Economic Report of the President

Transmitted to Congress | April 2022

Together with the Annual Report of the Council of Economic Advisers

ECONOMIC REPORT OF THE PRESIDENT

TRANSMITTED TO CONGRESS | APRIL 2022

TOGETHER WITH THE ANNUAL REPORT
OF THE COUNCIL OF ECONOMIC ADVISERS

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To the Congress of the United States:

When I took office on January 20, 2021, I looked out at a Nation that was in the midst of the COVID-19 pandemic and experiencing a weak and uneven economic recovery. There were roughly 4 million workers who had been unemployed for more than 6 months. The Congressional Budget Office and private sector forecasters predicted a slow decrease in the unemployment rate throughout 2021.

Our Nation needed an economic policy that was nimble enough to meet the significant and evolving challenges required to defeat a pandemic and recover from the severe economic disruptions it had caused. Recovery had to be swift and robust; it was not sufficient to return to where we had been, we also had to build toward a better future.

Today, we look out at a markedly different America. Over 200 million Americans have been fully vaccinated and are now protected from the worst of COVID-19. Businesses have been able to resume activity. Schools and childcare centers are open again. Our Nation's economic recovery has been strong, marked by dramatic increases in employment and GDP. Moreover, our progress has been achieved with a $360 billion decline in the Nation's deficit in fiscal year (FY) 2021 and a historic $1.3 trillion projected decrease in FY22.

This success was not preordained. It is the result of well-designed and well-administered policies.

At the start of my Administration, the most important task was to free ourselves from the grip of a deadly virus. Last year, I signed into law the American Rescue Plan Act of 2021 (ARP), one of the most consequential economic rescue packages in American history. The ARP provided an insurance policy for businesses, workers, and families harmed by the virus. It prioritized resources to get and keep economic recovery on track: aid to State and local governments, checks in Americans' pockets, support to allow schools to reopen safely, and a robust vaccination program.

In addition to immediate assistance, the ARP provided scaffolding for long-term recovery—enabling workers and businesses to avoid many of the long-term, harmful effects that often follow an economic shock. We saw success across nearly every metric. At the end of 2021, our economy had created more than 6 million jobs, the largest number ever in 1 year, and we experienced the fastest drop on record for the unemployment rate. The United States saw the strongest economic growth since 1984, with GDP expanding by almost 6 percent. Poverty is projected to have reached historic lows, particularly for children. Real disposable income was up for the bottom half of the income distribution.

With money in their pockets, Americans were poised to spend—and because the virus had depressed demand for travel, leisure, and other services, consumers largely turned to goods. This pent-up demand has added to backlogs, but my Administration has been working with industry to ease supply chain disruptions at every step in the process: the ports, the trains, and the trucks. As a result, store shelves are well stocked, and the much-predicted holiday supply chain crisis did not occur.

A pandemic-constrained economy, coupled with strong demand, has resulted in increasing prices. This trend is not unique to the United States; countries around the world are grappling with rising costs as the pandemic recedes and demand builds. Adding to this, the war in Ukraine has incited a supply shock that has increased energy and food prices around the globe.

While we tackle these immediate challenges, we must also expand our productive capacity for the future. The pandemic exposed cracks in the United States economy that had been widening for years: decades of low and unequal economic growth that left Black and brown Americans and Tribal Nations disproportionately vulnerable; inadequate investment in research and infrastructure; increasing corporate consolidation and decreasing competition; a hollowed-out manufacturing sector; and a lack of support for America's workers and middle-class families. We seek to build an economy that delivers stronger and more equitable growth for America's families and workers.

The Bipartisan Infrastructure Law (BIL) that I signed on November 15, 2021, provides a historic opportunity to build that economy. The BIL, which will create millions of new jobs, provides long-overdue investment in our Nation's physical infrastructure—resources to modernize roads and bridges, ensure clean drinking water, deliver efficient and affordable broadband, and produce clean, reliable energy. These critical investments will be especially transformative in rural America, creating jobs and building wealth for these communities.

This past year, I also signed several Executive Orders that improve the economy and increase the efficiency in Federal Government procurement. Examples include an Executive Order to promote competition so that firms cannot use concentrated market power to hurt workers or consumers, an Executive Order that establishes a $15 per hour minimum wage for workers on Federal contracts, and an Executive Order to address supply chain flaws. In my first year in office, I have also put forward whole-of-government approaches to combat climate change, strengthen worker organizing and empowerment, and pursue gender and racial equity.

We must continue this important work. For decades, the United States has underinvested in our families, in our communities, in American businesses, and in our Nation. When we put resources toward children and families, and workers and United States businesses, we raise both the floor and the ceiling of the economy for all of us.

We know, for example, that investments in education and training, particularly for young people, make economic sense. Universal access to high-quality preschool is the norm in most other advanced economies. Providing all children with access to high-quality preschool will pay for itself down the road by producing benefits well into adulthood.

Further, nearly half of new jobs created over the next decade are projected to require at least some postsecondary education or training at the entry level. Just as early-20th-Century universal elementary and secondary schooling helped create a highly skilled labor force, investments in higher education today can help workers fill the higher-paying jobs of tomorrow. The result will be broader and more robust economic growth.

We have seen the economic consequences of our failure to put in place policies to help families balance work and family life. In 1999, labor force participation for people between the ages of 25 and 54 peaked at more than 84 percent. Since that time, it has never again reached that level. We know that workplace supports such as affordable, high-quality childcare and long-term care, as well as access to paid family and medical leave, can all lead to higher labor force participation.

I have repeatedly said, and long maintained, that the middle class built this country, and unions built the middle class. Without unions, workers often lack bargaining power to secure higher wages, better working conditions, security for their families' futures, and a voice in their workplaces. However, we have seen worker power diminish for nearly 70 years. That is why we must find ways to strengthen the United States labor force, always the backbone of the American economy, by finding ways that workers can gain strength by organizing.

While we empower workers, we must also pay attention to costs families face, the ones that get discussed at the kitchen table and keep parents up at night: putting food on the table, caring for an aging parent, and ensuring their children are well cared for while they work. This past year, many American households were able to strengthen their own balance sheets, but we do not want to see cost increases erode the economic gains of 2021. From gas prices to groceries to housing costs, I will continue to use all the tools available to my Administration to address rising prices.

The backdrop to all of this is a planet heating up at rates that we simply cannot sustain. The costs of climate change can be seen everywhere: damage from an increasing number of devastating storms and fires, droughts and flooding that hamper food production and make it more expensive, supply chain disruptions that slow down our economy, and illness produced by pollution.

Last year alone, extreme weather and climate disasters cost our communities $145 billion and claimed hundreds of lives. Getting to net zero greenhouse gas emissions by 2050, while supporting American communities and workers and expanding new American industries, is a priority of my Administration. When I think of climate change, I think of jobs.

Moreover, the war in Ukraine reinforces the fact that the United States must attain energy independence, which can happen by eliminating dependence on fossil fuels over the long term.

As I said in my 2022 State of the Union Address, America has lived through 2 of the hardest years our Nation has ever faced. As I deliver this economic report, I am confident that we are building a historic recovery, and a better America.

I came into office promising to not only find a way to repair the harms of the pandemic, but to turn the page on an economy that benefits only those at the top and rewards wealth over work. My Administration is committed to making critical investments in people, in innovative ideas, in 21st-Century physical infrastructure, and in combating climate change. We have laid the groundwork to build an economy from the bottom up and the middle out, ensuring growth that benefits all Americans.

The White House
April 2022

The Annual Report of the Council of Economic Advisers

Letter of Transmittal

Council of Economic Advisers
Washington, April 14, 2022

Mr. President:

The Council of Economic Advisers herewith submits its 2022 *Annual Report* in accordance with the Employment Act of 1946, as amended by the Full Employment and Balanced Growth Act of 1978.

Sincerely yours,

Cecilia Elena Rouse
Chair

Jared Bernstein
Member

Heather Boushey
Member

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Chapter 1

The Public Sector's Role in Economic Growth

The U.S. economy is among the world's strongest and most productive, but trends over the last several decades threaten to undermine its standing—and to diminish the living standards of most Americans. Since the 2001 recession, the United States has seen relatively weak economic growth, with income and wealth disparities at levels not seen in a century. Divisions along lines such as race, ethnicity, and gender persist.

These economic challenges have many causes. A common theme among them is the retreat of the U.S. public sector from its complementary role vis-à-vis the private sector in economic growth. Over the last four decades, neglect of critical physical infrastructure, from ports to the power grid, has left the Nation with bottlenecks and vulnerabilities that restrict growth and make the economy less resilient to shocks and shifts. The United States has cast aside its history as a global leader in public funding for education—from the high school movement to the G.I. Bill—and now lags its peer countries in early childhood education and job training. Underinvestment has, in particular, diminished the pace of growth in U.S. economic capacity—that is, the maximum sustainable amount of goods and services our economy can produce when unemployment is low and other resources are being put to full use.

This transformation of the U.S. public sector's role did not occur by accident. It reflected an economic philosophy which maintained that private enterprise would thrive only if government got out of the way; otherwise, public sector investment would "crowd out" the activity of the private sector. Put to the test, these predictions did not deliver. Proponents of this philosophy had ignored some of the economics discipline's most celebrated ideas—ones revealing situations where the private sector cannot and will not substitute for the public sector. As a result, when the public sector stepped back, economic growth diminished and became less evenly shared. The private sector did not lose a rival; it lost a partner.

During the pandemic, infrastructure problems created by underinvestment became crises. The absence of reliable broadband Internet, for example, made remote education a challenge for millions of children and families, setting them back (Auxier and Anderson 2020). The capacity constraints of U.S. ports and other aspects of freight infrastructure snarled supply chains, harming U.S. manufacturers (U.S. Department of Transportation 2022b). Yet underinvestment had constrained U.S. economic capacity before the pandemic, and it would have continued to do so if the pandemic had not exposed these vulnerabilities.

When the public sector underinvested in people's health and education, the private sector was left with a weaker foundation on which to build, hire, and invest. When the public sector underinvested in innovation and basic science, the private sector had fewer ideas and technologies that it could apply to products in such industries as clean energy and biomedicine. By building a large, healthy, and highly skilled workforce, and by fueling technological progress, public investments can expand the capacity of the U.S. economy—and thereby sustain the long-run advance of the American standard of living.

The payoffs from public investment, however, are rarely immediate. Ideas take time to germinate into industries, as do children to mature into adults. This has two implications. First, the U.S. government must invest today if we are to benefit tomorrow, as the payoffs from investments take time to emerge. And if the government waits until the signs of underinvestment are fully revealed, it will have waited too long. There will be higher costs to replace infrastructure beyond repair, a more tumultuous transition to clean energy, and a greater need for public assistance for adults instead of public investment in disadvantaged children. Second, the government's role in increasing the aggregate capacity of our economy can be challenging and requires sustained effort. Building bridges, running research labs, enhancing the power grid, and educating children to become productive adults entail complex, long-term investments. They require patient, capable institutions that plan beyond budget horizons for the design and delivery of public services. When the public sector's role is neglected, these investment aspects of the government's capacity are likely to deteriorate the most.

A core aim of the Biden-Harris Administration's economic policy agenda is to restore the public sector as a partner in long-run growth, with a particular focus on the economy's supply side—from physical infrastructure to the vitality of our workforce. This means, first, fixing what is broken in physical infrastructure. The Bipartisan Infrastructure Law, signed by President Biden in November 2021, makes a historic investment in transportation and utility systems—spending that will address decades of deferred maintenance of the infrastructure that keeps lights on, water clean, and people and goods flowing across the country. This law also upgrades infrastructure in several strategic areas—such as lead abatement, rural broadband, and electric vehicles. Such investments are important to make growth more robust, more widely shared, and more environmentally sustainable.

However, restoring the public sector to its full role in promoting growth involves more than physical infrastructure investment. Long-run economic growth also depends on the growth of productive skills and abilities among workers—what economists call "human capital"—and the pace of technological progress (Romer 2019). These factors together determine the capacity of the U.S. economy. The U.S. government could also do much more to support growth through investments in workers, children, and families. For instance, though early childhood education is typically free or available at very low cost in other developed countries, it remains financially burdensome for a large share of American children born into lower-income families (Boushey, Barrow, and Rinz 2021). Investments in early childhood education, like other public investments in human capital, would raise long-run productivity growth as children and students grow up to become workers (Cascio 2021).

The fruits of economic growth must also be shared more broadly. Labor's share of income, once famously stable, has declined to historic lows in the United States, and the distribution of labor income has become more skewed to the top earners since the 1970s (Congressional Budget Office 2021). Public investments in physical infrastructure and human capital also help ensure that economic growth is more broadly shared by making sure that people have access to economic opportunities.

Two other ways to make growth more inclusive are tax policy and labor regulation. Some multinational corporations, for example, exploit the absence of effective international tax cooperation to shift where they report income and assets to tax havens, where tax rates are low and malleable. Establishing international standards and minimums can stop the global race to the bottom in corporate taxation, so that highly profitable companies pay for their fair share of the public investments and services they use. Stronger labor standards—such as a higher minimum wage, effective enforcement of wage-and-hour and occupational-safety regulations, and protections for workers' right to organize—will also help to boost workers' wages and working conditions.

The Administration's agenda could start to rebuild our economic capacity. According to an estimate by Moody's Analytics, passing additional legislation based on the President's policies, along with the Bipartisan Infrastructure Law and the American Rescue Plan, would lead to an economy that is about 1.5 percent larger in 2031 than it would have been without any of this legislation (Zandi and Yaros 2021). Economic projections from the Administration's Fiscal Year 2023 Budget find that passing it would raise the long-run annual growth rate by about 0.4 percentage point.

This introductory chapter explains why a strong and effective public sector is not only smart economics but also critical to putting the United States back on the path of robust, inclusive economic growth. It begins with a brief portrait of the U.S. economy before the COVID-19 pandemic—which, due in part to a depleted public sector, struggled with disappointing growth in its productive capacity. Each section then considers one of three complementary roles of the public sector: (1) ensuring macroeconomic stability; (2) addressing areas where the private sector fails to deliver (market failures); and (3) reducing inequality. It first explains, on a conceptual level, why government has a role to play in each of these areas. Next, it describes how the U.S. government performed in this role during the pandemic. Finally, it discusses what role for government remains unfinished.

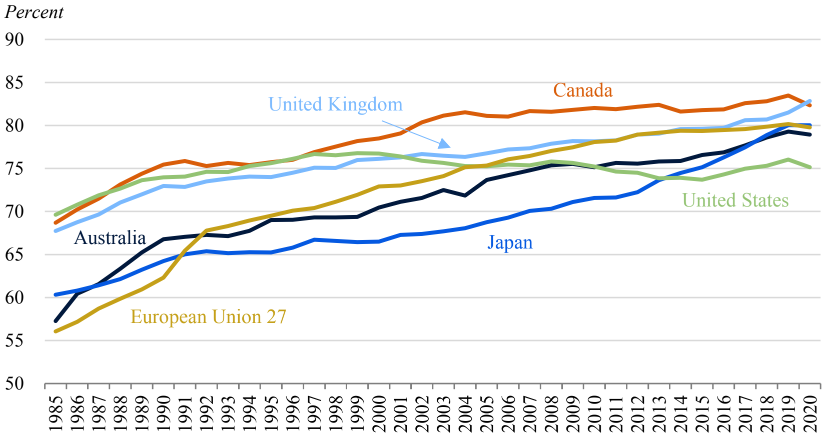
Before the Pandemic

How strong was the economy in the immediate years heading into the COVID-19 pandemic? By some measures of economic performance, it was stronger than it had been in many years. Unemployment was low, and stock and home prices were soaring. Yet that sunny account of the late 2010s ignores other weaknesses in the economic data, especially the warning signs coming from measures that serve as economists' best proxies for long-run growth in U.S. economic capacity.

Among these warning signs: U.S. labor force participation rates have dropped to some of the lowest in the developed world. Whereas in 1985, a larger share of prime-age American women participated in the labor force than their counterparts in Australia, Canada, the European Union, Japan, or the United Kingdom, U.S. female labor force participation has since been surpassed by all these countries or entities (figure 1-1).

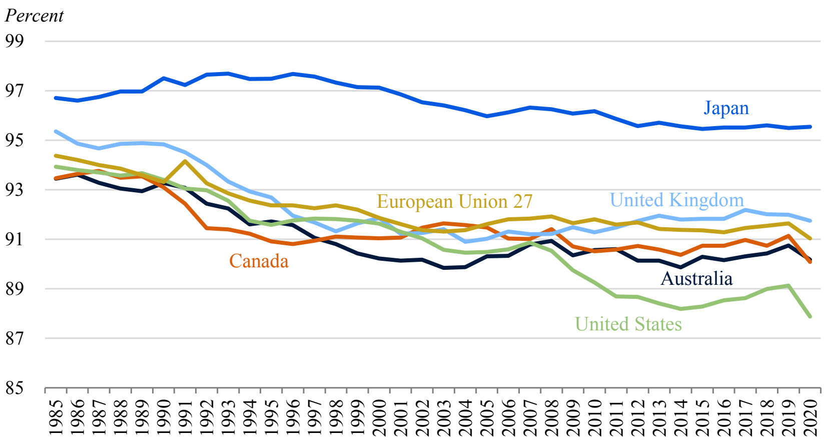
The decline in labor force participation among men is similarly staggering. In 1960, work among men age 25 to 54 years was nearly universal, with just 3 in 100 such men not working or looking for work (Krueger 2017). But, by 2019, nonparticipation among men of such ages had tripled, with more than 1 in 10 out of the labor force (figure 1-2). While this decline might have reflected changes in the gender division of household responsibilities, much of it appears unrelated to such shifts (White House 2016).

Figure 1-1. Women's Labor Force Participation Rate, 25 to 54 Years



Source: OECD (2021).

Figure 1-2. Men's Labor Force Participation Rate, 25 to 54 Years

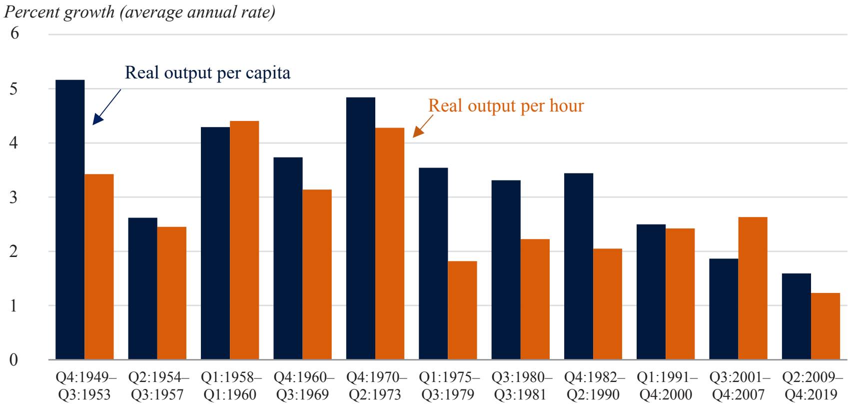


Source: OECD (2021).

The weakness in both male and female rates of labor force participation has directly diminished the growth of the U.S. economy's productive capacity. With a smaller labor force, U.S. firms can hire fewer workers domestically and thus can produce less in the United States than they would if participation rates were higher.

The slow growth rates of output and productivity provide another grim perspective on U.S. economic performance before the pandemic. Comparing all U.S. economic expansions from start to end since 1950, there is none with a weaker average growth rate than the recovery from the Great Recession. Compared with the average for these expansions, growth in both

Figure 1-3. Growth Rates in Economic Expansions



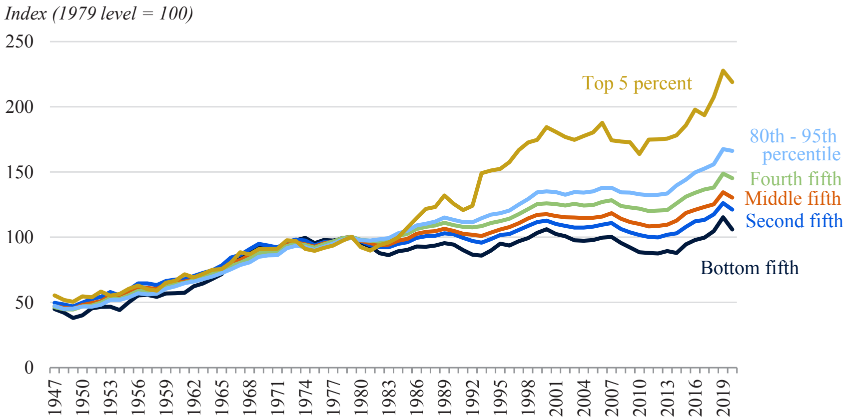
Sources: Bureau of Economic Analysis; CEA calculations.

real output per capita and productivity (real output per hour) during the prepandemic expansion was less than half as fast (figure 1-3). Productivity growth provides an especially clear view on the slowdown in U.S. capacity growth, given that it adjusts for cyclical changes in unemployment and resource utilization.

Economic growth has not only slowed; it has also become less broadly shared. From the end of World War II until the late 1970s, real incomes roughly doubled for families in the bottom fifth of the income distribution as well as families in the top 5 percent. Yet after the 1970s, the gains from growth became far more concentrated at the top. Since 1973, the real median income of households in the bottom fifth of the distribution has risen by less than 15 percent, compared with growth of more than 100 percent for families in the top 5 percent (figure 1-4). Furthermore, other data from the U.S. Federal Reserve and the World Inequality Database show that the share of net wealth held by the top 1 percent of households is at or near record highs (Federal Reserve 2021; World Inequality Database 2021).

Signs of economic underperformance also appear in an array of other indicators. Over the last few decades, U.S. life expectancy at birth has slowly fallen behind that in other high-income countries (OECD 2021). It is now the lowest in the Group of Seven, with little net increase over the last decade. Furthermore, inequality and underinvestment in health are linked to infant mortality (Chen, Oster, and Williams 2016), which has also remained higher in the United States than in its peer countries since the 1980s (figure 1-5). Maternal mortality rates are also higher in the United States than in any other developed country (Declercq and Zephyrin 2020). Many analysts have also blamed economic stagnation for a surge in so-called deaths of despair related to alcohol, drugs, and suicide (Case and Deaton 2020).

Figure 1-4. Growth in Average Family Income, by Income Group



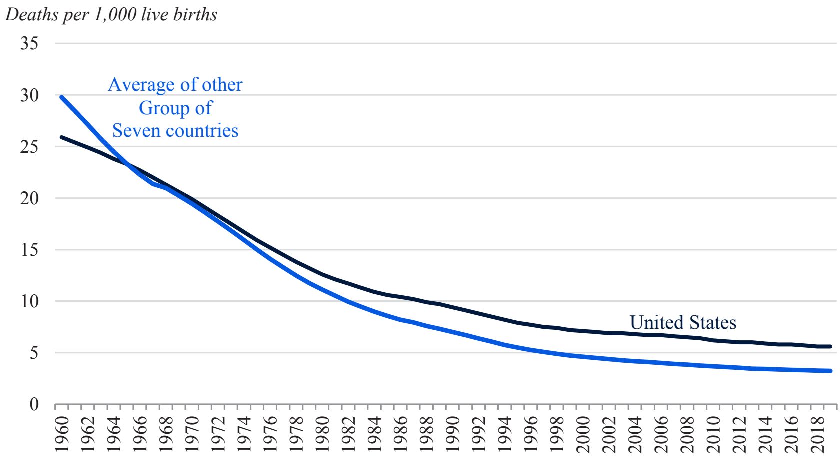
Sources: Census Bureau; CEA calculations.
Note: Income is in dollars adjusted by the Consumer Price Index for all Urban Consumers, retroactive series, using current methods.

To account for simmering discontent beneath a seemingly booming economy requires a more nuanced picture of the Nation's economic health. The prepandemic economy was indeed at or approaching full employment for the first time in 20 years. But while the U.S. economy benefited from cyclical gains, the structural foundations for long-run inclusive growth were not being maintained. Accommodative macroeconomic policy could not substitute for everything else that the public sector should do as a partner of private enterprise.

What is needed now is an effective partnership between the public and private sectors. The very existence of private business relies on functions that only the public sector can provide, ranging from an institutional legal framework to national security to reliable infrastructure. However, these basic government functions do not exhaust the complementary roles of the public sector in promoting economic growth through greater productive capacity, and in ensuring that well-being flourishes alongside growth.

These functions are, in some ways, troublingly easy to neglect: The damages wrought by underinvestment accumulate slowly, and the task of public investment is inherently more demanding than a tax cut. But when these functions are neglected, government becomes less capable and less responsive to economic change. At the onset of the COVID-19 pandemic, for example, the lack of administrative infrastructure to channel support to businesses meant that the Paycheck Protection Program was far costlier and less well-targeted toward businesses most in need of rescue than similar programs in other high-income countries (Autor et al. 2022). The bill for public sector underinvestment eventually comes due in the form of less effective government.

Figure 1-5. Infant Mortality



Source: World Bank.

Ensuring Macroeconomic Stability

Although the COVID-19 pandemic has been the worst global outbreak of disease since the influenza pandemic of 1918, societies are also often hit by other aggregate shocks, including recessions and swings in prices of critical commodities such as oil and staple foods. These shocks are economy-wide, sudden, and—especially in the case of epidemics—at once rare, costly, and hard to forecast. As such, they may be difficult or impractical for individuals themselves to prepare for.

An important function of government is to help insure society against such risks. For example, countercyclical monetary and fiscal policies are essential for boosting demand, output, and employment in depressed economies. Moreover, there are reasons to think that appropriate countercyclical policies raise living standards on average, instead of purely stabilizing the economy around its long-run growth path. When capacity is already being underused, as in a recession, the private sector faces weaker incentives to invest in more capacity, potentially limiting longer-run growth (DeLong and Summers 2012). Even if these so-called hysteresis effects are weak or absent, countercyclical policies may be able to raise the long-run level of output by reducing the amount of time spent below the economy's capacity level, as in Milton Friedman's famous "plucking" model of business cycles (Dupraz, Nakamura, and Steinsson 2021; Friedman et al. 1964).

Macroeconomic Stabilization during the Pandemic

At the onset of the pandemic, the loss of jobs and income threatened hardship for millions of families and bankruptcies for small businesses.

A massive public policy response likely prevented the pandemic's public health crisis from creating a prolonged and spiraling economic one.

The government provided the equivalent of an economy-wide insurance policy against the pandemic—with expanded unemployment insurance, support for temporarily shuttered businesses, aid to State and local governments, and Economic Impact Payments (EIPs, which were often referred to as "stimulus checks"). This response, as former Council of Economic Advisers Chair Christina Romer argued in a recent paper with David Romer, can be thought of as roughly enacting the "pandemic insurance" policy that families and businesses would have wanted to buy themselves, if such insurance had existed (Romer and Romer 2021).

Although there has been a larger public focus on discretionary fiscal policies like EIPs, much of what the government "did" to prevent a catastrophic pandemic-induced economic crisis happened without Congress or the executive branch taking any affirmative action, through a set of policies known as "automatic stabilizers." For instance, when workers are laid off, they can file for unemployment benefits and can typically collect up to 26 weeks of assistance as they search for work. Such spending eases those workers' hardships and, when many workers lose their jobs at once (as in a recession), has a macroeconomic impact of preventing a cascading decline in income and spending (Kekre 2021). In crises, a program called Extended Benefits automatically adds weeks in certain states when the unemployment rate reaches certain metrics. As discussed in box 1-1, Congress did take important actions to make unemployment insurance (UI) more generous and more widely available during the pandemic, reflecting weaknesses in the current system, but some of the UI system would have been triggered without Congressional action. For instance, almost 25 percent of the increase in UI payments in 2020 relative to 2019 was due to "normal" UI programs (regular benefits and extended benefits). Though this increase may not have been enough to support workers during the pandemic, or even amid a normal recession, it does speak to the importance of ensuring that future policy includes robust "automatic stabilizers."

Monetary policies adopted by the U.S. Federal Reserve System also play a crucial role in macroeconomic stabilization. As reviewed in a recent paper by former Fed Vice Chair Richard Clarida and coauthors Burcu Duygan-Bump and Chiara Scotti (2021), the Fed's efforts to halt and reverse the economic crisis sparked by the pandemic took several forms. First, the Fed implemented its conventional policy toolkit with unprecedented speed. It cut its benchmark nominal interest rate to zero, provided forward guidance that its zero-rate policy would remain until "the economy has weathered recent events and is on track to achieve its maximum employment and price stability goals," and announced $700 billion in asset purchases of U.S. Treasuries and mortgage-backed securities.

Box 1-1. Unemployment Insurance during the Pandemic

Unemployment insurance (UI) is an important component of the U.S. safety net, providing workers with income amid job loss that is out of their control. With UI, workers can continue to receive a portion of their wages and support their families as they search for new jobs. UI is also an automatic stabilizer (Kekre 2021). When the economy suffers a downturn, increased UI payments lift the economy, preventing a spiraling descent in consumption and output. Indeed, during the Great Recession in 2008, UI kept millions of Americans out of poverty while also saving millions of jobs (West et al. 2016).

However, the COVID-19 pandemic, and the unprecedented job loss it precipitated, put the UI system to the test and exposed underlying weaknesses. The current UI system is fragmented—jointly funded by the Federal government and States, but primarily administered by States, which, within broad standards, set their own eligibility criteria, benefit levels, and benefit durations. And as the nature of work has evolved even before the pandemic began, UI has not kept up. For instance, workers who are self-employed, including independent contractors, are ineligible for UI. As the labor force has changed and grown tremendously in the past few decades, the UI taxable wage base has not grown with it (Vroman and Woodbury 2014).

Expansions of UI enacted during the pandemic allowed the system to provide appropriate relief during a widespread national crisis, while strengthening the system's ability to support workers and stabilize the economy. The Federal Pandemic Unemployment Compensation and Pandemic Emergency Unemployment Compensation programs set nationwide standards in benefit amounts and durations that accounted for the unprecedented labor market challenges the pandemic posed. Meanwhile, at its peak, the Pandemic Unemployment Assistance program made benefits available to nearly 15 million workers ineligible for traditional UI (Bivens and Banerjee 2021).

The pandemic also highlighted a need for investment in UI systems and broader UI policy reforms (Bivens et al. 2021). In the summer of 2021, roughly 40 percent of workers receiving their first UI payment reported having to wait at least 3 weeks for it (U.S. Department of Labor 2022). Delay times in application processing and distribution of safety net polices can put financially vulnerable families in an even more precarious situation. Future economic downturns may require again extending UI benefits to currently excluded workers, suggesting a role for reforms that would incorporate them.

In the subsequent weeks and months, the Fed established additional programs to safeguard liquidity in financial markets and to encourage banks to lend to small businesses and municipal governments, many of which found themselves unable to borrow just when they most needed credit to survive. Finally, the Fed worked with banks to complete two rounds of stress tests focused on understanding the impact of the pandemic on banks' capital positions, creating transparency that, as in the 2008 financial crisis, had the goal of raising investor confidence about the readiness of U.S. financial institutions to weather the crisis (Morgan, Peristiani, and Savino 2014).

These policy actions helped to prevent not only another Great Depression but also another Great Recession. That is, through a response that was responsive to the scale and nature of the pandemic-induced crisis, the Fed's actions helped to avert an even larger economic catastrophe and to fuel a postcrisis recovery that to date has been far stronger than after the 2008 financial crisis.

The greatest challenges in years to come may arise with little warning. Just as the government buttressed the macroeconomy during the pandemic, so too must it be able to guide the economy through unanticipated shocks in the future. Social insurance programs that protect workers, families, and businesses from severe hardship play a central role in macroeconomic stabilization (McKay and Reis 2016). Unemployment insurance and the Supplemental Nutrition Assistance Program (SNAP) proved to be powerful countercyclical policy levers, shoring up household resources throughout the unforeseen demands of the pandemic (Rouse and Restrepo 2021). In the face of historic spikes in joblessness and hunger, some government aid was automatically assured. Recent updates to the Thrifty Food Plan will crucially reinforce the stabilizing power of SNAP in future recessions (Bauer 2021).

Addressing Market Failures

Although the private market adequately provides goods and services in many instances, there are textbook cases in which it does not. These situations constitute "market failures," which occur when individual actors—such as households or businesses—do not achieve efficient outcomes on their own. Market failures are a pervasive feature of real-world markets. Left unaddressed, they inhibit the efficiency and capacity of the economy.

One well-known example of a market failure is when the consequences of private decisions spill over onto people who were not party to those decisions, a phenomenon economists call "externalities." The choices of industrial factories over how much to spend on equipment to reduce their emissions, for example, matter for everyone who breathes the air and drinks the water near these factories. And yet, when making such decisions, private firms have incentives to control emissions only to the extent that they affect their bottom line, likely emitting more than is desirable for society as a whole. Government involvement can improve outcomes through policies that compel factories to account for this social damage in their decisionmaking.

Even the need for macroeconomic stabilization can be characterized as a form of market failure that stems from price rigidities, incomplete insurance markets, and externalities from shocks to aggregate demand. Market failures can also arise when people are credit-constrained. When these credit constraints inhibit people's ability to pay what something is worth, this inability to meet costs may incorrectly signal that the good or service has no long-term value. One notable example of this is childcare and education: just because families cannot meet the true costs of these services at this point in their lifecycle does not mean they are not valuable, hence motivating public involvement.

Furthermore, efficient markets require buyers and sellers to be informed about the quality and prices of the goods and services traded. When participants are uninformed, markets struggle to yield mutually beneficial trades between buyers and sellers. For instance, in the market for health insurance, people buying it know more about their individual health status than the insurance companies, which causes these markets to provide inadequate coverage, out of fear that only unhealthy people will choose to buy adequate coverage. Finally, markets may not reach efficient outcomes when production and sales are highly concentrated in one or a handful of companies. A dominant position gives such companies an incentive to price their goods and services above their cost, to innovate less, and to take other anticompetitive actions to entrench their position and to extract monopoly rents from buyers.

Market Failures during the Pandemic

The pandemic has shown that people's behaviors may accelerate or slow the spread of the virus. Testing, mask-wearing, social distancing, and vaccination all benefit more than just the people doing those things, producing beneficial health externalities for everyone with whom these people come in contact. Governments have taken several steps to encourage or require these pro-social behaviors during the pandemic, including the American Rescue Plan's funding for the national vaccination campaign and free COVID-19 tests. The Federal Government, and many State and local governments, also mandated mask-wearing indoors to reduce COVID-19's airborne spread. In addition, many State and local governments put in place temporary indoor capacity limits to encourage increased social distancing and implemented vaccine mandates for certain activities. The Federal Government has also funded the development and distribution of vaccines, given that vaccinations benefit many beyond vaccinated individuals themselves (see box 1-2).

Box 1-2. Effective COVID-19 Vaccines as Public Goods

The life-saving impact of COVID-19 vaccines illustrates the importance of an important public good: basic scientific research. One consideration that makes such research a public good is that one use of knowledge—for example, to cure a given disease—does not take away from other potential applications of the same knowledge. In the case of COVID-19 vaccines, the central scientific breakthroughs were the result of decades of publicly financed research against other viral threats, including Ebola, MERS, Human Papillomavirus, and Human Immunodeficiency Virus (Harris 2021). The Biomedical Research and Development Authority, for example, was a key funder of research on messenger RNA, the vaccine platform eventually used in the Moderna and Pfizer vaccines. Public investment was also crucial in the final step of developing the COVID-19 vaccine: Richard G. Frank, Leslie Dach, and Nicole Lurie conclude, reviewing a variety of estimates, that the U.S. government invested between $18 and $23 billion in COVID-19 vaccine research and development and spent about $12 billion more on advance purchases of the vaccines. The United States also spent $20 billion on the vaccination campaign, according to analyses from the Kaiser Family Foundation (Kates 2021) and the U.S. Federal Emergency Management Agency (2021).

Researchers have estimated that, without a vaccination program, there would have been approximately 1.1 million additional deaths and up to 10.3 million additional hospitalizations in the United States from December 2020 through November 2021 (Galvani, Moghadas, and Schneider 2021). Calculating the cost per life saved suggests that public spending on vaccines was remarkably cost-effective. In particular, assuming the COVID-19 vaccines would not have emerged without public investment, the cost of this investment was between $45,000 and $50,000 per American life saved.

By comparison, some U.S. government agencies typically consider spending to be cost-effective if it costs around $11 million per life saved—indicating that half of a cent of spending on COVID-19 vaccines saved as many lives as $1 of spending on other U.S. policies (U.S. Department of Health and Human Services 2021; U.S. Department of Transportation 2021). Such thresholds, referred to as the "value of a statistical life," are widely used to evaluate life-saving regulatory policies, from car safety to power-plant emissions (Viscusi 2018). Even these estimates, however, greatly understate the true cost-effectiveness of vaccine spending, as they do not account for the millions of lives saved abroad, those saved after November 2021, and those yet to be saved by COVID-19 vaccines, nor the avoided costs of hospitalizations, illnesses, and work absences. Taken together, these considerations suggest that public investments in COVID-19 vaccines were likely the single most cost-effective policy response to the pandemic.

An important special case of externalities relates to "public goods"—goods and services, like national defense and some forms of infrastructure, that cannot be depleted by one person's use and that benefit people whether or not they have paid for them. If left to the private sector to provide, public goods are undersupplied, as people can individually opt not to pay and to free ride on the willingness of others to pay. However, if everyone tries to free ride, there are no public goods to enjoy. Government spending on public goods can ensure that they are adequately provided and can thereby raise the economy's productive capacity (see box 1-2).

Emergency government assistance for small businesses during the pandemic can also be viewed as a policy response to market failures, as former Council of Economic Advisers Chair Joseph E. Stiglitz has argued (Stiglitz 2021). Many small businesses, for example, have insurance policies against "business interruption" to cover revenue losses due to fires, floods, or other disasters that are no fault of their own. These policies largely do not cover pandemics, which left the 41 percent of small businesses that temporarily closed in late April 2020 without coverage against revenue losses, putting them at risk of closing their doors forever (U.S. Census Bureau 2022). Grants and loans to small businesses, such as the Paycheck Protection Program and the Restaurant Revitalization Fund, addressed this lack of insurance coverage by directly providing a form of business interruption insurance.

Market Failures Beyond the Pandemic

Market failure is a unifying theme in making the case for public investment in infrastructure, child health and education, and clean energy. This subsection explores these areas of concern.

Infrastructure. There is much evidence that the United States lags far behind its competitors in supplying the essential inputs to economic capacity. U.S. infrastructure provides several examples. The World Economic Forum's *Global Competitiveness Report* found in 2019 that, out of 141 countries, the United States ranked 13th in quality of overall infrastructure, 17th in quality of road infrastructure, 23rd in electricity supply quality, and 30th in reliability of water supply (Schwab 2019). A separate ranking of global ports by the World Bank and IHS Markit found that no U.S. port made it into the top 50 globally, and just 4 are in the top 100. By comparison, of the top 10 ports, several are in China. The Federal Communications Commission (FCC 2018) has also ranked the United States 10th among developed countries for broadband speed and connectivity. In transporting goods and services, in connecting workers around the country and globe, in transforming technological progress into productivity gains, the United States is not at the frontier.

The public sector has an important role to play in building and maintaining the stock of physical infrastructure, which complements private capital investment. Though the private sector can adequately supply the economy with most physical capital—factories and offices, for instance—infrastructure projects, such as transportation systems, are far less suited to private development. Their construction often requires legal authority to use property to overcome holdups by individual landowners. Furthermore, some of the social benefits of these projects may stem from increases in innovation, economies of scale, and labor mobility—factors that private developers would not consider in their investment decisions, leading to underinvestment (Ramondo, Rodríguez-Clare, and Saborío-Rodríguez 2016; Perla, Tonetti, and Waugh 2021).

The supply chain disruptions during 2021–22 have illustrated the critical importance of fast, efficient transportation for economic growth and have highlighted the cost to the United States when government does not invest adequately in transportation infrastructure. When these systems are strained, they may become bottlenecks for the rest of the economy, causing cascading shortages, delays, and price increases (Bernstein and Tedeschi 2021; Helper and Soltas 2021). In mid-December 2021, 71 percent of U.S. manufacturing small businesses reported delays with their domestic suppliers (U.S. Census Bureau 2022). Facing higher shipping costs, and unable to promise timely deliveries, these manufacturers have been put at risk of losing sales to international competitors and being forced to cut jobs and investment (Hummels and Schaur 2013; Clark, Dollar, and Micco 2004; Hornbeck and Rotemberg 2021).

Children. Another large body of evidence documents how investments in children can have positive effects throughout the life cycle and on society at large (Almond, Currie, and Duque 2018). Education boosts workers' productivity and wages in the long run, while reducing adult mortality and incarceration, thereby lifting the economy's overall capacity (Card 1999; Oreopoulos and Salvanes 2011). Child health interventions, such as the provision of adequate nutrition, similarly have lasting effects on both medical and nonmedical aspects of well-being (Bailey et al. 2020). The returns to such educational and health investments have been shown for children of all ages, from newborns to young adults (Hendren and Sprung-Keyser 2020), suggesting broad benefits from investments in early education and childhood programs as well as in elementary and secondary schools.

However, the private costs of childcare and health care are increasingly burdensome and must be paid upfront, even as the rewards are reaped in the future (Council of Economic Advisers and Office of Management and Budget 2021). Many of these benefits accrue in large part to society, rather than just to the family itself—such as through higher tax receipts, less crime, and lower spending on public assistance (Hendren and Sprung-Keyser

2020). Furthermore, the quality of childcare is often variable and difficult for parents to ascertain (Mocan 2007). These considerations point to the possibility that families are unable to invest in children relative to the long-run benefits of these investments for society as a whole.

Government can help ensure that children receive high-quality education and care early in life through measures like direct public provision and subsidies. Despite strong evidence for the benefits of early education, only about half of three- and four-year-old Americans are enrolled in preschool, and children of lower-income families are much less likely to be enrolled in preschool than children of higher-income families (National Center for Education Statistics 2021; Cascio 2017). Improving pay for caregivers and instituting standards for care would raise quality across the country, which may also raise the long-term payoff from these programs by increasing their effectiveness (Banerjee, Gould, and Sawo 2021).

The past decades of underinvestment in children mean that the United States is not well prepared for current and future demographic changes. The aging workforce and the resulting increase in the number of retired workers suggest that growth in human capital per worker, and by extension growth in productive capacity, will slow unless the United States reverses underinvestment in our future human capital, as we discuss in chapter 4.

Climate change. Climate change caused by pollution presents another economic challenge. Each polluting activity contributes to global warming and environmental damage, but polluters do not individually bear the costs associated with their pollution. Already the economic damages from storms, floods, droughts, and wildfires have risen to over $100 billion per year in the United States (National Centers for Environmental Information 2022).

The mirror image of this problem is underinvestment in clean energy, as private actors bear the upfront costs of transition investments but cannot themselves capture all the long-term social benefits. Government can correct these externalities by helping to ensure that the private costs of carbon and other greenhouse gas emissions, as well as the private benefits of clean energy, correspond to their long-term costs and benefits for society. Replacing subsidies for fossil fuels with subsidies for clean energy investments, such as electric vehicles, helps align these private and social incentives.

Adapting the Nation’s energy systems for the future is not a task that can be achieved by individual households, businesses, or industries alone. Consider a consumer in North Dakota wishing to purchase an electric vehicle. According to the Department of Energy, North Dakota has a total of 138 public and private electric vehicle supply equipment ports (Alternative Fuels Data Center n.d.). That is one charging station per 510 square miles, which is equal to or beyond the distance that any electric vehicle currently sold in the United States can drive on one charge (Wallace and Irwin 2021).

Meanwhile, California has one charging station for each 4 square miles of land in the state (Alternative Fuels Data Center n.d.). A key challenge in electric vehicle infrastructure is coordination between vehicle buyers and charging-station suppliers: Neither wants to be the first to invest, creating a chicken-and-egg problem that delays the transition to electric vehicles (Li et al. 2017). This suggests a role for government in undertaking upfront investments in infrastructure, and thus allowing all Americans to take part in the energy transformation.

Reducing Inequality

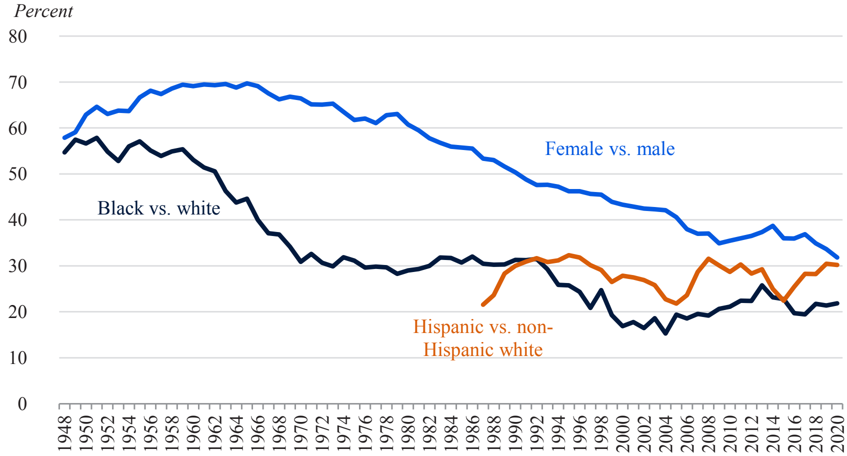
Both economic efficiency and equity are important goals. But there is no guarantee that efficient economic outcomes are equitable ones. Governments have a role to play in ensuring that the benefits of economic growth are shared when they would otherwise go to a fortunate few—and in spreading the costs of economic dislocations, such as trade adjustment and technological change, when they would otherwise wreak concentrated harm on particular local economies and groups. Another important, if difficult, task for government lies in confronting the ongoing legacies of de jure discrimination that many minority groups face, from labor market disadvantages to residential segregation (Rothstein 2017).

Inequality Before and Beyond the Pandemic

The U.S. economy has long featured substantial inequalities in income, wealth, and other economic outcomes among individuals and families. These inequalities reflect variations in opportunities, earnings ability, preferences, bargaining power, and luck—along with structural divisions by race, ethnicity, class, gender, sexual orientation, and other markers of difference.

Income inequality can be explained by two economic trends: the decline in labor's share of national income, and rising earnings inequality among workers. From 2000 to 2019, labor's share of income in the U.S. nonfarm business sector fell 6 percentage points, from 63 percent to 57 percent, according to Bureau of Labor Statistics data. In addition, labor earnings growth since the 1970s has been strongly tilted toward the best-off households (Congressional Budget Office 2021). Since the distribution of nonlabor income (i.e., payments to capital and business owners) is even more unequal than that of labor income, the decline in labor's share and the increase in earnings inequality have both contributed to rising inequality in overall income. The fall in the labor share and the rise in earnings inequality reflect many contributing causes—among them, shifting relative supply and demand for skills, changes in public policies like top tax rates and antitrust enforcement, and changes in labor market institutions such as

Figure 1-6. Gaps in Annual Earnings by Race, Ethnicity, and Gender



Sources: Bureau of Labor Statistics; CEA calculations.

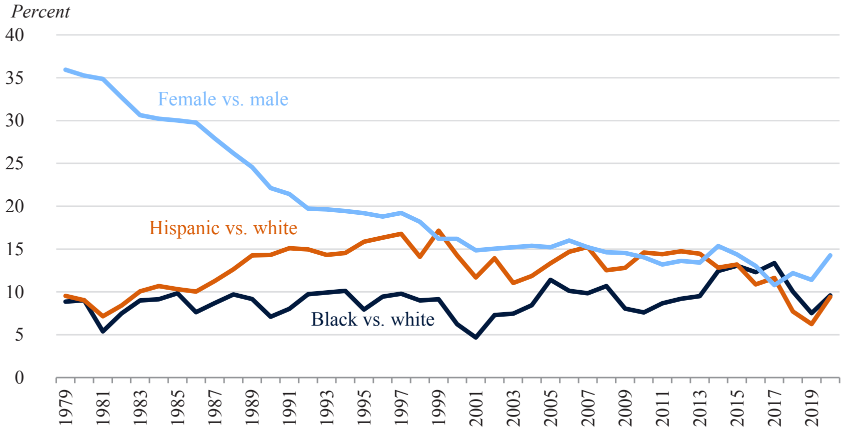
unions (Furman 2016). Collectively, these economic shifts and institutional changes have undermined worker power, especially that of the most vulnerable workers, for the benefit of top earners and the owners of capital and businesses.

At the same time, gaps by race and gender have been highly persistent. There has been strikingly little progress in closing gaps in hourly or annual earnings by race and ethnicity over the last 20 years, and progress in closing gender gaps has slowed over the same period (figures 1-6 and 1-7).

While these economic disparities have proved persistent, policy action and legal efforts against discrimination have been important in driving the progress that did occur. Critically, the reduction in racial and ethnic inequality has been "episodic" rather than "continual," reflecting identifiable shifts such as the Civil Rights Act of 1964, the Fair Labor Standards Act of 1966, and the tight labor market of the 1990s (Donohue and Heckman 1991; Derenoncourt and Montialoux 2021; Baker and Bernstein 2013). Improvements in school quality after the landmark U.S. Supreme Court decision in *Brown v. Board of Education* were another important contributor to the compression of racial and ethnic earnings gaps (Card and Krueger 1992).

Research also suggests that past antidiscrimination policies not only benefited minorities but also expanded the overall capacity of the U.S. economy, as discrimination prevented the economy from making full use of the potential of all Americans. According to one analysis, between 20 and 40 percent of all U.S. economic growth from 1960 to 2010 can be explained by reductions in discriminatory barriers by sex and race (Hsieh et al. 2019). Although women and racial and ethnic minorities are now more able to enter

Figure 1-7. Gaps in Average Hourly Earnings by Race, Ethnicity, and Gender



Sources: Bureau of Labor Statistics; CEA calculations.

high-earning occupations like law and medicine, occupational segregation remains an important contributor to income disparities by gender, race, and ethnicity (Cortes and Pan 2018; Weeden 2019). Overall, occupation and industry segregation account for about half of the gender pay gap as of 2011 (Blau and Kahn 2017). After the rapid advance of women in the workplace during the 1970s and 1980s (figures 1-6 and 1-7), progress in reducing gender disparities in the labor market has been slow in recent years.

A key factor behind the remaining gender gaps, much recent research has argued, is how household responsibilities are typically divided within heterosexual couples, especially those with children. In the United States, women's employment and earnings fall immediately upon the birth of their first child and remain 20 to 30 percent lower, even 10 years after childbirth. Worldwide, larger "child penalties" occur in countries and regions of countries with more traditional gender norms (Kleven 2021). Other research has suggested that the lack of fair and predictable work schedules may be a barrier to maternal labor force participation. Women are less willing to accept higher-paying jobs with longer commutes than men, likely because of their greater home and care responsibilities, and gender pay gaps are smaller in occupations that can accommodate flexible work hours (Barbanchon, Rathelot, and Roulet 2021; Goldin 2014). Though norms and a fundamental economic force—specialization in either paid or household work—push women and men to make different life choices, government could do more to accommodate caretakers, typically women, who want to manage both family and career, such as through paid leave and subsidized child care (Boushey 2016).

Inequality in the Pandemic

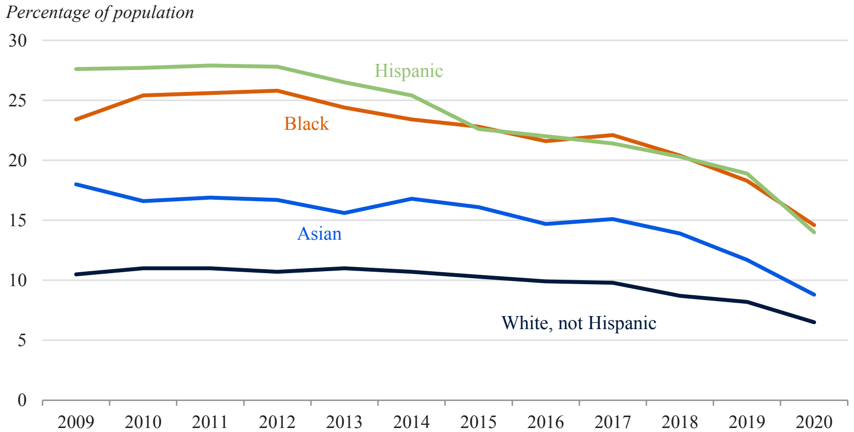
The COVID-19 pandemic laid bare vast, alarming economic disparities. Many higher-earning workers, for example, continued in their jobs through telework, while 80 percent of job losses after the pandemic were concentrated in the lowest quarter of wage earners (Gould and Kandra 2021). Women bore the brunt of school and childcare closures by picking up additional care responsibilities, and labor supply among mothers of young children remained depressed even two years into the pandemic (Goldin 2021). Furthermore, analyses that have parsed U.S. economic data by race, sex, ethnicity, and education have found weaker pandemic recoveries in labor force participation among women with compounding sources of disadvantage, such as Hispanic and non-Hispanic Black mothers or mothers with less than a bachelor's degree (Tüzemen 2021).

The government's pandemic response aimed to prevent its costs from falling heavily on specific groups of workers. Several programs provided targeted relief to pandemic-affected industries—such as air travel, hotels, and restaurants—as well as to their workers. In addition, the government patched several holes in the safety net that, if they had been left unaddressed, would have exposed millions of families to pandemic-related hardships (Wheaton, Giannarelli, and Dehry 2021).

One of these patches was the expansion of unemployment insurance to cover "gig" workers and others who are typically ineligible for such benefits, such as the self-employed and people with limited work histories, through Pandemic Unemployment Assistance (see box 1-1). A second patch to the safety net was in housing policy: The government forbade banks and landlords from foreclosing upon or evicting families, and it provided relief with the Emergency Rental Assistance Program and Homeowner Assistance Fund. Third, school closures during the pandemic meant that the nearly 30 million children who received free or reduced-price school lunches before the pandemic needed other forms of nutrition support—a safety-net hole patched with the Pandemic Electronic Benefits Transfer program (Economic Research Service 2022).

These safety net patches, along with other policies such as the expanded Child Tax Credit, helped to reduce poverty to its lowest level on record, despite the pandemic and recession. Official estimates for the year 2021 will not be released until late 2022, but in 2020, the poverty rate fell to 9.6 percent from 11.8 percent in 2019, according to the Supplemental Poverty Measure, which accounts for the resources that many low-income households receive from the government (Fox and Burns 2021). Declines in poverty were even larger for particular racial and ethnic groups, with the supplemental poverty rate among Black and Hispanic Americans falling by 3.7 and 4.9 percentage points, respectively (figure 1-8). The decline in the

Figure 1-8. Poverty Rate by Racial Group



Source: Census Bureau.

child poverty rate was equally dramatic, dropping by almost 3 percentage points and projected to fall even further in 2021 (Wheaton, Giannarelli, and Dehry 2021). The data illustrate the importance of public assistance in preventing pandemic hardships, because the poverty rate, as measured by the Official Poverty Measure—which does not reflect the increase in transfers—rose by a full percentage point to 11.4 percent in 2020 (Shrider et al. 2021).

Conclusion

Economists have long understood the myriad ways in which government action in the economy can promote growth and well-being, fulfilling the public sector's role as a partner of the private sector. Ensuring macroeconomic stability, investing in public goods, addressing market failures, and reducing inequality are just some of the functions that markets cannot do alone—or do too little in the absence of government. When governments fulfill these roles, they are not interfering in the market or crowding out private enterprise; they are creating, protecting, and expanding markets and their potential to produce an inclusive and prosperous society.

These complementary functions of government were on prime display during the COVID-19 pandemic. The health costs and risks of viral transmission meant that basic person-to-person interactions carried social implications, motivating a host of U.S. government policies to reduce these risks: physical distancing, subsidized testing, mask requirements, and public investment in vaccines and treatments for COVID-19. And just behind the public health crisis loomed a potential economic crisis, one that portended hardship for tens of millions of people who had lost jobs or income—a crisis that the U.S. government successfully alleviated with aggressive monetary and fiscal responses that sustained aggregate demand and strengthened the safety net throughout the pandemic. The U.S. response to COVID-19 has been intentional in recognizing and undoing the pandemic's unequal effects across our society—with progressive direct cash assistance, targeted support for workers in the industries most affected by the pandemic, and investments in broadband access and vaccine outreach to serve rural and other disadvantaged communities.

The partnership between public and private sectors worked during the pandemic and has the potential to contribute to increased future economic growth. As the remaining chapters of this *Report* discuss, understanding the role of government is important in assessing economic policy options. A policy agenda to fulfill these roles can improve U.S. economic outcomes and expand U.S. productive capacity, both now and over generations to come.

Chapter 2 provides an overview of the economy over the past year, focusing on how this recovery differs from past ones. The chapter discusses fiscal and monetary policy support, pandemic issues, inflation, and labor force participation. The macroeconomic forecast underpinning the Administration's Budget is also presented.

Addressing the pandemic-induced economic downturn has been a shared priority for countries around the world. Chapter 3 analyzes the U.S. economy in a global context, examining other countries' paths toward recovery, inflation trends, and labor markets, as well as shifts in international trade and their impact on the U.S. trade deficit. The chapter then discusses principles for a U.S. international economic policy that promotes economic resilience and generates benefits that are shared broadly across American society.

Human capital—or the knowledge, skills, health, and other valuable resources embodied in an individual—is a critical component of economic growth. However, the accumulation of human capital has slowed in recent years. For instance, life expectancy only rose by less than half a year in the decade before the pandemic, and the education levels of the current generation of young adults have grown only slightly compared with their parents' generation. Chapter 4 discusses education, workforce development, and health (several of the major components of human capital), and explores public investments that would support the development of these forms of human capital, and policy changes that could allow human capital to be used more productively and expand U.S. economic capacity.

Even when people develop strong human capital, countervailing forces can keep them from successfully utilizing it. For example, since the late 1990s, concentration has increased in about 75 percent of U.S. industries, and research shows that about 60 percent of U.S. labor markets are highly concentrated, likely reducing wages and the quality of working conditions (Grullon, Larkin, and Michaely 2019; Azar et al. 2019). Chapter 5 discusses the forces that inhibit competition—and why it is critical for long-run growth to address monopsonies (a lack of competition among employers or other buyers of goods and services); monopolies; and racial, ethnic, and gender discrimination. In addition, chapter 5 examines how persistent inequality may reduce economic efficiency and capacity growth, particularly through its effects on labor market outcomes, talent allocation, innovation, and incentives for human capital investment.

For decades, experts have warned that U.S. supply chains were fragile and thus vulnerable to shocks like extreme weather and global disturbances. However, it was not until the pandemic highlighted existing weaknesses that "supply chain" became a household term. Chapter 6 describes the evolution of the supply chain and discusses issues linked to firms' increased reliance on outsourcing and offshoring. In critical industries, supply chain resilience has national security implications. In other industries, the complexity of supply chains can make it difficult for firms to coordinate their private planning and decisionmaking, suggesting a role for policies such as industry standards and information aggregation and dissemination. The chapter then provides examples of Administration proposals that would help to address these issues, strengthening supply chains' resilience and innovation.

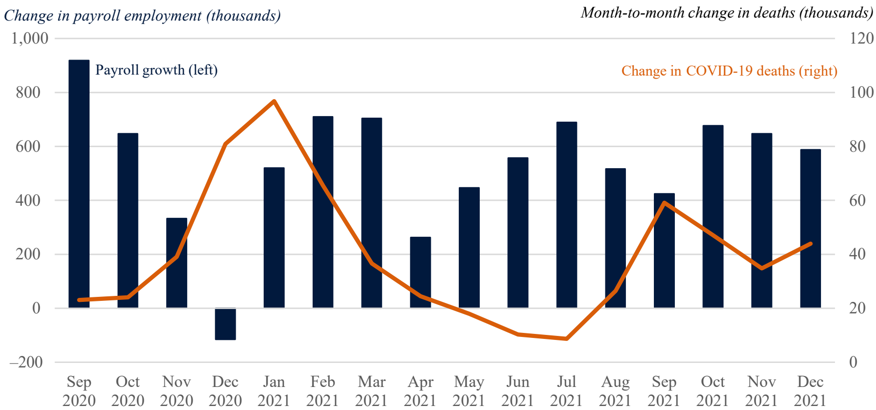
Chapter 7 discusses climate risks and the global progress in mitigating these risks by transitioning to clean energy. Then it outlines the factors holding back the energy transition and policies that can cost-effectively accelerate the transition. The chapter explains the economic rationale underlying Federal climate policies to smooth the energy transition for U.S. domestic industries and vulnerable communities. Specifically, the chapter describes the opportunities and challenges of government interventions to support domestic clean industries and place-based policies for economic development in fossil-fuel-dependent communities.

Chapter 2

The Year in Review and the Years Ahead

The COVID-19 pandemic was the dominant factor steering the U.S. economy in 2021, as it was in 2020. In early 2020, the paralyzing grip of the pandemic drove the deepest macroeconomic shock to the United States since the Great Depression; and, in 2021, more than a year after shutdowns and masking began, almost every driver of the economic ebbs and flows the United States experienced had stemmed directly or indirectly from this virus.[1] The growth of payroll employment, for example, varied inversely with the rises and falls of the COVID-19 fatality rate (figure 2-1).

Figure 2-1. Job Growth and Change in COVID-19 Deaths, September 2020–December 2021

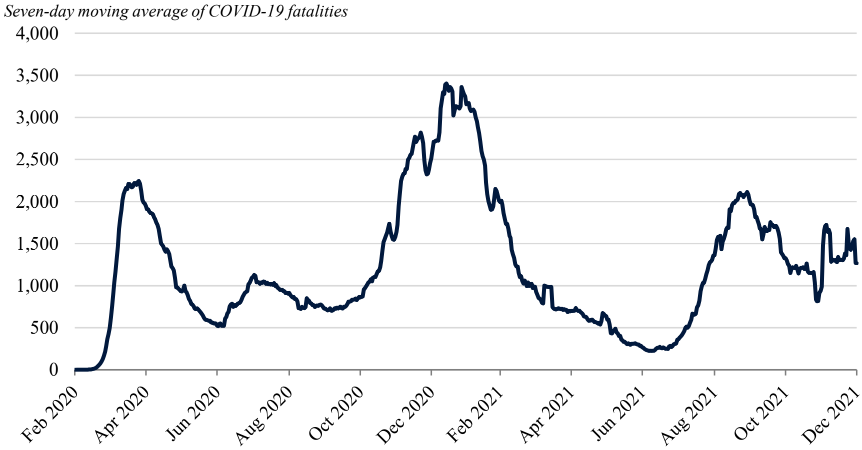


Sources: Johns Hopkins University; Bureau of Labor Statistics; Haver Analytics.

Two broad and interweaving forces influenced COVID-19 dynamics in 2021. The first was continuing waves of infections; the second was continued progress on vaccinations.[2] The official start of the pandemic in the United States was January 20, 2020, when the Centers for Disease Control and Prevention (CDC) confirmed the first U.S. coronavirus case in Washington State.[3] By the end of 2021, deaths in the United States had accu-

[1] For historical quarterly U.S. output data, see Gordon (1986).
[2] See 91-DIVOC (2022).
[3] David J. Spencer CDC Museum (2022).

Figure 2-2. Daily COVID-19 Fatalities, February 2020–December 2021



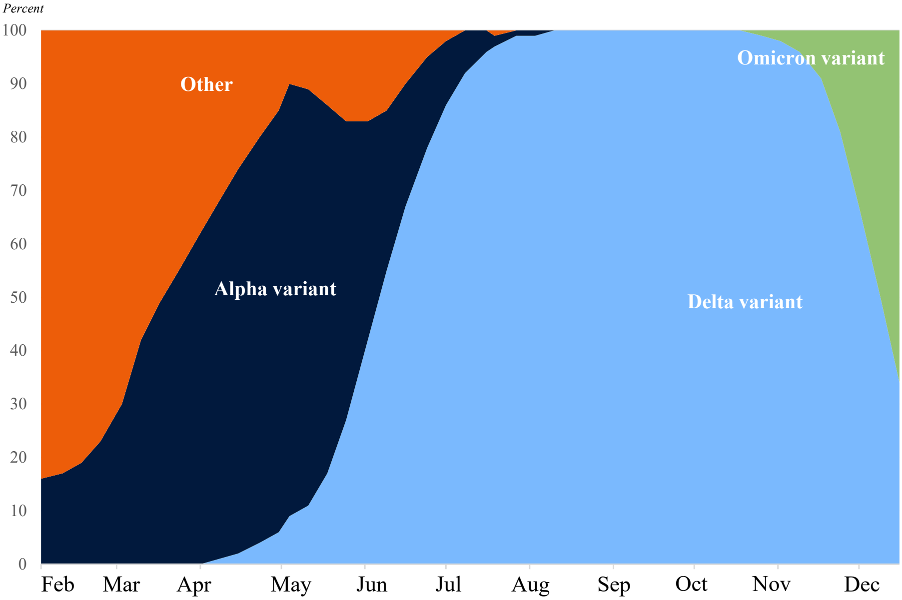
Sources: Our World in Data; CEA calculations.

mulated to over 800,000,[4] more than all the U.S. combat deaths combined in every war including the American Revolution.[5] In early January 2021, at the height of the pandemic, measured cases spiked and fatalities averaged about 3,400 a day over seven days (figure 2-2). Cases and deaths fell markedly throughout the winter and spring, as over 1.5 million people were fully vaccinated each day on average. COVID-19's more contagious Delta variant, however, emerged in June; and by August, Delta accounted for 90 percent of U.S. cases (figure 2-3), driving an increase in hospitalizations and deaths.[6] The Delta wave may have been partially responsible for the temporary weakening of growth in real gross domestic product (GDP) in 2021:Q3. Later in the year, the even-more-contagious Omicron variant of COVID-19 displaced Delta. These variants served as sober reminders that the pandemic—and the economic devastation it has wrought—was not over.

The second dynamic—the effort to vaccinate the population—began after the Food and Drug Administration (FDA) gave Emergency Use Authorization for the Pfizer/BioNTech vaccine on December 11, 2020; and, a week later, Moderna's vaccine also got the go-ahead.[7] Before taking office, President Biden set a goal of administering 100 million shots in his first 100 days in office and released a plan to accelerate the vaccination effort on his first full day in office, January 21, 2021.[8] On March 11, President Biden instructed States to make vaccines available to all adults

[4] See 91-DIVOC (2022).
[5] Department of Veterans Affairs (2021).
[6] CDC (2022a).
[7] *American Journal of Managed Care* (2021).
[8] White House (2021a).

Figure 2-3. Frequencies of Major SARS-CoV-2 Variants, 2021



Source: GISAID data via Nextrain.com, assembled by Hatfield et al., showing results of all sequence analyses in the United States, without regard for regional weighting.

18+ by May 1.[9] Driven by Federal efforts to increase vaccine supply, that date was later pulled forward to April 19.[10] The week ending April 12 saw 1.9 million new people each day become fully vaccinated—a pandemic record.[11] On his 92nd day in office, April 21, President Biden announced that the United States had administered 200 million shots since he entered office, doubling his initial target of 100 million shots in 100 days and doing so eight days ahead of schedule.[12]

By midyear, 162 million people (49 percent of the population) had been fully vaccinated; by the end of the year, this figure had risen to 207 million (62 percent of the population).[13] Among seniors, 78 percent of the population had been fully vaccinated by midyear, and 88 percent by year end.[14] Progress continued on broad vaccination of Americans, with FDA authorization of the vaccine for children age 12 to 15 on May 10 and for children age 5 to 11 on October 29.[15] In September, the Biden Administration announced vaccine requirements for Federal workers and contractors, as

[9] White House (2021b).
[10] Treisman (2021).
[11] See 91-DIVOC (2022).
[12] Naylor (2021).
[13] See 91-DIVOC (2022).
[14] This is from the CEA's analysis of CDC data; see CDC 2022b.
[15] See U.S. Food and Drug Administration (2021a, 2021b).

Box 2-1. Historical Precedents for the COVID-19 Pandemic

After the 2008 global financial crisis, the recovery started out slowly, with job growth averaging only 173,000 a month during 2011—the first full year of the recovery. Yet the United States went on to experience steady economic growth, which evolved into the longest expansion in the country's recorded history. The COVID-19 pandemic, however, upended society and halted economic activity, with devastating consequences for the well-being of countless Americans.

COVID-19 was not the first time that the United States had to cope with a pandemic or a seismic shift in economic activity. The 1918 influenza pandemic—the most recent major pandemic to hit the United States—had a devastating impact in lives lost. However, it did not have an easily detectable impact on the macroeconomy. U.S. economic data at the time were far more limited than in 2021, and often were only available on an annual basis, making precise measurement of the pandemic shock difficult. Moreover, the substantial World War I effort likely compensated for any macroeconomic impact, according to Benmelech and Frydman (2020).

Unlike World War I, World War II did not see a pandemic outbreak of similar magnitude. But the war and its aftermath offer an interesting parallel to the current COVID-19 experience. World War II involved dramatic wartime shifts in industrial production, followed by a rapid pivot back to regular economic activity after the peace. That shift in economic activity produced supply chain disruptions that very much resemble the disruptions witnessed in 2021. World War II shut down entire domestic industries or conscripted them for the war production apparatus. Not surprisingly, as a result of that shift in production capacity, supplies of regular products ran low or were exhausted entirely during the war. For instance, families had trouble buying cars and household appliances because they were not being produced. According to the Bureau of Labor Statistics, "[by] 1943, many durable goods, such as refrigerators and radios, were also dropped from the domain of the consumer price index as their stocks were exhausted" (BLS 2014). The lack of supplies put severe upward pressure on prices by the end of the war.

In addition, the pent-up demand of consumers pushed up prices after World War II. During the war, widespread rationing limited household purchases. The government rationed foods such as sugar, coffee, meat, and cheese along with durable goods, including automobiles, tires, gasoline, and shoes. Personal savings increased substantially and were spent soon after the war ended. Between 1945 and 1949, the population of roughly 140 million Americans purchased 20 million refrigerators, 21.4 million cars, and 5.5 million stoves. The supply chain disruptions and pent-up demand that have occurred with the COVID-19 pandemic are similar—but less severe—to those that occurred after World War II.

well as a requirement for health care workers to get vaccinated.[16] Workers at private businesses with 100 or more employees were required to either get vaccinated or be tested at least once a week.[17] These requirements helped drive additional progress on the vaccination effort through the second half of 2021, with entities that implemented the requirements often seeing vaccination rates rise by 20 percentage points or more and compliance rates in the high 90 percent range.[18]

The United States also made major progress in the fight against COVID-19 in 2021 with new therapeutics, more and better testing, greater understanding of the disease, and an improved public health surveillance system. With increasing levels of immunity and more tools like tests and treatments available, the pandemic is likely to progress to one with lower mortality. That said, continued evolution of the virus is likely to require additional vigilance and investments to prepare for future variants. (See box 2-1.)

The remainder of this chapter examines the COVID-19 recession and the emerging recovery through the lenses of fiscal policy, monetary policy, the rise in uncertainty, supply chain disruptions, and the expenditure components of GDP. The pandemic's effects on the labor market are then assessed, both on the supply and demand sides. The forecast for the post-COVID-19 economy that underpins the President's Fiscal Year 2023 Budget is presented. Finally, the chapter concludes with a look back at the convulsions of the past two years and makes an assessment for the years ahead.

Fiscal Policy in 2021

The fiscal response to COVID-19 in 2020 was swift and massive, as exemplified by the bipartisan Coronavirus Aid, Relief, and Economic Security (CARES) Act, which was signed into law in March of that year. Fiscal support was strengthened even further in 2021. The major fiscal relief programs enacted during the pandemic are shown in table 2-1.

One way to put the pandemic fiscal expansion into historical context is to look at past fiscal support. Table 2-2 identifies periods of fiscal support—that is, years when the primary (noninterest) deficit-to-GDP ratio was expanding. It then averages how much higher the primary deficit was during each of those years relative to the final year before the expansionary period. For example, during fiscal years 1941–43, the primary deficit was higher than in fiscal year 1940 by an average of 13 percent of GDP per year. Support during the two pandemic fiscal years has averaged 9.2 percent of

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[16] White House (2021c).
[17] See U.S. Department of Labor (2021).
[18] White House (2021d).

Table 2-1. Fiscal Support from Coronavirus Relief Laws in Fiscal Years 2020–23

Date		% of nominal fiscal-year GDP			
		2020	2021	2022	2023
4-Mar-2020	Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020, H.R. 6074				
	Effect on Federal fiscal deficit	0.0	0.0	0.0	0.0
18-Mar-2020	Families First Coronavirus Response Act, Public Law 116-127				
	Effect on Federal fiscal deficit	0.6	0.3	0.0	0.0
27-Mar-2020	Coronavirus Aid, Relief, and Economic Security (CARES) Act, Public Law 116-136				
	Effect on Federal fiscal deficit	7.7	2.0	–0.5	–0.6
21-Apr-2020	Paycheck Protection Program and Health Care Enhancement Act, H.R.266				
	Effect on Federal fiscal deficit	2.1	0.2	0.0	0.0
27-Dec-2020	Coronavirus Response and Relief Supplemental Appropriations[a]				
	Effect on Federal fiscal deficit	0.0	3.3	0.3	0.1
6-Mar-2021	American Rescue Plan, HR 1319				
	Effect on Federal fiscal deficit	0.0	5.2	2.2	0.4
Total increase in the deficit		10.4	11.0	2.0	0.0

Source: Cost estimates are from the Congressional Budget Office.
Note: The nominal fiscal-year GDP is from the Administration's economic forecast.
[a]Divisions M and N of the Consolidated Appropriations Act 2021, Public Law 116-260, enacted on December 27, 2020.

Table 2-2. Historical Episodes of Fiscal Expansion since 1941

Period	Episode of Fiscal Expansion	Average Annual Support (percentage of GDP)
1941–43	World War II mobilization	13.0
2020–21	COVID-19 pandemic	9.2
2008–9	Great Recession	5.5
1949–50	1949 Recession / Korean War	4.9
2001–4	2001 Recession and aftermath	4.7

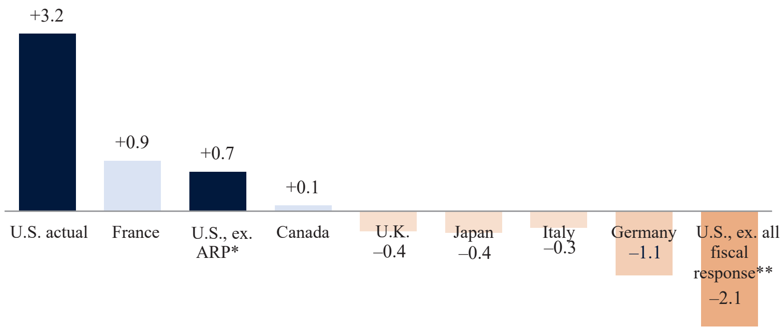
Sources: Office of Management and Budget; CEA calculations.
Note: This table shows the average annual increase in the primary deficit-to-GDP ratio, relative to the final year before the expansion (it includes both new and expanded programs).

GDP per year higher than in 2019, making it the period with the largest support since the end of World War II.

Fiscal support in 2021 began early. In the first weeks of January 2021, most households received a $600 economic impact payment for each adult through the Consolidated Appropriations Act of 2021 (H.R. 133), which was enacted in late December 2020. The legislation's $900 billion in COVID-19

Figure 2-4. Level of Real GDP, 2021:Q4, versus Before the Pandemic

Percentage of 2019:Q4 level



Sources: OECD; BEA; CBO; Department of the Treasury; CEA calculations.
* CEA calculations using actual ARP spendout and CBO pandemic multipliers.
** CEA ARP calculations plus CBO calculations of GDP effects of 2020 fiscal policy response and Federal Reserve credit facilities.

relief also reinstituted $300 per week in supplemental pandemic unemployment benefits, which the jobless began to see in January and which was key to making their families whole as the labor market recovered. Also in January, small businesses got an extension and expansion of the Paycheck Protection Program, giving many of them access to additional funds to maintain payroll and extend operations.

Beginning in March, Americans received additional fiscal pandemic support in the $1.9 trillion American Rescue Plan (ARP). The ARP funded the vaccination rollout and continued to fund the COVID-19 response, both directly and by aiding States in their responses. Households received $1,400-per-person (including children) economic impact payments soon after enactment. Families with children started receiving monthly payments from the expanded Child Tax Credit in July. These were the first refundable tax credits to be automatically delivered this way; the payments maxed out at $250 per child age 6–17 per month and $300 per child under 6 per month. Because this credit was fully refundable, low-income families were, for the first time, eligible for the full amount. Supplemental pandemic jobless benefits were extended through early September, though some States chose to end these benefits beginning in July. Aid to States' education efforts were designed to address educational challenges that arose during the pandemic, such as school closings and staffing issues. Also, the Emergency Rental Assistance program assisted households that were unable to pay rent or utilities.

The upshot: the Federal fiscal response had a sizable effect on the economic recovery in 2021. The U.S. economy ended 2021 3.1 percent larger in inflation-adjusted terms than its prepandemic level, the fastest recovery

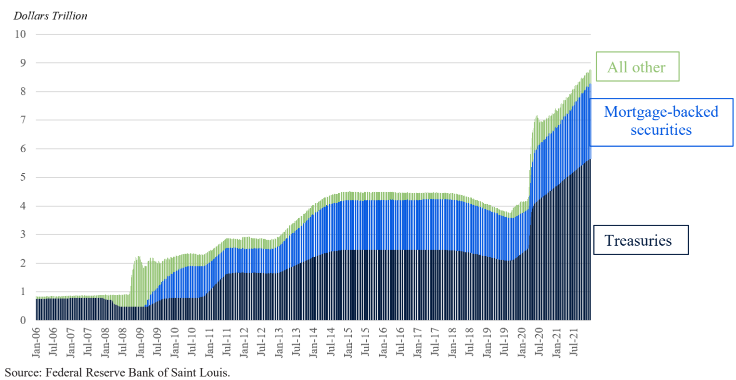
Box 2-2. Monetary Policy in 2021

In response to the sudden COVID-19 pandemic upheaval in March 2020, the Federal Reserve and other central banks around the world slashed interest rates and stepped into their role as lenders of last resort. In addition to lowering the cost of borrowing through traditional bank channels, the Federal Reserve created "emergency lending facilities" under Section 13(3) of the Federal Reserve Act to support certain segments of the financial markets. In 2008, the Federal Reserve established six emergency lending facilities over the span of nine months. In 2020, by contrast, the Federal Reserve launched 13 emergency lending facilities in just two months, some of which were direct real economy support programs, not solely financial sector support programs.

In early 2021, the emergency lending facilities funded by the CARES Act closed down. However, given the severity of the pandemic's economic impact, the Federal Reserve did not stop its asset purchases of U.S. Treasury securities and mortgage-backed securities. The Federal Reserve's balance sheet was $4.1 trillion in February 2020 (figure 2-i). Within three months, that shot up to $7.1 trillion and continued to grow at a rapid pace. From the end of 2020 through the end of 2021, the Federal Reserve's holdings of U.S. Treasuries increased from $4.69 trillion to $5.65 trillion, and its holdings of mortgage-backed securities increased from $2.04 trillion to $2.62 trillion. The Fed's overall balance sheet grew to $8.7 trillion by the end of 2021—more than double its size before the pandemic.

Of note, in November 2021, the Federal Open Market Committee (FOMC) voted to gradually reduce, or "taper," its ongoing purchases of Treasury and mortgage-backed securities. The FOMC planned to reduce the $120-billion-a-month net asset purchase pace by $15 billion per

Figure 2-i. Federal Reserve Balance Sheet Composition, 2006–21



Source: Federal Reserve Bank of Saint Louis.
Note: Excludes eliminations from consolidation.

month beginning in late November until purchases reached $0, though the FOMC also noted it was "prepared to adjust the pace of purchases if warranted by changes in the economic outlook." As of the end of 2021, the Federal funds rate target remained at 0 to ¼ percent.

among Group of Seven nations (see figure 2-4). The CEA finds that the ARP likely contributed at least 2½ points to this growth, using various data on ARP spendout as well as demand and output multipliers from the Congressional Budget Office (CBO).[19] Previously published CBO analyses of the 2020 fiscal relief packages, including the emergency Federal Reserve credit facilities, suggest that together these pre-ARP packages accounted for another 2.8 percentage points of real GDP growth during the pandemic.[20]

This extensive fiscal relief and monetary stimulus accomplished many critical goals—disseminating vaccines, restoring jobs, advancing the recovery, and reducing poverty. With the achievement of full employment, and with inflation rising as discussed in greater detail below, the Federal Reserve reduced its asset purchases and signaled an intent to start raising interest rates in 2022 (box 2-2).

The Rise in Economic Uncertainty

This section examines the rise in economic uncertainty, in the context of the COVID-19 pandemic. It explores, in turn, financial markets and consumer sentiment.

Financial Markets

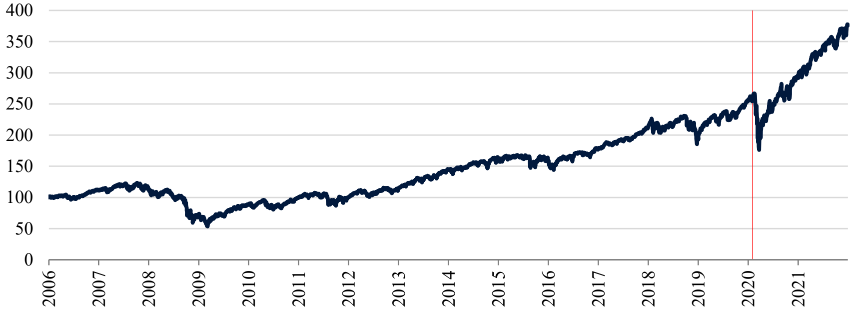
Financial markets have fully recovered since the onset of the COVID-19 pandemic, supported by strong fiscal and monetary policy interventions. With respect to equities, the Standard & Poor's 500 Index was 26.9 percent higher at the end of 2021 compared with the end of 2020; and it was 47.5

[19] Based on data from OMB, the Department of the Treasury, BEA, and others, the CEA estimates that roughly half of available ARP funds were spent out over the course of calendar year 2021. The CEA applied the output multipliers from Seliski et al. (2020) to these spendout estimates. The CEA chose to use the midpoints of the CBO multipliers under social-distancing assumptions, which were lower than multipliers without social distancing, leading to the result that real GDP growth was 2½ percentage points faster than it would have been otherwise during the four quarters of 2021, due to the ARP. If fiscal policy was in actuality more effective than the CEA assumes—e.g., because social distancing was less binding over 2021 than in 2020—then the ARP would explain a larger share of 2021 GDP growth than is accounted for here.

[20] Pre-ARP fiscal impact estimates are from Seliski et al. (2020) and the Congressional Budget Office (2021). At the time of this chapter's finalization, the second estimate of 2021:Q4 GDP was the latest available.

Figure 2-5. The Standard & Poor's 500 Index, 2006–21

Index level: Jan. 2017 = 100



Source: Haver Analytics.
Note: The red line denotes the start of the pandemic.

Figure 2-6. The U.S. Corporate Spread, 2006–21

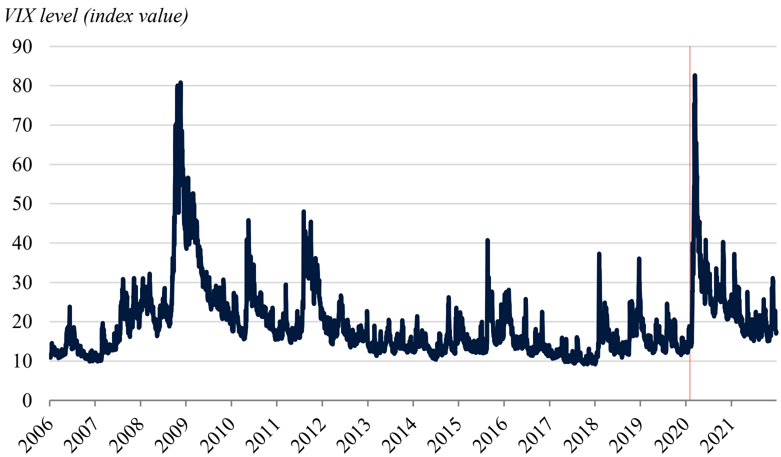
Percentage points

Source: Federal Reserve Economic Data from the Federal Reserve Bank of Saint Louis.
Note: This series is a proxy of U.S. corporations' borrowing costs, as measured by the Intercontinental Exchange Bank of America U.S. Corporate Index Option-Adjusted Spread. The index tracks the performance of dollar-denominated, investment-grade-rated corporate debt publicly issued in the U.S. domestic market. The red line denotes the start of the pandemic.

percent higher at the end of 2021 compared with the end of 2019, before the pandemic (figure 2-5).

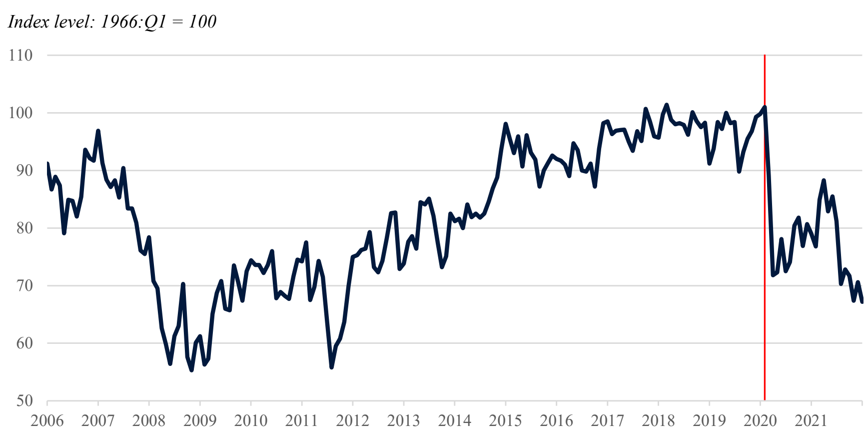
The credit market has similarly recovered. Consider, for instance, the U.S. corporate credit spread, a proxy for corporate borrowing costs. In March 2020, this spread peaked at over 400 basis points (figure 2-6). (The higher the spread, the worse the borrowing conditions for U.S. corporations.) After the rapid government and central bank interventions, the spread fell dramatically and continued to fall through 2021. The spread averaged

Figure 2-7. The CBOE's VIX Index: 2006–21



Source: Haver Analytics.
Note: This series is the Chicago Board Options Exchange's Volatility Index (CBOE VIX), which measures market expectation of near-term volatility conveyed by stock index option prices. The red line denotes the start of the pandemic.

Figure 2-8. University of Michigan Consumer Sentiment Index, 2006–21



Sources: Haver Analytics; CEA calculations.
Note: The red line denotes start of the pandemic.

approximately 94 basis points in 2021, compared with 156 basis points in 2020 and 124 basis points in 2019.

However, financial market *volatility* remained above pre-COVID-19 levels. Figure 2-7 shows a time series of the VIX, which measures the market's perception of its own riskiness as valued in options markets. In March 2020, the VIX spiked to levels not seen since the 2008 global financial crisis. In the 21 months since then, including the 12 months of 2021, the measure has generally been on a downward trajectory. As of the end of 2021, however, it still remained higher than its prepandemic levels—at about 21 in December 2021, versus its 2019 average of 15—likely due to uncertainty with respect to the future path of the pandemic.

Consumer Sentiment

Consumers' perceptions of the U.S. economy became highly pessimistic at the onset of the COVID-19 pandemic. According to the University of Michigan's Consumer Sentiment Index, sentiment fell to its lowest levels since 2011.[21] After a bounce-back in late 2020 and early 2021, consumer sentiment peaked in 2021:Q2, before declining in the second half of the year (figure 2-8). This decline in sentiment coincided with the onset of the Delta and Omicron waves, along with a rise in measured inflation.

The Economy during the Recession and Recovery: How Do This Recession and Recovery Differ from Others?

The 2020 U.S. recession was shorter than those in the past, and the recovery, based on several metrics, has been stronger. From February through April 2020, consumer spending fell faster and deeper than in any recession after World War II. However, the recovery has been faster than any other, and it differs in important ways, as is demonstrated in figures 2-9 to 2-19. For example, while the goods-consuming sector swiftly and completely recovered in 2020, the services-consuming sector has recovered only part of its loss, with some subsectors remaining far below their prepandemic peaks.

As of the end of 2021, real goods consumption was almost 14 percent above its prepandemic peak at the end of 2019, the fastest goods recovery of any post-World War II recession, as seen in figure 2-9 (see box 2-3 for an explanation of this "butterfly" figure and the 10 subsequent similar ones).[22]

In contrast, services spending recovered as slowly as any prior post–World War II recession, as shown in figure 2-10. From peak to trough, services spending fell more steeply than ever before, and more steeply than purchases of goods, from peak to trough. And although services spending rebounded swiftly, the level of spending eight quarters after the peak remained below what was experienced during any previous business cycle.

The low spending on services likely reflected social distancing

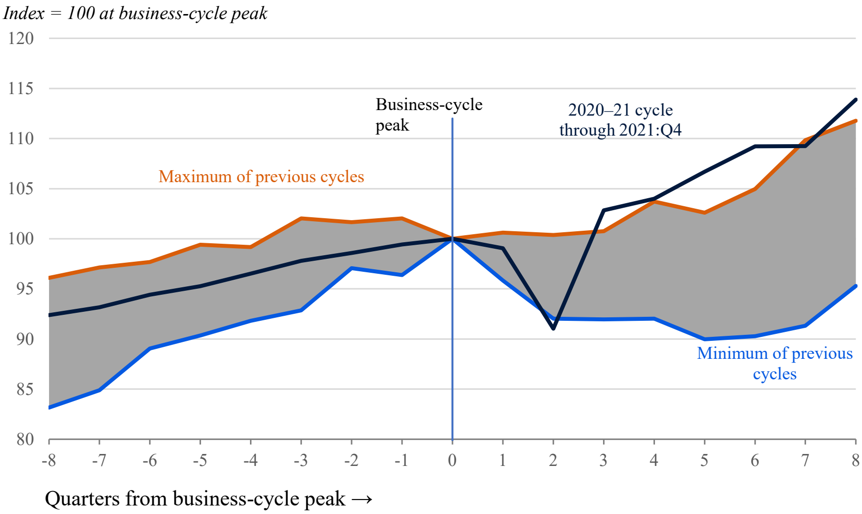
[21] Another often-cited survey is the Conference Board's Consumer Confidence Index. Consumer confidence similarly showed a drop at the onset of the COVID-19 pandemic, followed by a bounce-back in late 2020 and early 2021.

[22] The National Bureau of Economic Research's business cycle chronology names February 2020 and April 2020 as the monthly peak and trough of the 2020 recession, but in its quarterly chronology, the peak occurred in 2019:Q4, and the trough occurred in 2020:Q2. See National Bureau of Economic Research (2022).

Box 2-3. A Note on the Butterfly Figures

The butterfly figures—figures 2-9 through 2-19—show how spending on goods (or services or construction) compares with that in previous business cycles. After indexing at 100 at each of the 12 post–World War II business-cycle peaks, the orange line in these figures is the maximum of the 11 previous business cycles; the blue line is the minimum of these business cycles; and the gray area shows the range of historical variation. The goods GDP concept comes from the National Income and Product Accounts' (NIPA) table 1.2.6 and aggregates spending on goods within all GDP components (consumption, investment, government, exports, and imports). Spending on goods GDP in NIPA table 1.2.6 differs from the goods-producing sector in the GDP-by-industry accounts. For example, the value added from automobile retailing is part of goods GDP in NIPA table 1.2.6 but is part of the service-producing sector in the GDP-by-industry accounts.

Figure 2-9. Total Spending on Goods: Cyclical Comparison



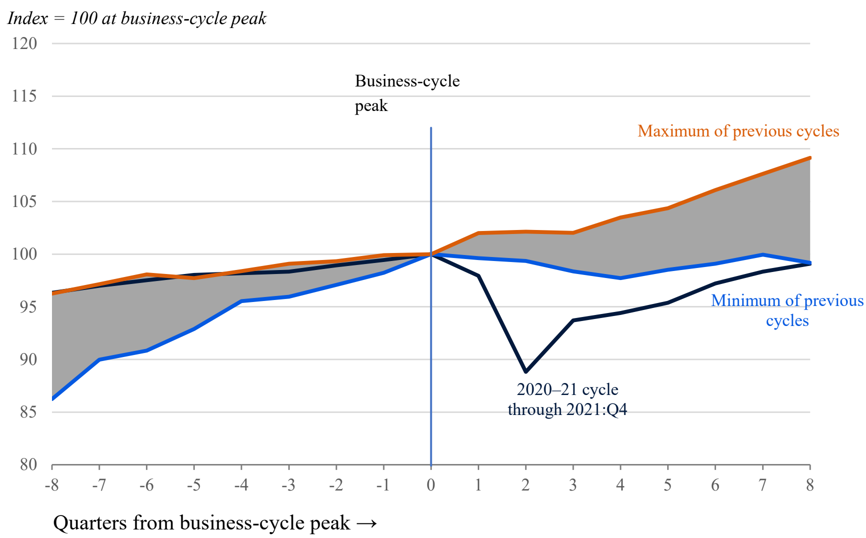
Source: BEA, NIPA table 1.2.6, "Real GDP by Major Type of Product."

and consumers' avoidance of businesses and situations that involve face-to-face interactions, such as theater, medical, and personal services.

Consumer Spending

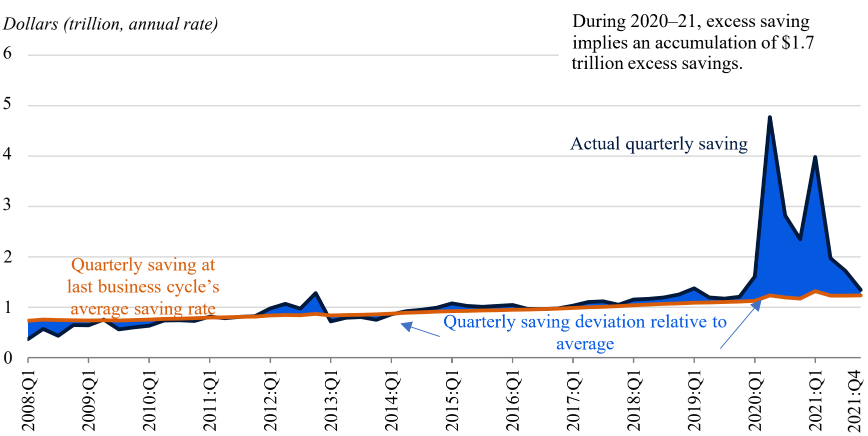
In 2021, consumer spending on goods increased rapidly, while consumer spending on services had not yet regained its peak, as shown in table 2-3.

Figure 2-10. Total Spending on Services: Cyclical Comparison



Source: BEA, NIPA table 1.2.6, "Real GDP by Major Type of Product."

Figure 2-11. Personal Saving during the Pandemic Relative to Its Average Pace, 2008–21



Sources: Data from Haver Analytics; CEA calculations.
Note: Quarterly saving at last cycle's average saving rate is defined as disposable personal income times the average saving rate from 2008 to 2019 (6.8 percent).

Because real consumer spending data are available monthly, the table shows real growth rates during the 22 months from the monthly (and prepandemic) business-cycle peak in February 2020 through December 2021. Overall, real consumer spending grew 1.6 percent at an annual rate during the 22-month

Table 2-3. Consumer Spending Growth since the Beginning of the Pandemic

Type of Good or Service	February 2020 to December 2021	
	% change, Annual Rate	Contribution[a]
	(1)	(2)
Total	1.6	1.6
Goods	6.5	2.10
Motor vehicles and parts	2.2	0.09
Durables, ex. motor vehicles	10.1	0.76
Nondurables	5.8	1.22
Services	–0.5	–0.36
Housing and utilities	1.2	0.21
Health care	–0.7	–0.11
Transportation	–5.3	–0.17
Recreation	–7.2	–0.27
Food services	0.9	0.06
Accommodations	–4.4	–0.05
Financial	3.0	0.24
Other[b]	–2.0	–0.16
NPISH[c]	–3.2	–0.10

Source: Bureau of Economic Analysis, NIPA tables 2.3.5U and 2.3.6U.

[a] Contribution to the annual rate of growth of real consumer spending. These contributions may not precisely sum to totals and subtotals because of approximations to the Fisher index formulas used in the National Income and Product Accounts.

[b] Other services include communication, education, professional and other services; personal pare and clothing services; social services and religious activities; household maintenance; and net foreign travel.

[c] NPISH = net consumption of nonprofit institutions serving households.

pandemic period, which was slightly lower than the roughly 2 percent annual rate of trend GDP growth.

Real consumer spending on goods grew at a 6.5 percent annual rate during those 22 months, far in excess of the pace at which consumer spending growth could be maintained in the long run. This rapid growth came even as motor vehicle sales were constrained by a worldwide chip shortage, holding the growth rate down to 2.2 percent. Excluding motor vehicles, consumer durables spending grew at a rapid 10.1 percent annual rate, while nondurables grew at a 5.8 percent rate.

In contrast, consumer services spending fell at a 0.5 percent annual rate during those 22 months, as shown in table 2-3. The consumer-spending categories with notable declines include health care (–0.7 percent), transportation (–5.3 percent), recreation (–7.2 percent), and accommodation services (–4.4 percent). Declines were also substantial among some of the categories within the "other services category" (not shown in table 2-3), including educational services (–2.4 percent), professional services (–1.8 percent), and

Table 2-4. Fixed Investment Components, 2019:Q4–2021:Q4

Investment Component	Annual Growth Rate
Nonresidential	1.3
Nonresidential equipment	3.0
Information processing equipment	12.8
Industrial equipment	7.7
Transportation equipment	–15.7
Other equipment	2.3
Nonresidential structures	–11.9
Office	–11.9
Health care	–6.3
Multimerchandise shopping	–20.4
Food and beverage establishments	–19.5
Warehouses	3.2
Other commercial buildings	–14.0
Manufacturing structures	–7.3
Power/communication facilities	–16.1
Mining exploration/shafts/wells	–9.0
Other nonres. structures	–16.5
Intellectual property	7.1
Software	10.2
Research and development	5.4
Entertainment/literary/artistic originals	2.0
Residential	6.7

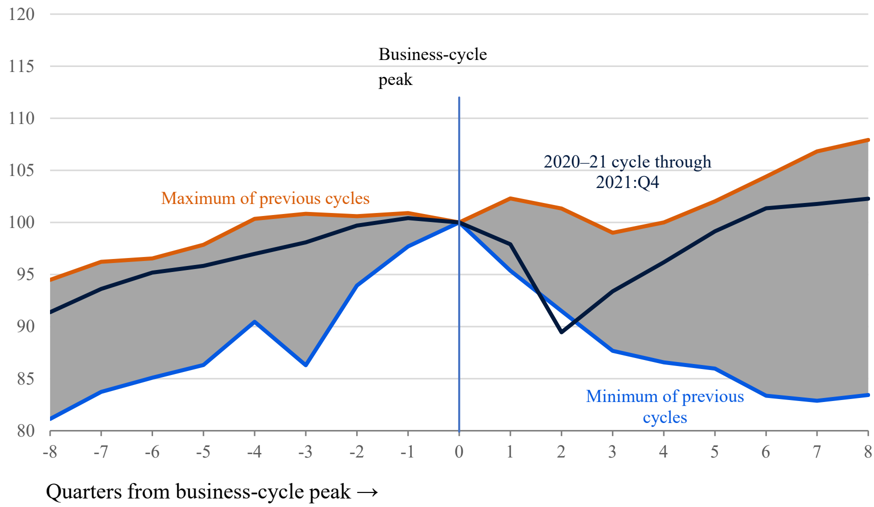
Source: Bureau of Economic Analysis, NIPA tables 1.5.6, 5.4.6U, and 5.5.6U.

personal care and clothing services (–16.0 percent). The spending categories that remained below their prepandemic levels were those that require face-to-face interaction.

Income exceeded what consumers spent during 2020–21, with the excess partly due (on the spending side) to the constrained services sector and partly due (on the income side) to income support programs under the CARES Act and the American Rescue Plan Act. Figure 2-11 shows actual quarterly saving (in trillions of dollars) relative to the saving that would have taken place if the saving rate had remained flat at its average during the 2008–19 business cycle (6.8 percent). The blue shading in this figure represents the deviation from average quarterly saving. By the end of 2021, the stock of "excess" savings during the pandemic interval accumulated to $2.7 trillion, or enough to sustain household outlays for 1.9 months.

Figure 2-12. Business Fixed Investment: Cyclical Comparison

Index = 100 at business-cycle peak



Source: BEA, NIPA table 1.1.6.

Business and Residential Investment

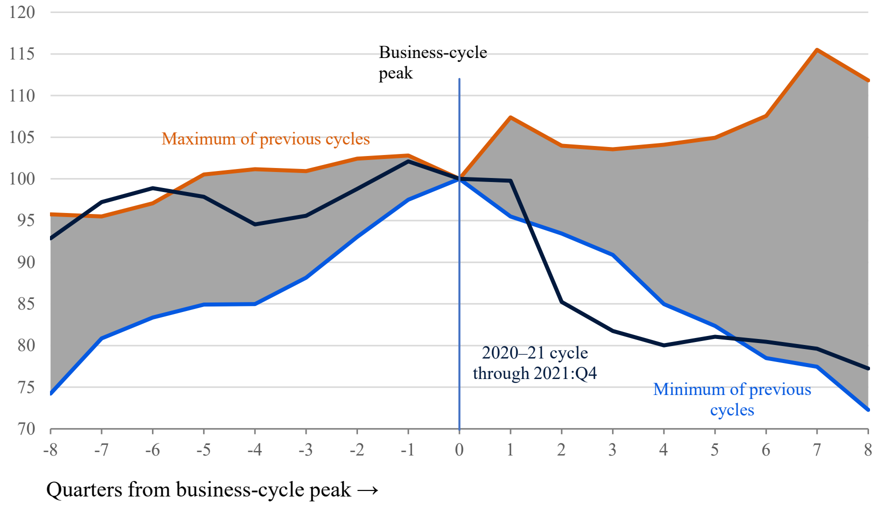
Real business fixed (nonresidential) investment edged up at a 1.3 percent annual rate from 2019:Q4 to 2021:Q4 (table 2-4). In comparison with the previous 11 post–World War II business cycles, overall business investment was stronger than the average cycle, but still within the previous range, as shown by figure 2-12.

Investment in Nonresidential Structures

Investment in nonresidential structures—which made up 3.1 percent of GDP in 2019—fell at an 11.9 percent annual rate (table 2-4) during the two years 2020–21 and was tracking near the lower end of preceding cycles at the end of 2021, as shown in figure 2-13. Sizable declines occurred in the construction of office buildings (possibly reflecting the transition to remote work). Construction also fell in those sectors that had been hurt by the general reluctance to engage in face-to-face transactions: health care facilities, shopping centers, and food and beverage establishments. Construction of manufacturing, power, and mining structures also fell. Most of these declines occurred during the four quarters of 2020, but overall nonresidential structures investment continued to decline slowly during 2021, with the major exception of petroleum and natural gas well drilling, which grew 40 percent, recovering from much of its year-earlier decline.

Figure 2-13. Structures Investment: Cyclical Comparison

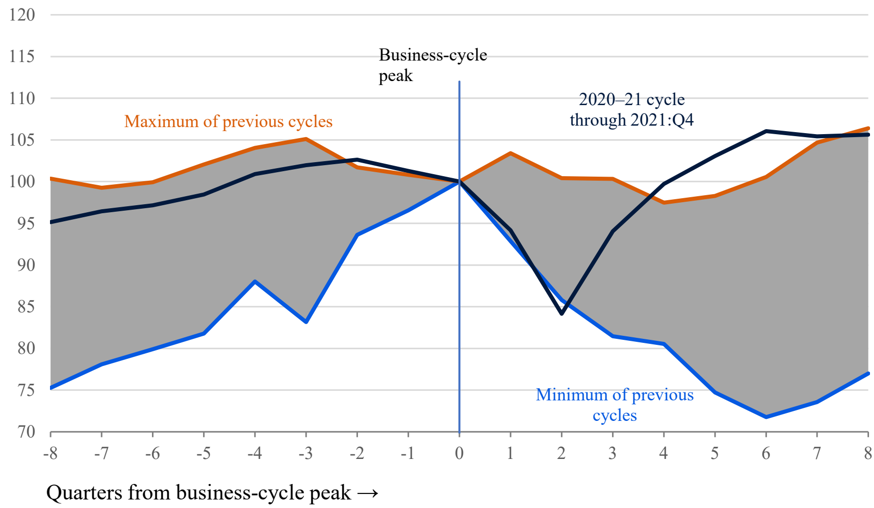
Index = 100 at business-cycle peak



Source: BEA, NIPA table 1.1.6.

Figure 2-14. Equipment Investment: Cyclical Comparison

Index = 100 at business-cycle peak

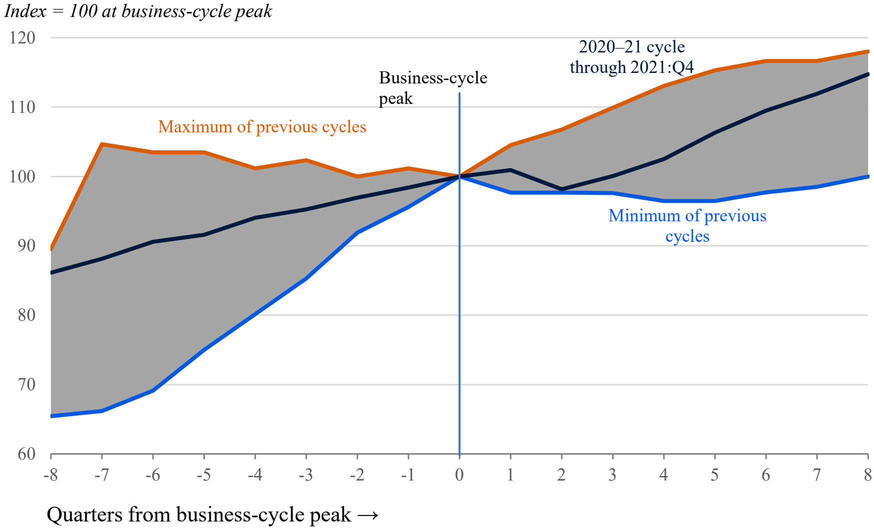


Source: BEA, NIPA table 1.1.6.

Investment in Equipment

In contrast to structures investment, investment in equipment (which made up 5.8 percent of GDP in 2019) grew at a 3.0 percent annual rate during the eight quarters through 2021:Q4, which was as fast as during any preceding business cycle (figure 2-14). During these two years, double-digit growth

Figure 2-15. Intellectual Property Investment: Cyclical Comparison



Source: BEA, NIPA table 1.1.6.

occurred in information-processing equipment, while industrial equipment investment grew at a 7.7 percent annual rate. In contrast, investment in transportation equipment fell sharply, likely due to the chip shortage that plagued motor vehicle manufacturing during 2021.

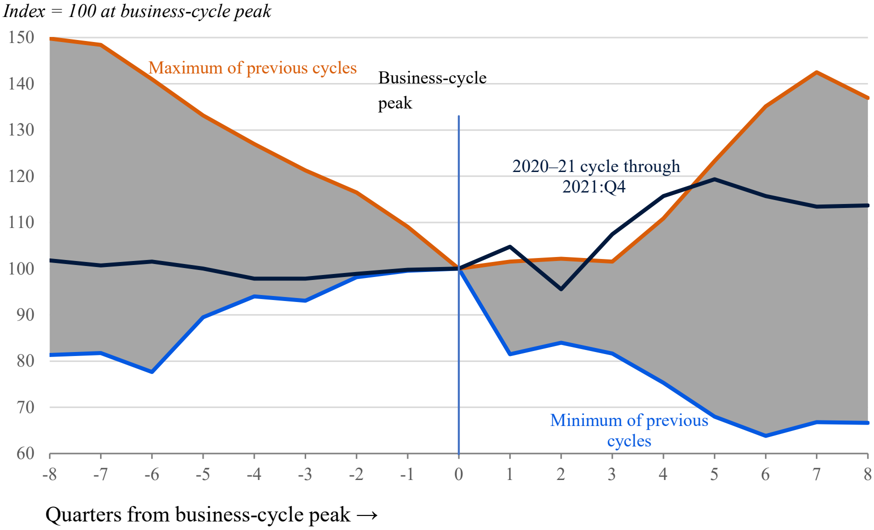
Intellectual Property

Investment in intellectual property, which made up 6.3 percent of GDP in 2019, grew 7.1 percent from 2019:Q4 to 2021:Q4, in the top half of the range experienced during the preceding cycles (figure 2-15). The subsectors of intellectual property diverged substantially: software investment skyrocketed, at a 10.2 percent annual rate; research and development rose at a 5.4 percent rate; and the category "entertainment, literary, and artistic originals" recovered from its early losses, and edged up slightly.

