwise occur. Here, the CEA's analysis finds little evidence to suggest that persistently tight labor markets are necessarily costly in inflationary terms; indeed, the period before COVID-19 featured historically low unemployment with quiescent inflation. Many previous episodes of full employment did not clearly correlate with high inflation (though some early ones did, recent periods did not). And though strong labor demand played a role in the excess inflation of 2021–22, much of it was clearly due to nondemand, non–labor market factors, including the pandemic and its impact on supply chains.

The chapter concludes with a review of the period since June 2022, when total personal consumption expenditures price inflation peaked at 7.1 percent. From the perspective of the Phillips curve model, decreasing inflation comes at the cost of increasing unemployment, a decrease in inflation expectations, or favorable supply shocks. Since June 2022, the U.S. economy has experienced a substantial degree of disinflation, with relatively little sacrifice in the form of labor market deterioration. This suggests that recent inflation has largely been driven by factors other than the low unemployment rate. The most likely explanation, since longer-term inflation expectations remained anchored, is a resolution of supply disruptions—both in production and labor supply—caused by COVID-19 and the recovery from it. This explanation is supported by a recent CEA analysis showing that supply-side variables, both alone and interacting with demand, explain most of the disinflation over the past few years (CEA 2023a).

It is, of course, always possible that further disinflation will require more declines in economic activity than have occurred thus far. But the disinflation that has occurred to date has very clearly not been accompanied by a

sacrificing of the tight labor market conditions that deliver critical benefits to American households.

What Is Full Employment, and Why Does It Matter?

Full employment is neither a new concept nor the sole purview of economists. Societal discussions of full employment predate economics as a discipline.[1] In simple terms, full employment describes an economy in which workers able and willing to work can obtain the jobs and hours they want. Modern economics has generally defined full employment by citing the theoretical concept of the lowest unemployment rate consistent with stable inflation, which is referred to as u^* ("u-star"), the natural rate of unemployment, or the nonaccelerating inflationary rate of unemployment (termed NAIRU).[2] (See box 1-1.)

Regardless of the specific model or definition, if unemployment is at u^*, the labor force is at full capacity, such that the number of workers needed (labor demand) roughly matches the number willing to work at the wages offered (labor supply). The value of u^* is necessarily above zero, as, even at full employment, so-called frictional unemployment exists, in which some job seekers (i.e., the unemployed) are between jobs while others may have wage demands that employers are unwilling to pay.

A separate and economically important way of conceptualizing u^* is to note that when unemployment is at its natural rate, additional demand for workers is more likely to generate inflation than boost real incomes. This conception of u^* returns to the trade-off embodied in the Phillips curve, as discussed above—specifically, the negative relationship between

[1] See, for example, the British *Historical Register* (1731, 187): "The more distinct the Employment is, the better, for many Inconveniencies have attended one Manufacture interfering with another; besides, there will be an Intercourse of Trade created by one Part of the Kingdom supplying the other with their distinct Manufactures; this will give full Employment to the whole Kingdom, and a universal Cheerfulness to every Body: For the Poor are never happier, nor their Minds easier, than when they have full Employment; and when they are employed, Riches are diffused over the Nation."

[2] This definition replaces employment with unemployment, primarily because individuals have many reasons for choosing to forgo work and attend school, retire, take care of family, etc. Full employment is a case in which demand is sufficient to provide employment to those who want to work. Of course, the unemployment rate itself may not be the only, or most inclusive, measure of labor market tightness, as addressed in box 1-1. Further, the government could enact many policies to boost incentives for individuals to join the labor force (some of which are highlighted in box 1-4 below), which might change the equilibrium rate of employment, although not necessarily the natural rate of unemployment.

Box 1-1. Alternative Measures of Labor Market Tightness

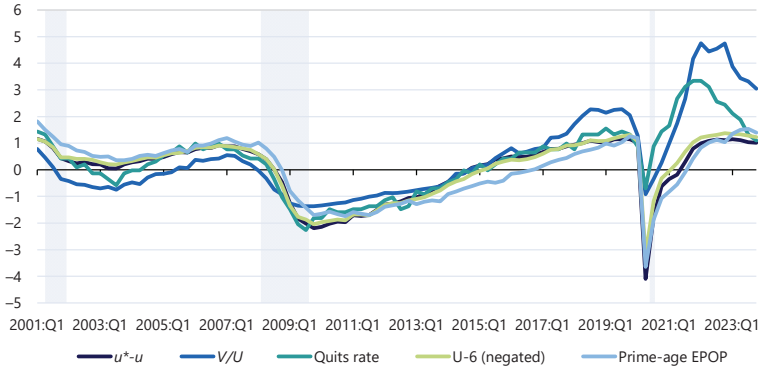
One working definition of full employment is the unemployment rate that is consistent with stable inflation. But the unemployment rate has notable downsides as a yardstick of labor market slack when set against the definition: it ignores workers who are out of the labor force, workers who are underemployed, and job openings that are unfilled—among other potential downsides.

While this chapter relies on the unemployment rate and the Congressional Budget Office's estimate of the natural rate of unemployment, this box considers four common alternative measures of labor market slack: (1) the ratio of vacancies to unemployment (V/U); (2) U-6, a broader measure of unemployment that incorporates some nonparticipants and some part-time workers; (3) the prime-age employment-to-population ratio; and (4) the quits rate.

A number of features make the ratio of vacancies to unemployment, V/U, appealing. First, in a large class of models of unemployment (Pissarides 2000), the degree of tightness in the labor market is measured via this ratio. Second, as a counterpart to the supply of workers who want jobs, V/U directly accounts for vacancies, a measure of the unmet demand for workers (Elsby, Michaels, and Ratner 2015). When there are more job openings than unemployed, the labor market is considered tight, since firms will have more difficulty recruiting and workers will have an easier time finding a job. V/U is strongly correlated with the unemployment rate, and researchers have found that it has a lower forecast error than the unemployment gap when predicting core personal consumption expenditures and wage inflation (Barnichon and Shapiro 2022). (Of course, there are critiques of vacancies as a measure of unmet labor demand, as well. For example, Davis, Faberman, and Haltiwanger 2013 show that recruiting intensity by firms is itself cyclical.) Further, Benigno and Eggertsson (2023) suggest that the unemployment-inflation relationship becomes nonlinear after V/U goes above 1, leading to accelerating prices when the labor market gets tight.

Both U-6 and the prime-age employment-to-population ratio are measures that expand the definition of job searchers beyond the unemployed. Focusing only on the unemployed assumes that those who are outside the labor force have a negligible job finding rate. However, when disaggregating into more granular groups, individuals who are out of the labor force but want a job are just as likely to transition to employment as the long-term unemployed. And even some nonparticipants who say they do not want a job transition to employment (Kudlyak 2017). Therefore, the unemployment rate could understate the true available labor supply (Hornstein, Kudlyak, and Lange 2014).

Figure 1-i. Measures of Labor Market Tightness



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Sources: Bureau of Labor Statistics; Congressional Budget Office (CBO); CEA calculations.
Note: EPOP = employment-to-population ratio. *u* = unemployment rate. *u** = CBO's natural rate of unemployment. U-6 rate includes marginally attached individuals and those working part time for economic reasons. *V/U*= job openings divided by unemployment. Z-scores were calculated using the sample mean and standard deviations of each measure from 2001 to 2019. Gray bars indicate recessions.
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U-6 starts with the standard unemployment rate as a base, but it also includes so-called marginally attached individuals and workers who are part time for economic reasons. Individuals are considered marginally attached if they would accept a job if offered one and have looked for work in the last year but not in the last four weeks. Workers are considered part time for economic reasons if they report working less than 35 hours per week due to slack work, unfavorable business conditions, an inability to find full-time work, seasonal declines in demand, or other economic reasons.

The prime-age employment-to-population ratio (PAEPOP) further includes all nonparticipants as potential job searchers. Focusing on those who are prime age (i.e., 25–54) excludes the effects of population aging and abstracts from school-going and retirement years. Researchers find that, compared with unemployment, the PAEPOP is equally predictive of core personal consumption expenditures inflation and is potentially a better predictor of real wage growth (Furman and Powell 2021).

One additional measure of labor market tightness is the quits rate, which counts the number of employed individuals who have voluntarily left their job (excluding retirements and transfers) in a month as a percentage of employment. The quits rate is a good indicator of the strength of a labor market, as an elevated number of employed individuals voluntarily leave their jobs if they believe they can find a better job (Gittleman 2022; Yellen 2014; CEA 2022). Researchers also find that the quits rate and job-to-job switching behavior is a better predictor of

wage growth and inflation than the unemployment rate (Karahan et al. 2017; Moscarini and Postel-Vinay 2017; Furman and Powell 2021). Faccini and Melosi (2023) found that elevated quits were directly linked to increases in the inflation rate in 2021.

Figure 1-i plots all four alternative measures, along with the unemployment gap, after normalizing each measure by its mean from 2001 to 2019 (inverting when necessary) and dividing by its standard deviation to make them comparable. All five measures track each other relatively well during the period before the COVID-19 pandemic, although the V/U ratio did indicate a slightly tighter labor market before COVID-19.

Both during and after the pandemic, both V/U and the quits rate diverge from the movements in the other three series. The two measures have suggested a notably tighter labor market since 2021 than the unemployment rate itself. The evolution of the two variables is precisely why policymakers have become focused on movements in the Beveridge curve and wage pressures in the labor market.

unemployment and inflation that has been at the center of macroeconomic models for decades.[3]

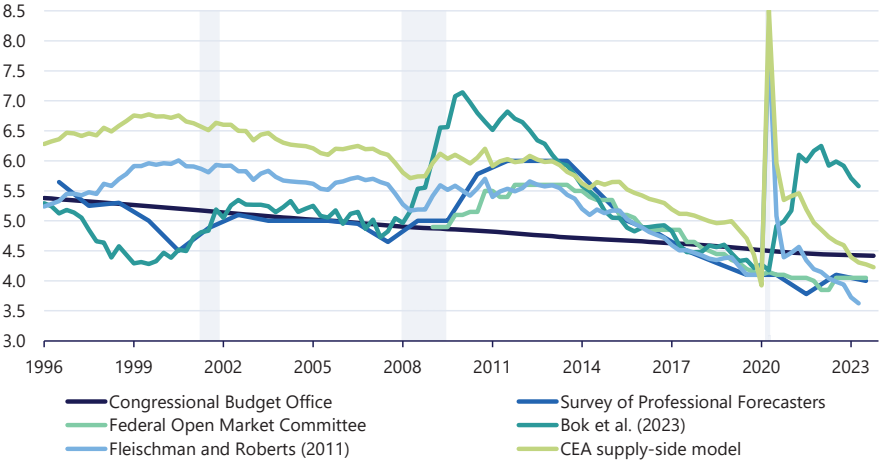
Estimates of the Natural Rate of Unemployment

Although the historical record confirms a negative correlation between unemployment and inflation in general (Crump et al. 2019), a number of both theoretical and empirical problems render u^* impractical for policy purposes. First, u^* is unobservable, meaning it must be estimated, which can only be done in the context of a particular model, and typically with wide margins of error (see chapter 1 of the 2016 *Economic Report of the President,* CEA 2016a). Figures 1-1 and 1-2 offer two perspectives on the issue. Figure 1-1 compares current estimates of the natural rate from multiple organizations—the Congressional Budget Office's (CBO's) reports, various Federal Reserve System estimates, the CEA's analyses, and those of professional forecasters. Clearly, estimates of u^* vary considerably over time and across estimators; the range of estimates spanned nearly 2 percentage points at its maximum at the height of the global financial crisis and exceeded 2 percentage points in the post-COVID period. However, even in the relatively calm period before COVID-19, the estimates varied by nearly a full percentage point.

