

## Macroeconomics in Context, Fourth Edition

# Chapter 7 Employment, Unemployment, and Wages

Some of the most important issues in the economy relate to questions of employment, unemployment and wages. For most people, securing a good job with adequate compensation and benefits is central to maintaining their livelihoods and achieving a good standard of living. For this reason government agencies devote a lot of effort to gathering data relating to current levels of employment, unemployment, and wages. In the first two sections of this chapter, we will look into what exactly these statistics mean. In Section 3 we will discuss various theories about how labor markets work. The final section offers some perspectives on how employment in the future might look, for workers and for society at large.

## 1 Employment and Unemployment

We have seen in previous chapters how official data are used to create a macro portrait of the economy—and how these data may emphasize some aspects (especially market activities) and ignore or downplay others. We start this chapter with a similar look at the official data on work issues. These data do not cover all issues related to work (for example unpaid household work is generally omitted), but it is important to know how to read the official data and what they can tell us.

### 1.1 Measuring Employment and Unemployment

Every month, the U.S. **Bureau of Labor Statistics (BLS)** interviews about 60,000 households, asking whether individual household members have jobs or are looking for work. In addition to conducting this household survey, it collects data every month from nearly 400,000 employers. Based on these two surveys, the BLS publishes monthly data on work issues, including the official unemployment rate.

**Bureau of Labor Statistics (BLS):** in the United States, the government agency that compiles and publishes employment and unemployment statistics

The BLS statistics only includes the **civilian non-institutional population** which consists of persons 16 years or older living in private households. Hence, children are excluded, as are people who are in compulsory military services, and those who live in prison, nursing homes, mental institutions, and long-term care hospitals. Of the civilian non-institutional population, those who did any work or had jobs as paid employees or business owners, or worked for 15 hours or more at a family business during the reference week are defined as being **employed**. **Unemployed** persons, on the other hand, are those in the civilian non-institutional population, who were not employed during the reference week, but were available to work, and had made specific efforts to find employment sometime in the four-week period ending with the reference week. Let us take a closer look at how the BLS classifies the employed and unemployed population.

**civilian non-institutional population (BLS definition):** persons 16 years or older who do not live in institutions (for example, correctional facilities, nursing homes or long-term care hospitals) and who are not on active duty in the Armed Forces

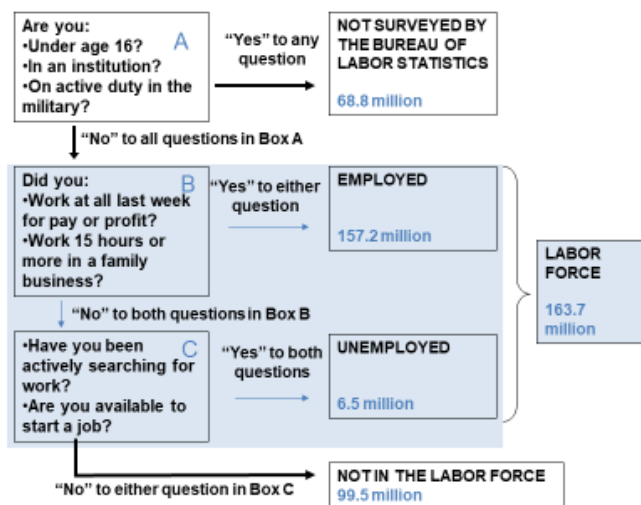
**employed person (BLS definition):** a person who did any work for pay or profit during the week before he or she is surveyed by the BLS or who worked for fifteen hours or more in a family business

**unemployed person (BLS definition):** a person who is not employed but who is actively seeking a job and is immediately available for work

The structure of the BLS household survey is illustrated in Figure 7.1. The survey starts with the three questions in Box A of Figure 7.1. If you can answer “no” to *all* these questions, you are part of the *civilian, non-institutionalized, age sixteen and over population* about which this survey gathers data on employment. If you answer “yes” to any question in Box A, the official employment and unemployment statistics do not include you. Trends in employment statistics over time, then, need to be analysed in the light of considerations such as changes in age demographics, military policy, and rates of disability and incarceration. (See Box 7.2, for more on incarceration in the United States.)

If you are part of the surveyed population, then you will be asked the questions in Box B of Figure 7.1, starting with: “Last week, did you do any work for pay or profit?” Anyone who answers “yes” will be classified as employed. If you did *any* paid work last week—even if you worked for only an hour or two at a casual job—the interviewer will code you as “employed.” If you answer “no,” then you will be asked more questions. For example, if you have a paid job but just did not happen to put in any hours last week because you were sick, on vacation, or on a leave, you will be coded as “employed.” Also, if you did *unpaid* work in a family-run business, such as a retail store or farm, you will be classified as “employed” as long as you worked for more than fifteen hours a week.

**Figure 7.1** Who Is In the Labor Force?



Sources: BLS News Release, “The Employment Situation—January 2022,” February 2022; U.S. Census Bureau Current Population Clock.

Note that the “family business” situation is the only case in which unpaid work currently counts as being employed in the official statistics. If you work fewer than 15 hours in your family business, or are, for example, occupied with caring for your children or other family members or doing community volunteer work, you will *not* be considered “employed.” Terms such as “labor,” “work,” and “employment” in official statistics generally refer only to *paid* work.

If your answers to the household survey do *not* result in your being classified as “employed,” you will be asked the questions about job search and availability shown in Box C of Figure 7.1. Activities such as contacting employers and sending out résumés count as an “active” job search. Merely participating in a job-training program or reading employment ads do not. The question about whether you could start a job concerns whether, in fact, you are *available* for work. If, for example, you are a college student searching during spring break for a summer job, but you are not available to start the job until June, you would answer “no” to the availability question. If you can answer “yes” to *both* these questions you are classified as unemployed.

If you are either employed or unemployed, the BLS classifies you as part of the **labor force**. But what if you are neither “employed” nor “unemployed”—if you do not have a job but are not actively seeking one? Then you are classified as “**not in the labor force**.” People in this category are often taking care of a home and family, in school, disabled, or retired.

**labor force (BLS definition):** people who are employed or unemployed

**“not in the labor force” (BLS definition):** the classification given to people who are neither “employed” nor “unemployed”

Notice, in Figure 7.1, that the vast majority of U.S. residents who are not “employed” either are “not in the labor force” (about 99.5 million) or are not part of the surveyed population (about 68.8 million). The latter group includes children under 16, and persons who are institutionalized. In comparison, about 6.5 million people in January 2022 were counted as “unemployed” while 157.2 million were counted as “employed”. (Figures are updated monthly at [www.bls.gov](http://www.bls.gov).)

## 1.2 The Unemployment Rate

Every month, having made estimates, based on the survey responses, of the total number of employed and unemployed people in the country, the BLS calculates the official **unemployment rate**. This is defined as the percentage of people in the labor force who do not have paid jobs but are actively looking for and available for paid work. Mathematically, it is calculated as:

$$\text{unemployment rate} = \frac{\text{number of people unemployed}}{\text{number of people in the labor force}} \times 100$$

**unemployment rate:** the percentage of the labor force made up of people who do not have paid jobs but are immediately available and actively looking for paid jobs

For example, in January 2022, there were 157.2 million employed people and 6.5 million unemployed people; so a total of 163.7 million people were in the labor force (Figure 7.1). The unemployment rate was thus calculated as 3.97 percent:

$$\text{unemployment rate} = \frac{6.5 \text{ million}}{163.7 \text{ million}} \times 100 = 3.97\%$$

The unemployment rate reported in the media is often “seasonally adjusted.” Over the course of a year, some swings in unemployment are fairly predictable. For example, agriculture and construction tend to employ fewer people in the winter months, and each year many students enter the labor force in May and June after graduation. The BLS releases “seasonally adjusted” figures that attempt to reflect only shifts in unemployment that are due to factors *other than* such seasonal patterns.

The BLS also estimates unemployment rates for various demographic groups, occupations, industries, and geographical areas. Historically, unemployment rates have generally been substantially higher for minority populations than for whites, for teenagers than for older people, and for less educated people than for the more educated. Unemployment rates often have differed somewhat by gender, though not with any consistent pattern. Some representative unemployment rates are given in Table 7.1.

**Table 7.1 Unemployment Rates for Different Groups, January 2022**

Group	Unemployment rate
All Workers	4.0
<b><i>Race and ethnicity*</i></b>	
White	3.4
Black/African American	6.9
Hispanic or Latino	4.9
<b><i>Age</i></b>	
Teenage (age 16-19)	10.9
Age 65 and older	3.5
<b><i>Education**</i></b>	
Less than a high school diploma	6.3
Bachelor’s degree and higher	2.3
<b><i>Gender</i></b>	
Adult male	3.8
Adult female	3.6

Source: BLS News Release, “The Employment Situation—January 2022,” February 4, 2022.

\*People are allowed to indicate more than one racial group. However, data from people who indicated more than one race are not included in these statistics.

\*\* Data on unemployment by education is for the age-group 25 years and over.

### 1.3 Discouraged Workers and Underemployment

The fact that some people “not in the labor force” might want jobs but have given up looking for them has long troubled employment analysts. To the extent that people give up looking, the official unemployment rate *underestimates* people’s need and desire for paid jobs.

The BLS survey includes questions to determine how many people in the “not in the labor force” population may want employment, even if they are not currently searching for work. Any individual in this population who is available for work, wants to work, and has looked for work in the past 12 months but not in the past 4 weeks, is categorized as “**marginally attached workers.**” In January 2022, marginally attached workers numbered 1.5 million.

**marginally attached workers:** people who want employment and have looked for work in the past 12 months but not in the past 4 weeks

If these marginally attached workers also say that the reason they are no longer looking is that they believe there are no jobs out there for them, they are called **discouraged workers.** They may have become discouraged because their skills do not match available openings, because they have experienced discrimination, or because they have been turned away time after time. In January 2022 the number of discouraged workers in the United States was estimated at about 408,000. Marginally attached workers who are not discouraged workers typically have not looked for work recently because of school attendance or family responsibilities.

**discouraged workers:** people who want employment but have given up looking because they believe that there are no jobs available for them

Let’s also take a closer look at the people classified as “employed.” In the BLS statistics, people are counted as “employed” if they do any paid work *at all* during the reference week, even if only for an hour or two. Some people prefer part-time work, of course, because of the time it leaves them for other activities, such as schooling or family care. Some are limited to part-time work for health reasons. But others want and need full-time work and are only settling for part-time work until they can find something better. The household survey asks people who work part time about their reasons for doing so.

In January 2022, 20.2 million people reported working less than 35 hours per week for “non-economic” reasons such as health or family responsibilities. In the same month, an additional 3.7 million people reported working part time for what the BLS calls “economic reasons”—that is, slack business conditions or because part-time work was all they could find.

What indicator, then, should we look at to see whether the national employment situation is “good” or “bad”? The BLS publishes various measures of labor underutilization that allow you to see the situation from a variety of different perspectives. For example, if the marginally attached workers and people who work part time involuntarily are added to the number of unemployed, the rate of labor

underutilization in January 2022 comes to 7.1 percent, compared to the official unemployment rate of 4.0 percent.