Residential Investment

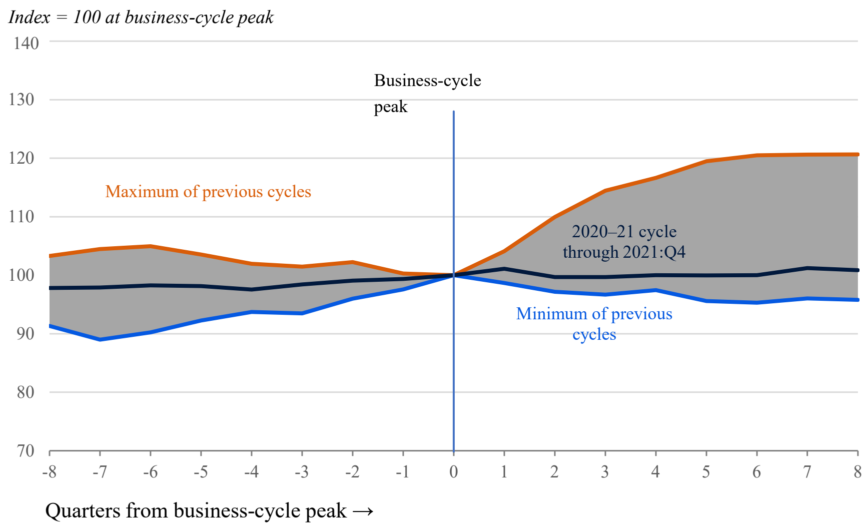
Residential investment, which made up 3.8 percent of GDP in 2019, grew at a 6.7 percent annual rate from 2019:Q4 to 2021:Q4, which places it in the top half of the historical record of this volatile sector (figure 2-16). Growth was strong during the four quarters of 2020 (15.9 percent), but starts and construction of single-family and multifamily homes appear to have been restrained by supply constraints in 2021, which limited the pace of growth in those construction components to more moderate gains. Manufactured homes grew in both years, while dormitory construction fell sharply in both years.

Figure 2-16. Residential Investment: Cyclical Comparison



Source: BEA, NIPA table 1.1.6.

Figure 2-17. State and Local Purchases: Cyclical Comparison



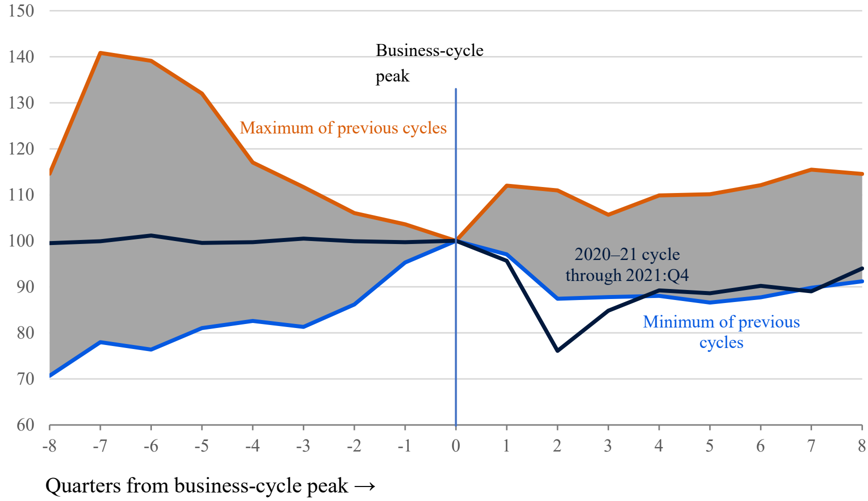
Source: BEA, NIPA table 1.1.6.

State and Local Purchases

State and local purchases (in real dollars) increased only slightly (0.4 percent, at an annual rate) from 2019:Q4 to 2021:Q4 (figure 2-17), about 3 percentage points per year less than the average historical recovery experience

Figure 2-18. Exports: Cyclical Comparison

Index = 100 at business-cycle peak



Source: BEA, NIPA table 1.1.6.

but only a bit less than during the preceding eight quarters through 2019:Q4. Because tax collections increased faster than nominal GDP and because of Federal grants-in-aid authorized during the pandemic-era spending programs listed in table 2-1, the increase in overall State and local receipts exceeded the increase in spending (including not only purchases, but also transfers and subsidies). As a result, the overall State and local fiscal position was positive (with net lending at $3.1 billion) in 2020 and likely will be positive again in 2021 (based on the first three quarters).[23] These would be the first positive annual fiscal positions for the State and local sector since 1946. These positive fiscal positions are consistent with the suggestion that some of the ARP funds were not yet fully dispersed as of 2021:Q3.

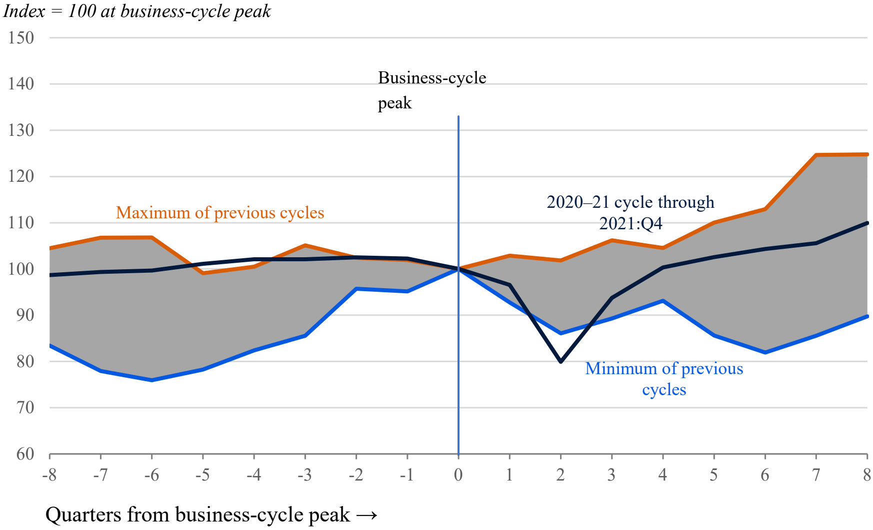
Exports and Imports

Exports have fallen at a 3 percent annual rate during the eight pandemic quarters, which places them at the lower end of the post–World War II business-cycle experience (figure 2-18). As discussed in chapter 3 of this *Report*, U.S. exports faced weak demand from abroad due to the severity of the economic effects of the pandemic and slower recovery in major U.S. trading partners as well as surging domestic demand for exportable goods.

Imports grew solidly in the upper half of the business-cycle record measured relative to the average business-cycle experience or the median

[23] At the time of this chapter's finalization, NIPA data on State and local revenues went through 2021:Q3.

Figure 2-19. Imports: Cyclical Comparison



Source: BEA, NIPA table 1.1.6.

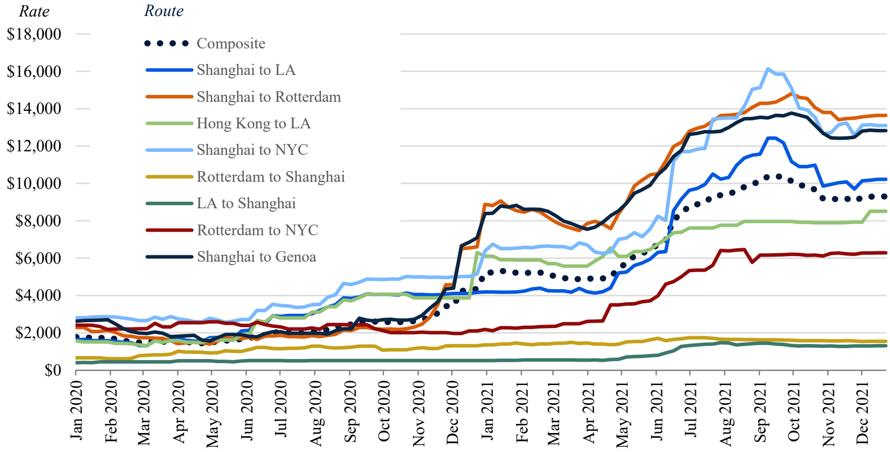
one (figure 2-19). The recovery in output was driven by an exceptionally strong domestic demand for goods; in some sectors, imports contributed to meeting that demand when supply constraints meant that domestic production could not. Because faster domestic growth pulls in more imports, the strength of imports relative to exports reflected faster growth in the United States compared with our trading partners. It also meant that the net exports were increasingly negative and subtracted from real GDP growth.

Global Supply Chain Disruptions

The COVID-19 pandemic threw global supply chains into disarray. Many of the problems that surfaced had their roots in growing U.S. reliance on products assembled globally and transported, as discussed in chapter 6 on supply chains. Delays for ships waiting to offload at the Port of Los Angeles lengthened though the second half of 2021. Shipping costs increased substantially in the supply chain, from trucking to air cargo, as shown in figures 2-20, 2-21, and 2-22. Supply chain bottlenecks were evident for motor vehicles, because a shortage of computer chips kept automakers from increasing production to meet demand.

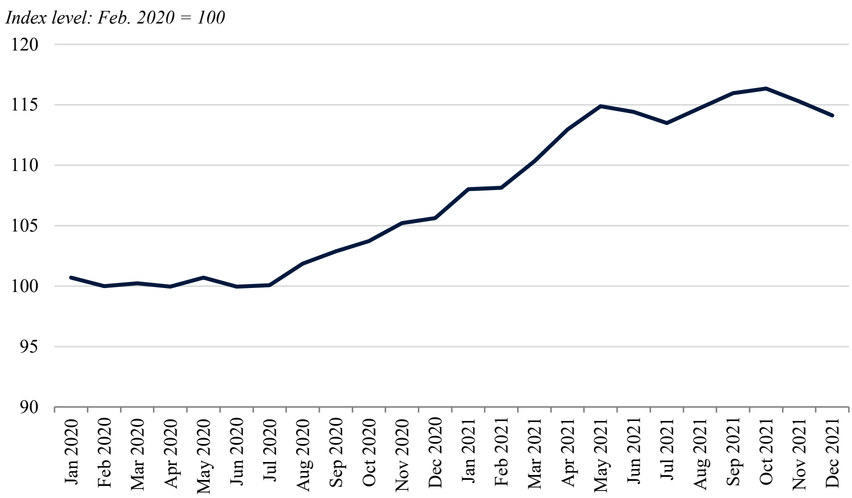
Data also suggest that shortages of other inputs held back business activity in other sectors in 2021. For example, homebuilders surveyed by the National Association of Homebuilders reported shortages of key materials

Figure 2-20. Forty-Foot Container Shipping Benchmark Rates by Route, 2020–21



Source: Data from Bloomberg.
Note: "Rate" refers to the benchmark rate for freight for a given shipping lane for a forty-foot container.

Figure 2-21. Cass Trucking Index

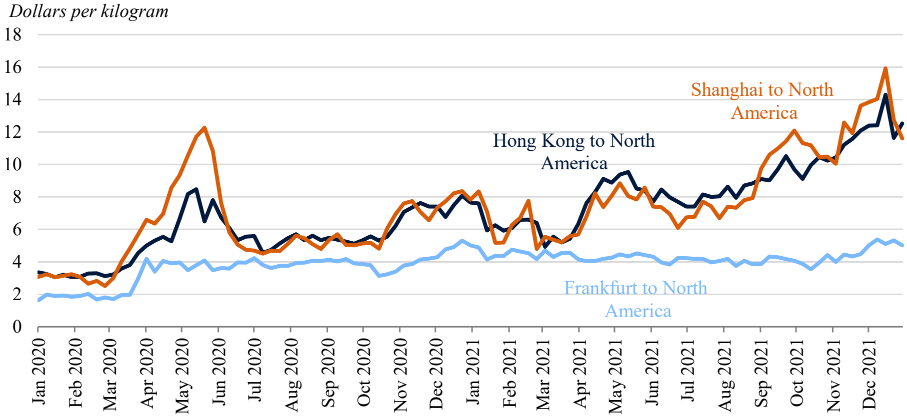


Source: Data from Bloomberg.

such as framing lumber, wallboard, and roofing.[24] Homebuilders responded to these shortages in part by delaying new construction, which was reflected in the slowdown of permanent-site residential investment to 4.0 percent during the four quarters of 2021 from its 16.0 percent increase in 2020.

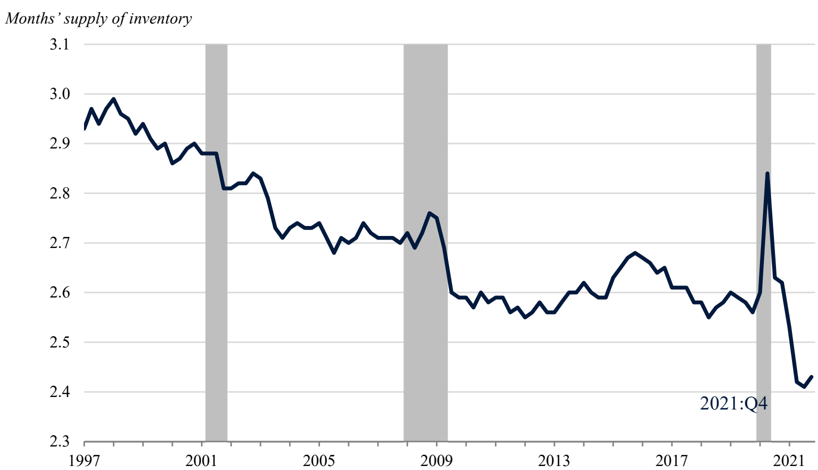
[24] NAHB (2021).

Figure 2-22. Air Cargo Rates by Route



Source: Data from Bloomberg.

Figure 2-23. Inventory-to-Sales Ratio (Private Inventories to Final Sales), 1997–21



Sources: Bureau of Economic Analysis (NIPA table 5.8.6); National Bureau of Economic Research.

Inventory Investment

These supply chain problems, together with increasing consumer demand for goods, led to declines in the stock of inventories during the first three quarters of 2021, before a partial rebuilding in the fourth quarter. The stock of inventories began 2021 at a low level, as stocks had been liquidated at a rapid rate during the first two quarters of the pandemic in 2020. With the rebound in real final sales, the inventory-to-sales ratio (real inventories to real final sales) fell from the 2019:Q4 ratio of 2.56 to 2.41 months' supply at the end of 2021:Q3, and the lowest on record, as shown in figure 2-23. Rebuilding these inventories beginning in 2021:Q4—and shifting from negative inventory investment in 2021:Q3—contributed 4.9 percentage points to the annual rate of real GDP growth in 2021:Q4. The accumulation of inventories in 2021:Q4 rebuilt roughly one-third of stocks that were drawn down during the preceding seven pandemic quarters.

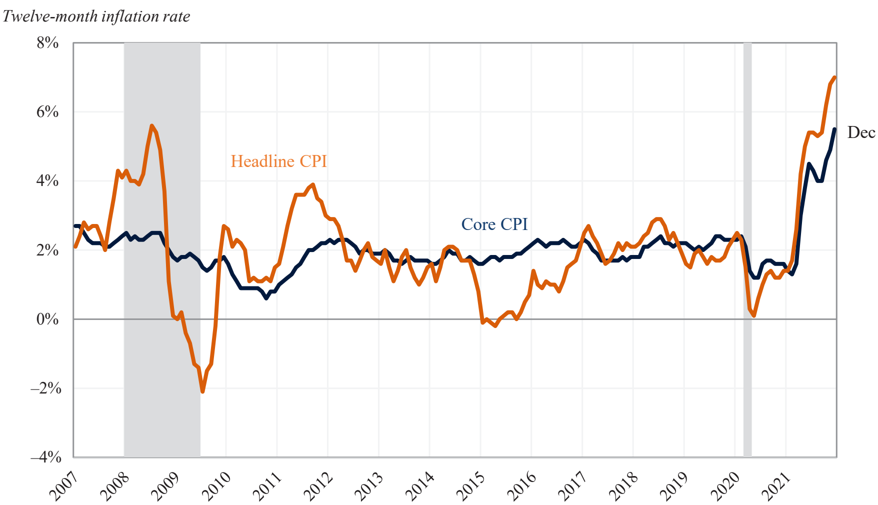
Consumer Price Inflation

The concentrated demand for goods and the limited supply of these goods, along with supply chain delays, elevated consumer price inflation. Headline inflation—according to the Consumer Price Index (CPI)—rose to 7.0 percent during the 12 months of 2021, up from the prepandemic rate of 2.3 percent during the 12 months of 2019 (figure 2-24). Some of the increase in inflation occurred in the volatile food and energy components; excluding food and energy, however, the core CPI also rose substantially during 2021, to 5.5 percent, from its prepandemic rate of 2.3 percent.

Within core inflation, most of the increase—since the pandemic began—has been in core goods, where inflation increased to 10.7 percent during the 12 months of 2021 from its 2019 prepandemic pace of 0.1 percent (figure 2-25). In contrast, core services increased only to 3.7 percent during the 12 months of 2021, up from a 3.0 percent rate.

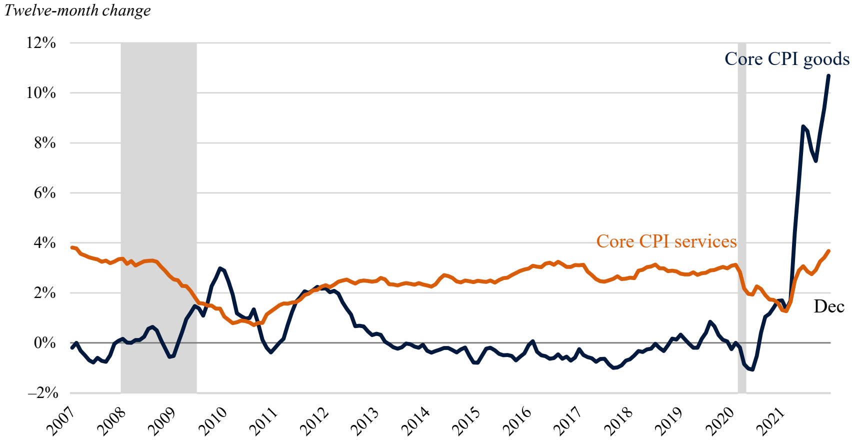
Supply chain disruptions also had a material impact on consumer goods prices, notably in the motor vehicles sector. Prices of motor vehicles (new, used, leased, and rental) increased 21 percent during the 12 months of 2021, and this increase accounted for 36 percent of 5.5 percent core

Figure 2-24. Consumer Price Index (CPI) Inflation, 2007–21



Sources: Bureau of Labor Statistics; National Bureau of Economic Research.

Figure 2-25. Components of Core CPI Inflation, Commodities versus Services, 2007–21



Sources: Bureau of Labor Statistics; CEA calculations.
Note: CPI = Consumer Price Index.

CPI inflation in 2021, and also for 40 percent of its year-to-year increase. That the rise in inflation was concentrated in goods suggests that the goods economy was operating close to its potential output in 2021.

Inflation Expectations

Expectations about future inflation are important in macroeconomic theory because they potentially create "self-fulfilling" outcomes; that is, when households and firms believe inflation will be high in the *future*, they may either ask for higher wages or raise their prices *today*.

Inflation expectations increased during 2021, but the magnitude of the increase differed according to whose expectations were being followed and the horizon over which expectations were surveyed. The increase in short-term inflation expectations was substantial for consumers (2.2 percentage points, to 4.8 percent, measured at the median, see row 1 of table 2-5), but more moderate (0.6 percentage point) for professional forecasters (row 2). To understand how inflation expectations for consumers and professional forecasters are moving after the first year, the first year's effect must be extracted from the longer-term average expectation. Measured this way, the increase in implicit long-term inflation expectations was relatively small in 2021, whether measured among consumers (row 5), professional forecasters (row 6), or agents in the market for Treasury Inflation Projected Securities (row 7). The relatively small increase in long-term inflation expectations—even for consumers—is roughly consistent with the idea that agents viewed the near-term increase in inflation as not permanent. The end-of-2021 expectations for CPI inflation were only slightly above what would be consistent

Table 2-5. Consumer Price Index Inflation Expectations

	Expectation	Term	Date of Survey: 2019 Avg.	Date of Survey: Nov.–Dec. 2021	Increase
	Short term (1-year ahead)				
1	Consumers (median)	1 year	2.6	4.8	2.2
2	SPF	1 year	2.0	2.6	0.6
	Long term (5–10 years, including year 1)				
3	Consumers (median)	Next 5 to 10 years	2.4	3.1	0.7
4	SPF	Next 10 years	2.2	2.6	0.4
	Long term (4–9 years) excluding year 1				
5	Consumers[a]	4–9 years after year 1	2.4	2.8	0.4
6	SPF[b]	9 years after year 1	2.2	2.5	0.3
7	TIPS 5/5	5 years, 5 years forward	1.8	2.4	0.6

Sources: University of Michigan Surveys of Consumers;
Philadelphia Federal Reserve Bank; Survey of Professional Forecasters;
Treasury Inflation-Protected Securities (TIPS) are from Haver Analytics.
[a]Calculated from rows 1 and 3.
[b]Calculated from rows 2 and 4; SPF = Survey of Professional Forecasters.

with the Federal Reserve's 2 percent target for a similar price index (the Price Index for Personal Consumption Expenditures), which generally is below CPI inflation by 0.3 percentage point a year.

The Labor Market

The labor market story in 2021 was complex and, at times, seemingly contradictory. There were both historic successes and continuing challenges. Some of the data suggest extraordinary tightness in the labor market, while others indicate considerable remaining slack.

The U.S. economy added more than 6 million jobs on net over 2021; yet the labor force still remained several million below the precrisis trend. The labor force participation rate (LFPR) for prime-age (25–54 years) workers rose at its fastest December-to-December pace since 1979, but the LFPR for workers 55 and older was little changed (though the reported 55+ LFPR rate increased in January 2022, due to statistical adjustments by the Bureau of Labor Statistics, BLS). Some metrics signaled that the labor market was tighter in 2021 than before the pandemic, such as high rates of job openings, quits, and wage growth. Other metrics were murkier: the unemployment rate fell markedly in 2021 but was still somewhat elevated relative to pre-pandemic levels, and the rate of prime-age employment and the LFPR were still lower than in February 2020, though they were rising briskly by the end of 2021.

With the exception of some prior structural trends that continued throughout the year—most notably, the aging of the U.S. population—COVID-19 was the dominant driver in the labor market. Whether in the form of worker concern, weak demand for certain services, school closures, workers absent or out of the labor force due to illness, long COVID, or other mechanisms such as limited child care options, this virus was ultimately responsible for the bulk of the labor force weakness starting in February 2020.

Ways in Which the Labor Market Appeared Tight in 2021

To illustrate how bifurcated the labor market was in 2021, imagine a simple (and more than a little far-fetched) thought experiment. Suppose a labor economist were frozen in 2019, thawed out in early 2022, and then immediately asked to assess the state of the labor market based solely on a handful of economic charts laid out before her. No doubt, after catching up with the events of the intervening years, she would be shocked at the magnitude of the declines that happened in early 2020. But as she then focused on the state of the economy in late 2021 and early 2022, what might she conclude? At the very least, she would notice several measures suggesting a very tight labor market—that is, one where labor demand was high relative to labor supply.

Job openings and quits. Two such metrics come from the Job Openings and Labor Turnover Survey (JOLTS): job openings and quits. In December 2021, there were 11.4 million open vacancies in the United States, the highest in the history of the data going back to late 2000, and about 50 percent more than the prepandemic record of 7.6 million openings set in November 2018.[25]

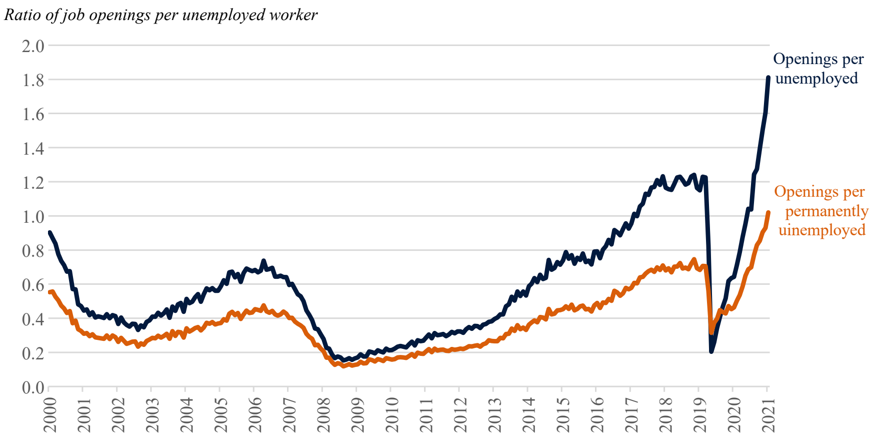
Economists generally think of job openings as a measure of unmet labor demand from firms; higher openings often suggest higher demand among employers, although equilibrium job openings can shift over time due to a number of different factors, such as the marginal cost of posting a vacancy and changes in workers' bargaining power.[26]

Even relative to the number of workers actively searching for a job, vacancies were elevated. On average, in December 2021, there were 1.81 job openings per unemployed person, the highest in the history of the JOLTS data and about 48 percent higher than just before the pandemic, in February 2020 (figure 2-26). A more permanent concept of unemployment can be seen by stripping out temporarily furloughed workers from the denominator—in

[25] BLS (2022).

[26] On the latter, see, e.g., Figura and Ratner (2015).

Figure 2-26. Job Openings per Unemployed Worker, 2000–2021



Sources: BLS; CEA calculations.
Note: The permanently unemployed are defined as the unemployed less the temporarily unemployed plus nonparticipants who want a job.

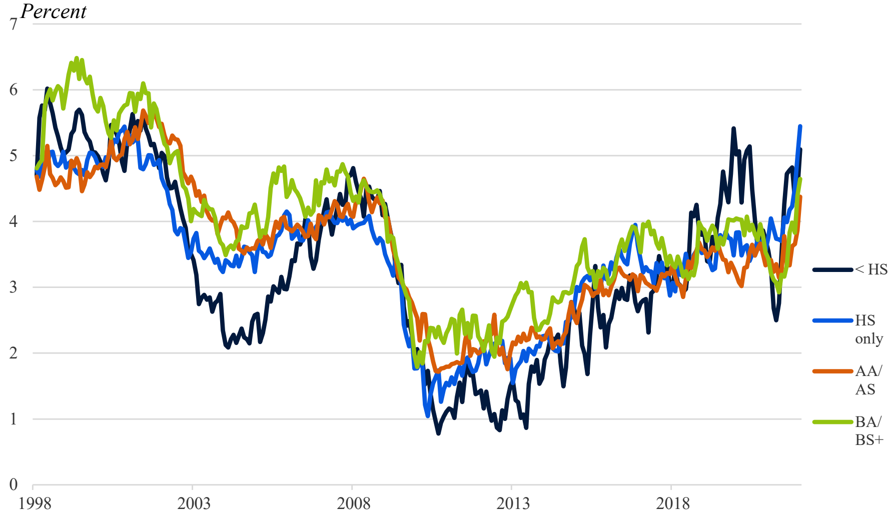
principle, a company is not supposed to count a furloughed worker's job as a job opening in JOLTS—and by adding workers who are out of the labor force but saying they want a job. This shifts the ratio to 1.02 openings per permanent unemployed worker, still a record, and 45 percent above where it was in February 2020.

In December 2021, the number of voluntary quits stood at 4.4 million, about 3 percent of employment and second only to November 2021 as the highest since JOLTS data began to be gathered in late 2000. Economists generally view a voluntary quit as a sign of labor market confidence, given other Census data suggest that people who voluntarily quit their jobs typically do so with another job already lined up, or are confident they can find another one quickly.[27]

Wages. An increase in nominal wage growth can be a sign that labor demand is outpacing labor supply. Several different wage measures accelerated in 2021. Average hourly earnings, a measure of the average wage of all nonfarm payroll workers in the private sector, rose by 4.9 percent over the 12 months ending in December 2021, in nominal terms (i.e., without adjusting for inflation).[28] That is the largest nominal wage growth in any December-to-December period since data on all private sector workers began being collected in 2006. Excluding managers and just looking at production and nonsupervisory workers—who constitute about 80 percent of all workers, and whose wage data stretch back to 1964—wages grew by 6.2 percent over

[27] For analyses of direct job-to-job transitions, see U.S. Bureau of the Census (2022b); and Fujita, Moscarini, and Postel-Vinay (2021).
[28] BLS (2022).

Figure 2-27. Median Hourly Wage Growth by Level of Education, 1998–21



Sources: CPS; CEA calculations.
Note: Values are Kalman smoothed monthly values. HS = high school; AA/AS = associate degrees; BA/BS = bachelor's degrees.

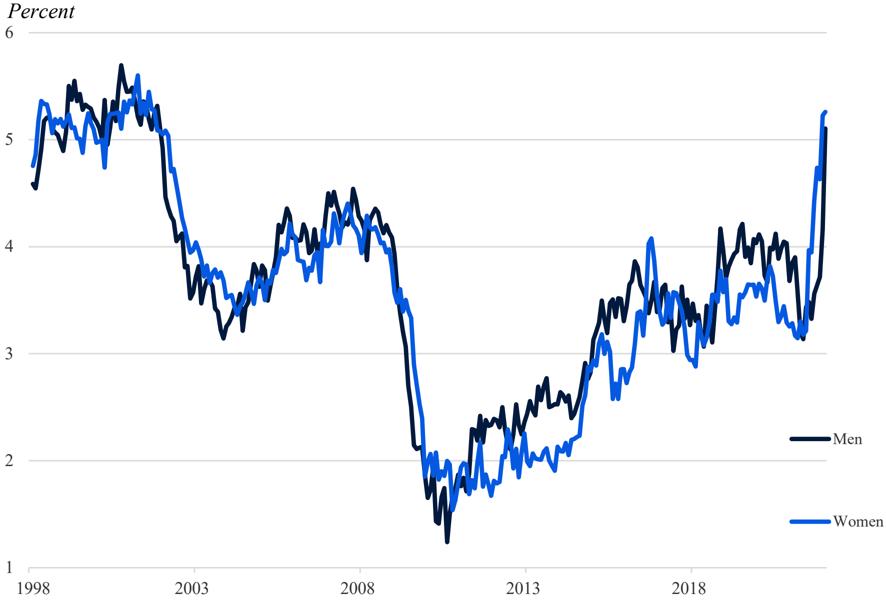
the same 12 months.[29] Before the pandemic, one needs to look all the way back to 1981 to find a single year when wage growth was so high. These and other data suggest that the pandemic has driven particularly strong wage growth for lower-wage workers, given that production and nonsupervisory workers typically earn less than managers. As explained below, however, overall nominal wage growth has not kept up with inflation.

There are three concerns when examining growth in average nominal wages: composition effects, distributional differences, and inflation. Composition effects arise in average wage measures when shifts in who has a job skew the average wage. For example, in the immediate wake of the pandemic—the sharpest macroeconomic contraction in almost a century—average hourly earnings *increased*. But this increase was not a signal of labor market tightness or economic health. It occurred because pandemic-related layoffs disproportionately hit lower-wage workers. As a result, the remaining workforce was distorted toward higher-wage workers, so the resulting average wage rose mechanically.

The Employment Cost Index (ECI), which is released by the BLS, controls for many such compositional effects.[30] It shows that nominal private sector wages rose 5 percent from December 2020 to December 2021, a bit higher than implied by average hourly earnings in that same period. This represents the largest nominal ECI growth since 1984.

[29] BLS (2022).
[30] The ECI measures changes in hourly compensation, fixing the industry and occupational composition of its sample to a base period to keep compositional shifts from affecting its results.

Figure 2-28. Median Hourly Wage Growth by Sex, 1998–21



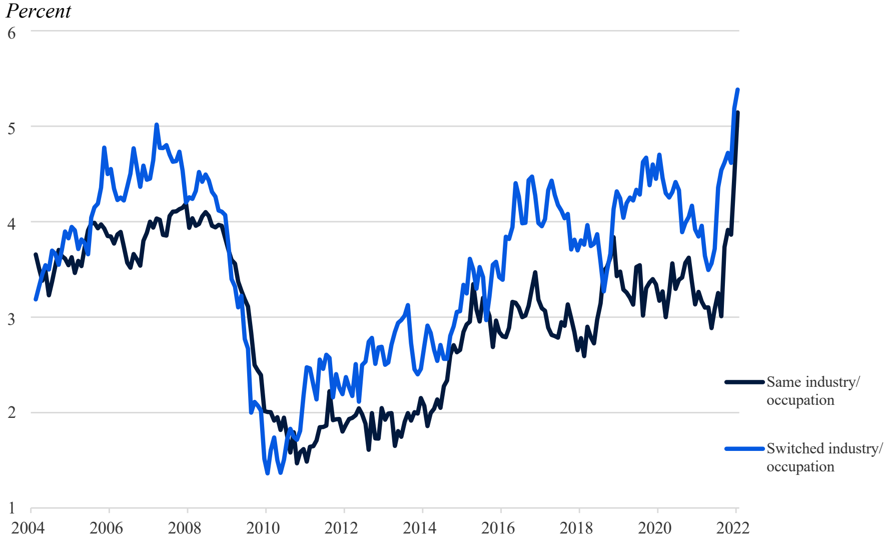
Sources: CPS; CEA calculations.
Note: Values are Kalman smoothed monthly values.

Average wages can also hide important distributional differences by, for example, education, race, and age. The average hourly earnings and ECI data do not provide demographic breakdowns, but the Current Population Survey (CPS) provides monthly data that can shed some light on how different groups saw their wages evolve.

The CPS suggests that year-on-year wage growth was not even across different groups during the pandemic, and that some groups that are typically on the margins of the labor force saw stronger wage growth. Notably, low-wage workers experienced some of the fastest median wage growth during the pandemic (figure 2-32), and wage growth was been faster among workers with only a high school education or less than it was for those with college degrees (figure 2-27).[31] Women saw faster growth during the pandemic than men, especially later on in 2021 (figure 2-28). Young workers under age 25 typically saw stronger wage growth than older workers; this

[31] The median wage growth is calculated in the CPS by comparing the same workers employed 12 months apart and noting the 50th-percentile change in hourly wages over the year for each worker. This method partially controls for compositional effects, since it is calculated from ~~of~~ identical workers 12 months apart. Because the sample of workers in the CPS changes each month, however, it is not a traditional panel of workers, which would better control for compositional effects over time.

Figure 2-29. Median Hourly Wage Growth for Workers Who Switch Industry/Occupation, 2004–21



Sources: CPS; CEA calculations.
Note: Values are Kalman smoothed monthly values.

was true even before the pandemic, due, in part, to the mechanical percentage effect of lower starting wages (figure 2-30). But during the pandemic, youth wage growth further widened its lead over other age groups. Finally, wage growth has accelerated across different race and ethnicities in recent months (figure 2-31).

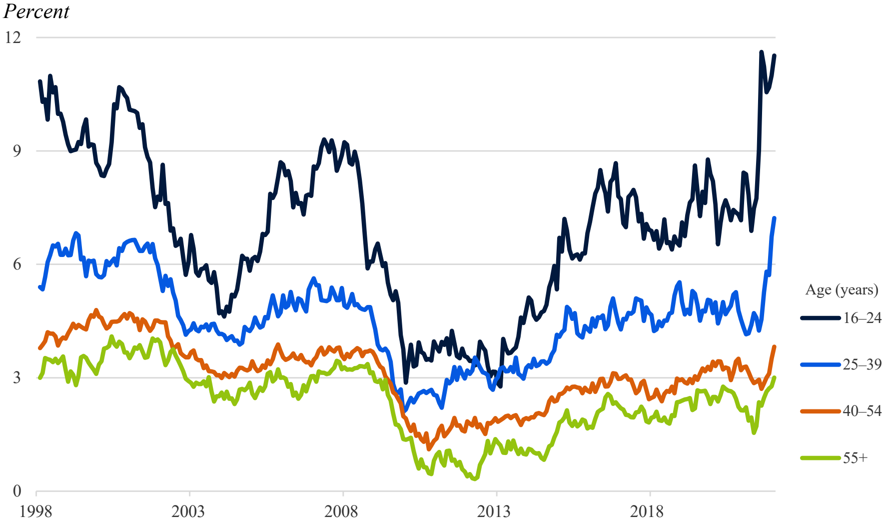
There is also some evidence that labor market churn—workers leaving and entering jobs—was associated with stronger wage growth. While it is not possible in the CPS data to fully identify workers who voluntarily quit their jobs, it is feasible to look at workers who stayed employed but switched industries or occupations—which captures many voluntary quits as well as some workers who nonvoluntarily left their jobs and found new ones in different lines of work (figure 2-29).

Adjusting for inflation is the final factor to consider. While nominal hourly wage growth increased in 2021, so did inflation. Real (inflation-adjusted) average hourly earnings continued growing earlier in the pandemic but fell on a year-on-year basis in the aggregate toward the end of 2021.[32]

There are two important other trends of note. First, in some specific industries, like leisure and hospitality, nominal wage growth outpaced overall consumer inflation. The second is that even though average hourly wage growth fell short of inflation in 2021, average real income growth per

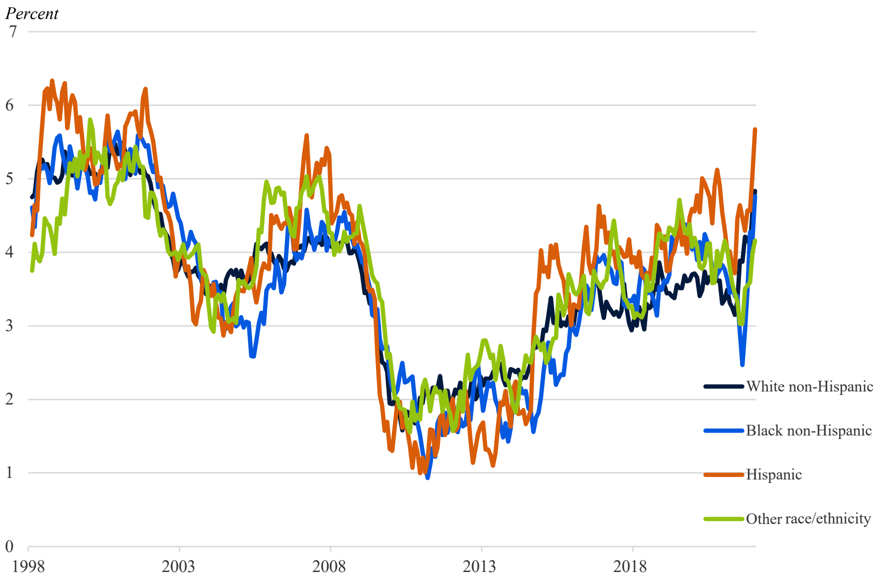
[32] BLS (2022).

Figure 2-30. Median Hourly Wage Growth by Age, 1998–21



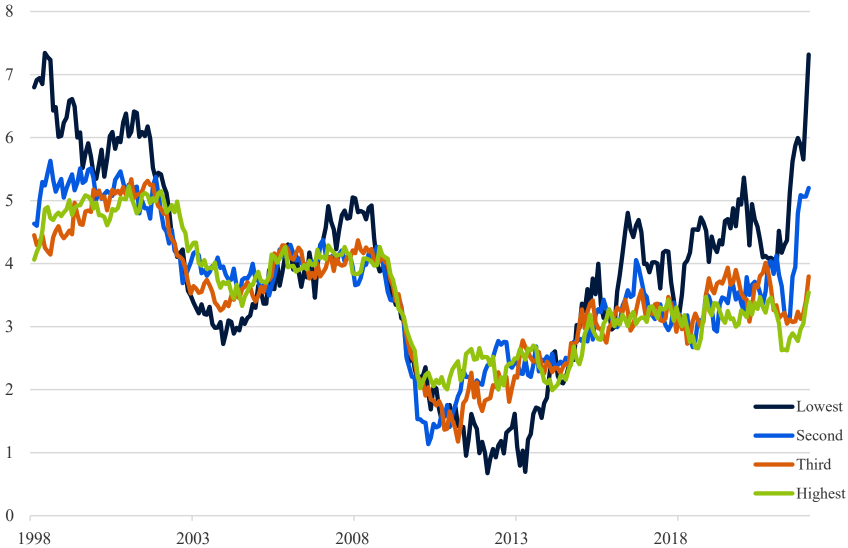
Sources: CPS; CEA calculations.
Note: Values are Kalman smoothed monthly values.

Figure 2-31. Median Hourly Wage Growth by Race/Ethnicity, 1998–21



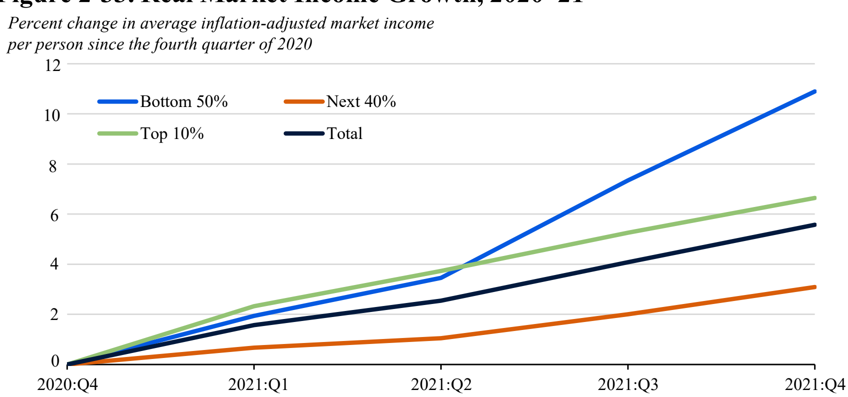
Sources: CPS; CEA calculations.
Note: Values are Kalman smoothed monthly values.

Figure 2-32. Median Hourly Wage Growth by Wage Quantile, 1998–21



Sources: CPS; CEA calculations.
Note: Values are Kalman smoothed monthly values.

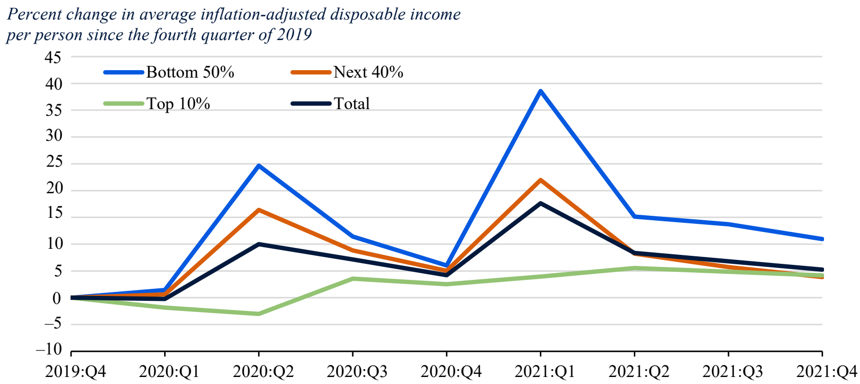
Figure 2-33. Real Market Income Growth, 2020–21



Source: Preliminary estimates by Blanchet, Saez, and Zucman (2022), via realtimeinequality.org.

adult across all sources was still often positive for the year. Preliminary data from a recent analysis by Blanchet, Saez, and Zucman (2022) suggest that average real market incomes—incomes from labor and capital before the effects of taxes and government benefits—rose by 5.6 percent during 2021 overall, and by almost 11 percent for the bottom half of households (figure 2-33). Real disposable income—which includes the effects of taxes and government benefits, including the recent fiscal response—was 5 percent

Figure 2-34. Real Disposable Income Growth, 2019–21



Source: Preliminary estimates by Blanchet, Saez, and Zucman (2022), via realtimeinequality.org.

above prepandemic levels at the end of 2021, and 11 percent above for the bottom half of adults (figure 2-34).

Ways in Which the Labor Market Appeared Loose in 2021

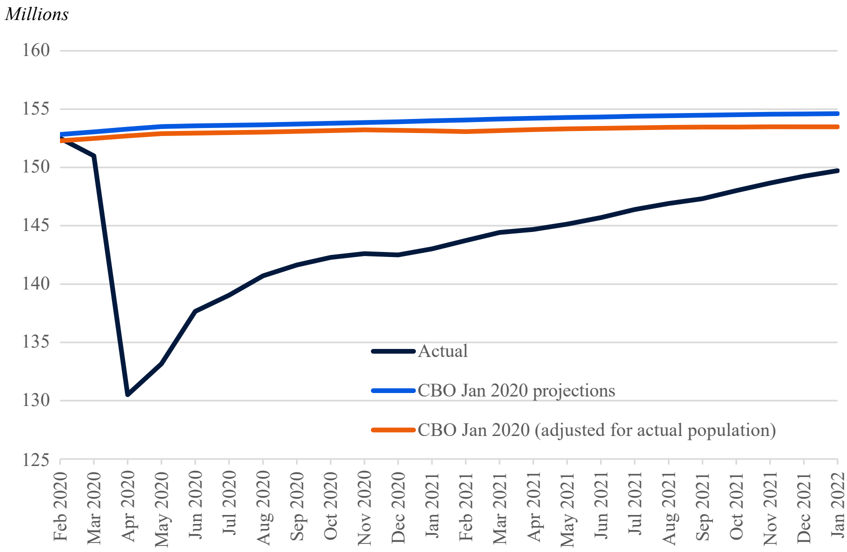
Our unfrozen economist would see much to suggest a tight labor market in 2021. But she would also quickly see several important measures suggesting a meaningful amount of room for further growth.

Employment. First, while the economy added 6.7 million jobs between December 2020 and December 2021, employment was still 3.3 million below its prepandemic level (figure 2-35). It is even further away when measured against the prepandemic trend, which tries to estimate the pace of job growth that would have prevailed without the pandemic. In its final prepandemic economic projections from January 2020, the Congressional Budget Office (CBO) assumed that payroll employment would grow at an average pace of about 97,000 a month during 2020 and 2021;[33] this implies that employment remained about 5.4 million below the trend at the end of 2021. Even if one adjusts the CBO's prepandemic projections for the mortality and lower immigration rates seen during the pandemic, its adjusted January 2020 path grows by 53,000 a month, suggesting that current employment is about 4.5 million below the estimated trend.

The pain of the pandemic did not spread evenly across industries (figure 2-36). The leisure and hospitality subsector, for example, lost nearly half its jobs between February and April 2020; in December 2021, its employment was 11 percent lower than before the pandemic. However, information, professional and business services, and transportation and warehousing had fully recovered beyond their prepandemic employment levels by the end of 2021.

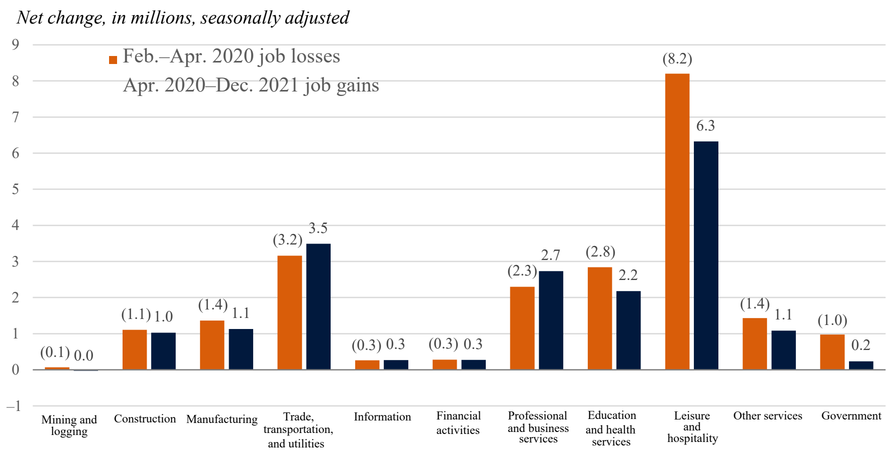
[33] CBO (2020).

Figure 2-35. Payroll Employment, 2020–22



Sources: BLS; CBO.

Figure 2-36. Employment Changes by Industry Sector, 2020 and 2021

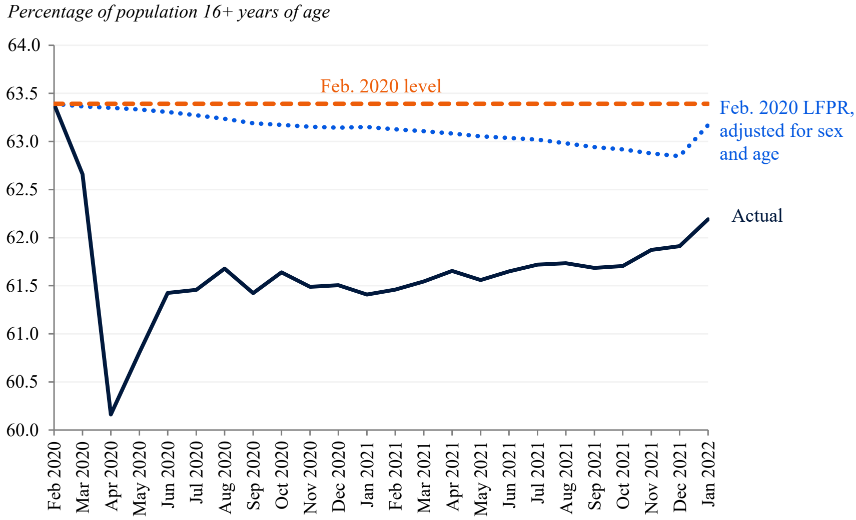


Sources: Bureau of Labor Statistics; CEA calculations.
Note: Parentheses denote negative values.

Labor Supply and Labor Force Participation

When the U.S. economy "shut down" due to the COVID-19 pandemic in early 2020, not only did employment fall sharply and unemployment rise quickly, but the Nation's labor force—the number of people either working or looking for work—also declined sharply. As figure 2-37 reveals, the labor

Figure 2-37. The Labor Force Participation Rate, 2020–22



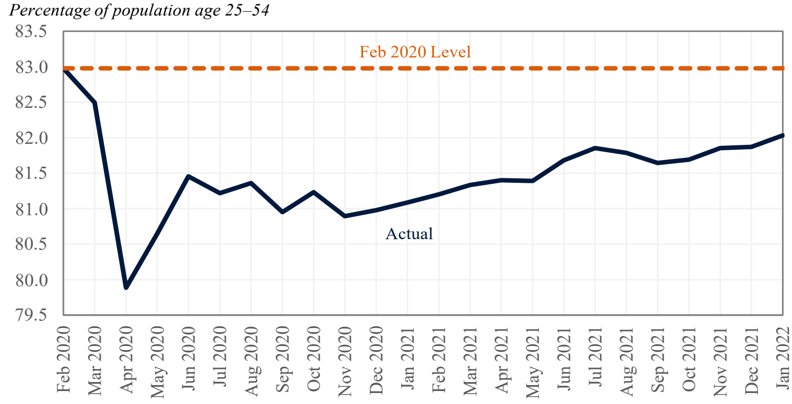
Sources: BLS; CEA calculations.
Note: LFPR = labor force participation rate.

force as a share of the population age 16 and older—called the labor force participation rate or LFPR, as mentioned above—fell by an unprecedented 3.2 percentage points in just two months. Since then, the LFPR has partially recovered, and it rose by 0.4 percentage point over the course of 2021 alone. In January 2022, the LFPR rose an additional 0.3 percentage point due to new population controls from the BLS, noted earlier in this chapter. Still, as of January 2022, it remains 1.1 percentage points below prepandemic levels.[34]

It is important to note that even before the pandemic, the aging U.S. labor force was putting downward pressure on the LFPR. Because people of different ages have different degrees of attachment to the job market, the age structure of the population is one determinant of the LFPR. In the years running up to the pandemic, the aging of the large baby boom cohort into retirement was cumulatively reducing the LFPR by about 25–30 basis points (i.e., hundredths of a percentage point) each year.[35] Many other determinants were (and still are) also in play, including the strength of labor demand, immigration trends, education levels (more highly educated persons tend to have higher LFPRs), persistent labor market barriers to entry, inadequate care options, and racial and gender discrimination.

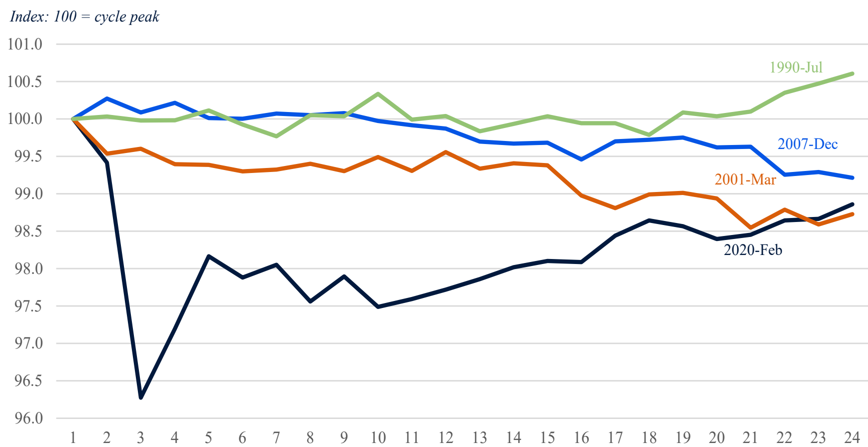
[34] Data in this section run through January 2022 rather than December 2021 due to the magnitude of the adjustment from the Census Bureau's 2022 population controls.
[35] From CEA calculations.

Figure 2-38. U.S. Prime-Age (25–54) LFPR, 2020–22



Sources: BLS; CEA calculations.
Note: LFPR = labor force participation rate.

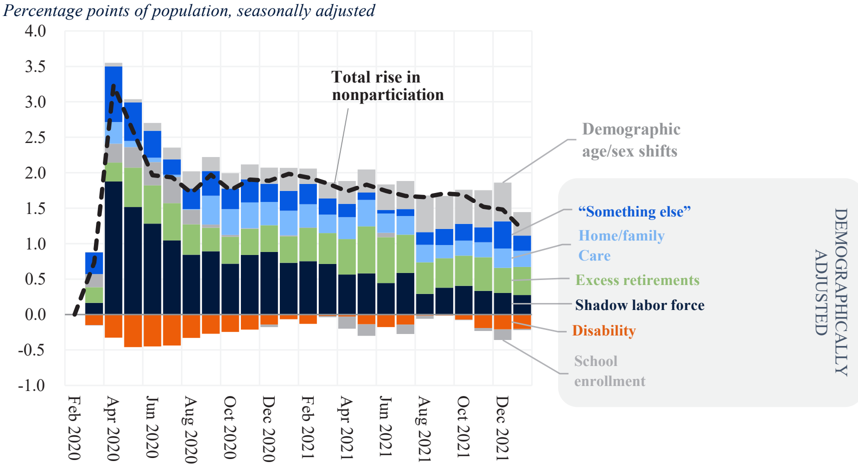
Figure 2-39. Prime-Age LFPRs during Past Recessions and Recoveries



Source: Data from Haver Analytics.
Note: The date denotes a month out from the monthly business-cycle peak (index level = 100).

But because of the exit of a large number of older workers (who are not replaced by the same number of younger workers), it is unlikely that the overall LFPR will revert back to its prepandemic peak (63.4 percent) in the near future, even as temporary factors abate. (See the blue dotted line showing adjustment for sex and age line in figure 2-37.) To put this in perspective, if every age group returned to its February 2020 rate of participation, the overall LFPR would have been 62.9 percent in December 2021 rather than the 63.4 percent prepandemic rate, due to the older profile of the American population today.

Figure 2-40. Change in U.S. Rate of Nonparticipation in the Labor Force, February 2020 – January 2022, by Reason for Nonparticipation



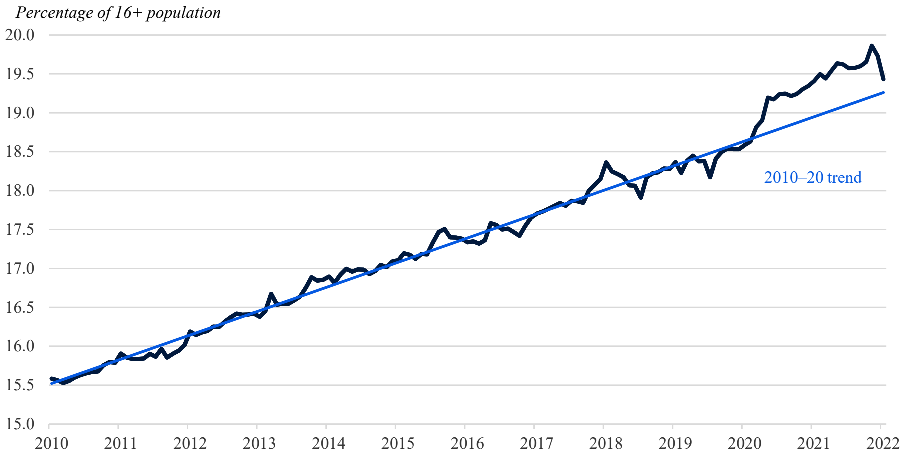
Sources: CPS; CEA calculations.

A different way to adjust for aging is to omit both seniors and the young and to look solely at prime-age participation. As figure 2-38 shows, the prime-age LFPR gradually rose throughout 2021; at the same point in the last two cycles, the prime-age LFPR was still falling (figure 2-39).

There is no single overriding factor explaining the change in the LFPR between February 2020 and early 2022; rather, a variety of explanations are at play. In January 2022, there were 3.2 million fewer workers in the labor force relative to the size of the labor force if the LFPR had remained at its prepandemic level. The information provided by respondents to the CPS can be used to break down why these 3.2 million workers said they were not looking for work (figure 2-40):

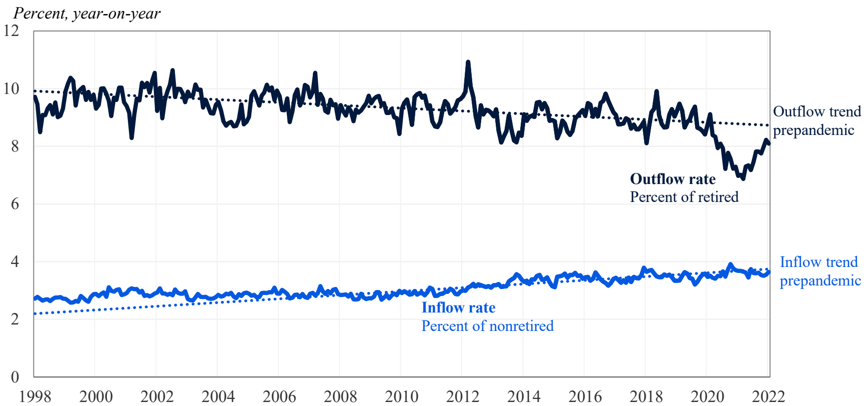
- *Aging of the population:* 880,000, explains 28 percent of the actual LFPR decline (none of the adjusted decline). As noted above, the aging of the population and retirement of the baby boomers is an ongoing force putting downward pressure on the LFPR (see, e.g., Cooper et al. 2021). Other population shifts have occurred during the pandemic, including lower immigration and higher mortality due to COVID-19. If the age profile of the U.S. population looked as it did in February 2020, in January 2022 the LFPR would have been about 35 basis points higher. Most of the persons accounted for in this category take the form of permanent retirements, though it is possible that a small portion may eventually reenter the labor force.
- *"Excess" retirements:* 1.0 million, explains 33 percent of the actual LFPR decline (46 percent of the adjusted decline). These are retirements

Figure 2-41. The Retirement Rate, 2010–22



Sources: Data from the Integrated Public Use Microdata Series and CPS; CEA calculations.
Note: Seasonally adjusted, with CEA calculations.

Figure 2-42. Retirement Flow Rates, 1998–22



Sources: Data from the Integrated Public Use Microdata Series and CPS; CEA calculations.
Note: Trends are calculated with a linear regression of flows on time trend, share of population.

beyond what one would expect, given aging (figure 2-41). The CEA finds that this increase was driven not by an increase in the likelihood of older workers entering retirement but by the diminished likelihood of leaving retirement to reenter the workforce (figure 2-42). That is, in the prepandemic course of retirement flows, an average share of about 9 percent of retirees each year left retirement status and reentered the labor force or engaged in other activities. This share declined between February 2020 and early 2021, but then began recovering. If this rise in retirement exits continues, overall retirement rates would decline.

- *People who are not in the labor force but who say they want a job:* 730,000, explains 23 percent of the actual decline (32 percent of the adjusted decline). Such workers, sometimes referred to as in the "shadow labor force," are not actively looking for a job, and thus are definitionally not unemployed. Historically, they have higher labor force reentry rates than other nonparticipants. The rise in the shadow labor force during the pandemic over 2021 was roughly even by sex but has been most acute among Hispanics.[36]
- *Family or home care:* 600,000, explains 19 percent of the actual decline (26 percent of the adjusted decline). Below, this chapter further explores the extent to which childcare and elder care responsibilities held back the labor supply of these caretakers, who are disproportionately women and mothers.
- *Enrollment and disability:* –580,000, explains –18 percent of the actual decline (–25 percent of the adjusted decline). Nonparticipation due to school enrollment and disability slightly declined after February 2020, meaning that fewer people were in school without a job or cited disability as a reason for not being in the labor force. Note that what is charted here is "disability" as measured in the CPS: whether a respondent who does not want a job believes that her disability is preventing her from looking for work. This is an entirely separate concept from participating in disability benefit programs, like Social Security Disability Insurance and Supplemental Security Income—though CPS disability is strongly correlated with participation in these programs, which has also declined during the pandemic and over the last year.[37]
- *Something else:* 560,000, explains 18 percent of the decline (25 percent of the adjusted decline). This category captures rises in nonparticipation not explicitly accounted for in CPS questions.

In summary, about 61 percent of the 1.2-percentage-point shortfall in the LFPR through January 2022 was due to either aging or excess retirements, with the remainder roughly split between the shadow labor force and workers who were out of the labor force due to family or home care obligations.

There were other factors that decreased the labor force via their effects on the population as a whole rather than on the LFPR. Such factors can exacerbate a reduced labor supply in certain industries. Two examples are COVID-19 mortality and immigration. The CEA estimates—based on the age, sex, and the state of COVID-19 deaths to date—that the labor force was about 250,000 smaller at the end of 2021 due to the direct effects of COVID-19 mortality. The population in 2021 was also smaller due to a decrease in immigration from the pre-2019 trend; this fall in immigration resulted from a combination of the pandemic along with prepandemic policies. The

[36] CEA calculations, using CPS microdata.
[37] SSA (2022).

CEA estimates that the labor force would have been about 550,000 larger in January 2022 if immigration had followed its pre-2019 trend.

The Historical Sluggishness of U.S. LFPR Recoveries

It is also worth noting that, in recent decades, the LFPR appears to have recovered more slowly than unemployment after recessions. Hobijn and Sahin (2021) highlight this pattern, decomposing the growth in the employment-to-population ratio into the part accounted for by falling unemployment and the part explained by rising LFPRs. In at least the last three business cycles, rising LFPRs lagged the falling unemployment rate, typically by many years. For example, applying this decomposition to the current period, employment-to-population ratios for prime-age workers were up 9 percentage points since jobs began recovering in May 2020. About one-fifth of this growth was due to the rising LFPR, with the rest due to the falling unemployment rate. This is actually a relatively large LFPR contribution compared with recent cycles. For example, if one investigates a comparable period after the global financial crisis and Great Recession in 2008, employment-to-population ratios barely changed, and the components due to the LFPR and the unemployment rate barely changed either.

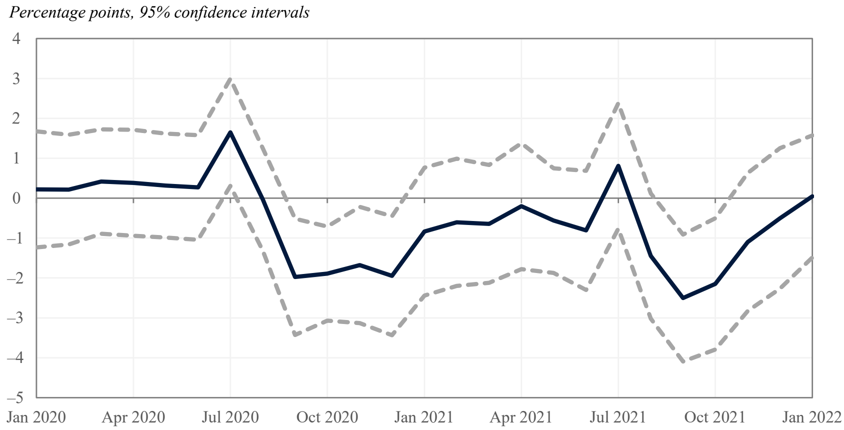
The CEA also examined the same pandemic-cycle decomposition by gender and race, finding that a rising LFPR explained 19 percent of the increased employment rate for men, and 22 percent for women. Black, Asian, and Hispanic employment rates were up 9, 10, and 12 percentage points, respectively; the rising LFPR explains 37 percent of the gain for Blacks, 30 percent for Asians, and 20 percent for Hispanics. Again, during the comparable period after the Great Recession, the LFPR had not rebounded for any subgroup during this time, and thus held back employment rates for all groups.

In one sense, this difference between the pandemic recovery and that of the Great Recession is not too surprising. The GDP and unemployment—and, to some extent, job growth—all bounced back faster in 2021 compared with slower, and initially more "jobless," recoveries after other recent downturns.

Caring for Family Members

Family members' responsibility to care for their children or elderly parents can also be a barrier to labor market entry or reentry, and the pandemic exacerbated the role of this barrier at times for some caregivers. One way to examine the potential role this of this barrier during the pandemic is to compare the labor force participation of parents and nonparents, or, because women disproportionately provide such care, between mothers and women without children. Research by the CEA and others reveals that at times

Figure 2-43. Maternal LFPR versus the Same Calendar Month in 2019



Sources: BLS; CEA calculations.
Note: LFPR = labor force participation rate. The graph shows mothers of young school-age (3–13) children versus otherwise similar women without children. The data include controls for age, sex, race/ethnicity, education, marital status, foreign-born status, State, and metro size.

during the pandemic, mothers were significantly less likely than otherwise similar women without children to be in the labor force, especially during the declines of 2020 and 2021, at the beginnings of school years. The CEA finds that relative to patterns that prevailed in 2019, the maternal LFPR was 2.1 percentage points lower than that of otherwise similar women without children in October 2021, but that this difference shrank and became insignificant in November and December 2021 (figure 2-43). There is some evidence that this reversal was due to schools and childcare centers reopening.

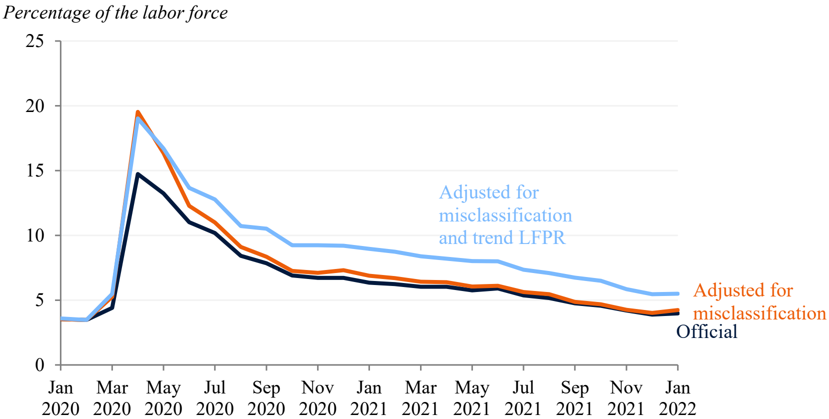
The Unemployment Rate

Just before the pandemic, the unemployment rate stood at 3.5 percent. The official rate then peaked at 14.7 percent in April 2020, before beginning a steady decline. Over the 12 months of 2021, it declined 2.8 percentage points, the largest December–December fall on record.

But the official unemployment rate is still somewhat higher than pre-pandemic levels, suggesting some amount of remaining slack in the labor market. Moreover, the decline in the LFPR over the course of the pandemic put mechanical downward pressure on the measured unemployment rate given that, holding employment constant, a lower LFPR lowers the measured unemployment rate.

The extent to which the official unemployment rate understates slack depends crucially on the assumed underlying trend participation rate. Assume for a moment, illustratively, that the LFPR recovered all the way back to the level consistent with where it was in February 2020 in age-adjusted terms. This implies that the unemployment rate would have been

Figure 2-44. The U.S. Unemployment Rate, 2020–22



Sources: BLS; CEA calculations.
Note: LFPR = labor force participation rate.

5.5 percent in January 2022 rather than 4.0 percent, with an extra 1.5 percentage points of slack in the unemployment rate space (figure 2-44). But if one assumes the other extreme—that the LFPR will not rise any further than current levels—then the official unemployment rate will not understate labor market slack, at least due to participation.

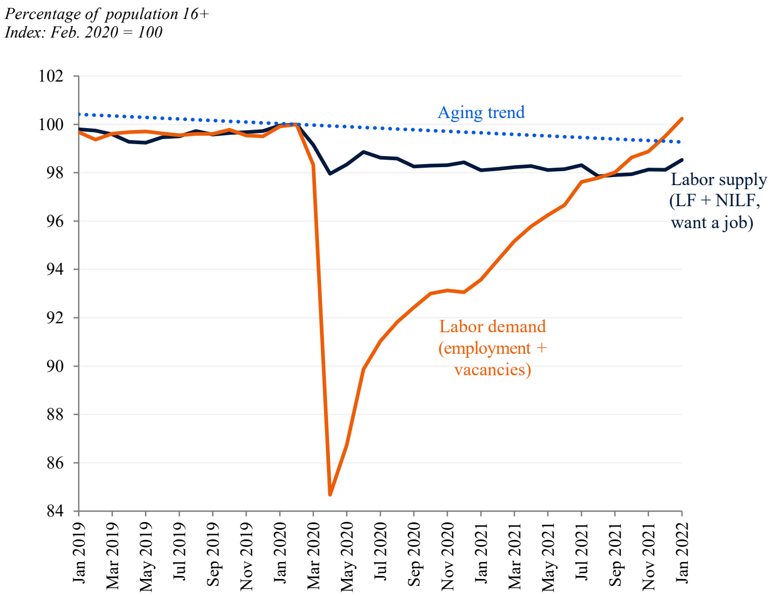
Reconciling the Paradox

How, then, does the unfrozen economist imagined earlier in the chapter reconcile these facts? How did the labor market seem to recover fully while also being more than 5 million jobs short of the prepandemic trend? Like so many other economic dynamics during the pandemic, a large part of the answer is that the COVID-19 pandemic has created an extraordinary set of circumstances in the U.S. labor market.

Labor supply—the number of workers with or wanting jobs—and labor demand—the number of jobs employers want to have filled—were still depressed at the end of 2021 in level terms relative to the prepandemic (figure 2-45). Labor force participation was lower by 1.5 percentage points overall, and, if one adjusts for aging, by 1 percentage point—representing 2.6 million people. Labor demand, in contrast, had almost recovered to its prepandemic level by end of 2021; and in January 2022, it had grown further to slightly exceed it.

Without question, demand for labor has recovered more quickly than the supply of workers. This is not surprising; as discussed above, the LFPR typically lags the unemployment rate in recovering during U.S. business cycles. And whereas labor demand was once clearly the binding, limiting factor in this pandemic, by the end of 2021 supply had become the more

Figure 2-45. Labor Supply and Demand, 2019–21



Sources: BLS; CEA calculations.
Note: "LF + NILF" means those in the labor force plus those not in the labor force,

binding component. This creates tightness in two ways. First, the level of tightness is high. Demand exceeds supply in the aggregate and in many industries. Second, momentum is high. Even in industries where demand still lagged supply at the end of 2021, demand often grew quickly over the last year, and this could have created labor market friction.

The Forecast

The Biden-Harris Administration finalized the economic forecast that underpins the President's Budget on November 10, 2021. By the third quarter of 2021, real GDP had recovered to a level that was 1.4 percent above its pre-pandemic level. That third-quarter level was, however, still 1.5 percent short of a plausible counterfactual path of 2 percent annual growth. Consistent with that shortfall from the counterfactual, and consistent with the consensus of professional economic forecasters, the Administration believes that the economy has additional room to grow during the next two years because aggregate demand appears to have enough momentum to make this happen.

The Administration's November 2021 forecast expected real GDP to grow 5.1 percent during the four quarters of 2021, and slow to 3.8 percent during 2022. In comparison, the consensus of private professional forecasters—the latest available at that time, published in October 2021—projected

5.5 percent real GDP growth during the four quarters of 2021 and a slowing to 3.5 percent growth in 2022.

Macroeconomic Forces during 2022

As this chapter has stressed, the ongoing pandemic generates unusually high forecast uncertainty, which has been exacerbated by the Russian invasion of Ukraine in February 2022. Nevertheless, the Administration must still present a central forecast. Among the expected manifestations of a supply-side surge were, at the time of the budget forecast in November, the anticipated resolution of supply chain problems, the gradual increase in the willingness of workers to staff a wide range of service industries, and a rebound in the LFPR.

The near-term prospects for demand growth depend on large but competing forces. On the positive side, the supply of excess savings—accumulated during a period of large Federal transfers with limited opportunity to spend those funds—will probably support continued growth of consumer spending. Customers are expected to return to consumer-facing businesses and those establishments that include crowds (bars, restaurants, theaters, etc.). On the negative side, fiscal policy is now turning sharply negative, reflecting the disappearance of the substantial Federal subsidies and transfers of the emergency pandemic programs (see figure 2-ii in box 2-4). The Administration forecasts above-trend growth during the four quarters of 2022 and 2023 (at 3.8 and 2.5 percent, respectively, as shown in table 2-6) reflecting the CEA's view in November 2021 that these supply and demand positives from emergence out of the COVID-restrained economy outweigh the swing to negative fiscal impetus due to the sunsetting of the temporary pandemic fiscal support. (See box 2-4.)

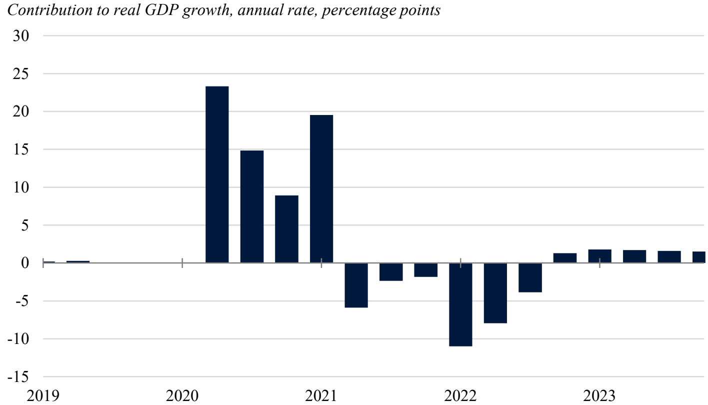
The Administration's inflation forecast focuses on two of the many price indices produced by the U.S. statistical agencies: the CPI and the price index for GDP. The CPI is important because it measures prices faced directly by consumers and because versions of it are used to escalate Social Security benefits, Federal pensions, and the notches in the Federal tax code. Based on the November forecast, the CPI is expected to rise 2.9 percent during the four quarters of 2022, down from its 6.7 percent (actual) pace during the four quarters of 2021 (which had been forecasted to be 6.6 percent when the forecast was finalized, as shown in table 2-6). This forecasted 2022 rate was higher than the consensus forecast available at the time the Administration forecast was finalized. Based on the forecast, starting in 2023, CPI inflation is expected to fall to the 2.3 percent rate that is consistent with the Federal Reserve's inflation target of 2.0 percent for a different (but closely related) price index, the Price Index for Personal Consumption Expenditures.

Box 2-4. Fiscal Impetus by Quarter

Positive effects on demand can follow an increase in Federal Government purchases or transfers, or a temporary tax cut. But as spending programs end, or temporary tax cuts expire, the subsequent quarters will exhibit negative demand effects. At the end of 2021, the large fiscal supports enacted during fiscal years 2020 and 2021 (see table 2-1 above) have mostly ended, and this ending will depress economic demand during 2022. To estimate the growth effects of this stimulus, and the negative effects of their termination, the CEA built an estimation system modeled on the one maintained by the Brookings Institution, which itself was modeled on one suggested by Federal Reserve staff. (See Kovalski et al. 2021; Brookings Institution 2019; Cohen et al. 1999; and Cashin et al. 2017.) The quarterly growth effects—both positive and negative—are shown in figure 2-ii. As can be seen, the effects of fiscal policy on growth are negative for 2022. These negative fiscal policy effects may be offset by positive supply side shocks from the emergence out of the pandemic-restrained economy, despite the uncertainty caused by the invasion of Ukraine and possible future variants of COVID-19.

Figure 2-ii. The Federal Fiscal Impetus by Quarter

Contribution to real GDP growth, annual rate, percentage points



Source: CEA calculations.

The price index for GDP measures the price of everything produced in the United States, and its measure of inflation differs from the CPI because—in addition to consumer prices—it includes the price of investment, government purchases, and exports, while import prices are excluded. When averaged over long intervals, GDP price-index inflation tends to run slightly lower than the CPI, partially due to a different indexing formula. In

Table 2-6. Economic Projections, 2020–32

Year	Percent Change (Q4 to Q4)				Level (calendar year)		
	Nominal GDP	Real GDP	GDP Price Index	Consumer Price Index	Unemployment Rate (percent)	Interest Rate 91-day Treasury Bills (percent)	Interest Rate 10-Year Treasury Notes (percent)
2020 (Actual)	–1.0	–2.3	1.5	1.2	8.1	0.4	0.9
2021	10.1	5.1	4.8	6.6	5.4	0.0	1.5
2022	6.3	3.8	2.4	2.9	3.9	0.2	2.1
2023	4.6	2.5	2.0	2.3	3.6	0.9	2.5
2024	4.1	2.1	2.0	2.3	3.7	1.6	2.7
2025	4.0	2.0	2.0	2.3	3.8	1.9	2.8
2026	4.0	2.0	2.0	2.3	3.8	2.1	3.0
2027	4.0	2.0	2.0	2.3	3.8	2.2	3.1
2028	4.1	2.1	2.0	2.3	3.8	2.3	3.1
2029	4.3	2.2	2.0	2.3	3.8	2.3	3.2
2030	4.4	2.3	2.0	2.3	3.8	2.3	3.2
2031	4.3	2.3	2.0	2.3	3.8	2.3	3.2
2032	4.3	2.3	2.0	2.3	3.8	2.3	3.3

Sources: Bureau of Economic Analysis; Bureau of Labor Statistics; Department of the Treasury; Office of Management and Budget; Council of Economic Advisers.
Note: The forecast was based on data available as of November 10, 2020. The interest rate on 91-day T-bills is measured on a secondary-market discount basis. GDP = gross domestic product.

the forecast, inflation—as measured by the price index for GDP—is projected to fall to 2.4 percent during the four quarters of 2022, from a projected 4.8 percent in 2021.

When the forecast was finalized, the October unemployment rate of 4.6 percent was the latest datum. The Administration expected it to fall further, and thus to average 3.9 percent in 2022, and to fall to 3.7 percent by the end of 2022, and then to average 3.6 percent in 2023. Subsequently, the unemployment rate fell sharply further in November (4.2 percent) and to 3.9 percent in December. Even so, the 3.9 percent average for 2022 remains plausible.

The Forecast over the Long Term

As described above, real GDP growth was forecast to edge down year by year from 2021 to 2024 (2 percent), in large part because by the end of 2021, GDP had almost fully rebounded from the recession, so less room remained for growth. Along this path, the unemployment rate descends to 3.6 percent by 2023:Q4, slightly overshooting the forecast estimate of the unemployment rate consistent with stable inflation (3.8 percent). But the unemployment rate edges back up to 3.8 percent by the end of 2024.

The consensus estimate (October 2021, the latest available when the forecast was finalized) for potential real GDP growth in the medium term appears to be about 2 percent annually. That is, the Blue Chip consensus panel forecasts a 2.0 percent average annual rate of growth during the four years 2024–27 while the unemployment rate is approximately constant.

The Administration believes that potential real GDP growth in the long run could be modestly higher because of a range of policies supported in the 2021 Bipartisan Infrastructure Law (BIL) and the President's other proposed economic policies. These include increments to infrastructure investment from the BIL, and a range of programs to enhance human capital formation and labor force participation. Altogether, these policies could plausibly boost real GDP growth by 0.3 or 0.4 percentage point a year during the 10-year budget window (2022–32).

In addition, real GDP growth is expected to increase during the last four years of the forecast interval 2029–32 because the change in the LFPR becomes less negative at that horizon. The retirement of the baby boom cohort (those born from 1946 to 1962), is currently subtracting about 0.4 percentage point per year from the growth rate of the LFPR, and this downward force is likely to continue for the next several years. However, after 2028, after the last of these baby boomers (those born in 1962) reaches the standard retirement age of 65–66, these retirements will diminish. The negative contribution to real GDP growth from the retirement of the baby boomers moderates from about –0.4 percentage point per year through 2027 to –0.3 percentage point per year in 2028–30, and to –0.2 percentage point in 2031–32.

During the last six years of the forecast (2027–32), the Administration's forecast grows faster than the Blue Chip consensus (1.9 percent per year) because of the possible combination of these two factors: the Blue Chip consensus may not completely incorporate the growth-promoting aspects of the President's proposals, and the consensus does not appear to account for the diminishment of baby boom retirements.

Interest rates are projected to slowly rise during the 11-year projection interval, following paths that are similar (but slightly steeper) than those projected in the Blue Chip consensus panel's October 2021 long-term interest rate projection. The Administration focuses on two interest rates: the rate on 91-day Treasury Bills, and the yield on 10-year Treasury notes. These interest rate forecasts are key to projecting the cost of servicing the Federal debt. The Treasury Bill rate is projected to creep up from an average of 0.0 percent in 2021 to a 0.9 percent average in 2023, and eventually to 2.3 percent during the last five years of our projection interval (2028–32). In comparison, the Blue Chip consensus panel's October 2021 forecast of the Treasury Bill rate plateaus at 2.1 percent. The Administration's interest rate forecast is slightly higher than that of the consensus because the

Administration also forecasts slightly higher real GDP growth during those years, and higher growth is likely to boost interest rates.[38]

The Supply Side of the Long-Term Forecast

Real GDP is expected to grow at an average 2.2 percent annual rate during the 13-year interval through the Administration's budget horizon in 2032. The six components of the supply-side identity that account for this growth are shown in table 2-7, both over the forecast interval as well as over relevant historical periods. Because the growth of these supply-side components over short intervals is erratic and has cyclical patterns, growth rates between business-cycle peaks are shown. For this reason, this table shows the growth rates of these supply-side components starting from the last business-cycle peak in 2019:Q4.

The Administration's forecast of growth of the working-age (16+) population comes from the latest Social Security Administration Trustees' report. The 0.7 percent projected rate of growth (row 1, column 5 in table 2-7) is below the average growth rate during the 66 years through 2019 (row 1, column 1), and also below the growth rates in each of the three preceding business cycles (columns 2, 3, and 4).

The LFPR is expected to decline further (row 2, column 5 in table 2-7) over the forecast window, due to the continuing retirement of the baby boom cohorts. But during the last five years of the projection interval, this decline will become less steep as the retirements of those baby boom cohorts near completion. In addition, the President's proposed policies are expected to promote higher labor force participation rates than would otherwise be the case.

The employed share of the labor force (row 3, column 5, in table 2-7, equal to 1 minus the unemployment rate) usually contributes little to GDP growth because the employment rates are similar among business-cycle peaks. The workweek in the nonfarm business sector (row 4, column 5) is projected to remain flat, after falling at a 0.2 percent annual rate during the 66-year interval shown in column 1. The workweek shortened during that interval because of generally declining employment in manufacturing (where workweeks are long) and the rise in the labor force participation of women (who generally entered the workforce with shorter workweeks than men). Looking ahead, the workweek is expected to stabilize at its 2019 level because female participation is expected to plateau while the workweek of women rises.

Labor productivity (output per hour in the nonfarm business sector) is expected to grow at an average 1.8 percent annual rate, above the 1.4

[38] Higher interest rates are expected with faster growth; see Council of Economic Advisers (2015).

Table 2-7. Supply-Side Components of Actual and Potential Real Output Growth, 1953–2032

	Component	Growth Rate (percentage points)				
		1953:Q2 to 2019:Q4	1990:Q3 to 2001:Q1	2001:Q1 to 2007:Q4	2007:Q4 to 2019:Q4	2019:Q4 to 2032:Q4
		(1)	(2)	(3)	(4)	(5)
1	Civilian noninstitutional population age 16+	1.4	1.2	1.1	1.0	0.7
2	Labor force participation rate	0.1	0.1	–0.3	–0.4	–0.2
3	Employed share of the labor force	0.0	0.1	0.1	0.1	0.0
4	Average weekly hours (nonfarm business)	–0.2	–0.1	–0.2	–0.1	0.0
5	Output per hour (productivity, nonfarm business)	2.0	2.4	2.4	1.4	1.8
6	Output per worker differential: GDO vs. nonfarm[a]	–0.3	–0.3	–0.6	–0.4	–0.1
7	Sum: Actual real GDO[b]	3.0	3.5	2.4	1.7	2.2
	Memo:					
8	Ratio of nonfarm business employment to household employment	0.0	0.3	0.4	0.1	0.3
9	Ratio of real GDO to nonfarm business output	–0.3	–0.6	–0.2	–0.3	–0.4

Sources: Bureau of Labor Statistics; Bureau of Economic Analysis; Department of the Treasury; Office of Management and Budget; CEA calculations.
[a]The output-per-worker differential (row 6) is the difference between output-per-worker growth in the economy as a whole and output-per-worker growth in the nonfarm business sector, and it is also equal to row 8 + row 9.
[b]Real GDO and real nonfarm business output are measured as the average of income- and product-side measures.
Note: All contributions are in percentage points at an annual rate. The forecast is made from data available on November 10, 2021. Totals may not add up due to rounding. The quarters 1953:Q2, 1990:Q3, 2001:Q1, 2007:Q4, and 2019:Q4 are all quarterly business-cycle peaks. Gross domestic output (GDO) is the average of GDP and gross domestic income. Population, labor force, and household employment have been adjusted for discontinuities in the population series.

percent average annual rate during the preceding business cycle but below the average 2 percent annual rate over the 66 years through 2019. Again, productivity growth is expected to be boosted by the BIL, as well as the human-capital-building aspects of the President's other proposed policies.

Both the workweek and productivity are measured in the nonfarm business sector, but the supply side identity adds up to GDP (which includes the farm, government, and household sectors in addition to the nonfarm sector), and the employment rate is measured (from the household survey) for the economy as a whole. As a result, a conversion factor is needed to translate from nonfarm business employment to total employment (row 8 of table 2-7) and also from nonfarm business to GDP (row 9). The sum of these two rows (row 6) is the difference between the growth rate of output per person in the economy as a whole and the growth rate of output per person in the nonfarm business sector. Because the National Income and Product Accounts assume that productivity does not grow in the government and household sectors, the nonfarm business is the sector where productivity grows. As a result, the row 6 is negative over any long interval.

Conclusion

The story of the U.S. economy in 2021 was again one where COVID-19 was in the driver's seat. But it was also one where the United States made enormous strides at recovery and normalization throughout the year, thanks in large part to extraordinary fiscal and monetary policy support and a historic campaign to research and distribute vaccines.

Pandemic-induced disruptions were still evident throughout the economy at the end of 2021. The Omicron variant caused a spike in cases, hospitalizations, and deaths. Consumers were still favoring goods more than they had before the pandemic, to the detriment of services. The strong demand for goods strained supply chains and put upward pressure on prices. And labor markets were not fully recovered, with such key measures as the unemployment rate, prime-age employment, and the prime-age labor force still weaker than in 2019.

But the progress over 2021 was significant. The United States ended the year with an economy more than 3 percent larger in real terms than just before the pandemic—the fastest pandemic recovery among the Group of Seven countries. The unemployment rate fell by its fastest December-to-December pace since modern data began to be collected after World War II, and the economy added 6.7 million jobs. Given the historic damage wrought by the pandemic in early 2020, such progress was not preordained. This pace of recovery raises hopes that, even while managing future COVID-19 variant risks and geopolitical upheavals, the United States will not just normalize but also emerge with a stronger, healthier, and more inclusive economy.

Chapter 3

The U.S. Economy and the Global Pandemic

The COVID-19 pandemic has had repercussions for economies around the globe. Although the U.S. economy suffered one of the sharpest contractions in its history during 2020, the economic damage was even greater in many foreign countries. Bolstered by an early and rapid vaccine rollout as well as by strong fiscal support, the United States' recovery has been robust, outpacing that of most of our major trading partners in 2021. Inflation emerged as a challenge for the United States and nearly all our major trading partners, as strong demand, skewed toward goods and away from services, interacted with the supply chain stresses described in detail in chapter 6 of this *Report*.

As a result of the rapid U.S. recovery relative to the rest of the world, the U.S. trade deficit has widened. The strength of the U.S. recovery has led to increased imports, as goods have flowed in from abroad to satisfy resurgent demand from firms and consumers. Although exports have hit record highs, they have increased at a slower pace than imports because many of the countries that buy U.S. goods have not recovered as fast. At the same time, new waves of infection depressed international travel and weighed on the recovery of some services that are important for U.S. exports, such as tourism.

The pandemic highlighted the need to tackle long-standing economic issues, including those resulting from global economic integration. Due to a lack of supportive public policy in the past, many American workers and communities have borne the costs of shifting production around the world but have not fully shared in its benefits, contributing to widening inequality.

Addressing these inadequacies requires policies that broaden the gains from trade while leveling the international economic playing field by countering unfair trade practices and putting in place a more equitable global tax system. Implementing such policy changes in a way that reduces uncertainty and engages with the United States' trade and commercial partners can ensure that American consumers, workers, businesses, and investors benefit from global trade.

The first section of this chapter places America's economic experience during the pandemic in the global context by comparing it with that of our largest trading partners: the euro area, the United Kingdom, China, Canada, and Mexico. The next section examines how international trade has recovered from its sharp pandemic decline, discussing the causes of the widening U.S. trade deficit and the effects of supply chain bottlenecks internationally on traded inputs such as auto parts and capital goods. The last section discusses how the Biden-Harris Administration is reorienting U.S. international economic policy to mitigate rather than exacerbate economic inequality and to level the international economic playing field.

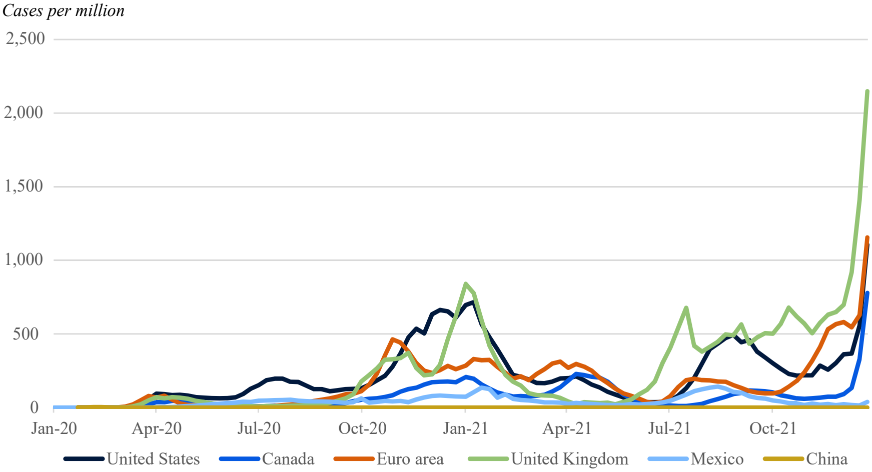
Recovery Amid Global Economic Challenges

Placing the U.S. recovery from the COVID-19 pandemic in the global context highlights how our robust fiscal support resulted in a faster return to a strong economy. The backdrop to this demand-driven recovery, however, was a tragic loss of human lives and higher inflation.

The Global Pandemic

The path of the global economy over the past year is best understood in the context of the coronavirus pandemic. The starkest measure of the pandemic's effect is the number of deaths attributed to COVID-19. By the end of 2021, reported deaths due to the virus had exceeded 5 million people globally, including more than 827,000 in the United States (OWID 2021). The true global toll is probably much higher, because data collection challenges outside the United States suggest that many other countries may have substantially underreported deaths. For example, some estimates put the true death toll *in India alone* in excess of 4 million (Anand, Sandefur,

Figure 3-1. International COVID Case Rates



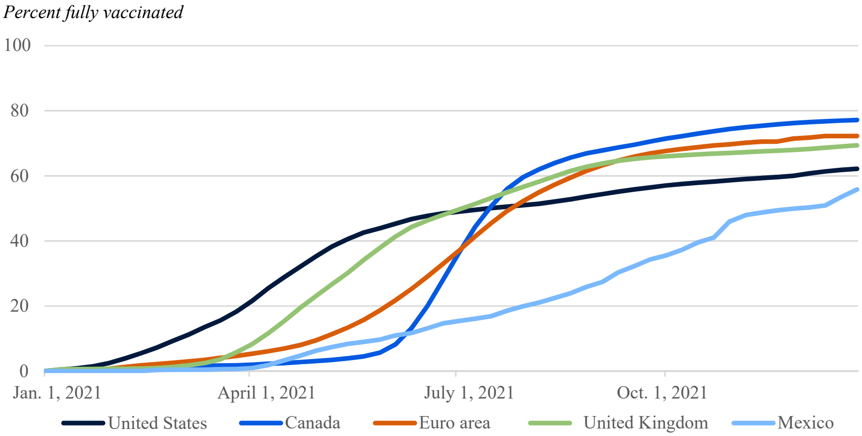
Source: Our World in Data.

and Subramanian 2021). With deaths measured as a share of the population, many of the hardest-hit countries have been middle-income countries in Latin America and Eastern Europe (Johns Hopkins 2022).

Looking at total deaths can obscure the fact that different countries have been hit by waves of differing severity at different times. Which country is faring worst at any point in time has varied significantly. Official data show that the United States, the United Kingdom, and the euro area have all had the highest recorded cases per capita at some point in time (figure 3-1). Early in the pandemic, the United States led in per capita cases while the United Kingdom led in deaths. In the second half of 2021, the reverse was true. And the euro area reported the highest per capita cases in the spring of 2021. This variation demonstrates how nearly all major economies have been severely affected at some point during the pandemic.

Progress and timeliness in vaccinating populations have also varied across countries. Both the United States and United Kingdom managed rapid vaccine rollouts that made them early leaders in the share of the population vaccinated (figure 3-2). Rollouts in Canada and the euro area accelerated dramatically in the summer of 2021, and vaccination rates in both places have since reached higher levels than in other major U.S. trading partners. During the second half of 2021, vaccination rates in many middle-income countries, such as Mexico, approached that of the United States, while rates in low-income developing countries (not shown) remain substantially lower (OWID 2021).

Figure 3-2. International COVID Vaccination Rates



Source: Our World in Data.
Note: "Fully vaccinated" is defined as having received all doses prescribed by the initial vaccination protocol. China does not report statistics on the share of its population that is fully vaccinated.

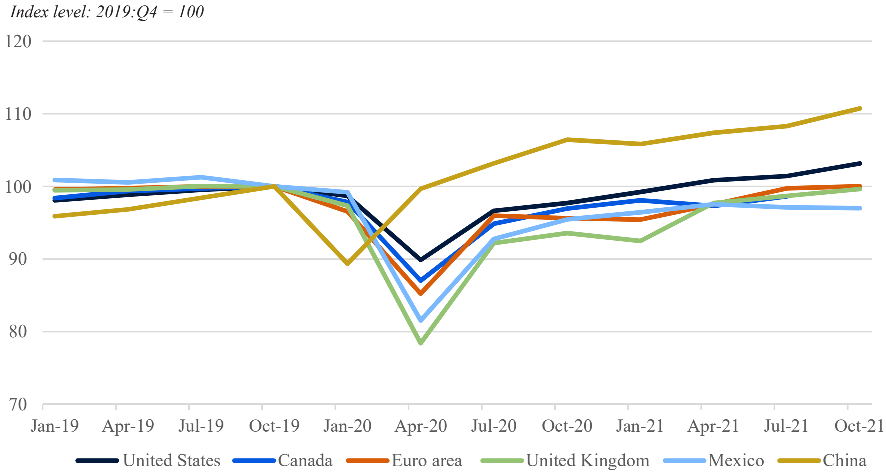
The United States' Economic Recovery in the Global Context

The path of real gross domestic product (GDP) since the onset of the COVID-19 pandemic provides the most basic measure of the virus's economic impact. The pandemic was accompanied by historic drops in output in almost all major economies. U.S. GDP fell by 8.9 percent in the second quarter of 2020 (figure 3-3), the largest single-quarter contraction in more than 70 years (BEA 2021c). Most other major economies fared even worse. The GDP of the United Kingdom in 2020:Q2 was 21.4 percent below its average in 2019 (ONS 2022). In the euro area, output fell by more than 12.4 percent (Eurostat 2022c). Closer to home, Canada's GDP was down 12.4 percent, while Mexico's GDP fell by 19 percent (Statistics Canada 2022; INEGI 2022).

The U.S. recovery has outpaced that of all its major trading partners except China. By the second quarter of 2021, U.S. real GDP exceeded its prepandemic level, ahead of most other major economies. Output growth picked up in the euro area and Canada in the third quarter of 2021; but at the end of 2021, output in most major U.S. trading partners had only just reached its prepandemic level, while U.S output was 3 percent higher than before the pandemic (see figure 3-3). Though many effects of the pandemic are not captured by GDP, measured by this most basic indicator, the United States' recovery remained farther along than those of nearly all its peers.

The initial drop in real output in China was of a very similar magnitude to that of the United States (see figure 3-3), but the initial recovery was even faster. By the third quarter of 2020, China's real GDP had not only exceeded its prepandemic level but was also above what would have

Figure 3-3. Real GDP by Country



Sources: National data organizations.
Note: Data are seasonally adjusted.

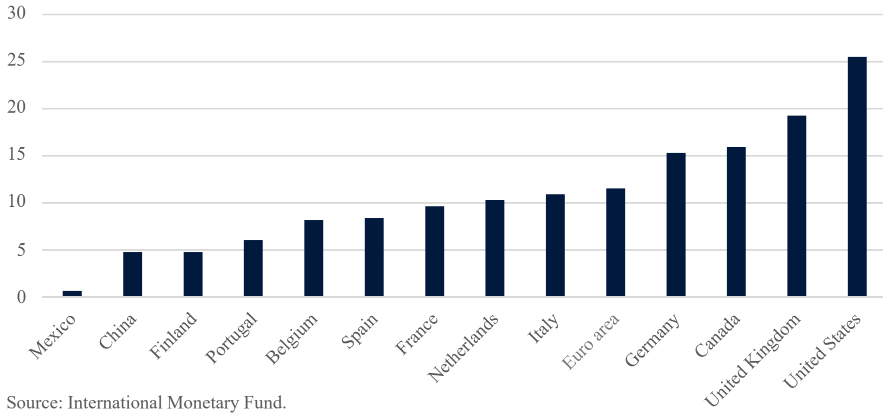
been expected based on its prepandemic trend. The Chinese government did extend substantial support, primarily through infrastructure spending. However, exports have been a key driver of China's recovery, climbing to more than 40 percent above their prepandemic level by the fourth quarter of 2021 (GACC 2021). As a result, the contribution of net exports to China's real GDP growth reached nearly 30 percent in 2020, its highest level in more than 20 years (CNBS 2021a). In this way, China has benefited from the pandemic-induced pivot of global consumption away from services and toward goods, many of which are manufactured in China. Despite continuing support from strong demand for its exports, output growth in China slowed in the second half of 2021 as government support for the economy was withdrawn (CNBS 2021b).

Future research by economists will fully assess what enabled some economies to weather the pandemic shock better or to bounce back more quickly. Based on what we know now, there are two areas of policy where the U.S. response stands out. The first is the speed of our vaccine rollout, discussed above. The fact that more than 40 percent of the U.S. population was fully vaccinated by May 2021, when vaccination rates in most European countries were still less than half that, gave our economic rebound an important head start.

The other area where the United States stands apart is fiscal policy, suggesting that this also played a role in accelerating the recovery beyond those of most of our trading partners. U.S. Federal Government spending to directly support firms and workers, as well as State and local governments,

Figure 3-4. Discretionary Fiscal Response, 2020:Q1–2021:Q3

Percentage of 2020 GDP



Source: International Monetary Fund.

was substantially larger than comparable efforts in other major economies (figure 3-4). As of the third quarter of 2021, the cumulative U.S. discretionary fiscal response (including not only additional spending but also revenue forgone due to discretionary tax cuts) exceeded 25 percent of GDP. By comparison, the U.K. response was under 20 percent of GDP, and average spending in the euro area was 12 percent of GDP. The scale here helped to ensure that, by the end of 2021, U.S. consumption had returned to its precrisis trend, while in the euro area, for example, consumption remained below its precrisis level (Boone 2021).

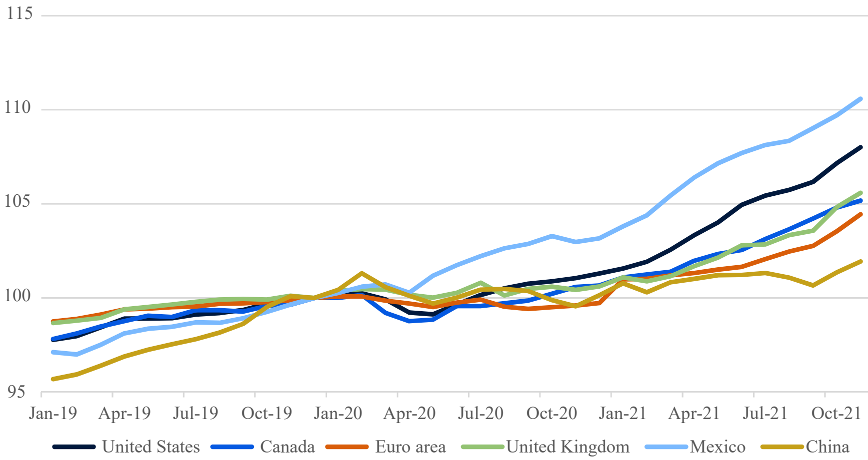
The Challenge of Inflation

Inflation has proved a serious challenge for many countries during the recovery. In the 12-month period ending December 2021, headline consumer price inflation in the euro area was 5.0 percent, well above its average of about 1 percent in the five years before the pandemic (Eurostat 2022a), as shown in figure 3-5. Canada and the United Kingdom have also seen substantially higher inflation than was the case before 2020. Inflation has also risen here; indeed, U.S. inflation has run higher than that of most of its major trading partners, although the gap narrowed in the second half of 2021.

The fact that inflation has accelerated in so many countries underscores its common drivers. Pandemic-induced changes in behavior led to relatively more demand for goods than services. In many countries, the balance of consumption remained unusually tilted toward goods throughout 2021, so demand for goods grew substantially faster than would have been the case in a normal recovery (Bruce 2021; Boone 2022). As a result, the world's economic recovery put stress on the already-vulnerable global

Figure 3-5. Consumer Price Level

Index level: Dec. 2019 = 100



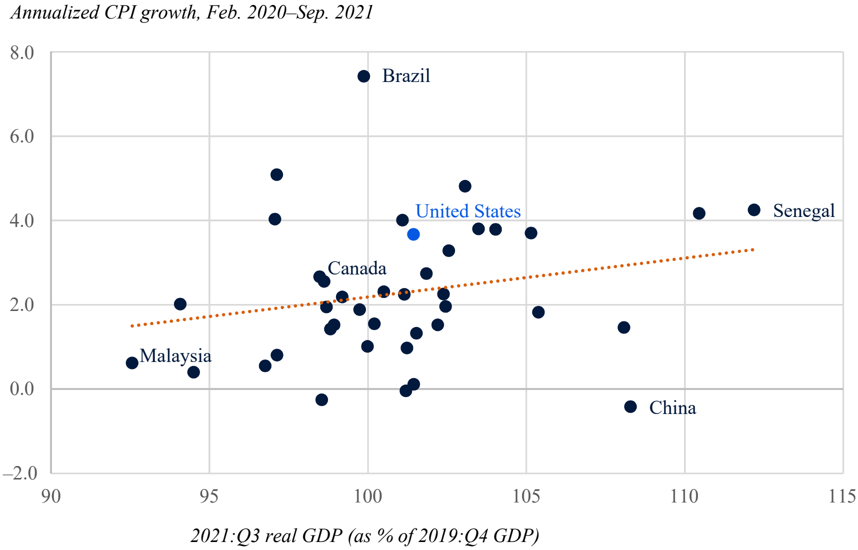
Sources: National data organizations.
Note: Data are seasonally adjusted.

supply chains for consumer goods, as discussed further in chapter 6 of this *Report*. This phenomenon of recovering demand for goods interacting with supply constraints can help to explain the relatively higher inflation in the United States, where the recovery was relatively stronger. Looking across countries, inflation was higher where the gap between the real GDP and its prepandemic level—a main measure of progress toward economic recovery—was smaller (figure 3-6).

Rising prices for motor vehicles were a key driver of U.S. inflation, with prices of new cars nearly 12 percent higher at the end of 2021 than they were a year earlier. Prices of used cars jumped by almost 40 percent during the year (BLS 2022b). Though other countries also saw higher car prices, their rise was not as dramatic. Indeed, the CEA calculates that consumer prices, excluding those of new and used cars, rose by similar magnitudes in the euro area (4.7 percent), for example, as in the United States (5.1 percent).

Globally, factors pushing up car prices included rebounding demand and a shortage of semiconductors (Gross, Miller, and Inagaki 2021). Car manufacturers both in the United States and abroad have faced production challenges due the semiconductor shortage, but during 2021, U.S. auto production outpaced that of many peers. At the end of 2021, U.S. auto production stood at just under 5 percent below its prepandemic level, ahead of the recovery of German, French, and Japanese production (Federal Reserve Board 2022; Eurostat 2022b; METI 2021). Thus, the greater rise in U.S. prices came in spite of a faster recovery in production. The fact that the rise in car prices has been larger here than abroad stems partly from the particularly resilient demand created by the U.S. recovery passing

Figure 3-6. Recovery in Output and Inflation



Sources: National data organizations.
Note: CPI = Consumer Price Index. Data are seasonally adjusted, except for Senegal's CPI.

through to the auto sector—real consumer spending on new motor vehicles rose 16 percent in 2021, a level reaching 18 percent above its prepandemic level (BEA 2022b). Though higher vehicle prices do pose challenges for American households and businesses, the strength of the recovery in the U.S. auto sector relative to other major auto-producing countries highlights the important benefits of the U.S. demand-driven recovery for workers and businesses. (See box 3-1.)

International Trade, the Economic Recovery, and Lingering COVID-19 Challenges

In 2021, international trade broadly recovered from the sharp decline that followed the onset of the COVID-19 pandemic, with U.S. exports and imports of goods exceeding prepandemic records. Import growth outpaced export growth, widening the U.S. trade deficit. Though trade in goods broadly recovered in 2021, supply bottlenecks slowed the recovery of both imports and exports of such products as automotive and capital goods that are at the heart of the global value chains that were disrupted by pandemic-related challenges.