[3] For example, a very simple reduced-form Phillips curve implies a u^* derived from this regression: $\pi_t - \pi^* = \alpha + \beta u_t + \epsilon_t$, where π_t is inflation and u_t is the unemployment rate. Setting $\pi_t = \pi^*$ (typically 2 percent) defines u_t^* as $-\alpha/\beta$.

Figure 1-1. Estimates of the Natural Rate of Unemployment

Percent



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Sources: Congressional Budget Office; Federal Reserve Bank of Philadelphia; Federal Reserve Board of Governors; Federal Reserve Bank of San Francisco; Bok et al. (2023); Fleischman and Roberts (2011); CEA calculations.
Note: Gray bars indicate recessions.
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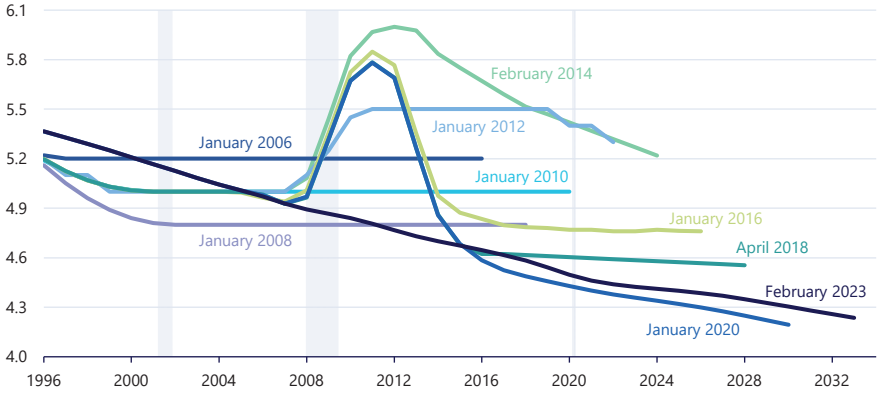
Second, the particular model underlying an estimate of the natural rate of unemployment is crucial. For example, some estimates are considered "long-run" estimates, which can be thought of as the unemployment rate toward which the economy would tend in the absence of shocks. Short-run shocks, such as those that impede matching workers and jobs in the labor market or that temporarily raise unemployment (or inflation), can raise the short-run natural rate, as they likely did after the global financial crisis and COVID-19. In figure 1-1, the natural rates presented reflect a combination of concepts. The CBO's estimate is akin to a long-run rate, while the Survey of Professional Forecasters' estimate is likely a combination of concepts across the different analysts who respond to the survey.[4] Bok and others (2023) present a number of measures, including one based on a Phillips curve concept of the stable inflation rate of unemployment, making it akin to a short-run approach.

Related to the distinction between the time horizon and model underlying any estimate of u^*, figure 1-2 offers another perspective on the difficulty of precisely estimating the value. The figure presents several vintages of CBO forecasts of the natural rate starting in the mid-1990s. As is apparent, the estimates are subject to large revisions over time. This is partly because the CBO has itself changed the definition of the natural rate over time,

[4] For a detailed discussion of the differences, see Bok et al. (2023).

Figure 1-2. The CBO's Estimates of the Natural Rate of Unemployment, 1996–2033

CBO 10-year projections (percent)



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Sources: Congressional Budget Office (CBO); CEA calculations.

Note: The natural unemployment rates shown are annual averages of quarterly projections by the Congressional Budget Office. Gray bars indicate recessions.

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settling recently on a long-term concept, whereas previously the agency distinguished short- and long-run rates.

Regardless of the reason, any entity's estimate of u^* in a given year may change dramatically if unemployment surprisingly falls below the estimated u^* for a sustained period, as it did in the pre-COVID era of low unemployment. The CBO's estimate of u^* for 2019, for example, fell when it updated its estimates from 2016 to 2018 and then again in 2020. Finally, as figures 1-1 and 1-2 show, u^* is not a constant. Its movements are generated by changes in the macroeconomy, workers' demographics, and fiscal and monetary policy changes. For example, the CBO's estimate of u^* was revised up at the onset of the global financial crisis (as were many other estimates); but as unemployment decreased in the latter stages of the recovery from the crisis, the CBO's estimate of u^* repeatedly moved down. There is good reason that the economist James Galbraith quipped, in a critique of u^*, "It's not only invisible; it moves" (Galbraith 2001).

Another key limitation of using u^* as a policy goal is that it embeds variation in labor market outcomes across groups. This variation in structural labor market outcomes may be undesirable for society. As the CEA explores in some detail, there is considerable structural variation in unemployment levels (and other labor market indicators) between demographic groups in the labor market. Black male workers, for example, historically (starting in 1976, when the data became available) have unemployment rates averaging 7 percentage points above the rate white men face. The differences cannot be explained in full by other observable characteristics (e.g., differences in education), suggesting that discrimination may be a factor in

the persistent differential. Therefore, were policymakers simply to aim for historical estimates of u^*, which have been consistent with large racial gaps, they risk embedding permanent disadvantages in groups that have long been left behind.

For all its shortcomings, the CEA still views u^* as a useful concept, as long as analysts understand that it cannot accurately be pinned down to a specific rate, especially in real time, and that it leaves out critical dynamics at play in the U.S. economy and labor market. Today, most economists would agree that 5 percent is above u^*, at least over a long enough period to allow acute short-run shocks to be worn away, and 3 percent is likely below it. Indeed, before the pandemic, the jobless rate was in the range of 3.5 to 4 percent and did not create inflationary pressures. During the current recovery, rates in this range have been maintained while inflation has fallen. In other words, recent history shows that unemployment rates between 3.5 and 4 percent can be consistent with sustainable inflation in the long run and allow the U.S. economy to enjoy the benefits of full employment.

The recent postpandemic period of tight labor markets and elevated inflation raises two questions: (1) Has u^* increased structurally, so that the pursuit of maintaining tight labor markets engenders greater overheating and inflationary risks than in prior cycles? Or (2) is pandemic economics a special case, and thus, outside its unusual effects, can the U.S. labor market still flourish with low unemployment not necessarily accompanied by high inflation?

To explain the importance of engaging in this section's u^* target practice, the next section gives a brief theoretical framework to delineate the interaction of labor markets at full employment and the empirical findings that the CEA presents in this chapter.

A Monopsonistic Labor Market

A brief summary of a basic labor market model helps ground an understanding of imperfect labor markets, in which employers wield some degree of wage-setting power, and which economists typically call monopsony power. In contrast, the textbook version of a perfect labor market envisions identical firms that are unable to set wages below the market level, lest they lose all workers to other employers, a case in which employers face a perfectly elastic labor supply curve. One implication of the perfect competition model is that wage discrimination and worker exploitation do not persist because competing firms can attract workers with better working conditions and pay. Discriminating firms with poorer labor standards must either improve or go out of business.

In reality, with monopsony power, firms are able to use their relative strength in the hiring market to set wages to some degree. (For a summary

of the empirical literature, see Ashenfelter et al. 2022.) Whereas a pure monopsony would feature only one employer in a given market, the real world is of course more complicated and closer to a model that features both monopsony and competition (Manning 2003, 2021; Yeh, Macaluso, and Hershbein 2022; CEA 2016b, 2022).

There are many plausible mechanisms that can lead to monopsonistic competition—for example, search frictions that delay job matching, employer concentration, job heterogeneity, and institutional or legal constraints like noncompete agreements (Burdett and Mortensen 1998; Manning 2021; CEA 2016b; Card et al. 2018; Berger, Herkenhoff, and Mongey 2022; U.S. Department of the Treasury 2022). The most commonly proposed source of monopsony power is the presence of search frictions, which impede the process whereby workers match with suitable employers. A canonical search model of monopsony power follows Burdett and Mortensen (1998), in which firms post wages to attract workers. A critical implication of the model is that the labor supply curve faced by the firms is upward sloping: higher wages reduce attrition, improve the ability to hire, and increase employment. This model is in stark contrast to the perfectly competitive model, in which firms are wage takers and face perfectly elastic labor supply curves.

Crucial for the analysis here is that the degree of labor market power a firm can wield is intimately related to the relative prevalence of available jobs and workers. In a tight labor market, monopsony power is reduced because workers' outside options improve as the likelihood of finding an alternative or better job rises. The ability of workers to switch to new jobs, or to quit and quickly find new jobs, allows them to raise their threat point with firms in wage negotiations. Relatedly, firms face elevated attrition rates and more difficulty recruiting workers. The improved bargaining position of workers helps to raise labor's share of income, as discussed in box 1-2.

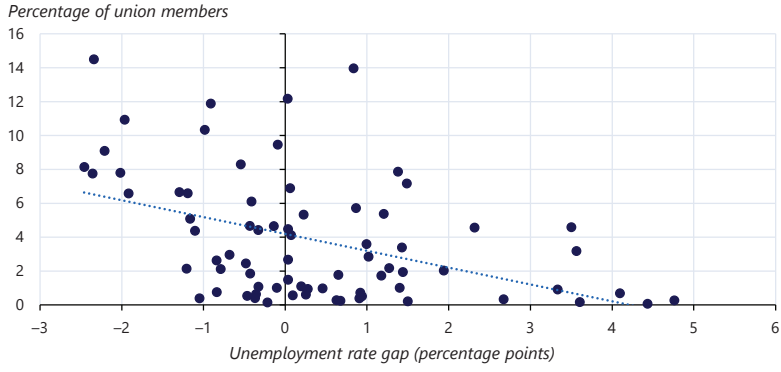
One important implication of an economic setting in which employers wield market power when competing for employees is that screening or discriminating against workers based on gender, race, disabilities, or other characteristics—for example, by changing hiring practices or weeding out résumés based on workers' characteristics—becomes a less economically feasible option when the job market is very tight. To do so risks failing to meet demand for the product or service that the employer sells, thereby reducing potential profitability and falling behind (nondiscriminatory) competitors. Informally, employer discrimination in tight labor markets risks "leaving money on the table." Thus, the economic framework of monopsonistic competition suggests that—and CEA research documents extensively—tighter labor markets are salutary for addressing persistent racial, gender, and other labor market gaps between advantaged and less advantaged groups.

Box 1-2. Workers' Bargaining Power and Full Employment

One consequence of tight labor markets, where jobs are plentiful relative to searchers, is that workers' bargaining power improves. The reasoning is intuitive: workers' bargaining power is in part derived from the range of options available in the labor market. In strong labor markets, it is relatively easy to find jobs, and the job offers available are more likely to include elevated wages or expanded opportunities. (See the evidence given below on wages and occupational upgrading.) For a more detailed discussion, see Stansbury and Summers (2020).