The BLS also counts people as employed even if the kind of work that they did does not match their skills. Suppose that you paint your aunt's living room for cash while you are waiting to hear back on job applications for management or computer positions. The BLS counts you as already employed. People who are working at jobs that underutilize their abilities, as well as those who work fewer hours than they wish to, are said to be **underemployed**.

**underemployment:** working fewer hours than desired or at a job that does not match one's skills

If we are concerned about human well-being, underemployment as well as unemployment should be of concern. While underemployment due to an underutilization of skills is of considerable concern for both efficiency and quality-of-life reasons, BLS official surveys do not currently attempt to measure this sort of underemployment.

#### 1.4 Labor Force Participation

The **labor force participation (LFP) rate** is defined as the proportion of people who either are in paid jobs or are actively seeking paid work out of the total pool of workers who could potentially be working. It is calculated by dividing the number of people officially in the labor force by the number of people age 16 or over who are not institutionalized or in the military:

*LFP Rate*

$$= \frac{\text{number of people in the labor force}}{\text{number of people age 16+, not institutionalized or in the military}} \times 100$$

**labor force participation (LFP) rate:** the percentage of potential workers either with a job or actively seeking a job or the labor force as a percentage of the civilian non-institutional population

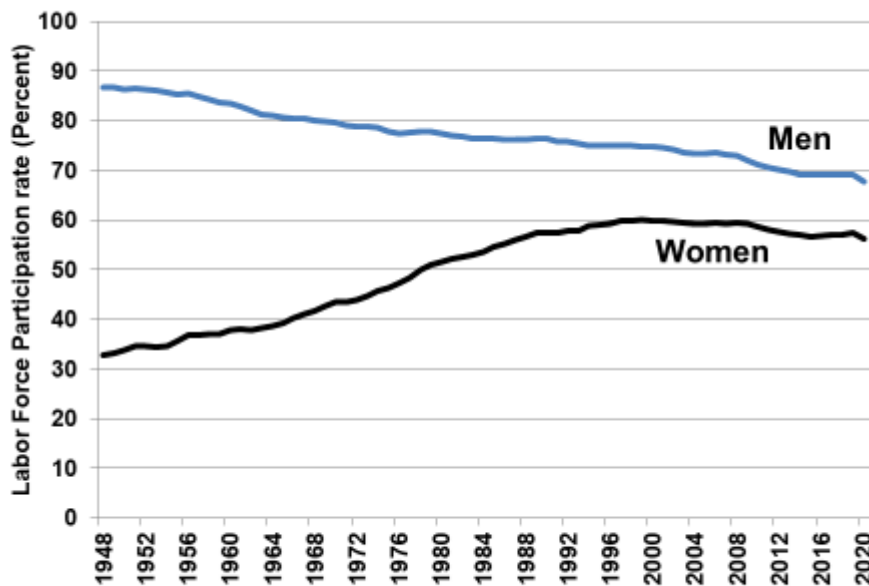
In 2021 the LFP rate in the United States was about 62 percent. About 38 percent of the surveyed population are not actively looking for jobs. This is an increase from 2000, when the percentage not participating in the labor force was less than 33 percent.

In the first half of the twentieth century, the labor force participation rates for men and women were very different: In 1948 the LFP rate for men was 87 percent, while for women it was only 33 percent. Since then, men's LFP rate has declined to about 68 percent in 2020 while the rate for women increased dramatically until about 2000, when it began to stabilize at around 60 percent as shown in Figure 7.2. The women's rights movement during the 1960s and 1970s contributed to this expansion in women's labor market activities. Other factors include the expansion of the service sector (discussed in Chapter 6) and reductions in the average number of children per family.

More recently the pandemic has caused a decline in labor force participation for both men and women. Overall, men's labor force participation has declined by 1.1 percent, compared to a decline of 1.3 percent for women. Exit from the labor force has

been higher for Black and Latina women, as well as for women living with children, and women with lower earnings.<sup>1</sup> Part of this decline can be explained by the loss of jobs in the services sector and the increase in childcare responsibilities during the pandemic.

**Figure 7.2** Male and Female Labor Force Participation Rates, 1948–2020



Source: Bureau of Labor Statistics, Labor Force Participation Rate, retrieved from FRED, Federal Reserve Bank of St. Louis

### Box 7.1 The Decline in Labor Force Participation of Prime-Age Men

In the past 60 years, the share of men between the ages of 25 and 54 either working or actively seeking work, also known as the prime-age male labor force participation (LFP) rate, has been falling. While over 96 percent of the prime-age men were in the labor force until the 1960s, this number has gradually declined to about 88 percent in 2021.

What explains this decline in men's LFP? Data from the U.S. Current Population Survey suggests that about 47 percent of the prime-age men not in the labor force are going to school, another 26 percent are either disabled or ill, 14 percent are retired, and the remaining 13 percent are either taking care of home or not working due to other reasons. Empirical evidence suggests that the decline in male LFP is concentrated among those with high school degree or less and that the drop in demand for low-skilled labor, due to the loss of manufacturing jobs, increased technology, and automation explains part of this decline. Other reasons for the decline in LFP cited in the literature include delayed family formation, rise of substance abuse, and heavy use of video games.<sup>2</sup>

These data raise some obvious questions; for one, how are these individuals getting by? Some males who have dropped out of the workforce might be dependent on income from a working spouse. But less than a quarter of prime-age men who are not in the workforce have a working spouse, and that figure has actually *decreased* during the last 50 years. In case we suppose that these workforce drop-

outs have other sources of income, data suggests that more than 35 percent of prime-age men not in the labor force lived in poverty in 2014.<sup>3</sup>

Can the trend be explained by generous public assistance? About half of non-working 25- to 54-year-old men are on Medicaid, collect Social Security disability insurance or both, and about two-fifths of them are on food stamps.<sup>4</sup> But it should be noted that disbursements from the Social Security Disability Insurance (SSDI) have increased by only 2 percentage points since 1967, compared to a 7.5 percentage-point decline in prime-age male labor force participation rates over that period. Analysis conducted in 2016 by the CEA found that increasing SSDI disbursements can explain at most 0.5 percentage point of the decline in prime-age male labor force participation over this period. At the same time, other government programs, such as Temporary Assistance for Needy Families (TANF), the Supplemental Nutrition Assistance Program (SNAP), and unemployment benefits have become increasingly hard to access for those out of work, and especially those without children.<sup>5</sup>

Some labor market researchers are also looking at the opioid crisis as an explanation for the decline in labor force participation of prime-age men with lower education levels. A 2018 paper finds a significant negative relationship between opioid prescription rates and labor market participation.<sup>6</sup> The authors estimate that resolving the opioid crisis would increase labor market participation among prime-aged males by 4 percentage points. It is also possible that the causation runs the other way—loss of good jobs could be leading to higher rates of opioid use.

The fall in labor force participation for prime-age men has been a hot political topic, as it is presumed to have swung a block of disaffected white male voters toward Donald Trump in the presidential race of 2016. But it should be noted that the decline has been steepest, and the rate remains lowest, for prime-age black men, who also suffer the highest rates of unemployment.

Other issues affecting labor force participation include the aging of the population and higher educational attainment. An increasing share of Americans are retired, and thus voluntarily out of the labor force. As more people attend college and graduate school, for a period of time they voluntarily remove themselves from the labor force. Because of the way LFP is calculated—excluding people who are institutionalized (in prison or jail)—changes in incarceration rates also have a significant effect on the statistics generated on labor force participation (see Box 7.2).

### Box 7.2 Incarceration in the United States

Not only does the United States incarcerate more individuals, in absolute numbers, than any other country in the world but it also has the world's highest incarceration rate. In 2019, the incarceration rate, calculated as number of prisoners per 100,000 adult population, was 629 for United States compared to 165 for Australia, 104 for Canada, and 103 for France.<sup>7</sup>

The total cost of public correction in America is estimated to be over \$80 billion per year. This figure, however, only includes spending on things like food, staff, and facilities. When spending on judicial and legal systems, policing, healthcare, private corrections and costs to families of those incarcerated are added, the total cost is estimated to be over \$182 billion.<sup>8</sup> Adding social costs, such as foregone wages and increased health risks of the incarcerated along with adverse health and education



effects and increased criminality of children of the incarcerated, could increase the total cost of incarceration to over 1 trillion dollars.<sup>9</sup>

The U.S. prison population has increased dramatically in the past few decades. Between 1980 and 2019, the prison population increased from about 500,000 people to over 2.1 million people.<sup>10</sup> Given that violent and property crimes decreased steeply during this same period, why has the prison population risen so much? Part of the increase is a result of the “war on drugs,” which mandated long prison sentences even for minor drug offenses, such as drug possession. However, only 1 in 5 incarcerated people are locked up for drug offenses. A 2020 report from the Prison Policy Initiative finds that most incarcerated people are charged with low-level offenses, including misdemeanors and non-criminal violations, such as probation or parole violations.<sup>11</sup>

Black men are imprisoned at six times the rate of white men. According to Census data from 2014, there are more young black high school dropouts in prison than have jobs. A *Workblog* analysis of government statistics noted that about 7.7 percent of prime age black men are institutionalized, as compared to 1.6 percent of prime-age white men. These facts have a significant impact on reported statistics concerning labor force participation. The statistics are normally given with reference to the “non-institutionalized” population. Officially, 84 percent of prime age white men were working in 2014, compared to 71 percent of black men. After including those incarcerated in the population (the denominator), the fraction of white men who have jobs hardly changes, but the black employment-population ratio drops to 66 percent.<sup>12</sup>

When people get out of prison, their chance of getting a job is substantially lower than for a similar individual without a record. One study found that a criminal record reduced the likelihood of a call-back or job offer by nearly 50 percent (28 percent of those without a criminal record get a call-back, vs. 15 percent of those with). Moreover, the negative effect of a criminal conviction is substantially larger for blacks than for whites. The chance of getting a call-back or job offer is reduced by 30 percent for whites, but by 60 percent for blacks.<sup>13</sup> The imprisonment of African Americans affects far more than labor force participation, of course. To mention just one additional aspect of this reality, one in thirteen black adults can’t vote because of their criminal records.

### Discussion Questions

1. How would the BLS classify you, personally, on the basis of your activities last week? Can you think of an example where someone you think of as *working* would not be considered by the BLS to be officially “employed”? Is it true that people who are *not working* are generally counted as “unemployed”?
2. Would you say that the official unemployment rate provides an accurate estimate of the actual labor market conditions in the economy? What are some of the issues with the way in which this number is calculated? How has the BLS addressed some of these issues?

## 2 A Closer Look at Unemployment

The unemployment rate is one of the most important indicators that economists use to judge the state of a country's economy. As we will see, some degree of unemployment is expected and even considered healthy in an economy. But being unemployed for a long time, against one's wishes, has a significant negative impact on people's well-being, including their mental and physical health.<sup>14</sup> In this section we will look at a variety of causes for unemployment as well as some historical patterns for the phenomenon.

### 2.1 Types of Unemployment

Although BLS statisticians are concerned mainly with calculating the number of the unemployed, economists try to understand the causes of unemployment. We will discuss four different categories that—while not closely related to BLS categories—can be helpful in thinking about some of the major causes of unemployment.