In contrast, waves of COVID-19 infections have weighed down the recovery of cross-border trade in services. Although trade in services that are less reliant on personal contact followed a recovery pattern similar to

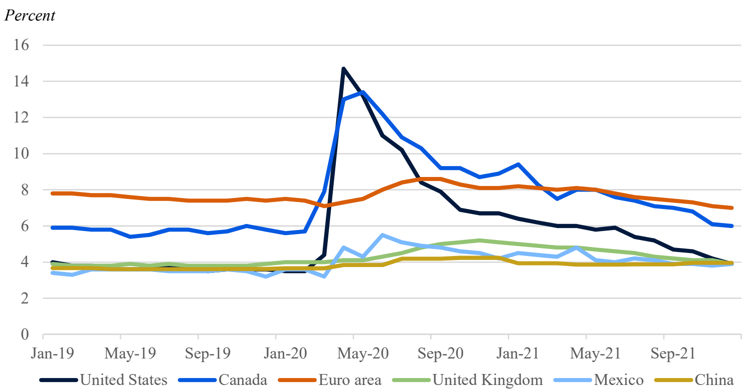
Box 3-1. Lessons from Abroad for Labor Market Policy

By some measures, the U.S. labor market appears to have recovered rapidly. America's unemployment rate jumped at the onset of the pandemic, but then fell steadily, and by the fourth quarter of 2021 was once again lower than in the euro area, Canada, or the United Kingdom (figure 3-i). However, though the number of people employed at the end of 2021 was above its prepandemic level in most of our trading partners, this is not true here (figure 3-ii). The reason: though labor force participation has increased significantly over the past year, relatively more people left the U.S. labor force early during the pandemic than in many other countries.

The discretionary fiscal response in the United States was larger than that of most of our trading partners when considering the three major pieces of fiscal legislation passed over the course of the pandemic, and the government support associated with that response was delivered to individuals and households in a very different way. As discussed in chapter 2, pandemic support payments were generally received in the form of unemployment insurance or as direct payments. By contrast, governments in the euro area and the United Kingdom adopted or strengthened existing job retention programs, which subsidized employed workers' incomes. (OECD 2020).

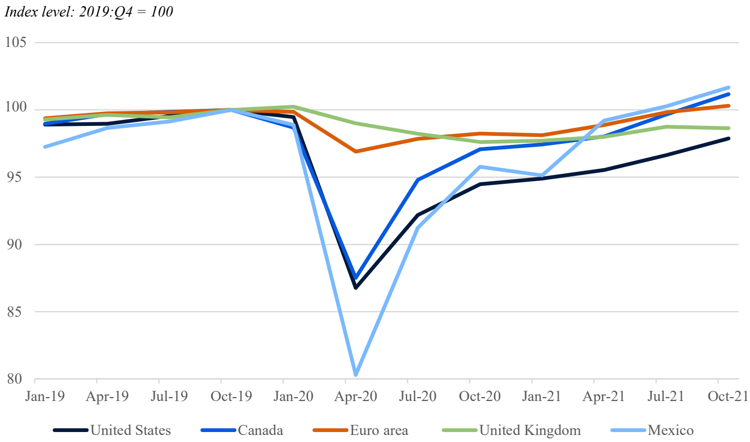
These programs come in two forms: short-time work programs, in which the government pays employees for hours not worked; and wage subsidies, in which the government either subsidizes pay for hours the employee actually works or raises employees' pay to a minimum level, regardless of time worked. These programs help explain why unemployment rates increased remarkably little in the euro area and the United

Figure 3-i. Unemployment Rates



Sources: National data organizations; OECD.
Note: Data are seasonally adjusted, except China. The United States measures age 16 and above, Canada measures age 15+, and China measures urban area unemployment. Other metrics are total unemployment.

Figure 3-ii. International Employment



Sources: National data organizations.
Note: Employment metrics vary slightly by source. The United States measures 16 years and above, Canada measures 15 years and above, and the United Kingdom measures a three-month rolling average for employment 16 years and above. The euro area and Mexico measure total employment. All data are seasonally adjusted, except for Mexico.

Kingdom, both in absolute terms and relative to the change in the U.S. unemployment rate. By design, job retention programs ensured that many people working few or no hours remained on the payroll, receiving paychecks from their employer that were almost entirely government funded (OECD 2020).

The difference between the U.S. approach and these job retention programs may seem semantic: workers were on the job dramatically less in the spring and summer of 2020, whether or not they were technically employed, and the magnitude of the drop was similar in the United States and other major economies. However, in the United States, workers were formally separated from their jobs and became unemployed (Boissay et al. 2021). Unemployed workers leave the labor force (meaning they stop looking for a job) at a rate almost 10 times greater than employed workers, who exit the labor force if they leave their job and do not try to find a new one (for details of what constitutes being in the labor force, see BLS 2014). Once they leave the labor force, workers tend to stay out (Hobijn and Şahin 2021). As the U.S. economy has recovered, unemployed workers have found jobs and the unemployment rate has fallen quickly. But unlike countries that adopted job retention programs, in the United States there are also more workers who are no longer in the labor force—meaning that they are neither working nor actively trying to find a job; and this slows the rebound in the number of people employed (BLS 2022a; CRS 2021).

Since 2012, the United States has had a job retention program—the Short-Time Compensation Program—similar to efforts adopted elsewhere during the pandemic. Twenty-six States, which are home to 70 percent of the U.S. labor force, have active versions of the Short-Time Compensation Program. However, participation in these local programs is very low, in part due to the associated administrative burdens (Von Wachter 2020). Viewed in light of the data on transitions in and out of the labor force discussed above, the trajectory of U.S. employment during 2021 suggests that reforms aimed at expanding participation in this program could ensure a speedier labor market recovery after future downturns. That said, in considering this policy option, a very important open question is how European-style job retention programs are affecting the reallocation of workers across types of jobs during the economic recovery.

goods, others—particularly travel and transportation services[1]—continue to be impaired by the persistence of the virus. The sharp contraction of trade in travel services was a notable drag on the U.S. trade balance in 2021. Exports of these services in the form of foreign tourists, students, and business travelers are typically a significant contributor to the surplus in the U.S. trade balance in services.

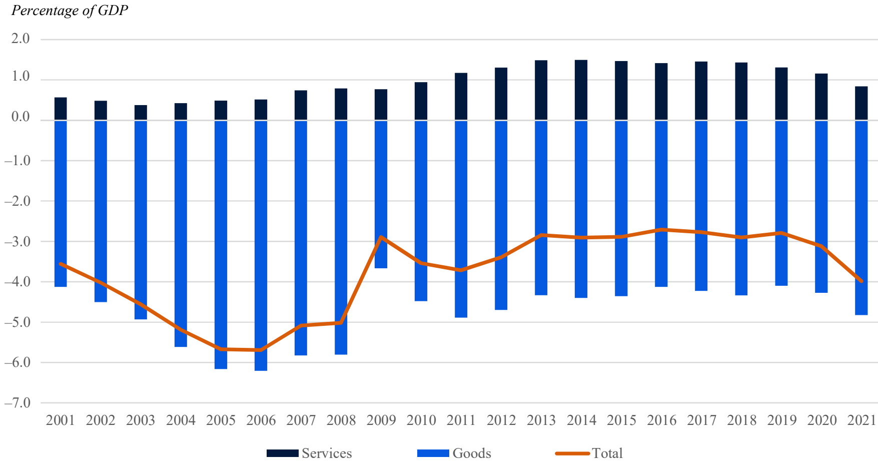
The U.S. Trade Balance

The strong domestic demand for goods that has characterized the economic recovery in 2021 is reflected in the deepening deficit of the U.S. trade balance—defined as the difference between the total value of goods and services that U.S. residents buy from abroad and the value of all the U.S. goods and services sold abroad (BEA 2022a). At 4 percent of GDP, the 2021 trade deficit is the largest since 2008 (measured as a share of GDP) (figure 3-7). Deeper trade deficits in the United States over the past two decades have been correlated with economic growth because they reflect strong demand; 2021 was no exception (BEA 2022b).

Over the past 20 years, the United States has typically maintained a deficit in goods trade that is partially offset by a surplus in services trade. The higher overall trade deficit in 2021 reflected a larger goods trade deficit and a smaller services trade surplus relative to recent years. In particular, the increase in the goods and services trade deficit from 2.8 percent of GDP in 2019 to 4.0 percent in 2021 reflects a 0.5-percentage-point reduction in the services surplus and a 0.7 percentage point increase in the goods trade deficit (figure 3-7). Although both developments can be traced to challenges stemming from COVID-19, the reasons for these outcomes are distinct.

[1] In official U.S. data on services trade, this category is named “transport” rather than “transportation.”

Figure 3-7. U.S. Trade Balance, 2001–21



Source: Bureau of Economic Analysis.

The increases in consumption and investment expenditures that drove strong economic growth in 2021 entailed greater expenditures on both domestically produced and imported goods and services. American producers of goods, challenged by pandemic-induced labor and input supply obstacles, strained to keep pace with surging domestic demand for goods, which reduced the available supply for exports (Furman and Powell 2021). The dampening of growth in exports of U.S. goods was amplified by the fact that America's fiscal policy response was larger than most other major economies (see figure 3-4). Though demand here exceeded its prepandemic trend, demand abroad lagged. As a result, American firms and consumers stepped up purchases of imported goods to a greater degree than their foreign counterparts, widening the U.S. trade deficit in goods (Milesi-Ferretti 2021). Also contributing to the widening goods trade deficit was the shift in the balance of trade in oil and petroleum products from surplus to deficit, which is discussed in box 3-2. Further, restrictions on foreign nationals entering the United States and rising costs of maritime freight transportation, a service that is primarily provided by foreign-owned firms, brought down the surplus in services trade (BEA 2022a).

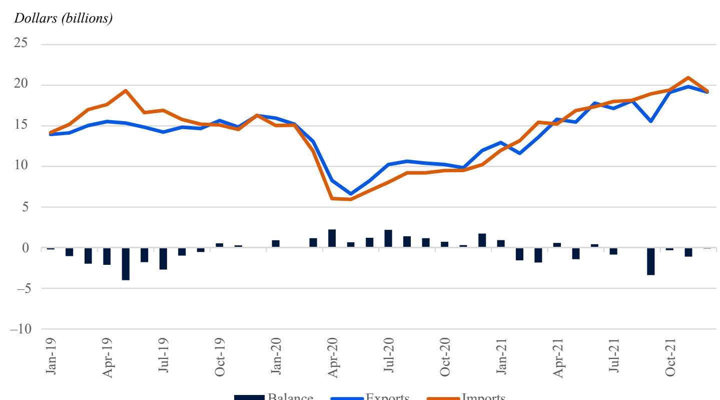
Macroeconomic developments here and abroad have contributed to the widening trade deficit through another channel: exchange rate movements. As the COVID-19 virus spread in early 2020, the U.S. dollar appreciated 9.7 percent from January to late March, reflecting the dollar's status as a safe asset (figure 3-8). In times of heightened economic uncertainty, investors around the world purchase dollar assets, which they view as a reliable store of value (Jiang, Krishnamurthy, and Lustig 2021). From the end of March 2020 through the end of 2020, the dollar depreciated as global

Box 3-2. Trade in Oil and Petroleum Products

The United States is the world's largest oil producer, and both an important exporter and a major importer of petroleum products (EIA 2021a). These products constitute more than 10 percent of U.S. exports and about 7 percent of U.S. imports. Prices of oil and gas rose significantly during the first 10 months of 2021, with West Texas Intermediate Crude prices finishing the year more than 55 percent above its end-2020 level (EIA 2022) and global natural gas prices increasing almost sixfold between November 2019 and November 2021 (IMF 2021). Higher prices, along with rising volumes of imports and exports, meant that the dollar values of U.S. petroleum products exports were almost 50 percent above their 2020 level, while imports were up more than 75 percent (figure 3-iii).

Foreign and domestic factors drove the rise in energy prices in 2021. In China, overall supply was constrained by ambitious government efforts to rein in the burning of coal while manufacturing establishments' energy demand jumped as production surged (Riordan 2021). As a result, natural gas prices in Europe and Asia jumped due to the higher Chinese demand for natural gas as a substitute for coal. Also pushing up global energy prices was the OPEC+ (Organization of the Petroleum Exporting Countries Plus) group of oil producers' reluctance to more rapidly expand oil production (Lawler, Ghaddar, and Astakhova 2021), which they had cut by 10 million barrels per day (about 10 percent of global production) in 2020 in response to the pandemic-induced drop in demand (EIA 2020). In the United States, weak investments in new energy sources during 2020 weighed on energy supply as the economy recovered in 2021 (IEA 2021). Additionally, bad weather, including an unusually cold winter in Texas and hurricanes Ida and Nicholas in the

Figure 3-iii. Trade in Petroleum Products



Source: Census Bureau.
Note: Data are seasonally adjusted.

Gulf of Mexico, also affected America's oil production (EIA 2021b, 2021c).

On the demand side, the widespread availability of vaccines starting in the spring of 2021 meant the resumption of travel and some commuting, pushing up gasoline demand (EIA 2021d). Pandemic-induced shifts in the modes of transportation used for travel and commuting further boosted gasoline demand, as many opted to drive rather than use mass transit or travel by plane (Bair, Guerra Luz, and Bradham 2021).

financial conditions began to normalize and the earlier flight to safety was reversed. That depreciation also reflected the very aggressive action of the Federal Reserve to support the U.S. economy by keeping interest rates low (*Economist* 2021). This benefits American businesses and households that borrow to purchase equipment or homes, but it makes U.S. financial assets less attractive to global investors. Lower foreign demand for U.S. assets, in turn, resulted in dollar depreciation from April through December 2020, as seen in figure 3-8.

In 2021, the dollar resumed appreciating and ended the year up 3.6 percent against the currencies of its major trading partners, as measured by a Federal Reserve Board index (figure 3-8). Expectations were that the Federal Reserve would begin to tighten policy earlier than other central banks, and that contributed to the rise in the dollar's value (Rovnick, Rennison, and Platt 2021). Such expectations reflected two aspects of America's macroeconomic performance relative to our trading partners: the more rapid recovery in U.S. output, and the relatively larger rise in inflation. A strengthening

Figure 3-8. Nominal Broad Dollar Index

Index level: Jan. 2, 2020 = 100

Source: Federal Reserve Board.

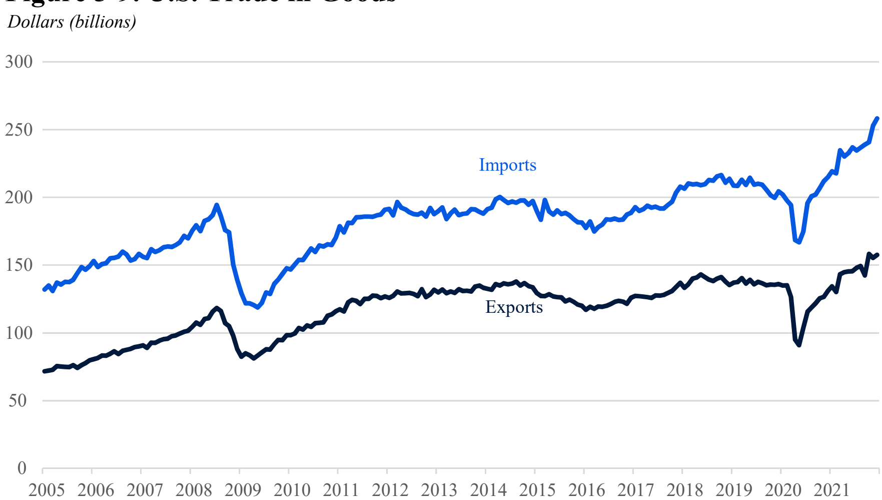
dollar tends to widen the trade deficit by making imported goods cheaper for American consumers, which boosts imports, and U.S. exports become more expensive for foreign buyers, depressing exports (Gruber, McCallum, and Vigfusson 2016).

International Trade in Goods

U.S. trade in goods rebounded relatively quickly after the sharp drop at the onset of the COVID-19 pandemic in 2020, and continued to rise through 2021. Both exports and imports of goods broke nominal records set in 2018. Goods imports breached record levels in real terms as well. This swift and robust rebound stands in sharp contrast to the stagnation in trade that followed the Great Recession, beginning in 2008 (figure 3-9). From the start of the Great Recession, goods exports did not recover from their precrisis peak for more than two years, and goods imports did not systematically rise above their precrisis peak for nearly 10 years.

As discussed in the previous section, 2021 growth in imports generally outpaced that of exports. This has been true throughout the economic recovery. Even though goods imports had fully recovered in real terms to prepandemic levels by November 2020, U.S. exports did not achieve that feat until more than a year later, in October 2021 (Census Bureau 2022b). The faster recovery of imports relative to exports is a direct consequence of the broader macroeconomic context discussed earlier in this chapter. However, the effects of pandemic-related disruptions inhibited export recovery for some products more than others.

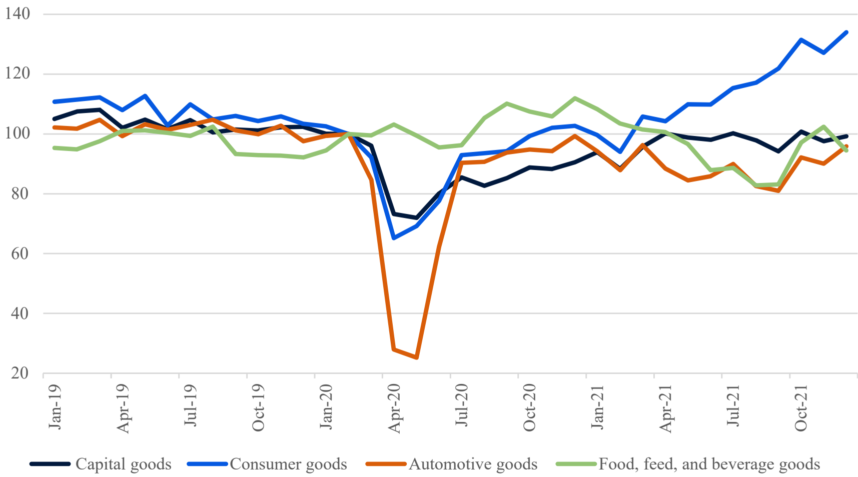
Figure 3-9. U.S. Trade in Goods



Source: Census Bureau.
Note: Data are seasonally adjusted.

Figure 3-10. Real Exports, Selected End-Use Categories

Index level: Feb. 2020 = 100



Source: Census Bureau.
Note: Data are seasonally adjusted.

In real terms, U.S. exports of food, feed, and beverages were little affected and exceeded their February 2020 levels for most of the second half of that year. U.S. exports of consumer goods surpassed their prepandemic level in November 2020 (figure 3-10).[2] By contrast, exports of capital goods did not exceed their prepandemic value until April 2021, and remained at about that level for the rest of the year. Exports of autos and parts were more than 10 percent below their prepandemic level for most of the year.

The relatively swift rebound in exports of consumer goods highlights the global nature of the pandemic-induced switch from services to goods consumption. The softer performance of capital goods and auto exports reflects the flip side of the strong demand unleashed by the economic recovery. Supply challenges for critical inputs disrupted the global value chains that characterize production in the automotive and other capital goods industries, inhibiting their ability to meet surging domestic and foreign demand (see chapter 6 for a full discussion of supply chain challenges). The final goods produced and exported by American businesses in these industries are complex. Automotive exports often rely on semiconductors, the global supply of which was notably stressed in 2021 (McKinsey & Company 2021; Ewing and Boudette 2021). Civilian aircraft, engines, and parts represented the largest share of the decline in exports of capital goods relative to 2019, reflecting diminished demand by airlines after COVID-19 dramatically reduced air traffic (Census Bureau 2022a; Kuzmanovic and Rassineux n.d.).

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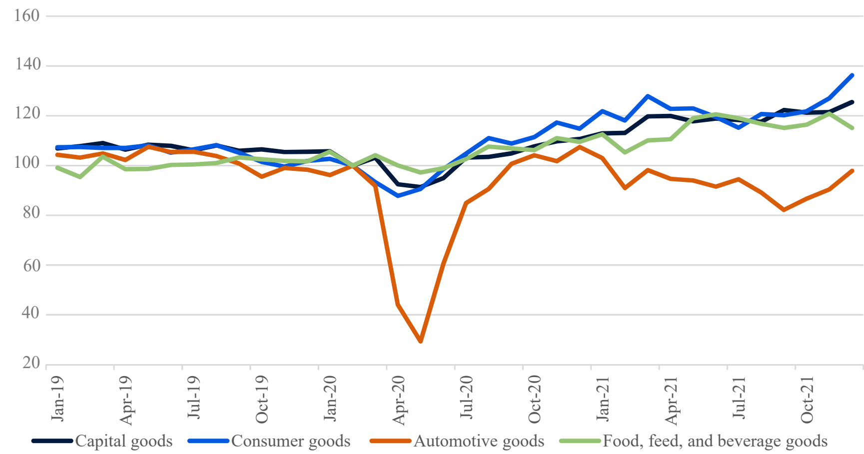
[2] The BEA end-use category "food, feed, and beverages" consists of agricultural commodities, including those used for animal feed, as well as fish and shellfish, prepared foods, and alcoholic and nonalcoholic beverages.

Figure 3-11. Real Imports, Selected End-Use Categories
Index level: Feb. 2020 = 100



Source: Census Bureau.
Note: Data are seasonally adjusted.

The composition of U.S. imports growth in 2021 highlights the strength with which U.S. demand has recovered and the challenges economies around the world continue to face. U.S. goods imports dipped across the board during the initial months of the pandemic, but to a lesser extent than exports, and then rapidly exceeded their pre-COVID-19 level (figure 3-11). Consistent with the increased consumption of goods relative to services, imports of consumer goods showed a striking increase in 2021, rising to 16.6 percent above their 2019 level. Imports of capital goods, such as machinery used in factories, also rose notably in 2021, to 11.3 percent in real terms above their 2019 level, as domestic American firms expanded to satisfy booming U.S. demand.

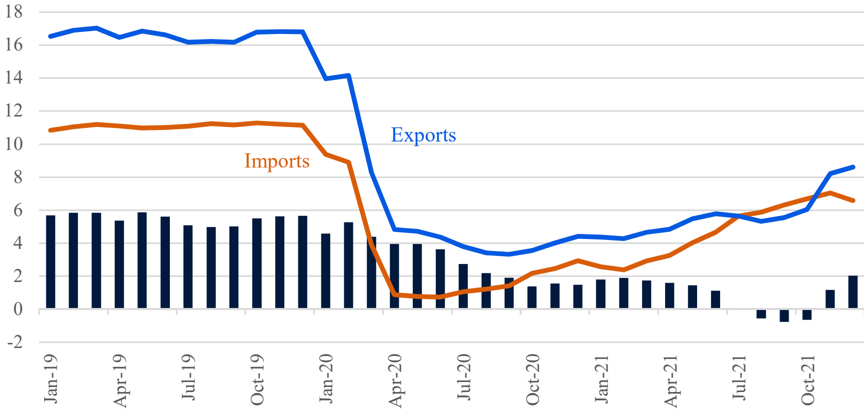
The trajectory of automotive imports illustrates the global nature of the supply chain stresses that emerged during 2021. Though automotive imports initially rebounded, they subsequently declined as global supply chains were disrupted (Ewing and Boudette 2021). Imports in this category were 9.6 percent below their 2019 level in 2021. This category includes both motor vehicles and parts, but the decline was entirely due to falling imports of finished vehicles, while parts were slightly above their 2019 level (Census Bureau 2022a). As discussed previously in this chapter, the recovery of the U.S. automotive sector outpaced that of other major auto-manufacturing countries in 2021.

International Trade in Services

In contrast to the relatively swift recovery of trade in goods, the exigencies of containing the spread of COVID-19 continue to suppress global demand

Figure 3-13. Trade in Travel Services

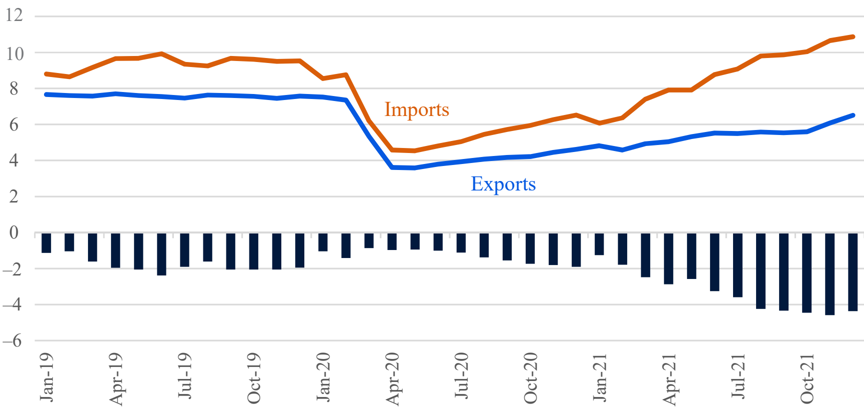
Dollars (billions)



Source: Bureau of Economic Analysis.
Note: Data are seasonally adjusted.

Figure 3-14. Trade in Transportation Services

Dollars (billions)



Source: Bureau of Economic Analysis.
Note: Data are seasonally adjusted. In official U.S. data on services trade, this category is named "transport" rather than "transportation."

Because nearly all major shipping firms are foreign-owned (Marine Digital 2021), these costs register as U.S. service imports. In contrast, U.S. exports of transportation services are dominated by passenger air transportation, which, like travel services, were suppressed by restrictions on foreign travel to the United States until the end of 2021 (BEA 2022a).

Categories of services that saw a robust recovery included finance and insurance trade and other business services imports. Because they do not rely as heavily on in-person interaction, both imports and exports increased year-on-year relative to their 2019 levels throughout the pandemic and recovery. Similarly, trade in intellectual property, telecommunications, and other business services recovered quickly and is now above 2019 levels.

Policies to Build an Equitable International Economy

U.S. participation in the global economy has yielded important benefits, including lower prices for consumers, lower costs for American manufacturing inputs, and access to a greater variety of products as well as larger markets for American-made goods and services. However, global economic integration has also increased the exposure of American businesses and their workforces to import competition, which has meant loss of livelihoods for some American workers, thus contributing to the troubling rise in inequality documented in chapter 1 of this *Report* (Clausing 2019; Autor, Dorn, and Hanson 2013, 2016, 2021). Other factors have also pushed up inequality, ranging from the declining progressivity of the tax system (Antràs, de Gortari, and Itskhoki 2017) to increased automation in manufacturing production (Moll, Rachel, and Restrepo 2021). Nonetheless, the effects of U.S. international trade and investment policies on American workers and communities, and thus on economic inequality, have also played a role.

The COVID-19 pandemic provided an opportunity to refocus domestic and international policies to alleviate the disruptions that participation in the global economy can inflict on American workers and increase the opportunities that it can offer them. This means seeking a better balance between, on one hand, reducing costs for American businesses and lowering prices for consumer products and, on the other hand, ensuring that workers whose livelihoods are at risk from global competition are not disproportionately harmed. Ensuring that U.S. participation in the global economy supports the Biden-Harris Administration's goal of a more equitable economy at home also requires policies that level the international economic playing field by improving labor standards abroad, confronting unfair practices by our trading partners, and making the international tax system fairer. Trade policy can also support another fundamental policy goal, the reduction in greenhouse gas emissions; box 3-3 describes how this can be accomplished.

Broadening the Gains from Trade

The uneven effects of the COVID-19 pandemic demonstrated inequalities within American society, showcasing how negative economic shocks can be disproportionately concentrated among individuals who are more economically vulnerable.[4] Similarly, the job and income losses that have accompanied rising import competition have often fallen disproportionately

[4] See, e.g., Mongey et al. 2021; Chetty et al. 2020; Liu and May 2020; and Hardy and Logan 2020.

Box 3-3. Greenhouse Gas Emissions and Trade

As an example of how trade policy can support a broader set of goals, consider international trade policy oriented toward incentivizing the reduction of greenhouse gas emissions. Effectively combating climate change requires policies that reduce global emissions of greenhouse gases and increase resilience to the climate changes that have already happened. However, those very policies can put domestic production at a competitive disadvantage relative to production in countries with less stringent mitigation policies (Dechezlepretre and Sato 2017). Further, local policies that reduce emissions by producers in one country are ineffective—from a global perspective—if their primary effect is to shift emissions elsewhere.

To create a level playing field in domestic markets with strong climate policies and ensure maximal decarbonization from those policies, scholars and policymakers have suggested introducing trade rules based on the carbon content of traded goods and services. Such a policy could, for example, impose a carbon fee on goods imported from countries with less ambitious climate policies that offsets the climate regulatory costs that producers face in the domestic market. Research suggests that these policies can help accelerate decarbonization globally and protect the domestic industry in the countries enacting them (Campbell, McDarris, and Pizer 2021). For example, the United States and European Union reached an agreement in late 2021 to negotiate a global arrangement for trade in steel and aluminum that takes the carbon intensity of these industries into account and that aims to drive industrial decarbonization around the globe (White House 2021b).

These emissions-based trade policies need not favor any one mechanism for incentivizing decarbonization, recognizing that domestic mitigation policies can take many forms—from regulations to tax incentives to a carbon price. Instead, these trade tools can retain the flexibility for countries to enact a range of climate policy tools, as long as emissions are decreasing. As discussed in chapter 7 of this *Report*, policies that encourage domestic industries to shift toward clean energy could, for example, take the form of regulations, tax incentives, and other similar provisions.

on low-skilled workers, exacerbating inequality (Clausing 2019). A large body of economic research focused on the effects of the dramatic increase in import competition from China in the early 2000s, the so-called China Shock, has demonstrated that, though the gains from international trade have been substantial, the costs have outweighed these gains for some U.S. communities. Increased import competition from China has had adverse effects on employment and incomes in labor markets that are more exposed to competition from China, and these adverse effects have persisted long after the initial shock (Autor, Dorn, and Hanson 2013, 2016, 2021).

In the future, U.S. policy should aim to mitigate and indeed reverse the effects that greater exposure to import competition has had on inequality in America. This requires rebalancing the objectives of trade policy to give greater weight to its impact on individuals and communities that are negatively affected. To effectively incorporate these interests, policymaking must become more inclusive, and thus must be informed not only by the views of American firms directly engaged in international trade and workers competing with imports but also by the views of affected communities and other stakeholders.

In addition, economic scholarship has consistently called for complementary domestic policies to increase American workers' competitiveness and address the disruptions experienced by those affected by negative trade shocks. Basic economic policies focused on workers would better equip them to adapt to changes in the economy, including those that are transmitted through international trade (Clausing 2019; Rodrik 1996; Hanson 2021; Dixit and Norman 1986). The investments in transportation infrastructure that have been made possible by the Bipartisan Infrastructure Law will make it easier for U.S. goods exports to reach markets overseas. Greater exports, in turn, promote economic growth and support well-paying jobs, especially for blue-collar workers (Riker 2015). Along with the other policy proposals to fortify America's supply chains discussed in chapter 6 of this *Report*, these investments will also bolster U.S. competitiveness both at home and abroad, and more broadly distribute the gains from the country's participation in the global economy. Looking ahead, the investments in human capital outlined in chapter 4 of this *Report* would equip American workers with skills and education that would enlarge their share in the benefits of international trade and investment.

Leveling the International Economic Playing Field

Key to broadening the gains from trade is ensuring that American workers are competing on a level playing field. Too often, the competitiveness of American workers and firms has been eroded by other countries' inadequate labor standards and unfair trade policies and practices, and also by international tax competition.[5] Economic analyses that ignore the negative effects of these practices provide only a narrow and potentially misleading view of the gains from trade and how they are distributed domestically and internationally.

Labor standards. An important component of modern trade agreements between countries are provisions to improve labor conditions. These

[5] Chapter 5 of this *Report* discusses the importance of fair competition in domestic markets.

are intended to ensure that workers are appropriately compensated and protected during their work, and that relative competitiveness is not driven by differences in labor standards between the countries. Twice in 2021, the United States invoked the rapid response mechanism included in the United States–Mexico–Canada Agreement to respond to allegations that workers in Mexico were being denied the rights of free association and collective bargaining. The first time was in response to corruption uncovered during a worker vote on a collective bargaining agreement at an automotive plant, which resulted in the United States and Mexico negotiating a plan to address the violations and provide for a free and fair vote on the agreement (USTR 2021b). The second responded to a petition filed by the AFL-CIO and others alleging violations during a union organizing campaign at an auto parts company (USTR 2021a). The resulting agreement with the company in question not only secured compensation for the adversely affected workers but also put in place mechanisms to protect workers' rights.

Labor standards are also crucial when some producers resort to practices that are not only unfair but also inhumane, in that they rely on forced labor. The International Labor Organization (ILO) estimates that 25 million individuals on any given day are subjected to forced labor (ILO 2017), and that this forced labor generates large profits for the firms involved (ILO 2014). Though some have argued that market forces on their own will drive coercive employers out of the labor market, recent theoretical modeling calls this result into question (Acemoglu and Wolitzky 2011). Indeed, the tragic persistence of forced labor suggests that policy actions are needed to combat the practice. To this end, Group of Seven leaders, including the United States, made combating forced labor a priority starting at their June 2021 meeting (Group of Seven 2021). After discussions of conditions in China's Xinjiang Uyghur Autonomous Region (White House 2021a), the Group of Seven called for strengthened cooperation and collective efforts to eradicate the use of all forms of forced labor in global supply chains.

Responding to unfair trade policies and practices. One of the most significant challenges for the United States' ability to realize broadly distributed gains from trade is the direct and indirect support for targeted industries used by some foreign governments to promote their own domestic producers at the expense of other producers, including the United States. Foreign governments implement such policies using a variety of tools, including taxes, subsidies, preferential regulatory treatment for domestic enterprises, broad support for state-owned enterprises or other state-affiliated entities, and formal and informal restrictions on the ability of foreign enterprises to compete in the domestic market. At a minimum, these interventions create economic distortions that disadvantage foreign producers in the domestic market and often in third-country markets as well, diminishing the benefits of the commitments they have made under multilateral and preferential trade agreements. In more egregious circumstances, they can concentrate market power in the country that uses them, stifling global competition, limiting innovation, and creating opportunities for economic coercion (Sykes 2003; Hart 2020; Autor et al. 2020; Bown 2022).

Global markets for industries such as steel, aluminum, and solar panels bear the hallmarks of government policies designed to secure market power. Over time, China's array of government support and policy directives, which experts have argued amount to sizable subsidies, have led China to become the dominant global supplier in each of these industries (Bown and Hillman 2019). Public statements of policy suggest that China is using continued, targeted government support for specific high-tech manufacturing industries aimed at promoting its dominance at the expense of its trading partners (CRS 2020; Creemers et al. 2021). Unchecked, the effects of China's capture of these industries can be expected to give Chinese firms substantial market power, further concentrating crucial aspects of global manufacturing in a single country, at the expense of producers of competing goods in the United States (Bown and Hillman 2019). Such policies can also hinder the adoption of critical innovations, because the subsidies that facilitate market dominance are not necessarily directed toward the best technology available (Hart 2020). Importantly, the burdens associated with China's system of targeted industrial policies fall not only on the United States but on all countries whose producers compete with China in global markets (McBride and Chatzky 2019). As such, efforts to counter the use of these policies are most effective when pursued collaboratively and in concert with U.S. allies and partners (Mattoo and Staiger 2020).

Reform of the international corporate tax system. Leveling the playing field for American workers and businesses requires reform of the international corporate taxation system to curtail a race to the bottom in corporate taxation, whereby countries lower their tax rates to attract mobile multinational activities (Azemar et al. 2020). This practice distorts businesses' decisionmaking, including production decisions, while also generating less tax revenue than could be obtained if countries engaged with one another cooperatively (Cobham and Jansky 2018). Large multinational firms have taken advantage of this tax competition among countries by shifting profits and economic activities to minimize their tax burdens (Guvenen et al. 2019).

In 2021, world leaders reached a historic agreement that will address these challenges and stabilize the international tax system. The plan to reform international tax practices was agreed to by the overwhelming majority of the world's economies—representing over 90 percent of world GDP. The agreement includes a global minimum tax of 15 percent that would apply to profits of multinational firms that have more than €750 million (about $822 million) in sales globally. It also includes provisions that would reallocate some taxing rights over certain residual profits of multinational firms to the markets where products are consumed, regardless of whether these firms have a physical presence in these markets (OECD 2021).

These reforms respond to concerns that businesses generate value from profits in certain jurisdictions while paying minimal taxes there. As such, the agreement addresses existing international tax tensions by incorporating commitments from several countries to withdraw digital services taxes that would have fallen disproportionately on multinationals headquartered in the United States (Giles 2021). The reforms would generate additional revenue that could help countries address the myriad challenges they face, including rising inequality.

A Collaborative, Transparent Policymaking Process

Reorienting policy to ensure that the United States' participation in the global economy does not exacerbate rising inequality requires important changes, but experience shows that the benefits of such policy shifts are greater when they happen after consultation with our trading partners and through a process that is transparent for those affected. Through trade agreements and through entities such as the World Trade Organization, the United States has long cooperated with its trading partners to establish and enforce global trade rules (Bagwell, Bown, and Staiger 2016). In addition to providing reliable market access for U.S. exporters, such institutions limit the use of beggar-thy-neighbor policies, which advance one country's targeted economic outcomes at the expense of those of other countries (Ossa 2014). An approach to addressing the flaws in current U.S. trade policy and in global trade rules that ignores the commitments the United States has made weakens these institutions and diminishes the benefits that they bring to American firms and workers. This is exemplified by the retaliatory measures taken by many of our trading partners in response to U.S. trade policy actions in 2018 and 2019 that they judged to be in violation of commitments made by the United States under the World Trade Organization's rules (Mattoo and Staiger 2020). These retaliatory measures cost U.S. manufacturing jobs (Flaaen and Pierce 2019), exports (Morgan et al. 2022), incomes, and more broadly economic welfare in the period immediately after their imposition (Amiti, Redding, and Weinstein 2019; Cavallo et al. 2021).

Fundamentally, the global system of trade rules benefits not only domestic producers directly engaged in international trade as importers or exporters but also buyers of goods and services for which prices are influenced by global markets. A large body of research has established that uncertainty negatively affects economic outcomes (Bloom 2014), and more recent work makes clear that this is also true of trade policy uncertainty (Caldara et al. 2020; Heise et al. 2021). Global trade rules limit uncertainty about future changes in tariffs or the imposition of other trade restrictions, which can in turn foster investment and employment. Although changes to U.S. trade policy are needed, elevated uncertainty about how trade policy might alter prices and availability along global value chains pose a particular challenge in the wake of the COVID-19 pandemic's supply chain disruption (Miroudot 2020).

Making the necessary changes to U.S. international economic policy to ensure the benefits from trade are more broadly distributed and that competition takes place on a level playing field demands rethinking some of the existing rules and norms governing international economic relations. The practical difficulties of making changes within existing institutions creates a complex challenge for governments seeking to develop sustainable international economic policy. However, implementing changes noncooperatively could ultimately leave the United States worse off if its trading partners no longer feel constrained to respect their own commitments (Mattoo and Staiger 2020; Bown and Hillman 2019). Trade policy that is long on combative rhetoric and indifference to trade partners' interests, but short on substance and consistency, puts American firms at a disadvantage. It dissuades our partners and allies from working with the United States to tackle common challenges. Importantly, it cannot deliver on creating jobs, reducing inequality, or promoting economic growth more generally. Since 2021, the Biden-Harris Administration has been renewing strong relationships with our trading partners, working to resolve outstanding trade issues and to establish cooperative frameworks to address emerging challenges.

Conclusion

Comparing the performance of the United States' economy during 2021 with that of our trading partners demonstrates this country's resilience at a time of daunting challenges. Supported by a strong fiscal response and a rapid vaccine rollout, the GDP of the United States exceeded its prepandemic level before those of other major advanced economies. However, as the recovery got under way, demand continued to tilt toward goods and away from services. This shift in global consumption patterns interacted with stressed supply chains to generate inflation in the United States and most of our major trading partners, although this effect was particularly pronounced here due to the relative strength of our recovery. The faster pace of the U.S. economic recovery has also resulted in a widening trade deficit.

Openness to international commerce provides substantial benefits to the U.S. economy. However, these benefits have at times come at the cost of wider domestic inequality. We must engage with our partners and allies to make international economic engagement work for all Americans, by ensuring that the global rules are aligned with domestic objectives and values, and that these rules are rigorously enforced.

★★★★★★

Chapter 4

Investing in People: Education, Workforce Development, and Health

To increase productivity and growth, we must invest in the American people. U.S. investments in universal primary and secondary education in the early 20th century, combined with medical advances in such areas as vaccines and antibiotics, contributed to strong growth throughout most of that century (Goldin and Katz 2008; Goldin 2016). Life expectancy at birth increased by nearly 30 years between 1900 and 2000 in the United States (CDC 2017), and we developed a highly skilled labor force (Goldin and Katz 2008). These gains contributed to economic growth and rising living standards across the Nation. However, increases in educational attainment and life expectancy have slowed in recent decades, and the United States is now falling behind other peer countries.

When society invests in people, the economy has more capacity to grow. In the first half of the 20th century, for example, the United States led the world in high school enrollment (Goldin and Katz 2008) and ranked among the top 10 in life expectancy.[1] In contrast, by 2017, the country had slipped to 12th in the share of 25- to 34-year-olds having completed some postsecondary education and to 29th in life expectancy at birth among members of the Organization for Economic Cooperation and Development (OECD) and its partner countries.[2] These slips in rank are not simply a matter of other

[1] CEA calculations, based on life expectancy data from Roser, Ortiz-Ospina, and Ritchie (2013).
[2] CEA calculations, based on tertiary education data from the OECD (2022a) and life expectancy data from the OECD (2022b). Tertiary education data are not available for India or China in 2017.

countries catching up, but rather of the United States falling further behind.[3] This suggests that the United States may be underinvesting in people, potentially dampening economic progress. Further, there are widespread and long-standing disparities in the United States by race, ethnicity, and gender in measures of human capital investment and accumulation. For example, in 2019, 82 percent of Asian young adults immediately enrolled in college after high school completion, compared with 58 percent of Black recent high school graduates (de Brey et al. 2021, table 302.20); and in 2018, life expectancy at birth for a Hispanic infant was seven years longer than for a non-Hispanic Black infant (Arias and Xu 2020). Inequitable access to relevant resources exacerbates the persistence of these issues. For more discussion of the structural nature of such racial and gender disparities, see chapter 5.

Economists analyze investments in people in terms of the "human capital" they produce—a concept that captures the knowledge, skills, health, and other valuable resources embodied in a person. Just as investments in physical or financial capital can reap benefits, well-timed investments in people can generate payoffs to individuals, employers, and society. Education and job training are classic examples of inputs to human capital. Other crucial investments include mental and physical health and work experience. The contributions these investments in people make to economic well-being and growth depend on how effectively the human capital they produce is developed and deployed.[4]

This chapter focuses on what is known about key investments in human capital—education, workforce development, and health—as well as policies to ensure that individuals, society, and the economy can fully benefit from

[3] In 1992, the United States ranked second in the percentage of young adults with postsecondary education, 3 percentage points behind Canada. By 2019, just over 50 percent of U.S. young adults had completed some form of postsecondary school, roughly 13 percentage points behind Canada and more than 19 percentage points below number-one-ranked South Korea. Further, in 1975, the U.S. life expectancy at birth was within three years of the top-ranked OECD country (Iceland); but by 2019, U.S. life expectancy at birth was four years below Iceland and five and a half years below that of top-ranked Japan.

[4] See Jacobs and Hipple (2018) for a discussion of inequality and intergenerational mobility with a similar frame.

these investments. The first section explains why human capital plays such an important role in economic growth. The second section discusses ways in which additional investments in education, workforce development, and health are needed to improve the development of human capital and reverse the course of the past 20 years. And the third and final section highlights several areas where changes to government policy or institutional and societal practices could help people deploy their human capital more productively.

Human Capital Is Critical for Economic Growth and Individual Well-Being

In thinking about how human capital affects individuals and the economy, researchers focus on both macroeconomic and microeconomic perspectives. From the macroeconomic perspective, human capital improvements are a key factor in generating economic growth; and, ultimately, long-run economic growth helps determine living standards. Generally, economists look for output to grow at least as fast as population growth to maintain living standards and to grow faster than population growth to improve them; thus, they often rewrite total output in terms of output per person.

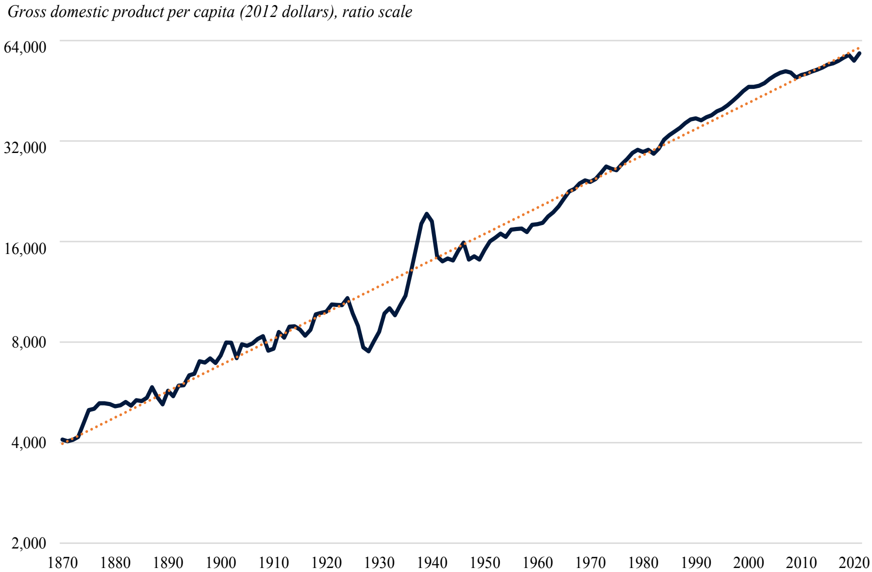
Figure 4-1 shows the time series of per capita U.S. gross domestic product (GDP)—the most popular measure of economic output—on a ratio scale from 1870 through 2021. The ratio scaling means that the slope of the fitted line (shown in orange dots) represents the average annual growth rate over the period. As shown in figure 4-1, the growth rate was remarkably stable over this time, despite large deviations from that trend during and after the Great Depression. Over the roughly 150-year period, per capita U.S. GDP grew at an average rate of 1.8 percent a year.

In a simple model of the economy, output per person can be written in terms of four factors—the (physical) capital-output ratio, human capital per person, research intensity (idea generation), and the number of people in the economy. When Fernald and Jones (2014) decompose per capita GDP growth into growth from these four components over the 1950–2007 period, they estimate that 20 percent of growth came from increases in human capital, nearly 60 percent can be attributed to increases in research intensity, and the remaining roughly 20 percent was due to a growing population.[5]

From a microeconomic perspective, human capital accumulation is associated with various benefits to individuals, their families, and their communities. Although many benefits of human capital investment accrue

[5] Since capital and output grew at roughly the same rate, the capital-output ratio added 0 percent to per capita GDP growth over this period.

Figure 4-1. U.S. Gross Domestic Product per Person, 1870–2021



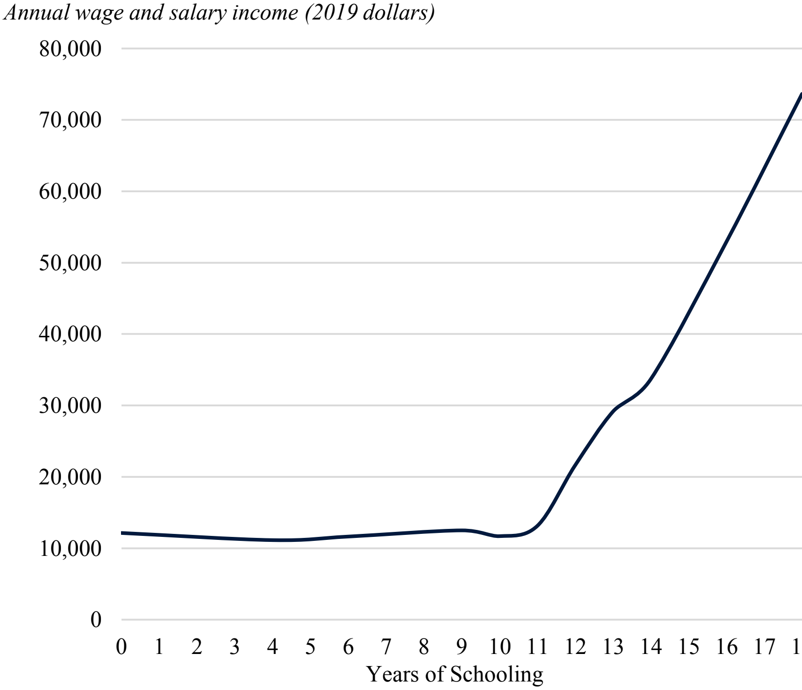
Source: Updated and reproduced from Fernald and Jones (2014). Data for 1870 to 1929 are from Madison (2008). Data for 1929 to 2021 are from the Bureau of Economic Analysis.
Note: Orange dots represent the fitted line.

directly to individuals in the form of buying power or the ability to enjoy life, this chapter primarily focuses on individuals as workers in the economy and how human capital investments contribute to U.S. productivity and growth.

The relationship between additional years of education and earnings is among the most extensively documented in economics. Figure 4-2 illustrates this relationship, reflecting that, on average, more highly educated workers both earn higher wages and enjoy higher employment rates. Researchers find positive returns to additional education at the elementary and secondary levels as well as the postsecondary level (Angrist and Krueger 1991; Card 1995; Kane and Rouse 1995; Ashenfelter and Rouse 1998; Card 1999; Zimmerman 2014). Additional years of education increase wages, on average, because education increases worker productivity in the labor market, which increases output growth. Similarly, work experience is associated with higher earnings as workers develop valuable skills through on-the-job training.

Researchers find that more education also reduces adult mortality rates (Buckles et al. 2016) and incarceration rates (Lochner and Moretti 2004) and raises civic engagement (Milligan, Moretti, and Oreopolous 2004). Research also finds that maternal education has a positive effect on infant health

Figure 4-2. Earnings Increase with Years of Schooling



Source: 2015–19, American Community Survey, 5-year sample.
Note: The sample is limited to individuals 25 and above.

(Currie and Moretti 2003). As such, investments in education can even raise the human capital of the next generation.

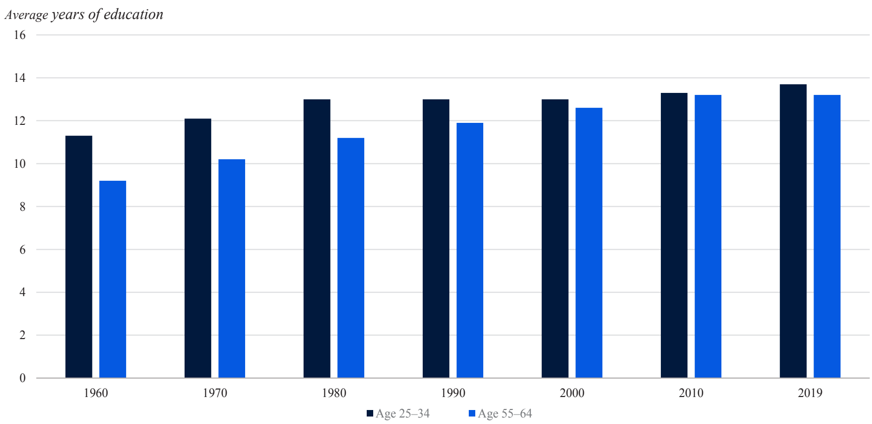
Although health is prominent as one of human capital's key elements (along with education, migration, labor market information, and job training) in the original formulation of human capital by Schultz (1962), fewer studies have explored health within this framework. Vaccines and public safety measures, through reductions in death and work-hampering disability, can increase the size and productivity of the workforce (Bleakley 2010; Hamory et al. 2021). Other health investments increase productivity by improving workers' mental health or quality of daily living. At the macroeconomic level, cross-country regressions suggest that health is a robust predictor of economic growth, with a one-year increase in life expectancy predicting an increase in GDP per capita of about 2 to 4 percent (Sharma 2018; Bloom and Canning 2003).

Measuring the Stock of Human Capital

Researchers would, ideally, like to study all forms of human capital but remain limited to those aspects that can be easily or consistently measured. For example, the World Bank's index of the stock of human capital in different countries is constructed using measures of childhood survival and health in addition to quality-adjusted educational attainment, which are combined with estimates of how these dimensions affect productivity (Kraay 2018). Measures of human capital used to estimate potential GDP growth in the United States depend largely on educational attainment, work experience, and estimates of how both affect productivity. Educational attainment and years of work experience are only proxies for human capital. Notably, years of completed education are not adjusted for differences in quality and do not reflect job-training programs, such as apprenticeships, that operate outside a school-based setting. Further, any systematic change in human capital that is unmeasured, such as improvements in the quality of education or declines in health, can bias estimates of human capital and potential output growth.

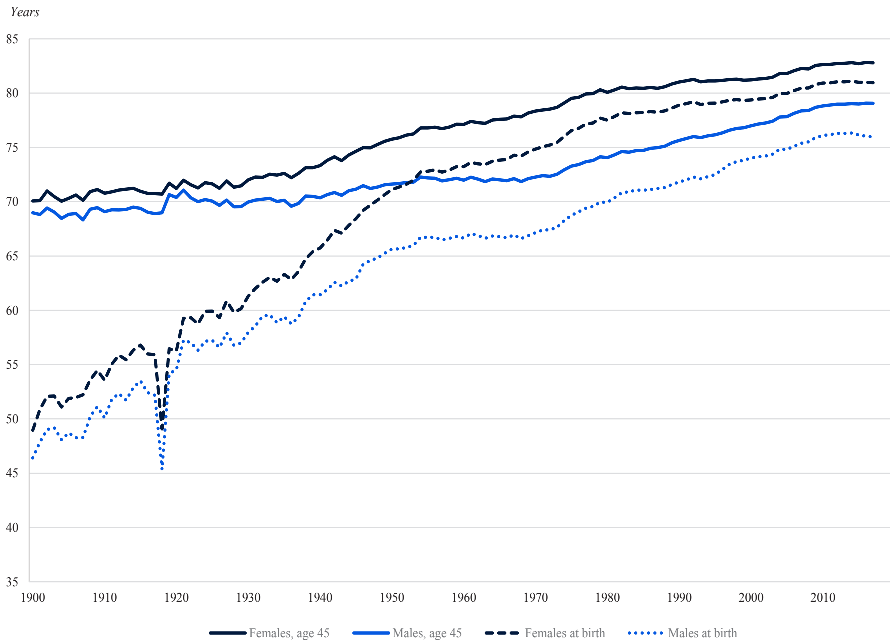
Rising U.S. educational attainment was a main driver of measured human capital growth over the second half of the 20th century (Aaronson and Sullivan 2001). However, though recent cohorts of Americans are the most educated ever, their average years of completed education only modestly exceed what the prior generation attained. Figure 4-3 displays average years of education over time for individuals age 25–34 years and age 55–64. In 1960, individuals in the 55–64 range had completed 9.2 years of education on average, while the younger group, 25–34, averaged 11.3 years of education, a difference of just over 2 years. By 1990 this gap had closed to

Figure 4-3. Average Years of Education by Age Group



Sources: Census Bureau; CEA calculations. Data for 1960 and 1970 are from the 1 percent sample; data for 1980, 1990, and 2000 are from the 5 percent sample; and data for 2010 and 2019 are from the American Community Survey.
Note: If educational attainment is nursery school to grade 4, the observation is coded as 4 years of education. If educational attainment is grade 5, 6, 7, or 8, the observation is coded as 8 years of education. Observations with 5+ years of college are coded as 17 years of education.

Figure 4-4. Life Expectancy, 1900-2019



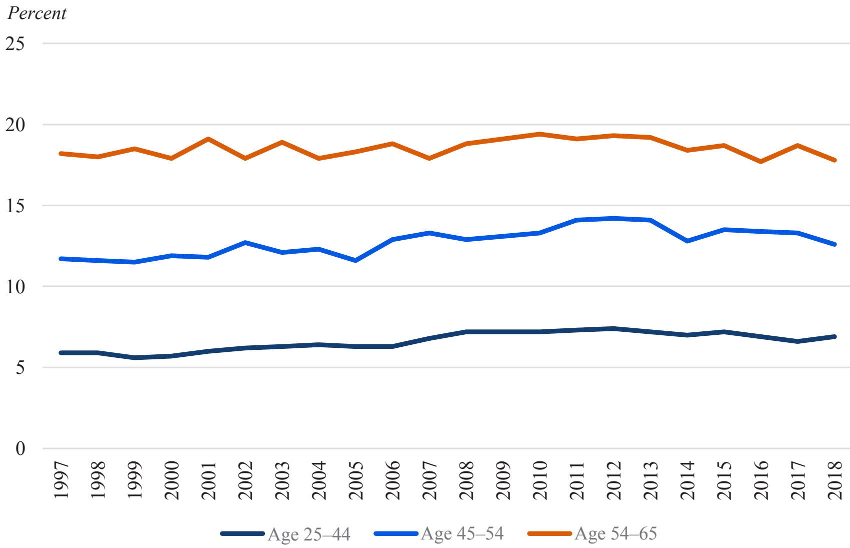
Source: Our World in Data 1900-2014, Social Security Administration 1915-2019.

just over 1 year, and by 2019 the gap was only half a year. When younger cohorts far exceed their elders in years of completed education, the average education level of the workforce increases rapidly. However, as that gap closes, retirees are replaced by new entrants with roughly the same level of education. This slowing in the growth of educational attainment corresponds to a slowing in the growth of human capital per worker, all else being equal.

When measuring health as a contributor to human capital, life expectancy at birth is a common metric used in the United States and other developed countries. Figure 4-4 illustrates life expectancy at birth and at age 45 for both males and females between 1900 and 2019. In that period, life expectancy at birth rose about 30 years for both sexes. Most of the gains occurred between 1900 and 1955, largely due to reductions in infant and child mortality (Crimmins, Preston, and Cohen 2011). As a result, life expectancy at age 45 increased by a more modest 13 years for females and 10 years for males. In the decade before the COVID-19 pandemic, life expectancy at birth rose by less than half a year, compared with gains averaging about 4 years per decade between 1900 and 1950 and 1.7 years per decade between 1950 and 2010.

The COVID-19 pandemic has directly destroyed human capital through death. The virus has also reduced and delayed investments in

Figure 4-5. Percent Reporting Health as Fair or Poor, 1997–2018



Source: National Health Interview Survey.

education, experience, and health. Of note, COVID-19 accounted for sizable reductions in estimates of provisional life expectancy between 2019 and 2020 (Arias et al. 2021), even though children who were born in 2020 are unlikely to experience the same conditions at older ages that led to the estimated decline. This is one example of why changes in life expectancy can be less meaningful as a reflection of health human capital than alternatives such as disease prevalence, work-limiting disabilities, or indices of activities of daily living. (For more on the effect of the COVID-19 pandemic on health human capital, see box 4-1.)

That said, the plateauing of gains in life expectancy before the pandemic is consistent with evidence from other measures of health that are only available for more recent years. Self-reported health, for example, can be predictive of subsequent mortality, even after controlling for socioeconomic status and comorbidities (McGee et al. 1999). Figure 4-5 presents data from the National Health Interview Survey on the percentage of respondents by age group reporting that their self-assessed health status was either fair or poor between 1997 and 2018. For adults in all three age groups, the percentage rating their health as fair or poor has held steady or even increased over this period. These findings suggest that the growth in the stock of health human capital among working-age adults has slowed.

Demographic change, driven by the current and upcoming retirements among the large baby boom generation, also has implications for growth in human capital per person. When baby boomers first started entering

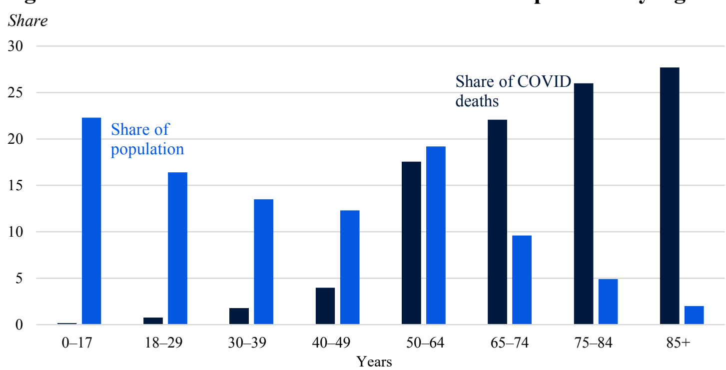
Box 4-1. COVID and Health

Through the end of 2021, there were over 820,000 reported deaths from COVID-19 in the United States (CDC 2022). One measure of excess deaths, which includes unreported pandemic deaths along with deaths from related causes, suggests the true COVID-19 death toll through 2021 might be 15 percent higher than reported (Giattino et al. 2020). About 75 percent of reported deaths from COVID-19 have occurred among those over age 65 (CDC 2021a). As shown in figure 4-i, deaths from COVID-19 are more concentrated among older people, especially those age 85 and above.

However, deaths do not tell the whole story; communities of color saw higher rates of hospitalization and greater losses in life expectancy between 2019 and 2020, largely due to the effects of COVID-19 (CDC 2021c; Arias et al. 2021). Further, there were over 54 million reported COVID-19 infections through the end of 2021, and tens of thousands of patients were hospitalized with the virus during a typical week in 2021 (CDC 2022; Johns Hopkins University 2022). These consequences of the pandemic are causes for concern from a human capital perspective: COVID-19 can cause many health complications aside from death, and those complications may be occurring in people who have much of their working lives ahead of them.

The effects of COVID-19 on health are not limited to those who become infected, however. Secondary consequences of the pandemic have created a series of health challenges. Primary among them has been an overall decline in mental health. More than half of women and a third of men reported worsening mental health after the beginning of the pandemic, with about a fifth saying the pandemic had a major impact

Figure 4-i. Share of COVID Deaths and Share of Population by Age



Source: Centers for Disease Control and Prevention.
Note: Data are current as of January 18, 2022.

(Frederiksen et al. 2021). One study estimates the risk of depression among college students in spring of 2020 was 50 percent higher than prepandemic rates (Giuntella et al. 2021); another finds that the average share of adults reporting symptoms of anxiety disorder and/or depressive disorder were up nearly fourfold in January 2021 (Panchal et al. 2021). The problem has also been worse for groups that are already socially marginalized. Women with children, Hispanic and Black people, the unemployed, and essential workers were more likely to report mental health issues during the pandemic (Panchal et al. 2021).

Declines in mental health during the pandemic exacerbated other negative outcomes. A late 2020 survey found that 15 percent of adults in the United States reported starting or increasing substance use as a way of dealing with the pandemic (Czeisler et al. 2021). In November 2021, the Centers for Disease Control and Prevention (CDC) estimated that there were 100,306 overdose deaths in the 12-month period ending in April 2021, up nearly 30 percent from the previous 12 months and the highest count on record (CDC 2021b). Domestic partner violence also increased globally by about a third in 2020 as compared with 2019 (Newman 2021).

The pandemic also created difficulties in receiving medical care for other conditions. In the initial phases of the pandemic, 29 percent of adults reported forgoing medical care due to fears of catching COVID-19, while another 7 percent missed care due to COVID-related financial concerns (Anderson et al. 2021). This number was still about 10 percent in April 2021, with Black and Hispanic adults, those with low incomes, and people with chronic conditions the most likely to miss care (Gonzalez, Karpman, and Haley 2021). Another study finds that, among adults reporting that they missed or delayed health care due to the pandemic, one-third reported that doing so negatively affected their health, ability to work, or ability to perform other activities (Gonzalez et al. 2021). Declines were particularly acute in the use of mental health services, substance use treatment, primary care, childhood vaccinations, and dental visits (CMS 2021). Uses of many types of care had not fully rebounded as of mid-2021. Hospital admissions were still about 20 percent below the prepandemic trend in April, while health spending remained 7 percent below trend in June (Gallagher et al. 2021). Some of these changes may be due to longer-lasting responses to the pandemic by medical professionals. Two percent of physicians in one survey reported closing their practice due to COVID-19, while 32 percent cut back on staff (Physicians Foundation 2021).

the labor market in the late 1960s, the average age of the labor force (and therefore the number of years of expected work experience) declined. This decline continued until the last of the baby boom generation entered the labor force in the mid-1980s (Aaronson and Sullivan 2001), at which point the average age of the labor force began to increase, marking a positive effect on average human capital. As the baby boom generation retires, the U.S. labor force is losing a large population of highly experienced workers.

Slowing growth in educational attainment and health improvements, combined with the retirement of baby boomers, results in slower overall growth in human capital per worker. These factors are reflected in economic forecasts of slower potential growth (see, e.g., Woodward 2013; Fernald 2016; and Fernald and Li 2019). There is scope for increasing human capital through targeted investments, and additional scope for increasing effective human capital through policies that help individuals deploy their human capital more efficiently. Such investments help bolster future economic growth.

Investing in Education and Skill Development

Long-term trends point to future cohorts having similar years of educational attainment but no more years of experience than current workers. This raises the question: how else can we develop more human capital during the time in life typically devoted to education? One promising strategy is working to close existing inequities between children in different circumstances—such as different racial or ethnic groups, urban and rural communities, and more- and less-advantaged economic backgrounds—through interventions starting with early childhood.

Early Childhood Education and Care

Although the terms used may differ based on the age of the children involved, all forms of care in early childhood present opportunities for important cognitive, social, and emotional development. Indeed, a National Academy of Sciences review notes that "virtually every aspect of early human development, from the brain's evolving circuitry to the child's capacity for empathy, is affected by the environments and experiences that are encountered in a cumulative fashion, beginning early in the prenatal period and extending throughout the early childhood years" (Shonkoff and Phillips 2000, 6).

Both theoretical models and empirical evidence indicate that access to high-quality early childhood care and education improves human capital. Cunha and Heckman (2007) develop a model of human capital production in which early investments in human capital are complements to investments made later in life. In this model, early investments make later investments more productive; conversely, early investments only have limited productivity if not backed up by later investments. This theory, referred to as dynamic complementarity, is an important basis for supporting investments in high-quality early childhood care and education.

Children from low-income families often begin kindergarten at an academic disadvantage. Though there are also disparities at entry by race and ethnicity, these differences are smaller than those by family income. Based on a nationally representative sample of children entering kindergarten in the fall of 2010, mathematics and reading skills for children from families in the bottom income quintile were, on average, more than 1 standard deviation below math and reading skills for children from families in the top income quintile;[6] by the spring of fifth grade, these gaps were largely unchanged.[7] These large differences in early skills are predictive of worse later outcomes in educational attainment and even arrest rates (Duncan and Magnuson 2011). As a result, expanding access to high-quality early care and education has long been viewed as having the potential to improve outcomes for children from low-income families.

In the short run, many early childhood programs have been shown to increase student achievement, particularly for children from low-income families (Cascio 2015, forthcoming; Yoshikawa, Christina, and Brooks-Gunn 2016). These early test-score advantages often fade out in the medium term (e.g., see Puma et al. 2012; Durkin et al. 2022). In contrast, high-quality early childhood programs have a long track record of improving a broad array of longer-term outcomes ranging from educational attainment and earnings to criminal activity. For example, a study of the cohorts of children who benefited from heavily subsidized universal child care as a result of the Lanham Act during World War II finds that they were more likely to be employed, had higher earnings, and received less cash assistance during adulthood than the cohorts of children born just after those exposed to the Lanham Act funding (Herbst 2017). Similarly, another study finds that a large-scale expansion of subsidized childcare in Norway during the mid-1970s had large positive effects on children's educational attainment and labor force participation as adults and reduced their welfare dependency (Havnes and Mogstad 2011). Further, studies of Head Start, the program established as part of President Lyndon B. Johnson's "War on Poverty" to boost services to low-income children and their families, find long-term benefits of these investments for several human capital and labor market outcomes (Ludwig and Miller 2007; Deming 2009; Bailey, Sun, and Timpe 2021). More recently, students who were randomly selected for preschool

[6] Researchers often measure differences in outcomes in standard deviation units in order to be comparable across different outcomes such as graduation rates and test scores. In a normal distribution, 68 percent of the observations are within 1 standard deviation of the mean, meaning that only 16 percent of all observations are more than 1 standard deviation below the mean. Thus, low-income students scoring, on average, more than 1 standard deviation below high-income students is a large difference.

[7] CEA calculations, based on de Brey et al. (2021, tables 220.40 and 220.41).

slots in Boston were more likely than students who were randomized out of preschool access to take the SAT, graduate from high school, and enroll in college (Gray-Lobe, Pathak, and Walters 2021).

The fact that high-quality early education and care programs have long-term effects on outcomes such as high school graduation and college enrollment suggests that they can generate long-run improvements in children's human capital. Building noncognitive skills (sometimes called soft or social skills) is particularly relevant because of their importance in the current labor market. In this computer age, the tasks that prove difficult to automate are those that rely on personal interactions (Autor 2015). Deming (2017) finds that, between 1980 and 2010, occupations requiring social skills grew by nearly 12 percentage points; wages also grew more rapidly for these types of jobs. This evidence reinforces the role early childhood education can play in increasing human capital and in providing the skills necessary for a modern economy.

However, access to high-quality early care and education differs by family income and race or ethnicity. For example, Hispanic and American Indian / Alaska Native populations are more likely to live in neighborhoods without adequate childcare availability, as are families in the lowest-income neighborhoods (Malik et al. 2018). In Georgia, Bassok and Galdo (2016) found that state preschool classrooms in low-income and high-minority communities were rated significantly lower in quality, even though Georgia is considered a national leader in high-quality early education and care.

Children from low-income families are also less likely to be enrolled in preschool. In 2019, 42 percent of three- and four-year-old children living in households below the poverty threshold were enrolled in preschool, compared with 54 percent of those living in households at or above 185 percent of the poverty threshold (de Brey et al. 2021, table 202.20). Thus, greater access to public preschool programs may help close gaps in kindergarten readiness between lower- and higher-income children. However, results vary between universal preschool programs, which serve all children, and ones that are means-tested, which serve only children from families with low enough incomes to qualify. Cascio (forthcoming) finds that state-funded universal preschool programs generate large test score gains, particularly for children from low-income families. Indeed, Cascio estimates a cost/benefit ratio of $3.52 for universal preschool programs. Universal preschool for all three- and four-year-old children, combined with investments in childcare provisions, could help ensure equal access to high quality early education and care for all children.

K-12 Education

Despite a long-standing debate on the question of whether increased school spending improves student outcomes, modern quasi-experimental research on the topic suggests that increased school spending has a positive causal effect on students' future education and labor market outcomes (Card and Payne 2002; Jackson, Johnson, and Persico 2016; Hyman 2017; Lafortune, Rothstein, and Schanzenbach 2018).

However, as in early childhood education and care, access to high-quality K-12 schools differs by family income and race or ethnicity. Rouse and Barrow (2006) and Barrow and Schanzenbach (2012) find that though some resource measures may be quite similar or even somewhat higher in districts with greater shares of disadvantaged children, children from more advantaged backgrounds arguably attend higher-quality public elementary and secondary schools. For example, students from families of low socio-economic status are more likely to have teachers with less than three years of experience and to attend schools with inadequate facilities or temporary buildings. Similarly, high-poverty schools are more likely to employ teachers who do not have a certificate or major in the field they teach. Additionally, differences in academic achievement by race and ethnicity widen between kindergarten entry and fifth grade, suggesting that there may be systematic differences in elementary school quality by student race and ethnicity.[8] As such, policy interventions aimed at improving school quality for children from disadvantaged families and communities of color are likely to be important for increasing human capital growth.

Although there is little consensus about effective education policies, several themes have emerged from the literature beyond the basic finding that resources matter. Barrow and Rouse (2007) review evidence on several inputs in K-12 education, including class size, teacher quality, time in school, and technology. Several studies find that class size matters, particularly for students in the early grades (Angrist and Lavy 1999; Krueger 1999; Krueger and Whitmore 2001), though class size reduction is expensive and implementation at scale can be a challenge (Bohrnstedt and Stecher 2002). Not surprisingly, researchers also find strong evidence that teachers matter (Aaronson, Barrow, and Sander 2007; Rivkin, Hanushek, and Kain 2005; Chetty, Friedman, and Rockoff 2014), and many school reform efforts in the early 2010s included the adoption of teacher performance rating systems that combined measures of teachers' effects on student achievement (value added) and classroom observation (National Council on Teacher Quality 2017). Researchers find that these types of reforms can improve average teacher quality by leading the lowest-performing teachers to exit teaching at higher rates (Sartain and Steinberg 2016; Dee, James, and Wycoff 2021).

[8] CEA calculations, based on de Brey et al. (2021, tables 220.40 and 220.41).

There is also some evidence that teacher performance evaluation can lead to improvements in teacher practice (Taylor and Tyler 2012).

Instructional time has also been shown to have a positive effect on student achievement, through evidence that a longer school year can improve student outcomes (Pischke 2007), as can longer school days (Figlio, Holden, and Ozek 2018; Atteberry, Bassok, and Wong 2019). The evidence on accountability policies and technology is somewhat more mixed. Though accountability policies have been shown to cause schools to change instructional practices in meaningful ways, leading to increased test score performance (Rouse et al. 2013), in other settings test score improvements have been shown to come from gaming the system rather than from generating improvements in educational practices that benefit all students (e.g., see Neal and Schanzenbach 2010; Booher-Jennings 2005; and Hout and Elliott 2011). Finally, research on the use of technology in the classroom continues to find mixed results (Bulman and Fairlie 2016), even though the potential for computer-aided instruction to allow for more self-paced learning remains promising (Barrow, Markman, and Rouse 2009).

The COVID-19 pandemic has disrupted instruction at all levels of education, with potentially serious consequences for students. For more discussion of this issue, see box 4-2.

Postsecondary Human Capital Development

The development of universal and compulsory primary and secondary education in the United States during the 20th century meant that, by 2019, more than 90 percent of adults age 25 years and above had completed at least high school (de Brey et al. 2021, table 104.10). After high school, Americans take many paths to further develop their human capital. Some enter the labor force directly and develop their skills through on-the-job training and experience. Others pursue apprenticeship opportunities, military service, or gap-year programs. The majority (66 percent in 2019), however, pursue further academic or vocational training—including certificate programs—at a college or university (de Brey et al. 2021, table 302.20). And over a lifetime, many workers find the need or desire to go back to school or enter a workforce training program to further their career or switch tracks entirely.

Access to postsecondary education has expanded over time, such that two out of three recent high school graduates enrolled in a two-year or four-year college in 2019, up from one out of two in 1965 (de Brey et al. 2021, table 302.10). Community colleges, also known as two-year public colleges, are open enrollment and tend to cost less than programs at public and private nonprofit four-year colleges and private for-profit institutions. They also offer flexibility that allows working adults to attend college. As a result, community colleges enroll nearly one in three first-time degree- or

Box 4-2. COVID and Education

The COVID-19 pandemic disrupted all levels of formal education in the United States, and exacerbated existing disparities in educational opportunities and outcomes (U.S. Department of Education 2021a). By the end of March 2020, leaders of 48 States, 4 territories, and the District of Columbia ordered or recommended building closures in K-12 schools for the remainder of the academic year, affecting over 50 million public school students (Decker et al. 2020). Many school districts, students, and families were not prepared for online learning, particularly in rural communities (Hampton et al. 2020), low-income communities, and communities of color. In 2019, over 10 percent of school-age children in families in the bottom income quartile did not have Internet access at home, and an additional 14 percent only had access through a smartphone (Irwin 2021). Before the pandemic, only 75 percent of Black and Hispanic children lived in a house with a computer, compared with 91 and 96 percent of white and Asian children, respectively (KewalRamani et al. 2018). Online school exacerbated barriers to good educational opportunities and outcomes, especially for children who lived in a home without a computer.

The challenges of switching to remote education thwarted many students' involvement in education. School districts saw attendance decline, and educators expressed concerns about adequate student engagement (Carminucci, Rickles, and Garet 2021; Chambers, Scala, and English 2020). The result has been higher rates of chronic absenteeism (Dorn et al. 2021), which has been shown to have negative effects on the absent students' grades, graduation rates, and college success (Allensworth and Evans 2016).

COVID-19 changed education in a way that also likely affected children's development of noncognitive/social and emotional skills. Students could not interact with their classmates and teachers in the same way and, in many cases, they were cut off from services they accessed at school, such as physical and mental health services, or the support of a social worker. Further, many extracurricular activities were canceled or moved online, limiting social interactions with peers. By limiting these activities, COVID-19 may have disrupted development of students' social and emotional skills, which are associated with future academic achievement (Blake et al. 2014).

School districts, which were largely unprepared for the transition to remote learning, were forced to make changes that will likely have an impact on human capital accumulation. Though some teachers, schools, and districts were ultimately able to effectively transition to remote learning, others were unable to develop a plan to deliver classroom work in a form that would be most effective for students, particularly in the short run. Before the pandemic (2011–12), only about one-third of teachers reported having training in the use of computers for instruction (Garcia and Weiss 2020). A nationally representative survey of school districts found that in the spring of 2020, 85 percent of school districts expected students to spend less than four hours daily on instructional activities during the pandemic (Rickles et al. 2020). The prepandemic daily instructional time average was five hours (U.S. Department of Education 2021a).

These changes to formal K-12 school have resulted in academic learning loss. One study finds that by the end of the 2020–21 school year, students were, on average, five months behind in math and four months behind in reading (Dorn et al. 2021); another study estimates that by the fall of 2021, students were scoring below expected performance levels based on historical trends by 9 to 11 percentile points in math and 3 to 7 percentile points in reading (Lewis et al. 2021). In both studies, estimated learning losses were larger for historically marginalized students and those enrolled in high-poverty schools.

The COVID-19 pandemic has also affected higher education. Fall enrollment in postsecondary institutions peaked in 2010 and had been declining at an average annual rate of 0.8 percent, primarily driven by declines in enrollment at sub-baccalaureate institutions and all levels of for-profit institutions (CEA calculations, based on de Brey et al. 2021, table 303.25). However, enrollment fell more precipitously with the pandemic, particularly at the sub-baccalaureate level. According to National Student Clearinghouse (2021) data, there was an approximately 8 percent drop in undergraduate enrollment between the fall of 2019 and the fall of 2021 (roughly 4 percent each year), with community colleges losing 14.8 percent of students over the two years. However, enrollments in graduate and professional certificate and degree programs rose, suggesting that, though fewer students were taking initial steps in higher education, more degree holders were returning for additional credentials.

Many students enrolled in higher education during the pandemic have seen disruptions to the mode of instruction, which may affect their learning and ultimately their completion. Prepandemic research found that taking a course online instead of in person reduced student success in the course and mitigated progress in college (Bettinger et al. 2017). Research conducted at the U.S. Military Academy during the pandemic also found that students randomly assigned to online instruction performed worse than those randomly assigned to in-person instruction covering the same material (Kofoed et al. 2021). Adverse effects of online instruction were largest for students who were academically at risk.

Learning loss associated with the pandemic is likely to lower the educational attainment of the future workforce by reducing the share of college-educated adults (Blagg 2021; Fuchs-Schündeln et al. 2020). Using estimates of the decline in the educational attainment of the future workforce from Fuchs-Schündeln and others (2020), Fernald, Li, and Ochse (2021) estimate that the pandemic learning disruption will decrease average yearly output over the next 70 years by 0.23 percentage point, peaking at a gap of half a percentage point (just below $150 billion, inflation-adjusted) from 2045 to 2050. Similar estimates at the microeconomic level translate learning losses into lifetime earnings losses. Goldhaber, Kane, and McEachin (2021) use the decline in math achievement found by Lewis et al. (2021) to estimate that these losses, if permanent, equal $43,800 in lifetime earnings for each student, or over $2 trillion across the 50 million public school students currently enrolled in grades K to 12.

In order to support educational equity and address these losses, the American Rescue Plan Act of 2021 included $122 billion in the Elementary and Secondary School Emergency Relief Fund to help schools safely reopen and address the academic, social, emotional, and mental health needs of their students (White House 2021a). The act further required States and districts to spend a combined minimum of 24 percent of the total funds on evidence-based practices to address lost instructional time and the coronavirus's impact on underserved students. The funding has been used for such activities as implementing summer learning and enrichment programs and hiring nurses and counselors (U.S. Department of Education 2021b).

certificate-seeking students.[9] Importantly, research shows that community colleges increase the earnings of their students (Kane and Rouse 1995; Marcotte 2010; Jepsen, Troske, and Coomes 2014; Bahr et al. 2015; Minaya and Scott-Clayton 2022).

However, college enrollment rates differ by family income and by race and ethnicity (as noted in the introduction). For example, in 2016, 83 percent of high school graduates from families in the top income quintile immediately enrolled in college after high school graduation, compared with only 67 percent of high school graduates from families in the bottom income quintile (Snyder, de Brey, and Dillow 2017, table 302.30). These differential enrollment rates suggest that some students may face more barriers than others in making the transition to college.

Students who decide to continue their education at a college or university must first navigate complex application, enrollment, and financial aid processes. These hurdles can deter students from continuing to develop their skills through formal education, and those from more advantaged families are likely to have access to better information about how to enroll in higher education than students from less advantaged families. For example,

[9] CEA calculations, based on two-year public institutions, given by de Brey et al. 2019, table 305.10.

students whose parents attended college are well situated to receive first-hand advice on navigating the college enrollment process and information on what to expect as a college student.

In addition, many students and their families have struggled to complete the Free Application for Federal Student Aid (FAFSA), a financial aid application necessary to access Federal postsecondary student aid, including Pell Grants and Direct Loans (Bettinger et al. 2012). Unclear and/or incorrect expectations about the cost of attending selective four-year institutions may dissuade low-income students from applying and attending schools where they would qualify for aid (Hoxby and Turner 2015; Dynarski et al. 2018). The FAFSA Simplification Act of 2021 aims to make applying for aid easier and the award amount more transparent and predictable for students (Congressional Research Service 2022b). These changes, combined with more readily available information on the net price a student faces (as opposed to the overall "sticker price"), can help reduce barriers in the transition to college.

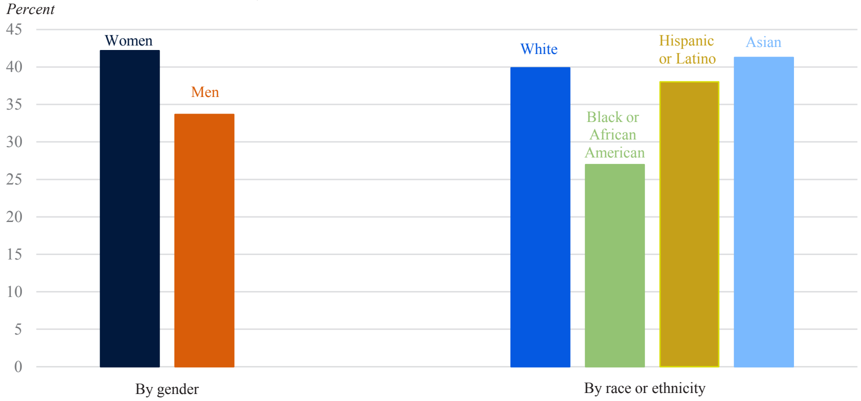
Free community college is another proposal aimed at increasing access to postsecondary education. Although some of the increased enrollment may come from students who would have otherwise enrolled in a four-year college or a private two-year junior college, there is strong evidence that making community college tuition free may also increase enrollment among individuals who otherwise would not have enrolled at all (Carruthers and Fox 2016; Mountjoy 2019; Nguyen 2020). Despite the fact that community college tuition is effectively free for many low-income students due to the availability of Federal Pell Grants and other State and local grant aid (Ma and Pender 2021), a recent study in Michigan finds that students are particularly responsive to a clear, upfront offer of free tuition (Dynarski et al. 2018). In this study, low-income, high-achieving students were randomly selected to receive a promise of free tuition and fees if they applied and were admitted to the University of Michigan in Ann Arbor.[10] Notably, the intervention did not change the probable costs for the students but rather guaranteed grant aid for which the students were likely already eligible.[11] The likelihood of applying to the university more than doubled, and the researchers find that students in the treatment group were 4 percentage points more likely than the control group to attend any postsecondary institution.

However, many students who do enroll in college still fail to complete any degree or certificate program (Chen et al. 2019), and completion rates at two-year public colleges are particularly low. Five years after enrolling, only 39 percent of first-time college students who started at a public two-year

[10] Randomization was at the school level, and parents and principals were also notified.

[11] The offer was unconditional, e.g., students were not required to fill out the FAFSA form, and the offer was guaranteed for four years. This was prominently stated in the mailing, but students were also encouraged to fill out the FAFSA because they would likely qualify for even more aid.

Figure 4-6. Degree or Certificate Completion Rates among Students Who First Enroll at a Public, Two-Year Institution



Source: U.S. Department of Education (2019).

institution in 2011–12, with the expectation of completing a four-year bachelor's degree, had received any degree or certificate, compared with 68 percent of students who started that year at a public four-year institution.[12] Further, as shown in figure 4-6, these completion rates differ by sex and race or ethnicity, ranging from 34 percent for men to 42 percent for women and 27 percent for Black or African American students to 41 percent for Asian students.

Investments aimed at encouraging higher education institutions—and community colleges in particular—to adopt evidence-based strategies for improving student completion are important for increasing human capital accumulation, particularly for students from backgrounds historically marginalized in higher education. These supports include wraparound services, ranging from childcare and mental health services to faculty mentoring. Community college students often live complicated lives, which may be one reason why completion rates are relatively low. Research on initiatives such as the Accelerated Study in Associate Programs has shown that enhanced student services combined with additional financial supports can double graduation rates (Scrivener et al. 2015).

Workforce development programs help create opportunities for displaced workers, new entrants, and current workers seeking higher-paying and more fulfilling work. Having workers with the right skills can raise labor productivity, which in turn increases economic growth. As Holzer (2021, 4) notes, "Workforce development policies, programs, and practices are critical to any effort to improve economic productivity, income mobility, and equity

[12] This computation was by PowerStats, from the National Center for Educational Statistics, using data from the U.S. Department of Education (2019).

among American workers." Such programs can be important alternatives for those not pursuing more formal education after high school. For example, registered apprenticeship programs—including many that are cooperatively run by employers and labor organizations—offer opportunities for individuals to earn industry-recognized credentials through a combination of on-the-job paid training and classroom-based instruction. These programs have been shown to be effective at increasing workers' earning potential. A study of apprenticeships in 10 States finds that individuals who completed their training earned an average of $240,037 more over their lifetime than nonparticipants.[13] Further, the study's conservative estimate of the net social benefits is $49,000 over the course of the apprentice's career (Reed et al. 2012).

That said, apprenticeships remain relatively rare. In a 2016 survey of adults focusing on participation in "work experience" programs—internships, externships, co-ops, practicums, and apprenticeships—a little over 20 percent reported having completed any type of work experience program, and only 3 percent reported having ever completed an apprenticeship program.[14] Even among apprenticeships, which many think of as being non-college-track work experiences, participation was highest among those with a bachelor's degree or higher (5.4 percent) and was lowest among those with no postsecondary enrollment (1.0 percent).

Other sector-focused training programs aimed at preparing disadvantaged workers for employment in high-demand occupations have also been shown to be successful. Examples of promising sector-focused training programs include the Wisconsin Regional Training Partnership, an association of unions and employers in Milwaukee concentrating on two- to eight-week training programs in construction, manufacturing, and health care (Maguire et al. 2010); Year Up, a year-long training program for young adults (18–24) focusing on employment in information technology and business and financial services; Project Quest, a one- to three-year program serving early- to mid-career adults (largely Hispanic women) targeting jobs in the health care sector; as well as programs evaluated under MDRC's WorkAdvance program, which targeted employment in information technology, health care, manufacturing, and transportation (Katz et al. 2020). Katz and others (2020) review these and other programs and investigate the mechanisms whereby programs affect participant outcomes. Their findings indicate that sectoral training programs increase earnings by getting participants into higher-wage jobs and higher-earning occupations, rather than simply increasing employment. They also find that programs that produce the largest and most persistent earnings gains offer a combination of upfront screening of participants

[13] This finding controls for demographic differences at the time of enrollment.
[14] This computation was by PowerStats, from the National Center for Educational Statistics, using data from the U.S. Department of Education (2016).

on basic skills and motivation, wraparound support services for participants, and strong connections to employers.[15]

Investing in Health

A multitude of studies link early-life conditions to human capital accumulation, though many lack definitive explanations of the mechanisms driving these links (Almond and Currie 2011). As Mushkin (1962) highlights, health and education are interrelated in many ways. She notes that formal education is impossible if a child is unable to attend school and learn due to poor health. Lengthening life expectancy by improving health increases the return to education.

The relationship between health and human capital development through school attendance is well documented. One early and important study finds that the eradication of hookworm in the southern U.S. States in the early 20th century increased school attendance, enrollment, and literacy. These changes resulted in higher income about 30 years later (Bleakley 2007). Investments in lead abatement have similar potential today. Other studies link poor childhood health and malnutrition to lower levels of educational attainment (Alderman, Hoddinott, and Kinsey 2006; Case, Fertig, and Paxson 2005; Haas, Glymour, and Berkman 2011). (For discussion of some of the recent Federal infrastructure investments with the potential to improve human capital, see box 4-3.)

Even if children are able to attend school, physical and mental health problems can hinder educational progress. For example, children in the United States and Canada with symptoms of Attention Deficit Hyperactivity Disorder (ADHD)—the most-common chronic neurodevelopmental disorder in young children—performed less well than their siblings without ADHD symptoms on such school-related outcomes as test scores and grade promotion (Currie and Stabile 2006), suggesting that children with ADHD symptoms may accumulate less human capital.

A relationship can also be drawn between health and the development of cognitive and noncognitive skills beyond the classroom. One recent study finds that childhood illnesses lead to poor financial management later in life (Luik 2016). Other studies show similar findings, noting that low income—and the poor early childhood health that comes along with it—is associated with lower socioemotional skills in later childhood (Fletcher and Wolfe 2016). That poor formation of noncognitive skills is associated with

[15] Minimum skill requirements applied to all participants before random assignment for treatment. As noted by Katz et al. (2020), whether these programs can provide a successful career pathway for individuals who do not meet the minimum skill requirements—high school diploma or General Educational Development certificate and testing at the 6th- to 10th-grade level in math and reading—remains an open question.

Box 4-3. Federal Investments in Lead Abatement and Rural Broadband

Recent Federal legislation, including the Bipartisan Infrastructure Law (BIL), provides funding for lead abatement and rural broadband development, both of which would be expected to have positive effects on human capital development. In particular, the BIL invests $55 billion in clean drinking water (White House 2021b); this increases the size of the Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF) to nearly six times their previous appropriation levels, with $15 billion for lead service line replacement as well as a combined $5 billion to address emerging contaminants (Congressional Research Service 2022a).

Reducing lead exposure through abatement methods is one of the key provisions of the BIL (White House 2021b). The Centers for Disease Control and Prevention recognizes that there is no safe blood lead level in children and that lead service pipes can be one source of lead in a child's environment (CDC n.d.). Situations like the Flint, Michigan, water crisis are a potent example of the nearly 10 million households that lack safe drinking water. Lead abatement also has important equity implications as Black children are at greater risk for elevated blood lead levels than white or Hispanic children, even after controlling for risk factors such as living in pre-1950s housing (Yeter, Banks, and Aschner 2020). Lower blood lead levels are associated with improved health, educational, and economic outcomes. Prenatal lead exposure has been linked to reduced gestational age, lower birth weight, and potential fetal loss (Schwartz 1992a; National Research Council 1993), and childhood exposure has been shown to increase adolescent impulsivity, anxiety, depression, and body mass index (Winter and Sampson 2017). Educationally, lower average blood lead level reduces the probability of suspension and detention among boys (Aizer and Currie 2019) and increases test scores (Aizer et al. 2018). Despite the potentially long-lasting nature of elevated blood lead levels, lead abatement interventions have shown promise in reversing many of the negative consequences of early childhood exposure, demonstrating the potential benefits of the BIL lead abatement funding even for somewhat older children (Billings and Schnepel 2017).

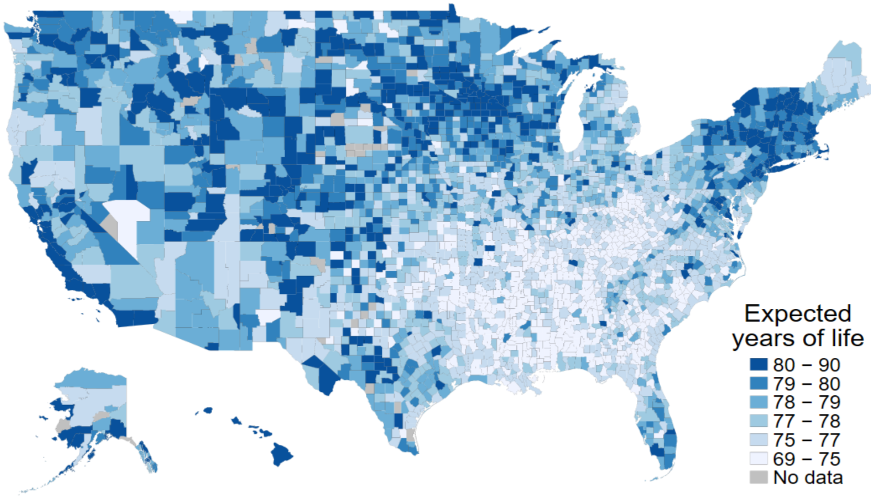
In addition, since the beginning of the COVID-19 pandemic, investments investments in rural broadband connection have been included in the Consolidated Appropriations Act (CAA), the American Rescue Plan (ARP), and the BIL. While the BIL funds $65 billion in broadband investments for all States (White House 2021b), the other bills include programs aimed at digital equity. The Emergency Broadband Benefit ($3.2 billion, CAA), the Emergency Connectivity Fund ($7.2 billion, ARP), and the Capital Projects Fund ($10 billion, ARP) all provide exclusive funding for expanding and discounting broadband to address education and health gaps. The ARP includes an additional nine provisions amounting to $388.1 billion in flexible funding that could apply to rural broadband, as well (Tomer and George 2021).

The investments in broadband help address digital equity and geographic disparities in Internet access. According to FCC estimates, about $80 billion in investments are necessary for ubiquitous broadband access (FCC 2017). Given that population density is a major determinant of both service provision and lower prices (Ribiero Pereira 2016), these investments will likely be heavily concentrated in rural areas. The economic benefits of broadband access are well documented. A 10-percentage-point increase in broadband penetration has been found to increase per capita economic growth by 0.9–1.5 percentage points (Czernich et al. 2011). Counties gaining broadband access in the early 2000s were found to have an increase in employment rates by 1.8 percentage points (Atasoy 2013). The benefits of broadband access likely expand to health and education benefits as well. A prepandemic survey of community-based health centers found that, among those not using telehealth, those located in rural areas were much more likely to report broadband as a barrier to adoption (Lin et al. 2018). And survey data show that students in rural school districts with high-speed Internet at home had higher grades and standardized test scores than their peers without access (Hampton et al. 2020). The investments in broadband in rural communities will help spur economic growth and help provide more equitable services to those previously left behind by the digital divide.

lower probabilities of employment in adulthood suggests the connection with human capital accumulation (Carneiro, Crawford, and Goodman 2007).

Interactions between health, life expectancy, and decision-making also affect human capital development. As shown in figure 4-7, life expectancy varies dramatically across geographic areas. In 2010–15, life expectancy at birth for a person born in Mississippi was 74.9 years (and was less than 70 in some areas), while those born in Hawaii could expect to live for 82 years (Tejada-Vera et al. 2020). Similarly, life expectancy at birth in 2018 across the United States was 81.8 years for Hispanic people and only 74.7 for non-Hispanic Black people (Arias and Xu 2020). And the difference in life expectancy between the richest and poorest 1 percent of individuals was 14.6 years (Chetty et al. 2016). Some of these variations are driven by differences in infant mortality rates. As shown in figure 4-8, the infant mortality rate for non-Hispanic Black babies is more than double the rates for Hispanic, white, and Asian babies (Ely and Driscoll 2021). Reducing these

Figure 4-7. Life Expectancy at Birth for U.S. Counties, 2010–19



Sources: Centers for Disease Control and Prevention, National Center for Health Statistics; CEA calculations.

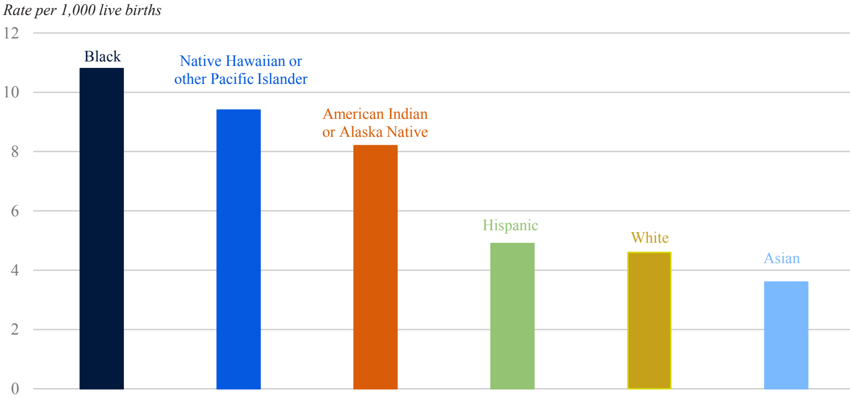
geographic, racial, and socioeconomic differences could improve average life expectancy without requiring scientific or medical advances.

Focusing on policies that improve health care access and equity could be one path toward improving human capital development. Becker (2007) notes that if an individual expects to live for fewer years, the return on investment in healthy decisions, such as exercising or avoiding addiction, is lower. In other words, he argues that it may not simply be that nonsmokers and people who exercise and eat well are healthier, but rather that the causality runs in the opposite direction. Namely, good health causes people to choose healthier habits.

Expansion of public health insurance coverage could boost the development of human capital. Studies of health insurance coverage during childhood have found many positive benefits, including improvements in school performance. For example, one study finds that eligibility for Medicaid reduced the probability of children being below grade for age (Qureshi and Gangopadhyaya 2021). These early human capital effects can be long-lasting; children with more years of Medicaid eligibility during childhood had higher college enrollment, delayed fertility, increased wages, and lower mortality as adults (Brown, Kowalski, and Lurie 2019).

Policies focusing on maternal health by expanding coverage for pregnancy and postpartum care could also lessen inequalities in human capital development. Expansions in postpartum Medicaid coverage under the

Figure 4-8. Infant Mortality Rates by Race or Ethnicity, 2018



Source: Centers for Disease Control and Prevention.

Affordable Care Act increased outpatient visits for mothers, likely improving health outcomes (Gordon et al. 2020). Adequate prenatal care can also create better health habits for mothers, with one study finding that first-trimester prenatal care led to decreases in parental smoking and increases in well-child visits after birth (Reichman et al. 2010).

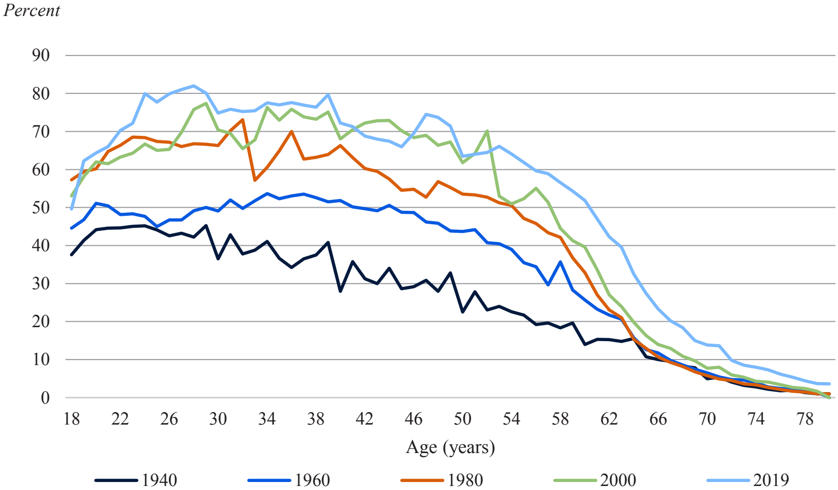
Deploying Human Capital

Deploying human capital effectively—putting a worker's skills to more productive use—is an important component of economic output. Although the deployment of human capital is often straightforward, the real world can present workers with obstacles to making the most of the skills they have rigorously developed. Health problems of their own—or those of a child, parent, or other loved one—can prevent an individual from putting their human capital to work. Sometimes entire groups of workers are legally prevented from working or have their options significantly limited. Other times, as shown in chapter 5, illegal discrimination in the labor market can keep affected workers from realizing their full potential, as can anticompetitive practices that limit workers' ability to change jobs. These obstacles create a smaller, less equitable economy and a less prosperous country.

Health

Better health allows people to deploy their existing human capital more effectively. In his canonical 1972 paper, Michael Grossman (1972) creates a model of "good health" that parallels other models of human capital. He assumes that such inputs as diet, exercise, and health care spending produce health stock, which provides a person with a time allocation of "healthy

Figure 4-9. Percent of U.S.-Born People Employed in the United States, by Age



Sources: CEA calculations from the Decennial Census; Bureau of Labor Statistics, American Community Survey; Statista data.
Note: This figure shows U.S.-born people employed in the United States as a percentage of all people born in the United States, by age. The denominator for the percentage in this figure includes people who have died or have emigrated from the United States, along with those living in the country. To estimate the total number of births for each age and year, we multiplied an estimate of the birth rate by population estimates for that year, interpolating where necessary.

days." People with more healthy days can readily take part in labor and leisure activities; however, those who are sick are more limited. Grossman's model implicitly underlies research showing that health is crucial in the deployment of human capital.

People in better health are more likely to enter and stay in the labor force. Krueger (2017) finds that 40 percent of men not in the labor force report that pain prevented them from doing jobs for which they were otherwise qualified. Further, adults with a serious mental illness are twice as likely to be out of the labor force as adults with no mental illness and are also less likely to be employed full time (Luciano and Meara 2014). Even for those who do enter the labor force, those with poorer health are often prevented from working a full number of days and hours. Multiple studies show that missed workdays due to mental and physical health problems, which result in significant payroll losses, are top causes of work absenteeism each year (Dewa et al. 2004; Luciano and Meara 2014; Currie 2008). Finally, being in good health allows workers to work more intensely on days when they are present, allowing them to more fully expend their human capital (Goldin 2016).

Good health also facilitates deployment of human capital through longer life expectancy; those who live longer and are in better health can work for more years. One analysis shows that "working life expectancies" have grown as healthy life expectancies and life expectancies have increased across Europe (Loichinger and Weber 2016). To illustrate how this has played out over time in the United States, figure 4-9 shows the likelihood that a U.S.-born person is alive and working, by age, from 1940 to 2019. At every adult age below 60, this likelihood has increased substantially since 1940. Gains in this age range were especially large between 1940 and 1980.

Family Support Policies

Family responsibilities can sometimes pose an obstacle to human capital deployment—a reality made all too clear during the COVID-19 pandemic. Short-term family priorities such as caring for a child or elderly relative may conflict with longer-term priorities, like maintaining a job or career that is necessary to support the family. Without external supports, people may be forced to make decisions that result in underutilization of their human capital. Evidence from settings ranging from recessions and mass layoffs (e.g., Jacobson, LaLonde, and Sullivan 1993; Sullivan and Von Wachter 2009; Oreopoulos, Wachter, and Heisz 2012; Yagan 2019; Stuart 2022; Rinz, forthcoming) to the birth of a child (Bertrand, Goldin, and Katz 2010; Angelov, Johansson, and Lindahl 2016; Goldin and Mitchell 2017; Kleven et al. 2019) to routine job separations (Fallick et al. 2021) indicates that spending time out of work can have persistent adverse effects on earnings and, more broadly, on accumulated human capital.

Providing financial support to keep people connected to their jobs while they address family-related needs can facilitate their return to work. Studies of State programs that provide paid family and medical leave suggest that access to leave can increase mothers' longer-term labor supply after the birth of a child (Baum and Ruhm 2016; Byker 2016; Jones and Wilcher 2020; Saad-Lessler 2020). Leave can also increase the likelihood that a mother returns to her prior employer after having a child (Baum and Ruhm 2016), which can be particularly beneficial when her job made good use of her human capital. Evidence suggests that paid leave may also produce labor supply benefits when used for other purposes, such as caring for a spouse with a work-limiting disability or chronic health condition (Anand, Dague, and Wagner 2021). Though evidence to date finds limited use of paid leave among fathers in U.S. programs (Baum and Ruhm 2016) and little role for paid paternity leave in mitigating gender earnings gaps that tend to emerge after the birth or adoption of a child (Andresen and Nix 2019), available research also suggests that these earnings gaps are driven largely by gender norms and preferences about the allocation of care responsibilities rather than biology (Andresen and Nix, forthcoming; Kleven, Landais, and Sogaard 2019). See chapter 5 for further discussion of paid leave and gender norms.

Paid leave helps with situations where family members want to take care of a new child or ill family member and also retain their job. In other cases, the family member may want to go to work but needs care for their child or disabled or infirm family member. Both childcare and care for the elderly and disabled can be prohibitively expensive. But research indicates that public childcare and preschool programs can help parents of young children, particularly mothers, remain engaged in the workforce. This evidence is based on State programs (Cascio and Schanzenbach 2013), Head Start (Wikle and Wilson 2021), the expansion of kindergarten access to slightly older children (Gelbach 2002; Cascio 2009), and historical experience with childcare provided in the United States from 1943 to 1946 under the Lanham Act (Herbst 2017), as well as various programs in other countries (Bauernschuster and Schlotter 2015; Finseraas, Hardoy, and Schøne 2017). Likewise, programs that provide care for elderly or disabled people can also increase their relatives' ability to work. One recent study finds that for every 2.4 to 3 women whose parents gained access to formal home care as the result of Medicaid covering that service in some States, one additional daughter worked full time (Shen 2021).

Employment Practices

Working conditions can also influence how effectively human capital is deployed. Certain employment practices, sometimes called "high road" practices, for which labor unions have long been important advocates, support employees' success on the job by meeting the needs they have in life. They can also increase workers' productivity and reduce turnover, benefiting both workers and businesses. Higher compensation is an important element of these practices. One recent study based on general compensation policies at a large online retail company indicates that higher wages for warehouse and call center workers increased productivity more than dollar for dollar (Emanuel and Harrington 2020). Another study finds that minimum wage increases led to increased productivity and reduced termination rates among department store sales workers (Coviello, Deserranno, and Persico 2021). Other studies find that increases in compensation driven by changes in the minimum wage reduce separations more generally (Reich, Hall, and Jacobs 2004; Dube, Lester, and Reich 2016; Bassier, Dube, and Naidu, forthcoming). Compensation in the form of benefits like paid sick leave or the ability to work remotely can improve employee health and reduce workplace infection (DeRigne, Stoddard-Dare, and Quinn 2016; Pichler and Ziebarth 2017; Stearns and White 2018; Zhai et al. 2018) or allow them to work under conditions they find most conducive to success (Bloom et al. 2015; Choudhury, Foroughi, and Larson 2021).

Maintaining a safe and respectful workplace also allows workers to get the most from their human capital. Workplace injuries and illnesses reduce productivity by decreasing the quantity and/or effectiveness of time spent at work. A study of randomized inspections by California's Division of Occupational Safety and Health suggests that attention to safety in high-injury industries can reduce injury rates and associated costs without reducing employment, sales, or business survival rates (Levine, Toffel, and Johnson 2012). Treating workers fairly and respectfully can also contribute to higher productivity. For example, one study indicates that the average worker would be willing to give up a substantial share of their wages to avoid having their employer set their schedule on short notice (Mas and Pallais 2017). Avoiding this practice can both improve workers' well-being (Harknett, Schnieder, and Irwin 2021) and increase their productivity. For example, when Gap, Inc., experimentally implemented consistent, predictable scheduling practices at its stores in San Francisco and Chicago, productivity increased by about 5 percent (Kesavan et al. 2021).