Another way that workers can exert bargaining power is through unionization and union activity. Figure 1-ii shows that the share of union members that engage in a work stoppage (y axis) increases when the gap between the unemployment rate and the CBO's natural rate decreases (x axis). The figure is striking in light of the surge in union activity in recent years. In the two years before the COVID-19 pandemic, about 450,000 workers engaged in work stoppages per year, highlighted by the educator strikes in 2018–19 (BLS 2024). The strike activity in these years was higher than had been registered since the mid-1980s. And in 2023, there was once again a notable wave of strikes, the most prominent of which occurred among workers who belong to the United Auto Workers union at the Big 3 auto plants. Of course, work stoppages are only one example of union activity, which is easy to measure and thus lends itself to this analysis; other examples of union activity by workers include filing for

Figure 1-ii. Share of Union Workers Involved in Work Stoppages, 1949–2022



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Sources: Bureau of Labor Statistics; Congressional Budget Office (CBO); Freeman (1998); Department of the Treasury (2023); CEA calculations.

Note: Dotted line is the line of best fit for the graphed series. The unemployment rate gap indicates the gap between the unemployment rate and the CBO's estimate of the natural rate of unemployment.

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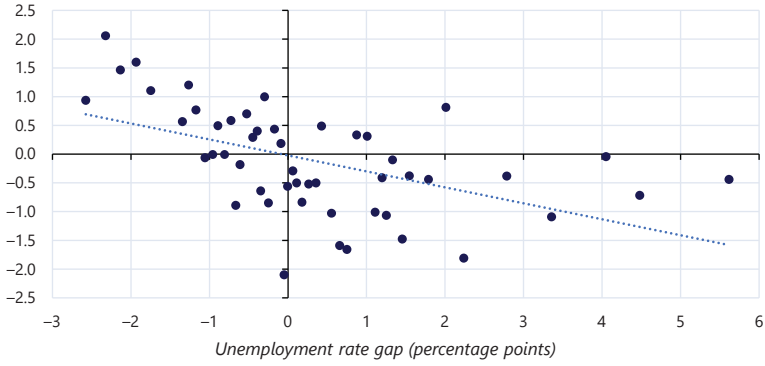
Figure 1-iii. Change in the Labor Share and the Unemployment Rate Gap, 1948–2023

Four-quarter log change in labor's share of income



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Sources: Bureau of Labor Statistics; Congressional Budget Office (CBO); CEA calculations.

Note: Dotted line is the line of best fit for the graphed series. The unemployment rate gap indicates the gap between the unemployment rate and the CBO's estimate of the natural rate of unemployment. Labor's share is for the nonfinancial corporate business sector.

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union elections and negotiating for fair contracts, which have important effects on the working conditions of those covered by union contracts.

The result of forces that raise bargaining power is that a larger slice of the economic pie goes to workers (both union and nonunion) as the economy achieves full employment. One measure of the size of the slice is what economists call labor's share of income, or, roughly speaking, the share of total income that accrues to workers in the form of compensation. Figure 1-iii shows that a higher labor's share (y axis) is associated with lower unemployment rate gaps (x axis).

Although the theoretical models provide a qualitative framework for defining full employment, the CEA's analysis shows that full employment is clearly associated with labor market conditions that are tight enough to provide workers with meaningful bargaining power. Such power is evident in the empirical results presented in the next section on the benefits of full employment.

Evidence on the Benefits of Full Employment

This section provides a set of stylized facts on the benefits that strong labor markets and full employment provide to workers, especially those who belong to groups that are typically less attached to the labor market and are less well compensated than other groups.

Long-Run Trends in Labor Market Outcomes

Long-run trends in unemployment and employment rates, disaggregated by race and ethnic groups, paint a striking picture of the beneficial effect of strong labor markets on these outcomes—a note highlighted by Spriggs (2017). In this chapter, CEA researchers extend the methodology used by Cajner and others (2017), who estimate gaps in the unemployment rate and employment-to-population ratios across selected demographic groups that are unexplained after controlling for age, geographic region, marital status, and education.[5] Figure 1-3 plots the unexplained portion of the unemployment rate for Black men minus white men and Black women minus white women using a common decomposition method.[6] Panel B of the figure shows Hispanic men minus white men and Hispanic women minus white women.[7]

There are several notable features of the differences in unemployment rates across groups that cannot be explained by observable characteristics. First, even after accounting for differences in explanatory variables, the unemployment rates of Black men and women are considerably higher than those of white men and women. However, the unexplained gaps have been shrinking since the early 1980s. Second, weak labor markets are particularly detrimental for economically vulnerable groups; during the global financial crisis, the unexplained gap in unemployment rates between Black and white men rose by about 2 percentage points, while the gap between Black and white women increased by 1.5 percentage points. Further, the unexplained unemployment rate gaps were persistently higher for the less advantaged groups after the recession: it took nearly 10 years for the Black male

[5] This work follows Cajner et al. (2017) in estimating Oaxaca-Blinder decompositions for each year of data starting in 1976 and reporting the unexplained portion of the difference in labor market outcomes (i.e., the portion not due to differences in the means of the explanatory variables). While age and gender are obvious choices for exogenous factors that are important in shaping employment and unemployment, Cajner et al. discuss the merits of controlling for variables that are outcomes of choices, such as education. For example, if certain groups face structural barriers to education, then controlling for education may understate the differences in labor market outcomes due to discrimination faced by the group.

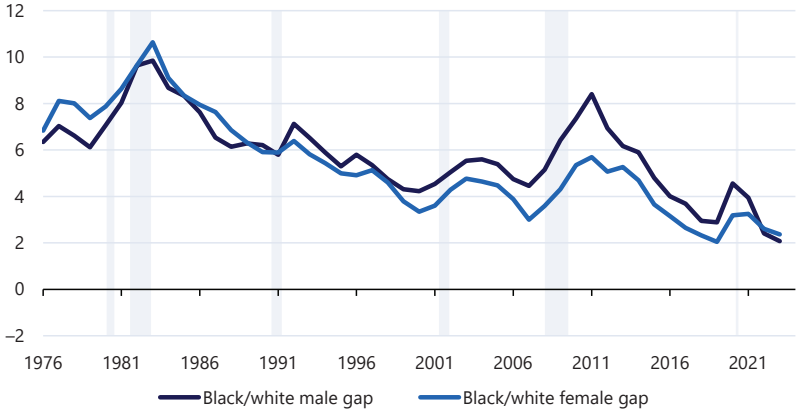
[6] This chapter follows Cajner et al. (2017), who focus on the absolute difference in labor market outcomes across groups rather than the ratios of labor market outcomes.

[7] It is important to note that the demographic groups shown here are not meant to be exhaustive of the groups that are economically vulnerable; indeed, within the relatively coarse groups presented, there is substantial heterogeneity in labor market outcomes and general socioeconomic well-being.

Figure 1-3. Racial Gaps in the Unemployment Rate

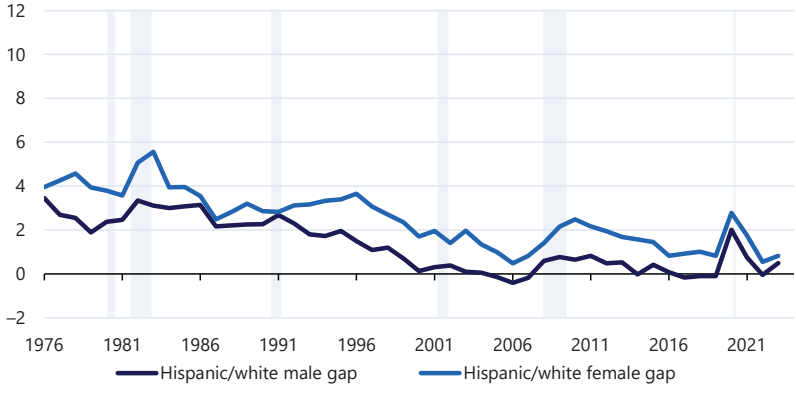
A. Black versus white

Percentage points of labor force



B. Hispanic versus white

Percentage points of labor force



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Sources: Current Population Survey; CEA calculations.
Note: White and Black populations are non-Hispanic. Estimated using methodology from Cajner et al. (2017). Gray bars indicate recessions.
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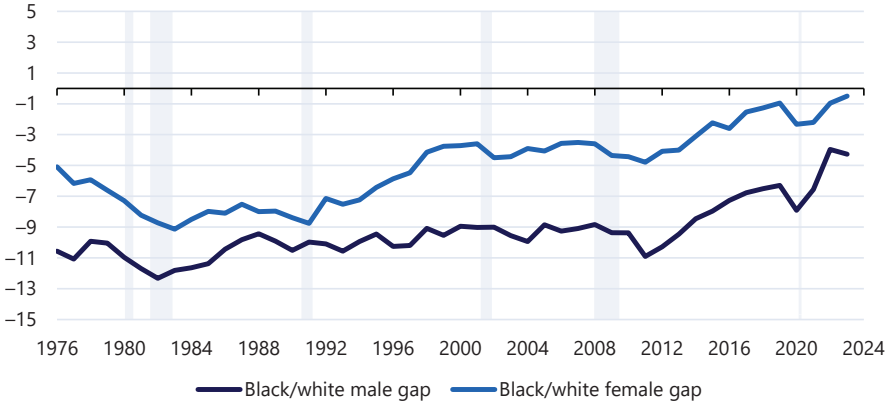
unemployment rate to recover relative to the white male unemployment rate. Nonetheless, it did recover, and when the labor market approached perhaps the tightest periods covered by the CEA data, in 2018–19 and 2022–23, the unemployment rate for Black men was as close to that for white men as has been on record.

Figure 1-4 presents unexplained gaps in employment-population ratios using the same controls and comparing the same demographic groups as shown in figure 1-3. Employment-population ratios are determined by the unemployment rate and labor force participation, which together help summarize labor market outcomes across groups. While the cyclicality of

Figure 1-4. Racial Gaps in the Employment-Population Ratio

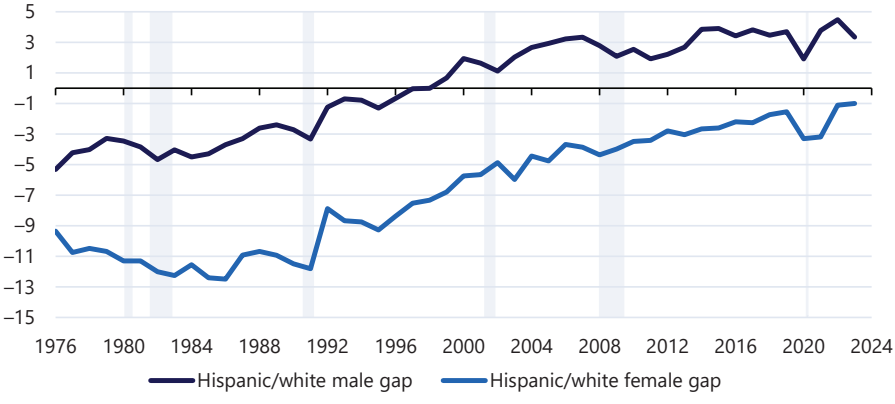
A. Black versus white

Percentage points of population



B. Hispanic versus white

Percentage points of population



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Sources: Current Population Survey; CEA calculations.

Note: White and Black populations are non-Hispanic. Estimated using methodology from Cajner et al. (2017). Gray bars indicate recessions.

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employment-population ratios is less pronounced, in part due to long-running trend changes in labor force participation, the figures show that strong labor markets are critical in closing the gaps in labor market outcomes between groups. For example, the gap between Black and white women narrowed substantially in the full employment labor market of the late 1990s. After the 2000 recession occurred, and the labor market remained weak until well into recovery from the global financial crisis, there was a lack of relative improvement for both Black men and women relative to white men and women. When the labor market reached full employment in 2015–19,

the gap closed substantially, and it continued to do so after the COVID-19 pandemic.