**Frictional (or search) unemployment** merely reflects people's transitions between jobs. The fact that some people are unemployed does not necessarily mean that there are no jobs available. In December 2021, for example, the number of job vacancies (10.9 million) was higher than the number of people looking for jobs (6.5 million), implying a shortage of workers, yet unemployment was still at 3.9 percent. An unemployment rate of 0 percent would only be possible if everyone who wants a job always takes one immediately, or at least within the BLS's monthly survey periods. Not only is this unrealistic but it is also in some ways undesirable. Everyone benefits if people take the time to find good job matches—work that puts their skills and talents to good use. Because information about job openings takes time to find, and employers may want to spend time interviewing and testing applicants, making a good job match is not an instantaneous process. Hence, even in a well-functioning economy, it may take time for people and suitable jobs to find each other.

**frictional unemployment:** unemployment that arises as people are in transition between jobs

For the most part, economists don't worry too much about frictional unemployment because much of it tends to be short term, and some frictional unemployment—about 2 to 3 percent—is seen as inevitable, although innovative web technologies for matching job offers to job seekers may reduce frictional unemployment by reducing search time.

**Cyclical unemployment** is unemployment due to macroeconomic fluctuations—specifically, unemployment that occurs due to a **recession**. Most economists look to the National Bureau of Economic Research (NBER), a non-profit and non-governmental economic research organization, to “officially” mark the beginning and end of recessions. The NBER determinations are strongly based on GDP data, though they also consider other indicators, such as the levels of industrial production and wholesale-retail sales. During recessions, when GDP declines for at least two consecutive quarters, unemployment rises as demand for the products of business falls off. During recoveries, this kind of unemployment should decrease.

**cyclical unemployment:** unemployment caused by a drop in aggregate demand (normally associated with a recession)

**recession:** a downturn in economic activity, usually defined as lasting for two consecutive calendar quarters or more

Whereas frictional unemployment is almost always present in an economy, cyclical unemployment is variable and is the kind of unemployment that can affect anyone, regardless of his or her education. Hence it is a significant source of insecurity for broad parts of the population. This is why a great deal of macroeconomic theorizing has to do with the causes of cyclical unemployment and the appropriate policy responses. Explanations of why macroeconomic fluctuations occur and what kind of policies might be used to dampen them (and thus reduce cyclical unemployment) are discussed in Part III of this book. In severe recessions, such as the Great Recession of 2007–2008, cyclical unemployment becomes unacceptably high and may remain high even after the economy is no longer formally in recession. This is what has been called a “jobless recovery”: Even after GDP starts to recover, job growth can be very slow. In contrast to the experience of the Great Recession, job growth was rapid during recovery from the 2020 recession (discussed further in Chapter 9).

Many job seekers rely on state unemployment insurance programs to ease their income needs while they spend time searching for work. In many states unemployment compensation benefits are set at half a worker’s earnings or a state-set maximum (whichever is less). In normal economic times, people who qualified for unemployment programs usually received up to twenty-six weeks’ worth of benefits. These benefits are often extended during periods of severe economic downturns, in order to allow people more time to find jobs when unemployment rates are high. For example, in the wake of the Great Recession of 2007–2008, unemployment benefits were extended, at one time to as long as 99 weeks. And the Pandemic Unemployment Assistance program, implemented in 2021 in response to the COVID-19 crisis, extended unemployment benefits for up to 79 weeks.<sup>15</sup> However, by February 2022, claims for unemployment benefits had fallen to the lowest point since the 1970s, as the economy had mostly recovered from its lowest point in March and April of 2020.<sup>16</sup>

**Structural unemployment** arises when there is a widespread mismatch between, on the one hand, the kinds of jobs being offered by employers and, on the other, the skills, experience, education, or geographic location of potential employees. One important cause of structural unemployment is sectoral shifts, such as those described in Chapter 6, where employment has been falling (relative to total population size) in the primary and secondary sectors, with the largest number of new jobs opening up in the tertiary (service) sector. The U.S. economy may have a lot of new openings for financial analysts and nurses’ aides in the Southwest, for example. But these will not do you much good if you live in the Northeast and your skills are in engine assembly or Web design. The labor shortage in 2021 was partly caused by the pandemic-related structural changes in the economy (See Box 7.3).

**structural unemployment:** unemployment that arises because people’s skills, experience, education, or location do not match what employers need

### Box 7.3 Labor Shortage in the U.S.

The COVID-19 pandemic transformed the labor market in the U.S. While the unemployment rate of 4 percent in January 2022 was close to the 3.5 percent unemployment at the end of 2019, there were a record number of job openings and quits, resulting in a shortage of workers and pushing wages higher. What caused this labor shortage?

One factor explaining this shortage is the increase in the number of working-age individuals dropping out of labor market because of job losses or concerns about their health and safety from being exposed to the virus at workplaces. Many who were infected experienced long-term health effects, preventing them from returning to work. Additionally, over 3 million older Americans took early retirement, reducing the size of labor force.<sup>17</sup> Some working parents, especially women, also left the labor market to provide care to their children and other family members. Hence, the pool of potential workers declined. The number of people employed in 2021 was 3.5 million fewer than the number in 2019, but only about 1.8 million people were actively seeking jobs in 2021.<sup>18</sup>

Another factor contributing to the labor shortage was the increase in the number of people switching jobs. The disruptions caused by the pandemic pushed many people to reconsider their career choices and switch to jobs that allow more flexibility and have better pay and better working conditions.<sup>19</sup> The pandemic-era unemployment benefits may have also provided workers with some cushion against immediate shocks from job losses and allowed them to take time to reconsider their job choices.

Some have blamed the labor shortage on these government benefits, arguing that people became reliant on overly generous unemployment benefits and therefore had little incentive to return to work. But empirical evidence to support this argument is rather weak. States that ended unemployment benefits early did not see a more rapid return of workers to the labor force.<sup>20</sup> Others have argued instead that the labor shortage is caused by the shortage of *good* jobs, i.e., the reason the open positions remain unfilled is that these positions have low wages, poor working conditions, and limited access to basic benefits.<sup>21</sup> A closer look at the problem reveals that labor shortages have been most significant in the accommodations, food, and retail industries—sectors that have low pay and less flexibility for workers. These industries have also had the highest quit rates. Just in September 2021, 4.4 million workers quit their jobs—what has been called “the Great Resignation”. More than one-third of these workers were in the accommodations, food, and retail services.<sup>22</sup>

For employers complaining about not being able to fill open positions, the solution seems to be to improve their offers for workers by increasing pay and providing better working conditions. Some firms are already doing this. According to the Bureau of Labor Statistics, average hourly wages have increased by about 4 percent in 2021, with the increases being the steepest in the leisure and hospitality industries (12.3 percent). But addressing the labor shortage requires a much broader change. Most importantly, the wages and working conditions need to be improved for “essential workers” who constitute about half of the workers in low-wage jobs. These workers were on the frontline during the pandemic, risking their health to keep the country functioning, yet they struggle to make ends meet.<sup>23</sup>

Major transitions in the kinds of work that are available—whether caused by new technologies or by sectoral shifts—are inevitably painful, and they have occurred repeatedly over the last few hundred years. Workers have fought back when they saw their jobs disappearing; most famous were the Luddites, a group of English textile workers and weavers in the 19th century who destroyed weaving machinery to protest how their use was replacing workers. The term is sometimes applied to anyone opposed to industrialization, automation, computerization, or new technologies in general. It commonly implies opposition to progress—but the grievances of those thrown out of work are real.

**Technological unemployment** may be considered a special case of structural unemployment. Ever since the beginning of the Industrial Revolution, technology has been recognized by a double-edged sword for workers. On the one hand, it has created circumstances wherein each worker has more natural and manufactured capital to work with, raising workers' productivity and hence (potentially, at least) their earnings. On the other hand, technology can replace workers, leading to a situation in which ever fewer workers are needed to produce a given quantity of output.

**technological unemployment:** unemployment caused by reduced demand for workers because technology has increased the productivity of those who have jobs

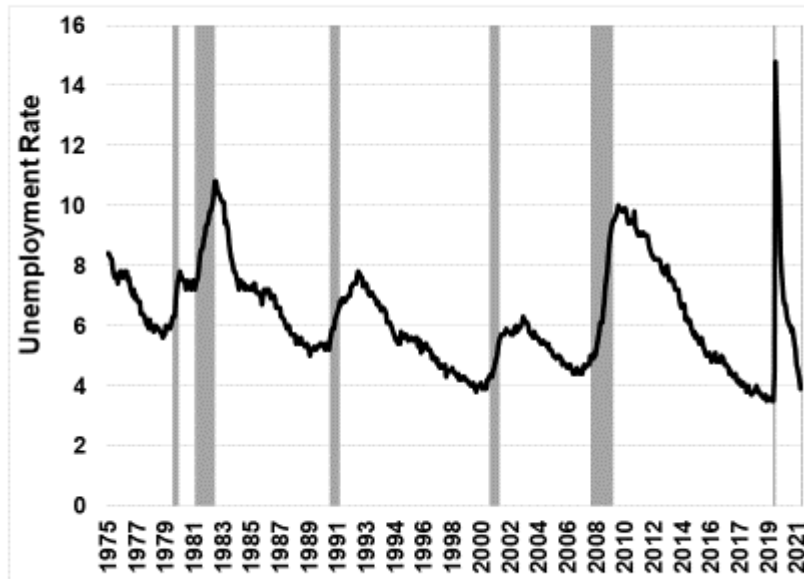
Fears of technological unemployment have been raised repeatedly during the last two and a half centuries. While these fears have been valid in specific areas—for example, tractors introduced in the 1920s were clearly a factor in reducing the need for farm labor, and computers have made many secretarial jobs obsolete—the total quantity of jobs has generally not declined as a proportion of the population. Indeed, in the twentieth century, the number of jobs in the United States increased significantly, as women successfully entered the labor force and increased the LFP rate, as mentioned above.

## 2.2 Patterns of Unemployment

Figure 7.3 shows the monthly unemployment rate in the United States from January 1975 to January 2022. Unemployment was at a low of 5.6 percent in 1969 and at a high of 10.8 percent in 1982. A steep increase in unemployment was seen during the Great Recession, when unemployment rate rose dramatically from less than 5 percent in late 2007 to its peak of 10.0 percent in October 2009. By early 2020, the unemployment rate was down to 3.5 percent, but the Covid-19-related business closures in March 2020 shot the unemployment rate to the highest level since the Great Depression, 14.7 percent in April 2020.

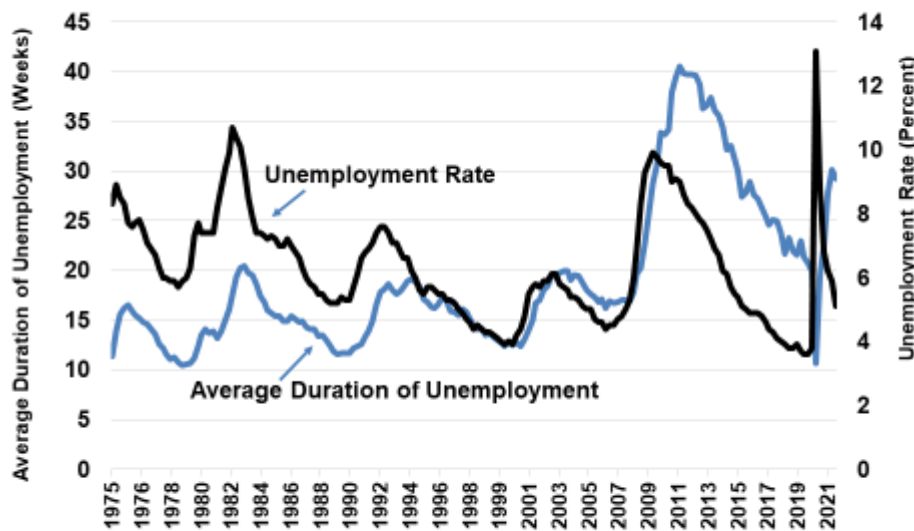
Notice in the figure that the U.S. economy experienced six recessions between 1975 and 2021, but the duration of the recessions in the early 1980s and in 2008 was much longer than the other recessions. In fact, the recovery from the 2008 recession was characterized by persistent high unemployment, and a dramatic increase in the average duration of unemployment. This is shown in Figure 7.4, which plots the average duration of unemployment in addition to the unemployment rate.