Skilled and experienced workers can be tapped to help businesses respond to changing economic conditions in ways that promote resilience and growth. When workers are invested in their jobs and unlikely to leave, managers can reorient business processes and adapt job content to get more from their employees. A wide variety of jobs could incorporate more satisfying tasks if, for example, workers were cross-trained in different types of work or allowed to make certain types of decisions. Setting up processes to reduce errors and eliminate waste can also ensure that employees are as productive as possible. Case studies indicate that, when implemented thoughtfully, these high-road approaches can succeed in sectors ranging from manufacturing (Helper 2009) to retail (Ton 2012). Because the adjustments are broad and largely depend on generating the desired response from workers to be worthwhile, a comprehensive implementation of high-road employment and managerial practices may be more effective than trying to change particular practices on a one-off basis.

Occupational Licensing

Occupational licensing policies are often introduced to ensure safe, high-quality services from professionals, like dentists and electricians, whose safety and quality are difficult for consumers to ascertain themselves. These policies frequently establish minimum standards for workers' human capital investments—such as by mandates to acquire specific credentials or to pursue continuing education. Kleiner and Soltas (2019) show that these standards induce workers who enter these occupations to invest more than they otherwise would, especially in occupation-specific forms of human capital such as vocational associate degrees and master's degrees.

However, occupational licensing can make it more difficult for workers to enter fields or move to places where their human capital would be more productive by increasing the cost of mobility in terms of fees for obtaining a license or time to complete required training or other licensing requirements. Research finds that licensing requirements decrease employment and churn within an occupation (Blair and Chung 2019; Kleiner and Soltas 2019; Kleiner and Xu 2020). On the positive side, licensing increases wages and wage growth within licensed occupations (Kleiner and Krueger 2010, 2013; Gittleman, Klee, and Kleiner 2017; Kleiner and Soltas 2019; Kleiner and Xu 2020). One analysis suggests that the magnitude of the licensing wage premium is comparable to the premium associated with union membership (Kleiner and Krueger 2010). Though licensed workers may benefit from higher wages, other similarly skilled workers who lack the resources to acquire a license may be prevented from moving into jobs where they would be more productive and better paid. There is also evidence that occupational licensing reduces interstate migration (Johnson and Kleiner 2020), making it more difficult for workers to relocate and deploy their human capital where it would be most beneficial for them. This especially affects mobile populations such as military spouses, who are 10 times more likely to have moved across State lines in the last year than their civilian counterparts and experience persistently high unemployment due to relocations (U.S. Department of the Treasury and U.S. Department of Defense 2012).

Although many occupations require licenses in some jurisdictions, relatively few require licenses in all jurisdictions (Council of Economic Advisers et al. 2015), suggesting that there is substantial scope to tailor occupational licensing to balance interests in quality, safety, and effective human capital deployment. In 2019, Current Population Survey data show that just under 20 percent of California's labor force held a professional certification or State or industry license, the lowest share for any State; at the other extreme, in Wyoming, that share was just over 30 percent. In the average State that year, about 84 percent of workers with licenses needed them to do their jobs.[16] In some cases, States have taken steps to reduce barriers associated with occupational licensing, such as creating reciprocity arrangements or interstate compacts related to licensing in certain occupations (National Conference of State Legislatures 2020). For example, during the COVID-19 pandemic, some States waived or modified requirements associated with telehealth to allow providers licensed in other States to serve their residents (Federation of State Medical Boards 2022). As more licensed occupations are deemed well-suited for remote work, further adoption of additional allowances will help reduce barriers for workers to deploy their human capital effectively.

[16] CEA calculations, based on Current Population Survey data.

Immigration

There are about 11 million undocumented immigrant residents of the United States, a group of people who are not able to fully deploy their human capital because they lack legal authorization to work or are authorized to work only temporarily. Research suggests that granting these immigrants permanent legal status would increase the productivity of their human capital. Unauthorized immigrants in the workforce experience a wage penalty relative to what native-born and authorized immigrant workers earn, even after controlling for educational attainment. The gap in wages can largely be explained by differences in the industrial and occupational composition of employment between unauthorized immigrants and other workers. This suggests that allowing these workers to move to different jobs that better utilize their skills could increase their productivity and wages (Rouse et al. 2021). Legal status would enable greater job mobility, a key channel through which workers find more productive job matches during their careers (Engbom 2022). Research also suggests that access to permanent legal status for undocumented immigrants could facilitate the development of additional human capital, because studies have found that legal status leads to increases in labor force attachment, education attainment, and other types of skill development (Gathmann and Keller 2018; Liscow and Woolston 2017; Cortes 2013).

Increasing authorized immigration can also lead to more human capital being deployed in the United States, boosting growth without waiting for a new generation of workers to complete the entirety of their education. Immigrants supply labor to produce a wide variety of goods and services, from agricultural products to medical services. Immigrants also consume a wide variety of goods and services, and this demand creates opportunities for other workers to deploy their human capital productively. On top of this, research identifies innovation and entrepreneurship benefits associated with immigration, which make use of the human capital of both the innovator/entrepreneur immigrants and the U.S. workers employed by their ventures (Hunt and Gauthier-Loiselle 2010; Fairlie and Lofstrom 2015).

Incarceration

A highly carceral criminal justice system as we have in the United States incapacitates a substantial amount of human capital; people cannot work to their full capacity while they are imprisoned. Even after they have served their time, the formerly incarcerated face barriers to being hired in jobs for which they may be fully qualified. About 1.4 million people were incarcerated in Federal or State prisons at the end of 2019, a population that is disproportionately male and nonwhite. About one-third were Black, and nearly another quarter were Hispanic (Carson 2020). Including people incarcerated in local jails, who are typically incarcerated for shorter periods, would likely bring the total closer to 2 million.[17] People who are incarcerated are generally not available to participate in the labor market, and they have very limited opportunities to put their human capital to use. This fact is sometimes overlooked because commonly used labor market indicators like the employment-population ratio and the labor force participation rate exclude people who are incarcerated.

Producing employment-population ratio measures that include the incarcerated population reveals lower levels of human capital utilization, especially for Black men, and larger gaps between races. In December 2019, the white employment-population ratio was 61.2 percent, while the Black employment-population ratio was 59.3 percent. If people who were incarcerated in Federal or State prisons were included in these estimates, the Black ratio would fall by about 0.8 percentage point, to 58.5 percent, and the white ratio would fall by only about 0.1 percentage point, to 61.0 percent—increasing the difference between the two races to 2.5 percentage points. Including people incarcerated in local jails in this exercise would likely increase this gap further.

Laws that limit post-incarceration employment opportunities create longer-term obstacles to effectively deploying human capital for the formerly incarcerated. Having been incarcerated renders workers ineligible for certain types of employment, licenses, or credentials, regardless of their qualifications. Federal, State, and territorial governments collectively apply over 40,000 restrictions and requirements to people who have been convicted of crimes, 72 percent of which affect the employment opportunities available to them (Umez and Gaines 2021). For example, some of the incarcerated people who helped fight wildfires in California in recent years found themselves ineligible to be hired as firefighters after being released from prison because they were not eligible to receive certification as emergency medical technicians (Romo 2020). Though California has since passed a law that attempts to address this, the law requires that formerly incarcerated people petition to have their convictions expunged, a process that can be burdensome (Smith 2021). Reducing incarceration and post-incarceration employment restrictions could mitigate the extent to which the criminal justice system limits the deployment of human capital, as could improving and increasing access to programs designed to help formerly incarcerated people return to work.

[17] A total of 734,500 people were incarcerated in local jails in 2019, and 549,000 people were incarcerated in local jails in 2020 (Minton and Zeng 2021, table 2). A total of 1,379,786 people were incarcerated in State or Federal corrections facilities in 2019, and 1,182,166 were incarcerated in 2020 (Minton and Zeng 2021, table 3) for total incarcerated populations of 2.1 million in 2019 and 1.7 million in 2020.

Government Personnel Policies

In certain fields, the government plays an important role in determining how human capital is managed and/or compensated. Decisions about how much Medicare and Medicaid pay for various medical procedures, for example, have a direct impact on physicians' earnings (Gottlieb et al. 2020). The government's role extends to other areas of health, such as home health care services.

Nursing homes are one area where government payment policies have particular significance. In 2019, Medicaid accounted for around 29 percent of all spending on nursing care facilities and continuing care retirement communities, and Medicare covered another 22 percent (MACPAC 2021). Evidence suggests that the introduction of State Medicaid policies designed to increase wages in nursing homes was associated with increased staffing of certified nurse aides (Feng et al. 2010). Other evidence on wages in nursing homes also suggests that higher pay keeps workers in the industry. Ruffini (2021) finds that higher minimum wages increased retention among low-wage workers in nursing homes. She also finds that higher wages improved the quality of service provided by nursing homes, as reflected in reduced inspection violations; adverse, preventable health conditions; and mortality. This suggests that increasing compensation not only helps direct human capital toward an industry where it is needed but also induces workers to deploy their human capital more productively.

Conclusion

Increases in human capital accumulation contribute to faster economic growth and improved standards of living. Yet human capital accumulation has slowed over the past two decades, and the United States has fallen behind many other countries in both educational attainment and life expectancy. Further, many long-standing discrepancies remain in human capital accumulation and in deployment between individuals by income, race, and ethnicity. Thus, the Nation can benefit from investing more in education, workforce development, and health, and from exploring policies that can help individuals deploy existing human capital more effectively. These policies range from improving early childhood education and care to ensure that children get a strong start in life to lifting barriers to permit unauthorized immigrants and the formerly incarcerated to employ their human capital in its most effective form. Investments in people expand the productive capacity of the U.S. economy, boost living standards, and ensure that our workforce has the skills and education needed to compete in this dynamic world.

★★★★★★

Chapter 5

Barriers to Economic Equality: The Role of Monopsony, Monopoly, and Discrimination

Markets function well when firms must compete for employees or customers. In competitive product markets, the right amounts of goods are produced to meet demand, with prices that accurately reflect value. In a well-operating labor market, workers are able to switch jobs, wages reflect productivity, and differences in earnings only reflect such factors as ability, effort, education, experience, and random chance.

However, empirical economics research has documented the many ways in which this ideal does not reflect reality. Perfect competition does not describe most labor markets, for example, and not all workers are able to easily move through the labor force to obtain more satisfactory compensation. Two concrete examples are (1) the market power of employers, which allows for unfair hiring and compensation practices; and (2) discrimination, which has exacerbated persistent forms of inequality in earnings across racial and gender lines. Nearly 20 percent of U.S. workers report being bound by noncompete agreements, which limit an employee's ability to join or start up a competing firm (Starr, Prescott, and Bishara 2021). Also, in general, employer market power is responsible for wages that are at least 15 percent lower than they would be in a perfectly competitive market (U.S. Department of the Treasury 2022). In addition, Federal government statistics show that, on average, Hispanic and Black employees earn less than 80 percent of what white employees earn (BLS 2021). Women earn, on average, roughly 83 percent of what men earn, and the disparities are even greater for most nonwhite women (Department of Labor 2022a). These earnings differences remain even after accounting for such factors as educational attainment and experience (Blau and Kahn 2017; Borowczyk-Martins, Bradley, and Tarasonis 2017). Although many groups can be targeted by such discrimination—including those with disabilities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) people; and members of religious minorities—this chapter focuses on discrimination by race, ethnicity, and gender.

Noncompetitive labor markets are not completely devoid of competitive forces, though they generally feature fewer job options, reducing the well-being of workers, and discriminatory barriers, resulting in a misallocation of talented workers. Broader costs for the overall economy include lower productivity and slower economic growth. New Deal labor reform laws sought to protect workers by establishing the right to bargain collectively, establishing a floor for wages, and providing protection from overwork, while the Civil Rights Act sought to break through discriminatory barriers across all kinds of economic activity, including in the labor market (Boone 2015). Emblematic of these laws' success, Hsieh and others (2019) estimate that the removal of barriers to higher-income occupations for women and people of color accounted for 20 to 40 percent of growth in output from 1960 to 2010; this was driven by an improvement in the allocation of talented workers within the economy.

Despite this progress, barriers to equality in the workplace remain today, in no small part due to the market power of employers. The opening section of this chapter provides a summary of current levels of inequality in wages, income, and wealth. The next sections document the forces that inhibit workers from being fully rewarded for their skills in labor markets—such as excessive wage-setting power by employers and racial and gender discrimination—and discuss how these forces impede economic growth. The final section discusses several policies, including legal measures designed to protect workers and members of disadvantaged groups and more general economic policies with the potential to counteract the adverse effects of a lack of competition—thereby, reducing inequality as well as boosting economic growth. The chapter finishes with a discussion of tax reforms that can help to offset inequality that may remain even if barriers to healthy competition are removed.

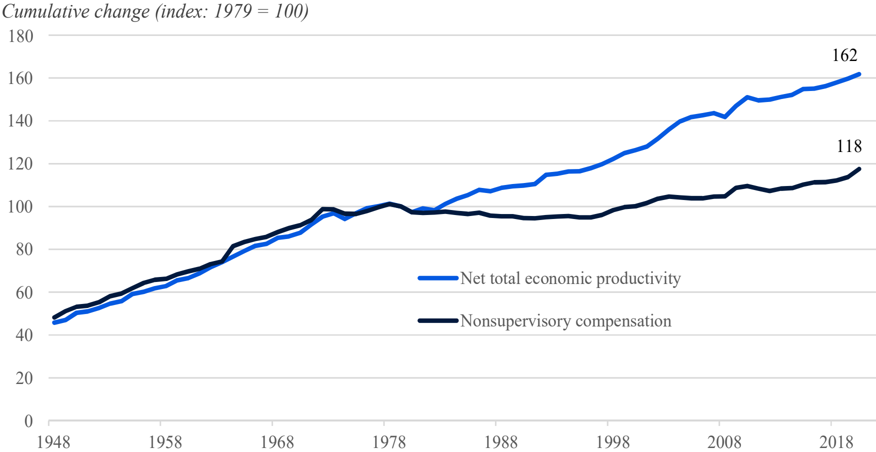
Labor Market Inequality

Research reveals the significant scope of economic inequality—in wages, incomes, and wealth—in the United States (Gould 2019; Congressional Budget Office 2021; Piketty 2014; Wolff 2021). These inequities across demographic groups cannot be fully explained by differences in such characteristics as education or experience that provide an indication of their productivity, suggesting that people may not be equitably rewarded for their economic contributions. This section reviews current patterns of inequality, with a primary focus on wage inequality by race, ethnicity, and gender. For most households, earnings account for most of their income; thus, wage inequality translates to income inequality. Wealth inequality reflects earnings and income inequality—as well as disparities in access to capital, returns on those assets, and transmission of wealth across generations (see box 5-1).

Figure 5-1 shows that, while net productivity has grown by nearly 62 percent over the past four decades, average hourly pay for the typical worker

Figure 5-1. The Gap Between Productivity and Worker Compensation, 1948–2020

Cumulative change (index: 1979 = 100)



Source: Economic Policy Institute, analysis of data from the Bureau of Labor Statistics and the Bureau of Economic Analysis.

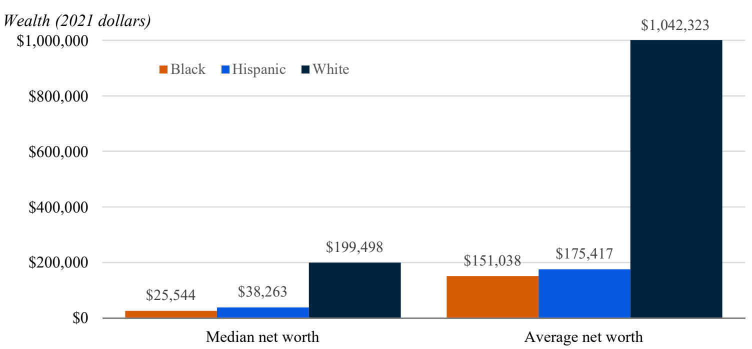
Box 5-1. Racial and Ethnic Wealth Gaps

Although differences in income across groups typically provide an account of inequality in resources on an annual basis, wealth disparities track how these income flows can contribute to divergences in accumulated resources across longer time periods and even over multiple generations. A household's net worth, measured as the difference between its assets and its debts, has many components. For most American families, the largest single asset is their home; thus, the largest portion of net worth is often tied to the value of one's home minus the mortgage or the other debts against it. Net worth also includes savings and retirement accounts, stocks and or other property, and inheritances and gifts from family members. Sources of debt also include credit card balances and loans for education, vehicles, or durable goods.

In the United States, there are substantial racial wealth gaps, as shown in figure 5-i. In 2019, the net worth of the median white family was $199,498, almost eight times higher than that of the median Black family and five times higher than that of the median Hispanic family (Bhutta et al. 2020). The average net worth within each group is higher than the median, because the average incorporates information about the ultrawealthy, who account for a large proportion of overall wealth: The average white family has nearly seven times more wealth than the average Black family and almost six times more than the average Hispanic family.

The causes of current wealth inequality are complex, as today's net worth reflects the accumulation of differences in past income between racial groups, differences in savings rates for households with similar incomes, differences in the return to savings for households with similar savings rates, differences in transfers of wealth between generations, and the possibility of individual-level and/or structural discrimination at any

Figure 5-i. Median and Average Wealth by Race and Ethnicity, 2019



Sources: 2019 Federal Reserve Board Survey of Consumer Finances; Haver analytics; CEA calculations.

of these stages. In this regard, civil and legal rights play an important role. For example, after Emancipation, the promise of land for Black freedmen in the South did not materialize, meaning that Black freedmen exited slavery without land they could farm and pass on to their children. This lack of land ownership has been documented to have affected asset accumulation (Miller 2020).

The lack of access to assets continued throughout much of the 20th century, as Jim Crow policies and practices limited access and mobility for Black Americans. Further, systemic disinvestment and exclusion from federally subsidized homeownership opportunities in Black neighborhoods, collectively referred to as "redlining," were associated with lower property values decades later (Aaronson, Hartley, and Mazumder 2021; Fishback et al. 2021). Moreover, Derenoncourt (2022) shows that the attempts of Black Americans to migrate to neighborhoods with greater opportunity were often met with "white flight" and disinvestment, limiting the potential for escape from segregated economic fortunes. Given the large role played by homeownership wealth on modern-day balance sheets, this history provides just one example of how racial wealth gaps are sustained over time.

has increased by just under 18 percent (Economic Policy Institute 2021). The divergence between the two trends suggests that there may be forces suppressing the pay of workers relative to their productivity.

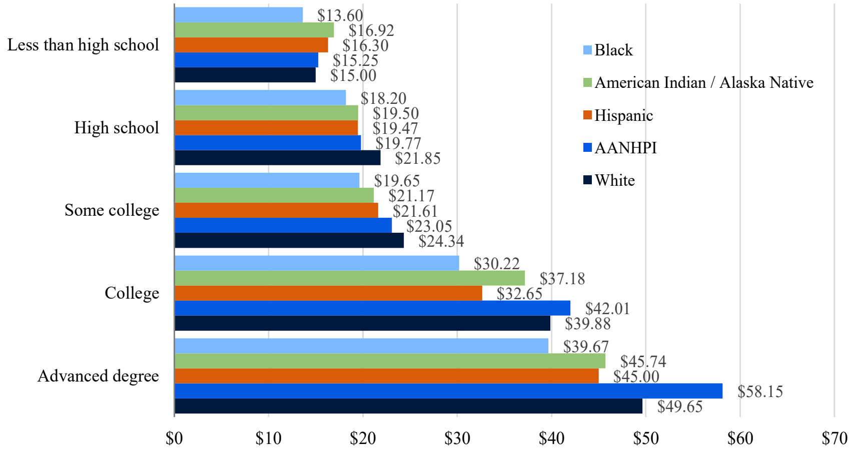
Racial, Ethnic, and Gender Wage Gaps

There are substantial differences in the wages paid to white women, and to Black, Hispanic, American Indian, and Alaska Native workers of any gender, relative to white men, and some differences remain even after accounting for differences in education, occupation, and experience. Focusing just on differences in educational levels, as shown in figure 5-2, reveals the basic pattern. In 2021, Black workers were paid less than white workers, on average at every education level, with the Black/white wage ratio ranging from 76 percent to 91 percent. Hispanic, American Indian, and Alaska Native workers were paid less than white workers at all but the lowest level of education (less than a high school degree). The patterns suggest that differences in earnings between these groups are driven by more than simply such differences as educational attainment and level of experience.

The wage profile of Asian American, Native Hawaiian, and Pacific Islander workers (AANHPI, or "Asian" for short) is distinct from that of other nonwhite groups. Asian workers earn more than white workers, on average, at most education levels. However, the overall group average

Figure 5-2. Wage Gaps by Education, Race, and Ethnicity, 2021

Average hourly wages (2021 dollars)



Sources: Economic Policy Institute; Current Population Survey extracts; CEA calculations.
Note: AANHPI = Asian American, Native Hawaiian, and Pacific Islanders.

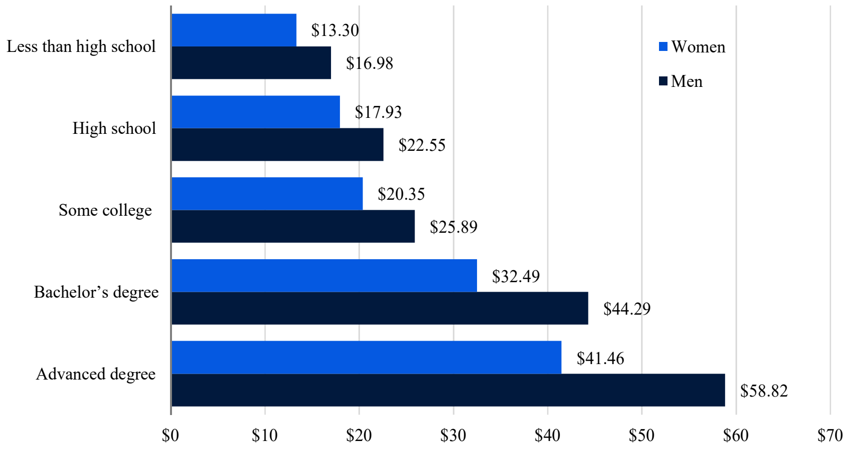
masks a substantially higher within-race wage inequality among Asian people than that found within other groups. This can be captured by comparing the wage of the worker at the 90th percentile in earnings, including earnings among salaried workers, with the wage of the worker at the 10th percentile. In 2021, among Asian people, the worker at the 90th percentile earned $81 an hour, 6.4 times more than the worker in the 10th percentile, who made almost $13 an hour. Meanwhile, among the other racial and ethnic groups, the wage of the 90th percentile worker was only 3.5 to 4.8 times as large as that of the wage of the 10th percentile worker. The varied experiences of Asian workers are further demonstrated by comparisons across different ethnic subgroups within the larger group (see box 5-2).

There are also earnings differences by gender: women are paid less, on average, than men. Although the wages of both men and women increase with education, figure 5-3 shows that the gender wage gap is even larger for those with more education. Among those with an advanced degree, the average wage for women is 70 percent of that for men.

As laid out by Crenshaw (1989), examining inequality along one dimension of identity at a time may obscure the specific experiences that lay at the intersection of race and gender identities. Figure 5-4 therefore presents wages separately by race and gender. On average, Black women's wages are 62 percent of white men's wages, while Hispanic and American Indian / Alaska Native women's wages are 59 and 62 percent of white men's wages, respectively. The average wages of Asian women are higher than those of women in the other racial and ethnic groups, though still below those of white men. In addition, Asian women experience a larger within-race gender

Figure 5-3. Gender Wage Gap by Level of Education, 2021

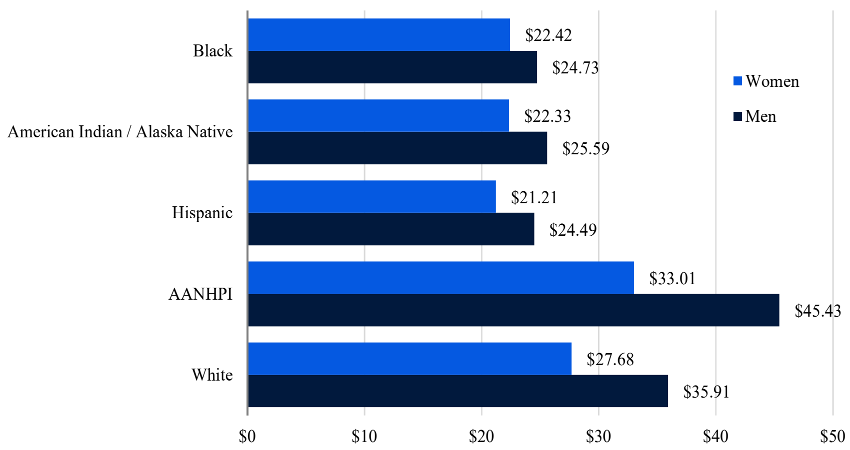
Average hourly wages (2021 dollars)



Source: Economic Policy Institute, Current Population Survey extracts.

Figure 5-4. Wage Gaps by Gender, Race, and Ethnicity, 2021

Average hourly wages (2021 dollars)



Sources: Economic Policy Institute, Current Population Survey extracts; CEA calculations.
Note: AANHPI = Asian American, Native Hawaiian, and Pacific Islanders.

gap than women in any of the other racial and ethnic groups, earning 73 percent of the average wage of Asian men. It is important to note that, as seen in figure 5-4, the lower gender wage gap among Black, Hispanic, American Indian, and Alaska Native workers is partly due to the relatively low wages earned by men in these groups.

Box 5-2. Improving Data Infrastructure for Equity Analysis

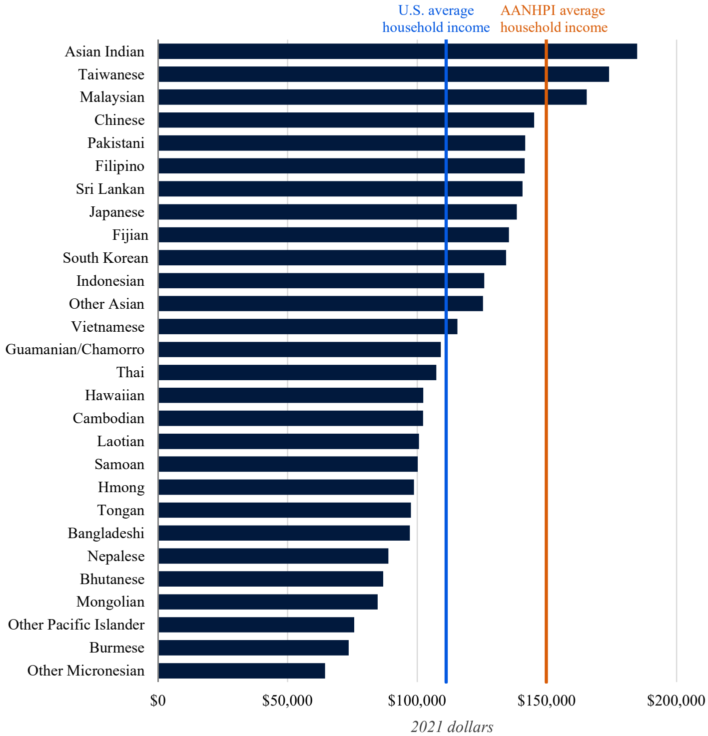
Understanding the mechanisms underlying the inequality discussed in this chapter involves gathering evidence, both quantitative and qualitative. Research plays an important role in uncovering these patterns, and shedding light on issues related to equity across different groups requires adequate information and data on the many dimensions of an individual's identity. However, many barriers remain to collecting the information needed for such equity analysis.

First, the existing set of questions typically asked on household surveys may not be detailed enough to capture certain important subpopulations. This may prevent the discovery of unique outcomes for important subgroups and can reduce the accuracy of equity analyses by lowering rates of self-identification among respondents who do not see themselves represented in the available categories (Census Bureau 2021). Members of Asian American, Native Hawaiian, and Pacific Islander racial/ethnic communities, for example, are commonly grouped together, masking the greater economic challenges faced by some subgroups within the broader category. This is demonstrated in figure 5-ii, which shows a great deal of variation in average income across subgroups of this population. In addition, survey respondents of Middle Eastern and North African origin generally do not have a satisfying option to select in the standard list of racial and ethnic categories, which may result in higher rates of nonresponse to these questions. Likewise, the concepts of sex and gender are often collapsed into binary categories that exclude a number of gender identities and expressions.

Moreover, even when surveys do have questions that capture key aspects of identity, the survey sample size may be too small to be representative of certain groups in the population, and privacy concerns may require suppression of statistics for those groups to prevent tracing the information back to a specific respondent. For example, before February 2022, labor force statistics from the Current Population Survey for American Indian and Alaska Native respondents were not reported as a separate category, due to small sample sizes. Likewise, statistics on wealth and net worth from the Survey of Consumer Finances are released publicly for Black, white, and Hispanic respondents, separately, but not for Asian, Native Hawaiian, Pacific Islander, American Indian, or Alaska Native respondents (Bhutta et al. 2020).

A second concern is that many key economic indicators are measured using administrative data; that is, data are collected for the purposes of implementing a program, and not necessarily with the primary purpose of facilitating general research analysis. In these cases, it may not be necessary to collect demographic information, and may be counterproductive or illegal to do so. For example, administrative tax

Figure 5-ii. Average Household Income among Asian American, Native Hawaiian, and Pacific Islander Subgroups



Sources: American Community Survey, 2017–19; Haver analytics; CEA calculations.
Note: AANHPI = Asian American, Native Hawaiian, and Pacific Islanders.

data have proven useful in analyses of income inequality by incorporating the incomes of the ultrarich, but the Internal Revenue Service does not collect many demographic characteristics on the 1040 tax return (Huang and Taylor 2019). Such demographic data are also not typically collected for other key programs that generate useful data for tracking economic outcomes, such as the Unemployment Insurance (Kuka and Stuart 2021) programs across different states, and the Supplemental Nutritional Assistance Program (Prell 2016).

There are possible solutions to the issues outlined above, and some efforts are under way to facilitate equity analysis. The Biden-Harris Administration's Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government established an Equitable Data Working Group, an interagency committee, to explore ways to make available data disaggregated by race, ethnicity, gender, and other key demographic variables (Nelson and Wardell 2021; White House 2021a). These include a comprehensive review of race, ethnicity, and gender-related questions on Federal surveys, and exploration of the possibility of merging Federal datasets to append demographic information to administrative data. An example of the type of analysis possible is the ongoing collaboration between the U.S. Treasury and U.S. Census Bureau to merge individual-level data on race and ethnicity with tax data to study when members of different racial groups received their first Economic Impact Payment as a part of the 2020 CARES Act (Adeyemo and Batchelder 2021; U.S. Congress 2020).

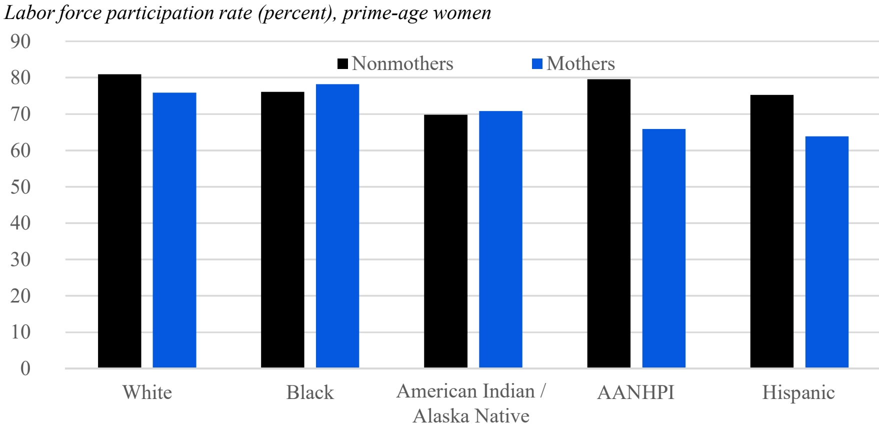
The Administration's National Strategy on Gender Equity and Equality calls for the collection of gender-disaggregated data to better track outcomes such as gender gaps in the labor market and entrepreneurship, financial outcomes, including within households, and gender-based violence (White House 2021b). In another case, the U.S. Census Bureau's Household Pulse Survey, designed to provide real-time tracking of outcomes during the COVID-19 pandemic, for the first time introduced separate questions about sexual orientation and gender identity on a Census Bureau survey in July 2021 (File and Lee 2021).

In terms of data by income group, the 2022 Green Book included proposed funding to share data between the Treasury and Bureau of Economic Analysis (BEA), which would aid in the estimate of the distribution of income growth across different income percentiles (U.S Department of the Treasury 2021a, 101). BEA has explored prototype estimates of the distribution of personal income, which covers outcomes as recently as two years in the past; and recent developments, such as the Realtime Inequality project (Blanchet, Saez, and Zucman 2022), demonstrate the potential for even more timely estimates at a higher frequency from BEA (U.S. Bureau of Economic Analysis 2021).

These wage gaps reflect the fact that women—particularly nonwhite women—and most nonwhite men are overrepresented among the low-wage workforce. For example, in 2021, nonwhite men made up 39 percent of all men in the workforce, but over half (51 percent) of low-wage men in the workforce. Likewise, nonwhite women made up 39 percent of all women in the workforce and 45 percent of low-wage women in the workforce.

The gender pay gap has narrowed over time, partially as a result of women increasing their skills through educational attainment and greater labor market experience. Women are now better educated than men—being more likely than men to graduate from college and earn graduate degrees (National Center for Education Statistics 2022). The share of women in the labor force (either working or actively looking for work) nearly doubled from 1950 to 2000, from 33.8 percent to 59.9 percent (BLS 2022a). Boustan and Collins (2014) show that these historical trends have varied across racial groups: the labor force participation rate for Black women, for example, was

Figure 5-5. Mothers' and Nonmothers' Labor Force Participation Rates, 2021



Sources: 2021 Current Population Survey; CEA calculations.
Note: AANHPI = Asian American, Native Hawaiian, and Pacific Islanders.

14 percent higher than that of white women in 1950, and the two rates did not converge until about 1990.

However, the increase in women's labor force participation has stalled since 2000, and the gap between the share of men and women in the labor force has remained fairly steady since that time in the United States, while such gaps continued to shrink across many other countries that belong to the Organization for Economic Cooperation and Development (OECD) (Blau and Kahn 2013). In 2019, before the COVID-19 pandemic, 58 percent of women and 69 percent of men were in the U.S. labor force. One general factor at play is parenthood; on average, prime-age (age 25 to 54 years) women with children have lower labor force participation rates than those without children, as shown in figure 5-5. However, there is variation in participation patterns across women of different racial and ethnic backgrounds, and the relationship between parenthood and participation does not hold for Black and American Indian women and for Alaska Native women, whose participation rates do not substantially differ by motherhood status. This differential pattern may in part be driven by a greater share of women in these groups being the breadwinners for their household (Institute for Women's Policy Research 2016) and therefore less able to afford to exit the labor force.

A number of studies have also documented a concentration of income among the richest households. This is the result of the wage inequality discussed above, including relatively high rates of compensation for executives (Mishel and Kandra 2021), and the fact that the highest-income households receive a disproportionately high share of capital income earned from assets and savings. The most recent estimates show that, in 2021, the top 1 percent received 19.5 percent of pretax income, as compared with only 11.4 percent for the bottom 50 percent of the population (Blanchet, Saez, and Zucman 2022). Although there is some variation in such estimates due to differences in data and methods, various studies find that between 14 and 20 percent of income has been accrued by the top 1 percent of households in recent years (Piketty, Saez, and Zucman 2018; Auten and Splinter 2020; Internal Revenue Service 2021; Congressional Budget Office 2021). There is also considerable income inequality among households below the top 1 percent. For example, in 2018, U.S. households at the 90th percentile of the income distribution earned 12.6 times more than households at the 10th percentile (Horowitz, Igielnik, and Kochhar 2020), a ratio that is among the highest for OECD countries (OECD 2022).

Sources of Earnings Inequality

This section explores how earnings inequality can arise from noncompetitive market forces and discriminatory barriers. A robust and growing body of evidence shows that some degree of economic inequality stems from forces inconsistent with competitive markets. In a noncompetitive market, barriers emerge that prevent some individuals from realizing the gains from their productivity. This chapter focuses on two specific aspects of noncompetitive markets: the market power of employers, and discrimination. New empirical research provides evidence that many firms have some power to set wages, violating the core tenet of a competitive labor market (Card 2022), and allowing for persistent differences in outcomes across racial and gender lines.

These are not the only sources of earnings inequality; nor does the presence of inequality necessarily imply that labor markets are not competitive. For example, even a random event such as a serious illness could have implications for an individual's potential earnings. Earnings inequality can also appear within competitive markets due to differences in worker productivity. A worker's skills and experience—that is, their human capital—affects their marginal productivity, as discussed more fully in chapter 4. A large body of research has focused on productivity-related explanations for inequality, examining the roles of technological change, innovation, and trade policy that have increased the productivity of some workers while replacing other workers whose jobs could be outsourced or automated (Autor, Levy, and Murnane 2003; Autor, Katz, and Kearney 2006; Acemoglu and Autor 2012; Autor 2010). Recent work has found evidence that import competition from China and other developed economies has had adverse effects on U.S. employment in manufacturing and per-capita income in more trade-exposed labor markets, particularly among workers with less than a college degree (Autor, Dorn, and Hanson 2013, 2016; Hakobyan and McLaren 2016). Further, these adverse effects spill over to overall employment and persist long after the initial severe loss of manufacturing jobs (Autor, Dorn, and Hanson 2021).

A Lack of Competition in Labor and Product Markets

Noncompetitive markets can emerge under many conditions, such as when mergers result in dominant firms that can use their consolidated market power to charge higher prices, offer decreased quality, and block potential competitors from entering the market (Boushey and Knudsen 2021). A distinguishing feature of noncompetitive markets is the existence of "economic rents," which are profits derived from prices that are higher than needed to cover the investment and production costs of goods. In a perfectly competitive market, neither workers nor firms earn such rents in the long run; if there are excess economic rents in a product market, for example, this would create an incentive for new firms to enter the market, which in turn would drive down prices and rents. A critical question in noncompetitive markets is how the economic rents are split between employer profits and employee wages. When firms use their market power to capture a greater share of economic rents, the outcome can be "suboptimal"; meaning that, from society's point of view, workers are paid too little or firms charge too much for their products. Another implication of noncompetitive markets is that they provide an incentive for firms to do less, not more. If the firm has labor market power, theory says it will restrain hiring to maintain low wages, because adding more employees would mean paying higher wages to lure new applicants. Similarly, a firm with product market power will restrain production in order to charge higher prices than it would if it had competitors. This subsection explains how a lack of competition not only affects efficiency but also can exacerbate labor market inequality.

Labor market monopsony. The classic form of a noncompetitive labor market is a monopsony. In the case of a pure monopsony, a concept first developed by Joan Robinson (1933), there is a single employer that uses its market power to set wages below what the competitive rate would be; that is, the firm has the power to set such wages. Robinson's theoretical model of a single employer has been extended to incorporate the concept that an employer's monopsony power can come from representing a larger share of the labor market, which limits the options of employees to push toward competitive wages. Employers may also derive monopsony power from situations where it is difficult for workers to switch jobs due to issues of commuting distance or workplace scheduling flexibility, which give employers greater power to set wages (Manning 2020a). Stelzner and Bahn (2021) argue that, because female and nonwhite workers may be more likely to experience these difficulties, monopsony power can translate into greater gender and racial inequality.

A number of studies focus on a direct measure of monopsony power by estimating a firm's ability to adjust the wages it offers, as opposed to offering a market wage that a competitive market would demand. Using job applications data, Azar, Berry, and Marinescu (2019) find strong evidence of this monopsony power in many markets, and they conclude that workers' productivity is 17 percent higher than the wage they receive. There is similar evidence of monopsony power even in online, on-demand labor markets where the costs of searching for and switching jobs should be relatively low (Dube et al. 2020). A meta-analysis of 53 studies concludes that, overall, the literature provides strong evidence for monopsony power among many employers, implying sizable markdowns in wages (Sokolova and Sorenson 2020). Importantly, two studies find that the degree of monopsony power is substantially larger in low-wage labor markets (Bassier, Dube, and Naidu 2021; Webber 2015). Moreover, research by Webber (2015, 2016) shows that the negative effect of a firm's market power on wages is strongest in the lower half of the earning distribution and among female workers, suggesting that monopsony power amplifies both overall and gender wage inequality.

One way that a firm can derive monopsony power is from providing a large share of the jobs available in a local labor market. Economic research has found a link between higher labor market concentration and lower wages (Azar, Marinescu, and Steinbaum 2019; Benmelech, Bergman, and Kim 2020, CEA 2016; Philippon 2019; Qiu and Sojourner 2019; Rinz 2020). Two recent studies find that wages are lower when concentration in local labor markets increases due to mergers and acquisitions (Arnold 2019; Benmelech, Bergman, and Kim 2020). A third study focuses on hospital mergers and finds that they decrease the wage growth of workers whose skills are specific to their industry (Prager and Schmitt 2021). Recent research has raised the question of whether employers are able to gain or maintain a greater share of the labor market through actions that may violate antitrust laws (Naidu, Posner, and Weyl 2018; Posner 2021).

Monopsony power can also arise from practices that reduce the outside options of workers (Manning 2020b). One such practice is the use of noncompete agreements, which prohibit employees from joining or starting competing businesses, typically within a specified time frame or geographic boundary. Starr, Prescott, and Bishara (2021) find that almost 20 percent of U.S. workers were bound by a noncompete agreement in 2014, including 12 percent of workers with annual income less than $20,000. Such agreements are increasingly used by employers in low-wage industries, such as fast food chains and home health agencies (Quinton 2017). A recent study found that when Oregon initiated a ban on noncompete agreements, wages rose by 2 to 3 percent, with larger effects in occupations where noncompete agreements were more common (Lipsitz and Starr 2021). Johnson, Lavetti, and Lipsitz (2021) examine this relationship in the national context, and find that greater enforcement of noncompete agreements reduces earnings, with stronger negative effects on the earnings of female and nonwhite workers.

Some employer practices hamper worker mobility by impeding their ability to gain information about important characteristics of potential jobs, such as expected compensation and working conditions. For example, nondisclosure agreements (NDAs), which are often bundled with noncompete agreements in employment contracts, prevent an employee or former employee from disclosing information about employers. Though NDAs can be used to protect confidential business information, some are much more broadly applied and can reduce the ability of workers to share information about the work environment. Research suggests that overly broad NDAs can reduce the reporting of workplace harassment (Sockin, Sojourner, and Starr 2021). Workers may also lack information on the wages offered at other jobs, partly due to employer practices that promote pay secrecy. Research has shown that workers, especially those with low incomes, are unaware of potential higher-paying job options (Jäger et al. 2021), and that reducing pay secrecy could reduce the gender wage gap (Baker et al. 2021).

Another practice that can reduce workers' mobility are no-poach agreements, which are compacts made between employers agreeing to not hire workers from each other for a specified period of time. Employees may not even be aware that these agreements are in effect, and because no-poaching agreements between separate employers are illegal per se under antitrust laws, and therefore hard to discover, it is difficult to know how common they are. In a slightly different context, Krueger and Ashenfelter (2021) documented that in 2016 almost 60 percent of franchise agreements, including for some major fast-food chains, contained no-poaching clauses. The study also found that no-poaching clauses were more common for franchises in low-wage and high-turnover industries, though a number of fast-food franchises have already dropped them from their franchisee contracts in response to public pressure and legal challenges (Abrams 2018).

Product market monopoly. Whereas a pure monopsony refers to a market with a single buyer, a pure monopoly refers to a market with a single seller. Accordingly, a firm gains greater monopoly power when the market in which it sells products is more concentrated—what is often referred to as an oligopolistic market—with just a handful of sellers. This allows the firm to charge higher prices and leads them to produce less than it would if it faced greater competition. In addition, Boushey and Knudsen (2021) cite growing evidence that market concentration has reduced innovation and economy-wide investment in the United States.

Product market concentration may also contribute to economic inequality. This can occur when firms with market power are able to set prices above what they would be in a competitive market. This pricing power harms consumers but improves the payoffs to shareholders, as explored in recent research (Gans et al. 2018; Philippon 2019). This phenomenon can exacerbate inequality, since consumers are spread across the income distribution, while the shareholders who benefit are more likely to be near the top of the income distribution. Research has also shown that higher levels of market concentration are associated with workers receiving a lower share of the income generated by economic output (Barkai 2020; Autor et al. 2020; Eggertsson, Robbins, and Wold 2021).

Joining the two strands of the literature on market concentration, Qiu and Sojourner (2019) note how product and labor market concentration may interact. They use the example of a town with two nursing homes, which may be the only employers of nurses and the only providers of nursing care in the local market, giving them power in both the labor and product markets. They find that the negative effect of labor market concentration on wages is stronger in more concentrated product markets. Chapter 6 explores additional cases where varying levels of competition and market power at different points along the supply chain create similar dynamics, as discussed here in the context of labor market inequality.

Racial and Gender Discrimination

Racial and gender inequality can arise from discrimination that occurs both at the individual level and under broader, more structural conditions. This section explores the extensive evidence on how discrimination has exacerbated inequality, along with how such inequality can be sustained and worsened by employer market power.

Not all differences in earnings by race, ethnicity, and gender are the result of a lack of competition or discrimination, because they can emerge in competitive labor markets due to differences in characteristics such as educational attainment that enhance a person's work productivity. There are notable disparities in educational achievement by race and ethnicity. For example, while 35.8 percent of white, non-Hispanic people have earned a bachelor's degree, the shares are lower for Black (21.6 percent), Hispanic (16.4 percent), Native Hawaiian and Pacific Islander (17.8 percent), and American Indian and Alaska Native (15.0 percent) people (McElrath and Martin 2021). Asian Americans have the highest educational attainment, with 54.3 percent earning a bachelor's degree or higher. There is a large literature on the extent to which differences in productivity-related characteristics, known as "human capital," can explain racial and gender earnings gaps.

Residual gaps in wages and earnings by race, ethnicity, and gender remain even after accounting for differences in educational attainment and a wide range of other productivity-enhancing characteristics (Burnette 2017;

Kamara 2015; Borowczyk-Martins, Bradley, and Tarasonis 2017). For example, recent research finds that—even after accounting for factors such as education, occupation, work experience, and unionization status—40 to 60 percent of the gender wage gap remains unexplained (Blau and Kahn 2017; Foster et al. 2020). In fact, given that educational attainment of women is now higher, on average, than that of men, accounting for gender differences in education increases the unexplained portion of the gender wage gap. This unexplained portion is even larger for Black and Hispanic women, who face wage gaps that are greater than the sum of the gender wage gap and the racial wage gap. (Paul et al. 2018; Bahn and McGrew 2018). Moreover, while educational disparities can explain some of the differences in economic outcomes across racial and ethnic groups, these disparities can also result from discrimination that occurs before individuals enter the workforce.

Individual-level discrimination. One leading explanation for "residual" inequality is individual-level discrimination in labor markets on the basis of race or gender. A large literature in the field of economics homes in on two leading models of discrimination in the labor market, (1) so-called taste-based discrimination (Becker 1971), where some employers individually have a distaste for hiring workers of a certain group; and (2) statistical discrimination (Phelps 1972; Arrow 1973), which occurs when employers that do not have full information about a potential worker's skills use the average characteristics of their racial or gender group to make wage offers (for a review of theory and empirical evidence, see Guryan and Charles 2013). Regardless of intent, both forms of discrimination have disparate negative effects on the group against which the discrimination is occurring.

These forms of discrimination in the labor market take place during individual transactions between workers and employers, and they are theoretically unlikely to persist in well-functioning markets. In the case of taste-based discrimination, differential treatment should decline as discriminatory employers are driven from the competitive market by those whose employment decisions reflect only the productive capacity of their workers. Meanwhile, statistical discrimination may potentially decline over time as employers gather more accurate information about workers (Altonji and Pierret 2001). However, Sarsons (2019) shows that this need not be the case, finding that after the death of a patient, female surgeons experience a greater drop in referrals from primary physicians than their male counterparts, which suggests that the same kind of information may be interpreted less favorably for women doctors as compared with men.

Evidence on individual-level discrimination by race or gender has been found through the use of experimental methods such as résumé studies, where résumés with identical qualifications, but with different racial or gender identities, are sent to employers. Bertrand and Mullainathan (2004) find that résumés with white-sounding names were called back at a 50 percent higher rate than those with Black-sounding names. Quillian and others (2017) conducted a meta-analysis of all such experimental studies of racial and ethnic discrimination, and find that white applicants got 36 percent more callbacks than Black applicants and 24 percent more callbacks than Latino applicants. The study also finds no change in the levels of discrimination against Black applicants between 1990 and 2015, but a modest decline in discrimination against Latino applicants. Related research focusing on discrimination against Hispanic and Latino workers in the housing market, which can reduce overall labor market mobility, finds that immigration and assimilation play an important role. An experimental study using email correspondence by Hanson and Santas (2014) finds that 6.9 percent of landlords discriminate against seemingly recent Hispanic immigrants, with little to no discrimination against applicants who appear assimilated, suggesting significant barriers to mobility for marginalized Hispanic and Latino people.

Experimental studies also find individual-level labor market discrimination against women. Qualified women are less likely to be hired or promoted compared with men (for a case study of symphony orchestras, see Goldin and Rouse 2000), and the hiring discrepancy is particularly strong for positions where expected income is higher (Neumark et al. 1996). More recent résumé studies shed light on how gender discrimination is concentrated among particular firms and is stronger in certain industries (Kline, Rose, and Walters 2021), and find evidence that it can be particularly acute among employers in male-dominated professions (Hangartner, Kopp, and Siegenthaler 2021) and those seeking to fill jobs that require a major in science, technology, engineering, and/or mathematics (Kessler, Low, and Sullivan 2019).

Beyond individual-level discrimination: structural racism. A growing body of research documents how theories of individual-level discrimination are incomplete, particularly in explaining the persistent gaps in outcomes between racial groups, because they do not adequately incorporate the legacy of historic forms of discrimination in the United States. For example, current Black/white gaps in economic outcomes can be partially explained by periods throughout U.S. history ranging from the era of chattel slavery, to Jim Crow regimes of segregation, to the present era of mass incarceration (Cook and Logan 2020).

To establish a theory capable of explaining these persistent gaps, William Darity Jr. developed the subfield of "stratification economics" (Darity 2005; Darity, forthcoming; Chelwa, Hamilton, and Stewart, forthcoming), in which he argues that economic gaps have persisted because of the material incentive to maintain distinct group identities. With these group identities in place and entrenched within a hierarchy, theories such as Acemoglu and Wolitzky's (2011) model of coercion can be used to show

how “structural” forms of racism can take hold in labor markets.[1] Under this theory, employers have an economic incentive to coerce workers into undesirable, low-wage work arrangements that maximize profits, in the extreme using force or violence, or, under softer versions of coercion, weakening workers’ bargaining power by limiting their mobility and outside options. Naidu (2010) provides evidence of this, showing that enticement fines that prevented employers in the postbellum U.S. South from recruiting already-employed agricultural workers reduced the labor market mobility and wages of Black sharecroppers.

A second key insight regarding structural racism is that discrimination by a subset of actors can spill over to others in the same setting or market, or in other parts of the economy, generating more pervasive disparities. For example, discrimination in law enforcement and legal systems exacerbates disproportionate rates of incarceration across racial groups. Though there are 233 people in State or Federal prisons per every 100,000 white U.S. residents, Hispanic people have a 50 percent higher rate, at 351 per 100,000, American Indian and Alaska Native people have more than twice the rate, at 565 per 100,000, and Black people have nearly five times the rate, at 1,160 per 100,000. And though those who identify as Asian American alone have a much lower imprisonment rate, of 39 per 100,000, people identified as Native Hawaiian and Pacific Islander have a rate more than 12 times as high, at 497 per 100,000 (Carson 2021). In addition, there is substantial evidence of labor force discrimination against formerly incarcerated people, both due to concerns about recidivism and gaps in work experience, and also due to a general stigma above and beyond productivity-related factors (Agan and Starr 2018). This discrimination is at times codified in restrictions that keep them from working in certain sectors; a number of States deny occupational licenses to those with a prior arrest or conviction (Sibilla 2020). Chapter 4 provides further detail on some of the obstacles that limit the employment opportunities of formerly incarcerated people. Even if the barriers faced by the formerly incarcerated were not racially targeted by design, higher rates of incarceration for certain racial groups mean that these employment barriers disproportionately block members of these groups, resulting in a structural form of racial discrimination.

In some cases, the long-run impact of historical racial discrimination can result in economic indicators that might naively be interpreted as evidence that discrimination has been overcome. Suzuki (1995) examines the improvement in economic outcomes for Japanese immigrants between 1920 and 1930, as measured by a greater share employed in “professional”

[1] For further discussion of this application, see the notes on structural economic racism by Acemoglu and Wolitzky (2011).

and higher-paid occupations during this period.[2] These patterns are cited by some as an example of exceptionalism among Asian American families, which continue to have some of the highest levels of earnings among different racial and ethnic groups. Suzuki (1995) challenges this common narrative, pointing out that during that 1920–30 period, nine States passed laws banning the purchase of farmland by Japanese immigrants, the Supreme Court deemed Japanese people ineligible for naturalization as they were neither white nor of African descent, and the U.S. government passed a law excluding Japanese immigrants. The author also shows that the laws were associated with a significant return of these immigrants to Japan, and that this outflow was disproportionately made up of those in lower-earning occupations. Thus, the apparent economic success story of Japanese immigrants may have actually been driven by highly discriminatory policies that resulted in selection bias among those who remained here.

One of the most notable cases of historic economic stratification involves the widespread dispossession of land from indigenous people and nations during the expansion of U.S. territory that began in the late 1700s. Carlos, Feir, and Redish (2021) argue that though historians often highlight the key roles of abundant land, property rights, and the rule of law in U.S. economic development, these discussions erase the simultaneous erosion of these very same inputs and institutions for members of existing Native groups and entities. In addition to the direct types of harm caused by the often-violent process of relocation and geographic restriction, the centuries-long process helped give rise to adverse economic outcomes for present-day American Indians and Alaska Natives. As just one example, Akee (2020) studies the Nelson Act of 1889, which took collectively held property of the Minnesota Anishinabe reservations and allotted parcels to individual owners, allowing them to sell lands to non-Indian buyers (U.S. Congress 1889). While increased private ownership of land might be expected to support a more productive use of land, Akee (2020) finds, compared with reservations not affected by the allotment, a rapid reduction in land ownership, home ownership, and self-employed farming, along with an increase in renting and wage labor in the timber industry. These reductions in land and capital ownership likely resulted in lower wealth levels and poorer economic outcomes for subsequent Anishinabe generations.

Gender-based occupational segregation and bias. Beyond employer discrimination in hiring and promotion, economists have also considered broader sources of gender inequality in the labor market, such as occupational segregation and employers' assumptions about the division of labor in the household. Occupational segregation plays a major role in the gender wage gap. Research finds that differences in the types of occupation and

[2] Although income itself may be considered a better measure, it was not captured by the Census surveys used for this analysis.

industries in which men and women work are some of the largest contributors to the wage gap, accounting for one-third to one-half of the gap (Blau and Kahn 2017; Foster et al. 2020). There is also evidence that the gender wage gap is linked to the disproportionate rewards for long hours and weekend work in some occupations (Goldin 2014; Foster et al. 2020). Although occupational segregation by gender has been decreasing over time, progress has stalled in recent decades (del Río and Alonso-Villar 2015). In the years 2011–15, more than 40 percent of workers were in occupations in which more than three-fourths of workers were of one gender, with women more likely to be in low-paying occupations (Gould, Schieder, and Geier 2016).

Women are more likely to enter occupations that entail caring for others. For example, 94 percent of workers in the childcare sector and 89 percent of workers in home health care are women; of those, Black, Hispanic, and Asian American / Pacific Islander women are overrepresented relative to their share in the overall workforce (Gould, Sawo, and Banerjee 2021). Average wages in these sectors are roughly half the average among workers overall. Furthermore, research has documented a wage penalty associated with certain caregiving occupations that persists after controlling for the education and skills required for these jobs (England, Budig, and Folbre 2002; Barron and West 2011; Pietrykowski 2017; Budig, Hodges, and England 2019; Folbre and Smith 2017). This "care penalty" means that even highly skilled care workers may be paid less than they would be in jobs that require similar qualifications but do not involve caregiving. Estimates of the care penalty vary across studies, but the most comprehensive recent study finds a 15 percent wage penalty for female childcare workers, nursing aides, and health aides (Budig, Hodges, and England 2019). The study also finds a 6 percent wage penalty among men in these fields, consistent with other studies that find that the wage penalties in these caregiving occupations are not confined to women. Recent research has found evidence that stereotypes about gender-specific skills and gender-specific roles can explain at least some of this occupational segregation (Bertrand 2020; Levanon, England, and Allison 2009; Pan 2015). The predominance of women in relatively low-paying occupations translates into greater gender wage inequality.

Another source of gender inequality relates to the division of labor in the household, as well as employers' assumptions about it. Though the increase in women's labor force participation has been accompanied by a decrease in their average time spent on household labor (including housework and child care), research shows that women spend a higher fraction of their hours in unpaid family care and that men spend a higher fraction of their hours in paid work (Bianchi et al. 2012). In 2019, mothers spent almost double the amount of time as fathers caring for children in the household (BLS 2020). This is true regardless of a woman's wages relative to those of her spouse, as Siminski and Yetsenga (2021) find even at the extreme—where women's wages are more than double those of their spouses—women do 44 percent more household work. A potential result of imbalances within the household is that mothers experience long-term wage penalties related to the reduction in labor supply and loss of work experience that occurs when a child is added to their household (Kleven et al. 2019).

In addition to the direct effect of this period of labor force exit on mothers' long-term earnings, experimental evidence shows that employers' expectations of women's greater childcare responsibilities can influence women's labor market outcomes. A résumé study modeled on the research of Bertrand and Mullainathan (2004) found that prospective employers were almost twice as likely to call back women without children as they were women with children, while their callbacks of men were unaffected by fatherhood status (Correll, Benard, and Paik 2007). Petit (2007) similarly uses a résumé study to find significant hiring discrimination against young women for high-skill positions in the French finance industry, where time off for dependent care may be particularly penalized.

How Inequality Affects Economic Efficiency and Growth

Although part of the motivation for addressing imperfect competition in labor markets and discrimination is rooted in the spirit of fairness and justice, there is also an important case to be made that such measures can contribute to overall economic output and growth. When the policies that reduce inequality also serve to curtail costly rent seeking, economic efficiency and productivity are improved. Similarly, when the inequality stems from barriers that have kept some from fully taking part in the economy, removal of these barriers supports economic growth.

Monopsony Power Produces Inefficient Labor Market Outcomes

As explained above, firms with monopsony power in the labor market can set lower wages and employ fewer workers than they would under more competitive conditions, contributing to wage inequality. These inefficiently low levels of employment also directly hurt economic output.[3] A recent study estimates that monopsony power in the U.S. economy reduces overall economic output by 13 percent (Naidu, Posner, and Weyl 2018). In addition, noncompete clauses and no-poach agreements, along with nondisclosure agreements and pay secrecy practices, can harm workers throughout the wage distribution. By reducing competition among employers and limiting workers' mobility, these restrictive employment practices reduce economic

[3] In addition, lower levels of employment and lower wages mean that there are fewer workers and that these workers have less money to spend, thereby reducing consumer demand. This reduction in consumer demand will, in turn, create a drag on overall economic growth in the long term (Caldwell and Naidu 2020).

efficiency by preventing some workers from finding the job that best matches their qualifications.

Discrimination Misallocates Talent and Suppresses Innovation

A number of empirical studies argue that various forms of racial and gender discrimination can sideline talented workers, resulting in slower economic growth. For example, a recent study by Buckman and others (2021) estimates that if employment, education, and earnings were equalized across racial and ethnic groups over the period from 1990 to 2019, gross domestic product would have increased by $22.9 trillion. These gains emerge both by allowing current workers to fully realize their potential, and also by signaling a more reliable return to investments in skills among underrepresented racial groups, which yields growth in the future. Likewise, Hsieh and others (2019) show that increased access to high-income occupations for underrepresented groups, over the period from 1960 to 2021, accounted for 20 to 40 percent of growth in aggregate output. Bucknor and Barber (2016) estimate an $80 billion cost to gross domestic product due to lower levels of employment among those who are formerly incarcerated, which is in part driven by discrimination and disproportionately affects Black, Hispanic, American Indian, and Alaska Native communities. Finally, research by Cook (2014) finds that racist violence led to hundreds of fewer patents by African American inventors in the late 19th and early 20th centuries, and a study by Cook and Gerson (2019) shows how closing the gaps in patenting for women and underrepresented minorities can increase economic growth.

As a concrete example, research shows that alleviating entrenched racism in the South was associated with greater regional economic growth. The brief period of increased Black political power in the South during Reconstruction saw increases in taxation and spending on public education (Logan 2020). Likewise, the Great Mississippi Flood of 1927, which forced the migration of Black workers to industrial cities and reduced the coercive powers of southern landowners, resulted in a greater reliance on capital investment and technology adoption (Hornbeck and Naidu 2014) in the region. Subsequent economic growth in these regions suggest that private gains from coercive labor practices had come at the expense of more socially valuable investment and efficient production. Most notably, Wright (2013) argues that the revolutionary changes brought about by the Civil Rights Movement led to improvements in access to jobs, education, and health care that yielded benefits not only for Black southerners but also for the entire southern economy, helping to partially undo decades of underdevelopment. Overall, the moments in history where entrenched racism in the South was partially dislodged have tended to be times where the region has best been able to catch up with the more industrialized northern economy.

Discrimination Reduces Incentives for Human Capital Investment

Discrimination and monopsony power can also have large, long-term negative effects on economic growth if they reduce the extent to which the affected individuals invest in their education and skill development. A worker who expects to be paid a wage lower than their productivity, whether due to discrimination or an employer's monopsony power, may have less incentive to engage in activities like training that could increase their productivity, compounding already-existing barriers to such training. For example, in one study, Latina high school students who anticipated future career barriers due to their immigration status were found more likely to plan to attend a two-year college than a four-year college (McWhirter, Ramos, and Medina 2013). The benefits of greater human capital development for economic growth are discussed in more detail in chapter 4.

Policies to Address Sources of Labor Market Inequality

Addressing inequality is important for ensuring that people are rewarded fairly for their efforts and contributions to productivity as well as for fostering stronger productivity and growth. Because this occurs in so many ways, there are no one-size-fits-all solutions. Instead, there are a number of specific policies designed to address the inequality that stems from noncompetitive and discriminatory market outcomes, as well as policies that address larger, structural problems.

Core to addressing inequality is increased enforcement of current labor protection and antidiscrimination laws. The 1935 National Labor Relations Act (U.S. Congress 1935), which established the National Labor Relations Board; the 1938 Fair Labor Standards Act (U.S. Congress 1938), which led to the Wage and Hour Division at the Department of Labor; and the 1964 Civil Rights Act (U.S. Congress 1964), which established the Equal Employment and Opportunity Commission, are each important to ensuring that workers are treated fairly. More recent policies, such as the Americans with Disabilities Act of 1990 (U.S. Congress 1990) and the Family and Medical Leave Act of 1993 (U.S. Congress 1993), have focused on particular equity concerns. The proposed Equality Act, if passed, would prohibit additional forms of discrimination, including on the basis of sexual orientation and gender identity in settings beyond the realm of employment (U.S. Congress 2021e).

Research on the effects of laws prohibiting discrimination against workers generally finds positive effects on outcomes for the intended beneficiaries (for studies of specific groups, see Collins 2003; Neumark and Stock 2006; and Neumark et al. 2019). These results also underscore the need to address workers' misclassification, whereby workers who should be classified as employees, and therefore receive coverage of the above laws, are instead treated as independent contractors. More general economic policies have the potential to further counteract the forces that underlie wage inequality and racial/gender discrimination. Though far from an exhaustive list, this section surveys several such policies.

Promoting Competition

Healthy market competition is fundamental to a well-functioning U.S. economy. Basic economic theory demonstrates that when firms must compete for customers, it generally leads to lower prices, higher-quality goods and services, greater variety, and more innovation. In 2021, President Biden signed the Executive Order on Promoting Competition in the American Economy, establishing a multiagency approach to push back on decades of decline in competition. The Executive Order not only calls on the traditional antitrust agencies—the Department of Justice (DOJ) and the Federal Trade Commission (FTC)—to enforce existing laws vigorously and to consider updating their merger guidelines; it also directs all agencies and departments to use their detailed knowledge and expertise to ensure that their work clearly supports competition in the markets they regulate (White House 2021c). This whole-of-government approach is designed to address the concern that antitrust agencies are limited both by resources and the current judicial interpretation of the antitrust laws. It also relies on the fact that Congress has delegated authority to police anticompetitive conduct and oversee mergers to many agencies—not just the DOJ and the FTC. The Executive Order therefore directs or encourages roughly a dozen agencies to engage in more than 70 specific actions that will remove barriers to entry and encourage more competition.

Increased enforcement of antitrust laws would also alleviate labor market monopsony and therefore its negative effects on wages, equality, and race- and gender-based pay gaps (Marinescu and Posner 2019). Antitrust law has been used to combat no-poaching agreements, noncompete agreements, and related contractual restrictions on workers' mobility. It can also be used to block mergers that would concentrate labor markets excessively and to penalize large employers that use illegal methods to obtain or maintain labor monopsonies. Though some of these uses of antitrust law have been rare until recently, the Executive Order on Promoting Competition calls for agencies to make greater use of antitrust law to promote competition in labor markets. For example, the DOJ and the FTC have begun the process for revising the merger guidelines, and have called for public comment on labor market implications (Federal Trade Commission 2022).

Unions and Labor Market Equity

Unions can provide workers the increased leverage to bargain with their employer, serving as a counterweight to the power that employers have to set wages and working conditions. Numerous studies support this notion, including research showing that unions' negotiating power increases wages (Card 1996; Chava, Danis, and Hsu 2020), and that union representation also increases worker satisfaction and job tenure (Freeman and Medoff 1984). Unions also give workers a voice, which can improve productivity (Cai and Wang 2020). In the presence of employer monopsony power, the compensation gains achieved by unions may shift economic rents from employers to employees, reducing inequality without significant efficiency costs. Consistent with this view, higher rates of unionization have been shown to mitigate the negative effect of monopsony on wages (Benmelech, Bergman, and Kim 2020; Qiu and Sojourner 2019; Prager and Schmitt 2021; Dodini, Salvanes, and Willen 2022), and there has been, historically, an inverse relationship between the degree of union membership and income inequality (Farber et al. 2021).

Unions also have the potential to foster equitable pay and working conditions for people of different genders and racial and ethnic backgrounds. For example, higher rates of union membership among Black workers have led to increased wages; and, for Black women, have led to a substantial reduction in the gap in their wages relative to white women (Rosenfeld and Kleykamp 2012). Also, collective bargaining is associated with lower gender wage gaps among teachers (Biasi and Sarsons 2022). This has not always been the case in U.S. history: some unions have, in the past, supported exclusionary, anti-Asian immigration policies (Frymer and Grumbach 2020), and major unions have at times faced criticism for discriminatory practices against Black workers (Hill 1959) or limited representation of women among leadership roles (Ledwith 2012). Nonetheless, labor unions were important proponents of the Civil Rights Act of 1964 (Collier and Grumbach 2022), and later waves of unionization in the United States have been associated with greater representation for women in these organizations (Milkman 1990). In 2021, union membership was quite diverse; more than a third of unionized workers are Black, Hispanic, Asian, or members of another nonwhite group, and almost half are women (BLS 2022b). And among white workers, Frymer and Grumbach (2020) find that union membership leads to lower racial resentment and greater support for policies that benefit African Americans.

Despite declining union membership since the 1960s, almost half of nonunionized workers report interest in joining a union if one were available at their workplace (Hertel-Fernandez 2020), suggesting that there is a valuable role for policy efforts that support the right to union organizing. To support these efforts, President Biden signed Executive Order 14025, which established the Task Force on Worker Organizing and Empowerment (White House 2021d). The Task Force, charged with identifying how the executive branch could support worker power and collective bargaining, released 70 recommendations focusing on how the Federal government can serve as a model employer and support workers by sharing information and improving transparency when it comes to organizing rights (Harris and Walsh 2022). In addition to the executive branch's efforts, key legislation related to worker empowerment includes the Protecting the Right to Organize (PRO) Act (U.S. Congress 2021a). The PRO Act aims to protect workers' right to join a union by introducing penalties for companies that violate workers' rights, expanding workers' collective bargaining rights, and ensuring access to fair union elections. The Public Service Freedom to Negotiate Act (U.S. Congress 2021b) similarly provides support to workers in the public sector, while the National Domestic Workers' Bill of Rights (U.S. Congress 2021c) proposes to expand coverage of labor protections to domestic workers, providing greater regulation of labor standards for a sector that is disproportionately home to women, workers of color, and immigrants.

The Minimum Wage

The Fair Labor Standards Act was first signed into law over 80 years ago, and subsequent amendments have extended coverage to a broader range of workers. In addition, 30 States and the District of Columbia currently have a minimum wage that is higher than the Federal minimum (Department of Labor 2022b), and 40 localities have adopted minimum wages above their State minimum wage (Economic Policy Institute 2022). Mandating a minimum wage can decrease inequality by ensuring that those with the least earnings potential receive at least a minimum level of compensation for each hour they work. The potential for minimum wages to—on net—make low-paid workers better off depends on several factors, including whether employers have to compete for workers. A minimum wage could cause employers in a perfectly competitive labor market to cut back on hiring workers at the higher hourly rate. However, when workers' wages are low due to a lack of competition or discrimination, minimum wage legislation may not be distortionary because employers are setting wages lower than a worker's productivity and hiring fewer workers than they would under more competitive conditions. Though debate continues on the employment effects of minimum wage laws (Neumark and Shirley 2021; Dube 2019; Cengiz et al. 2019; Card and Krueger 1994), recent empirical evidence indicates that they do not materially reduce employment in concentrated labor markets and may even increase employment as market concentration increases (Azar et al. 2019). This suggests that policies like the minimum wage can reduce wage inequality without reducing employment or sacrificing economic output.

The minimum wage has been shown to reduce inequality by increasing growth in earnings, with effects that persist over several years (Rinz and Voorheis 2018). When the Fair Labor Standards Act was amended in 1966 (U.S. Congress 1966) to extend Federal minimum wage coverage to some of the country's lowest-paid sectors, wages increased and racial earnings gaps were reduced (Bailey, DiNardo, and Stuart 2020; Derenoncourt and Montialoux 2021). Derenoncourt and Montialoux (2021) estimate that the minimum wage law accounted for 20 percent of the reduction in the Black/white earnings gap during the Civil Rights Era.

Although legislation is required to increase the Federal minimum wage from its current level of $7.25 per hour, the Biden-Harris Administration's Executive Order 14026 establishes a new hourly minimum wage of $15.00 for workers performing work on or in connection with covered Federal contracts (White House 2021e). In addition to directly lifting the wages of hundreds of thousands of contract workers, this Executive Order could have broader effects, as competitors in the same labor markets as Federal contractors may increase wages, too, as they seek to compete for workers (Derenoncourt et al. 2021). In addition, President Biden has endorsed several other adjustments to minimum wage policy, including raising the Federal minimum wage to $15 for all workers, indexing future increase to inflation, phasing out the lower minimum wage that applies to some workers who receive tips, and expanding coverage of the Federal minimum wage to teens and workers with disabilities, all of which are features of the proposed Raise the Wage Act of 2021 (U.S. Congress 2021d).

Full Employment and Tight Labor Markets

Although minimum wage legislation and support for unionization efforts can directly help to reduce overall wage inequality, fiscal and monetary policies to support full employment conditions can play a strong underlying role as well. Full employment—the lowest rate of unemployment possible without spurring inflation—can put workers in a position to demand pay increases in accordance with their productivity. This can both offset the market power of employers and limit their ability to engage in discriminatory practices. When the number of job openings relative to workers seeking jobs is high, there are improved outside options for all workers, which may be especially important for those subject to discrimination. For example, the American Rescue Plan, crafted both to address the COVID-19 pandemic and support the economy, contributed to much higher growth than anticipated, with over 6 million jobs added to the U.S. economy in 2021, the largest percentage rise during a calendar year since 1978. However, the world has learned that expansionary fiscal policy can become challenging when the supply of goods and services is constrained, as has been the case during the pandemic.

Research by Dahl and Knepper (2021) supports the idea that full employment can protect workers from discriminatory practices. They find that tighter labor markets and more generous unemployment insurance benefits, which allow job seekers greater ability to search for jobs, increase the reporting of sexual harassment by workers who may otherwise avoid reporting out of fear of retaliation. Beyond the substantial moral considerations, policies that support tighter labor markets and help limit gender discrimination in the workplace may also improve economic efficiency by allowing bad actors to be identified and held accountable, rewarding good employers, and ensuring better matches between employers and employees. Dahl and Knepper (2021) find similar evidence from discrimination claims that tighter labor markets reduce age-related discrimination.

There is also evidence that tighter labor markets can reduce the gender wage gap, as shown by Biddle and Hamermesh (2013). In contrast, however, the authors find that Black/white gaps in wages are actually larger during tighter labor markets, though that may be partially due to the fact that more low-wage Black workers are able to enter the workforce when unemployment is low (Ashenfelter 1970; Freeman et al. 1973). Indeed, other research finds that the Black/white gap in unemployment tends to fall during tighter labor markets (Rodgers 2008; Hoynes, Miller, and Schaller 2012; Cajner et al. 2017). This smaller Black/white gap in unemployment during tight labor markets does not appear to operate through lower levels of racial discrimination in callbacks to job applicants, however. A number of résumé studies have shown that the gap in callbacks between these groups persists through periods of both high and low unemployment (Bertrand and Mullainathan 2004; Nunley et al. 2015; Quillian et al. 2017).

Care Economy Policies

The provision of affordable childcare and early childhood education in the United States has the potential to reduce gender wage inequality by helping to support the paid labor force participation of women in families with children and reducing care-related discrimination by employers. The pandemic highlighted the importance of the availability of care, as school and childcare closures exacerbated existing shortages in the availability of care (Carson and Mattingly 2020). Childcare and universal preschool can ease the trade-offs that families with children must make between care responsibilities and paid work. But many families find the prices for high-quality childcare and early childhood education on the private market unaffordable, and credit constraints may keep them from accessing needed childcare at a time in their lives when their earnings and savings are lowest

(U.S. Department of the Treasury 2021b). Subsidizing childcare and providing universal public preschool, therefore, can help many families access otherwise unaffordable options. In addition, there may be positive economic spillovers that parents do not completely factor in when deciding whether to purchase childcare or early childhood education. As discussed in chapter 4, high-quality childcare provides long-lasting benefits for children, especially those who are more economically disadvantaged (Herbst 2017), thereby benefiting the rest of society by fostering economic growth. Moreover, viable options for childcare and preschool, by providing parents with the option to remain in the paid workforce, can mitigate the motherhood penalty associated with a labor force exit and reduce the likelihood of employer discrimination related to expectations of childcare responsibilities that arise even for women without children.

Much research on past childcare and preschool programs has found positive effects on maternal labor force participation and household income (Blau and Kahn 2013; Davis et al. 2018; Herbst 2017; Morrissey 2017; Bauernschuster and Schlotter 2015; Wikle and Wilson 2021). Olivetti and Petrongolo (2017) examine cross-country differences and find that the provision of early education and childcare are particularly beneficial to women's employment and earnings. In contrast, Kleven and others (2021) find that the expansion of parental leave and subsidized childcare in Austria had no effect on gender inequality in the labor market. This suggests that the provision of generous family policies is necessary, but not always sufficient, to reduce motherhood penalties in the labor market. Whether or not they are sufficient to reduce motherhood penalties, generous family policies do allow parents to ensure that their children will receive high-quality care while they have the option to participate in the labor force.

In addition, policies that support the care industry also have the potential to disrupt the "low road" equilibrium of low wages and difficult working conditions in this sector. Subsidies that bolster the wages of childcare workers, one of the lowest-paid occupations in the U.S. economy, can increase their earnings and expand employment. Moreover, given that the care sector is home to a disproportionate share of women—especially Black, Hispanic, and Asian American and Pacific Islander women—childcare subsidies can also directly reduce both gender and racial wage inequality.

Another policy that could help families manage care responsibilities is the establishment of a national paid family and medical leave program, building on the 1993 Family and Medical Leave Act, which requires covered employers to provide employees with 12 weeks of unpaid leave to care for a new child, care for a seriously ill family member, or recover from the worker's own serious illness. Paid family and medical leave programs have been enacted in nine U.S. States and the District of Columbia (Kaiser Family Foundation 2021). Paid leave used at the time of the birth of a child has been shown to increase the mother's attachment to the labor force (Byker 2016; Rossin-Slater, Ruhm, and Waldfogel 2013), which can potentially increase long-term earnings. Along with other policies that maintain their labor force participation, moderate lengths of parental leave can reduce motherhood wage penalties (Budig, Misra, and Boeckmann 2016). Paid leave may also produce labor supply benefits when used for other purposes, such as caring for a spouse with a work-limiting disability or a chronic health condition (Anand, Dague, and Wagner 2021).

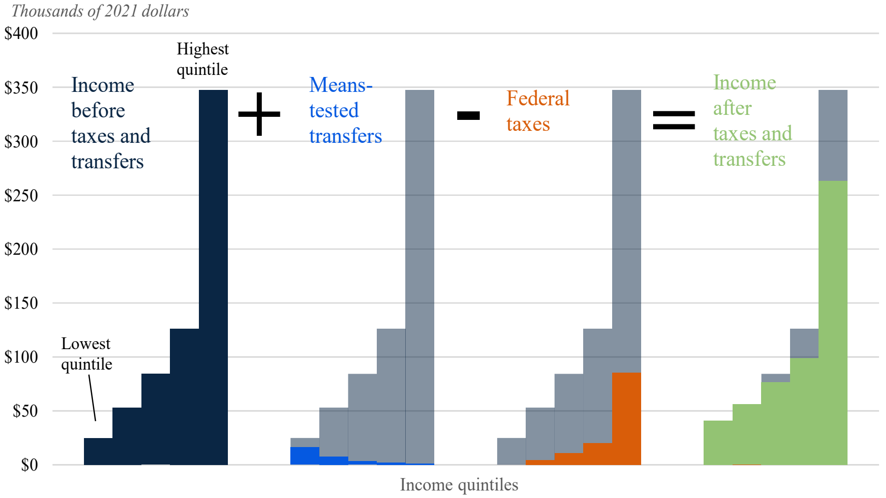
The structure of parental leave in the United States differs markedly from that of other countries, where parental leave is often tied to a child, and family members can choose who takes the leave. In contrast, leave in the United States is tied to the worker, and cannot be transferred between family members. This means that parents of a new child can maximize their combined parental leave by having more than one parent take it. This nontransferable leave has the potential to reduce care-based discrimination against women by creating an incentive for both men and women to use it. Research has shown that when other countries have introduced policies designed to increase fathers' use of parental leave, the labor supply and earnings of mothers have increased, though the persistence of the effects has varied (Dunatchik and Ozcan 2020; Druedahl, Ejrnaes, and Jorgensen 2019). Such polices have also had positive health effects on mothers as well as long-lasting effects on the division of labor in the household (Patnaik 2019; Persson and Rossin-Slater 2019).

Progressive and Equitable Tax Policy

A progressive system of taxation, where higher-income households pay a greater share of their income in taxes, can play an important role in reducing inequality, including that which is driven by differences in skills and luck, or other forces that remain even when barriers to competition have been addressed. Figure 5-6 demonstrates how the combination of means-tested transfers and Federal income taxes increased incomes of the lowest quintile by 68 percent, and reduced incomes in the highest quintile by 24 percent. Using an alternative summary measure of income inequality, the Gini coefficient was reduced by 8 percent by taxes and transfers in 2018. And given that white women and Black, American Indian, Alaska Native, and Hispanic people of any gender are overrepresented in the low-wage workforce, progressive taxation can also reduce racial, ethnic, and gender inequality.

Tax credits that provide direct transfers to middle- and lower-income households can support the goals of reducing inequality and enhancing equity. The Child Tax Credit has emerged as a key lever in this area. While this credit traditionally accrued to largely middle-income households, the American Rescue Plan Act temporarily increased the credit and made it fully

Figure 5-6. Average Income, Means-Tested Transfers, and Federal Taxes, 2018



Sources: Congressional Budget Office; Haver analytics; CEA calculations.

refundable in 2021, allowing all households at the lower end of the income distribution to receive the maximum credit, even if they had no tax liability. The most direct impact of these changes was to reduce poverty, especially for children in recipient households, with the greatest estimated reductions in poverty for Black and Latino children (Center on Poverty and Social Policy 2021). These credits also support investments in human capital, such as educational attainment, as discussed in chapter 4, and the associated long-run increases in employment, earnings, and longevity.

A key challenge to progressivity is the preferential tax treatment of capital income—such as dividends generated from an investment or the gain in the value of stocks or other assets (Tax Policy Center 2020). Capital income is generally taxed at lower rates than wage and salary income, and the increase in the market value of stocks and many other assets is not taxed until the gain is "realized" when the asset is sold. Thus, these capital gains are allowed to accrue and compound for years before being taxed, and, if passed on at death without being sold, the gains in the value of the asset over the lifetime of the holder will escape taxation completely. Recent research shows that when capital income is instead counted as income in the year it accrues, the 400 wealthiest households pay between 6 and 12 percent of their income in taxes (Leiserson and Yagan 2021). This is a much lower rate than would be paid by households that had received all their earnings through labor income, and because capital income is concentrated among higher income households, these factors tend to exacerbate inequality in after-tax income.

In addition, households with significant capital income are more likely to get away with tax evasion. It is estimated that nearly 99 percent of income taxes on labor wages and salary are paid, while a much lower percentage of taxes owed are collected on the forms of income, such as short-term capital gains, that are more likely to be accrued by higher-income households. (U.S. Department of the Treasury 2021c; Internal Revenue Service 2019). Recent research suggests that highly sophisticated forms of tax evasion, including through offshore accounts and pass-through businesses, go undetected and account for nearly one-third of evasion (Guyton et al. 2021). Moreover, while audits by the Internal Revenue Service (IRS) have decreased in general in recent years, they have decreased more rapidly among higher-income earnings, skewing enforcement toward a group with lower rates of underpayment (Sarin 2021). One reason for a decline in audits among higher-income taxpayers is that audits among this group are costly—they have access to advanced forms of evasion—and the IRS has been under-funded during the last decade.

Policies that achieve greater parity in tax rates on capital income relative to labor income, and greater funding for the IRS to enhance taxpayer compliance, can therefore improve the progressivity of the tax code. This includes taxing capital income at ordinary income tax rates and taxing the capital gains on assets transferred at death, both of which were proposed, with some progressive exclusions, as a part of the revenue policies in President Biden's Fiscal Year 2022 budget (U.S. Department of the Treasury 2021a). On the tax compliance side, this budget also outlined a number of improvements to the IRS's enforcement capability, including additional funding to help combat sophisticated forms of tax evasion, better information from third-party reporters on capital income, technological upgrades at the IRS, and improved regulation of paid tax preparers. This combination of policies would likely increase the effective tax rate faced by those with capital income, which, given the concentration of capital income among the richest households and the underrepresentation of marginalized groups among this category, would facilitate greater progressivity and racial and ethnic equity in the tax code.

Conclusion

This chapter has explored and defined the scope of forces that keep labor and product markets from being truly competitive, and that prevent individuals from reaching their full potential. These include a lack of competition in markets affecting a broad range of workers, and racial and gender discrimination more specifically. The costs of ignoring these structural forces are increased inequality and reduced economic growth and output. These societal and economic costs stem from inefficient labor market outcomes, misallocated talent, suppressed innovation, and reduced incentives for human capital investment. Government actions can curtail these forces by enforcing existing antidiscrimination laws and promoting competition in the economy—at large, and in labor markets in particular. Policies that establish a minimum wage or protect the rights of workers to join a union are examples of actions that counterbalance employers' market power, while government support for the care economy can bolster wages and increase employment in that sector. These and other polices can begin relieving the historical burdens on disadvantaged groups of workers, helping to reduce inequality and bolster economic output and growth.

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Chapter 6

Building Resilient Supply Chains

The year 2021 was when supply chains—the networks of producers, transportation companies, and distribution centers that develop and move products and services—entered dinner table conversations. Though this term has certainly been part of the lexicon going back to the 1980s, and has been a part of doing business for centuries, COVID-19 highlighted supply chains' vulnerabilities, which became front-page news. Supply chains have become more complex, interconnected, and global than they were in decades past. The share of world trade that crossed at least two borders increased from 37 percent in 1970 to nearly 50 percent in 2014 (World Bank 2020a, 2020b).

This increasing segmentation of the production process has reduced prices in the United States, while also raising productivity and aggregate incomes in many of the low-income countries that are integral to global supply chains (World Bank 2020a). However, the globalization of production has also made supply chains more vulnerable to disruption. This fragility has been exacerbated as firms have removed excess capacity (e.g., extra inventory, or reserves of people with the time and skills to solve problems), making supply chains less resilient. That is, they have less ability to recover quickly from unexpected events. Thus, though modern supply chains have driven down consumer prices for many goods, they can also easily break (Brede and de Vries 2009; Baldwin and Freeman 2021; Miroudot 2020; de Sá et al. 2019; White House 2021a).

Though it was not inevitable, movement toward this more fragile configuration has been happening for decades, as public and private policies have undermined firms' incentives to invest in such capacity to ensure resilience. The COVID-19 pandemic is not the first time that supply chains have been disrupted; the production and distribution of goods have been regularly snarled by natural disasters, cyberattacks, labor strikes, supplier bankruptcies, industrial accidents, and climate-induced weather emergencies (de Sá et al. 2019). The pandemic simply exposed just how complex and interconnected modern supply chains have become. These highly publicized disruptions and product shortages made the public painfully aware of the many steps involved in getting a product produced, transported, and placed on shelves or doorsteps.

The first section of this chapter describes modern supply chains and explains their evolution, focusing on manufacturing. Supply chains are shaped by a complex network of relationships; these relationships affect not just the movement of supplies from place to place but also the incentives of lead firms and suppliers to invest in producing new products, in providing good jobs, and in achieving resilience. The second section describes how increasingly frequent disruptions of the economy suggest that supply chain fragility will continue to be a problem. The third section outlines the private sector's incentives to become more resilient in the face of these challenges. Finally, the fourth section suggests vital roles for government in helping to shape supply chains and overcome market failures.

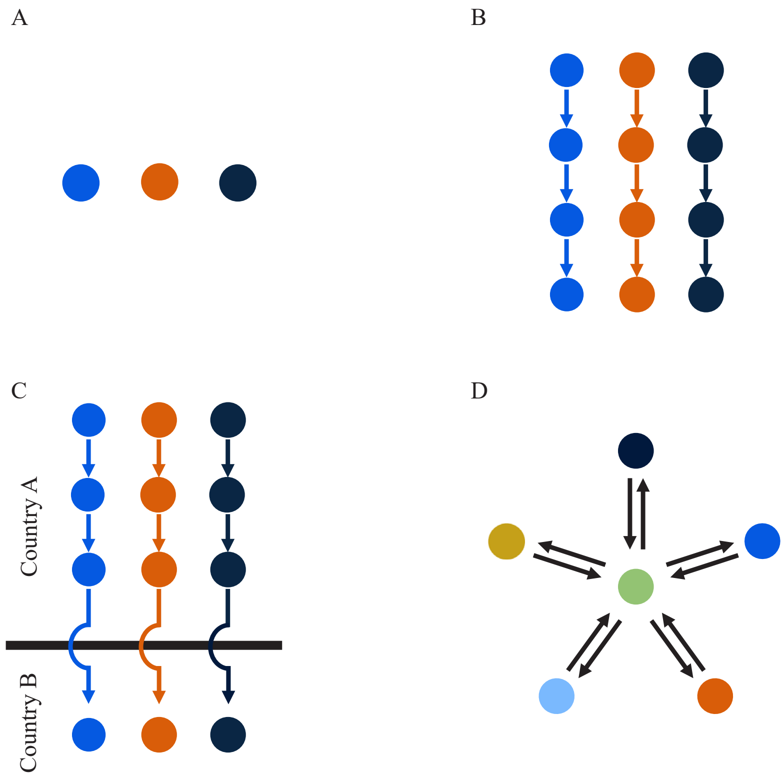
21st-Century Supply Chains

Supply chains are the linkages in the production process that facilitate the transformation of raw materials into finished goods or services. A supply chain is made up of producers and logistics providers that move inputs from one stage to the next, and also of participants in the distribution channels for the finished product, including wholesalers, distributers, and retailers. This chapter primarily focuses on manufacturing supply chains that facilitate the production of physical products from unprocessed materials.[1]

Figure 6-1 depicts some of the ways supply chains are commonly organized. Even within the same industry, firms have different supply chain

[1] In addition to goods, services are also part of supply chains and often face some of the same issues that are discussed in this chapter.

Figure 6-1. Common Types of Supply Chains



Source: Adapted from Cavalho (2014).
Note: From left to right: A, vertical integration with isolated industries; B, outsourcing with isolated industries; C, outsourcing and offshoring with isolated industries; D, outsourcing with a central node (star-shaped). Arrows denote flows of products, information, and the like between companies.

configurations (Kamalahmadi and Parast 2016; Lund et al. 2020). This figure gives four stylized examples of how supply chain relationships could be formed:

Vertical Integration with Isolated Industries

Panel A of figure 6-1 illustrates a three-firm configuration, where each firm (shown by the dots in the figure) is self-sufficient—that is, completely vertically integrated. Thus each firm produces everything, starting from raw materials and ending with the finished product. In this configuration, supply chains are completely internal to a firm. A prototypical example of this is the automaker Ford's River Rouge Plant, which in the 1930s included a steel mill, glass factory, power plant, rubber factory, foundries, machine shops, stamping plants, assembly lines, a cement plant, a paper mill, a leather plant, and a textile mill (Weber 2019). Ford also owned a rubber plantation in Brazil, coal mines in Kentucky and West Virginia, and railway cars to transport raw materials. This allowed Ford to maintain direct control over the entire manufacturing process. However, this complete vertical integration also made it difficult for Ford to cut costs during the sharp decrease in demand for cars during the Great Depression, as the automaker continued to bear the fixed costs of component production. In contrast, Chrysler, which was much less vertically integrated during this time period, did not need to bear these fixed capital and administrative costs; Chrysler's suppliers did (Chandler 1962, 1992). A firm's decision to vertically integrate depends in part on whether the costs of transacting in different markets outweighs the cost of managing these activities internally (Coase 1937).

Outsourcing with Isolated Industries

Panel B of figure 6-1 represents three industries, each with significant supply-chain relationships. Here, inputs travel "downstream," where they are transformed into a final good. The lead firm typically designs products and directs production by multiple tiers of suppliers in many locations, but it does not own most of these suppliers. This is called *outsourcing*. Outsourcing allows the lead firm to contract with firms that may have lower production costs due to lower wages or other competitive advantages (see box 6-3 below).

The chain includes direct suppliers of the lead firm (tier 1 suppliers), as well as suppliers to those suppliers (tier 2 suppliers), and so on—all the way back to the raw materials used to produce the good. A firm can have hundreds of tier 1 suppliers and thousands of tier 2 suppliers, as shown in figure 6-2 (Lund et al. 2020).[2] Looking at the publicly disclosed lists of suppliers for 668 companies, the McKinsey Global Institute found that the number of direct suppliers was large and that the network of indirect suppliers was even larger, often numbering in the thousands (Lund et al. 2020). As discussed below, the degree of coordination between the firms, represented by the arrows in figure 6-1, can vary between two extremes: arm's-length transactions and collaborative relationships.

Offshoring and Outsourcing with Isolated Industries

If lead firms choose suppliers across national boundaries, this is called *offshoring*, as shown in panel C of figure 6-1. Offshoring gives companies expanded scope to locate production in areas with lower wages, or that have other competitive advantages not available in their home country, such

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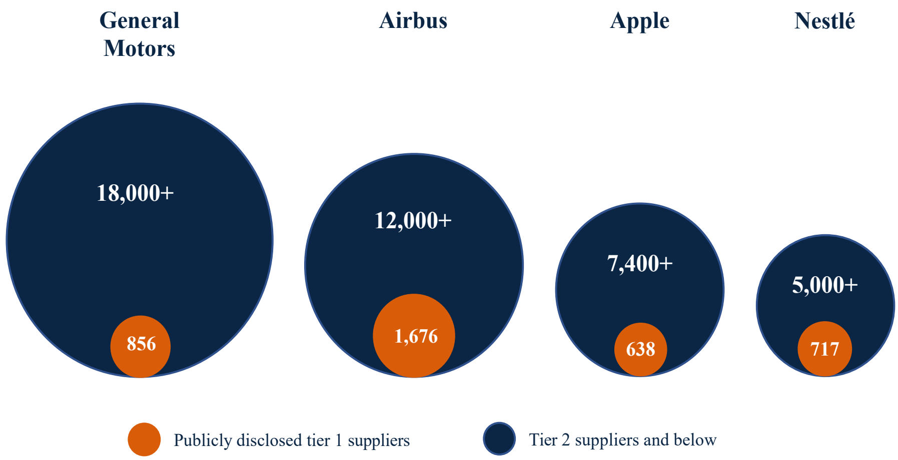
[2] Note that, due to data limitations, the tier 2 suppliers in figure 6-2 may not be supplying inputs into the lead firms' products; rather, they are suppliers of the tier 1 suppliers, which usually produce for more than one lead firm.

Figure 6-2. Examples of Tier 1 and Tier 2 Supply Relationships



Source: Adapted from Lund et al. (2020), relying on the Bloomberg Supply Chain Database.

as access to natural resources or better technology (Antràs 2020; World Bank 2020b). Competitive advantage may be the result of naturally occurring endowments or developed by government or private sector policies (Mazzucato 2016; Lee 1995). In the past, internationally traded goods were largely either raw materials, such as cotton, or finished goods, such as clothing. Since the early 1990s, there has been a large rise in trade of "intermediate goods" or components, such as fabric that has been cut but not sewn.

In both panels B and C of figure 6-1, no connections exist between the blue industry and the parallel orange and black industries. In this diagram, nodes are industries with few overlapping suppliers, such as electronics and autos in the past.

Outsourcing with a Central Node

In contrast to the isolated industries depicted in panels B and C of figure 6-1, supplier firms usually sell to more than one lead firm and may sell to several different industries, as shown in panel D (Carvalho and Tahbaz-Salehi 2019; Carvalho 2014). One example is a star-shaped configuration, with one central node (the green node) that is used in production by all other nodes. Firms in this general-purpose industry supply a wide number of other industries and often also use inputs from the industries they supply (Carvalho 2014).[3] These types of supplier relationships allow firms to take advantage of

[3] In practice, some suppliers, and even the central node of panel D, may be offshored as well as outsourced; for simplicity, this configuration is not depicted.

economies of scale, where per-unit costs decrease as the number of units produced increases and the supplier is able to sell to multiple firms.

Firms' decisions regarding the design of their supply chains lead to a complex web of connections. Aggregating firm-to-firm supply chain connections, industry A has supply chain connections to industry B when firms in industry A purchase inputs from firms in industry B. Though comprehensive data on firm-to-firm supply relationships are lacking for the United States, the network structure of the U.S. economy can be visualized at an industry level. This industry-level analysis can shed light on which industries supply inputs to many other industries and the structure of network connections between industries. These connections can amplify microeconomic disruptions.

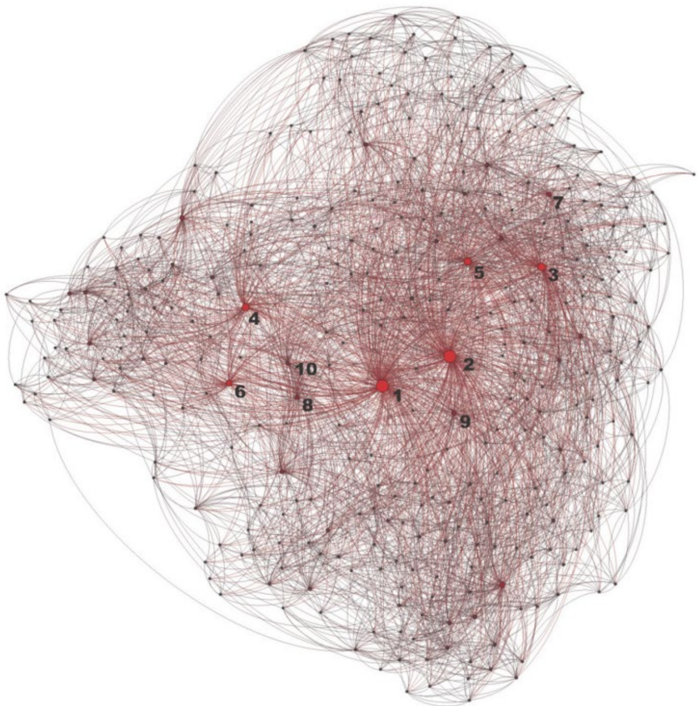
The U.S. economy is complex and interconnected, with several central hub industries that have connections to most other sectors. Using the most disaggregated, publicly available sectoral data—the Bureau of Economic Analysis's (BEA) Input-Output Accounts Data—it is possible to see the supply chain connections between 417 different industry sectors, as depicted in figure 6-3. Each node is a sector, and the connections between them represent flows of inputs from one supplying sector to another. The network is sparsely connected; on average, each narrowly defined industry is connected to only 11 other industries (Carvalho 2014). However, a small number of hub industries are highly connected to many others in the network. Although most industry pairs are not directly linked, they are indirectly connected by a small number of steps through these hub industries (Carvalho 2014). The most-connected input supply sectors (the numbered nodes) in 2002 included real estate, electricity generation and distribution, iron and steel mills, depository and credit intermediation, petroleum refineries, and truck transportation (Carvalho 2014). The CEA's analysis of the 2012 input-output tables shows that semiconductors have become a highly connected industry, while truck transportation has dropped from the top 10 list (Carvalho 2014; Bureau of Economic Analysis 2012). Other countries also have similar patterns of central hub industries, though the central industries may be different (Carvalho and Tahbaz-Salehi 2019; Fadinger, Ghiglino, and Teteryatnikova 2015; McNerney, Fath, and Silverberg 2013).

Arm's-Length and Collaborative Relationships

The arrows in figure 6-1 represent connections between the nodes in the supply chain. The nature of these connections can vary between two extremes: arm's-length transactions and collaborative relationships.

In an arm's-length transaction, a firm purchases a standard input from an unaffiliated firm, often choosing from a large set of possible sellers. In this case, the connection is very simple: the seller provides an off-the-shelf

Figure 6-3. The Production Network Corresponding to U.S. Input-Output Data in 2002



Source: Carvalho (2014). Copyright the American Economic Association; reproduced with permission of the *Journal of Economic Perspectives*.

product to the buyer, which sends payment. If there is a problem with a supplier (e.g., the price is too high or a disaster causes it to be unable to produce), the buyer can easily find another supplier. Lead firms may benefit from these relationships because they are able to easily change suppliers, creating competition that requires suppliers to reduce their prices to win business.

In collaborative relationships, firms in a supply chain communicate frequently about the product and production process; performance requirements (e.g., price, quality, specifications, and delivery schedule) are customized for a particular product, and are usually set by the lead firm (Gereffi 2020). In some instances, these are transactions between affiliates of a large company, while others involve a lead firm and financially independent suppliers. For instance, companies such as Nike do not own the facilities in which their products are manufactured; instead, they provide the design, product specifications, advertising, distribution, and coordination of the complex network of contractors that make the shoes (Gereffi and Korzeniewicz 1994).

Suppliers in collaborative relationships provide these highly customized inputs on a repeated basis, usually without complete or easily enforceable contracts (Hart and Moore 1990). Both the buyer and supplier invest in capital, equipment, or knowledge that is useful only with a particular partner (Antràs 2020). These relationship-specific investments increase the cost of finding and switching to a new supplier, but often pay off in components that better fit the lead firm's needs and in quicker responses to unexpected situations (Antràs 2020; Helper 1991; Gibbons and Henderson 2011). A large literature describes the potential benefits to lead firms of having collaborative relations with suppliers, such as reduced costs, defect rates, and lead times; and increased investment, responsiveness, innovation, and problem solving (Delbufalo 2012; Gibbons and Henderson 2011; Aoki and Wilhelm 2017).

A key reason for the long-term profitability of firms such as Toyota and Honda is their investment in collaborative relationships with their suppliers (Aoki and Wilhelm 2017; Liker 2004; Lieberman, Helper, and Demeester 1999). The rise of these sticky buyer–seller relationships is a distinctive aspect of the recent rise in global value chains (World Bank 2020a). Understanding why some firms adopt collaborative relationships and others do not is an area of active research in many disciplines, including economics, management, and sociology (Bernstein 2015; Gil and Zanarone 2018; Schrank and Whitford 2009). Box 6-1 provides an example of how one firm currently combines domestic production, offshoring, vertical integration, and offshoring to make its products.

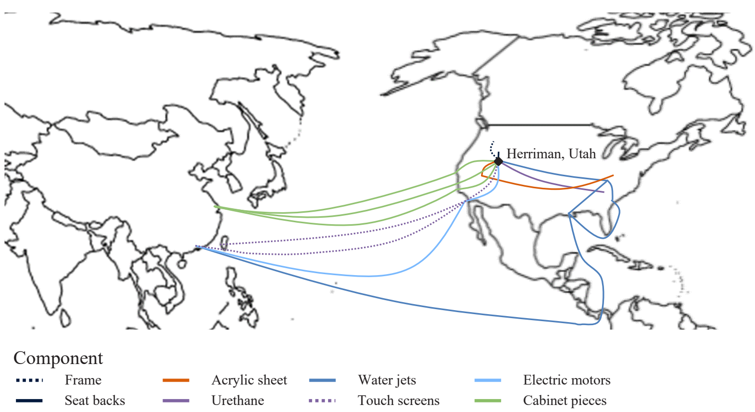
However, there is no single optimal way to organize a supply chain. Even within the same industry, firms often choose different strategies. For example, on average, automakers producing in the United States have 4.7 suppliers for each product category, a financial stake in 22 percent of transactions, and relationships with suppliers that last 2.4 years. However, there are substantial differences among automakers in these practices. Japanese vehicle manufacturers engage more in collaborative outsourcing than do their U.S. counterparts; therefore, Japanese relationships with suppliers last 70 percent longer, and they have fewer than half as many suppliers for each part as do U.S. automakers. These differences persist even when automakers are selling similar products in the same market, and after controlling for component volume and mix (Helper and Munasib 2022). Automakers differ in their offshoring strategies as well. For example, in 2020, Ford had 24 percent more production offshore than did Stellantis.[4]

[44] These data, from the American Automobile Labeling Act (AALA), do not allow the separation of U.S. and Canadian content (Center for Automotive Research 2020).

Box 6-1. The Supply Chain of a Hot Tub

The M9 hot tub is made by Bullfrog Spas in Utah, where 500 workers assemble almost 1,850 parts from 7 countries and 14 states (see figure 6-i). The hot tub top shell starts as a flat acrylic sheet from Kentucky, which is then combined with a different type of plastic in Nevada and sprayed with an industrial chemical from Georgia. Parts of the frame shell of the hot tub are driven in by trucks from Idaho several times a week. Many of the electric motors come from China and are assembled into water pumps in Mexico and then driven to Utah. Additional material for exterior cabinets is transported from Shanghai on container ships through the ports of Long Beach or Oakland. Water-spraying jets are made in Guangzhou, China; are sent through the Panama Canal and Eastern ports to the supplier's warehouse in Cleveland, Tennessee; and then are sent on to Utah. Once fully assembled, the finished hot tubs are placed on trucks or trains and delivered to retailer warehouses. This example illustrates both the extent of outsourcing, which increases the number of individual companies involved in the production of a single good, and the geographic distance traveled by each component, estimated to total nearly 900,000 miles, as well as the dependence on transportation and logistics this entails.

Figure 6-i. Sources of the Components of a Hot Tub



Source: Adapted from Hufford, Kim, and Levinson (2021).

Drivers of Change in Supply-Chain Structures

Global supply chains that involve offshoring, and often outsourcing, multiplied rapidly from 1990 to 2008, though their growth slowed after the 2008 global financial crisis (World Bank 2020a). Manufacturing firms also outsource services, including logistics, cleaning, and security. That is, workers providing these services are no longer direct employees of manufacturers; instead, they work for financially independent contractors. For example, in food, cleaning, security, and logistics services, the share of those working for such contractors in the United States rose from about 5 percent to about 30 percent between 1950 and 2015 (Dorn, Schmieder, and Spletzer 2018).

Two key changes have increased the attractiveness of outsourcing and offshoring. *The first change is increased access to foreign suppliers*, making offshoring more cost-effective for firms, largely due to advances in information technology (IT) and reductions in trade barriers since the 1990s. Advances in IT allow firms to convey detailed information about product and process specifications across long distances, while improvements in transportation, such as containerization, allow goods to be moved more quickly and consistently (Grossman and Rossi-Hansberg 2006). These developments make it possible to segment the production process, keeping highly skilled functions, such as research and development and management, in more advanced economies, while moving others, such as production of components or assembly, to countries with lower wages (Gereffi 2020).

Major trading nations have signed agreements that reduced barriers to trade, such as the 1994 North American Free Trade Agreement. These trade pacts contain strong protections for property rights of corporations, but far weaker protections for labor rights. This disparity increased the attractiveness to multinational firms of offshoring production to low-wage countries (Drake 2018). The result has been increased availability of cheaper goods for American consumers, but also significant pressure on wages and benefits that have often driven workers from the middle class (Hakobyan and McLaren 2016).

Finally, widespread international government subsidization of manufacturing industries has lowered prices that lead firms pay for inputs, and has oriented many nations' domestic industry toward global supply chain participation (Hauge 2020). For instance, in the past few decades, the Taiwan Industrial Technology Research Institute has facilitated relationships between young, domestic semiconductor manufacturers and multinational buyers. The institute helped organize two firms—the Taiwan Semiconductor Manufacturing Company and the United Microelectronics Corporation—and gave them intellectual property. By 2020, these two companies accounted for 60 percent of global semiconductor revenue (Lee 2021; Breznitz 2005). Taiwan and China have extensively subsidized their semiconductor industries, with subsidies often approaching nearly 30 percent of a company's revenue, according to the U.S. Department of Defense (2022, 36). "Made in China 2025," China's 10-year plan to transform itself into a world leader in high-tech industries, promotes policies that increase Chinese firms' market share and builds globally competitive industries in key sectors without relying on foreign firms (Congressional Research Service 2020). (See box 6-2.)

The second key change is the growing role of financial criteria and institutions in corporate decisionmaking. This "financialization" of the economy has encouraged outsourcing and offshoring because of savings in costs that are easily measurable. Firms increasingly tie executive compensation to such financial measures as earnings per share, stock prices, and return on equity. Before the 1970s, only 16 percent of the chief executive officers in Standard & Poor's 500 companies had compensation based on such measures; by the 1990s, 47 percent did, and in 2021, the vast majority employed by large corporations did (Admati 2017). Such incentives have encouraged managers to focus more on these financial statement numbers than on less easily measurable metrics, such as resilience.

However, financial metrics can be misleading. Although an outside or offshore supplier may offer a lower unit price, these savings may be eaten away by hidden costs, such as longer lead times, increased vulnerability to disruption, and reduced access to ideas for innovation due to linguistic and geographic distance (Gray, Helper, and Osborn 2020). Such hard-to-estimate costs are often ignored, even though they may negate the estimated savings from outsourcing (Barthelemy 2001). These less easily measurable metrics are often characterized as "soft" information, which, in contrast to "hard" information, may require knowledge of the environment and/or personal relationships to collect and understand.

Soft information includes operational measures that use physical units, such as defect rates or downtime, and involve such intangibles as the value of research and development or of employee training (Liberti and Peterson 2019; Edmans, Heinle, and Huang 2016). It is often difficult to convert soft information into dollars. For example, it is not easy to measure how much an investment in training will improve quality, and how much this improvement in quality will flow to the bottom line. Such investments are also hard for outsiders or those without experience with a given product to verify. Thus, the pursuit of favorable performance as measured by financial indicators may induce firms to act in ways that could be detrimental to long-term performance, essentially trading longer-term resilience and sustainability for nearer-term profitability (Edmans, Heinle, and Huang 2016).