Because the analysis controls for characteristics that partially determine labor market outcomes, such as age, their interpretation hinges on the source of the unexplained gaps shown in figure 1-4. One determinant is clearly racial prejudice, which has long been a determinant of labor market and other economic outcomes (Charles and Guryan 2008; Lang and Lehmann 2012). Why would tight labor markets reduce racial discrimination in employment?[8] First, it does so because workers can more easily find alternative and better jobs, and they can leave for better opportunities when they experience discrimination. Second, tight labor markets increase the cost of discriminatory behavior, making it less economically feasible. If the subset of employers that discriminates by race can find, despite their prejudices, the workers they need to maximize profitability, it is relatively costless to do so, especially since they may not suffer the legal or reputational harm from engaging in discriminatory behavior. But if the labor market is tight enough that discrimination is costly and leads to lost profits, employers may be less likely to discriminate and more likely to remove hiring barriers that exclude qualified workers. This dynamic is at least part of the reason why strong labor markets are salutary for narrowing racial gaps in the labor market.

A Rising Tide Lifts Some Boats More Than Others: Cyclical Variation Across Groups

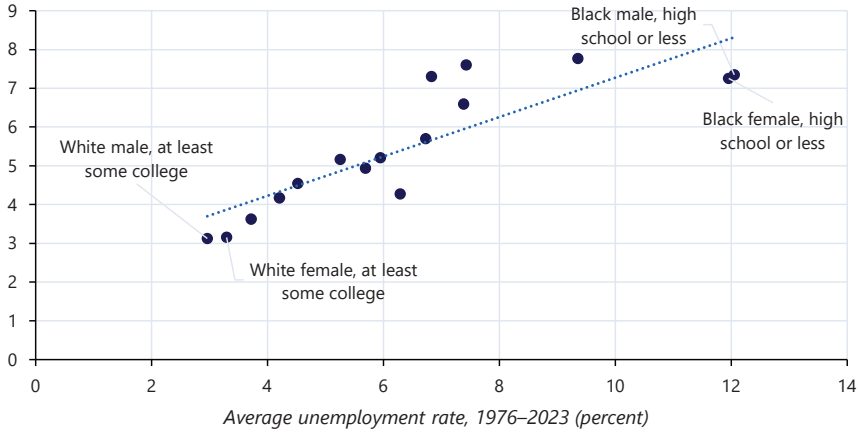
The CEA's analysis shows that in the United States, economically vulnerable demographic groups—those that, on average, experience worse labor market outcomes—are the same groups that benefit most from full employment. This examination starts by following a methodology similar to that developed by Wolfers (2019) to estimate the relationship between lower aggregate unemployment rates and the labor market outcomes of a broad swath of demographic groups.

First, the CEA splits the prime-age population into 16 groups defined by four race/ethnicity categories (Black non-Hispanic, white non-Hispanic, other non-Hispanic groups, and Hispanic), sex, and two education groups (a high school degree or less, and some college or more). Second, the CEA calculates the cyclical responsiveness of unemployment for each group across all business cycles after 1976, when granular microdata became available. Cyclical responsiveness is defined as the average increase (or decrease) in

[8] While employment discrimination against protected classes is illegal, racial gaps in the labor market persist. Strong antidiscrimination enforcement by agencies such as the Equal Employment Opportunity Commission and Department of Labor's Office of Federal Contract Compliance Programs are important for creating the long-term structural changes in employment practices that will prevent such discrimination.

Figure 1-5. The Cyclicality of Unemployment versus Average Unemployment

Change in unemployent rate over expansions and recessions (percentage points)



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Sources: Current Population Survey; CEA calculations.

Note: Dotted line is the line of best fit for the graphed series. Sample restricted to prime age (25–54) individuals. White and Black populations are non-Hispanic.

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the unemployment rate from the peak (trough) of a business cycle to the respective trough (peak), with dates defined by the business cycle minimum and maximum of the aggregate unemployment rate gap. Third, the CEA calculated the average unemployment rate for each group over the whole period, 1976–2023.

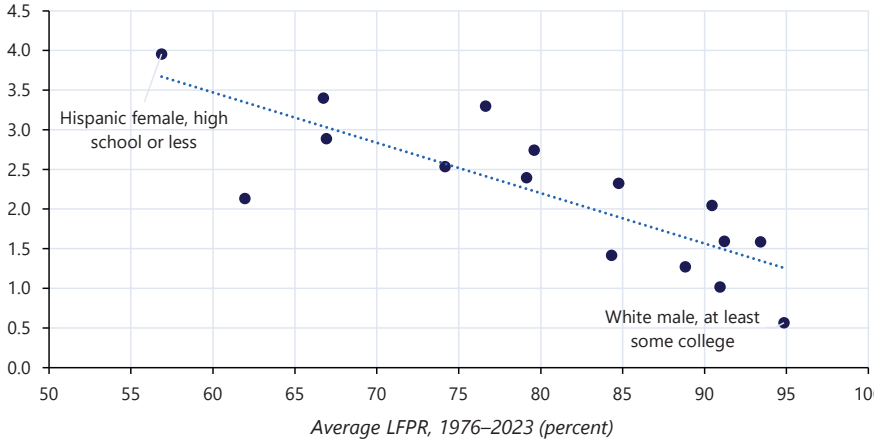
Figure 1-5 shows the average group-specific unemployment rate on the x axis and average cyclical responsiveness of the unemployment rate on the y axis, along with the regression line relating the two.

This picture shows a remarkably strong relationship—and not a mechanical one or one that need occur—between the group-average unemployment rate (higher x-axis value) and the degree to which the group's unemployment rate changes over the business cycle. For example, the top-right point of figure 1-5 gives the cyclical sensitivity for prime-age Black non-Hispanic men with an education of high school or less. The group's average unemployment rate is a staggering 12 percent, and this rate changes by about 7 percentage points over the average business cycle. Further, the regression line shows that if a group has a 1-percentage-point higher average unemployment rate, its unemployment rate is expected to change by about 0.5 percentage point more over the business cycle.

Figure 1-6 replaces the unemployment rate with the labor force participation rate (LFPR), which also shows clearly that less advantaged groups

Figure 1-6. The Cyclicality of the LFPR versus Average LFPR

Change in LFPR over expansions and recessions (percentage points)



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Sources: Current Population Survey; CEA calculations.

Note: LFPR = labor force participation rate. Dotted line is the line of best fit for the graphed series. Sample restricted to prime age (25–54) individuals. White and Black populations are non-Hispanic.

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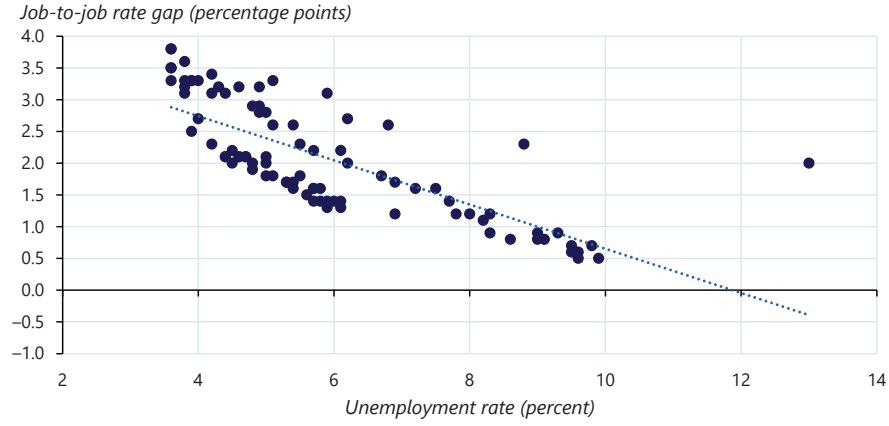
benefit more from strong labor markets.[9] The groups with a relatively low average LFPR (moving to the left on the x axis in the figure) experience relatively larger increases in the LFPR over the business cycle than other groups.

In addition to unemployment rates falling, and LFPR rising, workers from less advantaged groups have more success climbing the job ladder than they otherwise would in a weaker job market. The ability to change jobs, find better matches, and bargain for higher wages and benefits are all crucial features of an economy that provides long-lasting opportunities for workers (Topel and Ward 1992; Bjelland et al. 2011; Haltiwanger et al. 2018; Bosler and Petrosky-Nadeau 2016). Figure 1-7 shows that the ability of economically vulnerable groups to reap the benefits of moving up the job ladder is greater when the economy is at full employment than when it is not. The analysis focuses on differences between demographic groups in job-to-job switching rates—that is, the rate at which a worker takes a job at

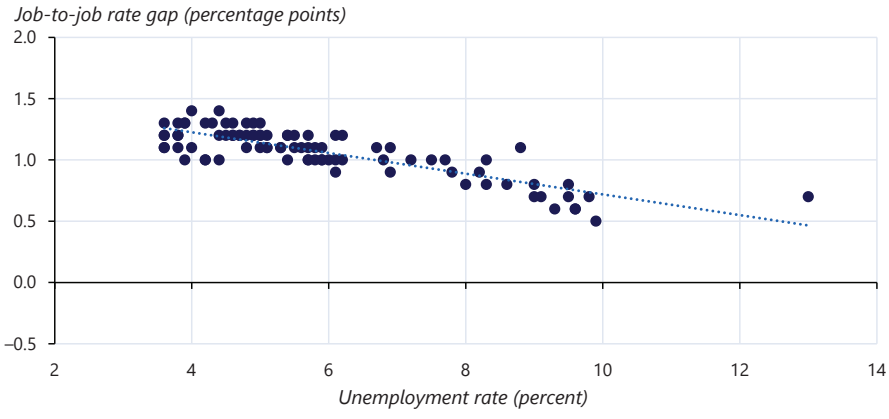
[9] There are likely two reasons why the relationship is not as precise for the LFPR. First, there are persistent long-term trends in the LFPR that are not controlled for and that may make it difficult to infer the cycle from the trend (CEA 2014; Aaronson et al. 2014). Second, the cyclicality of the LFPR is typically more muted than for the unemployment rate and likely has more complicated lag structures (Cajner, Coglianese, and Montes 2021).

Figure 1-7. The Cyclicality of Job-to-Job Rate Gaps, by Race and Education

A. By Race (Black—white)



B. By Education (High School—Some College or More)



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Sources: Census Bureau; CEA calculations.

Note: Dotted line is the line of best fit for the graphed series. White and Black populations are non-Hispanic.