**Figure 7.3** The Monthly Unemployment Rate in the United States, 1975–2021



Source: U.S. Bureau of Labor Statistics online database.  
Notes: Recessionary periods shaded.

**Figure 7.4** Average Duration of Unemployment and Unemployment Rate, 1975–2021



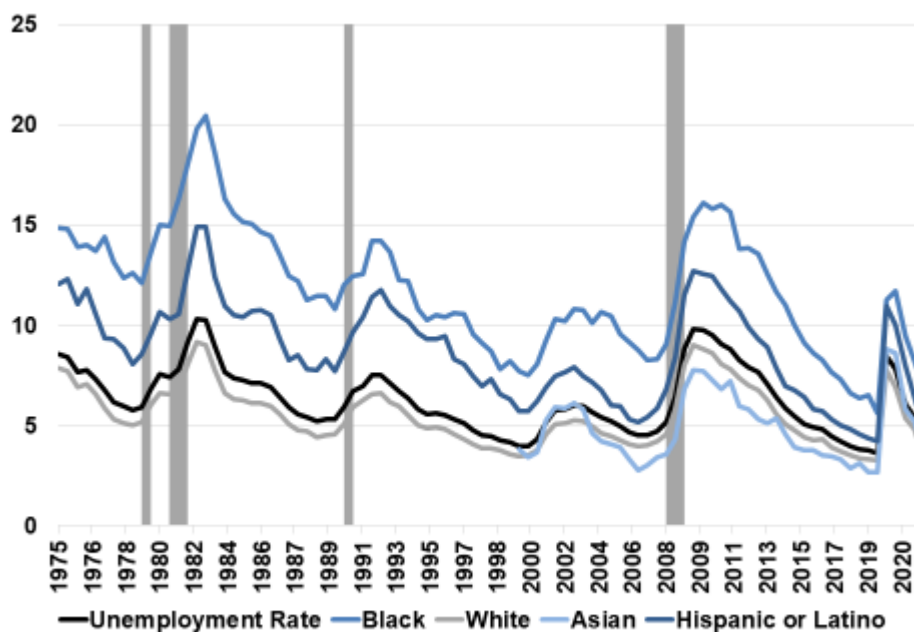
Source: U.S. Bureau of Labor Statistics online database.

The figure shows that when the unemployment rate goes up, the average duration of unemployment also rises. When job opportunities are scarcer, it takes longer for

workers who lose their jobs to find new ones. We see in Figure 7.4 that when the unemployment rate exceeded 10 percent in the early 1980s, the average duration of unemployment reached about 20 weeks. As a result of the recession in the early 2000s, the unemployment rate peaked at around 6 percent and the average duration of unemployment again hit 20 weeks. But as the unemployment rate rose during the Great Recession, the average duration shot up dramatically. Even as the unemployment rate began to fall in 2010, the average duration continued to rise, eventually reaching a peak of about 41 weeks in late 2011. The 2020 recession, however, was an exception to this general trend, as the downturn was severe but short—lasting just two months. As pandemic-related restrictions were lifted and businesses reopened in the third quarter of 2020, unemployment fell sharply, and unemployment duration never reached the levels it had in 2011.

As Figure 7.5 shows, unemployment is also unequally distributed by race. The overall unemployment rate reflects a slightly lower rate for whites, and a significantly higher rate for Black and Hispanic workers. The relationship between these rates has held fairly steady both in times of high and low unemployment. As a result, even in times of close to full employment, the unemployment rate for Black workers remains in the 7-9 percent range.

**Figure 7.5** Unemployment Rate by Race, 1975–2021



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

### Discussion Questions

1. Do you know of places in your city or region (or country) that have been hit particularly hard by unemployment and underemployment, recently or in past decades? Do you know why this hardship occurred? Would you characterize this unemployment as frictional, structural, or cyclical? Which kind of unemployment would you say is of deep concern to economists? Why?
2. Some economists believe that “technological unemployment need not lead to structural unemployment”. How can this statement be supported? What arguments or data might cast doubt on it?

### 3 Theories of Employment, Unemployment, and Wages

As of 2021, income from wages and salaries accounted for 62.6 percent of national income in the United States.<sup>24</sup> The other sources of income—rents, profits, and interest which make up capital income—mostly derive from various kinds and degrees of ownership of productive assets, such as buildings, land, or other resources, or stocks, which are ownership “shares” in companies. These sources of income are concentrated in a fairly small segment of the population.

A study from the Tax Policy Center finds that the higher you go up the income ladder, the greater the share of income from capital. For the poorest 20 percent of households, wages and salaries account for about half of all income and government transfers make about a third. For every other income group, except the richest 1 percent, wages and salaries account for over 60 percent of their income. The richest 1 percent gets about 40 percent of their income as wages and salaries and 60 percent from capital income. And for those at the very top (0.1 percent) capital income accounts for about three-quarters of the income, with wages and salaries being only one quarter.<sup>25</sup> Hence, capital income is mostly concentrated among those at the very top. For most people, wage and salary employment is essential to their livelihoods, comfort and wellbeing.

Jobs are easiest to find, and often better paid, under conditions of **full employment**. But often, the economy does not achieve full employment, and rising unemployment can create hardship for many. What explains why labor markets do not always reach full employment? Why don't wages play the role of other types of prices, to bring the market for labor into an equilibrium in which all those who want jobs can find them, and all employers can find appropriate workers? We now explore various theories and perspectives on this issue.

**full employment:** a situation in which those who wish to work at the prevailing wages are able to find it readily

#### 3.1 The Classical Theory

As we discussed in earlier chapters, a “classical” perspective generally favors the workings of free markets, with little or no government intervention. Applying this approach to the labor market gives us a supply and demand model for labor, as shown in Figure 7.6a. “Quantity,” on the horizontal axis, can be understood to mean either quantity of labor *services* or the amount of labor hours supplied and demanded. We can think of this quantity as being measured, for example, by the number of full-time equivalent days worked over a given time period. The “price” of labor is the wage, in this case, per day (we assume that this is a “real” wage, i.e., adjusted for inflation.)

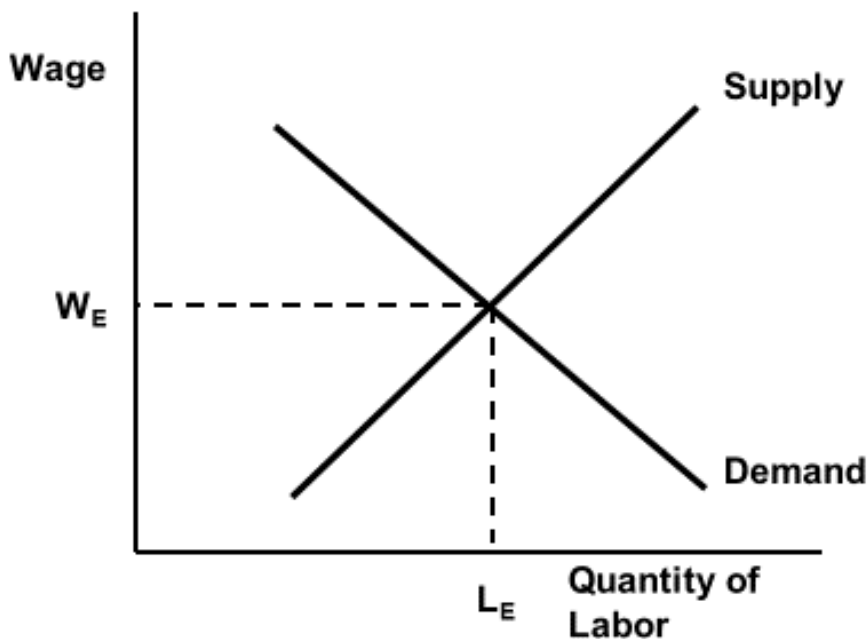
Employers demand labor, and as labor becomes more expensive (i.e. wages increase), their demand for labor declines. Hence, the labor demand curve is downward sloping. Workers are the suppliers of labor services. It is assumed that a rise in wages increases their willingness to supply labor; hence, the labor supply curve is upward sloping. This very simple model assumes that every unit of labor services is the same and every worker in this market will receive exactly the same wage. The equilibrium wage in this example is  $W_E$  and the equilibrium quantity of labor supplied is at  $L_E$ .



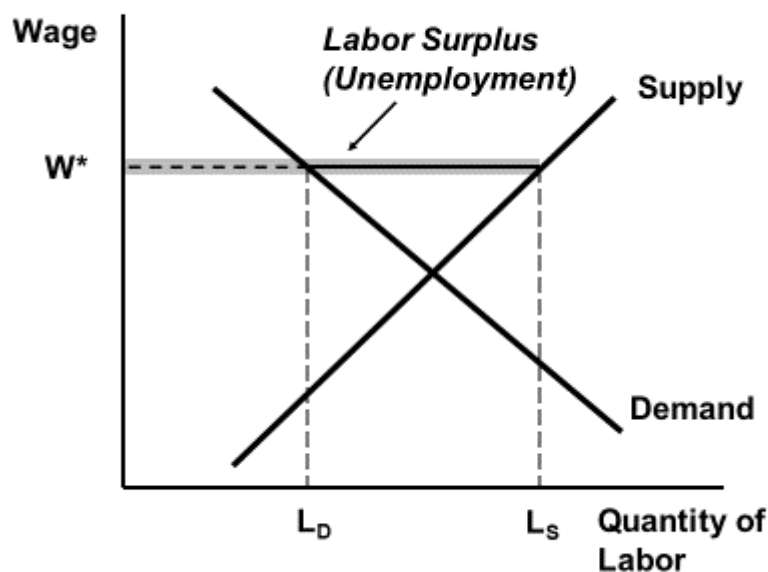
Because the market pictured in Figure 7.6a is free to adjust, there is no involuntary unemployment. Everyone who wants a job at the going wage gets one. There may be many people who would offer their services on this market if the wage were higher—as the portion of the supply curve to the right of  $L_E$  demonstrates. But, given the currently offered wage rate, these people have made a rational choice not to participate in this labor market.