For firms increasingly driven by short-term investors' demands, the temptation to ignore these costs has often been great. A survey of senior U.S. financial executives found a willingness to sacrifice long-term shareholder value to meet Wall Street earnings targets or smooth reported earnings. For example, when managers were asked if they would "accept a sacrifice in value . . . to avoid volatile earnings," 78 percent said yes; 55 percent would "delay starting a new project, even if this entails a small sacrifice in value"

Box 6-2. The Role of China in U.S. Supply Chains

A significant factor in the recent evolution of global supply chains has been the rise of China, which is now the largest source of U.S. imports. China's manufacturing began exploding in the 1990s, and its share of world manufacturing exports rose from 3.1 percent in 1991 to 17.6 percent in 2015, before dipping to 14.2 percent in 2018 (Autor, Dorn, and Hansen 2021).

Initially, China specialized in simply assembling products from imported components and designs. For example, it is estimated that in 2010 China provided less than 2 percent of the value added of the Apple iPhone 4; the product was designed in the United States, and the components were made in places like Japan and South Korea; no Chinese suppliers contributed components (Linden, Kraemer, and Dedrick 2011). However, China learned quickly, and for the iPhone X in 2018, it contributed more than 25 percent of the value added, including assembly and high-value components such as the battery pack and touch screen (Linden, Kraemer, and Dedrick 2007; Xing 2019).

China's entry into global supply chains was facilitated not only by technological advance in transportation and communication but also by changes in institutions. Particularly important were the United States' granting of Permanent Normal Trading Relations (PNTR) to China in 2000 and the admission of China to the World Trade Organization in 2001, steps that gave imports from China permanent access to the relatively low tariff rates reserved for members of the World Trade Organization. These steps did not require China to change its labor policies, which banned workers from joining independent trade unions, involved reprisals against workers who sought higher wages, and involved forced labor. These policies suppressed wages in China, increasing the competitiveness of firms, including multinational firms, that produced there.

China's competitiveness was also facilitated by large subsidies, and requirements that multinationals transfer technology to Chinese firms. As the Congressional Research Service concluded, China aims to advance its national development goals and future global economic position through industrial policies that seek global civilian and military leadership in advanced and emerging technologies. China's policies feature a heavy government role in directing and funding Chinese firms to obtain foreign expertise and intellectual property in strategic industries, including aerospace, semiconductors, microelectronics, pharmaceuticals, and electric vehicles (Congressional Research Service 2020). Through these policies, and aided by U.S. companies pursuing asset-light strategies, China gained large degrees of market power in a variety of critical supply chains. For example, China has 97 percent global market share of the ingots and wafers used to make solar panels (U.S. Department of

Energy 2022). It also produces 73 percent of global lithium-ion batteries, which are the primary source of energy for electric cars (Henze 2022).

These policies may have contributed to the decrease in extreme poverty in China, which fell by over 90 percent between 1990 and 2016 (the latest year for which data are available) (World Bank 2016; Goodman 2021). These policies had significant effects on U.S. consumer prices; one estimate is that prices for consumer tradables fell 0.19 percentage point annually between 2004 and 2015 due to trade with China (Bai and Stumpner 2019).

However, these policies had negative effects on U.S. factories' vitality and innovation; increased exposure to Chinese imports significantly reduced sales, profitability, and research-and-development expenditures at U.S. firms facing import competition (Autor et al. 2020). The China shock also had adverse effects on workers. In the decade from 2000 to 2010, one-third of U.S. manufacturing workers lost their jobs; at least a quarter of this effect was due to China's accession to the World Trade Organization (Autor, Dorn, and Hanson 2016). Workers in affected industries saw rapid job loss after the United States granted PNTR status to China (Pierce and Schott 2016). Communities more exposed to Chinese imports had reduced earnings for low-wage workers, housing prices, and tax revenues; and larger increases in childhood and adult poverty, single-parenthood, and mortality related to drug and alcohol abuse, as well as greater uptake of government transfers (Pierce and Schott 2016; Autor, Dorn, and Hansen 2021).

to avoid missing an earnings target (Graham, Harvey, and Rajgopal 2019, 8). Underlying this willingness is a view that stock market investors lack the information to properly value long-term investments (Asker, Farre-Mensa, and Ljungqvist 2015; Poterba and Summers 1995).

This financialization of the economy has been an important driver of U.S. lead firms' supply chain strategies. Outsourcing of production and other capital-intensive activities is prescribed by consulting firms promoting an "asset-light" strategy. These firms note that, all else held equal, a lower amount of capital makes a given amount of revenue yield a higher measured return on assets (Kachaner and Whybrew 2014); the importance of the "all else held equal" assumption is discounted. Offshoring to suppliers with a low quoted price is also attractive. Chinese subsidies and wage suppression have yielded very low unit costs for Chinese suppliers; often, the price from a Chinese manufacturer of a finished manufactured component has been less than the price of raw materials for a U.S. supplier (U.S. Department of Defense 2022, 27). The disadvantages of such purchasing strategies are hard to quantify; in a financialized environment, where many purchasing agents are rewarded exclusively for driving down quoted prices, these disadvantages have typically been assumed (without much evidence) to be small (Gray, Helper, and Osborn 2020).

Implications of Supply Chain Structures

This section examines the relationship between supply chains and innovation, and the role of supply chains in the business cycle. Both outsourcing and offshoring have significant effects on innovation, some positive and some negative.

Impact on Innovation

Outsourcing can lead to the development of highly specialized and innovative suppliers. Take the example of semiconductors. The particular trajectory of innovation in this industry has led to a production process with very large economies of scale; for instance, a new fabrication plant (fab) now costs at least $12 billion to build. Because of the significant overhead involved, the more semiconductor chips a fab produces, the lower the average cost of each chip. And, with more sales, a fab's owner can invest more in research and development, enabling it to produce even more sophisticated chips (White House 2021; Jie, Yang, and Fitch 2021). In part for this reason, it has become more advantageous for firms to purchase semiconductors from a specialized semiconductor firm than to make them in house (Breznitz 2005).[5]

This semiconductor example illustrates how a buyer can obtain the benefits of suppliers' innovation simply by buying the product; as semiconductors improved and their prices fell, manufacturers were able to dramatically increase the computing power of products ranging from refrigerators to computers. Though many firms buy generic semiconductors from distributors, innovation often results from the interaction between a buyer's needs and a supplier's capabilities (Batra et al. 2016; von Hippel 1988). Apple's cutting-edge products often result from significant interaction between its designers and the producers of its semiconductors (Owen 2021; Jie, Yang, and Fitch 2021).

Although collaborative relationships have many benefits, as described above, they may also have costs, particularly in lost flexibility (Levin 2002). To minimize the costs of switching suppliers, a lead firm may use arm's-length relationships and design its production processes to enable it to outsource to firms with weak bargaining power. Though this flexibility has benefits for lead firms, it may cause their suppliers to invest less in both

[5] As discussed above, government subsidies for semiconductor manufacturers were also an important reason why firms reduced their vertical integration into this industry.

innovation and workers due to uncertainty about the continuing demand for their products, because these investments often have customer-specific elements (see box 6-3) (Baker, Gibbons, and Murphy 1995; Helper and Henderson 2014).

The use of semiconductors in the auto industry illustrates this point. Although semiconductors became key to the operation of modern vehicles more than a decade ago, many automakers did not begin to communicate directly with semiconductor manufacturers until late 2021. Rather, they bought chips indirectly, through distributors or first-tier suppliers, and did not commit to purchases more than a few weeks out. Thus, although their product plans included more intensive use of semiconductors in future vehicles, automakers had not been credibly signaling this intention to manufacturers. Without this commitment, semiconductor manufacturers were unwilling to build new fabs for automotive-grade chips, since fabs must maintain very high capacity utilization to be profitable. Further, they did not devote resources to innovating on the dimensions important to automakers, such as reduced cost and increased reliability. In contrast, Apple has long paid to reserve capacity in advance at fabs, and has worked with semiconductor manufacturers and design firms to innovate on the dimensions important to them—speed and power (Burkacky, Lingemann, and Pototzky 2021; Ewing and Boudette 2021; Fogarty 2020; Lawrence and VerWey 2019).[6]

Innovation is affected by offshoring as well. In some cases, foreign purchases increase the ability of U.S. firms to innovate by allowing access to innovative technology developed abroad. For example, companies such as Apple, Qualcomm, and Advanced Micro Devices rely on semiconductor designs from a U.K. firm called Arm; firms such as Intel rely on the Dutch company ASML for its advanced lithography equipment (Associated Press 2022a). And some scholars have argued that offshoring of production increases U.S. firms' innovation by allowing them to focus on high-value tasks.

However, there is evidence suggesting that geographically separating production and innovation impedes innovation. Engineers overseeing production are exposed to the capabilities and problems of existing technology, helping them to generate new ideas both for improving processes and for applying a given technology to new markets. Losing this exposure reduces the opportunity to generate such innovative ideas. For example, when production of consumer electronics migrated to Asia in the 1980s, the United States lost the potential to later compete in the burgeoning market for follow-on products like flat-panel displays, LED lighting, and advanced batteries (Pisano and Shih 2012; Berger 2015; Fuchs and Kirchain 2010).

[6] As discussed below, U.S. automakers have recently announced significant changes in the way they purchase semiconductors.

Box 6-3. Outsourcing and Job Quality

Overall, 43 percent of U.S. workers are in supply-chain industries, employed either at lead firms or their suppliers (Delgado and Mills 2020). The structure of supply chains has significant implications for job quality for these workers.

As mentioned above, sometimes outsourcing is efficient. However, in other cases, lead firms use outsourcing to gain access to suppliers with weak bargaining power, adopting a strategy that David Weil has called "fissuring." In these cases, supplier firms have little ability to compete except by aggressively holding down wages (Weil 2017). For example, firms that sell to a small number of buyers pay lower wages than do similar firms with more customers; this greater dependence on large buyers lowers suppliers' wages and has accounted for 10 percent of wage stagnation in nonfinancial firms since the 1970s, according to one estimate (Wilmers 2018).

Research suggests that jobs that are outsourced from lead firms to suppliers are often worse for most workers, for several reasons (Handwerker and Spletzer 2015; Goldschmidt and Schmieder 2017; Helper 2021). As summarized by Helper (2021), these reasons include:

- *Design for supplier interchangeability.* Many lead firms structure their supply chains to make contractors easily replaceable. For instance, U.S. automakers in the past brought product design and complex subassemblies in house, making it possible to have contractors compete on making small, predesigned components under short-term contracts. This strategy lowered barriers to entry for suppliers, meaning that suppliers did not capture many rents (Helper and Henderson 2014). This style of production has led many lead firms in the apparel industry to employ long chains of anonymous subcontractors. Walmart Corporation, for example, was surprised when goods marked with its label were found in the aftermath of the horrific fire at the Rana Plaza complex, in which over 1,100 Bangladeshi apparel workers were killed due to subcontractors' poor safety practices (White 2017).
- *Monitoring without accountability.* Some lead firms specify in detail the actions to be taken by workers in their supply chains, even those who are not their employees (Davis-Blake and Broschak 2009). That is, lead firms can control workers without taking responsibility for paying them benefits. Tight monitoring from lead firms means that one of the few profit-making strategies available to subcontractors is to keep wages low. Sometimes these workers are misclassified as independent contractors, even though they lack the autonomy of running their own business. When firms misclassify workers in this way, "they offload labor costs and risks onto workers—for example, by avoiding unemployment insurance

taxes and workers' compensation premiums—and make it difficult for workers to organize or join a union and bargain collectively for better wages and conditions" (U.S. Department of the Treasury 2022, i).

- *Low supplier capability.* When lead firms maintain tight control over suppliers' work methods, subcontractors' ability to create or capture value is low. Even though investments might yield productivity improvements, contractors often do not make them because they lack the capability to do so or they would not capture much of the benefit due to fierce competition. As a result, subcontractors often cannot increase pay without risking bankruptcy. Suppliers to lead firms that adopt financialized metrics also have difficulty adopting management practices that have been shown to be effective. Fewer than half of second-tier auto suppliers have adopted practices such as quality circles, in which production employees gather regularly to explore ways to improve quality; one-third report that they do not consistently do preventive maintenance, and one-quarter employ no engineers. In contrast, suppliers that report a collaborative relationship with customers were more likely to adopt high-road policies such as cross-training of workers, and had higher productivity (Helper and Martins 2020).
- *Weak ecosystems.* Not only do U.S. suppliers lack support from lead firms; they are isolated in other ways as well (Berger 2015). The reason: There are few institutions to help with innovation, training, or finance (Ezell and Atkinson 2011). In contrast, Germany's Mittelstand, which are medium-sized firms, are the backbone of the German manufacturing sector due to the help they get from community banks, applied research institutes, training institutions, and unions (Berger 2015).

Impact on the Macroeconomy

The structure of production networks, as described in figure 6-1, has important effects on the macroeconomy. The location of supply relative to consumers, the degree of interconnection and substitutability among firms and industries, the geographic concentration of supply, and the amount of collaboration and trust between buyers and suppliers all affect the degree to which a shock to one firm or industry propagates through the entire economy.

Distinct configurations of supply chain structures carry distinct exposure profiles. For example, offshoring, or openness to international trade, can reduce exposure to domestic shocks by broadening supply or hedging against concentrated disruption (Caselli et al. 2020; Miroudot 2020).

However, the greater distance that imported inputs must travel increases risks associated with transportation. For example, 40 percent of U.S. containerized imports go through the ports of Los Angeles and Long Beach, where the rise in demand for goods induced by the COVID-19 pandemic caused significant delays (Karlamangla 2021). Even supply chains that had no production problems suffered from the shipping bottlenecks. In addition, risks to a supply chain can grow with more global connections, because a disruption in one country will affect suppliers in all other countries. For instance, Bonadio and others (2020) estimated that one-quarter of pandemic-related gross domestic product declines across 64 countries were related to global supply chain shock transmission. When disasters occur with supply chains abroad, as with the 2011 earthquake in Japan, recovery takes longer than if the supply chain was local due to the longer lead time involved in shipping.

Dependence on a single supplier or a single location also carries risk. This is true even if the suppliers are domestic; for example, a severe 2021 freeze in Texas led to months-long disruptions in U.S. and global supplies of plastics because of the concentration of petrochemical companies there (Wiseman and Krisher 2021). These risks can be greater in industries important to national security that are located abroad, because decisions about supply would be affected by the policies of another country, as discussed below.

If firms within an industry share suppliers with skills that are hard to replace, the bankruptcy of a few such suppliers can also take down other suppliers, and even lead firms, with them. Fear of this "cascading bankruptcy" in 2008, when auto sales suddenly fell 45 percent, led the CEO of Ford, Alan Mulally (2008), to ask for a government rescue of his major competitors, noting that 90 percent of Ford's suppliers were shared with other automakers. Auto suppliers have hard-to-replace skills that include the ability to maintain high quality standards (e.g., to control variation in the size of parts produced to no more than 1/1000th of an inch, thinner than the width of a human hair), consistently over millions of parts that sell for a few dollars each. If these firms fail, other firms cannot easily enter the market to replace them. Dependence on shared suppliers is not uncommon; the computer giants Dell and Lenovo have more than 70 percent commonality in their top 20 suppliers (Lund et al. 2020). In contrast, if each downstream firm were vertically integrated (i.e., produced its own inputs), some firms might be affected by a disruption, but it is likely others would still be able to produce.

Some of these potential vulnerabilities carry offsetting benefits. For example, geographic clustering of suppliers is common, and often is efficient, because suppliers can share skilled labor, specialized inputs, and innovative ideas (Marshall 1919; Delgado, Porter, and Stern 2015).[7] In addition, repeated dealings and face-to-face contact build the trust required for collaborative supplier–buyer relationships (Bernstein 2015). As discussed above, close relationships among firms in the supply chain could speed recovery from disruptions (Baldwin and Freeman 2021; Alfaro and Chen 2018). That is, the reduced ability to seek new suppliers is often offset by suppliers' increased incentive to pitch in to help others. If firms could quickly recover from supply disruptions, then the macroeconomy would not be affected as much by global supply chains' increasing exposure to shocks and dependence on other firms (Carvalho and Tahbaz-Salehi 2019).

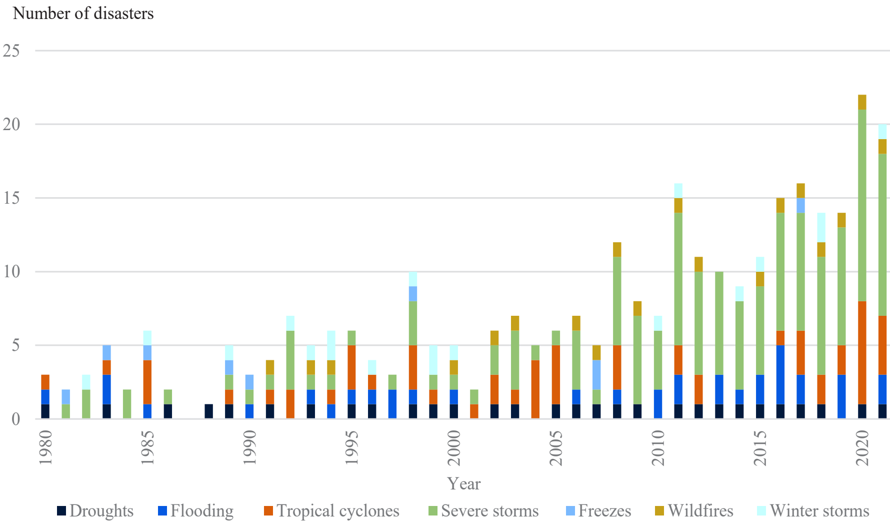
However, in the absence of such collaboration, shocks to supplier–buyer relationships can have persistent effects on the macroeconomy, especially if networks are highly connected (e.g., star-shaped) and frequently use hard-to-substitute inputs (Carvalho 2014). For instance, Barrot and Sauvagnat (2016) found that if a supplier was hit by a major U.S. natural disaster between 1978 and 2013, its key customers (those accounting for more than 10 percent of the supplier's sales) experienced an average drop of 2 to 3 percentage points in sales growth for one to two years afterward. If the disrupted supplier produced hard-to-substitute inputs, this disruption further propagated to suppliers that were not exposed to the original shock (Barrot and Sauvagnat 2016). Bigio and La'O (2020) estimate that the input-output structure of the U.S. economy amplified financial distortions by a factor of 2 during the 2008 global financial crisis.[8]

As the consulting firm McKinsey noted in 2011, "Many global supply chains are not equipped to cope with the world we are entering. Most were engineered, some brilliantly, to manage stable, high-volume production by capitalizing on labor-arbitrage opportunities available in China and other low-cost countries" (Malik, Niemeyer, and Ruwadi 2011, 1). These conditions are less prevalent now. As networks become more connected, and climate change worsens, the frequency and size of supply-chain-related disasters rises. For this reason and others, understanding how to promote quick recovery is increasingly important. It is also vital for companies to have the incentive to make sufficient investments in resiliency, even when they may not be able to monetize all the benefits of these expenditures because of spillovers to other parts of the networked system.

[7] Sometimes the clusters are near where natural resources required for production are or once were concentrated (e.g., steel in Cleveland). Other times "clusters" of suppliers develop near where an invention happened to occur (e.g., floor coverings in Dalton, Georgia; see Krugman 1991).

[8] The authors compared the effects of the current star-shaped structure of the U.S. economy (panel D of figure 6-1) to what they would have been if the economy looked more like panel A (vertically integrated firms).

Figure 6-4. Frequency of Billion-Dollar Natural Disasters by Type, United States



Sources: NCEI (2021, 2022).
Note: Disaster costs are adjusted for inflation using the Consumer Price Index for All Urban Consumers.

The Rising Incidence of Supply-Chain-Related Disasters

Although the pandemic has been a particularly dramatic example of a supply-side disruption, the global frequency of natural disasters increased almost threefold between 1975–84 and 2005–14 (Vinod and López 2015), mostly due to increases in climate-related events (NCEI 2021). Lund and others (2020) found that supply chain shocks affecting global production lasting at least a month occur on average every 3.7 years.

The magnitude of damage from these events is also growing; the number of billion-dollar disasters has risen from an average of 5 annually to 20 over the past 40 years (figure 6-4). The frequency of such events is likely to continue to rise in the future, according to the United Nations Intergovernmental Panel on Climate Change (IPCC 2022).

Private Sector Incentives for Resilience

As supply chains have increased in complexity, firms' need for risk management has also grown (Baldwin and Freeman 2021). When unable to produce due to lack of inputs, firms lose revenue, providing some incentive to invest in resilience (Miroudot 2020). Practices include understanding the structure of their supply chains (visibility), investing in backup capacity (redundancy), and improving their ability to solve problems and substitute between inputs (agility), as well as vertically integrating components of the production process (Christopher and Peck 2004; de Sá and de Souza Miguel 2019). However, these strategies, especially redundancy, increase costs (Baldwin and Freeman 2021). Thus, it is not cost-effective for firms to invest in completely avoiding all disasters. Instead, these practices are designed to reduce firms' risks, such that the perceived expected value of additional revenue during a disruption compensates for the cost of minimizing production issues (Miroudot 2020; Baldwin and Freeman 2021).

One consequence of a firm underinvesting in resiliency is that it increases the exposure of other firms in the networked system to the negative spillover effects of a disruption. This type of market failure is likely when the firm's investment decisions consider only its private costs and benefits, and it is unable to monetize the spillover benefits of its investment decisions for the rest of the system. Under certain conditions, the private sector can achieve an efficient level of investment. For example, if parties can bargain without high transaction costs, an efficient market outcome may be achieved through private contracting, or through self-policing, cooperative arrangements (Bernstein 2015). However, these approaches are infeasible when there is a large number of entities and/or contingencies involved, because these raise the transaction costs of negotiating and enforcing contracts (Coase 1960). In this case, there is an important role for government to play, as discussed below.

Visibility

A first step toward achieving resilience is for firms to learn more about their suppliers' production and inventory levels. This allows firms to monitor the capability of their supply chain to meet demand, even if the suppliers do not directly supply the lead firm. Visibility into supply chain relationships is necessary to identify vulnerabilities in supply chains, so that firms can properly plan for disruptive events (Fujimoto and Park 2014). Gaining this knowledge is not just a technical challenge but also depends on trust between buyer and supplier (MacDuffie, Heller, and Fujimoto 2021). One reason is that if a buyer learns that a supplier has a lot of extra production capacity, the buyer could push for a lower price. Beyond being able to identify suppliers, key metrics include "time to survive"—how long demand for a particular component could be met from inventory or another supplier if the regular supplier was unavailable—and suppliers' "time to recover" in case of an emergency (Simchi-Levi 2020; Simchi-Levi and Simchi-Levi 2020).

Redundancy

Firms may also invest in developing relationships with additional suppliers. Finding alternative suppliers for an input is time-consuming, and suppliers must often go through quality verification. If firms proactively invest in building relationships with several suppliers, the lead firm has ready alternatives. Even if one supplier is unable to produce, another one can step in as a replacement.

Firms can also hold additional inventory, particularly if suppliers' lead time, or how long it takes to make their products, cannot be brought down below their time to recover from a shock (Michaelman 2007). For example, Toyota learned that its semiconductor suppliers' lead time was four months, so the automaker has kept four months of inventory of these products (Shirouzu 2021). Though redundancy generally increases costs, it can also increase profits during periods of supply chain stress by allowing production to continue. However, holding inventory may not always be effective, given that the stored parts may not be the parts needed in a crisis (Sheffi 2022). (See box 6-4.)

Agility

Firms can invest in their and their workers' ability to solve problems, thus enabling them to pivot quickly to alternative products or processes or react to abnormal situations (Baldwin and Freeman 2021; MacDuffie, Heller, and Fujimoto 2021; Helper 2021). The new process may be one that allows use of a different raw material to replace one that is unavailable, or it may be a product and process very different from what the firm has traditionally made. Another option is to increase the flexibility of their production process so that the firm can use a less specialized input. A variety of techniques promote such flexibility, including:

- Reducing lead times, by identifying the critical path and working to speed it up (Ericksen 2021).
- Investing in surge capacity, for example, by maintaining more general-purpose equipment (such as 3D printers), and more generally trained workers.
- Maintaining collaborative relationships between suppliers and customers, to identify problems early and provide incentives to fix them.
- Building problem-solving capability, including for front-line workers (see the "high-road" discussion in chapter 4, on human capital).
- Maintaining real options, or the ability to postpone decisionmaking until more information is available; for example, by producing domestically rather than enduring long shipping lead times (de Treville and Trigeorgis 2010).

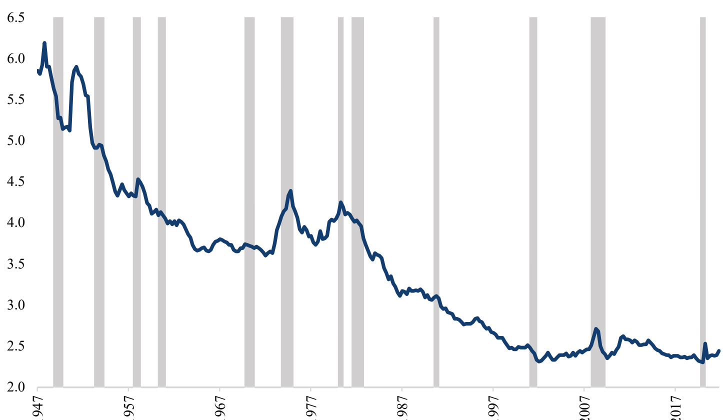
Agility may require upfront investment by firms in a supply chain, but over time may reduce costs and enhance efficiency. Investing in problem-solving capability that reduces lead time can improve performance in normal times as well as in emergencies.

Box 6-4. Low Inventories and Just-in-Time Production

In addition to moving production across firm and national boundaries, companies have been holding less inventory of both final and intermediate goods. Figure 6-ii graphs the ratio of private inventories to final sales from 1947 to 2021, for establishments operating in the United States. It is clear that, over the past 30 years, this ratio has decreased. Holding extra inventory for production increases storage costs; the lower their inventory, the less working capital is needed and the lower the probability the firm gets stuck with inputs that may become obsolete or spoil. However, if supply is disrupted and the firm has a low ratio of inventory to final sales, it has less inventory to fall back on, perhaps requiring it to shut down production until its supplier can recover its ability to produce or another supplier can be found.

As originally envisioned by Taichi Ohno at Toyota, just-in-time production combines low inventories with additional policies that offset the dangers discussed above, by speeding up the supply chain's ability to recover from disruption. These policies include localizing production near consumers and increasing operational "agility," as discussed above (Liker 2004; Handfield 2021). In contrast, many U.S. firms have combined reduced inventory with *longer* supply lines, often of 4 to 6 weeks (Buchholz 2020), and with workforce policies that limit their ability to respond to shocks, as discussed above. That is, low inventories by themselves do not necessarily lead to fragility; problems arise when low inventories are combined with low agility.

Figure 6-ii. Domestic Business Ratios of Private Inventories to Final Sales



Sources: Bureau of Economic Analysis; FRED Database of the Saint Louis Federal Reserve Bank.
Note: Shaded areas indicate U.S. recessions.

Collaborative relationships with suppliers are key to agile supply chains. For example, in February 1997, a fire at Aisin Seiki, the sole source for proportioning valves used in all Toyota vehicles, could have halted all Toyota production for weeks. However, assembly plants were reopened after only two days through collaboration between Toyota and its suppliers; more than 200 firms set up alternative valve production. This collaboration was orchestrated with limited direction from Toyota, haggling over intellectual property, or worry about repayment for expenses incurred. Long previous relationships, implicit competition for future contracts, pressure to maintain relationships, and trust with the Toyota group promoted the effectiveness and speed of the collaboration (Nishiguchi and Beaudet 1998).

Increasing domestic production may also make a firm more agile. Because proximity leads to reduced transportation time and increases the potential for better communication, domestic production helps firms develop build-to-order capability. Reduced lead time also allows decisionmakers to forecast for a smaller range of outcomes (de Treville and Trigeorgis 2010; MacDuffie, Heller, and Fujimoto 2021).

Public Sector Strategies for Promoting Resilience

The public sector can play an important role in promoting supply chain resilience, especially in helping to incentivize private sector decisions that align with broader geostrategic and economic priorities. A supply chain that crosses national boundaries means that production depends on the decisions and activities of other nations, adding uncertainty to supply. In addition, many aspects of supply chains have externalities; that is, decisions affect not only the direct decisionmakers but also other actors in the supply chain. In the presence of public goods, such as national security, government policy can improve national welfare.

The government's role in promoting robust supply chains is particularly important in two types of industries: those that provide inputs into many individual supply chains with large spillover effects, such as energy production, semiconductors, or transportation; and those that are important for national security, including climate and health security, where the assured supply provided by domestic production is especially valuable. Specifically, public sector interventions to build robust supply chains can address challenges related to aggregating and disseminating information, and to assuring that we have the products and goods essential to effective national security. Each is discussed here.

Aggregating and Disseminating Information

The public sector can play a role in disseminating information that helps markets work more efficiently. As noted above, firms often share suppliers with other firms, making them dependent on these other firms' actions. Because supply chain information can be a competitive advantage, firms may be unwilling to disclose certain data to other firms. For example, when there is a shortage of a product, such as personal protective equipment (PPE), individual hospitals are likely to overorder and hold more inventory because they want to ensure their supply. PPE suppliers in this situation do not know if they should increase capacity because they do not know if the new level of demand will continue or whether hospitals are accumulating inventory that will cause them to reduce the quantity they demand in the future. Yet hospitals would not be willing to share information about their true demand with suppliers because they could then be downgraded in priority or receive a smaller quantity of PPE.

The government has the capability to strategically collect sensitive data and release aggregate information to market participants in ways that can improve market functioning. For instance, the U.S. Department of Health and Human Services has taken on an important role in providing an accurate demand signal for PPE. The department's Supply Chain Control Tower receives near-daily data from distributors that represent more than 80 percent of the volume for the commodities it is tracking, along with supply status from 5,000 hospitals. This dashboard alleviates hospitals' fear of shortages, so they do not need to incur extra costs of holding inventory. The dashboard also allows distributors to receive a truer demand signal by reducing excessive ordering that exacerbates supply constraints (U.S. Department of Health and Human Services 2022, 13). In cases such as these, the public sector is well positioned to collect, aggregate, and disseminate this information.

The government also has a role to play in convening and coordinating private sector actors. For example, standards bodies, such as the National Institute for Standards and Technology in the Department of Commerce, have played a key role in developing standard interfaces, such as for USB ports, that allow many firms to easily participate in electronic supply chains, which promotes innovation and cost reduction.

In addition, major innovations in decentralized supply chains can suffer from a chicken-and-egg problem, in that upstream firms will not supply something until they see a demand for it, but downstream firms will not invest in products requiring that input unless there is a ready supply. A past success in resolving this dilemma was the 1990s development of a semiconductor industry road map by Sematech, a public–private partnership. The group came together to agree on common equipment needs and innovation direction, and to fund such equipment. Sematech's convening helped equipment manufacturers make products that were compatible with what chip designers were thinking, and, conversely, helped chip designers understand the directions where equipment makers might go. Over the seven years that Sematech received Federal funding, more than $1.65 in benefits was generated for each $1 in Federal spending (Link, Teece, and Finan 1996).[9]

During the chip shortage arising from the pandemic, in the fall of 2021 the Department of Commerce convened CEOs of leading companies, enabling automakers and chip leaders to meet each other for the first time, and to discuss supply chain bottlenecks and identify common solutions. One such meeting led to a partnership between Ford Motor Company and Global Foundries. This partnership will focus on increasing the production capacity for Ford's existing product lines and on facilitating joint research on future chip technologies that will be critical to the next generation of vehicles. Ford's CEO announced that the company will also act to give chip producers "more confidence in future production" by buying directly from them, rather than buying chips indirectly through other suppliers (Hicks 2021, 1). General Motors recently announced a similar partnership with seven semiconductor producers. Advances in supply chain management will be crucial for auto manufacturers in the next several years, given that new vehicles, especially electric vehicles, could lead to a doubling of semiconductor requirements (Colias and Foldy 2021).

National Security

Dependence on a foreign supplier in times of geopolitical conflict makes supply chains fragile, particularly for a good that has few close substitutes. Foreign control of a key resource is a valuable geopolitical bargaining chip (Sanger and Schmitt 2022). Currently, the United States is heavily dependent on foreign suppliers for semiconductors and batteries, which are key inputs for much military technology. In 2021, 92 percent of the world's supply of advanced semiconductors came from one company, TSMC, in one location, Taiwan (Lee, Shirouzu, and Lague 2021). Similarly, key parts of battery supply chains are largely located in China, which refines 60 percent of the world's lithium and 80 percent of the world's cobalt—two core inputs to high-capacity batteries, without close substitutes. Access to these inputs critical for defense is more assured if the goods are produced domestically (White House 2021a).

[9] The rationale for this calculation is as follows: "The unweighted ratio [of benefits to costs] for fully burdened cost is 3.3. Of course, when Federal dollars are added to the cost basis, all of the ratios in table 4 are reduced in half"; Link, Teece, and Finan (1996, 748). So, 3.33/ 2 = 1.65; these are private benefits only; the paper did not estimate public benefits (hence "more than" $1.65).

Profit-maximizing firms do not take full account of this spillover benefit to domestic production. National defense is an example of a public good; it is both nonrival—that is, consumption does not diminish others' ability to consume the good—and nonexcludable, which means that those that do not pay cannot be blocked from using the good. Because people can use public goods without paying for them, the private sector will undersupply these goods. For this reason, governments typically provide for national security.

Having at least some domestic production of critical goods also means that, in the event of a natural disaster, U.S. firms are not dependent on the policy choices of other countries. China's COVID-19 policies that locked down whole cities or ports for a small number of cases disrupted production for firms in countries with different policy approaches and different case counts (Kuttner 2022). Though the United States has underinvested in a variety of industries, moving toward 100 percent domestic production is not necessarily the best response to these risks, given that allies and partners may have a competitive advantage in some goods, and may allow diversification in case of domestic disruption (White House 2021a).

In addition to inputs directly used in defense production, governments spend significant amounts of time and money to protect electricity and communication networks from supply chain disruptions. These sectors are hub industries; as such, they are part of the production process for almost all economic activity. To protect the power grid from cyberattacks, the Federal Energy Regulatory Commission mandates minimum cybersecurity standards for systems necessary for operating the electric transmission network, and the Department of Energy provides cybersecurity training and guidance (GAO 2021). Though power generation companies have an incentive to protect against shutdowns that would decrease their revenue, disruption of the power sector could cause economywide disruption far larger than the impact on electricity industry revenue. In these types of industries, where disruptions affect the ability of other industries to produce, particularly industries that are important to the Nation's health and safety, the private sector does not internalize the full costs of disruption to society.

Public sector intervention can be beneficial in these cases. In critical sectors, the public may be willing to pay a higher cost than would the private sector to avoid shortages. For example, the United States maintains large stocks of food and keeps defense capabilities ready even during peacetime, because the possibility of insufficient supply is so costly (Baldwin and Freeman 2021). In these cases, the public sector must intervene to reach the socially optimal level of resilience. Such intervention could include investments in U.S. manufacturing, using public procurement to stabilize demand for U.S. supply chains, and helping small business invest in upgraded capabilities (see box 6-5).

Box 6-5. Policies to Improve the Functioning of Supply Chains

The Biden-Harris Administration has been taking a number of steps to help improve the functioning of supply chains. The focus has been on strengthening critical supply chains, including those necessary to tackle the climate crisis. The Administration has taken steps such as the following:

- Signed an executive order that directs agencies to fortify our Nation's supply chains and industrial bases, including focusing attention on the supply chains of products critical to our economic and national security (White House 2021a; Executive Order 14017 2021).
- Established the Supply Chain Disruptions Task Force to address the challenges arising from the pandemic-affected economic recovery (White House 2021c).
- Directed seven Cabinet agencies to publish reports identifying key weaknesses in some of the Nation's most crucial supply chains, and devised multiyear strategies to address these weaknesses (White House 2022b).
- Enacted the Bipartisan Infrastructure Law, which is our Nation's most significant investment ever in modernizing the transportation systems on which our supply chains depend (White House 2021d).
- Enacted the American Rescue Plan, which, among other programs, authorized the $10 billion State Small Business Credit Initiative, which will catalyze more than $70 billion in lending and investment in small businesses—including small manufacturers—during the decade (White House 2021e).
- Issued the new Buy American rule that increases required U.S. content in Federal procurement, and will create a new category of critical products that are eligible for enhanced price preferences to ensure that Federal spending supports American businesses (White House 2021f).
- Proposed a new domestic financing initiative through the Export-Import Bank to strengthen U.S. manufacturing exports.

In addition to their direct effects, policies such as these have the potential to catalyze private sector investments, consistent with the argument in chapter 1 that the public sector can be a partner of the private sector, rather than a rival.

National security includes not only direct inputs into military security but also inputs critical to citizens' health, climate, and economic security. As such, developing new supply chains is key to U.S. efforts to address climate change (see chapter 7 on climate). In general, private firms invest too little in addressing climate change due to the fact they do not capture all of the benefits, providing a rationale for government intervention, as discussed in chapter 7. Decentralized supply chains face an additional issue in making these investments: coordination of demand and supply (Samford and Breznitz 2022).

For example, firms will not invest in making components for electric vehicles unless they think there will be demand for them. Conversely, automakers will slow their investments in electric vehicles if they think components will be hard to obtain. The Biden-Harris Administration's actions will help to overcome these chicken-and-egg problems that make it hard to establish new industries. For example, the Bipartisan Infrastructure Law invests billions of dollars in establishing mining and recycling programs for batteries. The White House has also convened automakers, unions, environmental groups, and suppliers to coordinate plans to make and sell electric cars and trucks that would use these batteries. The Administration learned from these meetings what level of electric vehicle penetration might be feasible, before publicly announcing the goal that 50 percent of U.S. light vehicle sales should be "zero emission vehicles" by 2030 (White House 2021b). The certainty provided by these actions has unlocked billions in private sector investments in battery production that will employ thousands of people in states like Tennessee and Michigan (Associated Press 2022b; Eggert 2022). Similarly, the Administration has announced the goal that solar energy will produce 45 percent of U.S. electricity by 2050, with tax credits targeted at each stage of the solar panel supply chain (Fears 2021).

Indirect Supply Chain Policy

Many other government policies have implications for the structure of modern supply chains. This section provides examples of economic policies that are broader than supply chains but nevertheless have implications for their structure.

The price of shipping intermediate goods thousands of miles during the production process does not incorporate the social cost of emissions. Transportation contributes about 29 percent of all U.S. greenhouse gas emissions, which have been rising (EPA 2021). For example, international shipping currently accounts for about 3 percent of total global greenhouse gas emissions. If treated as a country, international shipping would have been the sixth-largest emitter of energy-related carbon dioxide in 2015—more than Germany (Chen, Fei, and Wan 2019; Gallucci 2021; IMO 2021; Olivier et al. 2016; Rose et al. 2021; Olner et al. 2017). Pricing in the true cost of moving goods—that is, to include greenhouse gas emissions—would incentivize firms to reduce their use of transportation services; for example, by producing closer to where their customers live, or investing in new low-carbon fuels. (See chapter 7, on climate.)

Trade policy also has enormous implications for the structure of supply chains. As discussed above, China's entry into the World Trade Organization led to a significant increase in offshoring, which has reduced consumer prices but also has harmed U.S. innovation, employment, and wages for decades. The North American Free Trade Agreement (NAFTA) has been found to have had similar employment and wage effects, albeit on a smaller scale (Hakobyan and McLaren 2016), although a 2020 revision to NAFTA, the United States–Mexico–Canada Agreement, has somewhat addressed these issues. Newer emissions-based policies—like the global arrangement for steel and aluminum trade between the United States and the European Union—promise to further reshape supply chains by incentivizing production of lower-emissions goods. These newer policies offer the promise that global supply chains can be designed in a way that benefits people in rich and poor nations alike.

Conclusion

Because of outsourcing, offshoring, and insufficient investment in resilience, many supply chains have become complex and fragile, with central nodes that lack agility and have few substitutes. Some of this change has been driven by advances in technology, which have beneficial effects. For example, because more of today's products are electronic, semiconductors have become a central node in the economy.[10] However, this evolution has also been driven by shortsighted assumptions about cost reduction that have ignored important costs that are hard to turn into financial measures, or that spilled over to affect others. The validity of these assumptions is reduced in a world where disruptions have become more prevalent and firms are more tightly interconnected.

The COVID-19 pandemic has made these issues salient to the general public, which has experienced frustrating waiting times for the delivery of goods ranging from personal protective equipment to appliances. Though supply chains have performed well in the aggregate, with over 20 percent more goods flowing through the economy in 2021 compared with pre-pandemic times, it is still important to address supply chain fragility, given that disruptions are likely to continue. As disruptions become more common, private firms are beginning to increase their resilience through visibility, redundancy, and agility. The Federal Government has acted, and will continue to act, to build resilience in critical supply chains—for example, by providing clear signals of demand and supply that are already transforming sectors critical for the Nation's military, climate, and health security.

[10] Note that this change was also significantly promoted by U.S. government supply chain policy over many decades, as described in the text; see also Council of Economic Advisers (2021).

Chapter 7

Accelerating and Smoothing the Clean Energy Transition

Responding to the severe risks of climate change ranks among the most important and difficult challenges facing the United States. Levels of heat-trapping carbon dioxide in the atmosphere are higher than they have been in millions of years, causing gradually increasing temperatures and sea levels and worsening the catastrophic consequences of hurricanes, wildfires, and other extreme events. Along with the governments of other major greenhouse-gas-emitting countries, the Biden-Harris Administration has declared the United States' intention to rapidly reduce greenhouse gas emissions to avoid the worst consequences of climate change.

Because three-quarters of human-caused U.S. greenhouse gas emissions come from burning fossil fuels for energy, the most important step in reducing emissions is to shift from carbon-intensive to clean sources of energy (U.S. Energy Information Administration 2021a)—in short, to pursue a clean energy transition. A large and robust economics literature shows how policies can accelerate this energy transition by encouraging cost-effective emissions reductions. Completing this transition by mid-century would constitute a transformation of the energy system at a pace without precedent, and mark a giant achievement in human history, given the scale of the avoided damage to current and future generations (Newell and Raimi 2018).

President Joseph R. Biden has also committed to build a clean energy supply chain stamped "Made in America," reflecting the considerable economic opportunities and associated challenges presented by the energy transition. One challenge is how to support America's continued industrial strength and energy security. Doing so will require government actions that enable U.S. firms to compete on a level playing field in emerging global industries, especially given the degree to which other countries are supporting their own domestic firms.

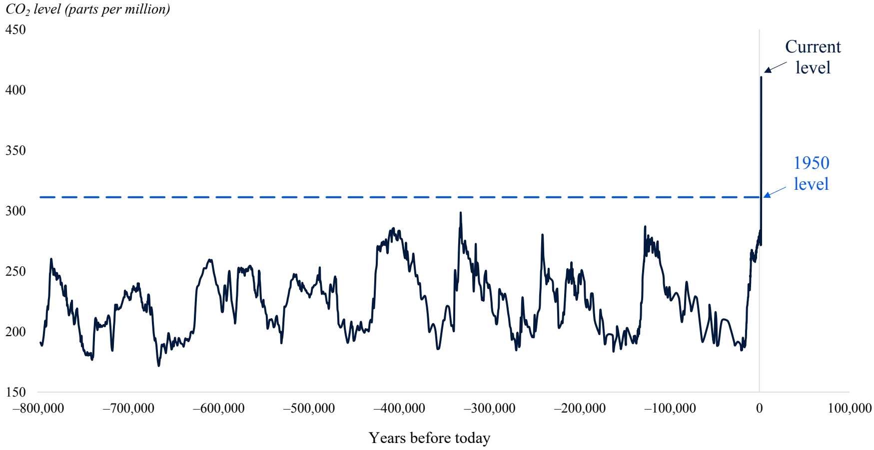
Another challenge presented by the transition is how to best support the communities across the United States that depend on carbon-intensive industries for jobs and tax revenue. In the past, when American communities have faced employment losses due to economic shocks—such as recessions, trade with China, and automation—workers and their families largely have not moved to communities where jobs are more plentiful, raising the important policy question of how to help people in the places where they are.

This chapter highlights what economics can tell us about effective policy strategies to accelerate and smooth the United States' clean energy transition. The first section provides background on climate risks, global progress in mitigating these risks, and the policies that will accelerate the transition. The second section describes the opportunities and challenges of supporting those domestic industries and communities that are most affected by the transition. The chapter concludes by highlighting the interdependency between the strategies to accelerate and to smooth the transition.

Accelerating the Energy Transition

The widespread adoption of fossil fuel energy technologies powered the steamships and factories that made the Industrial Revolution possible, and has helped spur economic growth for over a century (U.S. Energy Information Administration 2011; Friedrich and Damassa 2014). The burning of fossil fuels has also led to the rise in human-made carbon dioxide (CO_2) emissions, which is changing the composition of the atmosphere and, with it, environments around the globe. Over the 800,000 years before the 20th century, the atmospheric concentration of CO_2 vacillated between 150 and 300 parts per million, creating a climate hospitable for the world's development, as detailed in figure 7-1. In early 2022, CO_2 concentration levels are well above 400 parts per million and are continuing to grow. Because CO_2 is a heat-trapping greenhouse gas, rising levels in the atmosphere have led

Figure 7-1. Atmospheric CO_2 Level Across the Millennia to 2019



Source: NASA (2021).
Note: CO_2 = carbon dioxide.

to increasing temperatures, higher sea levels, more acidic oceans, and more frequent and severe cases of extreme weather and climate events (Zickfield, Solomon, and Gilford 2017; Bijma et al. 2013; Stott 2016).

Climate change poses considerable risks to the global economy. Climate-driven extreme events and biodiversity loss can result in cascading damage to such critical and interconnected systems as energy, public health, water, and food (Garcia et al. 2018; Porter et al. 2021). In the United States, estimated damage from storms, floods, wildfires, and other extreme weather events has grown to about $120 billion a year over the past five years (Smith 2021). Climate change disproportionately harms low-income and historically marginalized populations, because vulnerable individuals lack the resources to adequately prepare for or cope with extreme weather and climate events (U.S. Global Change Research Program 2018).

Because the rapid increase in greenhouse gases in the atmosphere is an ongoing planetary experiment, future damage from climate change is difficult to forecast precisely, and empirical estimates cover only a subset of likely effects. A 2017 meta-analysis finds that an increase in global temperatures of 5.4 degrees Fahrenheit (3 degrees Celsius) over preindustrial levels—a threshold that could be surpassed later in this century absent strong policy interventions—could cause economic damage equivalent to 7 to 11 percent of global gross domestic product (GDP) (Howard and Sterner 2017). In addition, studies that estimate the economic effects of climate change often fail to account for important aspects of climate change's impact on public health, including temperature-related mortality (Bressler 2021) and the deaths and sicknesses caused by local pollution from fossil-fuel-related emissions (Shindell et al. 2018; Scovronick et al. 2019).

Global Efforts to Reduce Greenhouse Gas Emissions

Average global temperatures have already risen about 1 degree Celsius above preindustrial levels (NASA 2021). CO_2 remains in the atmosphere for centuries, so our continued emissions will cause temperatures to continue to increase (Archer et al. 2009).

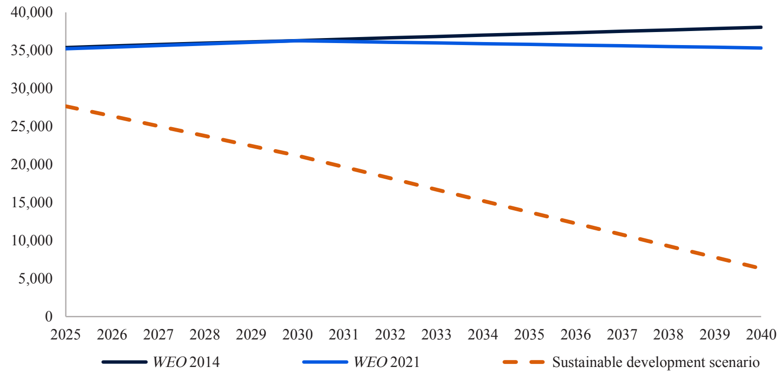
We can slow the pace of temperature increases by reducing global emissions, but halting global warming requires achieving net zero CO_2 emissions (Net Zero Climate 2022). Considerable momentum toward this goal is building worldwide. The world's major countries committed in the 2015 Paris Agreement to keep global warming well below 2 degrees Celsius above preindustrial temperatures, which is likely to require net zero emissions at the global level between 2050 and 2070 (UNFCCC 2021). Many countries, including the United States, have coalesced around a goal of net zero emissions by 2050. President Biden has additionally committed the United States to halve its net greenhouse gas emissions by 2030 (using a 2005 baseline) (McCarthy and Kerry 2021). In the European Union, the United Kingdom, and Japan, mid-century net zero emissions targets are stipulated by law (European Commission 2021a; Climate Change Committee 2021; Jiji Press 2021). The world's largest emitter of greenhouse gases—China—has committed to net zero emissions by 2060 (Myers 2020). Many of the world's largest companies have also made pledges to cut emissions to net zero, including financial institutions responsible for over $130 trillion in assets (Glasgow Financial Alliance for Net Zero 2022).

Global annual CO_2 emissions have begun to level off after centuries of increasing, partially as a consequence of this momentum (Our World in Data 2020). A recent United Nations report declares that the peaking of annual global emissions by 2030 is within reach (UNFCCC 2021). The projections of future global CO_2 emissions by the International Energy Agency (IEA), displayed in figure 7-2, also show annual global emissions peaking and then beginning to decline in the decades ahead.

But to achieve the climate goals specified seven years ago in the Paris Agreement, the energy transition will need to accelerate markedly from current trends: a recent study estimates that without additional policy actions, there is less than a 10 percent probability that temperatures will stay below 2 degrees Celsius above preindustrial temperatures by 2100 (Ou et al. 2021). Figure 7-2 shows that in 2040, global emissions under currently announced or implemented policies are projected to be seven times higher than emissions under a scenario in which the world is on pace to achieve net zero emissions by mid-century (IEA 2021b).

Figure 7-2. Global Carbon Dioxide Emission Projections, 2025–40

Million metric tons



Source: International Energy Agency (IEA 2014, 2021), *World Energy Outlook* (*WEO*).
Note: The WEO 2014 and WEO 2021 scenarios reflect projections that assume existing policy frameworks and announced policy intentions. The IEA's Sustainable Development Scenario outlines how the world can deliver on the three main energy-related goals: achieving universal access to energy, reducing the severe health effects of air pollution, and tackling climate change.

Accelerating the Energy Transition in the United States

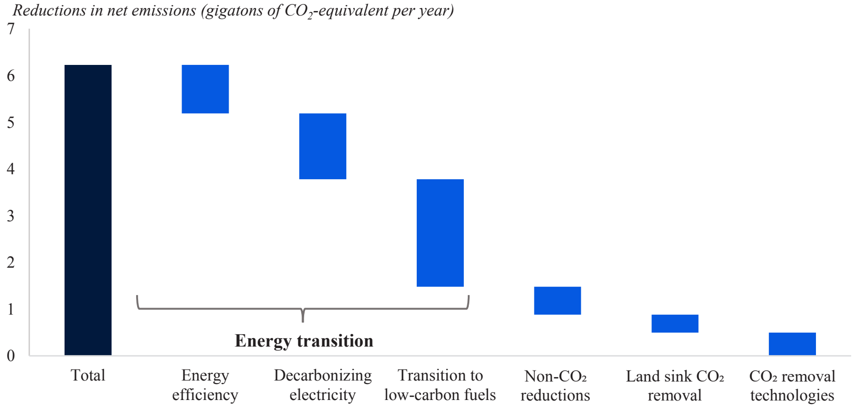
An effective response to climate change requires policy actions around the globe, starting here at home. The United States' annual greenhouse gas emissions are surpassed only by those of China, and our cumulative emissions are larger than those of any other country (Ritchie and Roser 2020; Our World in Data 2020).

Shifting from carbon-intensive to carbon-free energy systems is the major challenge to achieving net zero emissions in the United States (see figure 7-3). While reducing deforestation and other actions outside the energy sector are also critical to slowing climate change, the production and consumption of energy are responsible for about three-quarters of U.S. emissions (Ge, Friedrich, and Vigna 2020; Climate Watch 2021).

Successfully transitioning the U.S. economy to clean energy necessitates a large shift in economic activity. Americans spend over $1 trillion annually on energy, or about 5 to 10 percent of U.S. GDP in recent decades (U.S. Energy Information Administration 2018). Natural gas- and coal-fired power plants produce the majority of U.S. electricity, while petroleum products are the dominant fuel to transport people and products. Houses and buildings are often heated with furnaces and boilers that burn natural gas and oil, and the products Americans buy, the food we eat, and the sidewalks we walk on have carbon embedded in their production processes (White House 2021a). In 2019, 83 percent of the country's energy demand was satisfied by coal, oil, and natural gas, down from about 87 percent in 2000 (Ritchie and Roser 2020).

Meeting domestic and global climate targets means substantially stepping up the pace of clean energy deployments over the next decades,

Figure 7-3. Representative Pathway to Meet Net Zero Emissions in the United States, 2005–50



Source: U.S. Long-Term Climate Strategy.
Note: CO_2 = carbon dioxide.

as shown by a recent IEA analysis that details a pathway to net zero emissions by 2050 (see table 7-1) (Bouckaert et al. 2021). Though the world is not decarbonizing at the pace of this IEA scenario, recent trends and expert forecasts do tell a story of an explosive growth of clean energy technologies. In the United States, wind turbine technicians and solar energy installers are two of the five fastest-growing occupations, and over 80 percent of new electricity generation capacity built here in the first three quarters of 2021 was wind or solar (U.S. Bureau of Labor Statistics 2021a; Shahan 2021).

Although many details about the energy transition are impossible to know in advance, the road map to meeting the energy demands of a growing economy with clean energy has become much clearer in recent years. Dozens of "deep decarbonization" studies point to a similar recipe: produce electricity with carbon-free sources and shift energy uses to this carbon-free electricity and other low-carbon fuels (National Academies 2021).

A rapid energy transition will not occur without the implementation of a host of policy measures. If market prices fail to account for the damage caused by emissions, then consumers and producers will continue buying and selling too many artificially inexpensive, carbon-intensive goods and services. Carefully designed policies can change this behavior by raising the relative price of carbon-intensive goods and services compared with cleaner alternatives, which provides a financial incentive to shift away from the carbon-intensive products (Serrano and Feldman 2012).

Such carbon prices could be implemented directly via carbon taxes, indirectly through a cap on emissions and tradable permits, or through other similar policy tools. Government revenues from the carbon price can be used

Table 7-1. Global Clean Energy Deployments in 2020 and 2030 Consistent with Net Zero Emissions by 2050

Type of Clean Energy	2020	2030
Global wind installations	114 GW per year	390 GW per year
Global solar energy installations	134 GW per year	630 GW per year
Electric vehicles	5% of global car sales	60% of global car sales
Heat pump installations	180 million per year	600 million per year
Captured carbon	40 mt per year	1670 mt per year

Source: Bouckaert et al. (2021, tables 2.5, 2.6, 2.9).
Note: GW = gigawatts; mt = metric tons.

to compensate consumers for increases in energy prices or to invest in other societal priorities.

Carbon prices of some form exist at the national level in 45 countries, including those that have been successful at sustaining emissions reductions, such as the United Kingdom (see box 7-1) (World Bank 2021). Canada's federal carbon price is scheduled to increase from 50 Canadian dollars per metric ton of CO_2 in 2022 to 170 dollars in 2030 (Government of Canada 2021). However, many countries have failed to implement carbon prices at the scale and scope needed to achieve large emissions cuts (OECD 2021). In the United States, Federal-level carbon pricing proposals have stalled in Congress for over 30 years, including legislation that passed in the House of Representatives in 2009 but failed in the Senate (Center for Climate and Energy Solutions 2021).

Even in the absence of these political challenges, carbon prices are just one of many policy measures needed to cost-effectively accelerate the energy transition. After all, in addition to the failure of market prices to account for the damages caused by emissions, various other barriers stand in the way of a rapid, equitable, and low-cost transition. Complementary policies can make it cheaper or easier to conserve energy or to shift away from carbon-intensive products.

Policy measures are needed for situations in which consumers cannot or do not fully respond to price signals; for example, tenants are often responsible for paying utility bills but have no control over what landlords could do to effectively reduce energy consumption (Ryan et al. 2011). Well-designed incentives and standards can encourage broader use of energy-efficient products and other energy-conserving actions.

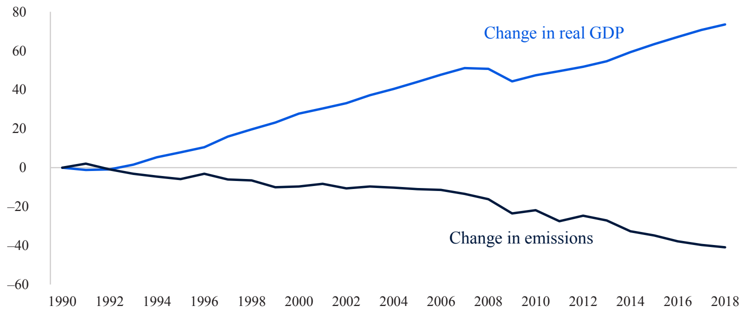
Measures that foster innovation are also necessary to reduce the costs of the clean energy transition. Private firms are likely to underinvest in technological progress because the benefits of their investments in emerging technologies partially accrue to society writ large. In addition, new products struggle to compete on a level playing field with established products due to

Box 7-1. The United Kingdom's Emissions Have Fallen Rapidly While Its Economy Has Grown

The United Kingdom passed a major climate change law in 2008 and implemented a combination of emissions pricing, regulations, subsidies, and spending on clean energy (London School of Economics 2020). Its emissions fell by about 20 percent between 2009 and 2019, as shown in figure 7-i; the trends shown are not due to swapping domestic production of carbon-intensive products for imports (i.e., "offshoring" emissions); in fact, between 2009 and 2019, emissions from imported goods decreased by more than emissions from exported goods (Ritchie and Roser 2020).

Figure 7-i. Changes in U.K. Greenhouse Gas Emissions and Real GDP since 1990

Percent change since 1990



Sources: Climate Watch; U.K. Office for National Statistics; CEA calculations.
Note: Real GDP is reported in chained 2019 pounds. Greenhouse gases are reported in megatons and use production-based accounting

a host of competitive disadvantages, which include access to capital and the difficulty of acquiring the talent, materials, and customer bases necessary to scale up production. Well-designed policies can help encourage investments at all stages of the innovation process, from research to demonstration projects to initial commercialization (Gundlach, Minsk, and Kaufman 2019).

Finally, even with these policies in place, the widespread adoption of cost-effective clean energy solutions requires building the necessary public infrastructure and regulatory structures that enable them to compete with more established products. For example, regulators can require financial institutions to assess climate risks in their investments, and Federal agencies can set guidelines to ensure that emerging technologies, such as carbon capture and storage, are deployed effectively and equitably (White House 2021b; Council on Environmental Quality 2021).

More broadly, policies that accelerate the transition can be designed to prioritize equity. Currently, lower-income households are often disproportionately harmed by higher energy bills. Further, energy infrastructure investments have historically led to environmental degradation in marginalized communities. Policies can be designed to lessen rather than exacerbate these equity concerns; for example, the Biden Administration has committed to devoting a substantial portion of Federal investments in clean energy development to disadvantaged communities through the Justice40 Initiative (White House 2021c). In many places that have implemented carbon prices (e.g., Canada's federal carbon pollution pricing system), the revenues are returned to lower-income households so that they receive more in government payments than they pay in higher prices of goods and services (Government of Canada 2022).

A Smooth Transition to Clean Energy

The need to shift to clean energy is paramount to lessen the severe threats of climate change. However, an equitable transition to a clean energy economy requires more than efforts to reduce emissions. This section highlights the need for public policies that support certain domestic industries and vulnerable communities in response to two key challenges posed by the energy transition.

First, domestic clean energy industries will become increasingly important for the Nation's security and global economic position. Currently, the United States' energy industry is carbon-intensive and a source of economic productivity and stability (U.S. Environmental Protection Agency 2021). For example, our domestic production of natural gas helps to keep costs low for American consumers and firms (U.S. Energy Information Administration 2021b). However, as the global energy transition progresses, the innovation and production of clean technologies will grow in importance. Fortunately, the United States has the needed resources, institutions, and workforce to support globally competitive clean industries. However, other nations are rapidly ramping up investments in clean energy and support for their domestic industries. Without strong and sustained Federal Government support, U.S. firms that can supply a clean economy are likely to struggle to compete in global markets.

The second portion of this section describes the challenges the energy transition poses to communities across the United States where jobs, income, and tax revenues depend on carbon-intensive industries, such as the production of fossil fuels or downstream products like automobiles. Fossil fuel-dependent communities across the country are already facing economic challenges, and the energy transition poses additional risks to communities that are not well prepared and supported (Interagency Working Group

2021). In the past, workers and their families largely have not moved to find jobs when faced with the loss of major employers in their communities. Strategies to support these groups of Americans through the energy transition therefore require policies that target fossil fuel-dependent local economies.

Although economists largely agree on the policy recipe for accelerating the energy transition, no similar playbook exists on how to smooth the transition for U.S. firms and communities. In fact, economists have long pointed to the risks of government interventions that advantage certain industries or geographic regions over others. However, the economic literature highlights ways to minimize policy risks and capitalize on the economic opportunities of creating global-leading firms and revitalizing local economies.

The First Challenge: Supporting Domestic Industries

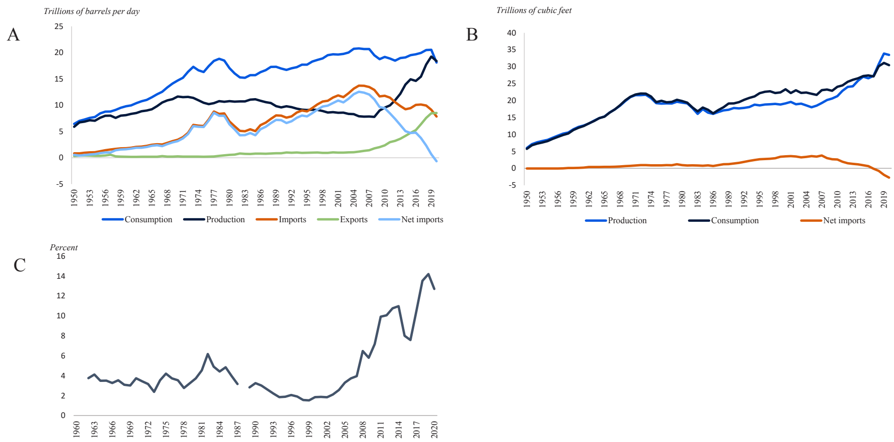
This subsection describes the need for policy measures that support domestic clean industries, and the opportunities and risks of government interventions that can enable U.S. firms to compete in global markets that are growing rapidly during this energy transition.

The domestic energy sector is important to the U.S. economy. Energy production is an important component of U.S. economic strength and stability. The United States is the world's largest producer of petroleum and natural gas, surpassing Saudi Arabia in petroleum production in 2018 and Russia in natural gas production in 2011 (U.S. Energy Information Administration 2019). Despite being the world's largest consumer of oil and natural gas, American producers are also now large exporters of these fuels (U.S. Energy Information Administration 2021c). Net imports of petroleum products (about three-fourths of which come from crude oil) fell from about 10 million barrels a day in 2000 (roughly half of U.S. consumption) to below zero by 2019; meanwhile, net imports of natural gas fell from about 4 trillion cubic feet in 2000 to about -2 trillion cubic feet in 2019 (U.S. Energy Information Administration 2021b, 2021c).

The United States is also the world's largest exporter of refined petroleum products and liquefied national gas (Observatory of Economic Complexity; U.S. Energy Information Administration 2021d). The value of fuel exports as a fraction of the total value of merchandise exports increased from about 2 percent in 2000 to 13 percent in 2020, indicating that fuel exports alone account for about 1 percent of U.S. GDP (World Bank 2020) (figure 7-4).

In addition to fossil fuels, American firms are large producers and exporters of many other energy- and carbon-intensive products, including chemicals and steel (DeCarlo 2017; U.S. International Trade Administration 2020; IEA 2022a). The carbon-intensive auto industry makes up 3 percent

Figure 7-4. U.S. Fossil Fuel Consumption for Selected Years



Sources: U.S. Energy Information Administration; World Bank.
Note: Figure panels, from left to right: A, U.S. petroleum consumption, production, imports, exports, and net imports, 1950–2020; B, U.S. natural gas consumption, dry production, and net imports, 1950–2020; C, U.S. fuel exports as a share of merchandise exports, 1960–present.

of GDP, more than any other manufacturing sector (American Automotive Policy Council 2020).

Despite the harmful effects of the United States' reliance on fossil fuels, the reality is that we currently benefit in certain ways from our domestic energy production. In the winter of 2021–22, Europe was immersed in an energy crisis, including historically high natural gas prices caused by a series of shocks that led to increased demand and constrained supply, due in part to the continent's dependence on natural gas from Russia (Cohen 2021; Stapczynski 2021; Sabadus 2021). The United States is somewhat insulated from turmoil in natural gas markets abroad due to our domestic production and the lack of a fully integrated global market—natural gas prices in Europe rose to over 10 times higher than prices in the United States in December 2021 (Reed 2021).

In contrast, the global oil market is highly integrated, with a group of countries that essentially set prices (Fattouh 2007) and a mixture of state-owned and private producers with widely varying costs of production (*Wall Street Journal* 2016). American consumers of oil are therefore vulnerable to geopolitical turmoil and the decisions of policymakers in petrostates. The uninterrupted availability of affordable energy is a national security concern for the United States (IEA 2022b). Ensuring the security of our energy supply will require policy measures that diversify our energy sources and supply chains, and that build resilience into the energy system as a buffer against future shocks (Yergin 2006).

The energy transition is an economic opportunity, but policies are needed to help build strong domestic clean industries. American oil

Box 7-2. The History of U.S. Government Support for Domestic Carbon-Intensive Energy Industries

As industry and consumers ramped up their use of fossil fuels in the early 20th century, experts became concerned that the country would run out of oil unless new oil fields were found and brought online (Olien and Olien 1993). In 1913, the Federal Government added the intangible drilling oil and gas deduction into the tax code, which allowed companies to deduct from their taxes most of the costs of drilling new wells, reducing the high up-front expenses that could discourage exploration (Center for a Responsible Federal Budget 2013). This deduction remains in place today; at $2.3 billion a year, it is the single largest production tax benefit for the fossil fuel industry (Roberts 2018).

The U.S. government has periodically intervened in markets to ensure stable prices in the face of turmoil. For example, in 1930 in East Texas, an enormous new oil field known as the "Black Giant" was discovered by the oilman Dad Joiner (Loeterman 1992). Thousands of independent producers (known as wildcatters) flocked to the area, flooding the market with supply and driving the price of oil down to as low as $0.02 a barrel, well below the cost of production. Faced with a possible collapse of the oil industry, the Governors of Texas and Oklahoma declared martial law in 1931, halting production and stabilizing the price (Goodwyn 1996). President Franklin D. Roosevelt's Secretary of the Interior, Harold Ickes, led an effort to work out quotas and regulations with producers in the area. Three decades later, the founders of OPEC would look to that system as their model (Loeterman 1992). In 1959, President Dwight D. Eisenhower imposed a quota system restricting oil imports that would remain in place until 1973 (Council on Foreign Relations 2021).

The U.S. government has also intervened to help American companies access energy sources around the world. For example, in the 1940s and 1950s, the U.S. Department of State worked with U.S. oil companies to negotiate profit-sharing agreements with oil-producing nations, including Venezuela and Saudi Arabia, to be as favorable as was feasible to U.S. companies (Council on Foreign Relations 2021). In a 1950 agreement with Saudi Arabia, negotiators cut a deal in which oil companies increased the taxes they paid to Saudi Arabia while reducing the taxes they paid in the United States (Ross 1950). This agreement allowed money to flow to Saudi Arabia outside the formal Congressional approval process. When the Mossadeq government in Iran nationalized the Anglo-Iranian Oil Company, the U.S. and U.K. governments launched Operation Ajax, which helped overthrow Mossadeq in 1953 (Allen-Ebrahimian 2017). In the aftermath, the five major U.S. oil companies, along with British and French companies, were given access to Iranian oil fields as part of the Iranian Consortium Agreement of 1954; the companies were also given control over production levels (Heiss 1994).

Government support comes in the form of boosting energy infrastructure and supply chains as well. A notable example is the Federal Highway Act of 1956, which built the networks necessary for fossil fuels to dominate personal and freight transportation in the United States, while potentially crowding out lower-carbon alternatives such as rail.

producers are also vulnerable to decisions made in petrostates. Though the United States is currently the world's largest oil producer, if the world moves to rapidly limit carbon and therefore reduce oil demand, state-owned oil producers in countries like Saudi Arabia may increasingly find it in their interest to maintain their production levels by setting prices closer to production costs than they are now, at the expense of higher-cost producers that include U.S. firms (U.S. Energy Information Administration 2021f). This means that while global oil demand may decrease only gradually in the coming decades, the effect on the U.S. oil industry may be more abrupt. Indeed, two recent projections show the oil market shares of the members of the Organization of the Petroleum Exporting Countries (OPEC) increasing from roughly one-third in 2021 to about one-half or two-thirds by 2050 in a net zero scenario (Bouckert et al. 2021; Mercure, Salas, and Vercoulen 2021).

At the same time, the rapid growth of the demand for carbon-free products globally creates massive—but possibly fleeting—opportunities for U.S. firms. A key question is how the economic productivity and energy security of the United States will be affected as countries transition to clean energy. Will U.S. firms be able to compete in emerging global carbon-free industries? If not, the energy transition could lead to our reliance on imports of the batteries, heat pumps, low-carbon steel, and other critical inputs to a clean energy economy.

Consider the transition from internal combustion engine (ICE) vehicles to electric vehicles (EVs). Cars are a major source of greenhouse gas emissions, and President Biden has announced a goal to increase the share of new passenger vehicle sales that are EVs and other zero emissions vehicles from 2.4 percent in 2020 to 50 percent in 2030 (Bui, Slowik, and Lutsey 2021). There are nearly 1 million workers in the U.S. automotive industry, and over 3 million in the car dealer industry (U.S. Bureau of Labor Statistics 2021b). The motor vehicle and parts industry has an annual output of over $500 billion (U.S. Bureau of Economic Analysis 2022). Reducing harmful emissions from vehicles will entail the reduction in output and employment related to ICE vehicles, but enormous growth in EVs—the value of the global EV market is expected to grow from $163 billion in 2020 to over $800 billion by 2030, according to one expert's forecast (Jadhav and Mutreja 2020).

Over the past century, the combination of automaker innovations, workers' unions, and labor laws have made ICE vehicles a staple of middle-class families—and in the process creating good jobs, new methods of production, and a strong domestic automobile industry. The United States has the resources and capital required to rapidly scale up a domestic EV industry that can satisfy the growing and changing nature of transportation needs. But this will not occur at a pace consistent with our climate goals without a policy strategy that encourages the redirection of capital and workers across the auto industry supply chain.

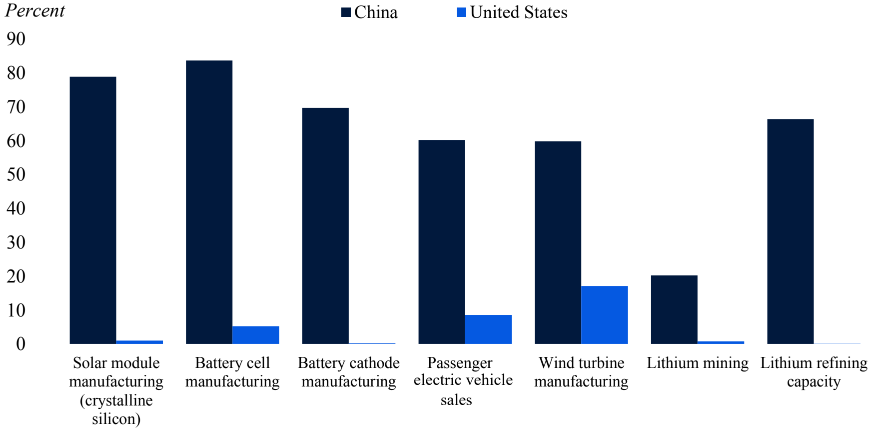
More broadly, the United States is well positioned to incubate leading-edge clean energy firms (Rodrik 2014; Cleary et al. 2018)—with a highly educated population (National Center for Education Statistics 2021) and institutions that have enabled global leaders in Silicon Valley, biotech, pharmaceuticals, and other industries. Further, a unique endowment of natural resources makes certain United States' geographic regions ideally suited to become hubs of carbon-free energy production (National Academies 2021).

However, U.S. firms will require support to compete in emerging global markets for clean products. The inability to capture the full societal benefits of innovation has led to insufficient private sector investments in emerging clean technologies, inhibiting the expansion of clean industries (Council of Economic Advisers 2021). For example, a first-of-its-kind demonstration facility for low-carbon cement production may provide large societal benefits but also have a cost and risk profile that the private sector is unwilling to take on without government support.

Even after a new technology has been successfully developed and demonstrated, its producers often face additional barriers competing with more established technologies. Established firms receive a range of benefits from the existence of a mature industry with extensive supply chains, agglomeration effects (i.e., interactions between innovation and production), and networks of consumers, whereas chicken-and-egg problems hinder emerging technologies. For example, the uptake of EVs is slowed by a lack of a nationwide charging network, and a nationwide charging network has not been built because there are not enough EVs on the roads (Wei et al. 2021).

The robust industrial policy strategies of other countries can also be an obstacle to emerging clean industries in the United States. In an efficient global market, each country would provide its domestic firms with only the support required to overcome the types of hurdles described above, which should enable the most productive firms worldwide to become market leaders. In reality, if the U.S. government fails to provide domestic firms with sufficient support, or if other governments overcompensate their own

Figure 7-5. The United States' and China's Percentages of the Market across Clean Technology Industries



Source: BloombergNEF.

domestic firms, American firms may not be able to compete in global markets, regardless of their potential competitive advantages.

The Chinese government has made a concerted and successful effort to build domestic industries that can supply a global clean energy economy (Liu and Urpelainen 2021). Therefore, Chinese firms dominate clean energy manufacturing worldwide. Chinese companies produce about 60 percent of the world's wind turbines and about 80 percent of its solar module cells (see figure 7-5).

In addition, China now produces over 80 percent of the world's battery cells used to power EVs. Ceding such industries to China is not only a lost opportunity for U.S. firms but also a risk to U.S. consumers, given the potential for the monopolization of important supply chains (see also chapter 6). Building a domestic battery industry—as well as other components of the EV supply chain, such as key critical minerals—that can compete with firms in China and other countries is a key challenge for the U.S. economy over the next decade—and a major economic opportunity, given the growing global demand for EVs.

China and Russia are also making large bets on nuclear energy, another source of clean energy with the potential to grow rapidly in a global energy transition (Berthélemy and Cameron 2021). A recent study by the International Atomic Energy Agency projects nuclear energy capacity could grow between 17 and 94 percent worldwide by 2030 (IAEA 2013). In contrast, the growth of nuclear energy has stalled in the United States due to concerns related to costs, safety, and waste, although the Bipartisan Infrastructure Law and other Biden-Harris Administration proposals include substantial incentives to support the domestic nuclear energy industry

(Bordoff 2022; U.S. Energy Information Administration 2021g). Ceding the global-leading positions in the nuclear industry to China and Russia, whose companies are now supplying reactor technologies to other parts of the world, would forgo not only economic opportunities for U.S. firms but also the potential for the U.S. government to influence nonproliferation efforts in other countries with nuclear energy facilities (Bordoff 2022).

Our allies are developing industrial policy strategies as well. For example, the European Union is the world's leader in subsidizing renewable electricity generation (Taylor 2020), and it recently introduced a new strategy to support domestic industries with increased access to financing, reduced regulatory burdens, and capacity building for the transition to sustainability and digitization (European Commission 2020). The EU has also provided substantial support to key emerging technologies such as batteries and clean hydrogen, positioning European clean energy firms to be the global leaders in potentially game-changing technologies (European Commission 2021b, 2022).

Strategies for Supporting Domestic Industries through the Energy Transition

The world's most advanced economies, including the United States, have implemented policy measures with the aim of industrial development (Goodman 2020). For over a century, U.S. policymakers have provided support to the fossil fuel industry, recognizing that a strong domestic energy industry is important for economic competitiveness and national security (Johnson 2011). Yet government interventions are not without risk; after all, market forces can improve the economic efficiency of decisions. The challenge for policymakers, then, is to design a fulsome strategy that maximizes the economic opportunities of the clean energy transition while minimizing the risks.

Although there is no established playbook for green industrial policy, economists have offered numerous general principles (Vogel 2021; Rodrik 2014; Mazzucato, Kattel, and Ryan-Collins 2019). First, the government should provide domestic industries with *transparent, high-level goals*. National governments can launch national missions to confront the largest challenges facing societies, including climate change (Mazzucato, Kattel, and Ryan-Collins 2019). For example, during the Space Race of the 1960s, funding for the U.S. National Aeronautics and Space Administration reached nearly 4.5 percent of Federal spending, which fueled domestic industries like computer chip production and spawned a new generation of engineers and scientists (Chatzky, Siripurapu, and Markovich 2021). In contrast to high-level missions, supporting specific companies or technologies over others comes with demanding informational requirements on policymakers, and government actors do not have complete information on the potential benefits, costs, and risks of each investment (Schultze 1983). Instead, the government may (at least partially) let political considerations influence investment decisions, which raises the odds of wasteful government spending.

Another recommendation is that government should *focus support on technologies that are not fully mature*—from research and development to demonstration projects to initial commercialization. Without government support, firms that produce emerging technologies often cannot compete with firms that produce mature technologies. Many of the largest industrial policy success stories have come from investing in innovative technologies that exhibit a wide range of potential (and often unforeseen) applications (Goodman 2020). In contrast, subsidies for fully mature technologies can cause long-term declines in allocative efficiency, largely by untethering prices and output allocations from underlying economic conditions (Kim, Lee, and Shin 2021). Importantly, it may not be possible or desirable to avoid supporting specific emerging clean energy technologies, despite the associated challenges noted above.

Governments need to balance the potentially conflicting needs to *foster collaborations with industry while avoiding its undue influence on the policy process*. Successful public policies often require considerable interaction between government officials and industry stakeholders, so that the government officials understand the businesses and technologies on which public policies focus (Rodrik 2014). Such interactions naturally heighten the concerns of political capture—whereby government officials put their own interests and the interests of industry stakeholders who lobby them above the interests of their constituents—because policy decisions are made by political actors (Gregg 2020). Indeed, whenever subsidies and tariffs are on the table, moneyed interests will lobby for the adoption and retention of their preferred policies, making these policies difficult to eliminate when they become unnecessary or counterproductive. For example, fossil fuel subsidies were first paid in the 1910s, and agriculture subsidies were first paid in the 1930s (Center for a Responsible Federal Budget 2013; Comparative Food Politics n.d.); in both cases, the subsidies have lasted to the present day due in large part to interests that benefit from them. Approaches to balance the needs to collaborate with industry, while avoiding their undue influence, include government institutions with some degree of independence from the political process and restrictions on a revolving door between government service and industry.

Another way to maximize the effectiveness of government interventions is to *make the regulatory environment as certain as possible*. Ensuring that the parameters and duration of government support are clear and concrete will give firms confidence about future technological and market opportunities, catalyzing investment and innovation that would not otherwise occur. In contrast, uncertain regulatory environments are not conducive to attracting private sector investments. For example, the periodic expiration (or near-expiration) of the production tax credit for renewables in the United States has inhibited investments in wind and other clean energy technologies and thus has inhibited the growth of these emerging industries (Sivaram and Kaufman 2019).

Finally, just as an investor may be wise to consider a diversified portfolio rather than a concentrated set of individual stocks, the government should *invest in a broad portfolio of clean energy solutions* (Rodrik 2014). An important role of government is to take on risks that the private sector will not bear; a diverse portfolio accommodates such risks, even in the presence of the inevitable failed investments. For example, the Department of Energy's Loan Programs Office was established to provide financing for innovative energy projects in the United States, including access to debt capital that private lenders cannot or will not provide (U.S. Department of Energy, Loan Programs Office 2017). The program has funded a few companies that went bankrupt—most notably the solar producer Solyndra—but those bankruptcies have not prevented the formation of a highly successful overall portfolio of investments (Rodrik 2014). The program has propelled the growth of game-changing companies, including Tesla (U.S. Department of Energy, Loan Programs Office 2017). The Federal Government should be willing to lose money to achieve such benefits; but instead, the monetary losses from the Loan Program have been less than one-third of the interest paid to the government on the loans to date (U.S. Department of Energy, Loan Programs Office 2021).

Following this playbook, President Biden has announced a goal for 50 percent of passenger vehicle sales by 2030 to be EVs, along with helping to build a domestic supply chain to support EV production (White House 2021d). Moreover, the Federal Government is investing in the infrastructure needed to entice consumers to purchase EVs; there are currently only about 5,000 of the fastest EV chargers in the United States for public use, and these chargers are clustered in a few regions, including in the Northeast and on the West Coast. The 2021 Bipartisan Infrastructure Law is investing billions of dollars in building a domestic supply chain for batteries and nationwide network of EV charging stations (White House 2021d, White House 2021e).

Previous attempts to support domestic industries in global markets have mixed track records (see box 7-3). Many failed investments might have been avoided with better processes for strategically targeting industrial policy opportunities. Perhaps more important than avoiding failed investments is creating the conditions where failures are expected and accepted as a learning experience, including with data collection, information sharing,

Box 7-3. Industrial Policy Successes and Failures

Governments worldwide have had many successes and failures supporting domestic industries. Perhaps the most prominent examples are in the context of economic development. South Korea is an often-lauded success story, due to its subsidies for a targeted set of industries that helped build a series of large, family run business conglomerates called the Chaebol, including well-known brands like Hyundai and Samsung (Albert 2018; Westphal 1990). One study found that targeted industries grew more than 80 percent more than nontargeted ones from 1973 to 2017 (Lane 2017). In contrast, several industrial policy pushes in Sub-Saharan Africa, North Africa, and the Middle East have been largely unsuccessful, with corruption, existing distortions, and weak government capacity limiting their effectiveness (Devarajan 2016). Even in cases where industrial policy has been successful in the development context, such as Japan, it is difficult to disentangle industry support from other factors that influence economic growth, such as favorable domestic economic conditions or high savings rates (Goodman 2020).

The anecdotal evidence of developed countries supporting domestic producers in emerging high growth industries offers notable successes and failures. Denmark has successfully leveraged a national strategy to build world-leading capabilities in offshore wind energy, while the billions of dollars spent by France, Germany, and the European Union in the early 2000s to fund search engines that could compete with Google were unsuccessful (Lewis 2021; Goodman 2020).

Efforts by the U.S. government to support domestic industry have similarly produced mixed results. Some of the largest anecdotal successes of government interventions have come in the face of threats, like the Space Race or the War Production Board during World War II (Chatzky, Siripurapu, and Markovich 2021). Facing intense competition from Japan in the 1980s, subsidization of the semiconductor industry created a globally competitive industry by the 1990s (Hof 2011). In contrast, the United States has provided strong support to the domestic shipping industry for a century—yet U.S. ships still cannot compete on cost with foreign vessels, in part due to poor labor standards in the industry abroad (which is also a highly relevant concern for clean energy production abroad) (Frittelli 2003, 2019; Ha et al. 2020; Kaplan, Buckley, and Plumer 2021).

and impact evaluations. This will enable policymakers to experiment with policy design, figure out what works, and take sufficient risks to reap the rewards of economy-boosting investments.

The Second Challenge: Supporting Communities That Rely on a Carbon-Intensive Economy

The geographic concentration of many of the industries most affected by the energy transition, including fossil fuel extraction and the manufacturing of high-carbon products, implies disproportionate risks for the regions of the country that rely on these industries for jobs and tax revenue, and important opportunities for public policies to mitigate these risks and invest in the residents of these same regions.

There is considerable overlap between the dual challenges of smoothing the energy transition for domestic economic sectors and for local communities. After all, clean energy-related investments in fossil fuel-dependent local economies can serve to boost *both* the industries and places most affected by the energy transition.

However, these two challenges also differ in marked ways. As described above, supporting domestic industries most effectively entails a national strategy that will lead to investments across the entire country, including but not limited to local economies that currently depend on fossil fuels. Similarly, effectively supporting fossil fuel-dependent communities will involve a commitment to these local economies with measures that are not limited to clean energy investments.

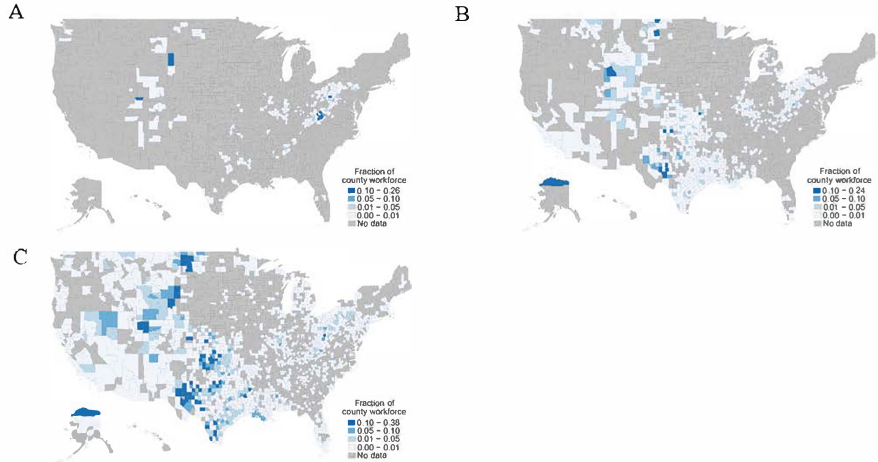
The remainder of this section describes the rationale for government interventions to support fossil fuel-dependent communities and the lessons learned from prior experience with place-based policies.

The Geographic Concentration of Fossil-Fuel-Dependent Communities

As a case study, consider the automobile industry's shift away from ICE vehicles. Certain industry jobs, including vehicle assembly and sales, may translate to jobs on the EV line relatively seamlessly. However, many of the jobs specific to ICE components and supply chains will decline. For example, the ICE and EV powertrains—the system by which the engine and motor deliver power to the wheels—require different parts. Of the 140,000 workers in the U.S. powertrain sector, 70 percent are mostly concentrated in small communities in Michigan, Ohio, and Indiana. In Monroe County, Michigan, more than one-quarter of employment relates to ICE vehicle powertrains (Raimi et al. 2021).

The risks of the energy transition may be even more acute for communities dependent on the extraction and combustion of fossil fuels. The U.S. fossil fuel industry is highly geographically concentrated, as shown in figure 7-6. The coal extraction industry (panel A) is largely located in Appalachia and portions of the Mountain West—about 90 percent of U.S. coal production takes place in 50 counties (U.S. Energy Information Administration

Figure 7-6. Fossil Fuel Employment by County



Sources: Quarterly Census of Employment and Wages; Bureau of Labor Statistics (BLS); CEA calculations.
Note: Figure panels, from left to right: A, coal mining; B, oil and gas extraction; C, support services for the mining and quarrying of minerals and for the extraction of oil and gas. Industries are defined by NAICS codes 211 (oil and gas extraction), 2121 (coal mining), and 213 (support activities for mining and oil/gas extraction). Each panel displays the fraction of the county's workforce in the NAICS industry. Cells with small employment are suppressed by the BLS.

2021h). In some counties, fossil fuel employment is as high as 30 to 50 percent of all employment (panels A, B, and C); these figures are higher when including jobs directly supported by the region's dominant industry, such as in the service sector, supply chain, and local government (Tomer, Kane, and George 2021).

Employment and economic activity associated with fossil fuel production is already declining in many regions of the country. Coal-mining jobs have decreased by about three-quarters since 1980, and employment in the oil and gas sector has declined by about 30 percent in the last decade (Interagency Working Group 2021; Federal Reserve Bank of Saint Louis 2022). The underlying reasons are myriad: automation; cheap natural gas causing a shift away from coal-fired electricity; lower prices of renewable energy; resource decisions that account for the damage caused by climate change and air pollution; volatility in oil markets; and weak international demand, which may continue to fall as countries seek to meet their Paris Agreement commitments (Look et al. 2021; Bowen et al. 2018).

Fossil fuel-dependent communities that are unprepared for the energy transition risk further reductions in employment and economic activity (Larson et al. 2020). These areas are often rural, undiversified, and have pre-existing economic challenges—poverty rates are higher in fossil fuel-reliant communities than in neighboring counties and the Nation as a whole, as are mortality rates due to such issues as opioid abuse and black lung disease (Interagency Working Group 2021; Bowen et al. 2018; Metcalf and Wang 2019; National Institute for Occupational Safety and Health 2018). Large populations in coal communities depend on pensions and other benefit funds with questionable solvency (Randles 2019).

More broadly, rural locations often lack both the basic infrastructure (e.g., roads and broadband Internet) and the financial infrastructure (e.g., easily accessible credit) necessary to transition to new industries (Raimi et al. 2021). Many rural locations also suffer from a dearth of opportunities, with undiversified economies and workers that are specialized for the jobs in the region. For instance, workers in Appalachia are 25 percent less likely than the national average to have a college degree (Appalachian Regional Commission 2022).

The loss of dominant employers can precipitate fiscal spirals from which jurisdictions struggle to recover, as previously shown in the experiences of steel towns in Pennsylvania, coal-producing regions of the United Kingdom, and the automobile-dominated economy of Detroit, among others. When major industrial firms depart, the supporting service sectors and nearby supply chains shrivel in size. Reduced economic activity leads to reduced government revenues from property and sales taxes, which often results in cuts to government services. Combined with reduced employment opportunities, these factors make it difficult for distressed communities to attract new businesses and for dislocated workers to find new job opportunities (Morris, Kaufman, and Doshi 2021).

The Inadequacy of Place-Neutral Policies

The geographic concentration of the risks of the energy transition does not, by itself, imply that government support should specifically target these regions. Instead of targeting economically distressed regions, policies could target struggling people, regardless of where they live. Indeed, many government programs already support people in communities that face economic shocks, even though they are often not targeted at specific communities. For example, Federal and State governments have implemented trade adjustment assistance programs to directly compensate workers who lose their jobs because of increased exposure to trade,[1] and assistance programs such as the Supplemental Nutrition Assistance Program (formerly known as Food Stamps) and Medicaid help people during times of economic hardship (Higdon and Robertson 2020).[2]

[1] Multiple reports have found limited effectiveness of trade adjustment assistance (TAA) programs at transitioning workers to new, higher-paying lines of work (Rodrik 2017; U.S. Government Accountability Office 2012a, 2012b). While TAA has a large, positive causal effect on employment and earnings, take-up of TAA is low, so some of the limited effectiveness of TAA may be explained by how few people use it (Hyman 2018; Autor et al. 2014).

[2] Social safety net programs may be especially important for aiding fossil-fuel-reliant communities, given preexisting economic challenges and the growing concerns about the solvency of industry-funded pension programs (Higdon and Robertson 2020; Walsh 2019).

However, new evidence suggesting that people largely do not move in response to economic shocks has challenged the argument for targeting people rather than places for transition assistance. For example, researchers who have studied the effect on U.S. communities of increased trade with China have found that trade-induced manufacturing job losses led to nearly one-to-one decreases in the employment-to-population ratio in affected communities, indicating that workers were not migrating to other communities or sectors (Autor, Dorn, and Hanson 2021). Similarly, Hershbein and Stuart (2021) find persistent decreases in employment-to-population ratios after severe recessions. Over half of Americans spend most of their career in their childhood metropolitan area (Bartik 2009). The reasons people do not move in response to shocks likely include their attachment to local communities (including support from family and neighbors), the falling housing prices in declining communities, and lower wages for noncollege workers in high-income cities (Notowidigdo 2020; Autor, Dorn, and Hanson 2021).

What often sparks migration is opportunity elsewhere, not the shock in one's community. Monras (2020) finds that the local differences to migration in response to recessions are driven by differences in *in-migration*, not in out-migration. In other words, conditional on deciding to move, people respond to local economic conditions when choosing a new location. The workers most likely to stay behind are those with lower earnings capacity (Notowidigdo 2011; Bound and Holzer 2000). For minority households, housing discrimination has also restricted mobility (Neumark and Simpson 2015).

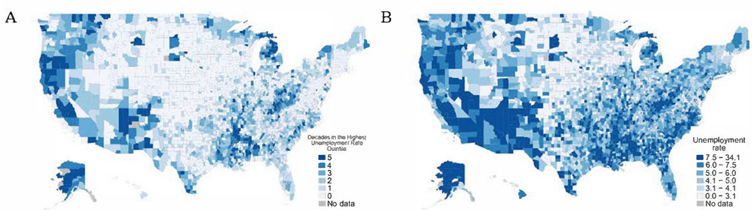
This tendency to remain in economically distressed communities and the inadequacy of assistance programs alone in ameliorating long-standing economic hardships (see box 7-4) implies the need for policies that help people where they are. This has led to an increase in scholarship on place-based, economic development policies aimed at improving the well-being of individuals in particular areas. Though the earlier literature highlighted the potential for inefficiencies, more recent findings focus on the conditions that may justify place-based policies. These include the invariance of location choices to local economic conditions; geographically segregated income groups that make investing in regions a reasonable proxy for investing in lower-income individuals (Akerlof 1978; Fajgelbaum and Gaubert 2021); the desire for insurance against location-specific economic shocks (Neumark and Simpson 2015), which may become more important as temperatures continue to rise; differences in the optimal hiring subsidies across regions based on local productivity levels (Kline and Moretti 2013); heterogeneity in local public goods provisions (Bartik 2020); and the desire to take advantage of agglomeration effects (Kline 2010).

Box 7-4. The Broader Issue of Distressed Local Economies

A proactive energy transition could prevent exacerbating problems in already distressed areas. The economies of many local communities are struggling, and some local economies have been distressed for a long time. Before the COVID-19 pandemic, in 2019, about 14 percent of U.S. counties had an unemployment rate above 8 percent (see figure 7-ii). Distressed local economies are concentrated in portions of the Black Belt, Appalachia, industrial Midwestern cities, and rural Western areas.

The causes of these struggles vary—the "China trade shock" (Autor et al. 2013), migration to urban centers, and technological change (Acemoglu and Restrepo 2020), to name a few—and the struggles are often persistent: about one-third of the counties with unemployment rates above 8 percent in 2019 also had unemployment rates in the worst quartile of U.S. counties in 1980, 1990, 2000, and 2010. Similarly, Kline and Moretti (2013) find that a plot of unemployment rates in 1990 and 2008 across 239 metropolitan areas shows "a remarkable degree of persistence," with a regression coefficient of 0.509 (.045) and R^2 of 0.35; they note that European labor markets show a similar (perhaps larger) degree of persistence.

Figure 7-ii. Distressed Counties in the United States



Source: American Community Survey, Census Bureau.
Note: Figure panels, from left to right: A, number of decennial censuses in which the county is the highest quintile of unemployment rate; B, unemployment rate in 2019.

Strategies for Place-Based Policies

While there is no established playbook for policymakers to follow in designing policies to support local economic development (Rodrik 2014), the following are general principles, drawn from the literature, for the design of place-based policies to support communities affected by the energy transition.

First, revitalizing communities requires a sustained commitment from the Federal Government to forming partnerships with local communities to fund suitable opportunities for economic development—a type of high-level national mission called out above in the context of industrial policy design.

Indeed, perhaps the most important cause of our limited understanding of successful place-based policies is how few resources have been devoted to these efforts at the Federal level. According to Bartik (2020), the U.S. government spends about $10.1 billion a year on Federal programs and tax credits that could fall under the umbrella of place-based policies. Such spending is a drop in the bucket compared with the resources spent on other Federal Government priorities, such as the annual grants of $417 billion to States and localities for Medicaid and the Children's Health Insurance Program (Shambaugh and Nunn 2018). If the Federal Government committed to providing communities with opportunities to rebuild after economic shocks, the subsequent policy experimentation would likely lead to a far better understanding of the most successful strategies for implementing place-based policies.

State and local governments spend above five times more per year than the Federal Government on place-based policies (Bartik 2020), and some State governments are an important source of support for distressed communities within their jurisdictions. However, for struggling regions facing binding budget constraints, economic development programs come in lieu of other public services—or, even worse, create a race to the bottom, in which local governments outbid one another to attract new businesses, depleting government coffers (Mast 2018). The Federal Government is the sole entity that can fund and implement a nationwide strategy to revitalize distressed areas.

A second principle for the design of place-based policies is to target the communities that will benefit most from the support. Austin, Glaeser, and Summers (2019) note that spending to boost employment is more effective in areas where unemployment is high. Bartik (2020) estimates that the benefits of added jobs are at least 60 percent greater in distressed regions than in booming local economies. Designing effective place-based policies therefore requires a process of selecting which communities to target. Avoiding political influence in making such decisions will be important for a program's success and credibility.

A third common recommendation for successful place-based policies is to avoid one-size-fits-all solutions. Place-based policies can be designed so that the same measure will be applied to any eligible region; or, at the cost of additional complexity, measures can be differentiated to accommodate local conditions and the relative strengths, needs, and existing assets of individual communities. Forming partnerships with communities and catering to local circumstances may be especially important for fossil fuel communities, given their distinctive characteristics noted above. For example, ReImagine Appalachia is a think tank that has proposed a blueprint for expanding opportunities for high-quality jobs with public investments that aim to match the skills of fossil fuel workers and contribute to sustainable economic development in the region (ReImagine Appalachia 2021).

Other recommendations for successful policy design include encouraging hubs of research and development activity, including in distressed communities, to take advantage of agglomeration effects (Gruber and Johnson 2019); and directing place-based policies toward industries for which investments create larger boosts in economic activity, which are referred to as higher-multiplier industries. For example, Bartik (2020) argues that multipliers in high-technology industries are especially large because the ideas and workers of one high-tech firm boost the productivity of nearby high-tech firms (Rodrik 2014, 2020; Mast 2018). (See box 7-5.)

The Clean Energy Transition Provides Unique Opportunities to Implement Successful Place-Based Policies

Place-based policies largely have not followed the principles described above (Bartik 2020), so it is perhaps unsurprising that the empirical evidence evaluating previous attempts at place-based policies is mixed. Bartik (2020) finds evidence supportive of the potential for place-based policies to generate large long-run benefits. He points to numerous examples of successful local economic development policies, including experiences involving the Tennessee Valley Authority and the Appalachian Regional Commission. At the same time, Neumark and Simpson (2015) conclude that, though place-based policies may increase economic activity when they are in effect, it is not clear from the evidence that place-based policies typically achieve their goal of jump-starting lasting economic development.

While support for struggling communities cannot focus only on clean energy investments, there are various reasons to believe that the energy transition will provide opportunities to improve the track record of place-based policies. The first reason is scale. Climate action requires large investments in a diverse set of emerging clean energy technologies. A recent National Academies panel estimated that roughly $2 trillion in incremental capital investments needs to be mobilized over the next decade to put the United States on track to achieve the goal of net zero emissions by 2050 (National Academies 2021). Princeton University's Net Zero America report estimates the need for 0.5 to 1 million additional jobs in the U.S. energy sector in the 2020s (Larson et al. 2020).

Indeed, many clean energy investments will vastly exceed the scale of the typical place-based policies of the past. For example, the Bipartisan Infrastructure Law includes money for large-scale demonstration projects for low-carbon hydrogen production and carbon capture retrofits for large steel, cement, and chemical production (see box 7-5) (White House 2021g).

Box 7-5. The Administration's Actions on Place-Based Policies for Energy Communities

The Biden-Harris Administration has taken actions in its first year that are intended to help energy communities. On January 27, 2021, President Biden signed Executive Order 14008, which established the Interagency Working Group (IWG) on Coal and Power Plant Communities and Economic Revitalization. The IWG's initial report identifies $37.9 billion in existing Federal funding that could be used to help energy communities; so far, IWG member agencies have delivered more than $2.8 billion in direct Federal funding to 25 priority energy communities across the country.

The American Rescue Plan Act of 2021 allocates $3 billion to the Economic Development Administration (EDA) to benefit underserved communities affected by COVID-19. The EDA has allocated $300 million to support communities that are dependent on the coal industry through Build Back Better Regional Challenge grants and Economic Adjustment Assistance grants.

The Bipartisan Infrastructure Law (BIL) includes a number of place-based investment provisions for which energy communities are prioritized (see table 7-i). Over the next five years, the BIL will allocate more than $27 billion to these programs—which includes $8 billion for regional clean hydrogen hubs, $3.5 billion for regional direct air capture hubs, and $2.5 billion for carbon capture demonstration projects.

The BIL also includes programs that target support to communities in other ways, including $55 billion for clean drinking water and eliminating lead pipes, $65 billion to ensure universal access to high-quality broadband, $110 billion to repair roads and bridges, and $21 billion for cleaning up legacy pollution by reclaiming mines and plugging orphaned oil and gas wells (White House 2021f).

Table 7-i. Selected BIL Programs That Target Energy Communities

BIL Program Name	Total (thousand dollars)
Regional Clean Hydrogen Hubs	8,000,000
Regional Direct Air Capture Hubs	3,500,000
Battery Material Processing Grants	3,000,000
Battery Manufacturing and Recycling Grants	3,000,000
Carbon Capture Demonstration Projects Program	2,537,000
Carbon Storage Validation and Testing	2,500,000
Advanced Reactor Demonstration Program	2,477,000
Carbon Dioxide Transportation Infrastructure Finance and Innovation	2,100,000
Clean Hydrogen Electrolysis Program	1,000,000

Source: U.S. House of Representatives (2022).
Note: BIL = Bipartisan Infrastructure Law. This table only includes programs with at least $1 billion in funding.

Such projects can involve many millions of dollars in investments in local economies (Jones and Lawson 2021).

Though place-based policies have not historically been well targeted to individual distressed communities, the diversity of clean energy solutions provides an opportunity to tailor investments to a community's strengths and needs, including characteristics related to geography, workforce skills, education levels, and preexisting infrastructure (Bartik 2020; Tomer, Kane, and George 2021). Importantly, the employment opportunities created by the energy transition may not, absent policy intervention, arise in fossil fuel-dependent communities that often support more extractive and labor-intensive industries. Yet place-based policies can channel investment to these communities. Some are well suited for a carbon capture project, while others are better suited for projects involving wind, solar, geothermal, nuclear, or other climate solutions. In many cases, policies can leverage the existing infrastructure and workforce skills in fossil fuel-dependent communities, including measures to repurpose retired power plants or equip facilities with the ability to sequester carbon underground (Tomer, Kane, and George 2021).

The energy transition also presents a unique opportunity to implement measures that raise the quality of jobs for American workers in the energy industry. Though roughly 30 percent of the clean energy workforce will require at least a bachelor's degree, 70 percent will require fewer than four years of related work experience (Larson et al. 2020). And though some clean energy jobs are already high paying, policy measures that incentivize high-quality clean energy jobs can help to ensure that opportunities in clean industries are suitable replacements for the relatively high-paying blue-collar jobs that constitute much of the employment in fossil fuel-reliant communities (Muro et al. 2019).

Once again, the growing EV industry provides an important example. The existing auto industry presents a unique economic opportunity to build a successful domestic EV industry in many of the same locations. For instance, Ford recently announced that it is converting its Van Dyke Transmission Plant in Sterling, Michigan, into the Van Dyke Electric Powertrain Center (Ford Motor Company 2021). Though market forces alone may be sufficient to incentivize such conversions in certain instances, policy support will often be needed to encourage automakers to take advantage of opportunities to shift to EVs in the communities where they currently operate.

Finally, it is worth reemphasizing that clean energy investments often carry atypical growth potential. The world needs clean energy solutions to rapidly scale up to successfully address the risks of climate change. Though clean energy investments are not devoid of risk, the likelihood that the demand for clean products will rapidly increase in coming decades is a major advantage compared with a generic, place-based investment.

Discussion and Conclusions

This chapter has emphasized that carefully designed policies are needed to accelerate the United States' transition to a clean energy economy. The host of market failures inhibiting this transition justifies the implementation of policies that reduce the relative prices of low-carbon products, offer incentives for innovation and energy efficiency, and provide public goods and regulatory measures that effectively support the development of a clean energy economy. These policies should be designed to ensure that they help to mitigate rather than exacerbate preexisting inequities in the economy.

Policies are also needed to smooth the transition to clean energy by lessening the risks to U.S. competitiveness in global markets and by supporting vulnerable communities. The literature points to numerous principles for how government can successfully intervene to boost domestic industries by setting transparent and high-level goals, providing regulatory certainty, creating a diversified portfolio of government investments, focusing on nonmature technologies, and pursuing measures that avoid having industry stakeholders exercise undue influence on the policy process.

Governments can also make sustained commitments to supporting and diversifying fossil fuel-dependent regional and local economies, by forming partnerships with these communities for measures that fit their particular characteristics, strengths, and challenges.

Fortunately, the energy transition provides opportunities for bolstering domestic firms in emerging carbon-free industries and for economic development in the communities that are most vulnerable to the transition's risks. Taking advantage of these opportunities is at the core of the Biden-Harris Administration's economic and climate strategies.

Given the lack of an established playbook for green industrial policies and place-based policies, policymakers need to be open to experimentation and must expect failures—along with lessons learned from these failures—as necessary aspects of what will become a successful portfolio of policies and investments.

The stakes are high. Although this chapter has separated the discussion of policies that *accelerate* the transition to clean energy from policies that *smooth* it, the fates of these two policy strategies are very much intertwined. The transition to clean energy has begun, but its pace is difficult to predict. Climate policies have long faced political opposition, partly because their costs are localized and front-loaded while their benefits accrue around the entire globe and for generations into the future. Failing to smooth the transition for workers, firms, and communities could erode public support for policies that can accelerate it and, most critically, can help us avoid the ever-worsening threats to our planet as it continues to warm.

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Chapter 4

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Appendix A

Report to the President on the Activities of the Council of Economic Advisers during 2021

Letter of Transmittal

Council of Economic Advisers
Washington, December 31, 2021

Mr. President:

The Council of Economic Advisers submits this report on its activities during calendar year 2021 in accordance with the requirements of Congress, as set forth by Section 10(d) of the Employment Act of 1946, as amended by the Full Employment and Balanced Growth Act of 1978.