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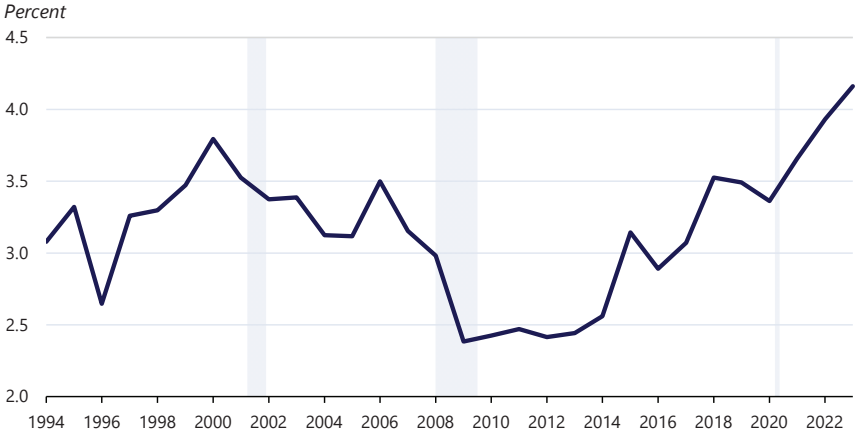
a different employer in a quarter—as produced by the Census's Longitudinal Employer-Household Data.[10]

Panel A of figure 1-7 represents the difference in job-to-job transition rates of Black workers relative to white workers. For example, from 2000:Q3 through 2022:Q3, the average job-to-job switching rate for Black workers was 6.8 percent and was 4.7 percent for white workers, an average

[10] The Census measure analyzed by the CEA is defined as, roughly, the number of workers whose job is with one employer in quarter t and another employer in $t + 1$. Workers are included if they spend one quarter or less unemployed between jobs at different employers. That number of job-to-job switches is divided by the average number of jobs in both quarters t and $t + 1$. For additional information, see Census (2023).

Figure 1-8. Monthly Transition Rate of the Disabled from Nonparticipation to Employment



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Sources: Current Population Survey; CEA calculations.

Note: Graph shows the annual average share of prime age (25–54) individuals with self-reported disabilities who report not being in the labor force in month *t* and employed in month *t*+1. Gray bars indicate recessions.

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gap of 2.1 percentage points. However, when the unemployment rate was below 4 percent in 2019, that gap increased to 3.4 percentage points. Meanwhile, when the unemployment rate was above 9 percent in 2010, the gap shrank to 0.7 percentage point. This cyclical pattern manifests in the downward-sloping regression line in panel A of figure 1-7.

Panel B of figure 1-7 echoes these findings for education groups, showing the difference in the job-to-job switching rate of those with only a high school degree relative to those with a college degree or more. The regression line is again downward sloping, indicating that strong labor markets benefit the job ladder prospects of the less educated relative to the more educated. Box 1-3 sheds additional light on the importance of cyclical upgrading for average wages, and box 1-1 above further discusses a related measure—the quits rate—as an alternative measure of labor market tightness.

Another important example of the kinds of workers who benefit directly from full employment are those with work-limiting disabilities. Figure 1-8 gives the rate at which prime-age workers who report a work-limiting disability move from nonparticipation to employment, calculated from longitudinally matched Current Population Survey data; the rate rises substantially when unemployment falls. Once such workers find jobs, they accumulate experience and can switch to better jobs. This dynamic process can lead to long-lasting benefits for these workers and their families, as well as for the overall productive capacity of the economy (Yellen 2016).

Box 1-3. Occupational Upgrading

Tight labor markets tend to boost average wage levels, and the CEA's analysis presented in this chapter shows that workers take advantage of strong labor markets to switch jobs. This box shows that these two dynamics are related: during tight labor markets, workers climb the occupational job ladder and move into jobs associated with higher pay.

To evaluate occupational advancement, the CEA uses an occupational index that takes the median wage in 2018 and 2019 according to detailed occupation and follows the share of the workforce in each occupation both backward and forward in time. To measure the occupational wage level in 2018 and 2019, the CEA takes the median of the hourly wage in the Current Population Survey Outgoing Rotation Group by occupation (using IPUMS's harmonized 2010 definitions). More formally, the index is calculated from parameters b_0 and b_1 in this ordinary-least-squares regression: $W_{it} = b_0 + b_1 t + BX_{it} + e_{it}$, where the sample uses individual-level Current Population Survey data and includes each individual in the labor force at time t in harmonized occupation i; W_{it} is the median wage of occupation i as of 2018–19, while X_{it} is a vector of demographic controls.

In panel A of figure 1-iv, the index is estimated with controls for sex, age, and birth cohort. It shows that while occupational advancement is indeed cyclical, it has shown steady progress over the last four decades. The index shown in panel B further controls for education. An important interpretative distinction between education and the other controls is that education is likely sensitive to economic conditions: Educational attainment may in part be countercyclical if individuals choose to enroll in educational programs when the labor market is weak.

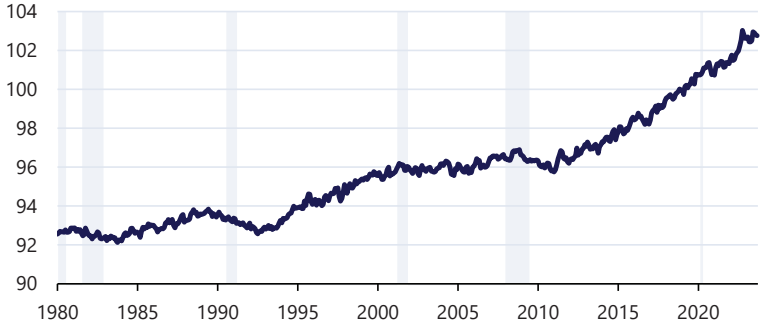
Over the last 40 years, average educational attainment has risen in the United States. In fact, the flatness of the line in panel B of figure 1-iv relative to the clear upward slope of the line in panel A suggests that education has been a key driver of occupational advancement since 1980: As workers have become increasingly likely to graduate from high school and earn a college degree, they have been able to move into higher-paying occupations.

In addition, the results suggest that the recessions of the early 1980s, and also in 2001 and 2008, represented a significant occupational decline among American workers that did not immediately recover (again, holding education constant). In contrast, during the tight labor markets of the late 1990s and from 2014 to 2019, occupational advancement began to accelerate again, then accelerated further during the COVID-19 pandemic. Over the roughly 10 years starting in 2014, workers made up for the earlier 30 years of losses in occupational advancement. By 2023, workers were on average in higher-paying jobs than at any point since 1980, even when controlling for education. This result suggests that

Figure 1-iv. Occupational Advancement Index

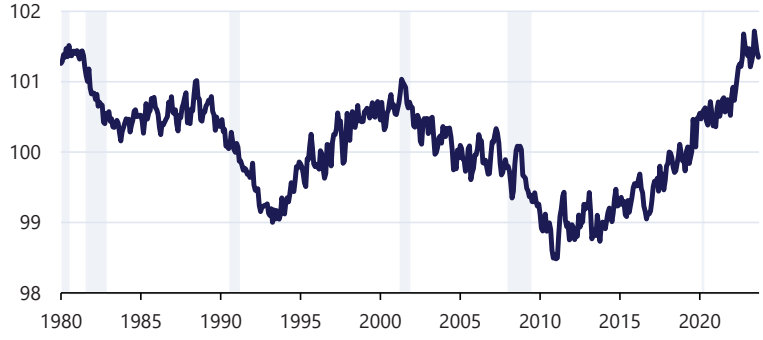
A. Age–Sex Controls

Index: 2018–19 = 100



B. Age–Sex–Education Controls

Index: 2018–19 = 100



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Sources: Current Population Survey; CEA calculations.

Note: Both series include cohort controls. Gray bars indicate recessions.

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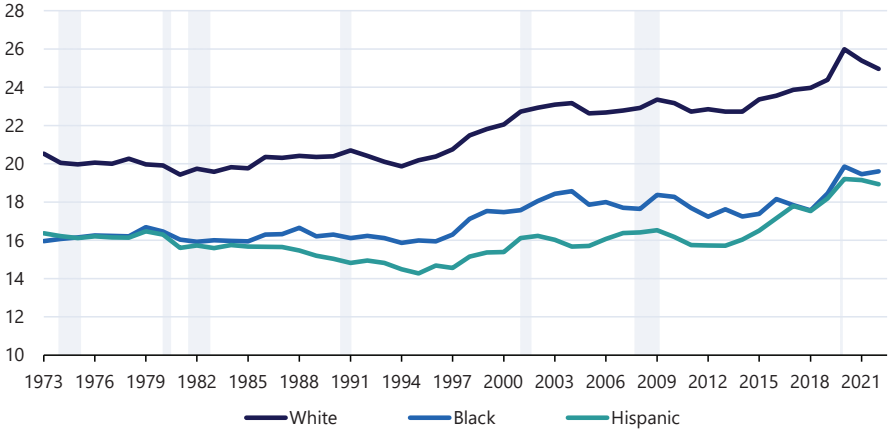
strong labor markets act through channels other than education and can help workers catch up on the occupational ladder when prior recessions have pushed them down.

Figure 1-9. Median Real Wages, by Race and Ethnicity

2022 dollars



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Sources: Bureau of Labor Statistics; Economic Policy Institute's State of Working America Data Library.
Note: White and Black populations are non-Hispanic. Gray bars indicate recessions.
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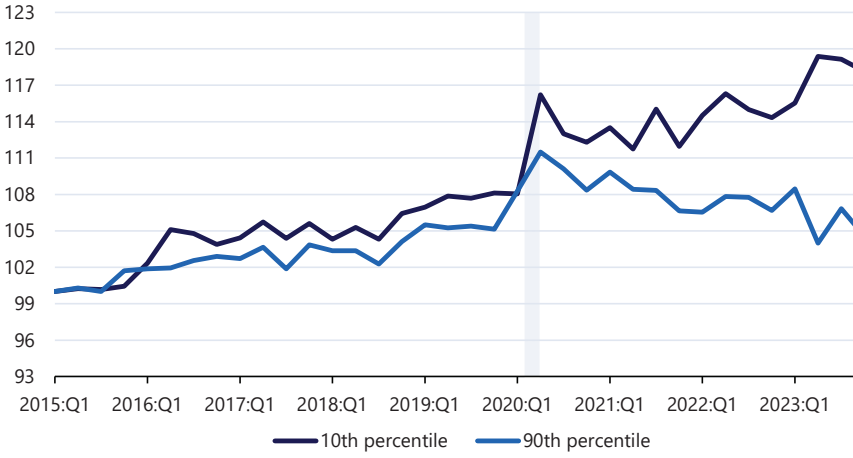
Full Employment's Effect on Wages and Household Incomes

The strong bargaining power afforded by tight labor markets raises not only employment rates but also wages and incomes for less advantaged groups. Figure 1-9 shows the median real wages of white non-Hispanic, Black non-Hispanic, and Hispanic workers since 1973. In the figure, real wages are stagnant over long stretches, aside from the periods of sustained growth during the tight labor markets in the late 1990s, late 2010s, and the immediate period following the COVID-19 pandemic.[11] Indeed, in the 23 years from 1973 up to 1996, when the CBO estimates the labor market began the prolonged period of full employment in the late 1990s, the unemployment rate was only below the natural rate in about 27 percent of quarters; in those years, white and Black median wages were roughly flat, whereas Hispanic wages fell by about 10 percent. From 1996 through the end of the data in 2023, the unemployment rate was below the natural rate in 47 percent of quarters, and wage growth performed better, rising 22, 23, and 29 percent at the median for, respectively, white, Black, and Hispanic workers.

[11] The composition of the workforce is known to have important implications for the dynamics of wages, especially during business cycles when the lowest-paid workers typically lose jobs sooner than more highly paid workers. This introduces an upward cyclical bias that can make the decline in wages during recessions less pronounced than it otherwise might be (Solon, Barsky, and Parker 1994; Daly and Hobijn 2017). This composition effect had a large impact on the wage data shown in figures 1-9 and 1-10, especially during the COVID recession, and is one reason why wages appeared to rise sharply at the onset of that downturn (CEA 2021).