In this model, the only way that involuntary unemployment can exist is if something gets in the way of market forces. The presence of a legal minimum wage is commonly pointed to as one such factor. As illustrated in Figure 7.6b, if employers are required to pay a minimum wage of  $W^*$  (“W-star”), which is above the equilibrium wage, this model predicts that they will hire fewer workers. At an artificially high wage  $W^*$ , employers want to hire only  $L_D$  workers. But at that wage more people ( $L_S$ ) want jobs. There is a situation of surplus, as we discussed in Chapter 3. In this case, the market is prevented from adjusting to equilibrium by legal restrictions on employers. Now there are people who want a job at the going wage, but cannot find one—that is, they are unemployed.

**Figure 7.6a**                      The Classical Labor Market Model



**Figure 7.6b** Unemployment in the Classical Labor Market Model



In the real world, where issues of motivation, labor relations, and power are also important, the classical idea that minimum wages cause substantial unemployment can be called into question. In a well-known study, economists David Card and Alan Krueger found that a moderate increase in the minimum wage in New Jersey did not cause low-wage employment to decline and may have even increased employment.<sup>26</sup> The economic logic behind this result is that the rise in minimum wages could increase people's income and consumption levels, which increases the demand for goods and services in the economy and leads to job creation.\* The study came under fire from economists who believed (given the analysis shown in Figure 7.6a) that such a result simply could not be true. But the classical world assumes perfect competition, whereas real-world employers may have enough power in the labor market to be able to pay workers less than they are worth.

Several other studies have since confirmed Card's and Krueger's findings for other regions and other countries, including a number of EU countries. However, the jury is still out on the overall impact of minimum wage increases on employment levels, as some other studies find that higher minimum wages results in fewer jobs, or that raising minimum wages has no impact on employment levels.<sup>27</sup>

The mixed findings might be partly explained by the fact that labor markets are different from the market for goods and services. Factors such as power relations between workers and employers, worker's interests and motivations, as well as social norms may influence labor market outcomes. There may also be an interaction with technology, where employers have a choice on the question of whether to hire more workers or invest in labor-replacing technology. In such circumstances the wage rate may have a more significant impact on hiring decisions.

In any case, the minimum wage affects only a portion of the workforce—people who are relatively unskilled, including many teenagers—but unemployment tends to affect people at all wage levels. Classical economists suggest other “market

\* This reasoning is based on the Keynesian theory, which will be introduced in Chapter 8.

interference” reasons for unemployment, as well. The economy might provide less than the optimal number of jobs, they believe, because:

- Regulations on businesses reduce their growth, restricting growth in the demand for labor
- Labor union activities and labor-related regulations (such as safety regulations, mandated benefits, or restrictions on layoffs and dismissals) increase the cost of labor to businesses, causing them to turn toward labor-saving technologies and thus reducing job growth
- Public “safety net” policies, such as disability insurance and unemployment insurance, reduces employment by causing people to become less willing to seek work.

Labor-market recommendations derived from a classical point of view tend to focus on getting rid of regulations and social programs that are seen as obstructing proper market behavior. Like other classical proposals, such labor market proposals assume that the economy works best under the principle of *laissez-faire*. But alternative explanations of the workings of labor markets suggest a different perspective. In considering some of these alternative explanations, we will step away from the assumptions of a single, homogeneous market in which all jobs and all workers are alike and the labor market is characterized by perfect competition. Labor markets are also influenced by many other factors, including history, psychology, power, resources, productivity, and technology.

### 3.2 Alternative Theories of Labor Markets

Since economics became an academic discipline over 200 years ago, economists have proposed a number of explanations for how wages are set and how overall employment and unemployment levels are determined. As economists have observed the failure of markets to supply jobs to meet the demand, they have sought to explain why wages for each kind of work are not always at the theoretical equilibrium point, where supply would be equal to demand. Some theoretical explanations are based on the real-world fact that supply and demand for labor is not just like markets for any other good: the “good” being supplied and demanded, in this case, is the work done by human beings.

Focusing on why wages don’t fall as readily as the price of any other good, economists have come up with a variety of “**sticky wage**” theories. Observations of human behavior include the force of habits and expectations, based on people’s memory of recent history. When some types of work are paid more highly than others, people who receive the higher wages are often able to hold out for a long time against other forces (including the forces of supply and demand) that would tend to reverse the relationship. Employers may react to this human reality with a reluctance to reduce wages because they don’t want to cause hardship among employees whom they know, or may fear that workers will strongly resist such a move—perhaps with strikes or other labor actions. Often when businesses find that their revenue does not readily support the existing payroll, instead of lowering wages some workers are laid off. In addition to psychological resistance to wage cuts, a minimum wage might also make wages “sticky,” or wages may also become set at particular levels by long-term contracts, such as those that some large employers negotiate with labor unions.

**“sticky wage” theories:** theories about why wages may stay at above-equilibrium levels, even when a labor surplus exists

A more recent attempt to explain why wages may not be at the equilibrium point is **efficiency wage theory**, which points out that managers must attract, train, and motivate workers if their enterprise is to be productive. Employers may therefore find it to their advantage to pay employees more than would be strictly necessary to get them to work. This theory can be illustrated by looking back at Figure 7.6b, where  $W^*$  could be read as the efficiency wage.

**efficiency wage theory:** the theory that an employer can motivate workers to put forth more effort by paying them somewhat more than they could get elsewhere

Efficiency wage theory is a good fit with many observations. When workers are better paid they may be healthier and better nourished and therefore more able to do quality work. (This is especially true when talking about wage rates at the low end of the scale.) Also, workers may be more highly motivated and may have a lower propensity to quit if they know they are getting “a really good deal” from their employer, as opposed to a situation where they are receiving barely enough to motivate them to take the job, or just the same pay as they could get anywhere else. Workers with a lower likelihood of quitting are more valuable to an employer because the employer saves on the costs of training new workers. Workers may also work more efficiently if they believe that they could lose their “really good deal” if they are caught shirking. If a pool of unemployed people results from the higher-than-necessary efficiency wages, those who are employed might have greater incentives to work hard out of fear of losing their good jobs.

Labor markets today have characteristics that can be described using other theories as well. **Dual labor market theory**, developed in the 1970s, is being re-examined for the light it can shed on issues of inequality as well as the quality of jobs. According to this theory, labor markets could be understood as segmented between a primary sector with relatively high wages, long average job tenure, and chances for advancement with the company; and a secondary sector with none of these characteristics.<sup>†</sup> Various issues of class background, education, and employment experience could get some workers stuck in the secondary sector, while making it relatively easy for others to enter and stay in a primary sector position.

**dual labor market theory:** a theory according to which workers tend to get slotted into either a “primary sector” of good jobs, or a “secondary sector” where workers are taken on essentially on an “as needed” basis

Contemporary versions of this theory emphasize the difference between workers who have a (fairly) secure relationship with the employer, vs. those who are taken on “as needed”. Examples of the latter include alternative employment arrangements such as contract work, on-call work, temporary help agencies, and others in the “gig” economy, where employment isn’t defined by a steady, full-time job, but by shorter-

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<sup>†</sup> Note that the categorization of primary and secondary sectors in the ‘dual labor market theory’ is different from the classification of the economy in primary, secondary and tertiary sectors in Chapter 6.

term freelance or contract projects. In 1995 10.0 percent of employed workers were in such alternative employment arrangements. Recent estimates indicate that between 25 to 35 percent of the workforce in the United States are now involved in the gig economy, though less than half of these workers rely on gig jobs as their primary source of income.<sup>28</sup> A similar shift is occurring in other countries. For example, the number of workers in the gig economy in England and Wales has more than doubled since 2016, and China's gig economy is also rapidly expanding.<sup>29</sup>

Market segmentation is also related to corporate behavior and strategies. Driven by ever-fiercer international competition to reduce costs, many large companies have taken the approach of hiring employees in jobs with primary sector characteristics—good pay, including benefits, etc.—only in the areas defined as their “core competence”, while outsourcing the rest (see Box 7.4).

#### Box 7.4 The Loss of Good Jobs

A 2012 report from the Center for Economic and Policy Research defines “a good job” as “one that pays at least \$37,000 per year, has employer-provided health insurance, and an employer-sponsored retirement plan.” By this definition, “the share of workers with a “good job” fell from 27.4 percent in 1979 to 24.6 percent in 2010. The writers find that even workers with college degree are less likely to have a good job now than three decades ago. They argue that the decline in good jobs is related to the deterioration in the bargaining power of workers, rather than technological change.<sup>30</sup>

Companies are often able to deny workers many kinds of protections required by the U.S. law by classifying them as independent contractors or self-employed workers. Thus, outsourcing and contracting has become a popular way for companies to reduce compensation costs. A 2016 study finds that independent contracting work rose by 30 percent between 2005 and 2015, and most of the increase was among low-wage workers.<sup>31</sup> While independent contractors have certain freedoms in how they operate their business, and some, such as lawyers and real estate agents, have high incomes, a majority of independent contractors suffer from lack of good pay and benefits.

For example, the hourly wage for Uber drivers after deducting Uber fees and operating expenses is estimated to be about \$11.77, but this drops to \$9.21 after factoring in the costs of benefits that the drivers must provide for themselves. This is substantially less than the average hourly compensation of \$32.06 in the private sector and \$14.99 for workers in low-paid service sector jobs.<sup>32</sup> In a 2010 paper, Economists Arindrajit Dube and Ethan Kaplan find that the pay for janitors fell by 4 to 7 percent and for security guards by 8 to 24 percent among American companies that outsourced janitorial and security services, hiring services that provided independent these workers as contractors, rather than hiring workers directly.

The rise in outsourcing and contracting has contributed to wage stagnation, rising income inequality, and increasing market power. If these trends are to be reversed to create better jobs that provide good financial security for workers, there will need to be a restructuring of corporate norms along with new legislations at the state and federal level to strengthen workers' bargaining power.<sup>33</sup>

John Maynard Keynes (pronounced “Kanes”), to whom we referred in Chapter 1, writing during the Great Depression of the 1930s, when unemployment reached over 25 percent, pointed out that aspects of real-world human psychology, history, and institutions make it unlikely and often undesirable for wages to fall quickly in response to a labor surplus. Wages may eventually adjust in the way shown in the classical model, but too slowly to keep the labor market in equilibrium. And even if wages do fall, this will not necessarily result in full employment.

While some Keynesian theorists emphasize sticky wages, Keynes’s critique of the classical model actually went much further. In more general terms, the Keynesian perspective challenges the entire classical assertion that unemployment results mainly from wage levels that are too high. The Keynesian perspective sees the labor market as a part of the whole economy, and suggests that the problem of insufficient demand for labor may be a consequence of insufficient **aggregate demand**—the total demand for all goods and services in a national economy. Falling wages could make this problem worse, as workers would be less able to buy goods and services. The policy responses that flow from this analysis will be touched on in the next section, and elaborated further in Part III of this book.

**aggregate demand:** the total demand for all goods and services in a national economy

### 3.3 Policy Responses

We saw in earlier parts of this chapter, that legally or contractually set wages, fear of worker unrest, and efficiency wages are all possible explanations for “sticky wages,” when unemployment is not solved by a lowering of workers’ wages, as the standard classical theory would predict. What sort of policies result from such theories? And what kinds of policies can effectively respond to job loss associated with technological change? Or to the forces that are driving a wedge between high and low earners, contributing to growing inequality? Here we will briefly summarize some relevant policies.