Sincerely yours,

Cecilia Elena Rouse
Chair

Jared Bernstein
Member

Heather Boushey
Member

Council Members and Their Dates of Service

Name	Position	Oath of office date	Separation date
Edwin G. Nourse	Chairman	August 9, 1946	November 1, 1949
Leon H. Keyserling	Vice Chairman	August 9, 1946	
	Acting Chairman	November 2, 1949	
	Chairman	May 10, 1950	January 20, 1953
John D. Clark	Member	August 9, 1946	
	Vice Chairman	May 10, 1950	February 11, 1953
Roy Blough	Member	June 29, 1950	August 20, 1952
Robert C. Turner	Member	September 8, 1952	January 20, 1953
Arthur F. Burns	Chairman	March 19, 1953	December 1, 1956
Neil H. Jacoby	Member	September 15, 1953	February 9, 1955
Walter W. Stewart	Member	December 2, 1953	April 29, 1955
Raymond J. Saulnier	Member	April 4, 1955	
	Chairman	December 3, 1956	January 20, 1961
Joseph S. Davis	Member	May 2, 1955	October 31, 1958
Paul W. McCracken	Member	December 3, 1956	January 31, 1959
Karl Brandt	Member	November 1, 1958	January 20, 1961
Henry C. Wallich	Member	May 7, 1959	January 20, 1961
Walter W. Heller	Chairman	January 29, 1961	November 15, 1964
James Tobin	Member	January 29, 1961	July 31, 1962
Kermit Gordon	Member	January 29, 1961	December 27, 1962
Gardner Ackley	Member	August 3, 1962	
	Chairman	November 16, 1964	February 15, 1968
John P. Lewis	Member	May 17, 1963	August 31, 1964
Otto Eckstein	Member	September 2, 1964	February 1, 1966
Arthur M. Okun	Member	November 16, 1964	
	Chairman	February 15, 1968	January 20, 1969
James S. Duesenberry	Member	February 2, 1966	June 30, 1968
Merton J. Peck	Member	February 15, 1968	January 20, 1969
Warren L. Smith	Member	July 1, 1968	January 20, 1969
Paul W. McCracken	Chairman	February 4, 1969	December 31, 1971
Hendrik S. Houthakker	Member	February 4, 1969	July 15, 1971
Herbert Stein	Member	February 4, 1969	
	Chairman	January 1, 1972	August 31, 1974
Ezra Solomon	Member	September 9, 1971	March 26, 1973
Marina v.N. Whitman	Member	March 13, 1972	August 15, 1973
Gary L. Seevers	Member	July 23, 1973	April 15, 1975
William J. Fellner	Member	October 31, 1973	February 25, 1975
Alan Greenspan	Chairman	September 4, 1974	January 20, 1977
Paul W. MacAvoy	Member	June 13, 1975	November 15, 1976
Burton G. Malkiel	Member	July 22, 1975	January 20, 1977
Charles L. Schultze	Chairman	January 22, 1977	January 20, 1981
William D. Nordhaus	Member	March 18, 1977	February 4, 1979
Lyle E. Gramley	Member	March 18, 1977	May 27, 1980
George C. Eads	Member	June 6, 1979	January 20, 1981
Stephen M. Goldfeld	Member	August 20, 1980	January 20, 1981
Murray L. Weidenbaum	Chairman	February 27, 1981	August 25, 1982
William A. Niskanen	Member	June 12, 1981	March 30, 1985
Jerry L. Jordan	Member	July 14, 1981	July 31, 1982

Council Members and Their Dates of Service

Name	Position	Oath of office date	Separation date
Martin Feldstein	Chairman	October 14, 1982	July 10, 1984
William Poole	Member	December 10, 1982	January 20, 1985
Beryl W. Sprinkel	Chairman	April 18, 1985	January 20, 1989
Thomas Gale Moore	Member	July 1, 1985	May 1, 1989
Michael L. Mussa	Member	August 18, 1986	September 19, 1988
Michael J. Boskin	Chairman	February 2, 1989	January 12, 1993
John B. Taylor	Member	June 9, 1989	August 2, 1991
Richard L. Schmalensee	Member	October 3, 1989	June 21, 1991
David F. Bradford	Member	November 13, 1991	January 20, 1993
Paul Wonnacott	Member	November 13, 1991	January 20, 1993
Laura D'Andrea Tyson	Chair	February 5, 1993	April 22, 1995
Alan S. Blinder	Member	July 27, 1993	June 26, 1994
Joseph E. Stiglitz	Member	July 27, 1993	
	Chairman	June 28, 1995	February 10, 1997
Martin N. Baily	Member	June 30, 1995	August 30, 1996
Alicia H. Munnell	Member	January 29, 1996	August 1, 1997
Janet L. Yellen	Chair	February 18, 1997	August 3, 1999
Jeffrey A. Frankel	Member	April 23, 1997	March 2, 1999
Rebecca M. Blank	Member	October 22, 1998	July 9, 1999
Martin N. Baily	Chairman	August 12, 1999	January 19, 2001
Robert Z. Lawrence	Member	August 12, 1999	January 12, 2001
Kathryn L. Shaw	Member	May 31, 2000	January 19, 2001
R. Glenn Hubbard	Chairman	May 11, 2001	February 28, 2003
Mark B. McClellan	Member	July 25, 2001	November 13, 2002
Randall S. Kroszner	Member	November 30, 2001	July 1, 2003
N. Gregory Mankiw	Chairman	May 29, 2003	February 18, 2005
Kristin J. Forbes	Member	November 21, 2003	June 3, 2005
Harvey S. Rosen	Member	November 21, 2003	
	Chairman	February 23, 2005	June 10, 2005
Ben S. Bernanke	Chairman	June 21, 2005	January 31, 2006
Katherine Baicker	Member	November 18, 2005	July 11, 2007
Matthew J. Slaughter	Member	November 18, 2005	March 1, 2007
Edward P. Lazear	Chairman	February 27, 2006	January 20, 2009
Donald B. Marron	Member	July 17, 2008	January 20, 2009
Christina D. Romer	Chair	January 29, 2009	September 3, 2010
Austan D. Goolsbee	Member	March 11, 2009	
	Chairman	September 10, 2010	August 5, 2011
Cecilia Elena Rouse	Member	March 11, 2009	February 28, 2011
Katharine G. Abraham	Member	April 19, 2011	April 19, 2013
Carl Shapiro	Member	April 19, 2011	May 4, 2012
Alan B. Krueger	Chairman	November 7, 2011	August 2, 2013
James H. Stock	Member	February 7, 2013	May 19, 2014
Jason Furman	Chairman	August 4, 2013	January 20, 2017
Betsey Stevenson	Member	August 6, 2013	August 7, 2015
Maurice Obstfeld	Member	July 21, 2014	August 28, 2015
Sandra E. Black	Member	August 10, 2015	January 20, 2017
Jay C. Shambaugh	Member	August 31, 2015	January 20, 2017

Council Members and Their Dates of Service

Name	Position	Oath of office date	Separation date
Kevin A. Hassett	Chairman	September 13, 2017	June 30, 2019
Richard V. Burkhauser	Member	September 28, 2017	May 18, 2019
Tomas J. Philipson	Member	August 31, 2017	
	Acting Chairman	July 1, 2019	
	Vice Chairman	July 24, 2019	June 22, 2020
Tyler B. Goodspeed	Member	May 22, 2019	
	Acting Chairman	June 23, 2020	
	Vice Chairman	June 23, 2020	January 6, 2021
Cecilia Elena Rouse	Chair	March 2, 2021	
Jared Bernstein	Member	January 20, 2021	
Heather Boushey	Member	January 20, 2021	

Report to the President on the Activities of the Council of Economic Advisers during 2021

Established by the Employment Act of 1946, the Council of Economic Advisers is charged with advising the President on economic policy based on data, research, and evidence. The Council is composed of three members: a Chair, who is appointed by the President with the advice and consent of the Senate; and two members, who are appointed by the President. Along with a team of economists, they analyze and interpret economic developments and formulate and recommend economic policies that advance the interests of the American people.

The Chair of the Council

Cecilia Elena Rouse was confirmed by the Senate on March 2, 2021, as the 30th Chair of the Council of Economic Advisers. She is the first African American to hold this position. In this role, she serves as President Biden's Chief Economist and a Member of the Cabinet. She is the Katzman-Ernst Professor in the Economics of Education and Professor of Economics and Public Affairs at Princeton University.

From 2012 to 2021, Rouse was Dean of Princeton University's School of Public and International Affairs. Rouse served as a Member of President Barack Obama's Council of Economic Advisers from 2009 to 2011. She also worked at the National Economic Council in the Clinton Administration as a Special Assistant to the President from 1998 to 1999. Her academic research has focused on the economics of education, including the economic benefits of community college attendance and impact of student loan debt on post-graduation outcomes, as well as other issues in labor economics, such as discrimination.

The Members of the Council

Jared Bernstein was appointed to the Council by the President on January 20, 2021. Before this appointment, Bernstein spent 16 years in senior roles at the Economic Policy Institute, and worked at the Department of Labor. He was a Senior Fellow at the Center on Budget and Policy Priorities from

2011 to 2020. From 2009 to 2011, he was Chief Economist and Economic Adviser to then–Vice President Biden.

Heather Boushey was appointed to the Council by the President on January 20, 2021. Before assuming this position, Boushey co-founded the Washington Center for Equitable Growth, where she was President and CEO from 2013 to 2020. She previously served as Chief Economist for Secretary Hillary Clinton's 2016 transition team and as an economist at the Center for American Progress, the Joint Economic Committee of the U.S. Congress, the Center for Economic and Policy Research, and the Economic Policy Institute.

Areas of Activity

A central function of the Council is to advise the President on all economic issues and developments. Over the past year, the priorities of the Council have included analysis on policies to spur economic growth and job creation while recovering from the global COVID-19 pandemic.

The Council works closely with officials at various government entities, including the National Economic Council, the Domestic Policy Council, the Office of Management and Budget, and Administrative Agencies to engage in discussions on numerous policy matters.

The areas on which the Council focused this year include economic stimulus and pandemic recovery; income inequality and inclusive growth; investment in resilient infrastructure and supply chains; innovation and competition, including in the labor market; inflation and unemployment; climate-related risks; and the cost of care, housing, and other household necessities.

The Council prepares almost-daily memos for the President, the Vice President, and White House senior staff on key economic data releases and policy issues.

The Council, the Department of Treasury, and the Office of Management and Budget—the Administration's economic "troika"—are responsible for producing the economic forecasts that underlie the Administration's budget proposals. The Council initiates the forecasting process twice each year, consulting with an array of outside sources, including leading private sector forecasters and other government agencies. The Council provides analysis and opinions on a range of trade-related issues involving the enforcement of existing trade agreements and the analysis of proposed trade policies.

The Council is a leading participant in the Organization for Economic Cooperation and Development (OECD), an important forum for economic cooperation among high-income industrial economies. The Council chairs the Economic Policy Committee, coordinating—including the Departments of Commerce, State, Treasury, and Labor, as well as the Office of

Management and Budget—to provide information for the OECD's review of the U.S. economy. Council Members and staff economists participate in working meetings on macroeconomic policy and contribute to the OECD's research agenda.

The Council produces economic analyses in a series of blogs and issue briefs. This past year, these included:

- An issue brief on how the economic stimulus of the American Rescue Plan (ARP) could help launch an equitable pandemic recovery (February 2021).
- A blog assessing the pandemic's effect on wage growth, employment, and prices, outlining the role of composition and base effects in wage volatility (April 2021).
- A blog describing the economic downturn caused by the COVID-19 pandemic and the potential for higher inflation driven by base effects, supply chain disruptions, and pent-up service demand (April 2021).
- A blog on how government support during the pandemic helped boost personal income and spending, thus contributing to economic growth (April 2021).
- An issue brief on the barriers that inhibit private sector investment in clean energy innovation and the importance of public-private partnerships (April 2021).
- An issue brief on the role of public sector investment in promoting sustained and equitable economic growth, highlighting the importance of investing in innovation, social programs, and physical and human infrastructure (May 2021).
- A blog outlining how supports that meet the needs of workers' families—such as affordable, high-quality childcare, home health care, and paid family and medical leave—can increase the U.S. labor supply and boost economic growth (May 2021).
- A blog describing pandemic-borne supply chain disruptions, ways in which supply chains have adjusted to disruptions in the past, and possible solutions (May 2021).
- A blog on the harm of exclusionary zoning laws and the potential of proposed policies to address persistent inequities in the housing market (June 2021).
- A blog on data volatility and the need to examine trends and a wide range of indicators rather than data from any single month or source

(June 2021).

- An issue brief on the effects of earlier Medicaid expansions on qualifying individuals' insurance coverage, health, food and housing security, financial well-being, and the like (June 2021).
- A blog outlining how additional Federal aid in the form of stimulus checks and supplemental Unemployment Insurance benefits was followed by marked improvements in food insecurity among households facing financial hardship (July 2021).
- A blog that examines historical parallels during periods of heightened inflation (July 2021).
- A blog on the importance of product and labor market competition in the American economy (July 2021).
- A blog on the importance of voting rights to secure economic well-being (August 2021).
- A blog on how the President's proposed policies can reduce inflationary pressure and increase economic capacity through long-term investments in physical infrastructure, human capital, clean energy, housing, and health care (August 2021).
- An issue brief, cowritten with the Office of Management and Budget (OMB), laying out how the rising prices of necessities—such as prescription drugs, childcare, and education—has have made an impact on U.S. families' budgets (August 2021).
- A blog on price increases and supply constraints in the housing market (September 2021).
- A blog on the relationship between rent, housing prices, and measured inflation (September 2021).
- A blog, cowritten with OMB, on estimating the average Federal individual income tax rate paid by America's 400 wealthiest families (September 2021).
- A blog on how the President's policy proposals can reduce greenhouse gas emissions while keeping energy costs low for consumers (September 2021).
- A blog on the economic benefits of extending permanent legal status to unauthorized immigrants (September 2021).
- A blog on the debt ceiling and the services that would be affected should

Congress not vote to raise the debt limit (October 2021).

- An issue brief on the economic benefits of investing in modern, climate-resilient physical infrastructure and the risks that continued disinvestment pose to the nation's economy (November 2021).
- An issue brief on the importance of incorporating climate change into the economic projections that underlie assessments of financial risk and government finances (November 2021).
- An issue brief analyzing disaggregated data provided by the U.S. Small Business Administration as a way for the Federal government to review its current procurement practices (December 2021).
- A monthly publication of Economic Indicators (January–December 2021).
- A monthly blog analyzing the employment situation to correspond to the monthly Jobs Report (January–December 2021).

The Council also contributed to the public's understanding of economic issues and the Administration's policies through briefings and interviews with the economic and financial press, speeches, discussions with outside economists, Congressional testimony, and regular updates on major data releases. The Chair and Members also regularly met to exchange views on the economy with the Chair and Members of the Board of Governors of the Federal Reserve System.

Public Information

The *Economic Report of the President*, together with the Annual Report of the Council of Economic Advisers, is an important vehicle for presenting the Administration's domestic and international economic policies. It is available for purchase through the Government Publishing Office, and is viewable at no cost at www.gpo.gov/erp. All the Council's written materials noted above can be found at www.whitehouse.gov/cea.

The Staff of the Council of Economic Advisers

Front Office

Elisabeth Hirschhorn Donahue	Chief of Staff & General Counsel
Martha Gimbel	Senior Adviser
Saharra Griffin	Special Assistant to the Chair
Abaigeal O'Shea	Special Assistant to the Members
Zehra Khan	Communications Specialist

Senior Economists

Lisa Barrow	Education, Labor
Steven Braun	Director of Macroeconomic Forecasting
Nathan Converse	Macroeconomics, International Finance
Gopi Shah Goda	Health, Long-term Care, Social Insurance
Kari Heerman	International Trade
Susan Helper	Supply Chains, Manufacturing
Damon Jones	Social Insurance, Inequality, Racial Equity
Noah Kaufman	Climate
Helen Knudsen	Industrial Organization, Small Business, Health
Greg Leiserson	Tax, Regulation
Kevin Rinz	Education, Labor
Ernie Tedeschi	Macroeconomics
Laura Tiehen	Poverty, Rural Issues
Jeffery Zhang	Macroeconomics, Finance, Housing

National Security Economist

Meghan Greene	Senior Adviser for National Security

Staff Economists

R. Daniel Bressler	Climate
Elliot Charette	Macroeconomics, Trade, Finance
Ryan Cummings	Macroeconomics, Finance, Energy
Brandon Enriquez	Climate, Rural Issues
Victoria Lee	Education, Labor
Lindsey Raymond	Industrial Organization, Supply Chains, Innovation
Evan Soltas	Education, Labor

Research Assistants

Bradley Clark . . . . Climate, Finance, Housing
Matthew Maury . . . . Climate, Finance, Housing
Stephen Nyarko . . . . Health, Supply Chains, Small Business
Anna Pasnau . . . . Climate, Social Insurance, Inequality, Infrastructure
Sarah Robinson . . . . Macroeconomics
Safia Sayed . . . . Tax, Regulation, Social Insurance
Sarah Wheaton . . . . Education, Labor

Statistical Office

Brian Amorosi. . . . . Director of Statistical Office

Administrative Office

Megan Packer . . . . Director of Finance and Administration

Interns

Malhaar Agrawal, Umang Bansal, Prosser Cathey, Aditya Dhar, Jay Philbrick, Dylan Saez, and Shoshana Singer

ERP Production

Alfred Imhoff . . . . Editor
Susan Kellam . . . . Editor

Appendix B

Statistical Tables Relating to Income, Employment, and Production

Contents

Labor Market Indicators

Production and Business Activity

Prices

Money Stock, Credit, and Finance

Government Finance

Corporate Profits and Finance

International Statistics

General Notes

Detail in these tables may not add to totals due to rounding.

Because of the formula used for calculating real gross domestic product (GDP), the chained (2012) dollar estimates for the detailed components do not add to the chained-dollar value of GDP or to any intermediate aggregate. The Department of Commerce (Bureau of Economic Analysis) no longer publishes chained-dollar estimates prior to 2002, except for selected series.

Because of the method used for seasonal adjustment, the sum or average of seasonally adjusted monthly values generally will not equal annual totals based on unadjusted values.

Unless otherwise noted, all dollar figures are in current dollars.

Symbols used:

p Preliminary.
... Not available (also, not applicable).
NSA Not seasonally adjusted.

Data in these tables reflect revisions made by source agencies through March 8, 2022.

Excel versions of these tables are available at www.gpo.gov/erp.

TABLE B–1. Percent changes in real gross domestic product, 1971–2021

[Percent change, fourth quarter over fourth quarter; quarterly changes at seasonally adjusted annual rates]

Year or quarter	Gross domestic product	Personal consumption expenditures			Gross private domestic investment							
						Fixed investment						Change in private inventories
							Nonresidential				Residential	
		Total	Goods	Services	Total	Total	Total	Structures	Equipment	Intellectual property products		
1971	4.4	5.4	6.6	4.3	13.1	10.5	4.7	–1.1	8.5	4.8	25.2	....
1972	6.9	7.3	8.5	6.2	15.0	12.0	11.5	5.1	17.0	6.2	12.9	....
1973	4.0	1.8	.4	3.2	10.2	3.5	10.6	7.9	13.5	5.1	–10.5	....
1974	–1.9	–1.6	–5.6	2.4	–10.4	–9.9	–3.9	–6.4	–3.7	1.6	–24.6	....
1975	2.6	5.1	6.1	4.1	–9.8	–2.6	–5.9	–8.1	–6.7	2.8	7.8	....
1976	4.3	5.4	6.4	4.5	15.2	12.1	7.8	3.8	9.0	11.8	23.8	....
1977	5.0	4.2	4.9	3.7	14.9	12.1	11.9	5.7	17.2	4.8	12.6	....
1978	6.7	4.0	3.5	4.4	14.3	13.1	16.0	21.7	14.5	10.3	6.8	....
1979	1.3	1.7	.3	2.9	–3.4	1.1	5.5	8.8	2.7	9.4	–9.1	....
1980	.0	.0	–2.5	2.2	–7.2	–4.8	–.9	2.7	–4.4	4.7	–15.3	....
1981	1.3	.1	–.2	.3	6.7	1.5	9.0	14.1	4.6	12.1	–22.0	....
1982	–1.4	3.5	3.6	3.4	–17.3	–8.0	–9.5	–13.5	–10.0	3.4	–1.7	....
1983	7.9	6.6	8.3	5.3	31.3	18.3	10.4	–3.9	19.9	13.0	49.7	....
1984	5.6	4.3	5.3	3.6	14.2	11.3	13.9	15.7	13.4	12.6	3.7	....
1985	4.2	4.8	4.6	5.0	1.9	3.7	3.2	3.3	1.7	7.7	5.2	....
1986	2.9	4.4	6.5	3.0	–4.1	.6	–3.2	–14.3	.8	5.4	11.8	....
1987	4.5	2.8	.4	4.6	9.8	1.5	2.2	4.9	.1	4.2	–.5	....
1988	3.8	4.6	4.5	4.7	–.5	3.7	5.1	–3.3	8.2	9.8	.1	....
1989	2.7	2.4	1.8	2.7	.7	1.5	4.5	3.3	2.5	11.3	–6.5	....
1990	.6	.8	–1.6	2.3	–6.5	–4.2	–.9	–3.2	–2.7	6.2	–13.6	....
1991	1.2	.9	–.8	2.0	2.1	–1.9	–3.4	–12.8	–3.2	7.2	2.9	....
1992	4.4	4.9	5.3	4.7	7.7	8.7	7.1	1.0	11.3	4.8	13.6	....
1993	2.6	3.3	4.4	2.7	7.6	8.4	7.6	.2	13.1	2.9	10.6	....
1994	4.1	3.8	5.5	2.8	11.5	6.6	8.5	1.6	12.5	5.8	1.6	....
1995	2.2	2.8	2.3	3.0	.8	5.5	7.4	4.7	8.1	8.3	.1	....
1996	4.4	3.4	4.8	2.7	11.2	9.9	11.3	10.9	11.1	12.1	5.6	....
1997	4.5	4.5	5.3	4.0	11.4	8.3	9.7	4.4	10.7	12.4	4.0	....
1998	4.9	5.6	8.1	4.3	9.7	11.5	11.6	4.3	14.8	11.5	11.3	....
1999	4.8	5.2	6.6	4.5	8.5	7.2	8.4	–.1	9.5	13.3	3.5	....
2000	2.9	4.3	4.0	4.5	4.3	5.9	8.5	10.8	8.5	6.6	–1.5	....
2001	.2	2.5	4.9	1.3	–11.1	–4.7	–6.8	–10.6	–7.7	–2.1	2.0	....
2002	2.0	2.0	1.7	2.1	4.4	–1.5	–5.1	–15.7	–3.7	.9	8.1	....
2003	4.3	3.8	6.6	2.3	8.7	8.6	6.8	1.9	9.6	5.8	12.7	....
2004	3.4	3.8	4.3	3.6	8.0	6.5	6.5	.3	9.8	5.7	6.6	....
2005	3.0	2.8	3.0	2.7	6.1	5.8	6.1	1.5	8.7	5.1	5.2	....
2006	2.6	3.2	4.6	2.5	–1.5	.0	8.1	9.0	7.1	9.3	–15.2	....
2007	2.2	2.0	1.8	2.0	–1.8	–1.1	7.3	17.7	3.9	4.0	–21.2	....
2008	–2.5	–1.5	–6.8	1.2	–15.3	–11.1	–7.0	–.8	–15.9	.9	–24.7	....
2009	.1	–.2	.6	–.6	–9.2	–10.5	–10.3	–27.1	–8.4	3.8	–11.5	....
2010	2.8	2.8	4.3	2.1	12.1	6.1	8.9	–3.6	22.6	1.6	–5.7	....
2011	1.5	1.0	.9	1.0	10.4	9.2	10.0	8.6	12.7	7.2	5.3	....
2012	1.6	1.5	2.4	1.1	4.0	7.2	5.6	4.0	7.8	3.7	15.4	....
2013	2.5	1.9	3.5	1.1	9.3	5.7	5.4	6.7	5.4	4.5	7.1	....
2014	2.6	3.5	5.0	2.7	5.3	7.0	6.9	9.3	5.6	6.9	7.7	....
2015	1.9	2.6	3.8	2.1	2.3	1.7	–.1	–7.3	1.5	3.3	9.2	....
2016	2.0	2.3	3.4	1.8	1.8	2.8	2.5	3.6	–2.2	8.4	4.0	....
2017	2.7	2.8	5.1	1.8	4.2	4.7	4.7	.0	6.4	5.8	4.5	....
2018	2.3	2.6	2.7	2.5	5.2	3.8	6.1	1.8	6.0	9.2	–3.9	....
2019	2.6	2.3	3.7	1.6	.8	2.9	3.1	5.8	–.9	6.3	2.2	....
2020	–2.3	–2.4	7.7	–6.9	2.4	.5	–3.8	–20.0	–.3	2.5	15.7	....
2021 p	5.6	7.0	7.4	6.9	8.9	4.4	6.6	–2.9	6.3	11.9	–1.7	....
2018: I	3.1	2.4	1.4	2.9	8.5	6.7	10.2	20.2	5.6	9.6	–4.2	....
II	3.4	3.5	4.2	3.1	.7	6.0	6.8	7.1	3.0	11.6	3.3	....
III	1.9	2.7	2.9	2.6	9.7	.8	2.8	–4.2	5.4	4.6	–5.8	....
IV	.9	1.7	2.1	1.5	2.2	1.8	4.8	–12.8	10.3	11.0	–8.3	....
2019: I	2.4	.6	1.3	.3	6.4	3.7	4.7	4.4	4.4	5.4	.1	....
II	3.2	3.6	7.0	2.0	2.6	6.1	6.7	14.3	2.5	7.2	4.1	....
III	2.8	3.2	4.9	2.4	1.1	3.1	2.9	14.0	–5.1	6.0	3.6	....
IV	1.9	1.7	1.8	1.7	–6.5	–1.1	–1.7	–8.0	–4.9	6.7	1.1	....
2020: I	–5.1	–6.9	.3	–10.0	–5.3	–2.3	–8.1	–.9	–21.3	3.8	20.4	....
II	–31.2	–33.4	–10.0	–42.4	–48.8	–30.4	–30.3	–46.8	–36.2	–10.6	–30.7	....
III	33.8	41.4	49.5	37.5	82.1	27.5	18.7	–15.3	55.9	8.1	59.9	....
IV	4.5	3.4	–.3	5.3	24.7	17.7	12.5	–8.2	26.4	10.2	34.4	....
2021: I	6.3	11.4	27.4	3.9	–2.3	13.0	12.9	5.4	14.1	15.6	13.3	....
II	6.7	12.0	13.0	11.5	–3.9	3.3	9.2	–3.0	12.1	12.5	–11.7	....
III	2.3	2.0	–8.8	8.2	12.4	–.9	1.7	–4.1	–2.3	9.1	–7.7	....
IV p	7.0	3.1	1.5	3.9	33.5	2.6	3.1	–9.4	2.4	10.6	1.0	....

See next page for continuation of table.

TABLE B–1. Percent changes in real gross domestic product, 1971–2021—*Continued*

[Percent change, fourth quarter over fourth quarter; quarterly changes at seasonally adjusted annual rates]

Year or quarter	Net exports of goods and services			Government consumption expenditures and gross investment					Final sales of domestic product	Gross domestic purchases [1]	Final sales to private domestic purchasers [2]	Gross domestic income (GDI) [3]	Average of GDP and GDI
	Net exports	Exports	Imports	Total	Federal			State and local					
					Total	National defense	Non-defense						
1971	....	–4.5	1.3	–2.4	–7.3	–11.5	5.6	2.8	4.0	4.7	6.5	4.8	4.6
1972	....	19.5	17.9	–.1	–2.6	–5.8	6.1	2.3	6.4	6.8	8.3	7.1	7.0
1973	....	18.4	–.5	–.3	–3.6	–5.0	–.3	2.9	2.8	2.8	2.2	3.8	3.9
1974	....	3.1	–1.0	3.0	3.7	1.2	9.5	2.4	–1.7	–2.3	–3.5	–2.9	–2.4
1975	....	1.6	–5.6	3.0	.8	.5	1.4	4.9	3.9	2.0	3.4	2.7	2.6
1976	....	4.3	19.2	–1.3	–1.0	–2.1	1.3	–1.6	3.8	5.4	6.7	3.8	4.1
1977	....	–1.4	5.7	1.9	2.3	.1	6.8	1.7	4.5	5.6	5.9	6.0	5.5
1978	....	18.8	9.9	4.4	3.5	2.9	4.8	5.2	6.4	6.0	6.1	5.4	6.0
1979	....	10.5	.9	.9	1.2	2.4	–1.1	.7	2.2	.5	1.5	.8	1.0
1980	....	3.9	–9.3	.3	4.0	3.7	4.6	–2.9	.4	–1.4	–1.2	1.3	.6
1981	....	.7	6.2	2.5	6.0	7.9	2.0	–.7	.3	1.8	.4	1.2	1.2
1982	....	–12.2	–3.9	2.6	4.5	7.3	–1.6	.8	.4	–.7	.8	–1.3	–1.3
1983	....	5.5	24.6	1.9	2.7	6.5	–6.6	1.1	6.0	9.5	9.1	6.6	7.3
1984	....	9.1	18.9	6.3	7.1	5.6	11.5	5.4	5.0	6.5	5.9	6.7	6.1
1985	....	1.5	5.6	6.1	6.7	8.2	2.8	5.5	4.6	4.5	4.6	3.4	3.8
1986	....	10.6	7.9	4.7	5.3	4.7	6.8	4.1	3.9	2.9	3.5	2.7	2.8
1987	....	12.8	6.3	3.0	3.6	5.3	–1.0	2.4	3.0	4.1	2.5	5.5	5.0
1988	....	14.0	3.8	1.4	–1.4	–.8	–3.0	4.1	4.6	3.0	4.4	4.7	4.2
1989	....	10.2	2.6	2.5	.5	–1.3	5.8	4.3	2.9	2.1	2.2	1.0	1.9
1990	....	7.4	–.2	2.6	1.5	.0	5.4	3.6	1.0	–.1	–.3	1.0	.8
1991	....	9.2	5.7	.0	–2.3	–4.9	4.3	1.9	.5	.9	.3	.7	.9
1992	....	4.5	6.5	1.3	1.6	–.4	6.2	1.1	4.5	4.6	5.6	3.9	4.1
1993	....	4.4	9.9	–.7	–4.5	–5.4	–2.5	2.2	2.7	3.2	4.3	3.0	2.8
1994	....	10.8	12.2	.0	–4.2	–6.7	1.1	3.1	3.3	4.3	4.4	4.3	4.2
1995	....	9.4	4.8	–.6	–4.8	–5.0	–4.3	2.2	3.0	1.8	3.3	2.9	2.6
1996	....	10.1	11.1	2.6	1.1	.3	2.6	3.6	4.2	4.6	4.8	4.8	4.6
1997	....	8.3	14.2	1.7	.2	–.8	1.9	2.7	3.9	5.2	5.3	5.5	5.0
1998	....	2.6	11.0	2.8	–.3	–2.4	3.3	4.6	5.2	5.9	6.9	4.9	4.9
1999	....	6.2	12.4	3.9	3.3	3.9	2.4	4.2	4.6	5.6	5.7	4.4	4.6
2000	....	6.0	11.1	.5	–1.9	–3.3	.4	1.8	3.2	3.7	4.7	3.6	3.2
2001	....	–12.2	–7.6	4.9	5.5	4.7	6.8	4.6	1.5	.4	.9	–.4	–.1
2002	....	4.0	9.6	3.8	8.1	8.1	8.2	1.5	.9	2.7	1.3	3.2	2.6
2003	....	7.2	5.9	1.8	6.5	8.9	2.6	–.8	4.3	4.2	4.8	2.7	3.5
2004	....	7.2	10.9	.9	2.6	2.8	2.3	–.2	3.1	4.0	4.4	3.8	3.6
2005	....	7.4	6.1	.9	1.8	1.8	1.9	.3	2.9	3.0	3.4	4.2	3.6
2006	....	9.9	4.0	1.9	2.4	3.1	1.3	1.6	2.9	2.1	2.5	2.5	2.6
2007	....	9.2	1.6	2.3	3.6	3.9	3.1	1.5	2.3	1.3	1.3	–.3	.9
2008	....	–2.0	–5.4	2.6	6.4	7.4	4.5	.3	–1.8	–3.1	–3.5	–2.6	–2.6
2009	....	1.4	–5.1	3.1	6.2	4.9	8.9	1.1	–.2	–.9	–2.1	.6	.3
2010	....	10.6	11.5	–1.5	1.8	1.3	2.7	–3.7	2.0	3.2	3.4	3.3	3.1
2011	....	4.7	3.3	–3.4	–3.6	–3.6	–3.5	–3.2	1.3	1.4	2.4	2.0	1.8
2012	....	3.0	.5	–2.1	–2.6	–4.7	1.2	–1.7	2.0	1.2	2.5	3.1	2.3
2013	....	5.2	2.9	–2.4	–6.1	–6.5	–5.4	.2	1.9	2.2	2.6	1.3	1.9
2014	....	2.4	6.5	.3	–1.0	–3.4	2.8	1.2	2.8	3.2	4.2	4.0	3.3
2015	....	–1.5	3.3	2.2	1.2	–.4	3.7	2.8	1.8	2.5	2.5	1.2	1.5
2016	....	1.3	2.2	1.6	.1	–.6	1.1	2.5	2.2	2.1	2.4	1.2	1.6
2017	....	5.9	5.1	.7	1.3	2.2	.0	.4	2.8	2.7	3.2	2.9	2.8
2018	....	.2	3.4	1.0	3.0	4.2	1.4	–.3	2.1	2.7	2.8	2.9	2.6
2019	....	.3	–2.0	3.2	4.3	5.0	3.4	2.5	2.9	2.2	2.4	1.8	2.2
2020	....	–10.7	.3	1.2	3.1	2.3	4.4	.0	–2.6	–1.0	–1.8	–.2	–1.2
2021 p	....	5.2	9.6	.1	–1.1	–3.7	2.7	.9	4.7	6.1	6.5	....	....
2018: I	....	1.8	2.6	.9	1.8	–1.2	6.3	.3	2.8	3.2	3.3	4.0	3.6
II	....	5.0	1.4	2.8	5.1	7.9	1.1	1.5	4.3	2.9	4.0	.8	2.1
III	....	–6.1	5.9	1.0	3.4	3.5	3.4	–.5	.4	3.5	2.3	5.1	3.5
IV	....	.5	3.9	–.8	1.9	6.8	–5.0	–2.4	.8	1.4	1.7	1.5	1.2
2019: I	....	3.1	.0	2.7	1.4	5.2	–3.9	3.5	1.9	2.0	1.2	2.3	2.3
II	....	–2.2	1.7	5.0	8.9	4.2	16.2	2.7	3.8	3.6	4.1	.8	2.0
III	....	–.8	–1.1	2.1	3.6	4.5	2.2	1.1	3.1	2.6	3.2	.9	1.9
IV	....	1.2	–8.5	3.0	3.5	6.0	.0	2.7	2.9	.5	1.1	3.0	2.4
2020: I	....	–16.3	–13.1	3.7	2.4	–.7	7.4	4.4	–4.6	–4.9	–6.0	–.8	–3.0
II	....	–59.9	–53.1	3.9	20.6	3.2	50.1	–5.5	–27.6	–30.8	–32.8	–32.7	–32.0
III	....	54.5	89.2	–2.1	–5.4	1.7	–14.3	.1	25.9	37.8	38.4	24.4	29.0
IV	....	22.5	31.3	–.5	–3.1	5.3	–14.1	1.2	3.4	6.1	6.2	19.6	11.9
2021: I	....	–2.9	9.3	4.2	11.3	–5.8	40.8	–.1	9.1	7.7	11.8	6.3	6.3
II	....	7.6	7.1	–2.0	–5.3	–1.1	–10.7	.2	8.1	6.7	10.1	4.3	5.5
III	....	–5.3	4.7	.9	–5.1	–1.7	–9.5	4.9	.1	3.5	1.4	6.4	4.3
IV p	....	23.6	17.6	–2.6	–4.5	–6.1	–2.2	–1.4	2.0	6.8	3.0	....	....

[1] Gross domestic product (GDP) less exports of goods and services plus imports of goods and services.
[2] Personal consumption expenditures plus gross private fixed investment.
[3] Gross domestic income is deflated by the implicit price deflator for GDP.

Note: Percent changes based on unrounded GDP quantity indexes.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–2. Contributions to percent change in real gross domestic product, 1971–2021

[Percentage points, except as noted; annual average to annual average, quarterly data at seasonally adjusted annual rates]

Year or quarter	Gross domestic product (percent change)	Personal consumption expenditures: Total	Personal consumption expenditures: Goods	Personal consumption expenditures: Services	Gross private domestic investment: Total	Fixed investment: Total	Nonresidential: Total	Nonresidential: Structures	Nonresidential: Equipment	Nonresidential: Intellectual property products	Residential	Change in private inventories
1971	3.3	2.29	1.23	1.06	1.63	1.08	–0.01	–0.06	0.05	0.01	1.08	0.56
1972	5.3	3.66	1.90	1.76	1.90	1.85	.97	.12	.75	.11	.87	.06
1973	5.6	2.97	1.52	1.45	1.95	1.47	1.51	.30	1.12	.08	–.04	.48
1974	–.5	–.50	–1.08	.58	–1.24	–.98	.10	–.08	.14	.05	–1.08	–.26
1975	–.2	1.36	.20	1.16	–2.91	–1.68	–1.13	–.42	–.73	.01	–.54	–1.24
1976	5.4	3.41	2.03	1.38	2.91	1.54	.66	.09	.39	.18	.88	1.37
1977	4.6	2.59	1.26	1.33	2.47	2.23	1.26	.15	1.01	.11	.97	.24
1978	5.5	2.68	1.19	1.49	2.22	2.10	1.72	.52	1.08	.12	.38	.12
1979	3.2	1.44	.45	.99	.72	1.11	1.34	.51	.62	.20	–.22	–.40
1980	–.3	–.19	–.72	.53	–2.07	–1.18	.00	.26	–.35	.09	–1.19	–.89
1981	2.5	.85	.33	.52	1.64	.50	.87	.39	.28	.21	–.37	1.13
1982	–1.8	.88	.19	.69	–2.46	–1.16	–.43	–.09	–.47	.12	–.72	–1.31
1983	4.6	3.51	1.69	1.82	1.60	1.32	–.06	–.56	.32	.17	1.38	.28
1984	7.2	3.30	1.91	1.39	4.73	2.83	2.18	.58	1.29	.30	.65	1.90
1985	4.2	3.20	1.38	1.83	–.01	1.02	.91	.31	.39	.21	.11	–1.03
1986	3.5	2.58	1.45	1.13	.03	.34	–.24	–.49	.08	.17	.58	–.31
1987	3.5	2.15	.47	1.67	.53	.11	.01	–.11	.03	.10	.10	.41
1988	4.2	2.65	.96	1.69	.45	.59	.63	.02	.43	.18	–.05	–.13
1989	3.7	1.86	.64	1.21	.72	.55	.71	.07	.35	.29	–.16	.17
1990	1.9	1.28	.16	1.12	–.45	–.25	.14	.05	–.14	.22	–.38	–.21
1991	–.1	.12	–.49	.61	–1.09	–.84	–.48	–.38	–.28	.18	–.35	–.26
1992	3.5	2.36	.76	1.60	1.11	.83	.33	–.18	.34	.17	.49	.28
1993	2.8	2.24	.99	1.26	1.24	1.17	.84	–.01	.73	.12	.32	.07
1994	4.0	2.51	1.26	1.26	1.90	1.29	.91	.05	.75	.11	.38	.61
1995	2.7	1.91	.71	1.20	.55	.99	1.15	.16	.78	.20	–.15	–.44
1996	3.8	2.26	1.06	1.20	1.49	1.48	1.13	.15	.65	.33	.35	.02
1997	4.4	2.45	1.12	1.33	2.01	1.49	1.38	.21	.76	.41	.11	.52
1998	4.5	3.42	1.54	1.88	1.76	1.82	1.44	.16	.91	.37	.38	–.07
1999	4.8	3.49	1.83	1.66	1.62	1.65	1.36	.01	.89	.45	.29	–.03
2000	4.1	3.29	1.23	2.06	1.31	1.34	1.31	.24	.71	.36	.03	–.03
2001	1.0	1.63	.72	.92	–1.11	–.27	–.31	–.04	–.31	.04	.04	–.84
2002	1.7	1.70	.92	.78	–.16	–.64	–.94	–.56	–.35	–.03	.29	.48
2003	2.8	2.13	1.15	.98	.76	.77	.30	–.09	.26	.14	.47	–.02
2004	3.9	2.54	1.21	1.34	1.64	1.23	.67	.00	.49	.18	.57	.41
2005	3.5	2.38	.98	1.40	1.26	1.33	.92	.06	.60	.26	.41	–.07
2006	2.8	1.95	.87	1.08	.60	.50	1.00	.22	.57	.21	–.50	.10
2007	2.0	1.63	.65	.98	–.48	–.24	.89	.42	.25	.23	–1.13	–.25
2008	.1	.10	–.71	.81	–1.52	–1.05	.08	.23	–.29	.14	–1.14	–.46
2009	–2.6	–.88	–.70	–.18	–3.51	–2.69	–1.95	–.71	–1.21	–.02	–.74	–.82
2010	2.7	1.31	.62	.68	1.85	.43	.52	–.50	.91	.11	–.08	1.42
2011	1.5	1.16	.49	.68	.94	.99	.99	.07	.69	.24	.00	–.05
2012	2.3	.94	.48	.46	1.64	1.47	1.16	.34	.62	.20	.31	.17
2013	1.8	1.01	.70	.31	1.10	.87	.53	.04	.28	.22	.33	.23
2014	2.3	1.82	.89	.93	.95	1.06	.95	.33	.42	.20	.12	–.12
2015	2.7	2.20	1.03	1.18	.95	.64	.32	–.03	.19	.16	.33	.31
2016	1.7	1.67	.73	.94	–.18	.35	.12	–.14	–.11	.37	.23	–.53
2017	2.3	1.65	.82	.83	.68	.69	.53	.13	.16	.25	.15	–.01
2018	2.9	1.96	.84	1.13	.98	.82	.85	.12	.36	.36	–.02	.16
2019	2.3	1.48	.71	.78	.60	.55	.59	.06	.19	.33	–.04	.05
2020	–3.4	–2.55	.96	–3.52	–.99	–.47	–.73	–.39	–.48	.14	.26	–.52
2021 p	5.7	5.30	2.70	2.60	1.69	1.37	.98	–.23	.69	.52	.39	.32
2018: I	3.1	1.64	.30	1.34	1.45	1.14	1.31	.57	.32	.42	–.17	.31
II	3.4	2.34	.89	1.45	.14	1.03	.90	.22	.18	.51	.13	–.89
III	1.9	1.79	.61	1.18	1.64	.15	.38	–.13	.31	.21	–.24	1.50
IV	.9	1.16	.44	.72	.39	.31	.65	–.42	.57	.49	–.34	.08
2019: I	2.4	.43	.29	.14	1.13	.64	.63	.13	.25	.25	.00	.49
II	3.2	2.37	1.42	.95	.48	1.06	.90	.42	.15	.34	.15	–.57
III	2.8	2.12	.99	1.13	.22	.54	.40	.42	–.31	.29	.14	–.32
IV	1.9	1.13	.35	.77	–1.18	–.19	–.23	–.26	–.29	.32	.04	–.99
2020: I	–5.1	–4.79	.04	–4.83	–.92	–.41	–1.14	–.02	–1.30	.18	.73	–.51
II	–31.2	–24.10	–1.89	–22.21	–9.64	–5.63	–4.28	–1.77	–1.99	–.51	–1.36	–4.01
III	33.8	25.51	9.92	15.59	11.71	4.88	2.72	–.46	2.73	.45	2.16	6.84
IV	4.5	2.26	–.07	2.34	4.01	2.92	1.57	–.22	1.29	.50	1.34	1.10
2021: I	6.3	7.44	5.69	1.75	–.37	2.25	1.65	.14	.75	.76	.60	–2.62
II	6.7	7.92	2.99	4.93	–.65	.61	1.21	–.08	.66	.62	–.60	–1.26
III	2.3	1.35	–2.21	3.57	2.05	–.16	.22	–.11	–.13	.46	–.38	2.20
IV p	7.0	2.13	.36	1.76	5.38	.48	.43	–.25	.14	.53	.05	4.90

See next page for continuation of table.

Table B–2. Contributions to percent change in real gross domestic product, 1971–2021—*Continued*

[Percentage points, except as noted; annual average to annual average, quarterly data at seasonally adjusted annual rates]

Year or quarter	Net exports of goods and services							Government consumption expenditures and gross investment					Final sales of domestic product
	Net exports	Exports			Imports			Total	Federal			State and local	
		Total	Goods	Services	Total	Goods	Services		Total	National defense	Non-defense		
1971	–0.18	0.10	0.00	0.10	–0.28	–0.32	0.04	–0.45	–0.80	–0.97	0.17	0.35	2.74
1972	–.19	.42	.43	–.01	–.61	–.55	–.06	–.12	–.37	–.60	.22	.25	5.20
1973	.80	1.08	1.05	.02	–.28	–.33	.05	–.07	–.39	–.40	.01	.32	5.16
1974	.73	.56	.49	.08	.17	.17	.00	.47	.06	–.07	.14	.41	–.28
1975	.86	–.05	–.14	.09	.91	.85	.06	.49	.05	–.07	.13	.43	1.03
1976	–1.05	.36	.34	.02	–1.41	–1.31	–.10	.12	.01	–.04	.06	.10	4.01
1977	–.70	.19	.12	.07	–.89	–.82	–.07	.26	.21	.06	.15	.05	4.38
1978	.05	.80	.64	.17	–.76	–.66	–.10	.60	.23	.04	.19	.37	5.42
1979	.64	.80	.69	.11	–.16	–.13	–.02	.36	.20	.15	.05	.16	3.56
1980	1.64	.95	.88	.07	.69	.66	.03	.36	.38	.22	.16	–.02	.63
1981	–.15	.12	–.05	.17	–.26	–.18	–.09	.20	.43	.40	.03	–.23	1.41
1982	–.59	–.71	–.63	–.08	.12	.20	–.08	.37	.35	.47	–.11	.01	–.50
1983	–1.32	–.22	–.21	.00	–1.10	–.98	–.12	.79	.65	.51	.14	.14	4.31
1984	–1.54	.61	.41	.20	–2.16	–1.78	–.38	.74	.33	.38	–.04	.41	5.34
1985	–.39	.24	.20	.05	–.63	–.50	–.13	1.37	.78	.62	.16	.59	5.20
1986	–.29	.53	.27	.25	–.82	–.80	–.02	1.14	.61	.52	.09	.53	3.77
1987	.17	.77	.62	.15	–.60	–.39	–.21	.62	.38	.38	.01	.24	3.05
1988	.81	1.23	.99	.24	–.41	–.35	–.07	.26	–.15	–.04	–.12	.42	4.31
1989	.51	.97	.72	.26	–.46	–.37	–.09	.58	.15	–.02	.18	.43	3.51
1990	.40	.78	.56	.22	–.37	–.25	–.13	.65	.20	.02	.18	.45	2.09
1991	.62	.61	.45	.16	.01	–.04	.05	.25	.01	–.06	.07	.24	.15
1992	–.04	.66	.52	.14	–.70	–.76	.05	.10	–.15	–.31	.16	.25	3.24
1993	–.56	.31	.22	.09	–.87	–.82	–.05	–.17	–.32	–.32	.00	.15	2.68
1994	–.41	.84	.65	.19	–1.25	–1.15	–.10	.02	–.31	–.28	–.02	.32	3.41
1995	.12	1.02	.83	.19	–.90	–.84	–.06	.10	–.21	–.21	.00	.31	3.13
1996	–.15	.86	.68	.18	–1.01	–.91	–.10	.18	–.09	–.08	–.01	.27	3.76
1997	–.31	1.26	1.10	.16	–1.57	–1.40	–.17	.30	–.06	–.13	.07	.36	3.92
1998	–1.14	.26	.17	.08	–1.39	–1.18	–.21	.44	–.06	–.09	.03	.50	4.55
1999	–.90	.52	.32	.20	–1.42	–1.31	–.11	.59	.12	.06	.06	.47	4.82
2000	–.85	.86	.72	.13	–1.71	–1.45	–.26	.33	.02	–.04	.06	.31	4.11
2001	–.24	–.59	–.49	–.10	.35	.39	–.04	.67	.24	.13	.12	.43	1.80
2002	–.67	–.19	–.24	.05	–.48	–.41	–.07	.82	.47	.30	.18	.35	1.21
2003	–.49	.19	.19	.01	–.68	–.67	–.01	.39	.45	.35	.10	–.06	2.81
2004	–.63	.88	.58	.30	–1.51	–1.28	–.22	.30	.31	.26	.05	–.01	3.45
2005	–.31	.67	.52	.15	–.98	–.88	–.09	.15	.15	.11	.04	.00	3.56
2006	–.06	.95	.71	.24	–1.01	–.81	–.20	.30	.17	.07	.10	.13	2.68
2007	.52	.94	.53	.41	–.42	–.27	–.15	.34	.14	.13	.01	.20	2.26
2008	1.04	.67	.48	.19	.37	.47	–.10	.49	.46	.33	.14	.03	.58
2009	1.07	–1.00	–1.00	.00	2.07	2.10	–.03	.72	.48	.29	.20	.24	–1.77
2010	–.43	1.43	1.13	.30	–1.86	–1.73	–.13	–.02	.34	.16	.18	–.36	1.29
2011	.12	.90	.65	.26	–.79	–.74	–.05	–.67	–.23	–.12	–.12	–.44	1.60
2012	.12	.54	.37	.17	–.42	–.38	–.04	–.42	–.16	–.18	.02	–.26	2.11
2013	.20	.40	.27	.13	–.20	–.28	.07	–.47	–.44	–.33	–.10	–.03	1.61
2014	–.31	.52	.41	.11	–.84	–.75	–.09	–.17	–.19	–.19	.00	.02	2.41
2015	–.78	.04	–.03	.07	–.81	–.75	–.07	.33	.00	–.09	.09	.33	2.40
2016	–.17	.05	.05	.00	–.22	–.14	–.08	.35	.03	–.02	.06	.31	2.20
2017	–.16	.49	.32	.17	–.65	–.53	–.12	.09	.02	.04	–.01	.07	2.26
2018	–.27	.35	.34	.01	–.62	–.62	.00	.24	.20	.13	.07	.04	2.76
2019	–.18	–.01	.00	.00	–.17	–.07	–.11	.38	.25	.20	.04	.14	2.24
2020	–.29	–1.57	–.76	–.81	1.28	.65	.63	.43	.33	.11	.21	.10	–2.89
2021 p	–1.39	.48	.52	–.04	–1.87	–1.61	–.26	.09	.04	–.04	.08	.04	5.36
2018: I	–.16	.24	.14	.10	–.40	–.54	.14	.15	.12	–.05	.16	.03	2.78
II	.40	.62	.89	–.27	–.22	–.04	–.18	.49	.32	.29	.03	.17	4.26
III	–1.66	–.78	–.75	–.03	–.88	–.87	–.01	.17	.22	.13	.09	–.05	.44
IV	–.51	.05	.13	–.08	–.57	–.29	–.27	–.14	.12	.26	–.14	–.26	.82
2019: I	.39	.36	.31	.05	.02	.01	.01	.47	.09	.20	–.11	.38	1.92
II	–.50	–.26	–.41	.15	–.24	.01	–.25	.86	.57	.16	.40	.29	3.78
III	.07	–.08	.10	–.18	.15	.19	–.03	.36	.23	.18	.06	.12	3.09
IV	1.43	.17	–.04	.21	1.26	1.16	.10	.52	.23	.23	.00	.28	2.88
2020: I	–.05	–1.95	–.32	–1.63	1.90	.85	1.05	.63	.16	–.03	.20	.47	–4.60
II	1.53	–8.34	–6.24	–2.09	9.87	7.27	2.59	.97	1.42	.16	1.26	–.45	–27.23
III	–3.25	4.64	4.75	–.11	–7.89	–7.37	–.52	–.19	–.32	.11	–.43	.13	26.95
IV	–1.65	2.07	1.59	.49	–3.73	–3.04	–.69	–.09	–.22	.22	–.44	.14	3.44
2021: I	–1.56	–.30	–.10	–.20	–1.26	–1.21	–.05	.77	.78	–.25	1.02	–.01	8.90
II	–.18	.80	.48	.32	–.99	–.51	–.48	–.36	–.38	–.04	–.34	.02	7.99
III	–1.26	–.59	–.39	–.19	–.68	.04	–.72	.17	–.35	–.07	–.29	.52	.10
IV p	–.07	2.35	1.63	.72	–2.42	–2.11	–.31	–.45	–.30	–.24	–.06	–.15	2.09

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–3. Gross domestic product, 2006–2021

[Quarterly data at seasonally adjusted annual rates]

Year or quarter	Gross domestic product	Personal consumption expenditures			Gross private domestic investment							
		Total	Goods	Services	Total	Fixed investment						Change in private inven-tories
						Total	Nonresidential				Resi-dential	
							Total	Struc-tures	Equip-ment	Intel-lectual property products		
	Billions of dollars											
2006	13,815.6	9,277.2	3,239.7	6,037.6	2,701.0	2,632.0	1,793.8	425.2	862.3	506.3	838.2	69.0
2007	14,474.2	9,746.6	3,367.0	6,379.6	2,673.0	2,639.1	1,948.6	510.3	893.4	544.8	690.5	34.0
2008	14,769.9	10,050.1	3,363.2	6,686.9	2,477.6	2,506.9	1,990.9	571.1	845.4	574.4	516.0	–29.2
2009	14,478.1	9,891.2	3,180.0	6,711.2	1,929.7	2,080.4	1,690.4	455.8	670.3	564.4	390.0	–150.8
2010	15,049.0	10,260.3	3,317.8	6,942.4	2,165.5	2,111.6	1,735.0	379.8	777.0	578.2	376.6	53.9
2011	15,599.7	10,698.9	3,518.1	7,180.7	2,332.6	2,286.3	1,907.5	404.5	881.3	621.7	378.8	46.3
2012	16,254.0	11,047.4	3,637.7	7,409.6	2,621.8	2,550.5	2,118.5	479.4	983.4	655.7	432.0	71.2
2013	16,843.2	11,363.5	3,730.0	7,633.6	2,826.0	2,721.5	2,211.5	492.5	1,027.0	691.9	510.0	104.5
2014	17,550.7	11,847.7	3,863.0	7,984.8	3,044.2	2,960.2	2,400.1	577.6	1,091.9	730.5	560.2	84.0
2015	18,206.0	12,263.5	3,923.0	8,340.5	3,237.2	3,100.4	2,466.6	584.4	1,119.5	762.7	633.8	136.8
2016	18,695.1	12,693.3	3,991.8	8,701.4	3,205.0	3,168.8	2,469.3	560.4	1,087.8	821.2	699.4	36.3
2017	19,479.6	13,239.1	4,158.6	9,080.6	3,381.4	3,351.9	2,591.6	599.3	1,117.4	875.0	760.3	29.5
2018	20,527.2	13,913.5	4,353.7	9,559.8	3,637.8	3,579.1	2,780.6	633.3	1,190.5	956.7	798.5	58.7
2019	21,372.6	14,428.7	4,478.9	9,949.8	3,826.3	3,752.6	2,938.7	672.6	1,231.3	1,034.8	813.9	73.6
2020	20,893.7	14,047.6	4,653.8	9,393.7	3,637.8	3,697.4	2,799.6	597.2	1,123.9	1,078.5	897.8	–59.6
2021 p	22,997.5	15,746.9	5,482.8	10,264.1	4,113.4	4,139.4	3,053.9	579.7	1,274.5	1,199.7	1,085.5	–25.9
2018: I	20,143.7	13,667.4	4,298.4	9,369.0	3,550.8	3,505.0	2,716.0	627.2	1,166.4	922.3	789.0	45.9
II	20,492.5	13,864.8	4,354.4	9,510.3	3,603.2	3,579.0	2,770.1	641.6	1,175.7	952.7	808.9	24.2
III	20,659.1	14,002.6	4,373.2	9,629.4	3,679.6	3,602.5	2,798.1	638.2	1,195.7	964.2	804.3	77.1
IV	20,813.3	14,119.3	4,388.8	9,730.5	3,717.5	3,629.9	2,838.1	626.1	1,224.2	987.7	791.8	87.7
2019: I	21,001.6	14,155.6	4,382.8	9,772.7	3,801.9	3,683.4	2,886.9	639.9	1,240.2	1,006.7	796.5	118.5
II	21,289.3	14,375.7	4,479.4	9,896.3	3,843.0	3,754.5	2,946.1	669.4	1,247.4	1,029.3	808.5	88.4
III	21,505.0	14,529.5	4,512.7	10,016.8	3,858.2	3,791.2	2,969.3	696.0	1,227.4	1,046.0	821.9	67.0
IV	21,694.5	14,653.9	4,540.8	10,113.2	3,801.9	3,781.4	2,952.6	685.3	1,210.3	1,057.0	828.8	20.6
2020: I	21,481.4	14,439.1	4,530.9	9,908.2	3,752.4	3,773.0	2,900.1	687.1	1,141.9	1,071.1	872.9	–20.6
II	19,477.4	12,989.7	4,349.9	8,639.8	3,167.0	3,456.9	2,659.1	585.9	1,020.6	1,052.6	797.8	–289.9
III	21,138.6	14,293.8	4,867.2	9,426.6	3,708.8	3,693.8	2,776.6	563.5	1,135.5	1,077.6	917.2	15.0
IV	21,477.6	14,467.6	4,867.3	9,600.4	3,923.2	3,865.9	2,862.7	552.3	1,197.5	1,112.9	1,003.2	57.3
2021: I	22,038.2	15,005.4	5,245.0	9,760.4	3,928.0	4,022.2	2,956.7	565.0	1,244.5	1,147.2	1,065.5	–94.2
II	22,741.0	15,681.7	5,529.8	10,151.9	3,925.1	4,099.4	3,029.2	572.8	1,270.4	1,186.0	1,070.2	–174.3
III	23,202.3	15,964.9	5,500.1	10,464.8	4,099.6	4,159.8	3,073.9	581.9	1,277.2	1,214.9	1,085.9	–60.2
IV p	24,008.5	16,335.5	5,656.2	10,679.2	4,501.1	4,276.1	3,155.7	599.1	1,306.1	1,250.5	1,120.4	225.1
	Billions of chained (2012) dollars											
2006	15,315.9	10,386.2	3,509.7	6,873.1	2,752.4	2,686.8	1,854.2	501.7	832.6	521.5	818.9	87.1
2007	15,623.9	10,638.7	3,607.6	7,027.0	2,684.1	2,653.5	1,982.1	568.6	865.8	554.3	665.8	40.6
2008	15,643.0	10,654.7	3,498.9	7,154.9	2,462.9	2,499.4	1,994.2	605.4	824.4	575.3	504.6	–32.7
2009	15,236.3	10,515.6	3,389.8	7,125.8	1,942.0	2,099.8	1,704.3	492.2	649.7	572.4	395.3	–177.3
2010	15,649.0	10,716.0	3,485.7	7,230.4	2,216.5	2,164.2	1,781.0	412.8	781.2	588.1	383.0	57.3
2011	15,891.5	10,898.3	3,561.8	7,336.7	2,362.1	2,317.8	1,935.4	424.1	886.2	624.8	382.5	46.7
2012	16,254.0	11,047.4	3,637.7	7,409.6	2,621.8	2,550.5	2,118.5	479.4	983.4	655.7	432.0	71.2
2013	16,553.3	11,211.7	3,752.2	7,460.3	2,801.5	2,692.1	2,206.0	485.5	1,029.2	691.4	485.5	108.7
2014	16,932.1	11,515.3	3,905.1	7,613.2	2,959.2	2,869.2	2,365.3	538.8	1,101.1	724.8	504.1	86.3
2015	17,390.3	11,892.9	4,090.9	7,809.8	3,121.8	2,979.0	2,420.3	534.1	1,134.6	752.4	555.4	137.6
2016	17,680.3	12,187.7	4,231.7	7,968.5	3,089.9	3,041.0	2,442.0	511.0	1,114.6	818.8	592.1	35.7
2017	18,079.1	12,483.7	4,395.2	8,110.1	3,212.5	3,164.3	2,541.4	532.5	1,145.5	865.2	615.9	33.6
2018	18,606.8	12,845.0	4,569.3	8,305.7	3,394.8	3,316.2	2,704.4	553.6	1,218.8	935.5	612.3	65.7
2019	19,032.7	13,126.3	4,723.0	8,443.7	3,510.6	3,421.3	2,822.0	565.0	1,258.8	1,002.9	606.7	75.1
2020	18,384.7	12,629.9	4,942.5	7,808.5	3,316.2	3,329.4	2,671.1	494.2	1,154.0	1,031.3	648.0	–42.3
2021 p	19,428.4	13,629.4	5,545.1	8,261.4	3,634.3	3,587.5	2,868.8	454.3	1,304.4	1,136.1	707.3	–38.1
2018: I	18,436.3	12,707.6	4,511.9	8,223.8	3,346.3	3,273.2	2,654.0	554.2	1,196.6	905.2	616.5	63.5
II	18,590.0	12,816.4	4,558.8	8,287.3	3,352.5	3,321.2	2,698.0	563.7	1,205.4	930.3	621.5	11.1
III	18,679.6	12,900.6	4,591.4	8,339.7	3,430.9	3,327.9	2,716.7	557.7	1,221.3	940.8	612.2	101.0
IV	18,721.3	12,955.5	4,615.2	8,371.8	3,449.6	3,342.6	2,749.0	538.9	1,251.7	965.8	599.0	87.3
2019: I	18,833.2	12,975.1	4,630.6	8,377.8	3,503.4	3,372.8	2,780.7	544.7	1,265.2	978.5	599.1	131.7
II	18,982.5	13,088.8	4,709.1	8,420.2	3,526.0	3,423.2	2,826.0	563.2	1,273.1	995.7	605.2	84.3
III	19,112.7	13,192.3	4,765.5	8,471.0	3,535.9	3,449.3	2,846.5	582.0	1,256.4	1,010.5	610.6	68.3
IV	19,202.3	13,249.0	4,786.9	8,505.9	3,477.1	3,439.9	2,834.7	570.0	1,240.6	1,027.1	612.2	16.3
2020: I	18,952.0	13,014.5	4,790.2	8,284.4	3,430.1	3,419.6	2,775.5	568.8	1,168.3	1,036.6	641.2	–30.4
II	17,258.2	11,756.4	4,665.8	7,217.3	2,901.9	3,123.0	2,535.7	485.8	1,044.0	1,008.0	584.9	–252.8
III	18,560.8	12,820.8	5,158.9	7,815.2	3,371.0	3,318.5	2,646.9	466.0	1,166.6	1,027.7	657.8	25.3
IV	18,767.8	12,927.9	5,155.0	7,917.0	3,561.9	3,456.6	2,726.2	456.1	1,237.1	1,053.0	708.2	88.8
2021: I	19,055.7	13,282.7	5,476.6	7,993.4	3,541.3	3,564.1	2,810.4	462.1	1,278.5	1,091.9	730.6	–88.3
II	19,368.3	13,665.6	5,646.7	8,214.3	3,506.0	3,593.0	2,873.1	458.6	1,315.7	1,124.6	708.2	–168.5
III	19,478.9	13,732.4	5,518.3	8,378.5	3,609.7	3,585.0	2,884.8	453.8	1,307.9	1,149.3	694.2	–66.8
IV p	19,810.6	13,836.7	5,538.8	8,459.4	3,880.2	3,607.8	2,907.0	442.7	1,315.6	1,178.5	696.0	171.2

See next page for continuation of table.

Table B–3. Gross domestic product, 2006–2021—*Continued*

[Quarterly data at seasonally adjusted annual rates]

Year or quarter	Net exports of goods and services: Net exports	Net exports of goods and services: Exports	Net exports of goods and services: Imports	Government consumption expenditures and gross investment: Total	Federal: Total	Federal: National defense	Federal: Non-defense	State and local	Final sales of domestic product	Gross domestic pur-chases [1]	Final sales to private domestic pur-chasers [2]	Gross domestic income (GDI) [3]	Average of GDP and GDI
							Billions of dollars						
2006	–786.5	1,470.2	2,256.6	2,623.8	1,001.2	640.8	360.4	1,622.7	13,746.6	14,602.0	11,909.2	14,019.9	13,917.8
2007	–735.9	1,659.3	2,395.2	2,790.6	1,051.0	679.3	371.8	1,739.5	14,440.3	15,210.2	12,385.7	14,454.4	14,464.3
2008	–740.9	1,835.3	2,576.2	2,983.0	1,152.0	750.3	401.6	1,831.1	14,799.1	15,510.7	12,556.9	14,572.9	14,671.4
2009	–419.2	1,582.8	2,001.9	3,076.3	1,220.8	787.6	433.2	1,855.6	14,628.8	14,897.2	11,971.7	14,276.0	14,377.0
2010	–532.3	1,857.2	2,389.6	3,155.6	1,300.2	828.0	472.2	1,855.4	14,995.1	15,581.3	12,371.8	14,966.4	15,007.7
2011	–579.6	2,115.9	2,695.5	3,147.9	1,299.8	834.0	465.8	1,848.2	15,553.5	16,179.3	12,985.2	15,612.0	15,605.9
2012	–551.6	2,217.7	2,769.3	3,136.5	1,287.0	814.2	472.8	1,849.5	16,182.8	16,805.6	13,597.9	16,442.8	16,348.4
2013	–479.4	2,287.0	2,766.4	3,133.0	1,227.2	764.2	462.9	1,905.9	16,738.7	17,322.6	14,085.0	16,958.0	16,900.6
2014	–510.0	2,377.4	2,887.4	3,168.8	1,216.0	743.4	472.6	1,952.8	17,466.7	18,060.7	14,807.9	17,807.9	17,679.3
2015	–526.2	2,268.7	2,794.9	3,231.6	1,221.8	729.7	492.0	2,009.8	18,069.2	18,732.2	15,363.9	18,440.5	18,323.3
2016	–506.3	2,232.1	2,738.4	3,303.1	1,234.5	727.9	506.6	2,068.5	18,658.8	19,201.4	15,862.0	18,788.5	18,741.8
2017	–539.9	2,383.8	2,923.7	3,399.1	1,262.8	746.5	516.3	2,136.3	19,450.1	20,019.6	16,591.0	19,598.5	19,539.1
2018	–596.2	2,533.5	3,129.7	3,572.0	1,339.0	792.8	546.2	2,233.0	20,468.4	21,123.3	17,492.6	20,652.6	20,589.9
2019	–596.3	2,519.7	3,116.0	3,713.9	1,414.9	847.5	567.4	2,299.0	21,299.0	21,968.8	18,181.3	21,442.2	21,407.4
2020	–651.2	2,123.4	2,774.6	3,859.5	1,501.8	881.3	620.5	2,357.8	20,953.3	21,544.9	17,745.0	21,064.3	20,979.0
2021 p	–915.9	2,479.9	3,395.8	4,053.0	1,565.0	905.3	659.7	2,488.0	23,023.4	23,913.4	19,886.2	....	....
2018: I	–580.1	2,504.4	3,084.5	3,505.5	1,305.8	767.4	538.4	2,199.7	20,097.9	20,723.8	17,172.4	20,276.4	20,210.0
II	–539.8	2,568.3	3,108.1	3,564.3	1,331.7	788.1	543.7	2,232.6	20,468.3	21,032.3	17,443.7	20,497.4	20,494.9
III	–624.0	2,534.2	3,158.2	3,600.9	1,350.8	799.4	551.4	2,250.1	20,582.0	21,283.1	17,605.0	20,823.8	20,741.5
IV	–640.9	2,527.1	3,168.1	3,617.4	1,367.7	816.2	551.4	2,249.7	20,725.7	21,454.2	17,749.2	21,012.9	20,913.1
2019: I	–606.4	2,524.6	3,131.0	3,650.5	1,387.0	829.3	557.6	2,263.5	20,883.1	21,608.0	17,839.0	21,195.6	21,098.6
II	–632.3	2,533.4	3,165.7	3,702.9	1,406.9	840.4	566.6	2,296.0	21,200.8	21,921.6	18,130.3	21,361.6	21,325.4
III	–614.0	2,512.1	3,126.1	3,731.3	1,424.1	852.5	571.7	2,307.2	21,438.0	22,119.0	18,320.7	21,481.9	21,493.4
IV	–532.4	2,508.7	3,041.1	3,771.0	1,441.7	868.0	573.7	2,329.2	21,673.9	22,226.8	18,435.3	21,729.8	21,712.2
2020: I	–541.7	2,385.5	2,927.3	3,831.6	1,454.7	868.3	586.4	2,376.9	21,502.0	22,023.1	18,212.0	21,755.9	21,618.6
II	–538.9	1,807.9	2,346.7	3,859.6	1,525.0	872.4	652.6	2,334.6	19,767.4	20,016.3	16,446.7	19,620.2	19,548.8
III	–725.7	2,079.6	2,805.3	3,861.7	1,515.1	883.9	631.3	2,346.5	21,123.6	21,864.3	17,987.6	20,908.5	21,023.6
IV	–798.4	2,220.7	3,019.1	3,885.3	1,512.3	900.8	611.5	2,373.0	21,420.3	22,276.0	18,333.5	21,972.6	21,725.1
2021: I	–872.5	2,311.9	3,184.5	3,977.3	1,568.6	897.1	671.6	2,408.7	22,132.5	22,910.8	19,027.7	22,547.9	22,293.1
II	–881.7	2,461.5	3,343.2	4,015.9	1,563.3	904.1	659.2	2,452.6	22,915.3	23,622.6	19,781.1	23,132.7	22,936.8
III	–947.0	2,485.2	3,432.3	4,084.9	1,562.0	910.9	651.1	2,522.9	23,262.5	24,149.4	20,124.7	23,833.2	23,517.8
IV p	–962.2	2,661.1	3,623.2	4,134.0	1,566.1	909.0	657.1	2,567.9	23,783.4	24,970.6	20,611.5	....	....
							Billions of chained (2012) dollars						
2006	–927.6	1,670.5	2,598.2	3,061.8	1,125.3	719.8	405.6	1,939.6	15,240.9	16,246.6	13,104.7	15,542.5	15,429.2
2007	–847.9	1,816.9	2,664.8	3,116.9	1,147.3	740.3	407.0	1,972.7	15,586.7	16,476.2	13,317.3	15,602.5	15,613.2
2008	–685.7	1,921.9	2,607.6	3,195.8	1,220.0	791.5	428.6	1,977.6	15,678.0	16,332.6	13,169.7	15,434.4	15,538.7
2009	–516.3	1,762.5	2,278.8	3,310.7	1,296.0	836.7	459.4	2,015.9	15,400.3	15,757.9	12,613.3	15,023.6	15,130.0
2010	–589.4	1,989.5	2,578.9	3,308.0	1,348.4	861.3	487.0	1,959.8	15,596.8	16,238.4	12,878.7	15,563.2	15,606.1
2011	–571.0	2,132.1	2,703.1	3,202.7	1,312.0	842.9	469.1	1,890.8	15,847.4	16,462.7	13,215.8	15,904.1	15,897.8
2012	–551.6	2,217.7	2,769.3	3,136.5	1,287.0	814.2	472.8	1,849.5	16,182.8	16,805.6	13,597.9	16,442.8	16,348.4
2013	–519.3	2,283.6	2,802.9	3,060.7	1,215.8	759.6	456.2	1,844.4	16,444.1	17,073.1	13,903.7	16,666.2	16,609.8
2014	–575.3	2,372.3	2,947.6	3,033.2	1,184.7	728.4	456.1	1,847.6	16,842.3	17,505.4	14,384.4	17,180.2	17,056.1
2015	–721.7	2,378.7	3,100.4	3,088.4	1,184.5	713.1	471.0	1,902.2	17,248.3	18,100.1	14,871.9	17,614.3	17,502.3
2016	–757.1	2,388.4	3,145.4	3,148.8	1,190.5	709.1	480.8	1,956.3	17,630.6	18,423.5	15,228.6	17,768.6	17,724.5
2017	–799.5	2,485.8	3,285.2	3,165.2	1,194.7	715.7	478.5	1,968.5	18,030.4	18,857.5	15,647.9	18,189.4	18,134.3
2018	–864.2	2,555.6	3,419.9	3,208.8	1,231.0	739.9	490.7	1,976.4	18,528.8	19,443.0	16,161.0	18,720.5	18,663.6
2019	–905.3	2,554.0	3,459.2	3,279.5	1,277.2	778.5	498.7	2,001.5	18,944.4	19,910.1	16,547.3	19,094.7	19,063.7
2020	–942.7	2,207.6	3,150.3	3,360.2	1,340.7	800.9	539.0	2,019.9	18,395.9	19,306.6	15,959.0	18,534.8	18,459.7
2021 p	–1,282.2	2,309.0	3,591.3	3,376.5	1,348.7	793.5	554.0	2,028.0	19,382.0	20,632.5	17,216.6	....	....
2018: I	–826.4	2,551.6	3,378.0	3,189.7	1,213.0	723.2	489.2	1,974.9	18,363.5	19,238.6	15,980.7	18,557.7	18,497.0
II	–807.2	2,582.9	3,390.1	3,212.2	1,228.1	737.1	490.5	1,982.5	18,558.0	19,376.1	16,137.4	18,594.4	18,592.2
III	–896.9	2,542.5	3,439.4	3,220.0	1,238.5	743.4	494.6	1,980.2	18,577.9	19,545.4	16,228.3	18,828.5	18,754.1
IV	–926.5	2,545.6	3,472.1	3,213.4	1,244.2	755.8	488.3	1,968.1	18,615.8	19,611.8	16,297.9	18,900.8	18,811.0
2019: I	–906.7	2,565.3	3,472.0	3,235.2	1,248.7	765.4	483.5	1,985.4	18,704.8	19,706.9	16,347.6	19,007.2	18,920.2
II	–935.3	2,551.3	3,486.6	3,274.9	1,275.5	773.4	501.9	1,998.7	18,881.4	19,883.1	16,511.6	19,047.0	19,014.8
III	–931.5	2,545.9	3,477.4	3,291.7	1,286.8	781.9	504.7	2,004.3	19,027.1	20,013.2	16,641.2	19,092.1	19,102.4
IV	–847.6	2,553.3	3,400.9	3,316.3	1,298.0	793.4	504.7	2,017.6	19,164.4	20,036.9	16,688.7	19,233.6	19,218.0
2020: I	–841.9	2,442.1	3,283.9	3,346.3	1,305.8	791.9	513.7	2,039.7	18,940.1	19,787.6	16,433.7	19,194.2	19,073.1
II	–774.8	1,943.0	2,717.7	3,378.1	1,368.4	798.2	568.6	2,011.0	17,471.0	18,046.1	14,879.0	17,384.7	17,321.5
III	–1,021.3	2,166.3	3,187.5	3,360.2	1,349.6	801.6	547.0	2,011.4	18,508.0	19,551.0	16,139.0	18,358.8	18,459.8
IV	–1,132.8	2,279.0	3,411.8	3,356.0	1,338.8	812.0	526.7	2,017.6	18,664.8	19,841.7	16,384.1	19,200.3	18,984.0
2021: I	–1,226.1	2,262.3	3,488.4	3,390.9	1,375.2	799.9	573.7	2,017.1	19,076.1	20,211.1	16,846.3	19,496.4	19,276.0
II	–1,244.5	2,304.2	3,548.7	3,373.8	1,356.7	797.8	557.7	2,017.9	19,449.3	20,540.9	17,258.3	19,701.9	19,535.1
III	–1,316.6	2,273.0	3,589.6	3,381.6	1,339.1	794.3	543.9	2,042.1	19,453.4	20,716.4	17,317.3	20,008.5	19,743.7
IV p	–1,341.7	2,396.6	3,738.3	3,359.7	1,323.9	781.9	540.9	2,035.1	19,549.0	21,061.4	17,444.4	....	....

[1] Gross domestic product (GDP) less exports of goods and services plus imports of goods and services.
[2] Personal consumption expenditures plus gross private fixed investment.
[3] For chained dollar measures, gross domestic income is deflated by the implicit price deflator for GDP.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–4. Percentage shares of gross domestic product, 1971–2021

[Percent of nominal GDP]

Year or quarter	Gross domestic product (percent)	Personal consumption expenditures			Gross private domestic investment							
						Fixed investment						Change in private inven- tories
							Nonresidential				Resi- dential	
		Total	Goods	Services	Total	Total	Total	Struc- tures	Equip- ment	Intel- lectual property products		
1971	100.0	60.1	29.4	30.7	16.9	16.2	11.2	3.7	5.9	1.6	5.0	0.7
1972	100.0	60.1	29.2	30.8	17.8	17.1	11.5	3.7	6.2	1.6	5.7	.7
1973	100.0	59.6	29.2	30.4	18.7	17.6	12.1	3.9	6.7	1.6	5.5	1.1
1974	100.0	60.2	29.2	31.0	17.8	16.9	12.4	4.0	6.8	1.7	4.5	.9
1975	100.0	61.2	29.2	32.0	15.3	15.6	11.7	3.6	6.4	1.7	4.0	–.4
1976	100.0	61.3	29.2	32.1	17.3	16.3	11.7	3.5	6.5	1.7	4.6	.9
1977	100.0	61.2	28.8	32.4	19.1	18.0	12.4	3.6	7.1	1.7	5.5	1.1
1978	100.0	60.5	28.2	32.3	20.3	19.2	13.4	4.0	7.7	1.7	5.9	1.1
1979	100.0	60.3	28.1	32.3	20.5	19.9	14.2	4.5	7.9	1.8	5.6	.7
1980	100.0	61.3	28.0	33.3	18.6	18.8	14.2	4.8	7.6	1.9	4.5	–.2
1981	100.0	60.3	27.1	33.2	19.7	18.8	14.7	5.2	7.5	2.0	4.0	.9
1982	100.0	61.9	26.9	35.0	17.4	17.8	14.5	5.3	7.0	2.2	3.3	–.4
1983	100.0	62.8	26.8	36.0	17.5	17.7	13.3	4.2	6.8	2.2	4.4	–.2
1984	100.0	61.7	26.3	35.4	20.3	18.7	14.0	4.4	7.2	2.4	4.7	1.6
1985	100.0	62.5	26.2	36.3	19.1	18.6	14.0	4.5	7.1	2.4	4.6	.5
1986	100.0	63.0	26.1	36.9	18.5	18.4	13.3	3.9	6.9	2.5	5.1	.1
1987	100.0	63.4	25.9	37.5	18.4	17.8	12.7	3.6	6.6	2.5	5.1	.6
1988	100.0	63.6	25.5	38.1	17.9	17.5	12.6	3.5	6.6	2.5	4.9	.4
1989	100.0	63.4	25.2	38.2	17.7	17.2	12.7	3.4	6.6	2.7	4.5	.5
1990	100.0	63.9	25.0	38.9	16.7	16.4	12.4	3.4	6.2	2.8	4.0	.2
1991	100.0	64.0	24.3	39.7	15.3	15.3	11.8	3.0	5.9	2.9	3.6	.0
1992	100.0	64.4	24.0	40.4	15.5	15.3	11.4	2.6	5.9	2.9	3.9	.3
1993	100.0	64.9	23.9	41.0	16.1	15.8	11.7	2.6	6.2	2.9	4.2	.3
1994	100.0	64.8	24.0	40.8	17.2	16.4	11.9	2.6	6.5	2.8	4.4	.9
1995	100.0	65.0	23.8	41.2	17.2	16.8	12.6	2.7	6.9	3.0	4.2	.4
1996	100.0	65.0	23.8	41.2	17.7	17.4	12.9	2.8	7.0	3.1	4.4	.4
1997	100.0	64.5	23.4	41.2	18.6	17.8	13.4	2.9	7.1	3.4	4.4	.8
1998	100.0	64.9	23.3	41.6	19.2	18.5	13.8	3.0	7.3	3.5	4.6	.7
1999	100.0	65.2	23.7	41.5	19.6	19.0	14.2	3.0	7.4	3.8	4.8	.6
2000	100.0	66.0	23.9	42.1	19.9	19.4	14.6	3.1	7.5	4.0	4.7	.5
2001	100.0	66.8	23.9	43.0	18.3	18.6	13.8	3.2	6.7	3.9	4.8	–.4
2002	100.0	67.2	23.8	43.5	17.7	17.5	12.4	2.6	6.0	3.7	5.1	.2
2003	100.0	67.6	23.8	43.8	17.7	17.6	12.0	2.5	5.9	3.7	5.6	.1
2004	100.0	67.4	23.8	43.6	18.7	18.1	12.0	2.5	5.9	3.6	6.1	.5
2005	100.0	67.3	23.6	43.6	19.4	19.0	12.4	2.7	6.1	3.6	6.6	.4
2006	100.0	67.2	23.4	43.7	19.6	19.1	13.0	3.1	6.2	3.7	6.1	.5
2007	100.0	67.3	23.3	44.1	18.5	18.2	13.5	3.5	6.2	3.8	4.8	.2
2008	100.0	68.0	22.8	45.3	16.8	17.0	13.5	3.9	5.7	3.9	3.5	–.2
2009	100.0	68.3	22.0	46.4	13.3	14.4	11.7	3.1	4.6	3.9	2.7	–1.0
2010	100.0	68.2	22.0	46.1	14.4	14.0	11.5	2.5	5.2	3.8	2.5	.4
2011	100.0	68.6	22.6	46.0	15.0	14.7	12.2	2.6	5.6	4.0	2.4	.3
2012	100.0	68.0	22.4	45.6	16.1	15.7	13.0	2.9	6.1	4.0	2.7	.4
2013	100.0	67.5	22.1	45.3	16.8	16.2	13.1	2.9	6.1	4.1	3.0	.6
2014	100.0	67.5	22.0	45.5	17.3	16.9	13.7	3.3	6.2	4.2	3.2	.5
2015	100.0	67.4	21.5	45.8	17.8	17.0	13.5	3.2	6.1	4.2	3.5	.8
2016	100.0	67.9	21.4	46.5	17.1	16.9	13.2	3.0	5.8	4.4	3.7	.2
2017	100.0	68.0	21.3	46.6	17.4	17.2	13.3	3.1	5.7	4.5	3.9	.2
2018	100.0	67.8	21.2	46.6	17.7	17.4	13.5	3.1	5.8	4.7	3.9	.3
2019	100.0	67.5	21.0	46.6	17.9	17.6	13.7	3.1	5.8	4.8	3.8	.3
2020	100.0	67.2	22.3	45.0	17.4	17.7	13.4	2.9	5.4	5.2	4.3	–.3
2021 p	100.0	68.5	23.8	44.6	17.9	18.0	13.3	2.5	5.5	5.2	4.7	–.1
2018: I	100.0	67.8	21.3	46.5	17.6	17.4	13.5	3.1	5.8	4.6	3.9	.2
II	100.0	67.7	21.2	46.4	17.6	17.5	13.5	3.1	5.7	4.6	3.9	.1
III	100.0	67.8	21.2	46.6	17.8	17.4	13.5	3.1	5.8	4.7	3.9	.4
IV	100.0	67.8	21.1	46.8	17.9	17.4	13.6	3.0	5.9	4.7	3.8	.4
2019: I	100.0	67.4	20.9	46.5	18.1	17.5	13.7	3.0	5.9	4.8	3.8	.6
II	100.0	67.5	21.0	46.5	18.1	17.6	13.8	3.1	5.9	4.8	3.8	.4
III	100.0	67.6	21.0	46.6	17.9	17.6	13.8	3.2	5.7	4.9	3.8	.3
IV	100.0	67.5	20.9	46.6	17.5	17.4	13.6	3.2	5.6	4.9	3.8	.1
2020: I	100.0	67.2	21.1	46.1	17.5	17.6	13.5	3.2	5.3	5.0	4.1	–.1
II	100.0	66.7	22.3	44.4	16.3	17.7	13.7	3.0	5.2	5.4	4.1	–1.5
III	100.0	67.6	23.0	44.6	17.5	17.5	13.1	2.7	5.4	5.1	4.3	.1
IV	100.0	67.4	22.7	44.7	18.3	18.0	13.3	2.6	5.6	5.2	4.7	.3
2021: I	100.0	68.1	23.8	44.3	17.8	18.3	13.4	2.6	5.6	5.2	4.8	–.4
II	100.0	69.0	24.3	44.6	17.3	18.0	13.3	2.5	5.6	5.2	4.7	–.8
III	100.0	68.8	23.7	45.1	17.7	17.9	13.2	2.5	5.5	5.2	4.7	–.3
IV p	100.0	68.0	23.6	44.5	18.7	17.8	13.1	2.5	5.4	5.2	4.7	.9

See next page for continuation of table.

Table B–4. Percentage shares of gross domestic product, 1971–2021—*Continued*

[Percent of nominal GDP]

Year or quarter	Net exports of goods and services							Government consumption expenditures and gross investment				
	Net exports	Exports			Imports			Total	Federal			State and local
		Total	Goods	Services	Total	Goods	Services		Total	National defense	Non-defense	
1971	0.1	5.4	4.0	1.4	5.4	4.0	1.4	23.0	11.5	8.4	3.1	11.4
1972	–.3	5.5	4.1	1.4	5.8	4.5	1.4	22.4	11.1	7.9	3.2	11.3
1973	.3	6.7	5.3	1.4	6.4	5.0	1.4	21.4	10.3	7.2	3.1	11.1
1974	–.1	8.2	6.7	1.5	8.2	6.8	1.5	22.1	10.3	7.1	3.2	11.8
1975	.9	8.2	6.7	1.6	7.3	5.9	1.4	22.6	10.3	7.0	3.3	12.3
1976	–.1	8.0	6.5	1.5	8.1	6.7	1.4	21.6	9.9	6.7	3.2	11.7
1977	–1.1	7.7	6.2	1.5	8.8	7.3	1.4	20.9	9.6	6.5	3.2	11.2
1978	–1.1	7.9	6.4	1.6	9.0	7.5	1.5	20.3	9.3	6.2	3.1	10.9
1979	–.9	8.8	7.1	1.6	9.6	8.1	1.5	20.0	9.2	6.1	3.0	10.8
1980	–.5	9.8	8.1	1.8	10.3	8.7	1.6	20.6	9.6	6.4	3.2	11.0
1981	–.4	9.5	7.6	1.9	9.9	8.4	1.6	20.4	9.8	6.7	3.1	10.6
1982	–.6	8.5	6.7	1.8	9.1	7.5	1.6	21.3	10.4	7.3	3.1	10.9
1983	–1.4	7.6	5.9	1.7	9.0	7.5	1.5	21.1	10.5	7.5	3.0	10.6
1984	–2.5	7.5	5.7	1.8	10.0	8.3	1.7	20.5	10.2	7.4	2.8	10.3
1985	–2.6	7.0	5.2	1.7	9.6	7.9	1.7	21.0	10.4	7.6	2.8	10.5
1986	–2.9	7.0	5.1	2.0	9.9	8.1	1.8	21.3	10.5	7.7	2.8	10.8
1987	–3.0	7.5	5.5	2.0	10.5	8.5	1.9	21.2	10.4	7.7	2.7	10.9
1988	–2.1	8.5	6.3	2.1	10.6	8.6	1.9	20.6	9.8	7.3	2.5	10.8
1989	–1.5	8.9	6.6	2.3	10.5	8.6	1.9	20.4	9.5	6.9	2.5	11.0
1990	–1.3	9.3	6.8	2.5	10.6	8.5	2.0	20.8	9.4	6.8	2.6	11.3
1991	–.5	9.7	7.0	2.7	10.1	8.1	2.0	21.1	9.5	6.7	2.7	11.6
1992	–.5	9.7	7.0	2.7	10.2	8.4	1.9	20.6	9.0	6.2	2.8	11.6
1993	–1.0	9.5	6.8	2.7	10.5	8.6	1.9	19.9	8.5	5.7	2.7	11.4
1994	–1.3	9.9	7.1	2.8	11.2	9.3	1.9	19.2	7.9	5.2	2.6	11.4
1995	–1.2	10.6	7.8	2.9	11.8	9.9	1.9	19.0	7.5	4.9	2.6	11.4
1996	–1.2	10.7	7.8	3.0	11.9	10.0	1.9	18.5	7.2	4.7	2.5	11.3
1997	–1.2	11.1	8.2	3.0	12.3	10.3	2.0	18.0	6.8	4.3	2.5	11.2
1998	–1.8	10.5	7.6	2.9	12.3	10.3	2.0	17.8	6.5	4.1	2.4	11.3
1999	–2.7	10.3	7.4	2.9	13.0	10.9	2.1	17.9	6.3	4.0	2.4	11.5
2000	–3.7	10.7	7.8	2.9	14.4	12.2	2.2	17.8	6.2	3.8	2.3	11.6
2001	–3.6	9.7	7.0	2.7	13.3	11.1	2.1	18.4	6.3	3.9	2.4	12.1
2002	–4.0	9.1	6.5	2.7	13.2	11.0	2.2	19.1	6.8	4.2	2.6	12.3
2003	–4.6	9.0	6.4	2.6	13.6	11.3	2.3	19.3	7.2	4.5	2.7	12.1
2004	–5.2	9.6	6.8	2.9	14.8	12.4	2.4	19.1	7.3	4.7	2.6	11.8
2005	–5.7	10.0	7.1	2.9	15.7	13.2	2.4	19.0	7.3	4.7	2.6	11.7
2006	–5.7	10.6	7.6	3.1	16.3	13.8	2.6	19.0	7.2	4.6	2.6	11.7
2007	–5.1	11.5	8.0	3.5	16.5	13.8	2.7	19.3	7.3	4.7	2.6	12.0
2008	–5.0	12.4	8.7	3.7	17.4	14.5	2.9	20.2	7.8	5.1	2.7	12.4
2009	–2.9	10.9	7.3	3.6	13.8	11.0	2.9	21.2	8.4	5.4	3.0	12.8
2010	–3.5	12.3	8.5	3.9	15.9	12.9	2.9	21.0	8.6	5.5	3.1	12.3
2011	–3.7	13.6	9.4	4.2	17.3	14.3	3.0	20.2	8.3	5.3	3.0	11.8
2012	–3.4	13.6	9.4	4.2	17.0	14.1	2.9	19.3	7.9	5.0	2.9	11.4
2013	–2.8	13.6	9.3	4.3	16.4	13.6	2.8	18.6	7.3	4.5	2.7	11.3
2014	–2.9	13.5	9.2	4.3	16.5	13.6	2.8	18.1	6.9	4.2	2.7	11.1
2015	–2.9	12.5	8.2	4.2	15.4	12.6	2.8	17.8	6.7	4.0	2.7	11.0
2016	–2.7	11.9	7.7	4.2	14.6	11.9	2.8	17.7	6.6	3.9	2.7	11.1
2017	–2.8	12.2	7.9	4.3	15.0	12.2	2.8	17.4	6.5	3.8	2.7	11.0
2018	–2.9	12.3	8.1	4.2	15.2	12.5	2.8	17.4	6.5	3.9	2.7	10.9
2019	–2.8	11.8	7.7	4.1	14.6	11.8	2.8	17.4	6.6	4.0	2.7	10.8
2020	–3.1	10.2	6.8	3.4	13.3	11.1	2.2	18.5	7.2	4.2	3.0	11.3
2021 *p*	–4.0	10.8	7.6	3.2	14.8	12.4	2.4	17.6	6.8	3.9	2.9	10.8
2018: I	–2.9	12.4	8.1	4.3	15.3	12.6	2.8	17.4	6.5	3.8	2.7	10.9
II	–2.6	12.5	8.3	4.2	15.2	12.4	2.8	17.4	6.5	3.8	2.7	10.9
III	–3.0	12.3	8.1	4.2	15.3	12.5	2.8	17.4	6.5	3.9	2.7	10.9
IV	–3.1	12.1	8.0	4.1	15.2	12.4	2.8	17.4	6.6	3.9	2.6	10.8
2019: I	–2.9	12.0	7.9	4.1	14.9	12.1	2.8	17.4	6.6	3.9	2.7	10.8
II	–3.0	11.9	7.7	4.2	14.9	12.0	2.8	17.4	6.6	3.9	2.7	10.8
III	–2.9	11.7	7.6	4.1	14.5	11.7	2.8	17.4	6.6	4.0	2.7	10.7
IV	–2.5	11.6	7.5	4.1	14.0	11.3	2.8	17.4	6.6	4.0	2.6	10.7
2020: I	–2.5	11.1	7.4	3.7	13.6	11.1	2.5	17.8	6.8	4.0	2.7	11.1
II	–2.8	9.3	5.9	3.4	12.0	10.0	2.1	19.8	7.8	4.5	3.4	12.0
III	–3.4	9.8	6.7	3.2	13.3	11.2	2.1	18.3	7.2	4.2	3.0	11.1
IV	–3.7	10.3	7.1	3.3	14.1	11.8	2.2	18.1	7.0	4.2	2.8	11.0
2021: I	–4.0	10.5	7.3	3.2	14.4	12.2	2.2	18.0	7.1	4.1	3.0	10.9
II	–3.9	10.8	7.6	3.2	14.7	12.4	2.3	17.7	6.9	4.0	2.9	10.8
III	–4.1	10.7	7.5	3.2	14.8	12.3	2.5	17.6	6.7	3.9	2.8	10.9
IV *p*	–4.0	11.1	7.8	3.3	15.1	12.6	2.5	17.2	6.5	3.8	2.7	10.7

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–5. Chain-type price indexes for gross domestic product, 1971–2021

[Index numbers, 2012=100, except as noted; quarterly data seasonally adjusted]

Year or quarter	Gross domestic product	Personal consumption expenditures			Gross private domestic investment						
						Fixed investment					
							Nonresidential				
		Total	Goods	Services	Total	Total	Total	Structures	Equipment	Intel-lectual property products	Residential
1971	22.761	21.798	33.079	16.733	31.092	30.134	37.997	12.757	63.848	39.318	16.943
1972	23.745	22.542	33.926	17.441	32.388	31.420	39.297	13.674	64.686	40.490	17.975
1973	25.045	23.756	35.949	18.284	34.153	33.169	40.882	14.734	65.780	42.494	19.571
1974	27.292	26.229	40.436	19.833	37.559	36.449	44.857	16.770	70.713	46.461	21.593
1975	29.827	28.415	43.703	21.533	42.059	40.874	50.766	18.773	81.484	50.190	23.590
1976	31.469	29.974	45.413	23.027	44.384	43.232	53.562	19.692	86.486	52.408	25.117
1977	33.424	31.923	47.837	24.770	47.655	46.550	57.111	21.401	91.800	54.709	27.683
1978	35.775	34.145	50.773	26.674	51.517	50.444	60.930	23.468	96.900	57.557	31.082
1979	38.741	37.178	55.574	28.911	56.141	54.977	65.830	26.194	103.167	61.382	34.593
1980	42.251	41.182	61.797	31.918	61.395	60.105	71.641	28.629	112.249	66.123	38.325
1981	46.240	44.871	66.389	35.187	67.123	65.624	78.453	32.566	120.463	71.058	41.425
1982	49.099	47.363	68.198	37.949	70.679	69.311	82.911	35.136	125.415	75.093	43.646
1983	51.018	49.378	69.429	40.280	70.896	69.575	82.774	34.241	125.776	77.898	44.680
1984	52.860	51.243	70.742	42.376	71.661	70.253	83.036	34.540	124.748	80.081	46.003
1985	54.533	53.031	71.877	44.450	72.548	71.277	83.893	35.361	124.748	81.413	47.267
1986	55.638	54.184	71.541	46.276	74.178	73.021	85.365	36.039	127.254	82.047	49.351
1987	57.004	55.855	73.842	47.660	75.723	74.506	86.339	36.618	128.083	83.518	51.486
1988	59.018	58.038	75.788	49.939	77.627	76.586	88.514	38.171	129.854	86.129	53.278
1989	61.331	60.572	78.704	52.293	79.606	78.561	90.572	39.666	132.337	87.240	55.020
1990	63.636	63.231	81.927	54.690	81.270	80.278	92.516	40.948	135.042	88.147	56.288
1991	65.777	65.345	83.930	56.829	82.648	81.683	94.267	41.689	137.330	90.271	57.021
1992	67.278	67.087	84.943	58.850	82.647	81.728	93.960	41.699	137.121	89.373	57.723
1993	68.874	68.758	85.681	60.885	83.627	82.711	94.161	42.922	135.518	89.998	60.074
1994	70.342	70.193	86.552	62.540	84.875	83.983	94.904	44.437	135.277	90.468	62.247
1995	71.819	71.671	87.361	64.288	86.240	85.378	95.849	46.362	133.796	93.134	64.473
1996	73.132	73.204	88.321	66.051	86.191	85.450	95.267	47.540	130.762	93.544	65.856
1997	74.399	74.478	88.219	67.914	86.241	85.599	94.735	49.355	127.156	94.052	67.444
1998	75.219	75.070	86.893	69.351	85.608	85.133	93.248	51.612	121.451	93.595	69.223
1999	76.272	76.164	87.349	70.731	85.690	85.277	92.314	53.198	116.763	95.105	71.816
2000	78.016	78.090	89.082	72.740	86.815	86.486	92.718	55.283	114.224	97.814	75.004
2001	79.814	79.656	89.015	75.063	87.555	87.241	92.346	58.178	110.858	97.684	78.564
2002	81.013	80.702	88.166	77.004	87.841	87.500	91.863	60.603	108.531	96.376	80.510
2003	82.635	82.398	88.054	79.574	88.561	88.265	91.156	62.769	105.725	95.647	84.325
2004	84.842	84.443	89.292	82.018	91.148	90.843	92.055	67.416	104.841	95.335	90.243
2005	87.490	86.876	91.084	84.774	94.839	94.597	94.443	75.733	104.598	95.952	96.706
2006	90.212	89.322	92.306	87.844	98.176	97.958	96.745	84.749	103.560	97.088	102.355
2007	92.653	91.614	93.331	90.786	99.656	99.456	98.310	89.748	103.191	98.284	103.708
2008	94.397	94.325	96.122	93.458	100.474	100.296	99.832	94.335	102.542	99.834	102.249
2009	95.019	94.062	93.812	94.182	99.331	99.076	99.184	92.613	103.169	98.589	98.671
2010	96.164	95.747	95.183	96.017	97.687	97.568	97.416	92.006	99.471	98.306	98.317
2011	98.157	98.170	98.773	97.875	98.704	98.641	98.559	95.362	99.447	99.517	99.049
2012	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
2013	101.769	101.354	99.407	102.322	100.979	101.091	100.251	101.455	99.787	100.081	105.054
2014	103.662	102.887	98.920	104.880	102.922	103.172	101.469	107.198	99.169	100.791	111.118
2015	104.662	103.116	95.896	106.796	103.535	104.075	101.909	109.403	98.671	101.374	114.114
2016	105.703	104.148	94.332	109.197	103.516	104.202	101.119	109.670	97.592	100.302	118.127
2017	107.742	106.051	94.615	111.965	105.230	105.928	101.977	112.545	97.542	101.125	123.454
2018	110.326	108.318	95.281	115.100	107.186	107.926	102.815	114.391	97.684	102.266	130.417
2019	112.279	109.922	94.832	117.836	108.906	109.684	104.137	119.058	97.816	103.172	134.145
2020	113.740	111.225	94.160	120.302	110.212	111.052	104.813	120.852	97.388	104.574	138.541
2021 p	118.490	115.529	98.892	124.213	113.822	115.386	106.433	127.655	97.683	105.591	153.768
2018: I	109.312	107.557	95.270	113.930	106.370	107.086	102.341	113.167	97.480	101.894	127.975
II	110.156	108.184	95.516	114.763	107.029	107.765	102.676	113.793	97.539	102.410	130.152
III	110.647	108.546	95.247	115.471	107.506	108.254	103.001	114.422	97.905	102.485	131.373
IV	111.191	108.986	95.092	116.236	107.840	108.597	103.243	116.182	97.811	102.273	132.167
2019: I	111.502	109.100	94.647	116.656	108.443	109.212	103.823	117.497	98.035	102.881	132.937
II	112.142	109.835	95.120	117.536	108.918	109.680	104.251	118.881	97.987	103.373	133.586
III	112.524	110.141	94.697	118.253	109.128	109.915	104.313	119.610	97.689	103.515	134.626
IV	112.947	110.612	94.863	118.900	109.134	109.930	104.160	120.243	97.552	102.920	135.430
2020: I	113.397	110.958	94.597	119.604	109.632	110.340	104.487	120.805	97.727	103.331	136.224
II	112.969	110.505	93.243	119.713	109.726	110.701	104.864	120.615	97.737	104.425	136.528
III	113.984	111.507	94.361	120.624	110.490	111.316	104.895	120.919	97.309	104.853	139.594
IV	114.611	111.928	94.437	121.267	111.000	111.850	105.005	121.071	96.780	105.688	141.817
2021: I	115.826	112.989	95.790	122.109	111.777	112.864	105.203	122.237	97.318	105.069	146.010
II	117.546	114.772	97.948	123.593	112.574	114.105	105.429	124.882	96.536	105.464	151.291
III	119.259	116.277	99.690	124.904	114.256	116.042	106.549	128.200	97.626	105.712	156.609
IV p	121.329	118.078	102.141	126.244	116.680	118.532	108.550	135.302	99.253	106.119	161.163

See next page for continuation of table.