Figure 1-10. Hourly Wage Compression, Pre- and Post-COVID

Index: 2015:Q1 = 100



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Sources: Current Population Survey; CEA calculations.

Note: Estimated using methodology from Autor, Dube, and McGrew (2023). Gray bars indicate recessions.

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Figure 1-10 also shows that real wages converged during the recent tight labor markets, especially at the low end of the income distribution. In figure 1-10, the CEA replicates the recent work of Autor, Dube, and McGrew (2023), who estimate wage convergence in the periods before and after COVID-19, adjusting for demographic differences due to age, labor market experience, race and ethnicity, region, and nativity.[12] Demographic controls were especially important during the peak of the COVID-induced recession due to the enormous shifts that occurred in the workforce.

Figure 1-10 shows the remarkable compression of wages in the labor market both before and after the pandemic, which were both periods of full employment. The 10th-percentile wage grew about 3 percentage points more than that of the 90th percentile in the pre-COVID period, from 2015:Q1 to 2019:Q4; in the period after COVID, starting at the business cycle trough in 2020:Q2 and going through 2023:Q4, real wages grew by about 7 percentage points more at the bottom of the distribution than at the top. While there are surely factors other than the strong labor market driving the post-COVID wage compression—for example, the shift to remote work likely has held down wage growth among higher-wage workers (Barrero et al. 2022)—the

[12] Autor, Dube, and McGrew (2023) implement a Dinardo-Fortin-Lemieux (1996) reweighting procedure, which allows for the comparison of wages at different points of the distribution under the assumption that the distribution of individual characteristics is fixed at a base year—in this case, immediately before the pandemic.

Table 1-1. Wage Compression in the Pre- and Post-COVID Labor Markets

Percent change in ratio over period

Ratio	2015:Q1–2019:Q4	2020:Q2–2023:Q4
90th percentile / 10th percentile	–3	–8
90th percentile / 50th percentile	–3	–2
50th percentile / 10th percentile	0	–5

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Sources: Current Population Survey; CEA calculations.

Note: This table shows the ratio of wages at the indicated percentiles. Estimated using methodology from Autor, Dube, and McGrew (2023).

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Table 1-2. Predicted Changes in Real Household Incomes over Selected Business Cycles

Type of Household	Percentile	1992–2000 Expansion		2006–09 Recession		2009–19 Expansion	
		Predicted Percent Change in Real Income	Percent of Actual Change in Real Income	Predicted Percent Change in Real Income	Percent of Actual Change in Real Income	Predicted Percent Change in Real Income	Percent of Actual Change in Real Income
All	10th	7	52	-11	63	12	43
	25th	4	27	-6	47	7	28
Black	10th	7	41	-12	64	13	29
	25th	6	14	-10	146	11	45
Single mothers	10th	8	44	-13	53	14	-145
	25th	6	14	-9	135	10	65

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Sources: Current Population Survey; Congressional Budget Office; CEA calculations.

Note: Estimated using methodology from Bernstein and Bentele (2019).

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compression of wages occurred alongside the strongest stretch in the U.S. labor market since the mid-1960s.

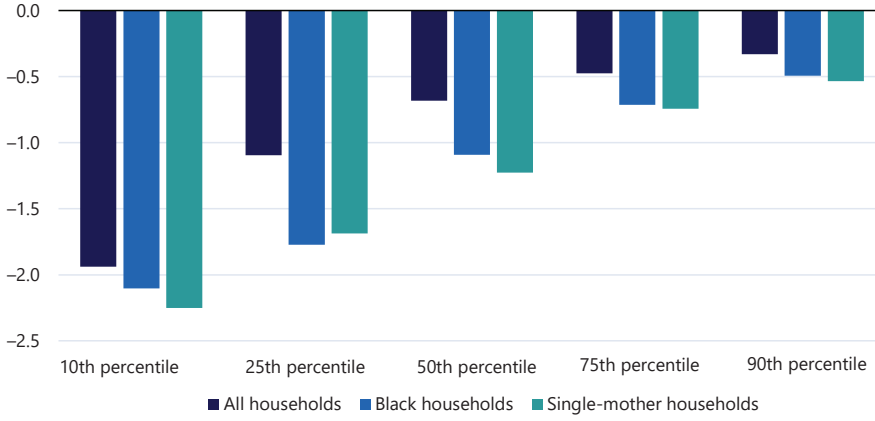
Table 1-1 records the changes in standard wage inequality ratios over the two periods. The data reinforce the remarkable compression of wages, especially between the top and bottom earners, as measured by the 90/10 wage ratio.

Following the methodology of Bernstein and Bentele (2019), figure 1-11 shows the effect on real annual earnings (equal to annual hours worked times hourly wages) of a 1-point increase in the aggregate unemployment rate relative to the CBO's at five quantiles of the earnings distribution for the overall population, Black households, and households headed by single mothers.[13] The relationship between labor market slack and incomes is larger for low and middle earners than for high earners across all groups; further, incomes respond more for low-income Black households, and those headed by single mothers.

[13] In particular, figure 1-11 plots the coefficients from group-specific regressions of the log real annual earnings from the Annual Social and Economic Supplements to CPS data on the CBO unemployment rate gap.

Figure 1-11. Effects of a Looser Labor Market on Household Income

Change in annual earnings (percent)



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Sources: Current Population Survey (CPS); Congressional Budget Office (CBO); CEA calculations.
Note: Estimated using methodology from Bernstein and Bentele (2019) with data from the 1977–2023 CPS Annual Social and Economic Supplements. Each bar shows the expected change in household income associated with a 1-percentage-point increase in the CBO's estimate of the unemployment rate gap.
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The lighter blue bars in figure 1-11 show the coefficients for Black households, which are larger in magnitude at each point of the distribution than those of the overall population (navy bars); however, the biggest difference for Black households relative to the population is at the 25th percentile. The same gradient is apparent among households headed by a single mother, a group typically faced with lower wages and that is less attached to the labor market than many other groups (Miller and Tedeschi 2019).

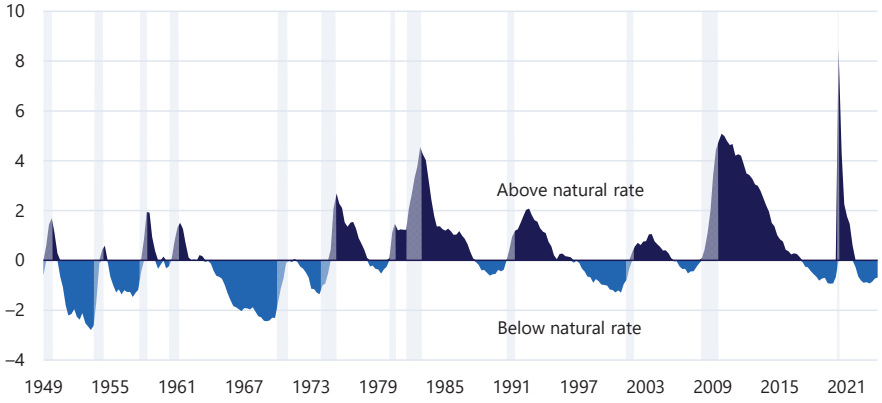
What do the coefficients mean in terms of real wage and income growth? Table 1-2 shows, in the first column for each period, the predicted percent change in real income based on the CEA's simple model for various groups during periods when the labor market tightened and slackened. The second column of each period reports the predicted income change (from the first column) as a share of the actual income changes experienced by the relevant group. The results show that a large share of income gains and losses are associated with aggregate labor market performance, reinforcing the view that a strong economy is crucial to the well-being of economically vulnerable groups.

Getting to and Staying at Full Employment

As the section above shows, the benefits of a persistently tight labor market, especially for groups that are often left behind in periods of slack, are deep and economically meaningful. But while recent U.S. economic history has

Figure 1-12. The Congressional Budget Office's Estimate of the Unemployment Rate Gap

Percentage points



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Sources: Bureau of Labor Statistics; Congressional Budget Office; CEA calculations.
Note: Gray bars indicate recessions.
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featured several periods at or near full employment, the longer sweep of post–World War II history is less encouraging. Figure 1-12 shows the quarters when $u > u^*$ in dark blue and quarters when $u < u^*$ in light blue, using the CBO's measure of u^*. The figure shows that over the first half of postwar history, from 1949 to 1981, the U.S. labor market spent 64 percent of quarters with the unemployment rate below the natural rate; however, over the second half of the period, starting in 1982, the United States achieved full employment in 38 percent of quarters. Moreover, in the first half, when the unemployment rate was below the CBO's natural rate, the gap between the unemployment rate and CBO's natural rate averaged –1.2 percentage points; in the second half, it averaged only –0.6 percentage point when it was below the natural rate.

Aside from missing out on the benefits laid out in this chapter, another cost of not being at full employment is what economists call hysteresis, meaning lasting or structural damage to the economy's supply side, which lowers its potential growth rate (Yellen 2016). The economy's growth rate is broadly a function of the growth in the workforce's size and the growth in the productivity of this workforce (CEA 2023b). If, for example, potential workers stay out of the workforce due to weak labor demand, they risk sacrificing the productivity-enhancing experience and skills associated with steady workforce attachment. One influential analysis by Reifschneider, Wascher, and Wilcox (2013) frames the problem as the "endogeneity of supply with respect to demand," meaning that labor supply is influenced by labor demand. One channel through which this operates is when weak labor

demand reduces potential labor supply if workers who experience long-term unemployment spells lose skills and, therefore, become persistently less employable. Another channel through which this operates is that less employment requires less capital investment, which can, in turn, reduce the supply of productive capital in the economy.

In the context of this chapter, the implication is that extended periods of unemployment exceeding u^* can generate persistently damaging hysteresis. While there is not much evidence for the notion that extended periods of tight labor markets can lead to reverse hysteresis (i.e., improvements in the economy's potential growth rate), the dynamic is certainly plausible (Yellen 2016). If, as this chapter has shown, full employment pulls workers into the labor market who might otherwise be left behind, the positive effects of reverse hysteresis might be realized. Full employment could also have positive effects on other supply-side fundamentals, such as productivity.

The benefits of full employment raise the question of which policy choices help lead to it and what trade-offs the choices involve. The inflation/unemployment trade-off embedded in the Phillips curve framework has long dominated the policy discussion and, as Baker and Bernstein (2013) show, was one reason for the long periods of slack shown in figure 1-12. In recent years, however, more economists have recognized the measurement challenges in u^* (see the uncertainty embedded in figure 1-1), leading policymakers, including those with the Federal Reserve, to become more "data driven" and rely less over time on point estimates of u^* (Staiger, Stock, and Watson 1997; Powell 2018).

More specifically, a data-driven argument surfaced that, because analysts could not identify u^* reliably enough to steer fiscal and monetary policy, and the price Phillips curve was viewed as relatively flat, economic policymakers could allow labor markets to tighten with a low risk of substantial inflationary consequences (Powell 2018). Findings like those shown above regarding the equalizing benefits of tight labor markets, including pulling in new workers from the sidelines (which also dampens inflationary pressures), further strengthened the argument (Bernstein and Bentele 2019; Cajner, Coglianese, and Montes 2021).

The full employment experiences of the late 1990s and the period before the pandemic showed the logic of the position through data on critical variables, such as jobs, the LFPR, wages, racial gaps in the labor market, and more. During those periods, both unemployment and inflation remained relatively low, representing a favorable trade-off on behalf of economically vulnerable groups without salient inflationary risks. And indeed, as figure 1-2 shows, during the tight labor market before the pandemic, estimates of the natural rate continued to be revised down over time, rewarding the Federal Reserve's data-dependent approach.