**Inflation and sticky wages:** Some economists argue that a moderate level of economy-wide price inflation tends to relieve some “sticky wage” unemployment. How could this be so? Suppose that you are working for \$12 per hour now, and your employer wants to cut your wage to \$10 per hour. You would probably resist if asked to accept this wage cut—especially if you see that other people are not suffering such wage cuts. But suppose, instead, that your wage stays at \$12 per hour, and, over time, inflation reduces the purchasing power of your wage to \$10 per hour (in terms of prices of the base year). Your nominal wage has stayed the same, but your real wage (and thus your real cost to your employer) has fallen. Because this has happened more subtly—and is felt more economy-wide—than a cut in your personal nominal wage, you may not feel as motivated to resist. According to some theories, such a drop in the real wages should cause employment to increase. Thus a small amount of inflation might help labor market adjustment without increasing unemployment.

**Government job creation:** Another policy option is job creation, such as the infrastructure projects mentioned in Chapter 6. The governments of some countries, notably Germany and France, as well as Japan in the 1980s and 1990s, have enacted industrial policies that directly encourage the development and retention of certain key industries through loans, subsidies, and tax credits. During negotiations on international trade (see Chapter 13), one sensitive issue is always the impact that

increased trade might have on the employment levels in various industries in each country.

**Making unemployment less painful:** Governments can also undertake various programs to relieve unemployment-related hardship, most obviously, unemployment benefits. Those benefits could be more effective if they also provided better search assistance as part of the Unemployment Insurance system, and gave workers more flexibility to use Unemployment Insurance to integrate into a new job.

**Responding to structural unemployment/ Education and training:** Government policies in the United States that target structural unemployment often focus on helping displaced workers find new employment. For example, the Trade Adjustment Assistance (TAA) Reform Act of 2002 provides benefits for certain workers displaced as a result of increased imports or the shifting of production to other countries. Workers who qualify for the program can receive retraining along with temporary income support payments and assistance with health insurance. The key feature of these programs is that they are targeted at particular workers in particular sectors of the economy. There has been some question, however, as to whether they have actually been successful in getting displaced workers into good new jobs. An evaluation of the TAA program, for example, found that at the end of four-year observation period TAA participants had almost entirely closed the gap in employment relative the comparison group of unemployment insurance claimants not eligible for TAA. The total income of the participants, however, was found to be lower than that of the comparison group, implying that the jobs they had landed were not especially good.<sup>34</sup> Another study reveals that trade-displaced workers often end up relying on Social Security and disability benefits.<sup>35</sup>

Business policies at the firm level are also relevant: Firms can help prevent structural unemployment if they make retaining or retraining their employees a priority, even while responding to changes in technology and trade. Community college and training systems could also be strengthened to help place people into jobs where there is strong demand.

More broadly, much of the discussion about structural and technological unemployment—among economists, policy-makers, and the general public—has focused on education as the solution. The problem has been defined as “a mismatch between worker preparation and job requirements,” while the solution is described as “education appropriate to the jobs of today and tomorrow.” This response seems correct if the “mismatch” is an accurate statement of the problem. An increased focus on computer literacy, starting in the early grades, more math and science, more focused occupational preparation, and expansion of life-long learning programs have been proposed as possible educational policy improvements.

**The Keynesian response: raising aggregate demand:** An important economic principle is that “the demand for labor is a derived demand”—meaning that it is derived from the demand for the output produced by labor. To Keynes and his followers, fixing the problem of unemployment in a recession or depression is not just a matter of making labor markets work more smoothly. Rather, aggregate demand for goods and services in the economy has to increase in order to stimulate hiring.

In this analysis, falling wages do not improve labor market conditions but would actually make things worse, because workers have less money to buy goods and services, leading to lower levels of business sales and further layoffs. Unlike the classical economists, Keynes believed that government policies in stimulating aggregate demand could be effective in response to an economic downturn.

The impact of Keynes' thinking has been widespread. A major concern of economic theory since the Great Depression has been the relationship between aggregate demand for goods and services, on the one hand, and the demand for, and rewards to, work, on the other. Rather than focusing just on labor markets, in this perspective the relevant issue is the level of overall economic activity. Part III of this book will provide a discussion of the macroeconomic policies that have been developed in efforts to maintain full employment.

### Discussion Questions

1. Which arguments on the relationship between wages and employment levels seem most convincing to you, those of “sticky wage” theorists, “efficiency wages” or economists concerned with aggregate demand? What are some strengths and weaknesses of each argument?
2. A number of policy responses to address job loss associated with technological change have been suggested above. Which of these measures, do you think, would be most effective? Can you suggest some other ways of addressing issues of unemployment?

## 4 Special Issues for the 21st Century

### 4.1 Jobs and Technological Change

How does technological progress affect the overall number of jobs in the economy? There are differing views on this. (See Box 7.5). An optimistic response is that “technological unemployment need not lead to structural unemployment.” The standard reasoning along these lines is as follows:

When technology reduces the need for labor in one part of the economy, it also results in more efficient production, increasing the overall wealth of society, because the same resources can produce a greater output, which is likely to be offered for sale at a lower cost. Thus, if a technological innovation results in a reduction of necessary labor inputs in a given sector, then the industry-wide cost of production falls, which lowers the competitive price. As the price goes down along a normal demand curve, the demand is expected to increase. Even if less labor is required per unit of output, increased demand is likely to increase the overall need (or “derived demand”) for labor inputs.

#### **Box 7.5** Technological Change and the Future of Work

Is the current situation of rapid technological change substantially different from previous eras? We are in what some call the second wave of the IT revolution, in which cloud-based platforms that deploy increasingly sophisticated forms of artificial intelligence are used to connect buyers and sellers, manage transactions, coordinate robots, drones and sensors, and provide other services. While the demand for software engineers is expanding rapidly, taxi and truck drivers are nervously watching the development of ride-sharing programs and self-driving vehicles; and many professions that had seemed immune from technological unemployment—law, banking, retail sales, education, healthcare, and public services—may now also be in danger.

The COVID-19 pandemic has further accelerated the shift towards automation as companies struggling to keep operating costs low amidst requirements for social



distancing increasingly replaced workers with machines. Is there a tipping point ahead, where the total number of jobs will fall behind the number of those seeking work?

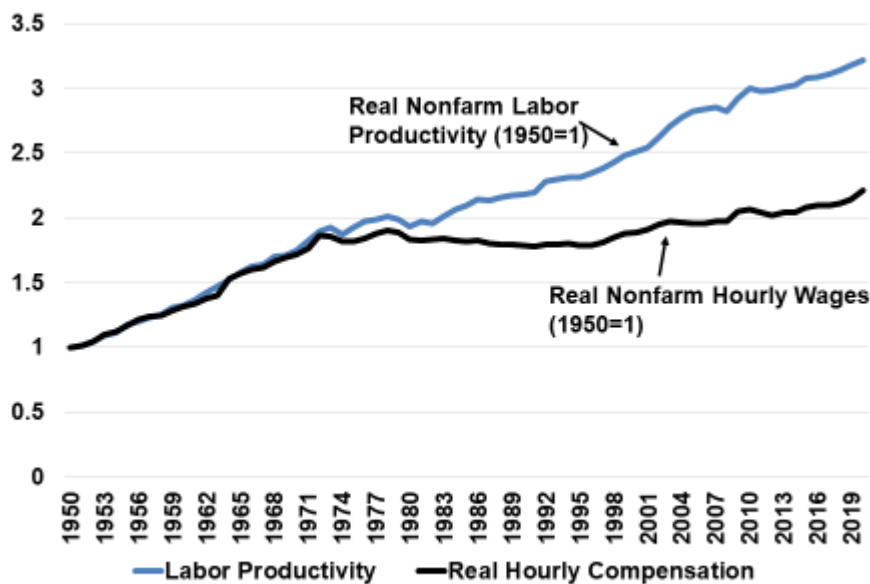
While this question has troubled workers for a long time, technological change and employment growth have generally gone hand in hand over the last hundred years. Some economists argue that this trend will continue. For example, the World Economic Forum estimates that by 2025 technology will create at least 12 million more jobs than it destroys.<sup>36</sup>

Automation does not necessarily lead to a disappearance of jobs overall. Rather, new jobs that require a different set of skills could be emerging from automation of some jobs. Also, changes in other areas, such as the transition to renewable energy, and the rise of the middle class in many emerging markets, could result in creation of many new jobs.

A 2013 study examining the risks of automation found that some jobs—telemarketers, loan officers, cashiers, tax preparers, taxi-drivers, fast-food cooks and sports referees—are more at risk than others such as therapists, mechanics, dentists, physicians, and healthcare and social workers. Martin Ford, futurist and author of *Rise of Robots* explains that the jobs that are most at risk are those which “are on some level routine, repetitive and predictable”. Jobs involving “genuine creativity” (artists, scientists), building complex social relationships (nurses, counselors), and those that are require special skills and ability to deal with rapidly changing situations, such as first responder jobs involving emergencies at different locations, face the lowest risk of automation.<sup>37</sup>

Other researchers have argued that the new wave of automation, with robotics and artificial intelligence (AI), have the potential to cause much wider worker displacement and inequality. A 2019 analysis suggests that the labor-saving shifts from automation are no longer offset by creation of new jobs, and that the shift to automation has not resulted in a similar increase productivity.<sup>38</sup> In some cases, such as with the use of self-service kiosks in grocery stores, automation has shifted labor from paid workers to unpaid customers. Additionally, the use of AI to monitor workers can often undermine worker power.<sup>39</sup> Addressing these challenges require a robust set of policies to ensure that the benefits of automation are widely shared, and workers are helped to adapt to the changing work environment through increased efforts on education and training.

**Figure 7.7** Real Nonfarm Median Wages and Labor Productivity, 1947–2016



Source: U.S. Bureau of Labor Statistics, Labor Productivity and Costs online database.

This indeed is what occurred during much of the second half of the 20th century, when wages kept up with increases in productivity, so that on average workers and their families saw their standard of living more than double.

Since about 1980, however, this trend has changed, as shown in Figure 7.7. While productivity has continued to increase, the rate of growth in wages has lagged significantly behind that of productivity growth. This change is a major reason for growing inequality, and it may also give some indications for future trends in employment and unemployment. This is a very important question for future labor market policy. We will consider these issues further in Chapter 14.

## 4.2 Some Future Possibilities

There is growing recognition of the scale, the significance, and the increase in inequality in the United States today—and, indeed, in much of the world. Also, the possibility of rising unemployment levels due to technological change has presented new challenges for the twenty-first century. These changes indicate a rather bleak possibility for the future of work in a hardening “dual labor market” wherein the lucky few have well-paying jobs, while the rest pick up what they can, with little security.

At the same time, there have been other changes in recent decades that suggest more positive possibilities, where it is conceivable that people could enjoy more leisure while maintaining their standard of living. Future transformations in the structure of the labor market, where employment may become more “flexible” for workers, giving workers more control over their time, could reverse some of the trends in inequality and ensure a better future for workers. This final section briefly summarizes some recent changes in the labor market and the ways in which labor and the products of

labor might be distributed—and what these changes might mean for human well-being in the future.

## Democracy in the Workplace

The dominant model of the firm today is one in which much of the economy consists of large enterprises that are owned by a small percentage of the population who make decisions on whom to hire and how to distribute the income generated from production. In reality, this structure is just one of the many possible ways to organize work.