Table B–5. Chain-type price indexes for gross domestic product, 1971–2021—*Continued*

[Index numbers, 2012=100, except as noted; quarterly data seasonally adjusted]

Year or quarter	Exports and imports of goods and services		Government consumption expenditures and gross investment					Final sales of domestic product	Personal consumption expenditures excluding food and energy	Gross domestic purchases [1]	Percent change [2]			
				Federal							Gross domestic product	Personal consumption expenditures		Gross domestic purchases [1]
	Exports	Imports	Total	Total	National defense	Non-defense	State and local					Total	Excluding food and energy	
1971	30.837	21.114	17.353	20.673	19.817	22.531	15.199	22.627	23.112	22.158	5.1	4.2	4.7	5.2
1972	32.187	22.593	18.664	22.488	21.883	23.589	16.163	23.609	23.856	23.147	4.3	3.4	3.2	4.5
1973	36.430	26.520	19.938	24.054	23.484	25.028	17.246	24.907	24.764	24.469	5.5	5.4	3.8	5.7
1974	44.865	37.942	21.854	25.975	25.404	26.916	19.158	27.136	26.726	26.954	9.0	10.4	7.9	10.2
1975	49.453	41.100	23.872	28.258	27.545	29.497	21.000	29.661	28.958	29.417	9.3	8.3	8.4	9.1
1976	51.076	42.338	25.183	30.016	29.345	31.137	22.025	31.305	30.718	31.033	5.5	5.5	6.1	5.5
1977	53.158	46.068	26.742	31.863	31.268	32.796	23.395	33.262	32.694	33.079	6.2	6.5	6.4	6.6
1978	56.391	49.315	28.510	34.012	33.561	34.627	24.915	35.614	34.861	35.431	7.0	7.0	6.6	7.1
1979	63.184	57.753	30.856	36.571	36.216	36.968	27.115	38.566	37.403	38.539	8.3	8.9	7.3	8.8
1980	69.594	71.945	34.048	40.104	39.919	40.124	30.082	42.056	40.840	42.551	9.1	10.8	9.2	10.4
1981	74.748	75.834	37.428	43.849	43.747	43.662	33.228	46.016	44.419	46.476	9.4	9.0	8.8	9.2
1982	75.104	73.281	39.973	46.950	47.039	46.309	35.403	48.889	47.306	49.154	6.2	5.6	6.5	5.8
1983	75.410	70.535	41.520	48.506	48.778	47.418	36.966	50.803	49.727	50.864	3.9	4.3	5.1	3.5
1984	76.116	69.925	43.322	50.644	51.013	49.300	38.546	52.637	51.789	52.585	3.6	3.8	4.1	3.4
1985	73.850	67.628	44.663	51.719	51.872	50.929	40.115	54.335	53.893	54.149	3.2	3.5	4.1	3.0
1986	72.618	67.627	45.413	51.964	51.894	51.770	41.271	55.456	55.752	55.278	2.0	2.2	3.4	2.1
1987	74.222	71.715	46.640	52.325	52.267	52.099	43.198	56.814	57.548	56.839	2.5	3.1	3.2	2.8
1988	78.022	75.146	48.181	54.033	53.904	53.997	44.642	58.851	59.994	58.850	3.5	3.9	4.3	3.5
1989	79.315	76.789	50.021	55.542	55.365	55.629	46.754	61.165	62.484	61.166	3.9	4.4	4.2	3.9
1990	79.762	78.991	52.118	57.258	57.162	57.118	49.156	63.477	65.016	63.586	3.8	4.4	4.1	4.0
1991	80.651	78.332	54.010	59.317	58.964	59.813	50.955	65.621	67.338	65.583	3.4	3.3	3.6	3.1
1992	80.259	78.396	55.647	60.832	60.678	60.851	52.692	67.125	69.384	67.108	2.3	2.7	3.0	2.3
1993	80.391	77.795	56.958	62.159	61.615	63.021	54.004	68.722	71.269	68.623	2.4	2.5	2.7	2.3
1994	81.325	78.526	58.468	63.870	63.229	64.926	55.397	70.194	72.864	70.062	2.1	2.1	2.2	2.1
1995	83.143	80.677	60.128	65.847	65.027	67.252	56.874	71.676	74.451	71.575	2.1	2.1	2.2	2.2
1996	82.039	79.271	61.361	66.946	66.114	68.373	58.180	73.009	75.863	72.820	1.8	2.1	1.9	1.7
1997	80.593	76.516	62.566	67.981	67.035	69.621	59.474	74.297	77.201	73.893	1.7	1.7	1.8	1.5
1998	78.685	72.396	63.630	68.850	67.871	70.548	60.633	75.152	78.183	74.386	1.1	.8	1.3	.7
1999	78.091	72.827	65.753	70.532	69.559	72.218	62.963	76.221	79.210	75.518	1.4	1.5	1.3	1.5
2000	79.592	76.013	68.577	72.898	71.908	74.616	65.989	77.983	80.625	77.480	2.3	2.5	1.8	2.6
2001	78.968	74.046	70.558	74.249	73.270	75.947	68.258	79.785	82.153	78.987	2.3	2.0	1.9	1.9
2002	78.287	73.164	72.386	76.648	75.714	78.272	69.792	80.978	83.526	80.070	1.5	1.3	1.7	1.4
2003	79.531	75.377	75.044	80.025	79.505	80.946	72.063	82.609	84.874	81.807	2.0	2.1	1.6	2.2
2004	82.435	78.971	78.169	82.777	82.263	83.689	75.382	84.814	86.544	84.151	2.7	2.5	2.0	2.9
2005	85.289	83.618	82.132	86.222	86.011	86.586	79.631	87.470	88.440	87.083	3.1	2.9	2.2	3.5
2006	88.006	86.854	85.695	88.969	89.022	88.858	83.659	90.195	90.558	89.885	3.1	2.8	2.4	3.2
2007	91.328	89.887	89.530	91.609	91.750	91.340	88.181	92.645	92.578	92.327	2.7	2.6	2.2	2.7
2008	95.493	98.795	93.334	94.397	94.801	93.647	92.590	94.392	94.393	94.947	1.9	3.0	2.0	2.8
2009	89.803	87.854	92.921	94.193	94.126	94.308	92.045	94.990	95.270	94.534	.7	–.3	.9	–.4
2010	93.350	92.655	95.391	96.425	96.128	96.951	94.674	96.142	96.651	95.951	1.2	1.8	1.4	1.5
2011	99.237	99.716	98.289	99.069	98.946	99.284	97.747	98.146	98.184	98.272	2.1	2.5	1.6	2.4
2012	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	1.9	1.9	1.8	1.8
2013	100.148	98.697	102.363	100.933	100.609	101.482	103.332	101.791	101.535	101.478	1.8	1.4	1.5	1.5
2014	100.216	97.961	104.470	102.643	102.056	103.621	105.698	103.707	103.187	103.181	1.9	1.5	1.6	1.7
2015	95.373	90.144	104.638	103.143	102.334	104.466	105.656	104.760	104.487	103.464	1.0	.2	1.3	.3
2016	93.458	87.058	104.899	103.695	102.650	105.370	105.739	105.832	106.138	104.187	1.0	1.0	1.6	.7
2017	95.897	88.996	107.389	105.702	104.306	107.902	108.524	107.874	107.935	106.157	1.9	1.8	1.7	1.9
2018	99.135	91.515	111.319	108.776	107.150	111.325	112.984	110.468	110.096	108.648	2.4	2.1	2.0	2.3
2019	98.660	90.078	113.246	110.781	108.865	113.775	114.863	112.429	111.959	110.326	1.8	1.5	1.7	1.5
2020	96.188	88.075	114.861	112.018	110.039	115.108	116.725	113.902	113.553	111.682	1.3	1.2	1.4	1.2
2021 *p*	107.549	94.611	120.041	116.058	114.106	119.123	122.671	118.783	117.320	116.014	4.2	3.9	3.3	3.9
2018: I	98.161	91.314	109.902	107.655	106.122	110.063	111.383	109.448	109.292	107.769	2.4	2.7	2.4	2.9
II	99.440	91.684	110.965	108.447	106.927	110.835	112.615	110.297	109.943	108.473	3.1	2.4	2.4	2.6
III	99.674	91.823	111.832	109.073	107.538	111.484	113.632	110.791	110.320	108.939	1.8	1.3	1.4	1.7
IV	99.264	91.239	112.576	109.928	108.011	112.920	114.307	111.337	110.829	109.411	2.0	1.6	1.9	1.7
2019: I	98.390	90.169	112.842	111.078	108.361	115.320	114.014	111.649	111.136	109.635	1.1	.4	1.1	.8
II	99.277	90.789	113.070	110.303	108.669	112.858	114.878	112.289	111.783	110.242	2.3	2.7	2.3	2.2
III	98.676	89.904	113.358	110.673	109.024	113.253	115.114	112.676	112.269	110.527	1.4	1.1	1.8	1.0
IV	98.295	89.448	113.713	111.068	109.408	113.669	115.447	113.101	112.647	110.898	1.5	1.7	1.4	1.3
2020: I	97.783	89.194	114.503	111.400	109.650	114.143	116.536	113.535	113.135	111.346	1.6	1.3	1.7	1.6
II	93.181	86.424	114.252	111.444	109.303	114.766	116.093	113.154	112.919	111.024	–1.5	–1.6	–.8	–1.2
III	96.164	88.098	114.921	112.269	110.264	115.403	116.659	114.143	113.904	111.924	3.6	3.7	3.5	3.3
IV	97.622	88.585	115.768	112.959	110.939	116.118	117.611	114.775	114.255	112.434	2.2	1.5	1.2	1.8
2021: I	102.383	91.385	117.292	114.065	112.152	117.070	119.416	116.034	115.010	113.523	4.3	3.8	2.7	3.9
II	107.030	94.312	119.031	115.228	113.335	118.207	121.544	117.833	116.731	115.130	6.1	6.5	6.1	5.8
III	109.539	95.720	120.796	116.643	114.686	119.720	123.541	119.593	118.045	116.708	6.0	5.3	4.6	5.6
IV *p*	111.244	97.027	123.045	118.294	116.254	121.494	126.182	121.673	119.493	118.694	7.1	6.3	5.0	7.0

[1] Gross domestic product (GDP) less exports of goods and services plus imports of goods and services.
[2] Quarterly percent changes are at annual rates.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–6. Gross value added by sector, 1971–2021

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Gross domestic product	Business [1]			Households and institutions			General government [3]			Addendum: Gross housing value added
		Total	Nonfarm [1]	Farm	Total	Households	Nonprofit institutions serving households [2]	Total	Federal	State and local	
1971	1,164.9	882.5	857.2	25.4	104.5	67.2	37.4	177.8	87.5	90.3	86.4
1972	1,279.1	972.5	942.9	29.7	114.0	72.7	41.4	192.6	92.4	100.2	93.9
1973	1,425.4	1,094.0	1,047.2	46.8	124.6	78.5	46.1	206.8	96.4	110.4	101.4
1974	1,545.2	1,182.8	1,138.5	44.2	137.2	85.5	51.7	225.3	102.5	122.8	110.4
1975	1,684.9	1,284.8	1,239.2	45.6	151.6	93.7	58.0	248.4	110.5	138.0	121.3
1976	1,873.4	1,443.3	1,400.2	43.0	164.9	101.7	63.2	265.3	117.3	148.0	130.9
1977	2,081.8	1,616.2	1,572.7	43.5	179.9	110.7	69.2	285.7	125.2	160.6	144.2
1978	2,351.6	1,838.2	1,787.5	50.7	202.1	124.8	77.3	311.3	135.8	175.5	160.2
1979	2,627.3	2,062.8	2,002.7	60.1	226.3	139.5	86.9	338.2	145.4	192.8	177.7
1980	2,857.3	2,225.8	2,174.4	51.4	258.2	158.8	99.3	373.4	159.8	213.5	204.0
1981	3,207.0	2,502.0	2,437.0	65.0	291.6	179.2	112.4	413.5	178.3	235.2	231.6
1982	3,343.8	2,568.6	2,508.2	60.4	323.8	198.2	125.6	451.4	195.7	255.6	258.6
1983	3,634.0	2,801.9	2,757.0	44.9	352.5	213.6	138.9	479.7	207.1	272.6	280.6
1984	4,037.6	3,136.7	3,072.6	64.2	383.8	230.9	152.8	517.1	225.3	291.9	303.1
1985	4,339.0	3,369.6	3,305.9	63.7	411.8	248.2	163.6	557.5	240.0	317.6	333.8
1986	4,579.6	3,539.3	3,479.4	59.9	447.0	268.4	178.6	593.3	250.6	342.7	364.5
1987	4,855.2	3,735.2	3,673.2	62.0	489.5	289.8	199.7	630.4	261.0	369.4	392.1
1988	5,236.4	4,019.3	3,957.9	61.4	539.8	316.4	223.4	677.4	278.5	398.8	424.2
1989	5,641.6	4,326.7	4,252.8	73.9	586.0	341.4	244.6	728.8	292.8	436.1	452.7
1990	5,963.1	4,542.0	4,464.2	77.8	636.3	367.6	268.8	784.9	306.7	478.2	487.0
1991	6,158.1	4,645.0	4,574.7	70.4	677.3	386.6	290.7	835.8	323.5	512.2	515.3
1992	6,520.3	4,920.2	4,840.4	79.9	720.3	407.1	313.2	879.8	329.6	550.2	545.2
1993	6,858.6	5,177.4	5,106.2	71.3	772.8	437.6	335.1	908.3	331.5	576.9	578.4
1994	7,287.2	5,523.7	5,440.1	83.6	824.7	472.7	352.0	938.8	332.6	606.2	619.6
1995	7,639.7	5,795.1	5,726.7	68.4	877.8	506.9	370.9	966.9	333.0	633.9	662.6
1996	8,073.1	6,159.5	6,066.9	92.6	923.2	534.6	388.7	990.3	331.8	658.6	695.0
1997	8,577.6	6,578.8	6,490.6	88.1	975.9	565.7	410.2	1,022.9	333.5	689.3	731.9
1998	9,062.8	6,959.2	6,880.2	79.0	1,040.6	601.6	439.0	1,063.0	336.8	726.2	774.8
1999	9,631.2	7,401.8	7,330.9	70.9	1,111.2	644.0	467.2	1,118.1	345.0	773.1	825.1
2000	10,251.0	7,875.9	7,799.9	76.0	1,190.7	692.3	498.4	1,184.3	360.3	824.0	880.6
2001	10,581.9	8,057.7	7,979.6	78.1	1,271.7	748.9	522.8	1,252.6	370.3	882.3	947.7
2002	10,929.1	8,256.0	8,181.7	74.3	1,344.7	781.6	563.0	1,328.4	397.8	930.6	983.5
2003	11,456.5	8,642.9	8,551.1	91.8	1,408.8	814.1	594.6	1,404.8	434.7	970.1	1,014.8
2004	12,217.2	9,249.3	9,129.1	120.2	1,489.2	862.6	626.6	1,478.7	459.4	1,019.3	1,074.1
2005	13,039.2	9,911.0	9,805.4	105.6	1,572.8	922.3	650.5	1,555.4	488.4	1,067.0	1,149.7
2006	13,815.6	10,524.7	10,427.2	97.5	1,658.9	976.2	682.8	1,631.9	509.9	1,122.1	1,209.4
2007	14,474.2	10,997.8	10,880.7	117.1	1,749.5	1,035.9	713.6	1,726.9	535.7	1,191.2	1,279.3
2008	14,769.9	11,061.8	10,943.6	118.2	1,886.9	1,125.2	761.7	1,821.2	569.1	1,252.1	1,388.7
2009	14,478.1	10,659.6	10,557.4	102.2	1,934.9	1,136.8	798.2	1,883.5	603.0	1,280.5	1,415.5
2010	15,049.0	11,137.8	11,021.6	116.2	1,965.0	1,150.7	814.3	1,946.1	640.0	1,306.1	1,443.9
2011	15,599.7	11,614.9	11,464.5	150.4	2,012.0	1,164.0	848.0	1,972.9	659.8	1,313.1	1,471.0
2012	16,254.0	12,206.4	12,058.5	148.0	2,058.4	1,168.8	889.6	1,989.1	663.7	1,325.5	1,493.6
2013	16,843.2	12,689.6	12,506.4	183.3	2,114.2	1,196.5	917.7	2,039.3	658.4	1,380.9	1,536.3
2014	17,550.7	13,279.8	13,113.8	166.0	2,182.9	1,228.3	954.6	2,088.0	666.8	1,421.1	1,582.8
2015	18,206.0	13,804.8	13,659.6	145.2	2,260.2	1,258.8	1,001.4	2,141.0	673.7	1,467.3	1,633.1
2016	18,695.1	14,168.5	14,038.6	129.9	2,344.1	1,299.3	1,044.8	2,182.5	683.9	1,498.6	1,691.5
2017	19,479.6	14,803.1	14,663.8	139.4	2,436.0	1,352.6	1,083.4	2,240.4	699.3	1,541.2	1,753.8
2018	20,527.2	15,643.7	15,506.6	137.1	2,551.4	1,416.5	1,134.9	2,332.1	726.0	1,606.1	1,835.7
2019	21,372.6	16,298.1	16,175.1	123.0	2,669.0	1,479.6	1,189.4	2,405.5	749.4	1,656.1	1,921.1
2020	20,893.7	15,666.4	15,531.7	134.7	2,755.5	1,528.0	1,227.4	2,471.9	782.5	1,689.4	1,988.9
2021 ^{p}	22,997.5	17,552.0	17,348.9	203.1	2,884.9	1,579.3	1,305.6	2,560.6	817.9	1,742.7	2,053.8
2018: I	20,143.7	15,341.2	15,201.2	140.0	2,505.8	1,389.8	1,116.1	2,296.7	715.1	1,581.6	1,801.0
II	20,492.5	15,633.8	15,489.6	144.1	2,536.9	1,407.7	1,129.2	2,321.8	722.9	1,598.9	1,824.0
III	20,659.1	15,747.4	15,615.8	131.6	2,564.4	1,425.3	1,139.1	2,347.3	730.2	1,617.1	1,847.1
IV	20,813.3	15,852.3	15,719.7	132.6	2,598.5	1,443.4	1,155.1	2,362.5	735.8	1,626.7	1,870.6
2019: I	21,001.6	16,001.0	15,880.1	120.9	2,627.4	1,459.1	1,168.3	2,373.2	741.7	1,631.4	1,891.9
II	21,289.3	16,247.2	16,127.8	119.4	2,653.2	1,472.8	1,180.4	2,388.9	745.7	1,643.2	1,911.8
III	21,505.0	16,406.9	16,283.2	123.7	2,680.8	1,485.8	1,195.0	2,417.3	752.5	1,664.8	1,930.4
IV	21,694.5	16,537.3	16,409.3	128.0	2,714.5	1,500.6	1,213.9	2,442.7	757.8	1,684.8	1,950.3
2020: I	21,481.4	16,249.0	16,106.4	142.6	2,753.7	1,517.8	1,235.8	2,478.7	765.6	1,713.1	1,973.1
II	19,477.4	14,318.1	14,214.2	103.9	2,716.4	1,527.1	1,189.4	2,442.9	776.7	1,666.2	1,986.8
III	21,138.6	15,899.9	15,766.9	133.0	2,756.9	1,533.3	1,223.6	2,481.8	792.2	1,689.6	1,996.2
IV	21,477.6	16,198.6	16,039.4	159.2	2,794.8	1,533.9	1,260.9	2,484.2	795.5	1,688.7	1,999.5
2021: I	22,038.2	16,726.8	16,554.2	172.6	2,812.1	1,545.7	1,266.3	2,499.4	803.0	1,696.4	2,013.8
II	22,741.0	17,361.1	17,148.0	213.1	2,845.7	1,566.2	1,279.6	2,534.1	812.9	1,721.2	2,037.7
III	23,202.3	17,702.2	17,484.5	217.6	2,909.6	1,589.0	1,320.6	2,590.6	822.4	1,768.2	2,064.8
IV ^{p}	24,008.5	18,417.9	18,208.9	209.0	2,972.1	1,616.4	1,355.8	2,618.5	833.5	1,785.0	2,099.0

[1] Gross domestic business value added equals gross domestic product excluding gross value added of households and institutions and of general government. Nonfarm value added equals gross domestic business value added excluding gross farm value added.

[2] Equals compensation of employees of nonprofit institutions, the rental value of nonresidential fixed assets owned and used by nonprofit institutions serving households, and rental income of persons for tenant-occupied housing owned by nonprofit institutions.

[3] Equals compensation of general government employees plus general government consumption of fixed capital.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–7. Real gross value added by sector, 1971–2021

[Billions of chained (2012) dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Gross domestic product	Business[1] Total	Business[1] Nonfarm[1]	Business[1] Farm	Households and institutions Total	Households and institutions Households	Households and institutions Nonprofit institutions serving households[2]	General government[3] Total	General government[3] Federal	General government[3] State and local	Addendum: Gross housing value added
1971	5,117.6	3,397.4	3,351.5	48.2	691.1	408.9	279.5	1,228.7	506.6	700.2	522.1
1972	5,386.7	3,619.3	3,577.2	48.2	718.4	425.8	289.6	1,226.9	487.2	724.6	546.8
1973	5,690.9	3,870.6	3,837.0	47.7	742.5	439.5	300.0	1,232.9	473.6	750.1	564.2
1974	5,660.1	3,811.6	3,779.4	46.6	772.8	459.1	310.4	1,257.1	473.8	777.4	591.9
1975	5,648.5	3,775.4	3,717.7	55.5	799.6	472.2	324.2	1,276.0	472.1	801.0	610.8
1976	5,952.8	4,030.5	3,984.3	52.8	810.0	478.4	328.4	1,286.8	473.3	811.7	616.9
1977	6,228.1	4,261.3	4,213.0	55.6	816.4	478.3	335.3	1,300.3	475.2	824.3	625.7
1978	6,572.8	4,533.1	4,494.3	53.5	846.9	501.3	342.2	1,325.1	481.5	843.7	648.2
1979	6,780.9	4,694.1	4,646.4	58.6	870.4	511.5	355.7	1,339.9	482.5	859.1	660.8
1980	6,763.5	4,651.7	4,606.8	56.9	896.6	526.1	367.4	1,359.9	490.3	871.1	684.1
1981	6,935.2	4,787.4	4,711.8	75.2	913.8	531.8	379.3	1,369.5	498.5	871.0	697.5
1982	6,810.1	4,650.0	4,567.7	78.8	941.5	539.1	401.1	1,385.7	507.7	876.9	713.7
1983	7,122.3	4,896.4	4,850.7	54.5	980.4	560.2	419.0	1,397.7	520.6	873.5	741.3
1984	7,637.7	5,330.7	5,261.1	72.7	1,002.9	570.7	431.4	1,418.3	534.1	879.0	755.5
1985	7,956.2	5,579.3	5,492.8	86.1	1,020.3	583.6	435.4	1,461.1	551.1	904.3	786.8
1986	8,231.7	5,782.0	5,700.6	82.4	1,052.2	595.3	456.5	1,500.5	564.4	930.7	808.2
1987	8,516.4	5,989.5	5,907.8	83.2	1,091.6	610.4	481.9	1,537.5	582.2	949.1	827.0
1988	8,872.2	6,246.0	6,176.9	73.9	1,147.8	635.7	513.6	1,580.7	593.4	981.6	854.3
1989	9,198.0	6,485.1	6,403.9	84.0	1,194.3	655.5	541.4	1,619.4	602.4	1,011.9	872.1
1990	9,371.5	6,589.0	6,499.6	90.7	1,232.6	668.2	568.4	1,659.8	612.9	1,042.2	889.6
1991	9,361.3	6,548.8	6,458.7	91.2	1,257.9	678.5	583.9	1,676.7	616.4	1,055.9	907.8
1992	9,691.1	6,826.1	6,721.2	105.3	1,289.8	693.9	600.8	1,683.9	606.3	1,073.9	929.9
1993	9,957.7	7,020.7	6,928.5	93.4	1,356.2	727.5	634.0	1,687.9	596.3	1,088.7	963.2
1994	10,358.9	7,359.3	7,247.4	113.0	1,401.9	764.4	641.5	1,689.5	579.7	1,107.7	1,004.4
1995	10,637.0	7,585.5	7,496.4	90.0	1,443.7	790.9	656.4	1,691.9	561.2	1,129.6	1,040.2
1996	11,038.3	7,937.6	7,833.7	104.1	1,472.5	807.1	669.0	1,695.2	547.8	1,147.1	1,058.1
1997	11,529.2	8,354.3	8,237.5	116.7	1,517.7	829.9	691.8	1,708.1	538.8	1,169.7	1,083.6
1998	12,045.8	8,813.8	8,700.2	112.6	1,537.4	851.5	688.8	1,726.8	533.1	1,194.6	1,109.0
1999	12,623.4	9,323.0	9,206.0	115.5	1,573.1	878.8	696.4	1,742.1	528.9	1,214.4	1,140.3
2000	13,138.0	9,741.3	9,607.5	136.6	1,633.7	917.7	717.7	1,770.3	531.7	1,240.0	1,179.4
2001	13,263.4	9,799.7	9,672.8	126.6	1,674.3	951.4	723.7	1,801.4	533.2	1,269.6	1,216.8
2002	13,488.4	9,966.6	9,835.1	132.3	1,698.4	956.4	743.6	1,835.6	542.6	1,294.4	1,215.6
2003	13,865.5	10,281.2	10,139.9	144.4	1,734.8	984.2	751.6	1,858.5	557.0	1,302.8	1,236.4
2004	14,399.7	10,733.3	10,578.9	159.2	1,798.6	1,020.5	779.3	1,871.5	565.1	1,307.5	1,280.1
2005	14,901.3	11,154.8	10,992.0	168.6	1,858.1	1,068.7	789.8	1,888.4	572.3	1,317.0	1,341.3
2006	15,315.9	11,520.2	11,357.8	165.5	1,888.4	1,097.0	791.4	1,903.9	576.7	1,328.3	1,367.7
2007	15,623.9	11,766.1	11,617.4	145.4	1,922.7	1,123.2	799.3	1,930.9	584.6	1,347.3	1,394.1
2008	15,643.0	11,663.6	11,514.9	145.7	2,007.0	1,185.0	821.5	1,970.9	606.3	1,365.3	1,467.0
2009	15,236.3	11,234.6	11,071.4	168.1	1,994.8	1,161.9	832.8	2,006.7	636.6	1,370.5	1,452.4
2010	15,649.0	11,597.6	11,436.4	162.7	2,035.1	1,186.5	848.4	2,016.3	658.0	1,358.5	1,492.0
2011	15,891.5	11,825.7	11,670.5	155.3	2,058.7	1,186.4	872.2	2,007.2	664.3	1,343.0	1,500.9
2012	16,254.0	12,206.4	12,058.5	148.0	2,058.4	1,168.8	889.6	1,989.1	663.7	1,325.5	1,493.6
2013	16,553.3	12,506.7	12,328.6	177.9	2,071.4	1,174.6	896.7	1,975.7	652.0	1,323.7	1,505.6
2014	16,932.1	12,874.0	12,695.2	178.3	2,088.0	1,182.5	905.5	1,971.9	646.9	1,324.7	1,516.6
2015	17,390.3	13,313.2	13,123.8	190.0	2,104.4	1,180.9	923.2	1,977.2	642.5	1,334.2	1,520.7
2016	17,680.3	13,564.1	13,364.9	203.0	2,126.4	1,186.6	939.5	1,995.5	645.4	1,349.5	1,528.9
2017	18,079.1	13,926.2	13,728.1	198.2	2,152.0	1,201.1	950.6	2,009.6	646.2	1,362.6	1,537.4
2018	18,606.8	14,410.8	14,206.7	203.6	2,185.2	1,220.8	964.1	2,024.3	649.5	1,373.9	1,559.8
2019	19,032.7	14,791.5	14,595.9	186.2	2,212.5	1,235.0	977.2	2,046.0	656.4	1,388.7	1,578.6
2020	18,384.7	14,164.4	13,952.9	221.0	2,182.8	1,235.1	947.8	2,043.5	674.4	1,369.1	1,582.1
2021 p	19,428.4	15,186.8	14,981.5	207.6	2,207.1	1,245.3	961.6	2,064.2	679.7	1,384.5	1,596.5
2018: I	18,436.3	14,258.6	14,057.5	200.3	2,172.0	1,212.0	959.7	2,017.8	647.3	1,369.6	1,548.9
II	18,590.0	14,398.2	14,191.7	207.7	2,181.2	1,218.1	962.8	2,024.1	649.7	1,373.5	1,556.5
III	18,679.6	14,474.9	14,270.2	204.2	2,189.9	1,223.9	965.8	2,028.8	651.6	1,376.3	1,563.5
IV	18,721.3	14,511.3	14,307.7	202.2	2,197.7	1,229.4	968.0	2,026.5	649.4	1,376.2	1,570.2
2019: I	18,833.2	14,621.2	14,427.6	184.2	2,205.9	1,234.4	971.3	2,022.0	644.2	1,376.8	1,576.5
II	18,982.5	14,749.3	14,554.7	184.8	2,210.4	1,234.8	975.3	2,039.9	657.7	1,381.4	1,577.9
III	19,112.7	14,863.7	14,668.2	185.4	2,213.8	1,234.7	978.8	2,053.4	661.0	1,391.6	1,578.8
IV	19,202.3	14,931.8	14,733.1	190.4	2,219.9	1,236.1	983.4	2,068.8	662.8	1,405.0	1,581.2
2020: I	18,952.0	14,670.6	14,454.4	223.0	2,223.4	1,237.0	985.9	2,070.3	666.4	1,402.9	1,582.8
II	17,258.2	13,080.9	12,885.1	204.9	2,144.6	1,236.9	909.0	2,015.2	672.6	1,343.1	1,583.5
III	18,560.8	14,346.5	14,129.8	228.8	2,176.1	1,234.5	941.9	2,050.2	680.8	1,369.7	1,581.8
IV	18,767.8	14,559.8	14,342.4	227.4	2,187.0	1,232.2	954.6	2,038.3	678.0	1,360.7	1,580.5
2021: I	19,055.7	14,848.7	14,635.8	218.4	2,188.0	1,236.1	951.9	2,043.5	678.5	1,365.3	1,585.9
II	19,368.3	15,143.8	14,936.7	209.4	2,199.1	1,242.4	956.6	2,055.6	680.5	1,375.3	1,593.5
III	19,478.9	15,211.1	15,010.8	201.5	2,216.9	1,249.5	967.2	2,079.6	680.1	1,399.4	1,601.1
IV p	19,810.6	15,543.6	15,342.8	201.3	2,224.5	1,253.3	970.9	2,078.1	679.7	1,398.2	1,605.6

[1] Gross domestic business value added equals gross domestic product excluding gross value added of households and institutions and of general government. Nonfarm value added equals gross domestic business value added excluding gross farm value added.

[2] Equals compensation of employees of nonprofit institutions, the rental value of nonresidential fixed assets owned and used by nonprofit institutions serving households, and rental income of persons for tenant-occupied housing owned by nonprofit institutions.

[3] Equals compensation of general government employees plus general government consumption of fixed capital.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–8. Gross domestic product (GDP) by industry, value added, in current dollars and as a percentage of GDP, 1997–2020

[Billions of dollars; except as noted]

Year	Gross domestic product	Private industries: Total private industries	Agriculture, forestry, fishing, and hunting	Mining	Construction	Manufacturing: Total manufacturing	Durable goods	Nondurable goods	Utilities	Wholesale trade	Retail trade
	Value added										
1997	8,577.6	7,432.0	108.6	95.1	339.6	1,382.9	823.8	559.1	171.5	527.5	579.9
1998	9,062.8	7,871.5	99.8	81.7	379.8	1,430.6	850.7	579.9	163.7	563.7	626.9
1999	9,631.2	8,378.8	92.6	84.6	417.7	1,489.6	875.2	614.4	180.0	584.2	652.8
2000	10,251.0	8,927.9	98.3	110.5	461.2	1,549.8	924.6	625.2	180.1	622.5	685.4
2001	10,581.9	9,189.0	99.8	123.9	486.4	1,473.5	833.3	640.3	181.3	613.7	709.4
2002	10,929.1	9,454.7	95.9	112.4	493.5	1,468.3	832.8	635.6	177.6	613.1	732.6
2003	11,456.5	9,904.1	114.6	138.9	525.2	1,524.0	863.1	660.9	183.9	641.4	769.5
2004	12,217.2	10,585.9	143.8	166.4	584.6	1,607.8	905.0	702.8	199.1	697.1	795.5
2005	13,039.2	11,328.9	129.5	225.4	651.6	1,692.5	956.3	736.2	197.9	754.7	840.6
2006	13,815.6	12,023.6	126.4	273.1	697.1	1,793.5	1,004.2	789.3	226.7	811.4	869.8
2007	14,474.2	12,587.2	145.5	314.1	715.7	1,845.8	1,031.0	814.7	231.9	858.2	869.4
2008	14,769.9	12,788.3	146.0	392.5	649.3	1,802.1	1,000.2	801.8	241.7	884.8	848.8
2009	14,478.1	12,433.0	129.1	275.4	565.4	1,700.8	880.4	820.5	257.8	833.8	827.3
2010	15,049.0	12,941.0	144.9	306.4	525.7	1,799.8	965.5	834.3	279.1	890.0	852.1
2011	15,599.7	13,462.7	179.2	357.8	525.6	1,873.6	1,017.9	855.7	288.3	937.1	873.1
2012	16,254.0	14,094.5	178.7	360.5	554.9	1,934.7	1,065.2	869.5	280.7	1,000.3	910.0
2013	16,843.2	14,630.7	214.3	387.8	588.7	1,997.3	1,104.5	892.8	286.9	1,042.2	950.6
2014	17,550.7	15,279.3	198.9	417.0	637.7	2,053.5	1,135.6	917.9	298.3	1,089.6	975.1
2015	18,206.0	15,866.6	180.1	261.7	695.3	2,131.0	1,184.4	946.6	299.2	1,143.6	1,020.3
2016	18,695.1	16,310.9	165.8	218.1	747.7	2,102.9	1,187.8	915.1	302.0	1,135.8	1,053.0
2017	19,479.6	17,032.6	175.9	276.9	800.6	2,199.3	1,235.4	963.8	311.6	1,165.7	1,081.6
2018	20,527.2	17,980.9	175.6	320.1	847.1	2,334.1	1,298.9	1,035.3	319.0	1,217.4	1,119.7
2019	21,372.6	18,750.8	162.6	295.7	903.6	2,370.9	1,327.9	1,043.0	333.3	1,275.0	1,166.7
2020	20,893.7	18,223.1	174.5	182.1	895.9	2,272.0	1,268.8	1,003.1	341.7	1,243.3	1,202.2
	Percent	**Industry value added as a percentage of GDP (percent)**									
1997	100.0	86.6	1.3	1.1	4.0	16.1	9.6	6.5	2.0	6.2	6.8
1998	100.0	86.9	1.1	.9	4.2	15.8	9.4	6.4	1.8	6.2	6.9
1999	100.0	87.0	1.0	.9	4.3	15.5	9.1	6.4	1.9	6.1	6.8
2000	100.0	87.1	1.0	1.1	4.5	15.1	9.0	6.1	1.8	6.1	6.7
2001	100.0	86.8	.9	1.2	4.6	13.9	7.9	6.1	1.7	5.8	6.7
2002	100.0	86.5	.9	1.0	4.5	13.4	7.6	5.8	1.6	5.6	6.7
2003	100.0	86.4	1.0	1.2	4.6	13.3	7.5	5.8	1.6	5.6	6.7
2004	100.0	86.6	1.2	1.4	4.8	13.2	7.4	5.8	1.6	5.7	6.5
2005	100.0	86.9	1.0	1.7	5.0	13.0	7.3	5.6	1.5	5.8	6.4
2006	100.0	87.0	.9	2.0	5.0	13.0	7.3	5.7	1.6	5.9	6.3
2007	100.0	87.0	1.0	2.2	4.9	12.8	7.1	5.6	1.6	5.9	6.0
2008	100.0	86.6	1.0	2.7	4.4	12.2	6.8	5.4	1.6	6.0	5.7
2009	100.0	85.9	.9	1.9	3.9	11.7	6.1	5.7	1.8	5.8	5.7
2010	100.0	86.0	1.0	2.0	3.5	12.0	6.4	5.5	1.9	5.9	5.7
2011	100.0	86.3	1.1	2.3	3.4	12.0	6.5	5.5	1.8	6.0	5.6
2012	100.0	86.7	1.1	2.2	3.4	11.9	6.6	5.3	1.7	6.2	5.6
2013	100.0	86.9	1.3	2.3	3.5	11.9	6.6	5.3	1.7	6.2	5.6
2014	100.0	87.1	1.1	2.4	3.6	11.7	6.5	5.2	1.7	6.2	5.6
2015	100.0	87.2	1.0	1.4	3.8	11.7	6.5	5.2	1.6	6.3	5.6
2016	100.0	87.2	.9	1.2	4.0	11.2	6.4	4.9	1.6	6.1	5.6
2017	100.0	87.4	.9	1.4	4.1	11.3	6.3	4.9	1.6	6.0	5.6
2018	100.0	87.6	.9	1.6	4.1	11.4	6.3	5.0	1.6	5.9	5.5
2019	100.0	87.7	.8	1.4	4.2	11.1	6.2	4.9	1.6	6.0	5.5
2020	100.0	87.2	.8	.9	4.3	10.9	6.1	4.8	1.6	6.0	5.8

[1] Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
[2] Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Note: Data shown in Tables B–8 and B–9 are consistent with the 2021 annual revision of the industry accounts released in September 2021. For details see *Survey of Current Business*, October 2021.

See next page for continuation of table.

Table B–8. Gross domestic product (GDP) by industry, value added, in current dollars and as a percentage of GDP, 1997–2020—*Continued*

[Billions of dollars; except as noted]

Year	Private industries—Continued							Govern-ment	Private goods-producing industries[1]	Private services-producing industries[2]
	Transpor-tation and ware-housing	Information	Finance, insurance, real estate, rental, and leasing	Profes-sional and business services	Educational services, health care, and social assistance	Arts, entertain-ment, recreation, accommo-dation, and food services	Other services, except govern-ment			
	Value added									
1997	257.3	394.1	1,612.4	840.6	590.6	301.8	230.3	1,145.6	1,926.1	5,505.9
1998	280.0	434.6	1,710.1	914.0	615.8	322.1	248.7	1,191.3	1,991.8	5,879.7
1999	290.1	485.3	1,835.4	997.4	654.1	354.2	260.9	1,252.3	2,084.5	6,294.3
2000	307.8	471.2	1,974.7	1,104.9	695.4	386.5	279.7	1,323.0	2,219.9	6,708.0
2001	308.0	502.3	2,129.4	1,155.3	749.8	390.7	265.5	1,392.9	2,183.7	7,005.3
2002	305.6	550.5	2,210.0	1,189.8	807.0	413.5	284.9	1,474.4	2,170.2	7,284.6
2003	321.4	564.8	2,294.2	1,247.4	862.7	432.1	283.8	1,552.3	2,302.8	7,601.3
2004	352.0	620.3	2,392.8	1,340.9	927.2	461.1	297.2	1,631.3	2,502.7	8,083.2
2005	375.6	642.0	2,611.4	1,446.0	970.2	481.1	310.6	1,710.3	2,698.9	8,630.0
2006	410.3	651.9	2,745.2	1,546.5	1,035.3	511.4	325.0	1,792.0	2,890.1	9,133.5
2007	414.0	707.5	2,865.6	1,667.3	1,088.0	533.6	330.5	1,887.1	3,021.1	9,566.0
2008	427.0	743.8	2,816.1	1,777.9	1,185.0	542.9	330.3	1,981.6	2,989.8	9,798.4
2009	404.4	721.4	2,903.1	1,688.1	1,267.0	533.0	326.4	2,045.1	2,670.7	9,762.3
2010	433.5	754.9	2,990.4	1,768.5	1,311.3	556.2	328.2	2,108.0	2,776.8	10,164.2
2011	452.5	763.0	3,080.8	1,860.0	1,356.2	581.9	333.5	2,137.1	2,936.1	10,526.5
2012	473.3	762.7	3,289.2	1,968.9	1,409.3	622.7	348.6	2,159.5	3,028.8	11,065.7
2013	492.1	831.4	3,362.0	2,020.1	1,448.4	652.3	356.7	2,212.5	3,188.0	11,442.7
2014	522.5	844.4	3,560.7	2,120.2	1,492.6	691.9	376.8	2,271.4	3,307.1	11,972.2
2015	566.1	907.8	3,713.8	2,237.7	1,571.2	747.0	391.6	2,339.4	3,268.2	12,598.4
2016	582.4	970.3	3,883.2	2,306.2	1,652.6	790.5	400.5	2,384.2	3,234.5	13,076.4
2017	609.4	1,004.7	4,020.2	2,434.3	1,710.7	828.2	413.5	2,447.1	3,452.7	13,579.9
2018	648.1	1,064.6	4,257.8	2,586.9	1,784.2	869.6	436.5	2,546.3	3,677.0	14,303.9
2019	685.7	1,134.5	4,451.5	2,731.3	1,871.4	914.2	454.4	2,621.8	3,732.8	15,018.0
2020	572.0	1,167.9	4,592.1	2,689.8	1,798.6	672.1	419.0	2,670.6	3,524.4	14,698.7
	Industry value added as a percentage of GDP (percent)									
1997	3.0	4.6	18.8	9.8	6.9	3.5	2.7	13.4	22.5	64.2
1998	3.1	4.8	18.9	10.1	6.8	3.6	2.7	13.1	22.0	64.9
1999	3.0	5.0	19.1	10.4	6.8	3.7	2.7	13.0	21.6	65.4
2000	3.0	4.6	19.3	10.8	6.8	3.8	2.7	12.9	21.7	65.4
2001	2.9	4.7	20.1	10.9	7.1	3.7	2.5	13.2	20.6	66.2
2002	2.8	5.0	20.2	10.9	7.4	3.8	2.6	13.5	19.9	66.7
2003	2.8	4.9	20.0	10.9	7.5	3.8	2.5	13.5	20.1	66.3
2004	2.9	5.1	19.6	11.0	7.6	3.8	2.4	13.4	20.5	66.2
2005	2.9	4.9	20.0	11.1	7.4	3.7	2.4	13.1	20.7	66.2
2006	3.0	4.7	19.9	11.2	7.5	3.7	2.4	13.0	20.9	66.1
2007	2.9	4.9	19.8	11.5	7.5	3.7	2.3	13.0	20.9	66.1
2008	2.9	5.0	19.1	12.0	8.0	3.7	2.2	13.4	20.2	66.3
2009	2.8	5.0	20.1	11.7	8.8	3.7	2.3	14.1	18.4	67.4
2010	2.9	5.0	19.9	11.8	8.7	3.7	2.2	14.0	18.5	67.5
2011	2.9	4.9	19.7	11.9	8.7	3.7	2.1	13.7	18.8	67.5
2012	2.9	4.7	20.2	12.1	8.7	3.8	2.1	13.3	18.6	68.1
2013	2.9	4.9	20.0	12.0	8.6	3.9	2.1	13.1	18.9	67.9
2014	3.0	4.8	20.3	12.1	8.5	3.9	2.1	12.9	18.8	68.2
2015	3.1	5.0	20.4	12.3	8.6	4.1	2.2	12.8	18.0	69.2
2016	3.1	5.2	20.8	12.3	8.8	4.2	2.1	12.8	17.3	69.9
2017	3.1	5.2	20.6	12.5	8.8	4.3	2.1	12.6	17.7	69.7
2018	3.2	5.2	20.7	12.6	8.7	4.2	2.1	12.4	17.9	69.7
2019	3.2	5.3	20.8	12.8	8.8	4.3	2.1	12.3	17.5	70.3
2020	2.7	5.6	22.0	12.9	8.6	3.2	2.0	12.8	16.9	70.3

Note (cont'd): Value added is the contribution of each private industry and of government to GDP. Value added is equal to an industry's gross output minus its intermediate inputs. Current-dollar value added is calculated as the sum of distributions by an industry to its labor and capital, which are derived from the components of gross domestic income.

Value added industry data shown in Tables B–8 and B–9 are based on the 2012 North American Industry Classification System (NAICS).

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–9. Real gross domestic product by industry, value added, and percent changes, 1997–2020

Year	Gross domestic product	Private industries: Total private industries	Agriculture, forestry, fishing, and hunting	Mining	Construction	Manufacturing: Total manufacturing	Manufacturing: Durable goods	Manufacturing: Nondurable goods	Utilities	Wholesale trade	Retail trade
	Chain-type quantity indexes for value added (2012=100)										
1997	70.931	70.046	77.781	72.719	124.354	73.447	54.511	107.960	81.637	67.499	76.759
1998	74.110	73.402	75.893	75.656	130.050	76.469	58.994	106.119	77.993	74.131	84.135
1999	77.663	77.229	78.203	73.421	135.421	80.746	63.131	109.889	90.800	76.606	87.240
2000	80.830	80.653	89.714	65.086	140.845	86.510	70.473	110.880	91.942	80.289	90.127
2001	81.601	81.255	86.605	75.515	138.221	83.058	66.103	109.949	76.548	81.714	93.502
2002	82.985	82.670	89.789	77.598	133.748	83.793	67.503	109.179	79.187	82.739	97.602
2003	85.305	84.993	97.128	68.794	136.061	88.483	72.557	112.634	77.791	87.144	102.667
2004	88.592	88.565	104.991	69.198	140.907	94.727	77.761	120.408	82.510	91.106	104.409
2005	91.678	91.949	109.754	70.313	141.526	97.591	83.117	118.265	78.281	95.261	107.790
2006	94.229	94.880	111.588	81.229	138.689	103.211	89.557	122.110	83.357	98.148	108.680
2007	96.123	96.595	99.272	87.622	134.513	106.720	93.800	124.218	85.179	101.407	105.184
2008	96.241	96.324	99.372	84.835	121.342	104.522	94.301	117.744	89.539	101.651	101.255
2009	93.739	93.332	110.461	97.011	103.961	94.688	80.569	114.123	84.369	89.214	96.810
2010	96.278	95.883	107.225	85.963	98.810	100.081	90.953	112.119	94.906	94.469	99.023
2011	97.770	97.540	103.127	89.386	97.298	100.599	97.223	104.835	98.679	96.638	99.257
2012	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
2013	101.842	101.880	116.130	103.744	102.401	102.945	102.358	103.671	98.755	102.072	103.046
2014	104.172	104.617	116.724	114.972	104.349	104.601	103.902	105.467	94.883	106.032	104.956
2015	106.991	107.828	124.160	125.161	109.037	105.768	105.519	106.067	94.918	110.553	108.872
2016	108.775	109.748	131.263	118.502	113.193	105.458	105.707	105.121	100.030	109.159	112.919
2017	111.229	112.474	129.287	120.941	117.231	108.976	110.096	107.530	101.224	109.730	116.680
2018	114.475	116.061	133.135	121.136	119.956	113.457	115.413	110.982	100.875	110.950	120.389
2019	117.096	119.008	124.990	135.434	121.588	115.469	116.330	114.334	102.103	110.431	123.395
2020	113.109	114.529	142.510	121.647	117.208	112.050	110.615	113.857	106.381	108.354	119.834
	Percent change from year earlier										
1997	4.4	4.9	8.5	3.7	0.5	6.6	9.1	3.1	–5.2	10.9	7.5
1998	4.5	4.8	–2.4	4.0	4.6	4.1	8.2	–1.7	–4.5	9.8	9.6
1999	4.8	5.2	3.0	–3.0	4.1	5.6	7.0	3.6	16.4	3.3	3.7
2000	4.1	4.4	14.7	–11.4	4.0	7.1	11.6	.9	1.3	4.8	3.3
2001	1.0	.7	–3.5	16.0	–1.9	–4.0	–6.2	–.8	–16.7	1.8	3.7
2002	1.7	1.7	3.7	2.8	–3.2	.9	2.1	–.7	3.4	1.3	4.4
2003	2.8	2.8	8.2	–11.3	1.7	5.6	7.5	3.2	–1.8	5.3	5.2
2004	3.9	4.2	8.1	.6	3.6	7.1	7.2	6.9	6.1	4.5	1.7
2005	3.5	3.8	4.5	1.6	.4	3.0	6.9	–1.8	–5.1	4.6	3.2
2006	2.8	3.2	1.7	15.5	–2.0	5.8	7.7	3.3	6.5	3.0	.8
2007	2.0	1.8	–11.0	7.9	–3.0	3.4	4.7	1.7	2.2	3.3	–3.2
2008	.1	–.3	.1	–3.2	–9.8	–2.1	.5	–5.2	5.1	.2	–3.7
2009	–2.6	–3.1	11.2	14.4	–14.3	–9.4	–14.6	–3.1	–5.8	–12.2	–4.4
2010	2.7	2.7	–2.9	–11.4	–5.0	5.7	12.9	–1.8	12.5	5.9	2.3
2011	1.5	1.7	–3.8	4.0	–1.5	.5	6.9	–6.5	4.0	2.3	.2
2012	2.3	2.5	–3.0	11.9	2.8	–.6	2.9	–4.6	1.3	3.5	.7
2013	1.8	1.9	16.1	3.7	2.4	2.9	2.4	3.7	–1.2	2.1	3.0
2014	2.3	2.7	.5	10.8	1.9	1.6	1.5	1.7	–3.9	3.9	1.9
2015	2.7	3.1	6.4	8.9	4.5	1.1	1.6	.6	.0	4.3	3.7
2016	1.7	1.8	5.7	–5.3	3.8	–.3	.2	–.9	5.4	–1.3	3.7
2017	2.3	2.5	–1.5	2.1	3.6	3.3	4.2	2.3	1.2	.5	3.3
2018	2.9	3.2	3.0	.2	2.3	4.1	4.8	3.2	–.3	1.1	3.2
2019	2.3	2.5	–6.1	11.8	1.4	1.8	.8	3.0	1.2	–.5	2.5
2020	–3.4	–3.8	14.0	–10.2	–3.6	–3.0	–4.9	–.4	4.2	–1.9	–2.9

[1] Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
[2] Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

See next page for continuation of table.

TABLE B–9. Real gross domestic product by industry, value added, and percent changes, 1997–2020—*Continued*

Year	Private industries—Continued							Govern-ment	Private goods-producing industries [1]	Private services-producing industries [2]
	Transpor-tation and ware-housing	Information	Finance, insurance, real estate, rental, and leasing	Profes-sional and business services	Educational services, health care, and social assistance	Arts, entertain-ment, recreation, accommo-dation, and food services	Other services, except govern-ment			
	Chain-type quantity indexes for value added (2012=100)									
1997	84.687	45.514	64.047	63.505	65.087	78.592	115.380	87.664	81.001	67.082
1998	88.991	50.255	66.832	66.440	65.370	80.744	120.186	88.684	84.104	70.519
1999	89.731	56.341	71.072	69.573	67.564	85.167	120.996	89.743	88.164	74.287
2000	89.480	55.253	74.812	73.644	70.038	90.255	123.725	91.570	93.389	77.217
2001	83.650	58.676	78.601	75.849	71.815	87.220	111.631	92.529	91.021	78.624
2002	80.670	64.338	79.078	76.729	74.683	89.599	114.679	94.176	91.172	80.375
2003	83.579	66.391	79.608	79.196	77.657	91.907	111.481	95.338	94.634	82.397
2004	90.509	74.041	81.082	81.122	81.355	96.013	112.927	96.193	100.195	85.441
2005	94.860	78.974	86.517	84.732	82.879	96.269	113.691	97.080	102.577	89.093
2006	100.505	81.801	88.398	87.160	86.244	98.946	114.286	97.638	107.155	91.577
2007	99.790	89.943	90.254	90.088	86.927	98.432	111.693	98.590	108.829	93.305
2008	98.863	95.681	88.297	94.308	92.430	96.222	107.558	100.494	104.591	94.115
2009	92.702	93.038	92.938	88.066	95.531	90.582	101.117	100.556	97.383	92.247
2010	97.391	98.573	94.383	91.902	96.650	94.163	99.308	101.076	98.450	95.186
2011	99.295	100.202	95.951	95.650	98.364	97.550	98.489	100.755	98.726	97.215
2012	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
2013	101.389	108.867	99.486	101.208	101.220	102.051	99.174	99.296	103.727	101.376
2014	104.448	111.584	101.652	105.828	103.045	105.746	102.044	99.081	106.526	104.095
2015	107.144	123.147	102.770	109.409	106.918	109.018	102.620	99.199	109.624	107.334
2016	108.740	134.001	103.834	111.630	109.940	110.917	101.787	100.179	110.207	109.587
2017	113.484	142.545	104.288	116.872	111.886	113.644	102.423	101.164	113.558	112.156
2018	117.549	153.585	106.100	123.568	114.997	115.686	105.804	102.015	117.308	115.701
2019	119.611	164.264	108.176	129.199	118.248	118.019	105.811	102.629	119.773	118.767
2020	103.584	169.990	108.494	126.159	110.728	82.895	92.653	101.667	116.329	114.042
	Percent change from year earlier									
1997	4.4	–1.3	4.2	7.3	1.8	5.7	4.7	1.3	5.4	4.7
1998	5.1	10.4	4.3	4.6	0.4	2.7	4.2	1.2	3.8	5.1
1999	.8	12.1	6.3	4.7	3.4	5.5	.7	1.2	4.8	5.3
2000	–.3	–1.9	5.3	5.9	3.7	6.0	2.3	2.0	5.9	3.9
2001	–6.5	6.2	5.1	3.0	2.5	–3.4	–9.8	1.0	–2.5	1.8
2002	–3.6	9.6	.6	1.2	4.0	2.7	2.7	1.8	.2	2.2
2003	3.6	3.2	.7	3.2	4.0	2.6	–2.8	1.2	3.8	2.5
2004	8.3	11.5	1.9	2.4	4.8	4.5	1.3	.9	5.9	3.7
2005	4.8	6.7	6.7	4.5	1.9	.3	.7	.9	2.4	4.3
2006	6.0	3.6	2.2	2.9	4.1	2.8	.5	.6	4.5	2.8
2007	–.7	10.0	2.1	3.4	.8	–.5	–2.3	1.0	1.6	1.9
2008	–.9	6.4	–2.2	4.7	6.3	–2.2	–3.7	1.9	–3.9	.9
2009	–6.2	–2.8	5.3	–6.6	3.4	–5.9	–6.0	.1	–6.9	–2.0
2010	5.1	5.9	1.6	4.4	1.2	4.0	–1.8	.5	1.1	3.2
2011	2.0	1.7	1.7	4.1	1.8	3.6	–.8	–.3	.3	2.1
2012	.7	–.2	4.2	4.5	1.7	2.5	1.5	–.7	1.3	2.9
2013	1.4	8.9	–.5	1.2	1.2	2.1	–.8	–.7	3.7	1.4
2014	3.0	2.5	2.2	4.6	1.8	3.6	2.9	–.2	2.7	2.7
2015	2.6	10.4	1.1	3.4	3.8	3.1	.6	.1	2.9	3.1
2016	1.5	8.8	1.0	2.0	2.8	1.7	–.8	1.0	.5	2.1
2017	4.4	6.4	.4	4.7	1.8	2.5	.6	1.0	3.0	2.3
2018	3.6	7.7	1.7	5.7	2.8	1.8	3.3	.8	3.3	3.2
2019	1.8	7.0	2.0	4.6	2.8	2.0	.0	.6	2.1	2.6
2020	–13.4	3.5	.3	–2.4	–6.4	–29.8	–12.4	–.9	–2.9	–4.0

Note: Data are based on the 2012 North American Industry Classification System (NAICS).
See Note, Table B–8.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–10. Personal consumption expenditures, 1971–2021

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Personal consumption expenditures	Goods						Services					Addendum: Personal consumption expenditures excluding food and energy [2]
		Total	Durable		Nondurable			Total	Household consumption expenditures				
			Total [1]	Motor vehicles and parts	Total [1]	Food and beverages purchased for off-premises consumption	Gasoline and other energy goods		Total [1]	Housing and utilities	Health care	Financial services and insurance	
1971	699.9	342.1	102.4	43.2	239.7	107.1	27.6	357.8	346.1	120.0	53.7	33.1	548.5
1972	768.2	373.8	116.4	49.4	257.4	114.5	29.4	394.3	381.5	131.2	59.8	37.1	605.8
1973	849.6	416.6	130.5	54.4	286.1	126.7	34.3	432.9	419.2	143.5	67.2	39.9	668.5
1974	930.2	451.5	130.2	48.2	321.4	143.0	43.8	478.6	463.1	158.6	76.1	44.1	719.7
1975	1,030.5	491.3	142.2	52.6	349.2	156.6	48.0	539.2	522.2	176.5	89.0	51.8	797.3
1976	1,147.7	546.3	168.6	68.2	377.7	167.3	53.0	601.4	582.4	194.7	101.8	56.8	894.7
1977	1,274.0	600.4	192.0	79.8	408.4	179.8	57.8	673.6	653.0	217.8	115.7	65.1	998.6
1978	1,422.3	663.6	213.3	89.2	450.2	196.1	61.5	758.7	735.7	244.3	131.2	76.7	1,122.4
1979	1,585.4	737.9	226.3	90.2	511.6	218.4	80.4	847.5	821.4	273.4	148.8	83.6	1,239.7
1980	1,750.7	799.8	226.4	84.4	573.4	239.2	101.9	950.9	920.8	312.5	171.7	91.7	1,353.1
1981	1,934.0	869.4	243.9	93.0	625.4	255.3	113.4	1,064.6	1,030.4	352.1	201.9	98.5	1,501.5
1982	2,071.3	899.3	253.0	100.0	646.3	267.1	108.4	1,172.0	1,134.0	387.5	225.2	113.7	1,622.9
1983	2,281.6	973.8	295.0	122.9	678.8	277.0	106.5	1,307.8	1,267.1	421.2	253.1	141.0	1,817.2
1984	2,492.3	1,063.7	342.2	147.2	721.5	291.1	108.2	1,428.6	1,383.3	457.5	276.5	150.8	2,008.1
1985	2,712.8	1,137.6	380.4	170.1	757.2	303.0	110.5	1,575.2	1,527.3	500.6	302.2	178.2	2,210.3
1986	2,886.3	1,195.6	421.4	187.5	774.2	316.4	91.2	1,690.7	1,638.0	537.0	330.2	187.7	2,391.3
1987	3,076.3	1,256.3	442.0	188.2	814.3	324.3	96.4	1,820.0	1,764.3	571.6	366.0	189.5	2,566.6
1988	3,330.0	1,337.3	475.1	202.2	862.3	342.8	99.9	1,992.7	1,929.4	614.4	410.1	202.9	2,793.1
1989	3,576.8	1,423.8	494.3	207.8	929.5	365.4	110.4	2,153.0	2,084.9	655.2	451.2	222.3	3,002.1
1990	3,809.0	1,491.3	497.1	205.1	994.2	391.2	124.2	2,317.7	2,241.8	696.5	506.2	230.8	3,194.9
1991	3,943.4	1,497.4	477.2	185.7	1,020.3	403.0	121.1	2,446.0	2,365.9	735.2	555.8	250.1	3,314.4
1992	4,197.6	1,563.3	508.1	204.8	1,055.2	404.5	125.0	2,634.3	2,546.4	771.1	612.8	277.0	3,561.7
1993	4,452.0	1,642.3	551.5	224.7	1,090.8	413.5	126.9	2,809.6	2,719.6	814.9	648.8	314.0	3,796.6
1994	4,721.0	1,746.6	607.2	249.8	1,139.4	432.1	129.2	2,974.4	2,876.6	863.3	680.5	327.9	4,042.5
1995	4,962.6	1,815.5	635.7	255.7	1,179.8	443.7	133.4	3,147.1	3,044.7	913.7	719.9	347.0	4,267.2
1996	5,244.6	1,917.7	676.3	273.5	1,241.4	461.9	144.7	3,326.9	3,216.9	962.4	752.1	372.1	4,513.0
1997	5,536.8	2,006.5	715.5	293.1	1,291.0	474.8	147.7	3,530.3	3,424.7	1,009.8	790.9	408.9	4,787.8
1998	5,877.2	2,108.4	779.3	320.2	1,329.1	487.4	132.4	3,768.8	3,645.0	1,065.5	832.0	446.1	5,132.4
1999	6,283.8	2,287.1	855.6	350.7	1,431.5	515.5	146.5	3,996.7	3,858.5	1,123.1	863.6	484.6	5,495.9
2000	6,767.2	2,453.2	912.6	363.2	1,540.6	540.6	184.5	4,314.0	4,156.0	1,198.6	918.4	541.9	5,904.5
2001	7,073.8	2,525.6	941.5	383.3	1,584.1	564.0	178.0	4,548.2	4,369.1	1,287.5	996.6	529.3	6,182.2
2002	7,348.9	2,598.8	985.4	401.3	1,613.4	575.1	167.9	4,750.1	4,551.8	1,329.5	1,082.9	539.0	6,460.4
2003	7,740.7	2,722.6	1,017.8	401.5	1,704.8	599.6	196.4	5,018.2	4,812.6	1,391.1	1,154.0	574.2	6,784.4
2004	8,232.0	2,902.0	1,080.6	409.3	1,821.4	632.6	232.7	5,329.9	5,123.6	1,466.6	1,238.9	619.3	7,198.5
2005	8,769.1	3,082.9	1,128.6	410.0	1,954.3	668.2	283.8	5,686.1	5,475.9	1,580.1	1,320.5	676.8	7,627.2
2006	9,277.2	3,239.7	1,158.3	394.9	2,081.3	700.3	319.7	6,037.6	5,798.4	1,665.7	1,391.9	719.5	8,056.6
2007	9,746.6	3,367.0	1,188.0	400.6	2,179.0	737.3	345.5	6,379.6	6,130.8	1,759.6	1,478.2	762.7	8,453.5
2008	10,050.1	3,363.2	1,098.8	343.3	2,264.5	769.1	391.1	6,686.9	6,399.6	1,872.7	1,555.3	777.5	8,666.3
2009	9,891.2	3,180.0	1,012.1	318.6	2,167.9	772.9	287.0	6,711.2	6,422.0	1,900.0	1,632.7	720.5	8,616.1
2010	10,260.3	3,317.8	1,049.0	344.5	2,268.9	786.9	336.7	6,942.4	6,648.0	1,947.9	1,699.6	768.0	8,915.3
2011	10,698.9	3,518.1	1,093.5	365.2	2,424.6	819.5	413.8	7,180.7	6,868.9	1,983.3	1,757.1	811.1	9,246.6
2012	11,047.4	3,637.7	1,144.2	396.6	2,493.5	846.2	421.9	7,409.6	7,068.1	2,014.7	1,821.3	830.9	9,571.6
2013	11,363.5	3,730.0	1,189.4	417.5	2,540.6	864.0	418.2	7,633.6	7,281.0	2,083.5	1,858.2	869.3	9,861.4
2014	11,847.7	3,863.0	1,242.1	442.0	2,620.9	896.9	403.3	7,984.8	7,619.2	2,151.4	1,940.5	922.9	10,315.3
2015	12,263.5	3,923.0	1,307.6	475.3	2,615.4	921.0	309.4	8,340.5	7,968.9	2,206.6	2,057.3	974.4	10,807.4
2016	12,693.3	3,991.8	1,345.2	484.3	2,646.7	940.6	275.7	8,701.4	8,300.0	2,280.8	2,159.4	996.1	11,256.1
2017	13,239.1	4,158.6	1,396.6	501.3	2,761.9	973.1	309.9	9,080.6	8,662.6	2,363.2	2,238.8	1,069.0	11,731.4
2018	13,913.5	4,353.7	1,469.2	519.5	2,884.5	1,000.3	350.4	9,559.8	9,115.1	2,472.1	2,339.6	1,151.9	12,318.7
2019	14,428.7	4,478.9	1,513.3	514.5	2,965.6	1,030.9	337.6	9,949.8	9,509.9	2,571.5	2,458.2	1,171.6	12,820.0
2020	14,047.6	4,653.8	1,616.4	541.3	3,037.4	1,146.7	246.8	9,393.7	8,872.9	2,668.1	2,308.4	1,196.3	12,414.0
2021 p	15,746.9	5,482.8	2,026.6	700.3	3,456.2	1,235.5	359.3	10,264.1	9,781.0	2,777.4	2,548.0	1,270.3	13,893.5
2018: I	13,667.4	4,298.4	1,449.4	514.7	2,849.1	992.8	343.2	9,369.0	8,940.9	2,431.8	2,300.2	1,128.5	12,091.6
II	13,864.8	4,354.4	1,471.3	519.4	2,883.2	997.7	352.9	9,510.3	9,071.4	2,460.2	2,326.3	1,147.2	12,269.1
III	14,002.6	4,373.2	1,478.2	522.8	2,895.0	1,002.3	354.2	9,629.4	9,184.8	2,479.4	2,364.4	1,161.3	12,406.6
IV	14,119.3	4,388.8	1,477.8	521.0	2,911.0	1,008.6	351.3	9,730.5	9,263.5	2,517.0	2,367.4	1,170.5	12,507.6
2019: I	14,155.6	4,382.8	1,473.3	500.1	2,909.5	1,013.4	323.9	9,772.7	9,336.7	2,534.7	2,408.7	1,156.3	12,573.7
II	14,375.7	4,479.4	1,509.2	512.6	2,970.1	1,027.4	350.1	9,896.3	9,459.1	2,554.1	2,449.7	1,166.6	12,763.4
III	14,529.5	4,512.7	1,531.4	519.0	2,981.3	1,041.3	332.8	10,016.8	9,571.5	2,585.3	2,469.9	1,177.0	12,915.6
IV	14,653.9	4,540.8	1,539.2	526.6	3,001.6	1,041.5	343.7	10,113.2	9,672.3	2,611.8	2,504.3	1,186.5	13,027.5
2020: I	14,439.1	4,530.9	1,484.9	482.0	3,046.0	1,125.1	305.2	9,908.2	9,387.7	2,622.6	2,406.9	1,193.9	12,784.0
II	12,989.7	4,349.9	1,468.3	485.2	2,881.7	1,152.1	188.5	8,639.8	8,062.8	2,667.7	2,000.3	1,168.7	11,401.2
III	14,293.8	4,867.2	1,753.3	595.8	3,113.9	1,159.5	245.4	9,426.6	8,932.1	2,682.6	2,369.2	1,200.5	12,645.1
IV	14,467.6	4,867.3	1,759.2	602.1	3,108.1	1,150.0	247.9	9,600.4	9,109.0	2,699.7	2,457.2	1,222.0	12,825.7
2021: I	15,005.4	5,245.0	1,957.8	674.9	3,287.2	1,201.5	300.3	9,760.4	9,281.7	2,727.2	2,464.2	1,244.9	13,251.4
II	15,681.7	5,529.8	2,092.2	758.1	3,437.6	1,223.4	345.5	10,151.9	9,684.8	2,753.4	2,534.4	1,256.4	13,859.9
III	15,964.9	5,500.1	1,995.2	667.9	3,505.0	1,245.3	376.2	10,464.8	9,984.4	2,792.6	2,574.5	1,276.3	14,081.5
IV p	16,335.5	5,656.2	2,061.3	700.5	3,595.0	1,271.7	415.2	10,679.2	10,173.0	2,836.5	2,618.8	1,303.8	14,381.3

[1] Includes other items not shown separately.
[2] Food consists of food and beverages purchased for off-premises consumption; food services, which include purchased meals and beverages, are not classified as food.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–11. Real personal consumption expenditures, 2002–2021

[Billions of chained (2012) dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Personal consumption expenditures	Goods						Services					Addendum: Personal consumption expenditures excluding food and energy [2]
		Total	Durable		Nondurable			Total	Household consumption expenditures				
			Total [1]	Motor vehicles and parts	Total [1]	Food and beverages purchased for off-premises consumption	Gasoline and other energy goods		Total [1]	Housing and utilities	Health care	Financial services and insurance	
2002	9,106.2	2,947.6	820.2	416.9	2,157.5	744.5	455.2	6,168.7	5,983.7	1,705.6	1,440.7	710.3	7,734.5
2003	9,394.4	3,092.0	879.3	429.2	2,233.6	761.8	455.6	6,306.3	6,104.2	1,730.0	1,479.3	711.3	7,993.5
2004	9,748.6	3,250.0	952.1	441.1	2,306.5	779.5	459.4	6,498.5	6,294.1	1,774.1	1,531.2	736.0	8,317.8
2005	10,093.8	3,384.7	1,004.9	435.1	2,383.4	809.2	457.4	6,707.4	6,505.2	1,846.2	1,581.9	775.2	8,624.1
2006	10,386.2	3,509.7	1,049.3	419.0	2,461.6	834.0	456.3	6,873.1	6,641.7	1,867.5	1,618.2	790.5	8,896.6
2007	10,638.7	3,607.6	1,099.7	427.3	2,503.4	845.2	455.4	7,027.0	6,788.8	1,906.3	1,657.2	809.7	9,131.3
2008	10,654.7	3,498.9	1,036.4	373.1	2,463.9	831.0	437.5	7,154.9	6,877.4	1,959.9	1,697.9	829.4	9,181.1
2009	10,515.6	3,389.8	973.0	346.7	2,423.1	825.3	440.1	7,125.8	6,837.0	1,966.3	1,735.1	821.2	9,043.8
2010	10,716.0	3,485.7	1,027.3	360.0	2,461.3	837.7	437.9	7,230.4	6,932.0	2,011.3	1,761.7	820.0	9,224.2
2011	10,898.3	3,561.8	1,079.7	370.1	2,482.9	839.0	427.8	7,336.7	7,023.9	2,019.1	1,788.7	841.3	9,417.7
2012	11,047.4	3,637.7	1,144.2	396.6	2,493.5	846.2	421.9	7,409.6	7,068.1	2,014.7	1,821.3	830.9	9,571.6
2013	11,211.7	3,752.2	1,214.1	415.3	2,538.5	855.5	429.7	7,460.3	7,114.7	2,033.6	1,832.6	826.0	9,712.4
2014	11,515.3	3,905.1	1,301.6	439.4	2,605.3	871.4	430.0	7,613.2	7,267.9	2,039.3	1,892.8	828.7	9,996.8
2015	11,892.9	4,090.9	1,400.6	472.8	2,693.7	884.8	450.0	7,809.8	7,471.7	2,039.6	1,994.6	848.8	10,343.3
2016	12,187.7	4,231.7	1,476.0	487.2	2,760.5	913.2	453.0	7,968.5	7,614.8	2,049.4	2,070.0	830.7	10,605.2
2017	12,483.7	4,395.2	1,568.4	510.4	2,834.2	945.9	450.8	8,110.1	7,755.3	2,052.8	2,115.0	846.5	10,869.0
2018	12,845.0	4,569.3	1,678.2	531.2	2,903.6	967.3	448.2	8,305.7	7,936.0	2,082.5	2,169.7	859.1	11,189.1
2019	13,126.3	4,723.0	1,749.7	524.9	2,988.1	987.1	447.6	8,443.7	8,090.8	2,102.2	2,240.3	849.3	11,450.7
2020	12,629.9	4,942.5	1,884.3	542.0	3,080.5	1,062.0	386.3	7,808.5	7,393.5	2,124.3	2,051.8	851.6	10,932.3
2021 ^{p}	13,629.4	5,545.1	2,225.3	623.4	3,360.4	1,109.4	423.4	8,261.4	7,906.4	2,148.5	2,201.0	877.4	11,841.7
2018: I	12,707.6	4,511.9	1,647.8	527.8	2,875.3	962.1	446.6	8,223.8	7,864.6	2,071.7	2,148.6	857.2	11,064.0
II	12,816.4	4,558.8	1,676.3	532.5	2,895.3	966.2	449.9	8,287.3	7,921.1	2,080.2	2,160.3	860.2	11,160.0
III	12,900.6	4,591.4	1,692.0	533.2	2,912.6	968.4	447.6	8,339.7	7,970.8	2,082.1	2,189.3	860.0	11,246.4
IV	12,955.5	4,615.2	1,696.7	531.5	2,931.3	972.6	449.0	8,371.8	7,987.4	2,096.3	2,180.6	858.9	11,286.0
2019: I	12,975.1	4,630.6	1,693.6	511.7	2,948.7	970.6	448.9	8,377.8	8,020.3	2,095.9	2,211.5	852.6	11,314.1
II	13,088.8	4,709.1	1,737.5	521.8	2,985.4	985.1	450.8	8,420.2	8,067.7	2,095.3	2,239.0	846.7	11,418.4
III	13,192.3	4,765.5	1,773.1	528.5	3,008.2	997.9	448.0	8,471.0	8,118.2	2,105.9	2,247.5	846.8	11,504.7
IV	13,249.0	4,786.9	1,794.7	537.5	3,010.1	994.7	443.0	8,505.9	8,157.0	2,111.8	2,263.3	850.9	11,565.6
2020: I	13,014.5	4,790.2	1,738.3	493.0	3,061.8	1,066.8	414.1	8,284.4	7,870.2	2,104.9	2,165.7	847.3	11,300.9
II	11,756.4	4,665.8	1,731.8	498.4	2,949.1	1,056.5	341.7	7,217.3	6,748.9	2,128.9	1,782.6	842.0	10,098.1
III	12,820.8	5,158.9	2,030.6	586.8	3,159.9	1,066.8	401.2	7,815.2	7,422.8	2,130.7	2,094.5	852.4	11,103.1
IV	12,927.9	5,155.0	2,036.4	589.7	3,151.1	1,057.9	388.3	7,917.0	7,531.9	2,132.5	2,164.4	864.7	11,227.2
2021: I	13,282.7	5,476.6	2,253.5	661.2	3,269.3	1,103.3	393.7	7,993.4	7,622.4	2,142.4	2,140.7	874.7	11,523.8
II	13,665.6	5,646.7	2,316.2	686.1	3,377.2	1,112.1	425.5	8,214.3	7,863.1	2,143.9	2,193.6	867.9	11,875.1
III	13,732.4	5,518.3	2,158.5	576.0	3,394.0	1,111.2	437.1	8,378.5	8,031.4	2,152.5	2,219.8	876.6	11,930.8
IV ^{p}	13,836.7	5,538.8	2,173.0	570.2	3,400.8	1,111.2	437.5	8,459.4	8,108.9	2,155.1	2,249.7	890.5	12,037.1

[1] Includes other items not shown separately.
[2] Food consists of food and beverages purchased for off-premises consumption; food services, which include purchased meals and beverages, are not classified as food.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–12. Private fixed investment by type, 1971–2021

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Private fixed investment	Nonresidential: Total nonresidential	Nonresidential: Structures	Nonresidential: Equipment: Total [1]	Equipment: Information processing equipment: Total	Information processing equipment: Computers and peripheral equipment	Information processing equipment: Other	Equipment: Industrial equipment	Equipment: Transportation equipment	Intellectual property products: Total [1]	Intellectual property products: Software	Intellectual property products: Research and development [2]	Residential: Total residential [1]	Residential: Structures: Total [1]	Residential: Structures: Single family
1971	188.6	130.4	42.7	69.1	14.9	2.8	12.2	19.5	18.4	18.7	2.4	11.9	58.2	56.9	25.8
1972	219.0	146.6	47.2	78.9	16.7	3.5	13.2	21.4	21.8	20.6	2.8	12.9	72.4	70.9	32.8
1973	251.0	172.7	55.0	95.1	19.9	3.5	16.3	26.0	26.6	22.7	3.2	14.6	78.3	76.6	35.2
1974	260.5	191.1	61.2	104.3	23.1	3.9	19.2	30.7	26.3	25.5	3.9	16.4	69.5	67.6	29.7
1975	263.5	196.8	61.4	107.6	23.8	3.6	20.2	31.3	25.2	27.8	4.8	17.5	66.7	64.8	29.6
1976	306.1	219.3	65.9	121.2	27.5	4.4	23.1	34.1	30.0	32.2	5.2	19.6	86.8	84.6	43.9
1977	374.3	259.1	74.6	148.7	33.7	5.7	28.0	39.4	39.3	35.8	5.5	21.8	115.2	112.8	62.2
1978	452.6	314.6	93.6	180.6	42.3	7.6	34.8	47.7	47.3	40.4	6.3	24.9	138.0	135.3	72.8
1979	521.7	373.8	117.7	208.1	50.3	10.2	40.2	56.2	53.6	48.1	8.1	29.1	147.8	144.7	72.3
1980	536.4	406.9	136.2	216.4	58.9	12.5	46.4	60.7	48.4	54.4	9.8	34.2	129.5	126.1	52.9
1981	601.4	472.9	167.3	240.9	69.6	17.1	52.5	65.5	50.6	64.8	11.8	39.7	128.5	124.9	52.0
1982	595.9	485.1	177.6	234.9	74.2	18.9	55.3	62.7	46.8	72.7	14.0	44.8	110.8	107.2	41.5
1983	643.3	482.2	154.3	246.5	83.7	23.9	59.8	58.9	53.5	81.3	16.4	49.6	161.1	156.9	72.5
1984	754.7	564.3	177.4	291.9	101.2	31.6	69.6	68.1	64.4	95.0	20.4	56.9	190.4	185.6	86.4
1985	807.8	607.8	194.5	307.9	106.6	33.7	72.9	72.5	69.0	105.3	23.8	63.0	200.1	195.0	87.4
1986	842.6	607.8	176.5	317.7	111.1	33.4	77.7	75.4	70.5	113.5	25.6	66.5	234.8	229.3	104.1
1987	865.0	615.2	174.2	320.9	112.2	35.8	76.4	76.7	68.1	120.1	29.0	69.2	249.8	244.0	117.2
1988	918.5	662.3	182.8	346.8	120.8	38.0	82.8	84.2	72.9	132.7	33.3	76.4	256.2	250.1	120.1
1989	972.0	716.0	193.7	372.2	130.7	43.1	87.6	93.3	67.9	150.1	40.6	84.1	256.0	249.9	120.9
1990	978.9	739.2	202.9	371.9	129.6	38.6	90.9	92.1	70.0	164.4	45.4	91.5	239.7	233.7	112.9
1991	944.7	723.6	183.6	360.8	129.2	37.7	91.5	89.3	71.5	179.1	48.7	101.0	221.2	215.4	99.4
1992	996.7	741.9	172.6	381.7	142.1	44.0	98.1	93.0	74.7	187.7	51.1	105.4	254.7	248.8	122.0
1993	1,086.0	799.2	177.2	425.1	153.3	47.9	105.4	102.2	89.4	196.9	57.2	106.3	286.8	280.7	140.1
1994	1,192.7	868.9	186.8	476.4	167.0	52.4	114.6	113.6	107.7	205.7	60.4	109.2	323.8	317.6	162.3
1995	1,286.3	962.2	207.3	528.1	188.4	66.1	122.3	129.0	116.1	226.8	65.5	121.2	324.1	317.7	153.5
1996	1,401.3	1,043.2	224.6	565.3	204.7	72.8	131.9	136.5	123.2	253.3	74.5	134.5	358.1	351.7	170.8
1997	1,524.7	1,149.1	250.3	610.9	222.8	81.4	141.4	140.4	135.5	288.0	93.8	148.1	375.6	369.3	175.2
1998	1,673.0	1,254.1	276.0	660.0	240.1	87.9	152.2	147.4	147.1	318.1	109.2	160.6	418.8	412.1	199.4
1999	1,826.2	1,364.5	285.7	713.6	259.8	97.2	162.5	149.1	174.4	365.1	136.6	177.5	461.8	454.5	223.8
2000	1,983.9	1,498.4	321.0	766.1	293.8	103.2	190.6	162.9	170.8	411.3	156.8	199.0	485.4	477.7	236.8
2001	1,973.1	1,460.1	333.5	711.5	265.9	87.6	178.4	151.9	154.2	415.0	157.7	202.7	513.1	505.2	249.1
2002	1,910.4	1,352.8	287.0	659.6	236.7	79.7	157.0	141.7	141.6	406.2	152.5	196.1	557.6	549.6	265.9
2003	2,013.0	1,375.9	286.6	670.6	242.7	79.9	162.8	143.4	134.1	418.7	155.0	201.0	637.1	628.8	310.6
2004	2,217.2	1,467.4	307.7	721.9	255.8	84.2	171.6	144.2	159.2	437.8	166.3	207.4	749.8	740.8	377.6
2005	2,477.2	1,621.0	353.0	794.9	267.0	84.2	182.8	162.4	179.6	473.1	178.6	224.7	856.2	846.6	433.5
2006	2,632.0	1,793.8	425.2	862.3	288.5	92.6	195.9	181.6	194.3	506.3	189.5	245.6	838.2	828.1	416.0
2007	2,639.1	1,948.6	510.3	893.4	310.9	95.4	215.5	194.1	188.8	544.8	206.4	268.0	690.5	680.6	305.2
2008	2,506.9	1,990.9	571.1	845.4	306.3	93.9	212.4	194.3	148.7	574.4	223.8	284.2	516.0	506.4	185.8
2009	2,080.4	1,690.4	455.8	670.3	275.6	88.9	186.7	153.7	74.9	564.4	226.0	274.6	390.0	381.2	105.3
2010	2,111.6	1,735.0	379.8	777.0	307.5	99.6	207.9	155.2	135.8	578.2	226.4	282.4	376.6	367.4	112.6
2011	2,286.3	1,907.5	404.5	881.3	313.3	95.6	217.7	191.5	177.8	621.7	249.8	303.4	378.8	369.1	108.2
2012	2,550.5	2,118.5	479.4	983.4	331.2	103.5	227.7	211.2	215.3	655.7	272.1	313.4	432.0	421.5	132.0
2013	2,721.5	2,211.5	492.5	1,027.0	341.7	102.1	239.6	209.3	242.5	691.9	283.7	337.9	510.0	499.0	170.8
2014	2,960.2	2,400.1	577.6	1,091.9	346.0	101.9	244.1	218.8	272.8	730.5	297.5	359.5	560.2	548.8	193.6
2015	3,100.4	2,466.6	584.4	1,119.5	352.8	101.3	251.5	218.2	306.3	762.7	307.1	378.3	633.8	622.1	221.1
2016	3,168.8	2,469.3	560.4	1,087.8	353.0	99.4	253.6	213.9	292.3	821.2	334.8	404.4	699.4	687.3	242.5
2017	3,351.9	2,591.6	599.3	1,117.4	369.2	104.7	264.5	225.0	294.0	875.0	365.7	423.5	760.3	747.9	270.2
2018	3,579.1	2,780.6	633.3	1,190.5	390.2	119.3	270.9	242.7	309.5	956.7	401.3	465.6	798.5	785.6	289.6
2019	3,752.6	2,938.7	672.6	1,231.3	393.9	119.1	274.8	251.9	320.3	1,034.8	427.7	514.4	813.9	800.8	280.0
2020	3,697.4	2,799.6	597.2	1,123.9	413.9	128.1	285.8	241.7	206.0	1,078.5	453.4	537.7	897.8	883.4	309.4
2021 p	4,139.4	3,053.9	579.7	1,274.5	472.0	146.5	325.5	287.4	220.9	1,199.7	504.3	601.5	1,085.5	1,068.4	407.9
2018: I	3,505.0	2,716.0	627.2	1,166.4	389.5	117.0	272.5	237.0	303.0	922.3	386.9	447.2	789.0	776.3	287.1
II	3,579.0	2,770.1	641.6	1,175.7	388.1	120.1	268.0	240.1	300.6	952.7	400.2	463.1	808.9	795.9	297.0
III	3,602.5	2,798.1	638.2	1,195.7	392.6	121.0	271.6	243.7	309.2	964.2	405.5	468.3	804.3	791.3	293.8
IV	3,629.9	2,838.1	626.1	1,224.2	390.6	119.2	271.4	250.1	325.2	987.7	412.8	483.7	791.8	779.0	280.4
2019: I	3,683.4	2,886.9	639.9	1,240.2	396.6	120.0	276.6	249.5	333.0	1,006.7	415.5	499.7	796.5	783.6	271.8
II	3,754.5	2,946.1	669.4	1,247.4	397.6	121.8	275.8	254.2	328.3	1,029.3	423.5	513.4	808.5	795.3	276.5
III	3,791.2	2,969.3	696.0	1,227.4	391.0	115.6	275.4	256.0	312.5	1,046.0	432.7	520.2	821.9	808.6	283.0
IV	3,781.4	2,952.6	685.3	1,210.3	390.2	118.9	271.3	247.8	307.4	1,057.0	439.1	524.3	828.8	815.7	288.6
2020: I	3,773.0	2,900.1	687.1	1,141.9	379.1	113.5	265.6	242.8	260.2	1,071.1	449.2	529.8	872.9	859.7	306.3
II	3,456.9	2,659.1	585.9	1,020.6	397.0	126.0	270.9	229.1	155.5	1,052.6	444.9	519.9	797.8	784.1	279.4
III	3,693.8	2,776.6	563.5	1,135.5	432.2	133.9	298.3	241.5	191.2	1,077.6	453.6	539.9	917.2	901.8	298.9
IV	3,865.9	2,862.7	552.3	1,197.5	447.3	138.9	308.5	253.4	217.1	1,112.9	466.0	561.3	1,003.2	988.2	353.0
2021: I	4,022.2	2,956.7	565.0	1,244.5	472.1	152.8	319.2	260.8	225.4	1,147.2	484.2	576.3	1,065.5	1,048.7	388.9
II	4,099.4	3,029.2	572.8	1,270.4	461.9	137.4	324.5	284.7	231.2	1,186.0	501.3	594.5	1,070.2	1,052.9	405.0
III	4,159.8	3,073.9	581.9	1,277.2	461.4	143.2	318.2	294.9	222.3	1,214.9	511.7	607.2	1,085.9	1,068.7	415.1
IV p	4,276.1	3,155.7	599.1	1,306.1	492.7	152.4	340.3	309.4	204.5	1,250.5	520.0	627.8	1,120.4	1,103.3	422.5

[1] Includes other items not shown separately.
[2] Research and development investment includes expenditures for software.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–13. Real private fixed investment by type, 2002–2021

[Billions of chained (2012) dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Private fixed investment	Nonresidential											Residential		
		Total nonresidential	Structures	Equipment						Intellectual property products			Total residential [2]	Structures	
				Total [2]	Information processing equipment			Industrial equipment	Transportation equipment	Total [2]	Software	Research and development [3]		Total [2]	Single family
					Total	Computers and peripheral equipment [1]	Other								
2002	2,183.4	1,472.7	473.5	607.8	133.3	35.9	98.3	181.4	162.4	421.5	125.5	244.1	692.6	685.1	327.1
2003	2,280.6	1,509.4	456.6	634.3	150.4	40.2	111.1	182.2	150.3	437.7	133.5	246.1	755.5	747.7	362.0
2004	2,440.7	1,594.0	456.3	688.6	169.4	45.7	124.7	178.8	171.2	459.2	149.3	248.1	830.9	822.1	405.4
2005	2,618.7	1,716.4	466.1	760.0	187.6	51.8	136.5	194.2	192.1	493.1	163.4	261.6	885.4	876.3	432.8
2006	2,686.8	1,854.2	501.7	832.6	217.0	64.7	152.4	210.6	206.4	521.5	173.5	279.6	818.9	809.5	390.4
2007	2,653.5	1,982.1	568.6	865.8	247.2	73.9	173.3	217.3	197.7	554.3	191.1	296.1	665.8	656.6	283.5
2008	2,499.4	1,994.2	605.4	824.4	260.6	79.7	180.9	208.3	155.0	575.3	206.7	304.8	504.6	495.7	178.1
2009	2,099.8	1,704.3	492.2	649.7	247.5	81.1	166.5	162.7	72.5	572.4	212.9	297.4	395.3	386.9	105.3
2010	2,164.2	1,781.0	412.8	781.2	289.1	94.1	195.1	162.5	141.5	588.1	220.9	298.5	383.0	373.8	114.3
2011	2,317.8	1,935.4	424.1	886.2	303.2	93.9	209.3	194.9	181.8	624.8	245.2	311.0	382.5	372.4	109.1
2012	2,550.5	2,118.5	479.4	983.4	331.2	103.5	227.7	211.2	215.3	655.7	272.1	313.4	432.0	421.5	132.0
2013	2,692.1	2,206.0	485.5	1,029.2	351.8	103.0	248.8	208.4	238.5	691.4	287.2	333.8	485.5	474.1	161.8
2014	2,869.2	2,365.3	538.8	1,101.1	370.2	102.9	267.7	216.5	265.0	724.8	305.3	346.9	504.1	491.8	171.8
2015	2,979.0	2,420.3	534.1	1,134.6	393.3	103.4	291.0	216.7	292.8	752.4	320.2	357.1	555.4	542.0	191.5
2016	3,041.0	2,442.0	511.0	1,114.6	410.5	103.0	309.3	213.4	276.3	818.8	354.0	387.1	592.1	577.7	201.3
2017	3,164.3	2,541.4	532.5	1,145.5	438.6	108.9	331.9	222.5	273.5	865.2	392.6	394.7	615.9	600.6	214.8
2018	3,316.2	2,704.4	553.6	1,218.8	472.0	123.7	349.2	235.4	287.0	935.5	437.1	419.9	612.3	596.9	220.7
2019	3,421.3	2,822.0	565.0	1,258.8	489.6	127.6	363.0	240.6	295.0	1,002.9	467.8	454.8	606.7	591.3	206.8
2020	3,329.4	2,671.1	494.2	1,154.0	523.0	140.7	382.5	228.8	191.3	1,031.3	502.3	458.8	648.0	631.6	219.7
2021 p	3,587.5	2,868.8	454.3	1,304.4	599.8	159.0	441.5	260.6	218.9	1,136.1	569.7	497.4	707.3	689.3	259.6
2018: I	3,273.2	2,654.0	554.2	1,196.6	467.2	121.1	347.2	231.6	281.9	905.2	420.1	407.1	616.5	600.9	222.7
II	3,321.2	2,698.0	563.7	1,205.4	468.4	124.5	344.4	233.3	279.2	930.3	434.5	417.6	621.5	605.8	226.7
III	3,327.9	2,716.7	557.7	1,221.3	475.5	125.3	350.9	235.6	285.6	940.8	441.4	421.0	612.2	596.8	222.7
IV	3,342.6	2,749.0	538.9	1,251.7	477.1	123.9	354.4	241.0	301.3	965.8	452.2	433.8	599.0	584.0	210.8
2019: I	3,372.8	2,780.7	544.7	1,265.2	487.0	125.7	362.8	239.2	307.7	978.5	454.8	443.4	599.1	584.0	201.9
II	3,423.2	2,826.0	563.2	1,273.1	492.6	129.9	363.5	243.1	301.2	995.7	461.4	453.8	605.2	589.8	205.5
III	3,449.3	2,846.5	582.0	1,256.4	487.8	124.7	364.8	244.1	288.5	1,010.5	471.2	458.7	610.6	595.0	208.6
IV	3,439.9	2,834.7	570.0	1,240.6	490.8	130.3	361.1	235.8	282.7	1,027.1	483.8	463.4	612.2	596.4	211.1
2020: I	3,419.6	2,775.5	568.8	1,168.3	478.0	125.1	353.8	230.2	237.1	1,036.6	497.4	463.0	641.2	625.2	221.8
II	3,123.0	2,535.7	485.8	1,044.0	501.7	138.1	363.0	217.4	140.9	1,008.0	492.2	446.1	584.9	569.2	201.1
III	3,318.5	2,646.9	466.0	1,166.6	545.9	146.6	399.5	228.5	178.5	1,027.7	503.5	457.1	657.8	640.6	210.5
IV	3,456.6	2,726.2	456.1	1,237.1	566.5	152.9	413.7	238.8	208.7	1,053.0	516.1	469.0	708.2	691.3	245.6
2021: I	3,564.1	2,810.4	462.1	1,278.5	600.1	167.8	431.1	243.0	212.6	1,091.9	547.1	480.1	730.6	712.2	262.4
II	3,593.0	2,873.1	458.6	1,315.7	588.1	150.2	440.0	260.9	236.1	1,124.6	565.5	493.0	708.2	689.9	263.4
III	3,585.0	2,884.8	453.8	1,307.9	586.1	154.6	432.4	265.1	225.8	1,149.3	578.2	501.6	694.2	676.5	259.0
IV p	3,607.8	2,907.0	442.7	1,315.6	624.9	163.6	462.6	273.4	201.1	1,178.5	587.9	515.1	696.0	678.5	253.6

[1] Because computers exhibit rapid changes in prices relative to other prices in the economy, the chained-dollar estimates should not be used to measure the component's relative importance or its contribution to the growth rate of more aggregate series. The quantity index for computers can be used to accurately measure the real growth rate of this series. For information on this component, see *Survey of Current Business* Table 5.3.1 (for growth rates), Table 5.3.2 (for contributions), and Table 5.3.3 (for quantity indexes).

[2] Includes other items not shown separately.

[3] Research and development investment includes expenditures for software.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–14. Foreign transactions in the national income and product accounts, 1971–2021

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Current receipts from rest of the world					Current payments to rest of the world									
	Total	Exports of goods and services			Income receipts	Total	Imports of goods and services			Income payments	Current taxes and transfer payments to rest of the world (net)				Balance on current account, NIPA [2]
		Total	Goods [1]	Services [1]			Total	Goods [1]	Services [1]		Total	From persons (net)	From government (net)	From business (net)	
1971	77.0	63.0	46.2	16.8	14.0	76.7	62.3	46.6	15.8	6.4	7.9	1.4	6.1	0.4	0.3
1972	87.1	70.8	52.6	18.3	16.3	91.2	74.2	56.9	17.3	7.7	9.2	1.4	7.4	.5	–4.0
1973	118.8	95.3	75.8	19.5	23.5	109.9	91.2	71.8	19.3	10.9	7.9	1.6	5.6	.7	8.9
1974	156.5	126.7	103.5	23.2	29.8	150.5	127.5	104.5	22.9	14.3	8.7	1.4	6.4	1.0	6.0
1975	166.7	138.7	112.5	26.2	28.0	146.9	122.7	99.0	23.7	15.0	9.1	1.3	7.1	.7	19.8
1976	181.9	149.5	121.5	28.0	32.4	174.8	151.1	124.6	26.5	15.5	8.1	1.4	5.7	1.1	7.1
1977	196.5	159.3	128.4	30.9	37.2	207.5	182.4	152.6	29.8	16.9	8.1	1.4	5.3	1.4	–10.9
1978	233.1	186.9	149.9	37.0	46.3	245.8	212.3	177.4	34.8	24.7	8.8	1.6	5.9	1.4	–12.6
1979	298.5	230.1	187.3	42.9	68.3	299.6	252.7	212.8	39.9	36.4	10.6	1.7	6.8	2.0	–1.2
1980	359.9	280.8	230.4	50.3	79.1	351.4	293.8	248.6	45.3	44.9	12.6	2.0	8.3	2.4	8.5
1981	397.3	305.2	245.2	60.0	92.0	393.9	317.8	267.8	49.9	59.1	17.0	5.6	8.3	3.2	3.4
1982	384.2	283.2	222.6	60.7	101.0	387.5	303.2	250.5	52.6	64.5	19.8	6.7	9.7	3.4	–3.3
1983	378.9	277.0	214.0	62.9	101.9	413.9	328.6	272.7	56.0	64.8	20.5	7.0	10.1	3.4	–35.1
1984	424.2	302.4	231.3	71.1	121.9	514.3	405.1	336.3	68.8	85.6	23.6	7.9	12.2	3.5	–90.1
1985	415.9	303.2	227.5	75.7	112.7	530.2	417.2	343.3	73.9	87.3	25.7	8.3	14.4	2.9	–114.3
1986	432.3	321.0	231.4	89.6	111.3	575.0	452.9	370.0	82.9	94.4	27.8	9.1	15.4	3.2	–142.7
1987	487.2	363.9	265.6	98.4	123.3	641.3	508.7	414.8	93.9	105.8	26.8	10.0	13.4	3.4	–154.1
1988	596.7	444.6	332.1	112.5	152.1	712.4	554.0	452.1	101.9	129.5	29.0	10.8	13.7	4.5	–115.7
1989	682.0	504.3	374.8	129.5	177.7	774.3	591.0	484.8	106.2	152.9	30.4	11.6	14.2	4.6	–92.4
1990	740.7	551.9	403.3	148.6	188.8	815.6	629.7	508.1	121.7	154.2	31.7	12.2	14.7	4.8	–74.9
1991	763.3	594.9	430.1	164.8	168.4	755.4	623.5	500.7	122.8	136.8	–4.9	14.1	–24.0	5.0	7.9
1992	785.1	633.1	455.3	177.7	152.1	830.7	667.8	544.9	122.9	121.0	41.9	14.5	22.0	5.4	–45.6
1993	810.4	654.8	467.7	187.1	155.6	889.8	720.0	592.8	127.2	124.4	45.4	17.1	22.9	5.4	–79.4
1994	905.5	720.9	518.4	202.6	184.5	1,021.1	813.4	676.8	136.6	161.6	46.1	18.9	21.1	6.0	–115.6
1995	1,042.6	812.8	592.4	220.4	229.8	1,148.5	902.6	757.4	145.1	201.9	44.1	20.3	15.6	8.2	–105.9
1996	1,114.0	867.6	628.8	238.8	246.4	1,229.0	964.0	807.4	156.5	215.5	49.5	22.6	20.0	6.9	–115.0
1997	1,233.9	953.8	699.9	253.9	280.1	1,364.0	1,055.8	885.7	170.1	256.8	51.4	25.7	16.7	9.1	–130.1
1998	1,239.8	953.0	692.6	260.4	286.8	1,445.1	1,115.7	930.8	184.9	269.4	60.0	29.7	17.4	13.0	–205.3
1999	1,355.2	992.9	711.7	281.2	324.6	1,631.9	1,252.5	1,051.2	201.3	293.7	85.7	36.3	25.0	24.4	–276.6
2000	1,527.8	1,096.1	795.1	301.1	390.6	1,924.7	1,477.2	1,251.2	226.0	352.2	95.4	38.6	26.8	29.9	–396.9
2001	1,411.6	1,026.8	739.6	287.2	339.6	1,803.0	1,403.6	1,176.2	227.4	289.3	110.2	42.5	26.7	41.1	–391.4
2002	1,390.6	998.0	706.6	291.4	335.8	1,846.0	1,437.7	1,198.9	238.9	290.0	118.3	44.4	29.3	44.6	–455.4
2003	1,478.5	1,035.2	733.9	301.3	377.4	2,006.2	1,557.1	1,299.0	258.1	318.9	130.1	46.1	32.0	52.0	–527.6
2004	1,705.6	1,176.4	828.0	348.4	464.7	2,343.4	1,810.5	1,513.6	296.9	388.0	144.9	49.5	34.0	61.4	–637.8
2005	1,940.9	1,301.6	919.3	382.2	569.3	2,692.0	2,041.5	1,722.8	318.7	494.5	156.1	54.4	39.9	61.8	–751.2
2006	2,247.7	1,470.2	1,043.1	427.1	702.6	3,067.0	2,256.6	1,900.6	356.0	656.2	154.2	57.1	41.7	55.3	–819.3
2007	2,584.4	1,659.3	1,159.7	499.6	850.2	3,325.2	2,395.2	2,002.7	392.5	754.5	175.5	65.3	49.1	61.0	–740.9
2008	2,779.9	1,835.3	1,291.0	544.3	855.2	3,484.1	2,576.2	2,148.7	427.5	710.0	198.0	71.1	54.3	72.5	–704.2
2009	2,362.1	1,582.8	1,057.4	525.4	689.3	2,745.3	2,001.9	1,588.1	413.8	539.0	204.3	69.8	62.9	71.6	–383.1
2010	2,714.1	1,857.2	1,272.9	584.3	760.0	3,153.8	2,389.6	1,947.0	442.5	554.3	209.9	72.1	63.3	74.6	–439.8
2011	3,049.8	2,115.9	1,468.5	647.4	827.9	3,510.1	2,695.5	2,231.1	464.3	589.9	224.7	74.7	66.8	83.2	–460.3
2012	3,161.8	2,217.7	1,529.6	688.1	827.4	3,585.8	2,769.3	2,293.3	476.1	594.7	221.8	75.7	67.3	78.7	–423.9
2013	3,265.2	2,287.0	1,563.9	723.1	847.2	3,617.2	2,766.4	2,293.9	472.5	616.9	233.9	77.8	66.6	89.6	–352.1
2014	3,404.8	2,377.4	1,617.0	760.5	881.6	3,781.0	2,887.4	2,389.3	498.1	646.4	247.2	83.7	65.3	98.1	–376.2
2015	3,267.5	2,268.7	1,496.7	772.0	860.8	3,692.2	2,794.9	2,289.6	505.3	640.4	257.0	89.5	65.2	102.3	–424.7
2016	3,272.2	2,232.1	1,447.6	784.5	893.5	3,675.9	2,738.4	2,218.7	519.7	661.5	276.0	90.6	69.2	116.3	–403.7
2017	3,582.2	2,383.8	1,546.7	837.1	1,032.7	3,955.1	2,923.7	2,369.9	553.8	738.2	293.3	95.7	67.9	129.7	–372.9
2018	3,829.6	2,533.5	1,669.3	864.2	1,142.1	4,269.9	3,129.7	2,559.1	570.6	847.9	292.3	98.7	74.3	119.2	–440.3
2019	3,844.4	2,519.7	1,641.7	878.0	1,160.3	4,324.2	3,116.0	2,517.9	598.1	893.9	314.3	102.9	74.3	137.1	–479.8
2020	3,287.7	2,123.4	1,416.6	706.8	992.9	3,874.8	2,774.6	2,309.2	465.4	770.6	329.6	105.8	84.5	139.3	–587.1
2021 [p]	....	2,479.9	1,740.3	739.7	....	....	3,395.8	2,849.6	546.2	....	340.0	108.6	89.0	142.4	....
2018: I	3,763.3	2,504.4	1,636.4	868.0	1,113.5	4,157.1	3,084.5	2,528.4	556.1	796.9	275.7	97.5	66.8	111.4	–393.8
II	3,872.3	2,568.3	1,706.1	862.2	1,151.1	4,247.5	3,108.1	2,539.6	568.5	850.4	289.1	98.4	76.2	114.5	–375.2
III	3,829.7	2,534.2	1,670.4	863.8	1,134.5	4,316.8	3,158.2	2,586.6	571.6	863.0	295.6	98.8	75.7	121.1	–487.1
IV	3,853.1	2,527.1	1,664.3	862.8	1,169.3	4,358.2	3,168.1	2,581.6	586.4	881.5	308.6	100.1	78.5	130.0	–505.0
2019: I	3,824.1	2,524.6	1,659.2	865.5	1,140.8	4,341.5	3,131.0	2,544.3	586.8	888.1	322.4	100.9	75.6	145.9	–517.4
II	3,878.2	2,533.4	1,648.4	885.1	1,184.4	4,384.2	3,165.7	2,563.2	602.5	908.8	309.8	101.9	70.0	137.9	–506.1
III	3,854.1	2,512.1	1,634.8	877.4	1,168.8	4,330.7	3,126.1	2,522.4	603.7	893.0	311.6	103.6	75.0	133.1	–476.6
IV	3,821.2	2,508.7	1,624.6	884.1	1,147.3	4,240.4	3,041.1	2,441.8	599.3	885.8	313.6	105.4	76.4	131.8	–419.2
2020: I	3,606.6	2,385.5	1,586.2	799.3	1,048.9	4,058.6	2,927.3	2,385.1	542.2	809.0	322.3	106.0	79.3	136.9	–452.0
II	2,858.7	1,807.9	1,146.3	661.5	883.5	3,386.5	2,346.7	1,942.1	404.6	711.5	328.3	106.7	91.4	130.1	–527.8
III	3,252.4	2,079.6	1,413.0	666.6	996.1	3,917.1	2,805.3	2,368.8	436.5	769.2	342.6	105.5	88.6	148.5	–664.8
IV	3,433.3	2,220.7	1,520.8	699.9	1,043.2	4,137.0	3,019.1	2,540.8	478.3	792.5	325.4	105.0	78.7	141.6	–703.7
2021: I	3,569.4	2,311.9	1,607.5	704.4	1,081.6	4,374.9	3,184.5	2,698.1	486.4	846.7	343.7	106.2	93.2	144.3	–805.5
II	3,746.4	2,461.5	1,726.8	734.8	1,112.4	4,549.8	3,343.2	2,819.0	524.2	882.0	324.5	106.8	77.1	140.6	–803.4
III	3,842.3	2,485.2	1,750.7	734.6	1,184.1	4,704.5	3,432.3	2,857.4	574.8	916.4	355.9	109.6	104.8	141.5	–862.2
IV [p]	....	2,661.1	1,876.2	784.9	....	....	3,623.2	3,024.0	599.2	....	335.7	111.6	80.9	143.3	....

[1] Certain goods, primarily military equipment purchased and sold by the Federal Government, are included in services. Beginning with 1986, repairs and alterations of equipment were reclassified from goods to services.
[2] National income and product accounts (NIPA).

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–15. Real exports and imports of goods and services, 2002–2021

[Billions of chained (2012) dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Exports of goods and services						Imports of goods and services					
	Total	Goods [1]				Services [1]	Total	Goods [1]				Services [1]
		Total	Durable goods	Nondurable goods	Nonagricultural goods			Total	Durable goods	Nondurable goods	Nonpetroleum goods	
2002	1,274.8	897.2	523.3	386.5	794.1	377.7	1,965.1	1,643.8	789.9	902.0	1,216.4	320.6
2003	1,301.6	923.1	540.7	394.0	818.1	378.5	2,065.8	1,744.1	837.0	959.0	1,289.8	321.8
2004	1,427.0	1,006.1	602.9	409.1	902.8	421.0	2,292.6	1,939.6	956.0	1,021.0	1,442.4	353.4
2005	1,526.1	1,082.6	662.0	421.7	973.1	443.6	2,441.4	2,075.8	1,042.2	1,061.9	1,555.7	366.6
2006	1,670.5	1,191.4	738.5	450.7	1,072.1	479.4	2,598.2	2,201.9	1,139.5	1,077.1	1,674.9	397.1
2007	1,816.9	1,274.7	795.9	475.0	1,147.0	542.1	2,664.8	2,244.4	1,171.4	1,084.5	1,722.4	420.6
2008	1,921.9	1,349.5	834.4	512.2	1,214.1	572.4	2,607.6	2,171.0	1,134.1	1,047.7	1,666.6	436.4
2009	1,762.5	1,189.3	694.1	499.3	1,059.1	572.7	2,278.8	1,835.1	904.2	951.7	1,380.4	441.3
2010	1,989.5	1,369.4	818.5	552.1	1,224.5	620.1	2,578.9	2,117.3	1,117.2	1,004.6	1,640.2	461.5
2011	2,132.1	1,471.5	896.8	574.7	1,327.9	660.6	2,703.1	2,234.1	1,222.7	1,012.0	1,761.4	469.1
2012	2,217.7	1,529.6	941.7	587.9	1,384.5	688.1	2,769.3	2,293.3	1,322.3	971.0	1,858.9	476.1
2013	2,283.6	1,574.6	962.5	612.1	1,427.5	709.0	2,802.9	2,339.3	1,384.4	954.9	1,929.8	463.9
2014	2,372.3	1,644.7	1,002.4	642.3	1,486.2	727.9	2,947.6	2,469.5	1,507.2	962.7	2,073.9	478.9
2015	2,378.7	1,638.9	980.3	660.5	1,477.5	739.2	3,100.4	2,612.4	1,607.7	1,004.4	2,206.1	490.6
2016	2,388.4	1,649.3	969.7	685.2	1,479.9	739.0	3,145.4	2,641.3	1,627.2	1,013.5	2,224.5	505.2
2017	2,485.8	1,717.4	1,000.6	724.7	1,545.0	768.4	3,285.2	2,759.4	1,741.4	1,010.6	2,335.0	527.1
2018	2,555.6	1,789.7	1,035.6	763.4	1,616.1	770.2	3,419.9	2,899.2	1,838.9	1,051.8	2,475.6	526.9
2019	2,554.0	1,788.5	1,008.5	793.3	1,616.2	769.6	3,459.2	2,914.6	1,844.4	1,061.8	2,504.4	547.4
2020	2,207.6	1,606.8	846.3	786.4	1,427.6	617.2	3,150.3	2,750.2	1,711.2	1,034.0	2,376.1	423.8
2021 p	2,309.0	1,728.4	950.2	795.3	1,567.4	609.2	3,591.3	3,149.8	2,012.6	1,122.3	2,732.7	472.4
2018: I	2,551.6	1,772.4	1,042.2	737.2	1,602.7	780.9	3,378.0	2,867.9	1,819.7	1,039.6	2,446.3	517.0
II	2,582.9	1,820.3	1,044.5	786.5	1,636.4	768.7	3,390.1	2,869.9	1,815.8	1,045.9	2,445.7	525.6
III	2,542.5	1,779.3	1,023.7	765.7	1,602.5	767.2	3,439.4	2,920.6	1,850.8	1,061.4	2,485.0	525.9
IV	2,545.6	1,786.6	1,032.0	764.3	1,622.8	763.9	3,472.1	2,938.4	1,869.1	1,060.2	2,525.3	539.1
2019: I	2,565.3	1,804.6	1,033.7	781.7	1,634.0	766.6	3,472.0	2,938.6	1,870.2	1,059.0	2,523.0	539.1
II	2,551.3	1,781.1	1,003.7	790.7	1,602.5	773.5	3,486.6	2,938.6	1,860.5	1,069.2	2,524.6	551.2
III	2,545.9	1,786.0	999.7	800.8	1,610.7	764.7	3,477.4	2,927.3	1,849.4	1,069.7	2,517.8	552.3
IV	2,553.3	1,782.5	997.1	799.9	1,617.6	773.7	3,400.9	2,853.9	1,797.4	1,049.5	2,452.2	547.0
2020: I	2,442.1	1,760.9	961.1	819.2	1,587.7	695.3	3,283.9	2,799.0	1,743.3	1,051.2	2,404.6	494.1
II	1,943.0	1,354.5	659.4	735.3	1,183.9	588.8	2,717.7	2,363.3	1,386.5	984.9	2,036.4	372.7
III	2,166.3	1,608.7	855.5	775.0	1,425.4	581.4	3,187.5	2,823.3	1,780.0	1,033.9	2,446.4	397.7
IV	2,279.0	1,703.1	909.2	815.9	1,513.4	603.4	3,411.8	3,015.4	1,935.1	1,065.8	2,616.9	430.7
2021: I	2,262.3	1,696.9	927.2	787.5	1,520.5	594.1	3,488.4	3,092.7	1,986.7	1,090.9	2,688.9	433.0
II	2,304.2	1,723.5	956.9	783.3	1,562.5	609.0	3,548.7	3,125.5	2,005.2	1,105.3	2,709.9	456.6
III	2,273.0	1,701.3	944.0	773.9	1,557.4	599.8	3,589.6	3,122.8	1,980.7	1,127.6	2,701.0	492.2
IV p	2,396.6	1,792.0	972.9	836.5	1,629.1	633.9	3,738.3	3,258.0	2,077.7	1,165.3	2,831.3	508.0

[1] Certain goods, primarily military equipment purchased and sold by the Federal Government, are included in services. Repairs and alterations of equipment are also included in services.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–16. Sources of personal income, 1971–2021

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Personal income	Compensation of employees							Proprietors' income with inventory valuation and capital consumption adjustments			Rental income of persons with capital consumption adjustment
		Total	Wages and salaries			Supplements to wages and salaries			Total	Farm	Nonfarm	
			Total	Private industries	Government	Total	Employer contributions for employee pension and insurance funds	Employer contributions for government social insurance				
1971	932.8	665.0	584.5	457.8	126.8	80.4	54.0	26.4	83.9	13.4	70.5	21.8
1972	1,024.5	731.3	638.8	500.9	137.9	92.5	61.4	31.2	95.1	17.0	78.1	22.7
1973	1,140.8	812.7	708.8	560.0	148.8	103.9	64.1	39.8	112.5	29.1	83.4	23.1
1974	1,251.8	887.7	772.3	611.8	160.5	115.4	70.7	44.7	112.2	23.5	88.7	23.2
1975	1,369.4	947.2	814.8	638.6	176.2	132.4	85.7	46.7	118.2	22.0	96.2	22.3
1976	1,502.6	1,048.3	899.7	710.8	188.9	148.6	94.2	54.4	131.0	17.2	113.8	20.3
1977	1,659.2	1,165.8	994.2	791.6	202.6	171.7	110.6	61.1	144.5	16.0	128.5	15.9
1978	1,863.7	1,316.8	1,120.6	900.6	220.0	196.2	124.7	71.5	166.0	19.9	146.1	16.5
1979	2,082.7	1,477.2	1,253.3	1,016.2	237.1	223.9	141.3	82.6	179.4	22.2	157.3	16.1
1980	2,323.6	1,622.2	1,373.4	1,112.0	261.5	248.8	159.9	88.9	171.6	11.7	159.9	19.0
1981	2,605.1	1,792.5	1,511.4	1,225.5	285.8	281.2	177.5	103.6	179.7	19.0	160.7	23.8
1982	2,791.6	1,893.0	1,587.5	1,280.0	307.5	305.5	195.7	109.8	171.2	13.3	157.9	23.8
1983	2,981.1	2,012.5	1,677.5	1,352.7	324.8	335.0	215.1	119.9	186.3	6.2	180.1	24.4
1984	3,292.7	2,215.9	1,844.9	1,496.8	348.1	371.0	231.9	139.0	228.2	20.9	207.3	24.7
1985	3,524.9	2,387.3	1,982.6	1,608.7	373.9	404.8	257.0	147.7	241.1	21.0	220.1	26.2
1986	3,733.1	2,542.1	2,102.3	1,705.1	397.2	439.7	281.9	157.9	256.5	22.8	233.7	18.3
1987	3,961.6	2,722.4	2,256.3	1,833.2	423.1	466.1	299.9	166.3	286.5	28.9	257.6	16.6
1988	4,283.4	2,948.0	2,439.8	1,987.7	452.0	508.2	323.6	184.6	325.5	26.8	298.7	22.5
1989	4,625.6	3,139.6	2,583.1	2,101.9	481.1	556.6	362.9	193.7	341.1	33.0	308.1	21.5
1990	4,913.8	3,340.4	2,741.2	2,222.2	519.0	599.2	392.7	206.5	353.2	32.2	321.0	28.2
1991	5,084.9	3,450.5	2,814.5	2,265.7	548.8	636.0	420.9	215.1	354.2	26.8	327.4	38.6
1992	5,420.9	3,668.2	2,965.5	2,393.5	572.0	702.7	474.3	228.4	400.2	34.8	365.4	60.6
1993	5,657.9	3,817.3	3,079.3	2,490.3	589.0	737.9	498.3	239.7	428.0	31.4	396.6	90.1
1994	5,947.1	4,006.2	3,236.6	2,627.1	609.5	769.6	515.5	254.1	456.6	34.7	422.0	113.7
1995	6,291.4	4,198.1	3,418.0	2,789.0	629.0	780.1	515.9	264.1	481.2	22.0	459.2	124.9
1996	6,678.5	4,416.9	3,616.5	2,968.4	648.1	800.5	525.7	274.8	543.8	37.3	506.4	142.5
1997	7,092.5	4,708.8	3,876.8	3,205.0	671.9	832.0	542.4	289.6	584.0	32.4	551.6	147.1
1998	7,606.7	5,071.1	4,181.6	3,480.3	701.3	889.5	582.3	307.2	640.2	28.5	611.7	165.2
1999	8,006.8	5,402.7	4,457.9	3,724.2	733.8	944.8	621.4	323.3	696.4	28.1	668.3	178.5
2000	8,655.9	5,847.1	4,824.9	4,045.2	779.8	1,022.2	677.0	345.2	753.9	31.5	722.4	183.5
2001	9,012.8	6,038.3	4,953.6	4,131.6	822.0	1,084.7	726.7	358.0	831.0	32.1	798.9	202.4
2002	9,160.9	6,135.1	4,995.8	4,123.0	872.9	1,139.3	773.2	366.0	870.0	20.2	849.8	208.4
2003	9,498.5	6,353.6	5,138.3	4,224.3	914.0	1,215.3	832.8	382.5	897.5	37.1	860.4	227.1
2004	10,044.3	6,719.5	5,421.0	4,468.7	952.3	1,298.5	889.7	408.8	962.9	52.4	910.5	242.8
2005	10,604.9	7,066.1	5,691.4	4,700.1	991.3	1,374.7	946.7	428.1	979.1	47.9	931.2	221.1
2006	11,384.7	7,479.7	6,056.7	5,022.2	1,034.5	1,422.9	975.6	447.3	1,050.9	34.3	1,016.6	181.1
2007	12,021.4	7,878.5	6,396.4	5,307.8	1,088.5	1,482.1	1,020.4	461.7	995.5	41.7	953.8	186.3
2008	12,477.6	8,056.8	6,534.1	5,390.2	1,143.9	1,522.7	1,051.3	471.4	959.7	38.9	920.7	290.3
2009	12,080.4	7,759.0	6,249.1	5,073.9	1,175.2	1,509.9	1,051.8	458.1	937.6	27.2	910.5	347.6
2010	12,594.5	7,925.4	6,372.5	5,181.3	1,191.2	1,552.9	1,083.9	469.0	1,107.3	37.6	1,069.7	433.7
2011	13,339.3	8,226.2	6,626.2	5,431.3	1,194.9	1,600.0	1,107.3	492.7	1,227.4	63.0	1,164.4	506.5
2012	14,014.3	8,567.4	6,928.1	5,729.8	1,198.3	1,639.2	1,125.9	513.3	1,346.4	59.9	1,286.4	534.5
2013	14,193.6	8,835.0	7,114.0	5,906.0	1,208.0	1,721.0	1,194.7	526.3	1,402.2	87.0	1,315.3	577.4
2014	14,976.6	9,250.2	7,476.3	6,239.4	1,236.9	1,773.9	1,227.5	546.4	1,445.6	67.7	1,377.9	602.7
2015	15,685.2	9,699.4	7,859.5	6,583.7	1,275.8	1,839.9	1,270.6	569.4	1,420.8	54.1	1,366.7	609.5
2016	16,096.9	9,966.1	8,091.2	6,783.2	1,308.0	1,874.9	1,293.9	580.9	1,423.3	34.1	1,389.2	626.6
2017	16,850.2	10,426.1	8,474.7	7,126.7	1,348.0	1,951.5	1,346.5	604.9	1,505.8	39.5	1,466.4	652.7
2018	17,706.0	10,959.5	8,900.5	7,499.1	1,401.4	2,059.0	1,434.3	624.7	1,580.4	38.9	1,541.5	681.9
2019	18,424.4	11,447.7	9,323.5	7,873.3	1,450.2	2,124.2	1,474.6	649.6	1,598.9	38.4	1,560.5	692.1
2020	19,627.6	11,572.2	9,444.1	7,949.6	1,494.5	2,128.0	1,464.4	663.7	1,650.0	70.2	1,579.9	711.6
2021 p	21,076.8	12,580.5	10,326.8	8,791.5	1,535.4	2,253.7	1,526.4	727.3	1,821.0	97.8	1,723.1	727.5
2018: I	17,406.1	10,784.1	8,762.3	7,381.0	1,381.3	2,021.8	1,404.6	617.2	1,567.0	37.4	1,529.5	671.8
II	17,598.5	10,891.8	8,842.9	7,448.7	1,394.2	2,048.9	1,427.7	621.1	1,572.1	39.5	1,532.6	677.3
III	17,821.1	11,044.3	8,969.8	7,558.7	1,411.1	2,074.5	1,445.8	628.7	1,581.3	30.1	1,551.1	689.8
IV	17,998.3	11,118.0	9,027.1	7,608.1	1,419.0	2,090.9	1,459.0	631.9	1,601.4	48.6	1,552.8	688.6
2019: I	18,238.9	11,336.1	9,226.3	7,802.7	1,423.6	2,109.7	1,466.6	643.2	1,585.5	33.1	1,552.4	687.0
II	18,345.4	11,394.1	9,275.4	7,840.4	1,435.0	2,118.7	1,472.5	646.2	1,572.8	23.6	1,549.2	691.0
III	18,464.7	11,453.9	9,326.8	7,867.8	1,459.1	2,127.1	1,477.4	649.6	1,610.6	46.4	1,564.1	691.5
IV	18,648.5	11,606.8	9,465.6	7,982.4	1,483.3	2,141.2	1,481.8	659.4	1,626.8	50.6	1,576.1	699.0
2020: I	18,842.2	11,755.5	9,604.1	8,088.9	1,515.2	2,151.4	1,483.7	667.7	1,638.3	58.1	1,580.2	712.2
II	20,348.7	11,029.2	8,979.0	7,511.3	1,467.7	2,050.2	1,410.5	639.7	1,471.1	44.9	1,426.2	709.5
III	19,777.4	11,539.7	9,410.3	7,911.5	1,498.8	2,129.4	1,464.9	664.5	1,760.7	69.2	1,691.5	714.5
IV	19,542.0	11,964.2	9,783.0	8,286.6	1,496.4	2,181.1	1,498.3	682.8	1,730.0	108.5	1,621.5	710.0
2021: I	21,867.3	12,088.9	9,879.2	8,376.5	1,502.7	2,209.7	1,510.9	698.9	1,714.0	73.0	1,640.9	716.9
II	20,669.9	12,416.6	10,180.4	8,661.3	1,519.1	2,236.2	1,518.3	717.9	1,848.2	119.4	1,728.7	716.3
III	20,823.8	12,756.5	10,487.2	8,933.0	1,554.2	2,269.3	1,531.9	737.4	1,867.0	110.6	1,756.3	729.0
IV p	20,946.1	13,060.2	10,760.6	9,195.2	1,565.4	2,299.6	1,544.5	755.1	1,854.8	88.3	1,766.5	747.7

See next page for continuation of table.