Table 1-3. Inflation and Labor Market Outcomes Since Total PCE Peak

Outcome	June 2022 (percent)	December 2023 (percent)	Change (percentage points)
Total PCE, yearly	7.1	2.6	–4.5
Total PCE, three-month annualized	7.4	0.5	–6.9
Core PCE, yearly	5.2	2.9	–2.3
Core PCE, three-month annualized	5.1	1.5	–3.6
Unemployment rate	3.6	3.7	0.1
Black unemployment rate	5.8	5.2	–0.6
LFPR	62.2	62.5	0.3
Black LFPR	62.2	63.4	1.2
Nonfarm payrolls[a]	152,348	157,347	3.3

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Sources: Bureau of Labor Statistics; Bureau of Economic Analysis; CEA calculations.

Note: PCE = Personal Consumption Expenditures Price Index; LFPR = labor force participation rate. Unemployment rates and LFPRs are adjusted for the 2023 population control revisions.

[a] Nonfarm payrolls are in thousands and nonfarm payroll change is in percent.

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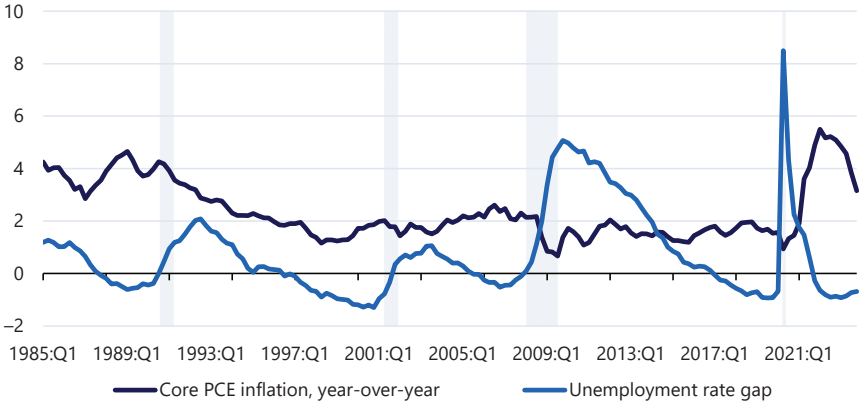
The past several years have challenged this pattern. When the pandemic began and the economy shut down, the unemployment rate soared to almost 15 percent and inflation turned negative. Then, as the economy reopened, lifted by historically strong fiscal and monetary support, unemployment fell sharply while inflation rose to a 40-year high in the summer of 2022. Such movements are associated with a steep price Phillips curve, rather than a flat one. As stated previously in this chapter, the period raises two questions: (1) Has u^* increased structurally, so that the pursuit of maintaining tight labor markets engenders greater overheating and inflationary risks than in prior cycles? Or (2) is pandemic economics a special case, and thus, outside its unusual effects, can the U.S. labor market still flourish with low unemployment not necessarily accompanied by high inflation?

The CEA pursued the same question in the 2023 *Economic Report of the President*, wherein, based on the evidence available, the researchers concluded that "the combination and interaction of numerous factors exacerbated the elevated inflation. Although it is difficult to determine the relative importance of each factor, the pandemic, and responses to it, had substantial effects on both the supply and demand sides of the economy. Specific factors of note include pandemic-induced supply disruptions, shifts in consumer demand, the accumulation of excess savings, and stimulative fiscal and monetary support throughout 2020 and 2021" (CEA 2023b, 52).

Given the developments over the year since the previous assessment, the CEA has found more evidence that supply factors played a key role in both inflation's rise and its subsequent decline. Consider that if full employment were the main cause of the increase in inflation, the subsequent disinflation the economy has experienced should have brought about a substantial slackening of the labor market. However, the low magnitude of the

Figure 1-13. Core PCE Price Inflation and Unemployment Rate Gap

Percent (core PCE), percentage points (unemployment rate gap)



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Sources: Bureau of Labor Statistics; Bureau of Economic Analysis; Congressional Budget Office (CBO); CEA calculations.
Note: PCE = Personal Consumption Expenditures. Core PCE inflation is year-over-year percentage change. The unemployment rate gap indicates the gap between the unemployment rate and the CBO's estimate of the natural rate of unemployment. Gray bars indicate recessions.
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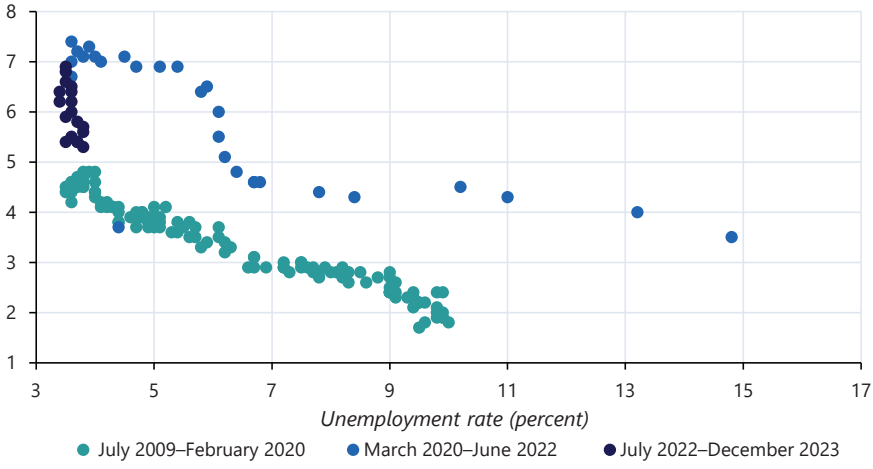
so-called sacrifice ratio—the amount of increased unemployment or reduced economic activity required to lower inflation—during the recent disinflation since the peak in June 2022 suggests otherwise. Table 1-3 shows the decline in personal consumption expenditures inflation—total and core, which excludes volatile food and energy prices—along with the changes in various labor market variables (also see figure 1-13). Over the period covered, which includes the most recent data available at publication time, the disinflation has required little sacrifice in terms of labor market slack or job loss.

This phenomenon is mirrored in the evolution of job openings and unemployment, which have been analyzed via the Beveridge curve, as shown in figure 1-14, with the job openings rate on the y axis and the unemployment rate on the x axis. The Beveridge curve has become a common tool for analyzing shifts in the unemployment rate, allowing analysts to parse changes in unemployment vis-à-vis job openings to determine if changes in unemployment are more of a structural or cyclical nature (Daly et al. 2011; Elsby, Michaels, and Ratner 2015; Barlevy et al. 2023). An outward shift in the curve (i.e., a rise in unemployment for a given level of job openings) indicates a likely deterioration in the ability of workers to find available jobs, one of the factors economists use to infer u^*.

Figure 1-14 shows three distinct periods, the first after the global financial crisis up to the COVID-19 pandemic, the second in the pandemic-induced recession and recovery through June 2022 (the peak of personal

Figure 1-14. The Beveridge Curve, Pre- and Post-COVID

Job openings rate (percent)



Council of Economic Advisers

Sources: Bureau of Labor Statistics; CEA calculations.

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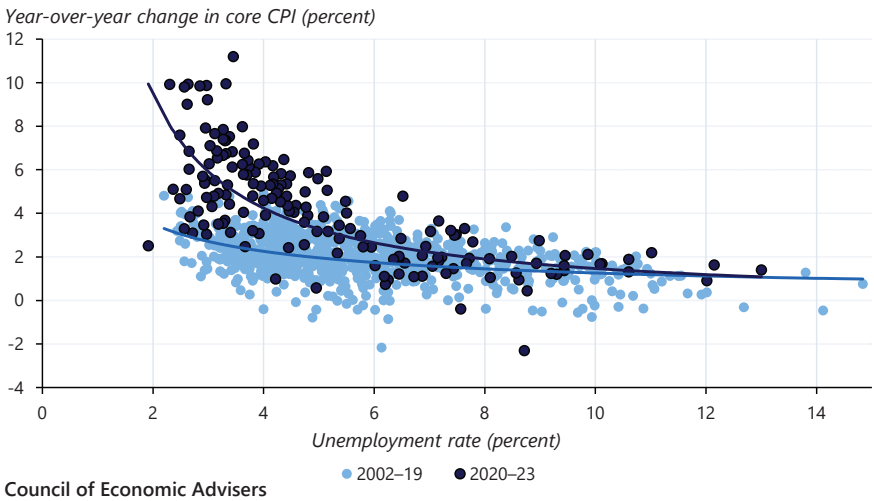
consumption expenditures inflation), and the third from July 2022 to December 2023, coinciding with the start of the period of disinflation covered in table 1-3. Since June 2022, the job opening rate has fallen sharply, by over 20 percent, while the unemployment rate has only edged up; this is in sharp contrast to the typically close negative relationship between vacancies and unemployment (Elsby, Michaels, and Ratner 2015; Figura and Waller 2022; Blanchard, Domash, and Summers 2022).

One interpretation of the recent decline in vacancies without a commensurate increase in unemployment is an improvement in what the economics literature describes as the efficiency of the matching process between workers and available jobs, or "matching efficiency." This interpretation would imply a period of deteriorated matching efficiency—the blue locus of points during the recovery from COVID through June 2022—potentially resulting from a rise in labor market churn, including a large increase in worker quits, caused by disruptions resulting from COVID (Barlevy et al. 2023). Thus, one possibility is that the recent improvement in matching efficiency, which reduced job openings for a roughly constant unemployment rate, may reflect post-COVID renormalization. Another potential explanation, one put forth by Figura and Waller (2022), is that, in theory, the Beveridge curve ought to be especially steep at high openings and low unemployment rates. The reason is that as the number of vacancies rises relative to the number unemployed—that is, moving to the upper left of the Beveridge curve diagram—it becomes increasingly hard to fill open jobs; thus, firms

Figure 1-15. Phillips Curve, Pre- and Post-COVID, MSA-Level Data



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Sources: Bureau of Labor Statistics; CEA calculations.

Note: MSA = Metropolitan Statistical Area. CPI = Consumer Price Index. Core CPI includes all items less food and energy. Data are semiannual and not seasonally adjusted. Fitted lines are predictions from log-log specification regressions. The lighter blue fitted line is estimated over the pre-COVID period, and the dark navy line is estimated starting in 2020.

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must post increasingly more vacancies to fill each open position, thereby reducing unemployment only a small amount for all the additional vacancies. Consequently, Figura's and Waller's view was that the job openings rate could fall without a large increase in job losses or unemployment as the economy slid down a steep Beveridge curve.

Ultimately, the underlying reasons why job openings have come down substantially with little sacrifice in terms of higher unemployment may not be known for many years. This limits analysts' ability to answer the crucial question: Will matching efficiency continue to improve, *or* has the labor market reached a flatter portion of the Beveridge curve and will any further reduction in openings require an increase in unemployment? In other words, it remains to be seen whether the labor market can benefit from further normalization, putting reduced pressure on wages and prices, without a substantial deterioration of job and income prospects for Americans.