One alternative which has been growing gradually in the past few decades, is a cooperative model, which includes worker cooperatives, employee-owned firms, credit unions, community land trusts, foundation-owned companies, and any form of organization that is owned and controlled by its workers or community. Worker cooperatives are for-profit businesses that are owned and run by workers. Unlike traditional corporations, where profits are distributed among stockholders who often have little connection with or knowledge of the business, profits from cooperatives go to their workers. Workers also control the decision-making process in cooperatives, either through individual votes or by electing a board of members. This allows workers to participate in the decisions related to their working conditions, wages, and job security.

Having a more democratic work space where workers control production and distribution processes could not only encourage workers to be more innovative and dedicated to their work but also help reduce disparities in income levels. Estimates on the pay ratio between highest- and lowest-paid workers in cooperatives range between 2:1 and 5:1 compared to the CEO-to-average-worker pay in corporations being as high as 351:1 in 2020.<sup>40</sup> Also, worker cooperatives are more likely to offer regular work hours, health insurance, and other benefits, than conventional companies.<sup>41</sup> And during economic downturns workers are more likely to decide on working fewer hours rather than laying off people, hence distributing work and income as well as the costs of the economic downturn more evenly.<sup>42</sup>

The cooperative model, of course, is not perfect. Though the democratic process may mitigate inequalities, the structure may be less efficient, and conflicts between workers' interests can present significant challenges. Also, not all employees may want to share the risks of ownership, and it might be difficult for some workers to go against the system of corporate hierarchy.<sup>43</sup> Additionally, having to compete with capitalist firms that focus on cost-cutting and profit-maximization may put severe pressure on worker cooperatives.

Worker cooperatives are still quite marginal in the United States. According to a 2019 Worker Cooperative report, of the approximately 6 million U.S. firms with employees, roughly 465 are worker-owned cooperatives employing about 6,454 workers.<sup>44</sup> Employee ownership in the form of Employee Stock Ownership Plans (ESOPs) is much more common in the U.S., with roughly 6,500 ESOPs benefitting more than 14 million workers.<sup>45</sup> The ESOPs, however, only provide employees with shares of stocks over time; workers may not have control over company operations, as there is no requirement for democratic governance. The cooperative model is better developed in some other countries, mainly in Europe. The world's largest cooperative, the Mondragon Corporation in Spain has about 85,000 employees.

## Work Flexibility

In recent years it has become popular to talk about how employment is becoming more “flexible.” But the term “flexibility” has two very different meanings, depending on whether it is considered from the point of view of the worker or the employer.

One meaning of “flexible” work is that it is more suited to workers’ varying needs. Such work arrangements include flexibility in setting hours, job sharing, and the ability to work from home at times. Workers may be able to adjust their starting and quitting times, say to make commuting or dropping off a child at school or day care easier. They may also be able to “compress” a standard workweek by working longer daily hours, and taking a weekday off every week. Job sharing typically means that two employees work part-time, essentially sharing a full-time job between them. Working from home, at least occasionally, reduces commuting time and costs, and allows workers to care for children or other relatives at home. Research shows that not only are flexible workers more satisfied with their jobs, but they also tend to be more productive and take sick leave less often.<sup>46</sup>

As a result of the COVID-19 pandemic, many workers worked from home to reduce their exposure to illness. Between 2008 and 2014, the percentage of employers allowing workers to work regularly at home increased from 23 percent to 38 percent.<sup>47</sup> This number rose sharply to over 70 percent during the pandemic. Some of this switch towards remote working is expected to be permanent as workers’ demand for flexible work arrangement has increased and many firms have restructured to allow hybrid work arrangements, where workers are allowed to work remotely at least for part of the week.

A 2021 Gallup poll finds that about 45 percent of full-time U.S. workers worked from home at least part-time. Among white-collar workers about 67 percent were able to work remotely, compared to 48 percent of workers in education and 35 percent of workers in health care being able to work remotely. Another Gallup survey finds that 91 percent of the workers working remotely hope to continue doing so at least part-time even after the pandemic, and 3 in 10 are likely to seek another job if they do not have the ability to continue working remotely.<sup>48</sup>

A somewhat different type of employment flexibility from the perspective of workers is “gig” jobs. These are jobs, part-time or full-time, that involve working under short-term contracts doing consulting, freelance, project-based, or other work. A common example is drivers for ride services such as Uber and Lyft who work when they want to and are needed. An increasing number of American workers participate in the gig economy, either by choice or necessity. Gig workers in the U.S. are disproportionately minority and young, with relatively low incomes. While most gig workers describe their work as a side job, more than half say the extra income is “essential” or “important” for meeting their basic needs.<sup>49</sup> The majority of gig workers in the U.S. are satisfied with their work, but gig workers are less likely to have employment benefits such as paid vacations and health care.<sup>50</sup>

There are both winners and losers in the gig economy.<sup>51</sup> Workers with specialized skills and experience can often get good pay while retaining a high level of autonomy and flexibility. Gig jobs are often attractive to retirees, students, stay-at-home parents, and others who want control over working hours and may not need a full-time salary. But many workers are forced into gig jobs because they cannot find “regular” jobs, and end up making low wages with no benefits. (See Box 7.4.)

A desire for flexibility from the employer perspective is driving the gig economy at least as much as demand for gig jobs by workers. By hiring contract workers, employers avoid providing benefits such as health care and retirement plans. Workers paid as consultants bear the full burden of social insurance taxes, while firms must contribute half of these taxes for regular workers. Firms can also adjust the hours of gig workers, or terminate them, as economic conditions change, much more easily than with traditional employees.

According to conventional economic theory, more “flexible” labor markets—where it is easier for employers to hire and fire workers—are often associated with greater efficiency. Over time, the labor market in the U.S. has become more flexible for employers, characterized by low levels of labor market regulation and employment protections. But it is not clear that this increase in “efficiency” benefits workers. Increased flexibility for employers at the expense of lower employment protection for the workers could be a significant factor in the rise in inequality in the U.S. in recent years.

On a more positive note, workplace flexibility could be designed to allow workers to choose either more work, more income, and more consumption of marketed goods and services or less income but more time to spend engaging in other activities that may satisfy important needs and wants outside of the market. This could be compatible with a less consumption-oriented economy, possibly also reducing pressure on the environment.

## More Leisure

Figure 7.7 shows that labor productivity more than doubled between 1980 and 2020. One interpretation of this result is that the United States can now produce twice the quantity of goods and services with the same amount of labor used in 1980. But an alternative possibility is that we could produce the *same quantity* of goods and services produced in 1980, but with *half the amount of labor*.

Consider this statement in light of the notion of labor flexibility. Suppose that workers had the choice between taking productivity gains as either wage increases or labor time decreases. Theoretically, American workers could be living at the same material living standards as in 1980, but working only six months of every year! This example is extreme, but the suggestion that more leisure could be preferable to extra income, at least for some workers, could have significant economic implications. Of course, some workers may always choose more pay over shorter hours, but allowing for more work choice accords with standard economic theory, stated as follows:

According to economic theory, we should let each worker choose how many hours to work. If workers choose shorter hours, it is because they get greater satisfaction from more free time than they would get from more income. According to the basic principle of market economics, interfering with individuals’ choices between more free time and more income reduces total wellbeing, just as interfering with individuals’ choices between two products would reduce total well-being by forcing some people to buy the product that gives them less.<sup>52</sup>

If it turns out that many workers are willing to work shorter hours for an equivalent reduction in pay, a choice for more leisure rather than more consumption could have important environmental benefits, in rates of natural resource degradation and extraction.

Various recent studies demonstrate a positive correlation between work-life balance and subjective well-being. For example, a 2018 study asked over 30,000 workers in South Korea how well their work hours fit in with their commitments outside of work.<sup>53</sup> Those with a better work-life balance reported higher subjective well-being. A 2019 study of workers in Pakistan also found that those who were more satisfied with their work-life balance reported higher average subjective well-being.<sup>54</sup> Similarly, a positive correlation between work-life balance and SWB has been obtained in the United Kingdom,<sup>55</sup> China,<sup>56</sup> and Indonesia.<sup>57</sup>

Unfortunately, in the United States part-time jobs are generally much less attractive than full-time jobs because hourly wages are often low and few benefits are provided. Some countries have enacted policies to promote higher-quality part-time jobs. One example is the Netherlands where discrimination against part-time workers is illegal and employers must offer the same pay to all workers who are doing the same kind of work, whether they work part-time or full-time, unless the business can prove that hiring part-time workers would impose an economic hardship. Another approach is taken in Denmark, where, in the 1990s “flexicurity” policies were designed to help workers cope with rapid changes in what employers are looking for in their worker force. These policies combine lifelong learning with income support to workers as they transition between skills and jobs.

### Other Possibilities

We can imagine a future in which the work that has to be done by humans is reduced by continuing technological progress, while the economy continues to produce enough to satisfy all the people’s needs, and many of their wants. This scenario could be appealing in terms of flexible work and more leisure, but it could also lead to many being “left out” of the market for good jobs, thus increasing inequality. One policy that could respond to this problem is a **universal basic income (UBI)**. A UBI is a periodic (e.g., monthly) cash payment available to all without means-test or work requirements, so that people can at least cover basic expenses such as housing, food, and healthcare. While some argue that a UBI would reduce incentives to work, experience with experimental UBI programs indicates that this is not the case (see Box 7.5).

**universal basic income (UBI):** a periodic cash payment to all citizens (or all adult citizens) regardless of means-test or work requirements, so that people can at least cover basic expenses such as housing, food, and healthcare

Some economists base a positive view of future employment on demographics; the work force in the United States (without immigration) is growing at its slowest pace in more than 50 years, as baby boomers who joined the labor force from the 1960s to the 1980s now gradually age out of it. The decline in workforce during the pandemic, discussed earlier in the chapter, could in theory return relative power to employees, in relation to employers. On other hand, a declining work force could create problems with the availability of labor for key areas such as medical services and elder care, as well as creating strains on the Social Security system.

### Box 7.5 Universal Basic Income

With automation replacing many routine and mechanical jobs, some researchers estimate that about half of the current jobs may disappear in the next decade. One policy response that has been suggested is to provide all individuals with a basic minimum income to meet their essential needs. This approach, referred to as the guaranteed or universal basic income (UBI), generally involves providing some form of periodic cash payments unconditionally to all individuals.

Advocates of UBI argue that such a program would provide a basic safety net with some financial security and help relieve work-related stress. The advantages of a UBI system could include lower crime rates, reduced environmental damage from some economic activities, and encouraging innovation by providing individuals with freedom to explore their interests.