While these economic conditions have supported low-sacrifice-ratio dynamics thus far, the current inflationary episode is not over. The key question for staying at full employment then becomes: Can inflation continue to decline without a large rise in unemployment? Figure 1-15 offers some perspective, showing the price Phillips curve both before COVID and since the pandemic, with year-over-year core Consumer Price Index inflation on the y axis and the unemployment rate on the x axis for an available set of

21 metropolitan statistical areas (or, roughly speaking, major cities).[14] The Phillips curve steepened considerably during the COVID era, as can be seen by comparing the light blue pre-COVID line with the dark blue line. (See also Barlevy et al. 2023.) The recent disinflation with little unemployment sacrifice has likely been due in part to a movement back down the steeper Phillips curve.

Because the normalization of inflation is a work in progress, analysts cannot, at this time, conclude which sacrifice ratio the American economy will ultimately face, though the evidence thus far supports a relatively low one. Either way, the fact remains that, based on the benefits of full employment labor markets and costs of slack, especially to economically vulnerable groups, fiscal and monetary policymakers should use expansionary macroeconomic policy to achieve and stay at full employment in periods of slack, while maintaining a data-driven view in terms of reacting to inflationary pressures. Regarding fiscal policy, an appropriately timed and targeted fiscal stimulus is a crucial pillar of economic policy to close the output gap in periods of recession or in response to negative shocks to growth. As demonstrated here, the other pillar is data-driven monetary policy that takes into account both the numerous benefits attending a tight labor market and the uncertainty surrounding u^* in the context of fulfilling the Federal Reserve's dual mandate of full employment and stable prices. However, while macroeconomic stabilization policy can help achieve full employment for some groups, other groups will undoubtedly be left behind where these policy remedies are ill suited to address structural disadvantages. Box 1-4 considers potential policy levers.

Conclusion

Analysts of the United States economy have learned many critical macroeconomic lessons in recent decades. One such lesson is that the difficulty of estimating the lowest unemployment rate consistent with stable inflation makes it challenging for policymakers to bring about periods of full employment. These lessons have, however, reinforced the importance of policymakers following a data-driven approach to evaluating the supply and demand forces that shape the tightness of the labor market. Further, while analysts cannot reliably identify u^*, the evidence does suggest that (1) unemployment below 4 percent helps facilitate the many benefits of full employment, and (2) outside large supply/demand shocks of the type that occurred during the COVID-19 pandemic, low unemployment can be consistent with low and stable inflation.

[14] McLeay and Tenreyro (2019) and Hazell et al. (2022) show that regional variation in inflation and unemployment can identify dynamics that national data fail to pick up.

Box 1-4. Policies Targeting Structural Labor Market Slack

This chapter focuses largely on cyclical labor market slack and urges the use of fiscal and monetary policies to attain and maintain full employment in the labor market. But disaggregated labor market data focusing on economically vulnerable populations reveal that many people suffer not just from cyclical unemployment but also from structural unemployment. A simple way to understand this distinction is to note that for workers facing structural barriers, even at full employment, their unemployment rate will be elevated.

As the CEA's analysis has shown, full employment helps less advantaged groups in both absolute terms (e.g., reduced unemployment and elevated real earnings) and relative terms (stronger gains compared with others). However, other policies are needed to help some workers overcome structural barriers that are somewhat invariant to labor market cycles.

Affordable childcare. While the tight labor market in the current cycle has facilitated historic workforce gains by women, including those with children, the absence of affordable childcare is a structural barrier that suppresses the ability of those with childcare responsibilities to fully participate in strong labor markets. The link between affordable childcare, which is demonstrably underprovided in America (U.S. Department of the Treasury 2021), and employment has been well researched; this work is summarized in chapter 4 of the 2023 *Economic Report of the President* (CEA 2023b, 132). This literature review finds the availability of affordable care has "large, positive effects on maternal employment. . . . Several studies of programs in other countries—specifically Canada, Germany, and Norway—also confirm the responsiveness of mothers' employment to [childcare] expansions." Mothers most affected by the enhanced availability of care tend to be "relatively disadvantaged (i.e., single mothers and those with lower levels of education)." Finally, the research finds that "policies that expand access to [care] can boost [working mothers'] productivity in the workplace by allowing them to get additional education or job training and increasing the likelihood they will work full time." The Biden-Harris Administration's commitment to affordable childcare takes seriously the distributional and macroeconomic consequences of affordable childcare. A recent CEA analysis shows that the American Rescue Plan's historic investment in the childcare industry succeeded in slowing cost growth for families, stabilizing employment and increasing wages for childcare workers, and increasing maternal labor force participation (CEA 2023c).

Antidiscrimination. As discussed in the text of this chapter, full employment makes it more expensive for employers to racially discriminate; but history has clearly shown that tight labor markets are far from

sufficient in preventing discrimination (Kline, Rose, and Walters 2022). For example, even in periods when the overall unemployment rate is below 4 percent, the unemployment rate for Black workers averaged 6.1 percent. Some argue that because highly educated groups have lower unemployment, the differential is due to Black workers' lower levels of education, on average. But figure 1-3 shows that even after controlling for education, Black workers face higher unemployment rates than white workers.

The research evidence shows that at certain periods in U.S. history, antidiscrimination policies have helped to partially overcome structural barriers. In the 1960s, legislation was passed targeting gender and racial labor market discrimination. Various studies show that these new laws first exposed and then helped ameliorate extensive workplace discrimination, which partially blocked the cyclical benefits of full employment for discriminated groups (Tomaskovic-Devey et al. 2006; Kurtulus 2016; Sanchez Cumming 2021). (The Equal Pay Act of 1963 prohibited unequal pay based on gender for equal work, and the 1964 Civil Rights Act—Title VII—prohibited workplace discrimination by race, gender, and other protected classes, and the Age Discrimination in Employment Act of 1967 prohibited employment discrimination against older workers. Notably, enforcement mechanisms were initially limited—e.g., employers accused of discriminatory practices could be investigated but not sued; Sanchez Cumming 2021. Later, in 1990, the Americans with Disabilities Act was passed, which extended the protections of Civil Rights Act of 1964 to those with disabilities.)

It is, however, well documented that the track record of the programs implementing these policies is uneven, and evidence shows that their effectiveness waned beginning in the 1980s, in part due to a lack of funding and commitment to their cause by government sponsors and agencies. Sanchez Cumming (2021, 7) points out that the Reagan Administration actively tried to repeal an Executive Order enforcing equity in workplace practices by government contractors. Though the administration failed in the repeal effort, Sanchez Cumming writes that "there was a decline in the number of sanctions issued for noncompliance, fewer firms were required to adopt affirmative action plans, and compliance reviews rarely found that women workers or workers of color were unfairly underrepresented in contractors' workforces." Even as antidiscrimination laws and U.S. institutions advocating for labor market equity led to important progress toward fairer and more equitable labor market outcomes, employment discrimination today continues to be a pervasive feature of the U.S. economy. Insufficient funding and vulnerability to political whims often prevent a robust enforcement effort from further ameliorating discrimination in the labor market. Indeed, the relative lack of progress has led some racial justice advocates to call for

more ambitious and direct programs to counter the effects of structural, systemic racism, most notably guaranteed jobs programs. Paul, Darity, and Hamilton (2018, 5), for example, argue on behalf of a "federal job guarantee [that] would provide a job, at non-poverty wages, for all citizens above the age of 18 that sought one."

Affordable housing in robust economic areas. Chapter 4 of this Report documents the lack of affordable housing in America, which, in the context of full employment, serves to amplify the spatial mismatch between where low-income households can afford to live and places with robust labor demand. As an Urban Institute (2019) analysis puts it, "This spatial mismatch between regional employment clusters and potential worker populations limits access to jobs." Important research by Ganong and Shoag (2017) documents how the problem has worsened over time as affordable housing in places with strong labor demand has become increasingly scarce. Their work documents a sharp decline in "income convergence" across places and ties it both to housing costs and, as emphasized in chapter 4 of this Report, restrictions on land use.

Other structural barriers. While childcare, housing, and discrimination are among the most salient structural barriers to full employment, other frictions also exist. Increased industrial concentration, whereby powerful firms dominate single industries, can suppress job creation and quality through anticompetitive effects, thereby reducing structural demand even during strong cycles. Because unemployment and education levels are negatively correlated, individuals without access to higher education face structural barriers to labor market opportunities. There are also structural disincentives to elevated labor supply in the tax code, including the "marriage tax penalty" (i.e., filing jointly means incurring a larger tax bill than filing separately) and the phasing out of schedules for government benefits that raise the marginal tax rate of an extra hour of work.

Finally, two recent developments are worth noting. First, the significant rise in working from home has the potential to reduce a structural barrier to work for caretakers and others (e.g., those with long commutes). Some recent evidence from Hansen and others (2023) suggests that more than 10 percent of jobs may allow for the option, though it is too soon to tell whether the trend will persist.

Second, an important recent analysis by Hobijn and Şahin (2021) of labor market flow data finds that it can take longer to return to full employment after a labor market shock when the shock causes people to leave the labor force. That is, the research finds that when workers leave the labor force, it can lengthen the amount of time it takes to return to full capacity in the labor market. This finding argues for policies, such as those more common in European economies, that keep people connected to work during a downturn, versus the emphasis in the United States on

unemployment insurance for those separated from work due to layoffs. In fact, the United States has a policy known as short-time compensation (informally called "work sharing"), administered by the unemployment insurance system, which can be used to help keep people at work during periods of weak demand by reducing their hours and using the system's funds to partially make up the lost earnings. Of course, it is possible that an economic shock could lead to structural changes such that a fulsome recovery would be facilitated by workers moving to different jobs in different sectors, so each downturn could require its own analysis regarding the policy choice to encourage work sharing. To the extent that work sharing can lessen the time it takes the job market to return to full employment, its use is consistent with reaping the benefits documented in this chapter.

In addition, the CEA's research finds that tight labor markets provide benefits across a large swath of the population. Groups with higher average unemployment rates see larger declines in unemployment during full employment labor markets than groups with relatively low unemployment rates. Groups with less attachment to the labor force on average also see a relatively larger increase in participation rates when the unemployment rate falls. Relatedly, racial gaps in labor market outcomes narrow in tight labor markets. In the most recent period of full employment just before COVID-19 and in the last year, the gaps between Black and white men in unemployment and employment have fallen to the lowest rates on record. Economically vulnerable groups—for example, the comparatively less educated—are more able to switch jobs when the unemployment rate is low and climb the job ladder when jobs are plentiful. Workers who face a work-limiting disability are also brought in from the sidelines and obtain jobs more often in particularly strong labor markets. As this chapter has shown, these labor market benefits translate into higher wages and income, particularly for workers who are more likely to be left behind in slack labor markets.

While wages and earnings tend to be flat in periods of weak or stagnant labor markets, they grow when the economy experiences a tight period, as in the late 1990s, late 2010s, and after the COVD-19 pandemic. There is also a wage convergence across groups and percentiles, just as there is in unemployment and employment rates. Indeed, there has been a remarkable decline in wage inequality since 2015, a time that has featured two periods of full employment.

Given the importance of full employment for racial equity, inequality, workers' empowerment, and the Biden-Harris Administration's fundamental goal of ensuring that workers have the bargaining power they need to claim their fair share of the growing economy, it is clear that maintaining tight labor markets must be an integral policy goal of American administrations. Many economists have recognized that labor markets do not necessarily settle into full employment and have reevaluated the importance of policies that actively promote full employment conditions. And every time this has occurred, the benefits of full employment have blossomed. Economists and policymakers must therefore use the policy tools at their disposal to get to and stay at full employment.

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