In recent years, several governments and private research groups have conducted experimental trials of basic income policies. The government of Finland, for example, began a two-year experiment in January 2017 making monthly cash payments of €560 (US\$590) to 2,000 unemployed individuals and comparing their experience to those receiving unemployment benefits. Results show higher life satisfaction, less mental strain, and small increase in employment for basic income recipients compared to the control group.<sup>58</sup>

Similar programs have been launched in regions in Canada (Ontario), Germany, Netherlands, and Spain (Barcelona). Experiments on basic income have also been carried out in developing countries such as India, Namibia, Uganda, and Kenya. Results from these experiments show that a pilot program implemented in the Namibian village of Omitara in 2008 and 2009 showed that the introduction of basic income program increased the rate of those engaged in income-generating activities from 44 percent to 55 percent, mostly by enabling recipients to start their own small businesses.<sup>59</sup> Here child malnutrition was reduced, school enrolment went up, and crimes declined. Similarly in India basic income led to improved sanitation, nutrition, and school attendance; and in Kenya cash transfer programs have stimulated the economy.<sup>60</sup>

The most well-known UBI experience in the United States is in the state of Alaska, where each individual gets an annual share of the state's fossil fuel income—\$1,600 per person in 2019. A high-profile experiment launched in Stockton, California in 2018 gave 125 randomly selected residents living in low-income neighborhoods \$500 per month for two years. The results indicate that the recipients experienced an improvement in their job prospects, financial stability, and overall well-being. Also, the additional income did not dissuade people from working. In recent years, similar UBI programs have popped up in cities across the U.S.<sup>61</sup>

The challenges of instituting a BI system include the following questions:

Would giving people unconditional income disincentivize them from seeking work? Experiments such as those listed above have been neutral, or, more often, encouraging in finding that BI recipients continue to work productively in the economy, appreciating the opportunity to be more flexible in seeking work opportunities.

How would psychological well-being be affected among those who do not participate in the market sphere of the economy? In many parts of the world, during many different eras, women at various socio-economic levels have been responsible for taking care of home and family, without payment from the market. The

psychological rewards of such situations have varied widely, but have often been harmful unless the choice to remain at home was truly voluntary. One proposal suggests that UBI income should be directly tied to care work in home and community; this idea is being looked at for broader contributions to care of the earth (on farms, in relation to forests, wilderness, water, etc.).

Most critically, how would we fund such a program? The World Bank estimates that a comprehensive UBI program set at the national poverty level would cost about 20 percent of GDP in low-income nations and about 5 percent of GDP in upper-middle-income countries.<sup>62</sup> In the U.S., giving every American \$10,000 a year—an income below the poverty line—would cost at least \$3 trillion, which is about eight times the current government spending on social service programs.<sup>63</sup> As has been noted in several places, the U.S. is well behind other developed countries in the level of such spending—but this situation does not seem likely to change soon. Other suggestions are based on the idea that society as a whole owns, and should benefit from “all the creations of nature and society that we inherit jointly and freely, and hold in trust for future generations.”<sup>64</sup> This includes, for example, fees from government-created monopolies (such as the broadcast spectrum and utilities), or income from private uses of government land (currently leased out, in general, far below market rates), or income from taxing carbon emissions. Such additional revenues could help to fund a UBI program.

It is also possible that job opportunities could be expanded with benefits both to workers and the environment. New employment opportunities exist for satisfying real needs that are now going unmet—including needs for infrastructure improvement, expanded education, health and other human services, as well as investment in building a green, post-fossil-fuel economy. Many of these areas are labor-intensive, creating jobs for humans rather than robots.

We will return to some of these issues in Chapter 17, where we deal with growth and sustainability. First, however, we go into detail in Part III regarding macroeconomic theories of stabilization, growth, and employment.

### Discussion Questions

1. What evidence have you seen—in your own family or in the media—of increasing “flexibility” in labor markets? Do you think that these changes have been beneficial, harmful, or both?
2. Do you think having more worker cooperatives might help mitigate economic inequality in the United States? What might be some of the challenges in encouraging firms to adopt this model?
3. What do you think of the effectiveness of basic income programs in addressing inequality?

### Review Questions

1. What population is included in the official household survey that measures employment and unemployment?
2. What questions are asked to determine whether someone is “employed”?
3. What makes a person count as “unemployed”?
4. How is the unemployment rate calculated?



5. What are marginally attached workers? Discouraged workers?
6. What is the labor force participation rate and how is it calculated? How has it changed in recent decades for men and women in the United States?
7. What are some of the reasons for the declining labor force participation of men in the U.S. labor force?
8. List and describe the three types of unemployment.
9. What policies may be used to combat frictional and structural unemployment?
10. What is technological unemployment? How might productivity-increasing advances in technology affect employment levels?
11. What is the relationship between the average duration of unemployment and the unemployment rate?
12. Describe how “sticky wages” could lead to unemployment.
13. What are some reasons that wages might be “sticky”?
14. What are “efficiency wages,” and why might payment of them lead to unemployment?
15. What is the dual labor market theory? How does this theory contribute to our understanding of issues of inequality and employment?
16. How can high levels of unemployment be explained in the Keynesian model?
17. What are some of the policy measures that might help reduce unemployment levels?
18. What are some of the arguments for and against having more democratic workplaces?
19. What does employment flexibility mean from the perspective of workers? From the perspective of employers?
20. What are some of the advantages of universal basic income programs? What kinds of challenges may be faced in implementing such programs?

### Exercises

1. The small country of Nederland counts its unemployed using the same methods as the United States. Of the population of 350 people, 70 are under age 16, 190 are employed in paid work, and 80 are adults who are not doing paid work or looking for work because they are doing full-time family care, are retired or disabled, or are in school. The rest are unemployed. (No one is institutionalized, and the country has no military.) Calculate the following:
  - a. The number of unemployed
  - b. The size of the labor force
  - c. The unemployment rate
  - d. The labor force participation rate (overall, for both sexes)
2. The population of Tatoonia is very small. Luis works full-time for pay. Robin works one shift a week as counter help at a fast-food restaurant. Sheila is

retired. Shawna does not work for pay, but is thinking about getting a job and has been looking through employment postings to see what is available. Bob has given up looking for work, after months of not finding anything. Ana, the only child in the country, is 12 years old.

- a. How would a household survey, following U.S. methods, classify each person?
  - b. What is the labor force participation rate in Tatoonia?
  - c. What is the unemployment rate in Tatoonia?
3. A computer software company advertises for employees, saying “We offer the best-paid jobs in the industry!” But why would any company want to pay more than it absolutely *has to* in order to attract workers? Can this phenomenon help to explain the existence of unemployment? Explain in a paragraph.
  4. Locate the most recent news release on employment and unemployment statistics at the Bureau of Labor Statistics Web site ([www.bls.gov](http://www.bls.gov)). In a paragraph, describe how the labor force, overall unemployment rate, and unemployment rates by race and ethnicity, gender, age, and education differ from the numbers (for January 2022) given in the text.
  5. Match each concept in Column A with a definition or example in Column B.

Column A	Column B
a. “Not in the labor force”	1. The theory that unemployment is caused by insufficient aggregate demand
b. Worker cooperatives	2. Occurs during a recession
c. Marginally attached workers	3. An example of an employment flexibility policy
d. Frictional unemployment	4. Occurs when the skills, experience, and education of workers do not match job openings
e. Employed	5. For-profit businesses owned and run by businesses
f. Trade Adjustment Assistance Reform Act	6. Immediately available for and currently looking for paid work
g. Unemployed	7. Military personnel
h. “Sticky wages”	8. A policy response to structural unemployment
i. Structural unemployment	9. Worked 15 hours or more in a family business
j. Keynesian theory	10. Occurs as people move between jobs

Column A	Column B
k. Cyclical unemployment	11. Want to work and have looked in the past year but not the past month
l. Not included in the household survey covering employment	12. Unemployment may occur because wages are slow to fall
m. Technological unemployment	13. Occurs when technology reduces the overall need for workers
n. Paid parental leave	14. A retired person

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  - <sup>5</sup> CEA, 2016a.
  - <sup>6</sup> Aliprantis and Schweitzer, 2018.
  - <sup>7</sup> Based on data from the World Prison Brief, <https://www.prisonstudies.org/>.
  - <sup>8</sup> Wagner and Rabuy, 2017.
  - <sup>9</sup> McLaughlin et al., 2016.
  - <sup>10</sup> Gramlich, 2021.
  - <sup>11</sup> Sawyer and Wagner, 2020.
  - <sup>12</sup> Guo, 2016.
  - <sup>13</sup> Pager and Western, 2009.
  - <sup>14</sup> Rainer, 2006.
  - <sup>15</sup> Delaney and Scheller, 2015 and BEA, 2021.
  - <sup>16</sup> Mutikani, 2022.
  - <sup>17</sup> Faria-e-Castra, 2021.
  - <sup>18</sup> Fowers and Dam, 2021.
  - <sup>19</sup> Hoff and Kaplan, 2021.
  - <sup>20</sup> Leonhardt, 2021.
  - <sup>21</sup> Schweitzer and Khattar, 2021.
  - <sup>22</sup> Ibid.
  - <sup>23</sup> Kinder and Stateler, 2021.
  - <sup>24</sup> BEA data Tables 1.1.5 and 2.1.
  - <sup>25</sup> Stallworth, 2019.
  - <sup>26</sup> Card and Krueger, 1994.
  - <sup>27</sup> See, for example, Neumark and Wascher, 2007; and Cengiz *et al.*, 2019.
  - <sup>28</sup> Gig Economy Data Hub, 2022.
  - <sup>29</sup> Butler, 2021; and Weller, 2021.
  - <sup>30</sup> Schmitt and Jones, 2012.
  - <sup>31</sup> Katz and Krueger, 2016.
  - <sup>32</sup> Mishel, 2018.
  - <sup>33</sup> Bahn, 2019.
  - <sup>34</sup> D'Amico and Schochet, 2012.
  - <sup>35</sup> Autor et al., 2016.
  - <sup>36</sup> World Economic Forum, 2020.
  - <sup>37</sup> Frey and Osborne, 2013.
  - <sup>38</sup> Acemoglu and Restrepo, 2019.
  - <sup>39</sup> Zickuhr, 2021.
  - <sup>40</sup> Estimate on highest-to-lowest paid worker in cooperative is from Austin 2014 and Palmer 2020 . Estimate on CEO to average employee in corporations is from Mishel and Kandra, 2021.
  - <sup>41</sup> Gillies, 2016.
  - <sup>42</sup> Rieger, 2016.
  - <sup>43</sup> Gillies, 2016.
  - <sup>44</sup> Palmer, 2020.
  - <sup>45</sup> Based on data from National Center for Employee Ownership: <https://www.esop.org/>.
  - <sup>46</sup> Gaskell, 2016.
  - <sup>47</sup> Matos and Galinsky, 2014.
  - <sup>48</sup> Saad and Wigert, 2021.
  - <sup>49</sup> Anderson *et al.*, 2021.
  - <sup>50</sup> Molla, 2021.
  - <sup>51</sup> Mulcahy, 2016.
  - <sup>52</sup> Siegel, 2006.
  - <sup>53</sup> Yang *et al.*, 2018.
  - <sup>54</sup> Shams and Kadow, 2019.
  - <sup>55</sup> Fan and Smith, 2017.
  - <sup>56</sup> Wong *et al.*, 2021.
  - <sup>57</sup> Gunawan, 2020.
  - <sup>58</sup> Allas *et al.*, 2020.



<sup>59</sup> Claudia and Dirk Haarmann. 2014. Basic Income Grant Coalition. See: [http://www.bignam.org/BIG\\_pilot.html](http://www.bignam.org/BIG_pilot.html).

<sup>60</sup> Samuel, 2020.

<sup>61</sup> Lowrey, 2021.

<sup>62</sup> World Bank, 2019.

<sup>63</sup> Goodman, 2017.

<sup>64</sup> Barnes et al., 2003.