TABLE B–16. Sources of personal income, 1971–2021—*Continued*

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Personal income receipts on assets			Personal current transfer receipts								Less: Contributions for government social insurance, domestic
					Government social benefits to persons						Other current transfer receipts, from business (net)	
	Total	Personal interest income	Personal dividend income	Total	Total [1]	Social security [2]	Medicare [3]	Medicaid	Unemployment insurance	Other		
1971	125.1	100.1	25.0	88.1	85.4	36.6	8.0	6.7	6.2	19.4	2.7	51.2
1972	136.6	109.8	26.8	97.9	94.8	40.9	8.8	8.2	6.0	21.4	3.1	59.2
1973	155.4	125.5	29.9	112.6	108.6	50.7	10.2	9.6	4.6	23.3	3.9	75.5
1974	180.6	147.4	33.2	133.3	128.6	57.6	12.7	11.2	7.0	28.4	4.7	85.2
1975	201.0	168.0	32.9	170.0	163.1	65.9	15.6	13.9	18.1	35.7	6.8	89.3
1976	220.0	181.0	39.0	184.3	177.6	74.5	18.8	15.5	16.4	38.7	6.7	101.3
1977	251.6	206.9	44.7	194.6	189.5	83.2	22.1	16.7	13.1	40.9	5.1	113.1
1978	285.8	235.1	50.7	209.9	203.4	91.4	25.5	18.6	9.4	44.9	6.5	131.3
1979	327.1	269.7	57.4	235.6	227.3	102.6	29.9	21.1	9.7	49.9	8.2	152.7
1980	396.9	332.9	64.0	280.1	271.5	118.6	36.2	23.9	16.1	62.1	8.6	166.2
1981	485.8	412.2	73.6	319.0	307.8	138.6	43.5	27.7	15.9	66.3	11.2	195.7
1982	557.0	479.5	77.6	355.5	343.1	153.7	50.9	30.2	25.2	66.8	12.4	208.9
1983	599.5	516.3	83.3	384.3	370.5	164.4	57.8	33.9	26.4	71.5	13.8	226.0
1984	680.8	590.1	90.6	400.6	380.9	173.0	64.7	36.6	16.0	74.3	19.7	257.5
1985	726.3	628.9	97.4	425.4	403.1	183.3	69.7	39.7	15.9	78.0	22.3	281.4
1986	768.2	662.1	106.0	451.6	428.6	193.6	75.3	43.6	16.5	83.0	22.9	303.4
1987	791.1	679.0	112.2	468.1	447.9	201.0	81.6	47.8	14.6	86.4	20.2	323.1
1988	851.4	721.7	129.7	497.5	476.9	213.9	86.3	53.0	13.3	93.6	20.6	361.5
1989	964.3	806.5	157.8	544.2	521.1	227.4	98.2	60.8	14.4	103.1	23.2	385.2
1990	1,005.3	836.5	168.8	596.9	574.7	244.1	107.6	73.1	18.2	113.9	22.2	410.1
1991	1,003.7	823.5	180.2	668.1	650.5	264.2	117.5	96.9	26.8	127.0	17.6	430.2
1992	998.8	809.8	189.1	748.0	731.8	281.8	132.6	116.2	39.6	142.9	16.3	455.0
1993	1,007.0	802.3	204.7	793.0	778.9	297.9	146.8	130.1	34.8	150.0	14.1	477.4
1994	1,049.8	814.6	235.2	829.0	815.7	312.2	164.4	139.4	23.9	156.1	13.3	508.2
1995	1,136.6	878.6	258.0	883.5	864.7	327.7	181.2	149.6	21.7	164.0	18.7	532.8
1996	1,201.2	899.0	302.2	929.2	906.3	342.0	194.9	158.2	22.3	167.6	22.9	555.1
1997	1,285.0	947.1	337.9	954.9	935.4	356.6	206.9	163.1	20.1	166.4	19.4	587.2
1998	1,370.9	1,015.5	355.4	983.9	957.9	369.2	205.6	170.2	19.7	170.0	26.0	624.7
1999	1,364.3	1,017.7	346.6	1,026.2	992.2	379.9	208.7	184.6	20.5	174.4	34.0	661.3
2000	1,490.0	1,106.5	383.5	1,087.3	1,044.9	401.4	219.1	199.5	20.7	179.1	42.4	705.8
2001	1,481.7	1,112.3	369.3	1,192.6	1,145.8	425.1	242.6	227.3	31.9	192.4	46.8	733.2
2002	1,413.6	1,014.8	398.8	1,285.2	1,251.0	446.9	259.7	250.0	53.5	211.3	34.2	751.5
2003	1,452.3	1,020.2	432.1	1,347.3	1,321.0	463.5	276.7	264.5	53.2	231.2	26.3	779.3
2004	1,527.1	965.4	561.7	1,421.2	1,404.5	485.5	304.4	289.8	36.4	254.3	16.8	829.2
2005	1,695.2	1,117.4	577.8	1,516.7	1,490.9	512.7	332.1	304.4	31.8	273.5	25.8	873.3
2006	1,981.7	1,258.9	722.8	1,613.8	1,593.0	544.1	399.1	299.1	30.4	281.5	20.8	922.5
2007	2,194.5	1,379.2	815.3	1,728.1	1,697.3	575.7	428.2	324.2	32.7	294.9	30.8	961.4
2008	2,204.0	1,399.4	804.6	1,955.1	1,919.3	605.5	461.6	338.3	51.1	417.7	35.8	988.4
2009	1,853.7	1,300.7	553.0	2,146.7	2,107.7	664.5	493.0	369.6	131.2	398.0	39.0	964.3
2010	1,786.8	1,242.9	543.9	2,325.2	2,281.4	690.2	513.4	396.9	138.9	484.2	43.7	983.7
2011	1,937.1	1,255.6	681.5	2,358.7	2,310.1	713.3	535.6	406.0	107.2	484.8	48.5	916.7
2012	2,153.7	1,318.6	835.1	2,363.0	2,322.6	762.1	554.7	417.5	83.6	434.4	40.4	950.5
2013	2,058.9	1,265.6	793.3	2,424.3	2,385.9	799.0	572.8	440.0	62.5	432.5	38.4	1,104.3
2014	2,290.0	1,336.8	953.2	2,541.5	2,498.6	834.6	600.0	490.9	35.5	453.5	42.9	1,153.6
2015	2,474.9	1,441.8	1,033.1	2,685.4	2,635.1	871.8	634.9	535.9	32.5	467.4	50.3	1,204.7
2016	2,542.6	1,465.2	1,077.4	2,777.0	2,717.3	896.5	662.1	562.8	32.0	467.1	59.7	1,238.8
2017	2,707.9	1,553.4	1,154.5	2,856.4	2,807.6	926.1	692.5	573.8	30.2	473.6	48.7	1,298.8
2018	2,868.3	1,615.0	1,253.3	2,976.3	2,926.1	972.4	734.9	589.8	27.7	481.5	50.2	1,360.5
2019	2,968.0	1,652.0	1,316.0	3,139.1	3,083.1	1,030.7	785.7	614.0	27.6	494.2	56.0	1,421.4
2020	2,912.1	1,614.4	1,297.8	4,241.1	4,181.3	1,077.9	819.2	657.3	536.6	944.7	59.9	1,459.5
2021 p	2,940.7	1,640.2	1,300.5	4,598.2	4,531.2	1,115.0	826.0	745.7	339.0	1,345.3	67.0	1,591.1
2018: I	2,786.0	1,581.8	1,204.2	2,940.6	2,892.6	961.1	716.7	581.9	29.0	486.9	48.0	1,343.4
II	2,842.4	1,605.1	1,237.3	2,967.9	2,918.5	968.1	728.2	592.6	27.6	483.4	49.4	1,352.9
III	2,884.4	1,620.0	1,264.4	2,990.3	2,939.4	976.5	740.6	595.1	27.2	479.5	50.9	1,369.0
IV	2,960.5	1,653.1	1,307.3	3,006.5	2,954.0	984.0	754.2	589.5	27.1	476.3	52.5	1,376.6
2019: I	2,944.3	1,647.4	1,296.9	3,093.8	3,039.6	1,019.4	768.3	598.8	28.4	499.0	54.2	1,407.6
II	2,972.5	1,660.5	1,312.0	3,129.6	3,074.1	1,026.4	781.1	614.5	27.8	495.4	55.6	1,414.6
III	2,973.2	1,646.2	1,327.0	3,157.7	3,101.0	1,034.2	792.1	622.4	27.4	492.4	56.7	1,422.0
IV	2,982.1	1,654.0	1,328.0	3,175.3	3,117.9	1,042.9	801.3	620.5	26.8	489.8	57.5	1,441.4
2020: I	2,976.4	1,638.2	1,338.1	3,231.8	3,173.8	1,067.9	808.5	606.2	39.5	511.0	58.0	1,472.0
II	2,910.9	1,611.3	1,299.6	5,633.9	5,570.5	1,074.8	821.6	654.2	1,039.4	1,836.1	63.3	1,405.9
III	2,851.7	1,597.6	1,254.2	4,369.4	4,310.5	1,080.2	825.8	690.4	767.8	799.0	58.9	1,458.7
IV	2,909.6	1,610.3	1,299.2	3,729.5	3,670.2	1,088.8	821.0	678.3	299.9	632.7	59.2	1,501.3
2021: I	2,898.8	1,630.2	1,268.7	5,982.5	5,920.6	1,106.3	814.1	695.9	565.8	2,586.0	62.0	1,533.8
II	2,932.1	1,639.4	1,292.8	4,329.0	4,257.8	1,109.7	815.3	730.5	480.4	965.4	71.2	1,572.2
III	2,945.2	1,636.3	1,308.8	4,137.5	4,069.6	1,117.2	826.5	775.0	272.3	916.2	67.9	1,611.3
IV p	2,986.7	1,655.1	1,331.6	3,943.7	3,877.0	1,127.0	847.9	781.6	37.6	913.7	66.7	1,647.0

[1] Includes Veterans' benefits, not shown seperately.

[2] Includes old-age, survivors, and disability insurance benefits that are distributed from the federal old-age and survivors insurance trust fund and the disability insurance trust fund.

[3] Includes hospital and supplementary medical insurance benefits that are distributed from the federal hospital insurance trust fund and the supplementary medical insurance trust fund.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–17. Disposition of personal income, 1971–2021

[Billions of dollars, except as noted; quarterly data at seasonally adjusted annual rates]

Year or quarter	Personal income	Less: Personal current taxes	Equals: Disposable personal income	Less: Personal outlays				Equals: Personal saving	Percent of disposable personal income [2]		
				Total	Personal consumption expenditures	Personal interest payments [1]	Personal current transfer payments		Personal outlays		Personal saving
									Total	Personal consumption expenditures	
1971	932.8	101.7	831.1	719.2	699.9	16.4	2.8	111.9	86.5	84.2	13.5
1972	1,024.5	123.6	900.8	789.3	768.2	18.0	3.2	111.5	87.6	85.3	12.4
1973	1,140.8	132.4	1,008.4	872.6	849.6	19.6	3.4	135.8	86.5	84.3	13.5
1974	1,251.8	151.0	1,100.8	954.5	930.2	20.9	3.4	146.3	86.7	84.5	13.3
1975	1,369.4	147.6	1,221.8	1,057.8	1,030.5	23.4	3.8	164.0	86.6	84.3	13.4
1976	1,502.6	172.7	1,330.0	1,175.6	1,147.7	23.5	4.4	154.4	88.4	86.3	11.6
1977	1,659.2	197.9	1,461.4	1,305.4	1,274.0	26.6	4.8	155.9	89.3	87.2	10.7
1978	1,863.7	229.6	1,634.1	1,459.0	1,422.3	31.3	5.4	175.1	89.3	87.0	10.7
1979	2,082.7	268.9	1,813.8	1,627.0	1,585.4	35.5	6.0	186.8	89.7	87.4	10.3
1980	2,323.6	299.5	2,024.1	1,800.1	1,750.7	42.5	6.9	224.1	88.9	86.5	11.1
1981	2,605.1	345.8	2,259.3	1,993.9	1,934.0	48.4	11.5	265.5	88.3	85.6	11.8
1982	2,791.6	354.7	2,436.9	2,143.5	2,071.3	58.5	13.8	293.3	88.0	85.0	12.0
1983	2,981.1	352.9	2,628.2	2,364.2	2,281.6	67.4	15.1	264.0	90.0	86.8	10.0
1984	3,292.7	377.9	2,914.8	2,584.5	2,492.3	75.0	17.1	330.3	88.7	85.5	11.3
1985	3,524.9	417.8	3,107.1	2,822.1	2,712.8	90.6	18.8	284.9	90.8	87.3	9.2
1986	3,733.1	437.8	3,295.3	3,004.7	2,886.3	97.3	21.1	290.6	91.2	87.6	8.8
1987	3,961.6	489.6	3,472.0	3,196.6	3,076.3	97.1	23.2	275.4	92.1	88.6	7.9
1988	4,283.4	505.9	3,777.5	3,457.0	3,330.0	101.3	25.6	320.5	91.5	88.2	8.5
1989	4,625.6	567.7	4,057.8	3,717.9	3,576.8	113.1	28.0	340.0	91.6	88.1	8.4
1990	4,913.8	594.7	4,319.1	3,958.0	3,809.0	118.4	30.6	361.1	91.6	88.2	8.4
1991	5,084.9	588.9	4,496.0	4,100.0	3,943.4	119.9	36.7	396.0	91.2	87.7	8.8
1992	5,420.9	612.8	4,808.1	4,354.2	4,197.6	116.1	40.5	453.9	90.6	87.3	9.4
1993	5,657.9	648.8	5,009.2	4,611.5	4,452.0	113.9	45.6	397.7	92.1	88.9	7.9
1994	5,947.1	693.1	5,254.0	4,890.6	4,721.0	119.9	49.8	363.4	93.1	89.9	6.9
1995	6,291.4	748.4	5,543.0	5,155.9	4,962.6	140.4	52.9	387.1	93.0	89.5	7.0
1996	6,678.5	837.1	5,841.4	5,459.2	5,244.6	157.0	57.6	382.3	93.5	89.8	6.5
1997	7,092.5	931.8	6,160.7	5,770.4	5,536.8	169.7	63.9	390.3	93.7	89.9	6.3
1998	7,606.7	1,032.4	6,574.2	6,127.7	5,877.2	180.9	69.5	446.5	93.2	89.4	6.8
1999	8,006.8	1,111.9	6,894.9	6,550.9	6,283.8	190.8	76.3	344.0	95.0	91.1	5.0
2000	8,655.9	1,236.3	7,419.6	7,068.1	6,767.2	217.7	83.2	351.4	95.3	91.2	4.7
2001	9,012.8	1,239.0	7,773.8	7,390.9	7,073.8	225.6	91.5	382.8	95.1	91.0	4.9
2002	9,160.9	1,052.2	8,108.8	7,646.3	7,348.9	200.6	96.7	462.5	94.3	90.6	5.7
2003	9,498.5	1,003.5	8,495.0	8,038.3	7,740.7	196.5	101.1	456.7	94.6	91.1	5.4
2004	10,044.3	1,048.7	8,995.5	8,550.1	8,232.0	207.3	110.9	445.4	95.0	91.5	5.0
2005	10,604.9	1,212.5	9,392.5	9,124.5	8,769.1	237.3	118.1	268.0	97.1	93.4	2.9
2006	11,384.7	1,357.0	10,027.7	9,669.1	9,277.2	266.9	124.9	358.7	96.4	92.5	3.6
2007	12,021.4	1,492.5	10,528.9	10,176.2	9,746.6	291.2	138.4	352.7	96.7	92.6	3.3
2008	12,477.6	1,507.5	10,970.1	10,466.7	10,050.1	272.0	144.6	503.4	95.4	91.6	4.6
2009	12,080.4	1,152.4	10,928.0	10,288.4	9,891.2	252.8	144.3	639.7	94.1	90.5	5.9
2010	12,594.5	1,237.6	11,356.9	10,647.6	10,260.3	242.3	145.0	709.3	93.8	90.3	6.2
2011	13,339.3	1,453.7	11,885.6	11,079.6	10,698.9	229.9	150.8	806.0	93.2	90.0	6.8
2012	14,014.3	1,509.5	12,504.8	11,431.8	11,047.4	229.6	154.8	1,073.1	91.4	88.3	8.6
2013	14,193.6	1,676.4	12,517.3	11,751.3	11,363.5	229.5	158.3	766.0	93.9	90.8	6.1
2014	14,976.6	1,784.6	13,192.0	12,261.1	11,847.7	243.7	169.6	930.9	92.9	89.8	7.1
2015	15,685.2	1,939.9	13,745.3	12,710.4	12,263.5	263.5	183.5	1,034.9	92.5	89.2	7.5
2016	16,096.9	1,958.2	14,138.7	13,150.8	12,693.3	272.8	184.8	987.8	93.0	89.8	7.0
2017	16,850.2	2,049.0	14,801.2	13,724.8	13,239.1	291.6	194.1	1,076.4	92.7	89.4	7.3
2018	17,706.0	2,076.3	15,629.7	14,438.8	13,913.5	321.0	204.3	1,190.9	92.4	89.0	7.6
2019	18,424.4	2,205.1	16,219.3	14,981.5	14,428.7	340.4	212.4	1,237.8	92.4	89.0	7.6
2020	19,627.6	2,195.6	17,432.0	14,544.5	14,047.6	285.4	211.5	2,887.5	83.4	80.6	16.6
2021 p	21,076.8	2,582.5	18,494.2	16,230.0	15,746.9	264.9	218.2	2,264.2	87.8	85.1	12.2
2018: I	17,406.1	2,076.2	15,329.8	14,176.5	13,667.4	309.3	199.8	1,153.3	92.5	89.2	7.5
II	17,598.5	2,049.8	15,548.7	14,383.7	13,864.8	315.6	203.3	1,165.0	92.5	89.2	7.5
III	17,821.1	2,091.3	15,729.7	14,536.1	14,002.6	327.5	206.0	1,193.7	92.4	89.0	7.6
IV	17,998.3	2,087.7	15,910.6	14,658.8	14,119.3	331.5	207.9	1,251.8	92.1	88.7	7.9
2019: I	18,238.9	2,169.3	16,069.6	14,692.9	14,155.6	330.6	206.8	1,376.7	91.4	88.1	8.6
II	18,345.4	2,222.8	16,122.6	14,928.3	14,375.7	339.3	213.2	1,194.4	92.6	89.2	7.4
III	18,464.7	2,205.2	16,259.6	15,087.9	14,529.5	346.6	211.8	1,171.7	92.8	89.4	7.2
IV	18,648.5	2,223.2	16,425.3	15,216.9	14,653.9	345.0	217.9	1,208.4	92.6	89.2	7.4
2020: I	18,842.2	2,241.6	16,600.6	14,989.2	14,439.1	337.8	212.3	1,611.4	90.3	87.0	9.7
II	20,348.7	2,099.0	18,249.6	13,477.7	12,989.7	273.6	214.4	4,772.0	73.9	71.2	26.1
III	19,777.4	2,181.8	17,595.7	14,774.3	14,293.8	274.4	206.1	2,821.3	84.0	81.2	16.0
IV	19,542.0	2,259.8	17,282.2	14,936.8	14,467.6	255.9	213.2	2,345.5	86.4	83.7	13.6
2021: I	21,867.3	2,412.1	19,455.3	15,475.6	15,005.4	255.3	214.8	3,979.7	79.5	77.1	20.5
II	20,669.9	2,532.5	18,137.4	16,165.0	15,681.7	267.4	215.9	1,972.4	89.1	86.5	10.9
III	20,823.8	2,641.1	18,182.7	16,456.2	15,964.9	271.7	219.6	1,726.4	90.5	87.8	9.5
IV p	20,946.1	2,744.4	18,201.7	16,823.2	16,335.5	265.2	222.6	1,378.5	92.4	89.7	7.6

[1] Consists of nonmortgage interest paid by households.
[2] Percents based on data in millions of dollars.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–18. Total and per capita disposable personal income and personal consumption expenditures, and per capita gross domestic product, in current and real dollars, 1971–2021

[Quarterly data at seasonally adjusted annual rates, except as noted]

Year or quarter	Disposable personal income				Personal consumption expenditures				Gross domestic product per capita (dollars)		Population (thousands)[1]
	Total (billions of dollars)		Per capita (dollars)		Total (billions of dollars)		Per capita (dollars)				
	Current dollars	Chained (2012) dollars	Current dollars	Chained (2012) dollars	Current dollars	Chained (2012) dollars	Current dollars	Chained (2012) dollars	Current dollars	Chained (2012) dollars	
1971	831.1	3,812.6	4,002	18,357	699.9	3,211.0	3,370	15,460	5,609	24,640	207,692
1972	900.8	3,996.2	4,291	19,036	768.2	3,407.7	3,659	16,233	6,093	25,660	209,924
1973	1,008.4	4,244.8	4,758	20,028	849.6	3,576.3	4,009	16,874	6,725	26,851	211,939
1974	1,100.8	4,196.8	5,146	19,621	930.2	3,546.4	4,349	16,580	7,224	26,462	213,898
1975	1,221.8	4,299.8	5,657	19,908	1,030.5	3,626.8	4,771	16,792	7,801	26,153	215,981
1976	1,330.0	4,437.1	6,098	20,346	1,147.7	3,828.9	5,262	17,557	8,590	27,296	218,086
1977	1,461.4	4,577.7	6,634	20,780	1,274.0	3,990.7	5,783	18,116	9,450	28,272	220,289
1978	1,634.1	4,785.8	7,340	21,497	1,422.3	4,165.4	6,388	18,710	10,563	29,524	222,629
1979	1,813.8	4,878.6	8,057	21,672	1,585.4	4,264.4	7,043	18,944	11,672	30,123	225,106
1980	2,024.1	4,915.1	8,888	21,584	1,750.7	4,251.1	7,688	18,668	12,547	29,700	227,726
1981	2,259.3	5,035.2	9,823	21,891	1,934.0	4,310.0	8,408	18,739	13,943	30,152	230,008
1982	2,436.9	5,145.0	10,494	22,156	2,071.3	4,373.1	8,919	18,832	14,399	29,326	232,218
1983	2,628.2	5,322.6	11,216	22,714	2,281.6	4,620.7	9,737	19,718	15,508	30,394	234,333
1984	2,914.8	5,688.2	12,330	24,062	2,492.3	4,863.8	10,543	20,575	17,080	32,309	236,394
1985	3,107.1	5,859.0	13,027	24,565	2,712.8	5,115.6	11,374	21,449	18,192	33,358	238,506
1986	3,295.3	6,081.6	13,691	25,268	2,886.3	5,326.8	11,992	22,132	19,028	34,201	240,683
1987	3,472.0	6,216.1	14,297	25,597	3,076.3	5,507.6	12,668	22,680	19,993	35,070	242,843
1988	3,777.5	6,508.6	15,414	26,559	3,330.0	5,737.7	13,589	23,413	21,368	36,204	245,061
1989	4,057.8	6,699.2	16,403	27,080	3,576.8	5,905.0	14,458	23,869	22,805	37,181	247,387
1990	4,319.1	6,830.7	17,264	27,303	3,809.0	6,023.9	15,225	24,078	23,835	37,459	250,181
1991	4,496.0	6,880.4	17,734	27,138	3,943.4	6,034.8	15,554	23,803	24,290	36,924	253,530
1992	4,808.1	7,166.9	18,714	27,895	4,197.6	6,256.9	16,338	24,353	25,379	37,720	256,922
1993	5,009.2	7,285.2	19,245	27,990	4,452.0	6,474.8	17,104	24,876	26,350	38,258	260,282
1994	5,254.0	7,485.1	19,943	28,411	4,721.0	6,725.7	17,919	25,529	27,660	39,320	263,455
1995	5,543.0	7,733.9	20,792	29,011	4,962.6	6,924.1	18,615	25,973	28,658	39,900	266,588
1996	5,841.4	7,979.7	21,658	29,586	5,244.6	7,164.4	19,445	26,563	29,932	40,926	269,714
1997	6,160.7	8,271.8	22,570	30,304	5,536.8	7,434.2	20,284	27,236	31,424	42,238	272,958
1998	6,574.2	8,757.4	23,806	31,712	5,877.2	7,829.0	21,283	28,350	32,818	43,620	276,154
1999	6,894.9	9,052.7	24,684	32,409	6,283.8	8,250.3	22,496	29,536	34,480	45,192	279,328
2000	7,419.6	9,501.3	26,274	33,645	6,767.2	8,665.8	23,963	30,687	36,300	46,523	282,398
2001	7,773.8	9,759.2	27,255	34,216	7,073.8	8,880.4	24,801	31,135	37,100	46,502	285,225
2002	8,108.8	10,047.8	28,160	34,894	7,348.9	9,106.2	25,521	31,624	37,954	46,842	287,955
2003	8,495.0	10,309.7	29,230	35,474	7,740.7	9,394.4	26,635	32,325	39,420	47,709	290,626
2004	8,995.5	10,652.8	30,674	36,325	8,232.0	9,748.6	28,070	33,242	41,660	49,102	293,262
2005	9,392.5	10,811.4	31,732	36,526	8,769.1	10,093.8	29,626	34,101	44,052	50,343	295,993
2006	10,027.7	11,226.5	33,558	37,570	9,277.2	10,386.2	31,046	34,758	46,234	51,255	298,818
2007	10,528.9	11,492.6	34,899	38,093	9,746.6	10,638.7	32,306	35,263	47,976	51,787	301,696
2008	10,970.1	11,630.0	36,021	38,188	10,050.1	10,654.7	33,001	34,986	48,498	51,365	304,543
2009	10,928.0	11,617.9	35,568	37,814	9,891.2	10,515.6	32,194	34,226	47,123	49,591	307,240
2010	11,356.9	11,861.4	36,654	38,282	10,260.3	10,716.0	33,115	34,586	48,570	50,507	309,839
2011	11,885.6	12,107.2	38,059	38,769	10,698.9	10,898.3	34,259	34,898	49,952	50,886	312,295
2012	12,504.8	12,504.8	39,732	39,732	11,047.4	11,047.4	35,102	35,102	51,645	51,645	314,725
2013	12,517.3	12,350.0	39,474	38,947	11,363.5	11,211.7	35,836	35,357	53,117	52,202	317,099
2014	13,192.0	12,821.9	41,276	40,118	11,847.7	11,515.3	37,070	36,030	54,914	52,979	319,601
2015	13,745.3	13,330.0	42,672	41,383	12,263.5	11,892.9	38,072	36,922	56,521	53,988	322,113
2016	14,138.7	13,575.5	43,556	41,821	12,693.3	12,187.7	39,103	37,546	57,593	54,466	324,609
2017	14,801.2	13,956.6	45,283	42,699	13,239.1	12,483.7	40,504	38,193	59,596	55,311	326,860
2018	15,629.7	14,429.4	47,536	43,886	13,913.5	12,845.0	42,317	39,067	62,432	56,591	328,794
2019	16,219.3	14,755.2	49,073	44,644	14,428.7	13,126.3	43,655	39,715	64,665	57,585	330,513
2020	17,432.0	15,672.8	52,544	47,241	14,047.6	12,629.9	42,342	38,069	62,978	55,415	331,761
2021 p	18,494.2	16,007.3	55,670	48,184	15,746.9	13,629.4	47,400	41,026	69,225	58,482	332,213
2018: I	15,329.8	14,253.3	46,724	43,443	13,667.4	12,707.6	41,657	38,732	61,397	56,192	328,091
II	15,548.7	14,373.0	47,329	43,750	13,864.8	12,816.4	42,203	39,012	62,377	56,586	328,526
III	15,729.7	14,491.8	47,805	44,043	14,002.6	12,900.6	42,556	39,207	62,786	56,770	329,040
IV	15,910.6	14,599.1	48,284	44,304	14,119.3	12,955.5	42,848	39,316	63,162	56,813	329,522
2019: I	16,069.6	14,729.6	48,715	44,653	14,155.6	12,975.1	42,913	39,334	63,667	57,093	329,868
II	16,122.6	14,679.3	48,820	44,450	14,375.7	13,088.8	43,530	39,633	64,465	57,480	330,245
III	16,259.6	14,763.1	49,163	44,638	14,529.5	13,192.3	43,932	39,888	65,023	57,789	330,729
IV	16,425.3	14,850.5	49,592	44,837	14,653.9	13,249.0	44,244	40,002	65,501	57,977	331,208
2020: I	16,600.6	14,962.7	50,072	45,132	14,439.1	13,014.5	43,552	39,255	64,794	57,165	331,534
II	18,249.6	16,516.9	55,020	49,796	12,989.7	11,756.4	39,162	35,444	58,722	52,031	331,692
III	17,595.7	15,782.4	53,024	47,560	14,293.8	12,820.8	43,074	38,635	63,701	55,933	331,841
IV	17,282.2	15,443.0	52,058	46,518	14,467.6	12,927.9	43,580	38,942	64,696	56,533	331,978
2021: I	19,455.3	17,221.6	58,609	51,880	15,005.4	13,282.7	45,204	40,014	66,390	57,405	331,949
II	18,137.4	15,805.6	54,627	47,604	15,681.7	13,665.6	47,231	41,159	68,493	58,335	332,021
III	18,182.7	15,640.0	54,718	47,066	15,964.9	13,732.4	48,044	41,326	69,824	58,619	332,297
IV p	18,201.7	15,417.5	54,728	46,357	16,335.5	13,836.7	49,117	41,604	72,188	59,566	332,584

[1] Population of the United States including Armed Forces overseas. Annual data are averages of quarterly data. Quarterly data are averages for the period.

Source: Department of Commerce (Bureau of Economic Analysis and Bureau of the Census).

Table B–19. Gross saving and investment, 1971–2021

[Billions of dollars, except as noted; quarterly data at seasonally adjusted annual rates]

Year or quarter	Gross saving										
	Total gross saving	Net saving							Consumption of fixed capital		
		Total net saving	Net private saving			Net government saving			Total	Private	Government
			Total	Personal saving	Undis-tributed corporate profits [1]	Total	Federal	State and local			
1971	246.1	97.2	149.4	111.9	37.5	–52.2	–50.9	–1.3	148.9	107.6	41.3
1972	277.6	116.6	159.6	111.5	48.0	–42.9	–49.0	6.1	161.0	117.5	43.5
1973	335.3	156.6	189.3	135.8	53.5	–32.7	–38.3	5.6	178.7	131.5	47.2
1974	349.2	142.3	186.0	146.3	39.7	–43.7	–41.3	–2.3	206.9	153.2	53.7
1975	348.1	109.6	218.3	164.0	54.3	–108.7	–97.9	–10.7	238.5	178.8	59.7
1976	399.3	139.1	224.4	154.4	70.0	–85.3	–80.9	–4.4	260.2	196.5	63.7
1977	459.4	169.6	242.5	155.9	86.6	–72.9	–73.4	.5	289.8	221.1	68.7
1978	548.0	220.8	278.0	175.1	102.9	–57.2	–62.0	4.9	327.2	252.1	75.1
1979	613.5	239.6	288.2	186.8	101.4	–48.6	–47.4	–1.2	373.9	290.7	83.1
1980	630.1	201.7	296.4	224.1	72.3	–94.7	–88.8	–5.9	428.4	335.0	93.5
1981	743.9	256.6	354.9	265.5	89.4	–98.2	–88.1	–10.2	487.2	381.9	105.3
1982	725.8	188.9	379.0	293.3	85.6	–190.1	–167.4	–22.8	537.0	420.4	116.6
1983	716.7	154.1	379.7	264.0	115.7	–225.6	–207.2	–18.4	562.6	438.8	123.8
1984	881.6	283.2	479.9	330.3	149.5	–196.7	–196.5	–.2	598.4	463.5	134.9
1985	881.0	240.8	442.5	284.9	157.5	–201.7	–199.2	–2.4	640.1	496.4	143.7
1986	864.5	179.2	399.1	290.6	108.5	–219.9	–215.9	–4.0	685.3	531.6	153.7
1987	948.9	218.5	398.6	275.4	123.2	–180.1	–165.7	–14.4	730.4	566.3	164.1
1988	1,076.6	292.1	463.4	320.5	142.9	–171.3	–160.0	–11.3	784.5	607.9	176.6
1989	1,109.8	271.5	450.2	340.0	110.3	–178.7	–159.4	–19.3	838.3	649.6	188.6
1990	1,113.4	224.8	464.4	361.1	103.2	–239.5	–203.3	–36.2	888.5	688.4	200.1
1991	1,153.4	221.0	529.5	396.0	133.5	–308.5	–248.4	–60.1	932.4	721.5	210.9
1992	1,147.6	187.4	592.8	453.9	139.0	–405.5	–334.5	–71.0	960.2	742.9	217.4
1993	1,163.4	159.9	545.9	397.7	148.2	–386.0	–313.5	–72.5	1,003.5	778.2	225.3
1994	1,295.1	239.5	559.0	363.4	195.7	–319.6	–255.6	–63.9	1,055.6	822.5	233.1
1995	1,426.3	303.9	616.5	387.1	229.4	–312.5	–242.1	–70.4	1,122.4	880.7	241.7
1996	1,578.9	403.6	636.8	382.3	254.5	–233.2	–179.4	–53.8	1,175.3	929.1	246.2
1997	1,780.5	541.2	675.1	390.3	284.9	–133.9	–92.0	–42.0	1,239.3	987.8	251.6
1998	1,930.6	620.8	649.5	446.5	203.0	–28.7	1.4	–30.1	1,309.7	1,052.2	257.6
1999	2,007.2	608.3	578.1	344.0	234.0	30.2	69.1	–38.9	1,398.9	1,132.2	266.7
2000	2,124.6	613.4	494.3	351.4	142.9	119.0	159.7	–40.6	1,511.2	1,231.5	279.7
2001	2,069.1	469.6	573.5	382.8	190.7	–104.0	15.0	–119.0	1,599.5	1,311.7	287.8
2002	1,996.0	338.0	788.7	462.5	326.2	–450.7	–267.8	–182.9	1,658.0	1,361.8	296.2
2003	1,983.5	264.5	843.1	456.7	386.5	–578.7	–397.4	–181.3	1,719.1	1,411.9	307.1
2004	2,153.4	331.6	874.1	445.4	428.6	–542.5	–393.5	–149.0	1,821.8	1,497.1	324.7
2005	2,349.4	378.3	774.9	268.0	506.9	–396.6	–293.8	–102.8	1,971.0	1,622.6	348.4
2006	2,636.9	512.8	819.7	358.7	461.1	–307.0	–221.9	–85.0	2,124.1	1,751.8	372.3
2007	2,504.4	251.6	640.5	352.7	287.9	–389.0	–259.7	–129.3	2,252.8	1,852.5	400.3
2008	2,206.0	–152.8	693.0	503.4	189.6	–845.8	–624.9	–220.9	2,358.8	1,931.8	427.0
2009	1,987.4	–384.1	1,200.5	639.7	560.8	–1,584.5	–1,243.2	–341.3	2,371.5	1,928.7	442.8
2010	2,287.7	–103.3	1,522.6	709.3	813.3	–1,625.8	–1,318.4	–307.5	2,390.9	1,933.8	457.2
2011	2,521.2	46.7	1,555.9	806.0	749.9	–1,509.2	–1,234.1	–275.1	2,474.5	1,997.3	477.2
2012	3,007.7	431.7	1,787.2	1,073.1	714.1	–1,355.5	–1,072.7	–282.8	2,576.0	2,082.4	493.6
2013	3,189.2	507.9	1,405.0	766.0	639.1	–897.1	–631.8	–265.3	2,681.2	2,176.6	504.6
2014	3,527.8	712.7	1,548.0	930.9	617.1	–835.3	–597.4	–237.9	2,815.0	2,298.5	516.6
2015	3,669.6	758.2	1,534.2	1,034.9	499.3	–776.0	–560.2	–215.8	2,911.4	2,388.5	522.9
2016	3,534.7	547.7	1,460.0	987.8	472.1	–912.3	–667.6	–244.7	2,987.1	2,459.9	527.1
2017	3,795.8	677.6	1,628.9	1,076.4	552.5	–951.3	–720.7	–230.6	3,118.2	2,576.1	542.1
2018	4,025.6	752.1	1,876.0	1,190.9	685.0	–1,123.8	–928.1	–195.8	3,273.4	2,708.1	565.4
2019	4,156.1	720.5	1,917.0	1,237.8	679.2	–1,196.5	–1,047.5	–149.0	3,435.6	2,848.6	586.9
2020	4,002.9	426.9	3,460.8	2,887.5	573.3	–3,033.9	–3,110.0	76.1	3,575.9	2,969.6	606.4
2021 [p]	....	....	....	2,264.2	....	....	....	....	3,847.9	3,202.3	645.6
2018: I	3,980.7	771.0	1,848.1	1,153.3	694.7	–1,077.1	–909.7	–167.4	3,209.7	2,654.6	555.1
II	3,938.5	682.1	1,831.9	1,165.0	666.9	–1,149.7	–928.8	–221.0	3,256.3	2,693.0	563.3
III	4,065.6	769.9	1,871.0	1,193.7	677.3	–1,101.1	–901.4	–199.7	3,295.7	2,726.9	568.8
IV	4,117.5	785.4	1,952.9	1,251.8	701.1	–1,167.5	–972.5	–195.0	3,332.0	2,757.7	574.3
2019: I	4,203.4	825.4	2,009.0	1,376.7	632.3	–1,183.6	–1,015.4	–168.2	3,378.0	2,798.1	580.0
II	4,147.3	726.3	1,883.9	1,194.4	689.5	–1,157.6	–1,033.2	–124.4	3,421.0	2,836.1	584.9
III	4,101.4	643.5	1,874.9	1,171.7	703.2	–1,231.4	–1,080.9	–150.5	3,457.9	2,867.9	589.9
IV	4,172.2	686.8	1,900.2	1,208.4	691.8	–1,213.4	–1,060.4	–153.0	3,485.5	2,892.5	593.0
2020: I	4,347.5	825.2	2,117.7	1,611.4	506.3	–1,292.5	–1,158.0	–134.6	3,522.3	2,924.5	597.8
II	3,556.7	5.8	5,077.8	4,772.0	305.8	–5,072.0	–5,625.6	553.6	3,550.9	2,949.0	601.9
III	3,596.3	5.2	3,587.9	2,821.3	766.5	–3,582.6	–3,516.3	–66.3	3,591.0	2,981.5	609.6
IV	4,511.0	871.6	3,059.8	2,345.5	714.4	–2,188.3	–2,140.1	–48.2	3,639.4	3,023.3	616.1
2021: I	4,423.0	727.0	4,827.7	3,979.7	848.0	–4,100.6	–4,088.9	–11.8	3,696.0	3,071.2	624.7
II	4,305.8	518.0	3,001.9	1,972.4	1,029.6	–2,484.0	–3,312.7	828.7	3,787.9	3,150.1	637.8
III	4,676.3	780.5	2,810.5	1,726.4	1,084.0	–2,030.0	–2,235.6	205.6	3,895.8	3,244.4	651.5
IV [p]	....	....	....	1,378.5	....	....	....	....	4,012.0	3,343.5	668.5

[1] With inventory valuation and capital consumption adjustments.

See next page for continuation of table.

TABLE B–19. Gross saving and investment, 1971–2021—*Continued*

[Billions of dollars, except as noted; quarterly data at seasonally adjusted annual rates]

Year or quarter	Gross domestic investment, capital account transactions, and net lending, NIPA [2]: Total	Gross domestic investment: Total	Gross domestic investment: Gross private domestic investment	Gross domestic investment: Gross government investment	Capital account transactions (net) [3]	Net lending or net borrowing (–), NIPA [2, 4]	Statistical discrepancy	Addenda: Gross private saving	Gross government saving: Total	Gross government saving: Federal	Gross government saving: State and local	Net domestic investment	Gross saving as a percent of gross national income	Net saving as a percent of gross national income
1971	255.6	255.3	196.8	58.5	0.0	0.3	9.5	257.0	–10.9	–21.8	10.9	106.4	21.2	8.4
1972	284.8	288.8	228.1	60.7	.0	–4.1	7.2	277.1	.6	–18.8	19.4	127.8	21.7	9.1
1973	341.4	332.6	266.9	65.6	.0	8.8	6.1	320.8	14.5	–6.0	20.4	153.9	23.4	10.9
1974	356.6	350.7	274.5	76.2	.0	5.9	7.4	339.1	10.1	–6.0	16.0	143.8	22.5	9.2
1975	361.5	341.7	257.3	84.4	.1	19.8	13.3	397.1	–48.9	–59.2	10.3	103.1	20.7	6.5
1976	420.0	412.9	323.2	89.6	.1	7.0	20.7	420.9	–21.6	–39.2	17.6	152.6	21.4	7.4
1977	478.9	489.8	396.6	93.2	.1	–11.0	19.4	463.6	–4.2	–28.2	24.0	199.9	22.1	8.1
1978	571.3	583.9	478.4	105.6	.1	–12.7	23.3	530.1	17.9	–12.4	30.3	256.7	23.3	9.4
1979	658.6	659.8	539.7	120.1	.1	–1.3	45.1	579.0	34.6	7.2	27.3	285.9	23.5	9.2
1980	674.6	666.0	530.1	135.9	.1	8.4	44.4	631.4	–1.2	–28.4	27.1	237.6	22.1	7.1
1981	781.9	778.6	631.2	147.3	.1	3.3	38.1	736.8	7.1	–20.6	27.6	291.3	23.2	8.0
1982	734.7	738.0	581.0	156.9	.1	–3.4	8.8	799.4	–73.5	–92.0	18.4	201.0	21.5	5.6
1983	773.6	808.7	637.5	171.2	.1	–35.2	57.0	818.5	–101.8	–126.1	24.3	246.1	19.8	4.3
1984	923.2	1,013.3	820.1	193.2	.1	–90.2	41.6	943.4	–61.8	–105.9	44.1	414.9	21.9	7.0
1985	935.2	1,049.5	829.7	219.9	.1	–114.5	54.3	938.9	–57.9	–102.3	44.4	409.4	20.4	5.6
1986	944.6	1,087.2	849.1	238.1	.1	–142.8	80.1	930.7	–66.2	–112.4	46.2	401.9	19.1	4.0
1987	992.7	1,146.8	892.2	254.6	.1	–154.2	43.8	964.9	–16.0	–55.6	39.6	416.4	19.7	4.5
1988	1,079.6	1,195.4	937.0	258.4	.1	–115.9	3.0	1,071.3	5.3	–41.0	46.4	410.9	20.5	5.6
1989	1,177.8	1,270.1	999.7	270.4	.3	–92.7	68.0	1,099.9	9.9	–32.5	42.4	431.9	19.8	4.9
1990	1,208.9	1,283.8	993.4	290.4	7.4	–82.3	95.5	1,152.8	–39.4	–69.8	30.4	395.3	18.9	3.8
1991	1,246.3	1,238.4	944.3	294.1	5.3	2.6	93.0	1,250.9	–97.6	–108.3	10.8	306.0	18.9	3.6
1992	1,263.6	1,309.1	1,013.0	296.1	–1.3	–44.3	115.9	1,335.7	–188.1	–191.2	3.1	348.9	17.8	2.9
1993	1,319.3	1,398.7	1,106.8	291.9	.9	–80.2	156.0	1,324.1	–160.7	–166.5	5.8	395.2	17.3	2.4
1994	1,435.1	1,550.7	1,256.5	294.2	1.3	–116.9	140.0	1,381.6	–86.4	–105.3	18.8	495.0	18.1	3.3
1995	1,519.3	1,625.2	1,317.5	307.7	.4	–106.3	93.0	1,497.2	–70.9	–88.6	17.7	502.8	18.8	4.0
1996	1,637.0	1,752.0	1,432.1	320.0	.2	–115.2	58.1	1,565.9	13.0	–25.7	38.7	576.7	19.6	5.0
1997	1,792.1	1,922.2	1,595.6	326.6	.5	–130.6	11.6	1,662.9	117.6	62.3	55.3	682.9	20.7	6.3
1998	1,875.3	2,080.7	1,736.7	344.0	.2	–205.6	–55.2	1,701.7	228.9	156.8	72.1	770.9	21.1	6.8
1999	1,978.9	2,255.5	1,887.1	368.5	6.7	–283.3	–28.3	1,710.3	296.9	227.3	69.7	856.6	20.7	6.3
2000	2,030.4	2,427.3	2,038.4	388.9	4.6	–401.4	–94.2	1,725.9	398.8	322.8	76.0	916.0	20.5	5.9
2001	1,955.3	2,346.7	1,934.8	411.9	–11.9	–379.5	–113.8	1,885.2	183.8	179.5	4.4	747.2	19.3	4.4
2002	1,918.7	2,374.1	1,930.4	443.7	4.2	–459.6	–77.3	2,150.5	–154.5	–101.0	–53.5	716.1	18.1	3.1
2003	1,963.6	2,491.3	2,027.1	464.2	8.8	–536.4	–19.9	2,255.1	–271.6	–225.1	–46.4	772.2	17.2	2.3
2004	2,129.7	2,767.5	2,281.3	486.2	4.6	–642.4	–23.7	2,371.2	–217.8	–213.0	–4.8	945.6	17.5	2.7
2005	2,296.8	3,048.0	2,534.7	513.3	–.7	–750.5	–52.5	2,397.5	–48.1	–103.2	55.1	1,077.0	17.8	2.9
2006	2,432.5	3,251.8	2,701.0	550.9	7.7	–827.0	–204.3	2,571.5	65.4	–20.7	86.0	1,127.7	18.7	3.6
2007	2,524.2	3,265.0	2,673.0	592.0	6.4	–747.2	19.8	2,493.0	11.3	–46.9	58.2	1,012.2	17.2	1.7
2008	2,403.0	3,107.2	2,477.6	629.6	.8	–705.0	197.0	2,624.8	–418.8	–399.1	–19.7	748.4	15.0	–1.0
2009	2,189.5	2,572.6	1,929.7	642.9	6.3	–389.4	202.0	3,129.2	–1,141.8	–1,009.5	–132.2	201.1	13.8	–2.7
2010	2,370.2	2,810.0	2,165.5	644.5	7.4	–447.2	82.5	3,456.3	–1,168.7	–1,074.6	–94.1	419.1	15.1	–.7
2011	2,508.8	2,969.2	2,332.6	636.6	9.5	–469.8	–12.3	3,553.2	–1,032.1	–979.2	–52.9	494.7	15.9	.3
2012	2,818.8	3,242.8	2,621.8	621.0	–.5	–423.4	–188.9	3,869.6	–861.9	–811.0	–50.8	666.8	18.0	2.6
2013	3,074.3	3,426.4	2,826.0	600.4	7.0	–359.0	–114.8	3,581.6	–392.4	–365.9	–26.5	745.2	18.6	3.0
2014	3,270.6	3,646.7	3,044.2	602.6	6.9	–383.0	–257.2	3,846.5	–318.7	–327.1	8.4	831.7	19.6	4.0
2015	3,435.1	3,859.8	3,237.2	622.6	8.3	–433.0	–234.5	3,922.7	–253.1	–288.7	35.6	948.4	19.7	4.1
2016	3,441.3	3,845.0	3,205.0	639.9	7.0	–410.7	–93.4	3,919.9	–385.1	–396.9	11.7	857.9	18.6	2.9
2017	3,676.9	4,049.8	3,381.4	668.4	16.0	–388.9	–118.9	4,205.0	–409.2	–444.8	35.6	931.6	19.1	3.4
2018	3,900.1	4,340.4	3,637.8	702.6	4.7	–445.0	–125.5	4,584.0	–558.5	–643.2	84.7	1,067.0	19.2	3.6
2019	4,086.4	4,566.3	3,826.3	740.0	6.9	–486.7	–69.7	4,765.6	–609.5	–754.2	144.6	1,130.7	19.1	3.3
2020	3,832.3	4,419.4	3,637.8	781.5	5.9	–593.0	–170.6	6,430.4	–2,427.5	–2,806.5	379.0	843.5	18.8	2.0
2021 p	....	4,915.7	4,113.4	802.3	....	....	....	....	....	....	....	1,067.8	....	....
2018: I	3,848.1	4,241.9	3,550.8	691.0	5.8	–399.6	–132.7	4,502.7	–522.0	–628.7	106.7	1,032.1	19.3	3.7
II	3,933.6	4,308.8	3,603.2	705.6	12.2	–387.4	–4.9	4,524.9	–586.4	–644.5	58.1	1,052.5	18.9	3.3
III	3,900.9	4,388.0	3,679.6	708.4	2.2	–489.3	–164.7	4,597.9	–532.3	–615.0	82.8	1,092.3	19.3	3.6
IV	3,917.9	4,422.9	3,717.5	705.4	–1.5	–503.6	–199.6	4,710.7	–593.2	–684.4	91.2	1,090.9	19.3	3.7
2019: I	4,009.4	4,526.8	3,801.9	724.8	11.4	–528.7	–194.0	4,807.1	–603.6	–724.1	120.5	1,148.7	19.6	3.8
II	4,075.0	4,581.1	3,843.0	738.1	3.9	–510.0	–72.3	4,719.9	–572.6	–741.3	168.7	1,160.0	19.2	3.4
III	4,124.5	4,601.2	3,858.2	743.0	4.0	–480.7	23.1	4,742.9	–641.5	–786.7	145.2	1,143.3	18.9	3.0
IV	4,136.8	4,556.0	3,801.9	754.1	8.2	–427.4	–35.4	4,792.7	–620.4	–764.6	144.2	1,070.6	19.0	3.1
2020: I	4,073.0	4,525.1	3,752.4	772.7	11.9	–463.9	–274.5	5,042.2	–694.7	–859.8	165.1	1,002.7	19.8	3.8
II	3,413.9	3,941.7	3,167.0	774.7	4.2	–532.0	–142.8	8,026.8	–4,470.1	–5,324.0	853.9	390.8	18.0	.0
III	3,826.3	4,491.1	3,708.8	782.3	2.7	–667.4	230.0	6,569.3	–2,973.0	–3,211.2	238.2	900.0	17.0	.0
IV	4,016.0	4,719.7	3,923.2	796.5	4.9	–708.7	–495.0	6,083.1	–1,572.2	–1,830.9	258.7	1,080.3	20.3	3.9
2021: I	3,913.3	4,718.8	3,928.0	790.8	14.6	–820.1	–509.7	7,898.9	–3,475.9	–3,776.1	300.2	1,022.9	19.4	3.2
II	3,914.2	4,717.6	3,925.1	792.5	3.9	–807.3	–391.7	6,152.0	–1,846.1	–2,995.5	1,149.4	929.7	18.4	2.2
III	4,045.5	4,907.7	4,099.6	808.1	–11.6	–850.6	–630.9	6,054.8	–1,378.5	–1,913.0	534.5	1,011.9	19.4	3.2
IV p	....	5,318.9	4,501.1	817.7	....	....	....	....	....	....	....	1,306.8	....	....

[2] National income and product accounts (NIPA).
[3] Consists of capital transfers and the acquisition and disposal of nonproduced nonfinancial assets.
[4] Prior to 1982, equals the balance on current account, NIPA.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–20. Median money income (in 2020 dollars) and poverty status of families and people, by race, 2013–2020

Race, Hispanic origin, and year	Families [1]						People below poverty level [2]		Median money income (in 2020 dollars) of people 15 years old and over with income [3]			
	Number (millions)	Median money income (in 2020 dollars) [3]	Below poverty level [2]				Number (millions)	Percent	Males		Females	
			Total		Female householder, no husband present							
			Number (millions)	Percent	Number (millions)	Percent			All people	Year-round full-time workers	All people	Year-round full-time workers
TOTAL (all races) [4]												
2013 [5]	81.2	$71,026	9.1	11.2	4.6	30.6	45.3	14.5	$39,209	$56,699	$24,556	$45,184
2013 [6]	82.3	72,869	9.6	11.7	5.2	32.2	46.3	14.8	39,656	57,228	24,626	45,298
2014	81.7	72,926	9.5	11.6	4.8	30.6	46.7	14.8	39,731	56,316	24,341	44,651
2015	82.2	77,242	8.6	10.4	4.4	28.2	43.1	13.5	40,576	57,084	25,969	45,619
2016	82.9	78,426	8.1	9.8	4.1	26.6	40.6	12.7	41,927	57,679	26,850	46,597
2017	83.1	80,187	7.8	9.3	4.0	25.7	39.7	12.3	42,656	58,958	26,912	46,862
2017 [7]	83.5	80,395	7.8	9.3	4.0	26.2	39.6	12.3	42,655	58,608	27,346	48,396
2018	83.5	81,070	7.5	9.0	3.7	24.9	38.1	11.8	42,898	58,983	27,914	47,962
2019	83.7	87,085	6.6	7.8	3.3	22.2	34.0	10.5	44,863	61,636	29,774	50,755
2020	83.9	84,008	7.3	8.7	3.6	23.4	37.2	11.4	42,921	65,111	29,261	52,542
WHITE, non-Hispanic [8]												
2013 [5]	53.8	80,830	3.7	6.9	1.6	22.6	18.8	9.6	44,655	62,835	26,467	47,618
2013 [6]	54.7	83,065	4.0	7.3	1.9	25.8	19.6	10.0	45,472	65,527	26,415	47,944
2014	53.8	83,899	3.9	7.3	1.7	23.7	19.7	10.1	44,952	64,258	26,272	48,414
2015	53.8	87,982	3.5	6.4	1.6	21.7	17.8	9.1	46,114	66,374	28,002	49,924
2016	54.1	88,525	3.4	6.3	1.6	21.1	17.3	8.8	46,814	66,011	28,579	51,032
2017	53.9	90,656	3.2	6.0	1.4	19.8	17.0	8.7	48,401	65,915	28,633	51,699
2017 [7]	54.2	91,831	3.2	5.9	1.4	20.2	16.6	8.5	48,777	65,807	29,367	53,387
2018	54.2	92,205	3.2	5.8	1.4	19.7	15.7	8.1	49,291	67,294	30,376	52,257
2019	54.3	98,313	2.7	5.0	1.1	17.1	14.2	7.3	51,196	71,174	31,730	54,404
2020	53.7	96,168	3.1	5.8	1.3	18.7	15.9	8.2	50,269	72,466	31,355	57,227
BLACK [8]												
2013 [5]	9.9	46,287	2.3	22.8	1.6	38.5	11.0	27.2	27,663	46,334	22,309	39,379
2013 [6]	9.9	46,623	2.2	22.4	1.7	36.7	10.2	25.2	27,958	45,006	23,449	38,555
2014	9.9	47,227	2.3	22.9	1.6	37.2	10.8	26.2	29,079	45,192	22,946	38,666
2015	9.8	50,019	2.1	21.1	1.5	33.9	10.0	24.1	29,941	45,571	23,614	40,546
2016	10.0	53,248	1.9	19.0	1.3	31.6	9.2	22.0	31,969	45,283	24,631	40,274
2017	10.0	53,428	1.8	18.2	1.3	30.8	9.0	21.2	31,797	46,144	24,962	39,651
2017 [7]	10.0	53,483	1.9	18.9	1.4	31.9	9.2	21.7	31,020	44,794	25,266	40,720
2018	9.8	54,742	1.7	17.7	1.2	29.4	8.9	20.8	32,081	46,995	26,247	41,454
2019	10.0	59,248	1.6	16.3	1.1	27.3	8.1	18.8	31,651	47,327	27,358	42,514
2020	10.2	57,476	1.7	16.8	1.2	28.1	8.5	19.5	31,316	51,486	26,650	46,049
ASIAN [8]												
2013 [5]	4.4	85,035	.4	8.7	.1	14.9	1.8	10.5	44,690	66,951	27,647	50,169
2013 [6]	4.4	92,148	.4	10.2	.1	25.7	2.3	13.1	47,624	68,135	28,763	52,554
2014	4.5	90,547	.4	8.9	.1	18.9	2.1	12.0	44,764	65,995	27,789	53,132
2015	4.7	99,257	.4	8.0	.1	16.2	2.1	11.4	47,751	70,733	28,988	54,758
2016	4.7	100,853	.3	7.2	.1	19.4	1.9	10.1	50,255	72,523	28,877	55,423
2017	4.9	97,976	.4	7.8	.1	15.5	2.0	10.0	51,575	74,780	29,841	55,149
2017 [7]	4.9	100,005	.4	7.4	.1	16.3	1.9	9.7	51,938	74,564	29,146	56,652
2018	5.1	104,365	.4	7.6	.1	19.6	2.0	10.1	53,384	73,972	32,148	59,841
2019	5.1	113,627	.3	5.7	.1	14.4	1.5	7.3	54,345	79,331	32,500	61,025
2020	5.2	109,448	.3	6.4	.1	15.4	1.6	8.1	51,879	89,535	32,173	71,898
HISPANIC (any race) [8]												
2013 [5]	12.1	47,045	2.6	21.6	1.3	40.4	12.7	23.5	28,282	36,672	19,769	34,279
2013 [6]	12.4	45,565	2.9	23.1	1.4	40.5	13.4	24.7	26,936	36,023	18,867	34,692
2014	12.5	49,375	2.7	21.5	1.3	37.9	13.1	23.6	29,195	38,431	19,246	33,741
2015	12.8	51,709	2.5	19.6	1.2	35.5	12.1	21.4	30,712	39,303	20,655	34,588
2016	13.0	55,125	2.3	17.3	1.1	32.7	11.1	19.4	32,912	41,187	21,472	34,557
2017	13.2	56,614	2.2	16.3	1.1	32.7	10.8	18.3	32,408	42,134	21,449	34,254
2017 [7]	13.3	56,594	2.2	16.4	1.1	33.4	10.8	18.3	32,198	40,703	21,659	34,689
2018	13.3	56,791	2.1	15.5	1.0	30.8	10.5	17.6	32,386	41,604	22,356	36,253
2019	13.2	61,688	1.8	13.9	.9	26.8	9.5	15.7	32,688	42,516	23,712	37,366
2020	13.7	59,976	2.0	14.8	1.0	28.6	10.4	17.0	32,115	45,868	22,856	40,300

[1] The term "family" refers to a group of two or more persons related by birth, marriage, or adoption and residing together. Every family must include a reference person.

[2] Poverty thresholds are updated each year to reflect changes in the consumer price index for all urban consumers (CPI-U).

[3] Adjusted by consumer price index research series (CPI-U-RS).

[4] Data for American Indians and Alaska natives, native Hawaiians and other Pacific Islanders, and those reporting two or more races are included in the total but not shown separately.

[5] The 2014 Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC) included redesigned income questions, which were implemented to a subsample of the 98,000 addresses using a probability split panel design. These 2013 data are based on the 2014 ASEC sample of 68,000 addresses that received income questions similar to those used in the 2013 ASEC and are consistent with data in earlier years.

[6] These 2013 data are based on the 2014 ASEC sample of 30,000 addresses that received redesigned income questions and are consistent with data in later years.

[7] Reflects implementation of an updated processing system.

[8] The CPS allows respondents to choose more than one race. Data shown are for "white alone, non-Hispanic," "black alone," and "Asian alone" race categories. ("Black" is also "black or African American.") Family race and Hispanic origin are based on the reference person.

Note: For details see *Income and Poverty in the United States* in publication Series P–60 on the CPS ASEC.

Source: Department of Commerce (Bureau of the Census).

TABLE B–21. Real farm income, 1957–2022

[Billions of chained (2022) dollars]

Year	Income of farm operators from farming [1]							
	Gross farm income						Production expenses	Net farm income
	Total	Value of agricultural sector production				Direct Federal Government payments		
		Total	Crops [2, 3]	Animals and animal products [3]	Farm-related income [4]			
1957	269.9	262.0	105.9	140.9	15.2	7.9	183.9	86.0
1958	295.3	287.1	113.8	157.5	15.8	8.3	195.5	99.8
1959	283.5	278.4	110.5	151.0	16.9	5.1	203.3	80.2
1960	284.8	279.6	115.7	146.7	17.3	5.2	202.1	82.8
1961	296.1	285.2	115.5	151.8	17.9	10.9	208.8	87.3
1962	305.5	292.9	120.2	154.6	18.1	12.6	218.5	87.0
1963	309.4	297.3	127.9	150.5	18.9	12.1	225.4	84.0
1964	297.3	281.9	118.6	143.8	19.5	15.3	223.5	73.7
1965	321.2	304.2	131.3	153.1	19.8	17.0	232.2	89.0
1966	338.8	316.8	122.9	173.6	20.2	22.0	245.1	93.7
1967	329.5	309.5	125.4	163.0	21.1	20.1	249.1	80.5
1968	324.4	302.7	118.4	163.3	21.0	21.7	247.3	77.1
1969	336.4	313.8	117.4	174.9	21.5	22.6	251.2	85.2
1970	333.2	312.2	116.3	174.3	21.6	21.1	251.8	81.4
1971	334.9	318.0	126.3	169.6	22.0	17.0	254.0	80.9
1972	367.7	347.2	134.1	190.7	22.4	20.5	267.1	100.6
1973	484.7	471.9	211.0	236.9	24.0	12.8	316.3	168.3
1974	441.8	439.4	221.0	192.5	25.8	2.4	319.2	122.6
1975	413.7	410.4	207.4	176.9	26.1	3.3	308.8	105.0
1976	401.4	398.5	188.6	181.8	28.1	2.9	322.7	78.7
1977	399.4	392.7	187.8	173.8	31.1	6.7	326.4	73.0
1978	440.6	430.2	194.2	201.9	34.1	10.4	354.2	86.4
1979	477.4	473.1	211.1	225.5	36.4	4.4	390.6	86.8
1980	433.6	429.9	186.9	204.2	38.7	3.7	386.7	46.9
1981	441.4	436.3	209.4	186.9	40.0	5.1	370.1	71.3
1982	410.3	401.6	179.5	176.2	45.9	8.7	350.7	59.6
1983	370.1	347.7	136.8	168.5	42.5	22.4	335.8	34.3
1984	390.0	370.4	180.5	167.2	22.7	19.6	329.7	60.3
1985	362.5	345.1	165.8	155.2	24.1	17.3	298.3	64.2
1986	344.4	318.3	139.6	156.1	22.6	26.1	275.7	68.6
1987	362.6	326.5	138.8	163.1	24.6	36.1	280.7	81.8
1988	370.0	339.9	144.0	163.5	32.3	30.1	287.5	82.4
1989	383.4	361.6	163.1	167.0	31.5	21.8	290.4	93.0
1990	381.5	363.5	160.5	173.6	29.4	17.9	292.2	89.2
1991	358.3	343.0	151.5	162.8	28.7	15.3	283.2	75.1
1992	365.8	349.1	162.5	159.0	27.7	16.7	274.3	91.5
1993	365.3	341.4	147.3	163.9	30.2	23.9	282.1	83.3
1994	377.0	363.3	175.3	156.6	31.4	13.7	285.3	91.7
1995	360.3	347.8	163.9	150.0	34.0	12.4	292.3	68.0
1996	395.7	383.4	194.1	154.5	34.8	12.3	296.8	98.9
1997	392.6	380.3	185.6	158.9	35.8	12.4	308.0	84.6
1998	379.5	359.3	166.6	153.6	39.0	20.2	302.6	76.9
1999	378.0	343.4	149.3	153.2	40.9	34.6	301.3	76.7
2000	380.2	343.6	149.4	155.8	38.4	36.5	300.4	79.7
2001	384.2	349.8	146.1	163.5	40.1	34.5	299.8	84.4
2002	349.3	330.5	148.3	141.6	40.6	18.8	290.0	59.3
2003	384.2	359.7	161.3	155.9	42.5	24.5	293.7	90.6
2004	426.5	407.8	181.0	179.8	47.0	18.8	300.1	126.4
2005	418.7	384.5	160.4	177.5	46.6	34.2	308.2	110.5
2006	394.7	373.3	161.5	162.3	49.5	21.5	316.6	78.1
2007	449.8	434.0	200.1	183.3	50.5	15.8	357.0	92.7
2008	473.8	457.9	225.9	181.2	50.8	15.9	372.5	101.4
2009	434.7	419.0	212.6	154.5	51.9	15.7	354.4	80.3
2010	455.0	439.1	214.5	179.0	45.7	15.8	356.6	98.4
2011	525.6	512.6	249.2	204.7	58.7	13.0	383.6	142.0
2012	552.0	538.9	261.2	207.5	70.1	13.1	433.7	118.3
2013	583.7	570.5	281.9	218.4	70.2	13.3	434.6	149.2
2014	572.2	560.6	244.2	253.8	62.6	11.6	463.0	109.2
2015	516.9	504.2	216.1	227.6	60.4	12.7	421.1	95.8
2016	478.6	463.6	219.8	192.1	51.7	15.1	406.3	72.3
2017	484.5	471.4	214.0	201.5	55.9	13.1	399.0	85.6
2018	472.6	457.4	206.9	197.3	53.2	15.2	382.5	90.2
2019	467.2	442.7	194.0	191.2	57.5	24.5	380.9	86.3
2020	488.8	439.5	204.8	178.3	56.4	49.3	386.0	102.8
2021	529.1	501.0	244.5	200.9	55.6	28.1	405.7	123.4
2022 [p]	525.3	513.6	238.9	213.3	61.5	11.7	411.6	113.7

[1] The GDP chain-type price index is used to convert the current-dollar statistics to 2022=100 equivalents.
[2] Crop receipts include proceeds received from commodities placed under Commodity Credit Corporation loans.
[3] The value of production equates to the sum of cash receipts, home consumption, and the value of the change in inventories.
[4] Includes income from forest products sold, the gross imputed rental value of farm dwellings, machine hire and custom work, and other sources of farm income such as commodity insurance indemnities.

Note: Data for 2022 are forecasts.

Source: Department of Agriculture (Economic Research Service).

Table B–22. Civilian labor force, 1929–2021

[Monthly data seasonally adjusted, except as noted]

Year or month	Civilian noninstitutional population[1]	Civilian labor force: Total	Employment: Total	Employment: Agricultural	Employment: Non-agricultural	Unemployment	Not in labor force	Civilian labor force participation rate[2]	Civilian employment/population ratio[3]	Unemployment rate, civilian workers[4]
	Thousands of persons 14 years of age and over							Percent		
1929	......	49,180	47,630	10,450	37,180	1,550	......	......	......	3.2
1930	......	49,820	45,480	10,340	35,140	4,340	......	......	......	8.7
1931	......	50,420	42,400	10,290	32,110	8,020	......	......	......	15.9
1932	......	51,000	38,940	10,170	28,770	12,060	......	......	......	23.6
1933	......	51,590	38,760	10,090	28,670	12,830	......	......	......	24.9
1934	......	52,230	40,890	9,900	30,990	11,340	......	......	......	21.7
1935	......	52,870	42,260	10,110	32,150	10,610	......	......	......	20.1
1936	......	53,440	44,410	10,000	34,410	9,030	......	......	......	16.9
1937	......	54,000	46,300	9,820	36,480	7,700	......	......	......	14.3
1938	......	54,610	44,220	9,690	34,530	10,390	......	......	......	19.0
1939	......	55,230	45,750	9,610	36,140	9,480	......	......	......	17.2
1940	99,840	55,640	47,520	9,540	37,980	8,120	44,200	55.7	47.6	14.6
1941	99,900	55,910	50,350	9,100	41,250	5,560	43,990	56.0	50.4	9.9
1942	98,640	56,410	53,750	9,250	44,500	2,660	42,230	57.2	54.5	4.7
1943	94,640	55,540	54,470	9,080	45,390	1,070	39,100	58.7	57.6	1.9
1944	93,220	54,630	53,960	8,950	45,010	670	38,590	58.6	57.9	1.2
1945	94,090	53,860	52,820	8,580	44,240	1,040	40,230	57.2	56.1	1.9
1946	103,070	57,520	55,250	8,320	46,930	2,270	45,550	55.8	53.6	3.9
1947	106,018	60,168	57,812	8,256	49,557	2,356	45,850	56.8	54.5	3.9
	Thousands of persons 16 years of age and over									
1947	101,827	59,350	57,038	7,890	49,148	2,311	42,477	58.3	56.0	3.9
1948	103,068	60,621	58,343	7,629	50,714	2,276	42,447	58.8	56.6	3.8
1949	103,994	61,286	57,651	7,658	49,993	3,637	42,708	58.9	55.4	5.9
1950	104,995	62,208	58,918	7,160	51,758	3,288	42,787	59.2	56.1	5.3
1951	104,621	62,017	59,961	6,726	53,235	2,055	42,604	59.2	57.3	3.3
1952	105,231	62,138	60,250	6,500	53,749	1,883	43,093	59.0	57.3	3.0
1953	107,056	63,015	61,179	6,260	54,919	1,834	44,041	58.9	57.1	2.9
1954	108,321	63,643	60,109	6,205	53,904	3,532	44,678	58.8	55.5	5.5
1955	109,683	65,023	62,170	6,450	55,722	2,852	44,660	59.3	56.7	4.4
1956	110,954	66,552	63,799	6,283	57,514	2,750	44,402	60.0	57.5	4.1
1957	112,265	66,929	64,071	5,947	58,123	2,859	45,336	59.6	57.1	4.3
1958	113,727	67,639	63,036	5,586	57,450	4,602	46,088	59.5	55.4	6.8
1959	115,329	68,369	64,630	5,565	59,065	3,740	46,960	59.3	56.0	5.5
1960	117,245	69,628	65,778	5,458	60,318	3,852	47,617	59.4	56.1	5.5
1961	118,771	70,459	65,746	5,200	60,546	4,714	48,312	59.3	55.4	6.7
1962	120,153	70,614	66,702	4,944	61,759	3,911	49,539	58.8	55.5	5.5
1963	122,416	71,833	67,762	4,687	63,076	4,070	50,583	58.7	55.4	5.7
1964	124,485	73,091	69,305	4,523	64,782	3,786	51,394	58.7	55.7	5.2
1965	126,513	74,455	71,088	4,361	66,726	3,366	52,058	58.9	56.2	4.5
1966	128,058	75,770	72,895	3,979	68,915	2,875	52,288	59.2	56.9	3.8
1967	129,874	77,347	74,372	3,844	70,527	2,975	52,527	59.6	57.3	3.8
1968	132,028	78,737	75,920	3,817	72,103	2,817	53,291	59.6	57.5	3.6
1969	134,335	80,734	77,902	3,606	74,296	2,832	53,602	60.1	58.0	3.5
1970	137,085	82,771	78,678	3,463	75,215	4,093	54,315	60.4	57.4	4.9
1971	140,216	84,382	79,367	3,394	75,972	5,016	55,834	60.2	56.6	5.9
1972	144,126	87,034	82,153	3,484	78,669	4,882	57,091	60.4	57.0	5.6
1973	147,096	89,429	85,064	3,470	81,594	4,365	57,667	60.8	57.8	4.9
1974	150,120	91,949	86,794	3,515	83,279	5,156	58,171	61.3	57.8	5.6
1975	153,153	93,775	85,846	3,408	82,438	7,929	59,377	61.2	56.1	8.5
1976	156,150	96,158	88,752	3,331	85,421	7,406	59,991	61.6	56.8	7.7
1977	159,033	99,009	92,017	3,283	88,734	6,991	60,025	62.3	57.9	7.1
1978	161,910	102,251	96,048	3,387	92,661	6,202	59,659	63.2	59.3	6.1
1979	164,863	104,962	98,824	3,347	95,477	6,137	59,900	63.7	59.9	5.8
1980	167,745	106,940	99,303	3,364	95,938	7,637	60,806	63.8	59.2	7.1
1981	170,130	108,670	100,397	3,368	97,030	8,273	61,460	63.9	59.0	7.6
1982	172,271	110,204	99,526	3,401	96,125	10,678	62,067	64.0	57.8	9.7
1983	174,215	111,550	100,834	3,383	97,450	10,717	62,665	64.0	57.9	9.6
1984	176,383	113,544	105,005	3,321	101,685	8,539	62,839	64.4	59.5	7.5
1985	178,206	115,461	107,150	3,179	103,971	8,312	62,744	64.8	60.1	7.2
1986	180,587	117,834	109,597	3,163	106,434	8,237	62,752	65.3	60.7	7.0
1987	182,753	119,865	112,440	3,208	109,232	7,425	62,888	65.6	61.5	6.2
1988	184,613	121,669	114,968	3,169	111,800	6,701	62,944	65.9	62.3	5.5
1989	186,393	123,869	117,342	3,199	114,142	6,528	62,523	66.5	63.0	5.3

[1] Not seasonally adjusted.
[2] Civilian labor force as percent of civilian noninstitutional population.
[3] Civilian employment as percent of civilian noninstitutional population.
[4] Unemployed as percent of civilian labor force.

See next page for continuation of table.

Table B–22. Civilian labor force, 1929–2021—*Continued*

[Monthly data seasonally adjusted, except as noted]

Year or month	Civilian noninstitutional population [1]	Civilian labor force: Total	Employment: Total	Employment: Agricultural	Employment: Non-agricultural	Unemployment	Not in labor force	Civilian labor force participation rate [2]	Civilian employment/population ratio [3]	Unemployment rate, civilian workers [4]
	Thousands of persons 16 years of age and over							Percent		
1990	189,164	125,840	118,793	3,223	115,570	7,047	63,324	66.5	62.8	5.6
1991	190,925	126,346	117,718	3,269	114,449	8,628	64,578	66.2	61.7	6.8
1992	192,805	128,105	118,492	3,247	115,245	9,613	64,700	66.4	61.5	7.5
1993	194,838	129,200	120,259	3,115	117,144	8,940	65,638	66.3	61.7	6.9
1994	196,814	131,056	123,060	3,409	119,651	7,996	65,758	66.6	62.5	6.1
1995	198,584	132,304	124,900	3,440	121,460	7,404	66,280	66.6	62.9	5.6
1996	200,591	133,943	126,708	3,443	123,264	7,236	66,647	66.8	63.2	5.4
1997	203,133	136,297	129,558	3,399	126,159	6,739	66,837	67.1	63.8	4.9
1998	205,220	137,673	131,463	3,378	128,085	6,210	67,547	67.1	64.1	4.5
1999	207,753	139,368	133,488	3,281	130,207	5,880	68,385	67.1	64.3	4.2
2000 [5]	212,577	142,583	136,891	2,464	134,427	5,692	69,994	67.1	64.4	4.0
2001	215,092	143,734	136,933	2,299	134,635	6,801	71,359	66.8	63.7	4.7
2002	217,570	144,863	136,485	2,311	134,174	8,378	72,707	66.6	62.7	5.8
2003	221,168	146,510	137,736	2,275	135,461	8,774	74,658	66.2	62.3	6.0
2004	223,357	147,401	139,252	2,232	137,020	8,149	75,956	66.0	62.3	5.5
2005	226,082	149,320	141,730	2,197	139,532	7,591	76,762	66.0	62.7	5.1
2006	228,815	151,428	144,427	2,206	142,221	7,001	77,387	66.2	63.1	4.6
2007	231,867	153,124	146,047	2,095	143,952	7,078	78,743	66.0	63.0	4.6
2008	233,788	154,287	145,362	2,168	143,194	8,924	79,501	66.0	62.2	5.8
2009	235,801	154,142	139,877	2,103	137,775	14,265	81,659	65.4	59.3	9.3
2010	237,830	153,889	139,064	2,206	136,858	14,825	83,941	64.7	58.5	9.6
2011	239,618	153,617	139,869	2,254	137,615	13,747	86,001	64.1	58.4	8.9
2012	243,284	154,975	142,469	2,186	140,283	12,506	88,310	63.7	58.6	8.1
2013	245,679	155,389	143,929	2,130	141,799	11,460	90,290	63.2	58.6	7.4
2014	247,947	155,922	146,305	2,237	144,068	9,617	92,025	62.9	59.0	6.2
2015	250,801	157,130	148,834	2,422	146,411	8,296	93,671	62.7	59.3	5.3
2016	253,538	159,187	151,436	2,460	148,976	7,751	94,351	62.8	59.7	4.9
2017	255,079	160,320	153,337	2,454	150,883	6,982	94,759	62.9	60.1	4.4
2018	257,791	162,075	155,761	2,425	153,336	6,314	95,716	62.9	60.4	3.9
2019	259,175	163,539	157,538	2,425	155,113	6,001	95,636	63.1	60.8	3.7
2020	260,329	160,742	147,795	2,349	145,446	12,947	99,587	61.7	56.8	8.1
2021	261,445	161,204	152,581	2,291	150,290	8,623	100,241	61.7	58.4	5.3
2019: Jan	258,239	163,072	156,614	2,543	154,017	6,458	95,168	63.1	60.6	4.0
Feb	258,392	163,114	156,992	2,483	154,381	6,122	95,278	63.1	60.8	3.8
Mar	258,537	163,035	156,869	2,362	154,387	6,166	95,502	63.1	60.7	3.8
Apr	258,693	162,642	156,744	2,362	154,402	5,898	96,051	62.9	60.6	3.6
May	258,861	162,803	156,868	2,426	154,517	5,935	96,058	62.9	60.6	3.6
June	259,037	163,029	157,123	2,327	154,919	5,906	96,008	62.9	60.7	3.6
July	259,225	163,472	157,488	2,438	155,061	5,984	95,753	63.1	60.8	3.7
Aug	259,432	163,774	157,780	2,410	155,564	5,993	95,658	63.1	60.8	3.7
Sept	259,638	164,015	158,249	2,441	155,916	5,766	95,623	63.2	60.9	3.5
Oct	259,845	164,336	158,356	2,433	155,994	5,980	95,509	63.2	60.9	3.6
Nov	260,020	164,434	158,504	2,379	156,030	5,930	95,586	63.2	61.0	3.6
Dec	260,181	164,633	158,772	2,517	156,097	5,861	95,549	63.3	61.0	3.6
2020: Jan	259,502	164,479	158,653	2,384	156,141	5,826	95,023	63.4	61.1	3.5
Feb	259,628	164,583	158,866	2,468	156,240	5,717	95,045	63.4	61.2	3.5
Mar	259,758	162,764	155,599	2,386	153,084	7,165	96,994	62.7	59.9	4.4
Apr	259,896	156,358	133,320	2,385	131,023	23,038	103,538	60.2	51.3	14.7
May	260,047	158,122	137,182	2,319	134,988	20,940	101,925	60.8	52.8	13.2
June	260,204	159,834	142,218	2,265	140,039	17,616	100,370	61.4	54.7	11.0
July	260,373	160,015	143,727	2,165	141,493	16,288	100,358	61.5	55.2	10.2
Aug	260,558	160,707	147,176	2,185	145,252	13,532	99,851	61.7	56.5	8.4
Sept	260,742	160,153	147,569	2,280	145,417	12,584	100,590	61.4	56.6	7.9
Oct	260,925	160,834	149,719	2,488	147,315	11,115	100,091	61.6	57.4	6.9
Nov	261,085	160,539	149,761	2,456	147,142	10,777	100,546	61.5	57.4	6.7
Dec	261,230	160,671	149,883	2,448	147,199	10,789	100,559	61.5	57.4	6.7
2021: Jan	260,851	160,184	150,004	2,454	147,404	10,180	100,667	61.4	57.5	6.4
Feb	260,918	160,359	150,367	2,307	147,887	9,992	100,560	61.5	57.6	6.2
Mar	261,003	160,631	150,940	2,227	148,550	9,691	100,372	61.5	57.8	6.0
Apr	261,103	160,978	151,259	2,275	148,978	9,719	100,125	61.7	57.9	6.0
May	261,210	160,801	151,550	2,291	149,381	9,251	100,409	61.6	58.0	5.8
June	261,338	161,114	151,612	2,309	149,564	9,502	100,224	61.6	58.0	5.9
July	261,469	161,375	152,704	2,289	150,498	8,671	100,094	61.7	58.4	5.4
Aug	261,611	161,505	153,167	2,307	151,146	8,339	100,106	61.7	58.5	5.2
Sept	261,766	161,471	153,806	2,247	151,686	7,666	100,294	61.7	58.8	4.7
Oct	261,908	161,610	154,234	2,296	152,070	7,375	100,298	61.7	58.9	4.6
Nov	262,029	162,126	155,324	2,212	152,933	6,802	99,902	61.9	59.3	4.2
Dec	262,136	162,294	155,975	2,308	153,409	6,319	99,842	61.9	59.5	3.9

[5] Beginning in 2000, data for agricultural employment are for agricultural and related industries; data for this series and for nonagricultural employment are not strictly comparable with data for earlier years. Because of independent seasonal adjustment for these two series, monthly data will not add to total civilian employment.

Note: Labor force data in Tables B–22 through B–28 are based on household interviews and usually relate to the calendar week that includes the 12th of the month. Historical comparability is affected by revisions to population controls, changes in occupational and industry classification, and other changes to the survey. In recent years, updated population controls have been introduced annually with the release of January data, so data are not strictly comparable with earlier periods. Particularly notable changes were introduced for data in the years 1953, 1960, 1962, 1972, 1973, 1978, 1980, 1990, 1994, 1997, 1998, 2000, 2003, 2008 and 2012. For definitions of terms, area samples used, historical comparability of the data, comparability with other series, etc., see *Employment and Earnings* or concepts and methodology of the CPS at http://www.bls.gov/cps/documentation.htm#concepts.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–23. Civilian employment by sex, age, and demographic characteristic, 1976–2021

[Thousands of persons 16 years of age and over, except as noted; monthly data seasonally adjusted]

Year or month	All civilian workers	By sex and age			By race or ethnicity [1]									
		Men 20 years and over	Women 20 years and over	Both sexes 16–19	White			Black or African American			Asian	Hispanic or Latino ethnicity		
					Total	Men 20 years and over	Women 20 years and over	Total	Men 20 years and over	Women 20 years and over	Total	Total	Men 20 years and over	Women 20 years and over
1976	88,752	49,190	32,226	7,336	78,853	44,171	27,958	8,227	4,120	3,599	....	3,720	2,109	1,288
1977	92,017	50,555	33,775	7,688	81,700	45,326	29,306	8,540	4,273	3,758	....	4,079	2,335	1,370
1978	96,048	52,143	35,836	8,070	84,936	46,594	30,975	9,102	4,483	4,047	....	4,527	2,568	1,537
1979	98,824	53,308	37,434	8,083	87,259	47,546	32,357	9,359	4,606	4,174	....	4,785	2,701	1,638
1980	99,303	53,101	38,492	7,710	87,715	47,419	33,275	9,313	4,498	4,267	....	5,527	3,142	1,886
1981	100,397	53,582	39,590	7,225	88,709	47,846	34,275	9,355	4,520	4,329	....	5,813	3,325	2,029
1982	99,526	52,891	40,086	6,549	87,903	47,209	34,710	9,189	4,414	4,347	....	5,805	3,354	2,040
1983	100,834	53,487	41,004	6,342	88,893	47,618	35,476	9,375	4,531	4,428	....	6,072	3,523	2,127
1984	105,005	55,769	42,793	6,444	92,120	49,461	36,823	10,119	4,871	4,773	....	6,651	3,825	2,357
1985	107,150	56,562	44,154	6,434	93,736	50,061	37,907	10,501	4,992	4,977	....	6,888	3,994	2,456
1986	109,597	57,569	45,556	6,472	95,660	50,818	39,050	10,814	5,150	5,128	....	7,219	4,174	2,615
1987	112,440	58,726	47,074	6,640	97,789	51,649	40,242	11,309	5,357	5,365	....	7,790	4,444	2,872
1988	114,968	59,781	48,383	6,805	99,812	52,466	41,316	11,658	5,509	5,548	....	8,250	4,680	3,047
1989	117,342	60,837	49,745	6,759	101,584	53,292	42,346	11,953	5,602	5,727	....	8,573	4,853	3,172
1990	118,793	61,678	50,535	6,581	102,261	53,685	42,796	12,175	5,692	5,884	....	9,845	5,609	3,567
1991	117,718	61,178	50,634	5,906	101,182	53,103	42,862	12,074	5,706	5,874	....	9,828	5,623	3,603
1992	118,492	61,496	51,328	5,669	101,669	53,357	43,327	12,151	5,681	5,978	....	10,027	5,757	3,693
1993	120,259	62,355	52,099	5,805	103,045	54,021	43,910	12,382	5,793	6,095	....	10,361	5,992	3,800
1994	123,060	63,294	53,606	6,161	105,190	54,676	45,116	12,835	5,964	6,320	....	10,788	6,189	3,989
1995	124,900	64,085	54,396	6,419	106,490	55,254	45,643	13,279	6,137	6,556	....	11,127	6,367	4,116
1996	126,708	64,897	55,311	6,500	107,808	55,977	46,164	13,542	6,167	6,762	....	11,642	6,655	4,341
1997	129,558	66,284	56,613	6,661	109,856	56,986	47,063	13,969	6,325	7,013	....	12,726	7,307	4,705
1998	131,463	67,135	57,278	7,051	110,931	57,500	47,342	14,556	6,530	7,290	....	13,291	7,570	4,928
1999	133,488	67,761	58,555	7,172	112,235	57,934	48,098	15,056	6,702	7,663	....	13,720	7,576	5,290
2000	136,891	69,634	60,067	7,189	114,424	59,119	49,145	15,156	6,741	7,703	6,043	15,735	8,859	5,903
2001	136,933	69,776	60,417	6,740	114,430	59,245	49,369	15,006	6,627	7,741	6,180	16,190	9,100	6,121
2002	136,485	69,734	60,420	6,332	114,013	59,124	49,448	14,872	6,652	7,610	6,215	16,590	9,341	6,367
2003	137,736	70,415	61,402	5,919	114,235	59,348	49,823	14,739	6,586	7,636	5,756	17,372	10,063	6,541
2004	139,252	71,572	61,773	5,907	115,239	60,159	50,040	14,909	6,681	7,707	5,994	17,930	10,385	6,752
2005	141,730	73,050	62,702	5,978	116,949	61,255	50,589	15,313	6,901	7,876	6,244	18,632	10,872	6,913
2006	144,427	74,431	63,834	6,162	118,833	62,259	51,359	15,765	7,079	8,068	6,522	19,613	11,391	7,321
2007	146,047	75,337	64,799	5,911	119,792	62,806	51,996	16,051	7,245	8,240	6,839	20,382	11,827	7,662
2008	145,362	74,750	65,039	5,573	119,126	62,304	52,124	15,953	7,151	8,260	6,917	20,346	11,769	7,707
2009	139,877	71,341	63,699	4,837	114,996	59,626	51,231	15,025	6,628	7,956	6,635	19,647	11,256	7,649
2010	139,064	71,230	63,456	4,378	114,168	59,438	50,997	15,010	6,680	7,944	6,705	19,906	11,438	7,788
2011	139,869	72,182	63,360	4,327	114,690	60,118	50,881	15,051	6,765	7,906	6,867	20,269	11,685	7,918
2012	142,469	73,403	64,640	4,426	114,769	60,193	50,911	15,856	7,104	8,313	7,705	21,878	12,212	8,858
2013	143,929	74,176	65,295	4,458	115,379	60,511	51,198	16,151	7,304	8,408	8,136	22,514	12,638	9,056
2014	146,305	75,471	66,287	4,548	116,788	61,289	51,798	16,732	7,613	8,663	8,325	23,492	13,202	9,431
2015	148,834	76,776	67,323	4,734	117,944	61,959	52,161	17,472	7,938	9,032	8,706	24,400	13,624	9,853
2016	151,436	78,084	68,387	4,965	119,313	62,575	52,771	17,982	8,228	9,219	9,213	25,249	14,055	10,217
2017	153,337	78,919	69,344	5,074	120,176	63,009	53,179	18,587	8,500	9,514	9,448	25,938	14,355	10,543
2018	155,761	80,211	70,424	5,126	121,461	63,719	53,682	19,091	8,745	9,751	9,832	27,012	14,873	11,045
2019	157,538	80,917	71,470	5,150	122,441	64,070	54,304	19,381	8,883	9,910	10,179	27,805	15,204	11,516
2020	147,795	76,227	66,873	4,695	115,341	60,570	51,048	17,873	8,150	9,176	9,437	25,952	14,333	10,593
2021	152,581	78,216	69,099	5,266	118,291	61,737	52,389	18,726	8,597	9,525	10,016	27,429	15,138	11,165
2020: Jan	158,653	81,310	72,040	5,303	123,292	64,337	54,772	19,545	8,879	10,091	10,029	28,401	15,573	11,706
Feb	158,866	81,224	72,244	5,397	123,305	64,225	54,768	19,730	8,923	10,216	10,269	28,503	15,513	11,838
Mar	155,599	79,828	70,661	5,110	120,955	63,092	53,793	19,158	8,798	9,809	10,036	27,626	15,004	11,500
Apr	133,320	70,006	59,969	3,345	104,024	55,775	45,614	16,228	7,453	8,349	8,532	22,603	12,774	9,085
May	137,182	71,760	61,592	3,830	107,542	57,388	47,160	16,541	7,605	8,432	8,515	23,297	13,173	9,347
June	142,218	73,668	64,285	4,265	111,614	58,969	49,299	16,933	7,679	8,691	8,751	24,708	13,616	10,129
July	143,727	74,184	65,142	4,401	112,346	59,035	49,814	17,182	7,846	8,790	9,189	24,928	13,757	10,236
Aug	147,176	75,873	66,610	4,692	115,179	60,379	51,044	17,506	8,047	8,935	9,449	25,884	14,214	10,637
Sept	147,569	76,195	66,402	4,972	115,452	60,694	50,824	17,566	7,983	9,003	9,547	25,841	14,450	10,320
Oct	149,719	76,947	67,638	5,134	117,092	61,224	51,778	17,955	8,174	9,227	9,590	26,570	14,760	10,688
Nov	149,761	76,753	67,902	5,107	116,705	60,835	51,806	18,097	8,184	9,324	9,677	26,618	14,670	10,821
Dec	149,883	76,949	67,933	5,000	116,707	60,871	51,858	18,076	8,270	9,244	9,647	26,436	14,485	10,802
2021: Jan	150,004	77,185	67,776	5,043	116,663	60,987	51,705	18,335	8,465	9,278	9,629	26,452	14,575	10,767
Feb	150,367	77,203	68,005	5,158	116,996	61,024	51,846	18,180	8,396	9,224	9,813	26,719	14,715	10,829
Mar	150,940	77,262	68,486	5,192	117,288	61,008	52,162	18,419	8,510	9,300	9,798	26,942	14,794	11,020
Apr	151,259	77,423	68,436	5,399	117,475	61,185	52,012	18,543	8,503	9,423	9,791	26,902	14,886	10,921
May	151,550	77,489	68,633	5,428	117,626	61,273	52,072	18,617	8,549	9,461	9,899	27,086	15,020	11,006
June	151,612	77,665	68,747	5,200	117,359	61,217	52,062	18,779	8,652	9,476	9,818	27,196	15,024	11,104
July	152,704	78,135	69,306	5,264	118,304	61,699	52,466	18,765	8,614	9,514	10,100	27,593	15,241	11,210
Aug	153,167	78,480	69,390	5,297	118,557	61,944	52,432	18,879	8,616	9,653	10,135	27,666	15,327	11,255
Sept	153,806	78,952	69,555	5,298	119,009	62,257	52,574	19,017	8,644	9,702	10,207	27,758	15,408	11,272
Oct	154,234	79,164	69,790	5,281	119,376	62,374	52,800	18,962	8,699	9,673	10,310	27,962	15,410	11,374
Nov	155,324	79,736	70,257	5,331	120,084	62,835	53,030	19,143	8,787	9,802	10,362	28,432	15,681	11,531
Dec	155,975	79,892	70,795	5,287	120,749	63,047	53,493	19,057	8,723	9,794	10,326	28,427	15,580	11,682

[1] Beginning in 2003, persons who selected this race group only. Persons whose ethnicity is identified as Hispanic or Latino may be of any race. Prior to 2003, persons who selected more than one race were included in the group they identified as the main race. Data for "black or African American" were for "black" prior to 2003. See *Employment and Earnings* or concepts and methodology of the Current Population Survey (CPS) at http://www.bls.gov/cps/documentation.htm#concepts for details.

Note: Detail will not sum to total because data for all race groups are not shown here.

See footnote 5 and Note, Table B–22.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–24. Unemployment by sex, age, and demographic characteristic, 1976–2021

[Thousands of persons 16 years of age and over, except as noted; monthly data seasonally adjusted]

Year or month	All civilian workers	By sex and age			By race or ethnicity [1]									
					White			Black or African American			Asian	Hispanic or Latino ethnicity		
		Men 20 years and over	Women 20 years and over	Both sexes 16–19	Total	Men 20 years and over	Women 20 years and over	Total	Men 20 years and over	Women 20 years and over	Total	Total	Men 20 years and over	Women 20 years and over
1976	7,406	3,098	2,588	1,719	5,914	2,504	2,045	1,334	528	477	....	485	217	166
1977	6,991	2,794	2,535	1,663	5,441	2,211	1,946	1,393	512	528	....	456	195	153
1978	6,202	2,328	2,292	1,583	4,698	1,797	1,713	1,330	462	510	....	452	175	168
1979	6,137	2,308	2,276	1,555	4,664	1,773	1,699	1,319	473	513	....	434	168	160
1980	7,637	3,353	2,615	1,669	5,884	2,629	1,964	1,553	636	574	....	620	284	190
1981	8,273	3,615	2,895	1,763	6,343	2,825	2,143	1,731	703	671	....	678	321	212
1982	10,678	5,089	3,613	1,977	8,241	3,991	2,715	2,142	954	793	....	929	461	293
1983	10,717	5,257	3,632	1,829	8,128	4,098	2,643	2,272	1,002	878	....	961	491	302
1984	8,539	3,932	3,107	1,499	6,372	2,992	2,264	1,914	815	747	....	800	393	258
1985	8,312	3,715	3,129	1,468	6,191	2,834	2,283	1,864	757	750	....	811	401	269
1986	8,237	3,751	3,032	1,454	6,140	2,857	2,213	1,840	765	728	....	857	438	278
1987	7,425	3,369	2,709	1,347	5,501	2,584	1,922	1,684	666	706	....	751	374	241
1988	6,701	2,987	2,487	1,226	4,944	2,268	1,766	1,547	617	642	....	732	351	234
1989	6,528	2,867	2,467	1,194	4,770	2,149	1,758	1,544	619	625	....	750	342	276
1990	7,047	3,239	2,596	1,212	5,186	2,431	1,852	1,565	664	633	....	876	425	289
1991	8,628	4,195	3,074	1,359	6,560	3,284	2,248	1,723	745	698	....	1,092	575	339
1992	9,613	4,717	3,469	1,427	7,169	3,620	2,512	2,011	886	800	....	1,311	675	418
1993	8,940	4,287	3,288	1,365	6,655	3,263	2,400	1,844	801	729	....	1,248	629	418
1994	7,996	3,627	3,049	1,320	5,892	2,735	2,197	1,666	682	685	....	1,187	558	431
1995	7,404	3,239	2,819	1,346	5,459	2,465	2,042	1,538	593	620	....	1,140	530	404
1996	7,236	3,146	2,783	1,306	5,300	2,363	1,998	1,592	639	643	....	1,132	495	438
1997	6,739	2,882	2,585	1,271	4,836	2,140	1,784	1,560	585	673	....	1,069	471	401
1998	6,210	2,580	2,424	1,205	4,484	1,920	1,688	1,426	524	622	....	1,026	436	376
1999	5,880	2,433	2,285	1,162	4,273	1,813	1,616	1,309	480	561	....	945	374	376
2000	5,692	2,376	2,235	1,081	4,121	1,731	1,595	1,241	499	512	227	954	388	371
2001	6,801	3,040	2,599	1,162	4,969	2,275	1,849	1,416	573	582	288	1,138	495	436
2002	8,378	3,896	3,228	1,253	6,137	2,943	2,269	1,693	695	738	389	1,353	636	496
2003	8,774	4,209	3,314	1,251	6,311	3,125	2,276	1,787	760	772	366	1,441	693	555
2004	8,149	3,791	3,150	1,208	5,847	2,785	2,172	1,729	733	755	277	1,342	635	504
2005	7,591	3,392	3,013	1,186	5,350	2,450	2,054	1,700	699	734	259	1,191	536	464
2006	7,001	3,131	2,751	1,119	5,002	2,281	1,927	1,549	640	656	205	1,081	497	414
2007	7,078	3,259	2,718	1,101	5,143	2,408	1,930	1,445	622	588	229	1,220	576	446
2008	8,924	4,297	3,342	1,285	6,509	3,179	2,384	1,788	811	732	285	1,678	860	567
2009	14,265	7,555	5,157	1,552	10,648	5,746	3,745	2,606	1,286	1,032	522	2,706	1,474	911
2010	14,825	7,763	5,534	1,528	10,916	5,828	3,960	2,852	1,396	1,165	543	2,843	1,519	1,001
2011	13,747	6,898	5,450	1,400	9,889	5,046	3,818	2,831	1,360	1,204	518	2,629	1,345	984
2012	12,506	5,984	5,125	1,397	8,915	4,347	3,564	2,544	1,152	1,119	483	2,514	1,195	995
2013	11,460	5,568	4,565	1,327	8,033	3,994	3,102	2,429	1,082	1,069	448	2,257	1,090	855
2014	9,617	4,585	3,926	1,106	6,540	3,141	2,623	2,141	973	943	436	1,878	864	764
2015	8,296	3,959	3,371	966	5,662	2,751	2,249	1,846	835	811	347	1,726	820	686
2016	7,751	3,675	3,151	925	5,345	2,594	2,100	1,655	737	724	349	1,548	720	627
2017	6,982	3,287	2,868	827	4,765	2,288	1,923	1,501	663	657	333	1,401	632	585
2018	6,314	2,976	2,578	759	4,354	2,094	1,743	1,322	582	573	304	1,323	591	547
2019	6,001	2,819	2,435	746	4,159	1,967	1,664	1,251	571	527	280	1,248	553	497
2020	12,947	6,118	5,804	1,025	9,090	4,334	4,013	2,304	1,069	1,062	894	3,018	1,451	1,291
2021	8,623	4,302	3,625	696	5,854	2,957	2,411	1,756	845	791	529	1,995	986	812
2020: Jan	5,826	2,679	2,409	739	3,884	1,859	1,523	1,310	559	574	306	1,267	534	542
Feb	5,717	2,709	2,323	685	3,844	1,859	1,538	1,263	583	520	266	1,303	500	606
Mar	7,165	3,390	2,943	832	4,933	2,400	1,968	1,395	657	547	426	1,743	785	733
Apr	23,038	10,474	10,945	1,619	17,130	7,833	8,056	3,235	1,417	1,633	1,437	5,232	2,530	2,286
May	20,940	9,368	9,894	1,678	15,114	6,852	7,073	3,328	1,375	1,676	1,482	4,991	2,361	2,179
June	17,616	8,265	8,113	1,238	12,423	5,762	5,694	3,043	1,466	1,409	1,397	4,191	2,003	1,830
July	16,288	7,636	7,597	1,055	11,402	5,314	5,322	2,887	1,386	1,346	1,242	3,673	1,757	1,656
Aug	13,532	6,536	6,067	929	9,209	4,499	4,045	2,576	1,224	1,192	1,120	3,071	1,569	1,263
Sept	12,584	6,046	5,584	953	8,702	4,245	3,756	2,416	1,176	1,101	932	2,987	1,410	1,275
Oct	11,115	5,551	4,735	828	7,535	3,823	3,113	2,197	1,062	963	789	2,606	1,343	1,062
Nov	10,777	5,474	4,486	818	7,392	3,802	2,976	2,111	1,060	936	707	2,503	1,282	974
Dec	10,789	5,287	4,561	940	7,517	3,758	3,092	2,011	967	864	624	2,731	1,413	1,084
2021: Jan	10,180	5,006	4,311	863	7,062	3,570	2,815	1,863	880	861	676	2,473	1,204	1,036
Feb	9,992	4,911	4,250	831	6,873	3,446	2,812	1,973	944	899	530	2,434	1,189	1,001
Mar	9,691	4,786	4,149	756	6,614	3,338	2,746	1,925	911	882	613	2,240	1,147	873
Apr	9,719	4,961	4,050	708	6,560	3,428	2,639	2,000	966	886	590	2,235	1,134	879
May	9,251	4,808	3,866	578	6,289	3,271	2,597	1,872	920	860	578	2,080	1,023	881
June	9,502	4,834	4,008	660	6,503	3,333	2,708	1,892	951	870	594	2,123	1,009	954
July	8,671	4,410	3,628	633	5,990	3,118	2,456	1,666	798	771	552	1,895	949	807
Aug	8,339	4,192	3,472	675	5,650	2,870	2,332	1,803	855	819	476	1,815	904	722
Sept	7,666	3,899	3,089	678	5,194	2,699	2,000	1,608	745	748	445	1,808	918	661
Oct	7,375	3,539	3,139	697	4,903	2,320	2,101	1,603	780	710	457	1,701	803	680
Nov	6,802	3,272	2,876	654	4,593	2,138	2,039	1,335	679	500	419	1,547	741	639
Dec	6,319	3,010	2,660	649	4,032	1,953	1,684	1,449	655	651	413	1,456	687	606

[1] See footnote 1 and Note, Table B–23.

Note: See footnote 5 and Note, Table B–22.

Source: Department of Labor (Bureau of Labor Statistics).

TABLE B–25. Civilian labor force participation rate, 1976–2021

[Percent [1]; monthly data seasonally adjusted]

Year or month	All civilian workers	Men				Women				Both sexes 16–19 years	By race or ethnicity [2]			
		20 years and over	20–24 years	25–54 years	55 years and over	20 years and over	20–24 years	25–54 years	55 years and over		White	Black or African American	Asian	Hispanic or Latino ethnicity
1976	61.6	79.8	85.2	94.2	47.8	47.0	65.0	56.8	23.0	54.5	61.8	59.0	....	60.8
1977	62.3	79.7	85.6	94.2	47.4	48.1	66.5	58.5	22.9	56.0	62.5	59.8	....	61.6
1978	63.2	79.8	85.9	94.3	47.2	49.6	68.3	60.6	23.1	57.8	63.3	61.5	....	62.9
1979	63.7	79.8	86.4	94.4	46.6	50.6	69.0	62.3	23.2	57.9	63.9	61.4	....	63.6
1980	63.8	79.4	85.9	94.2	45.6	51.3	68.9	64.0	22.8	56.7	64.1	61.0	....	64.0
1981	63.9	79.0	85.5	94.1	44.5	52.1	69.6	65.3	22.7	55.4	64.3	60.8	....	64.1
1982	64.0	78.7	84.9	94.0	43.8	52.7	69.8	66.3	22.7	54.1	64.3	61.0	....	63.6
1983	64.0	78.5	84.8	93.8	43.0	53.1	69.9	67.1	22.4	53.5	64.3	61.5	....	63.8
1984	64.4	78.3	85.0	93.9	41.8	53.7	70.4	68.2	22.2	53.9	64.6	62.2	....	64.9
1985	64.8	78.1	85.0	93.9	41.0	54.7	71.8	69.6	22.0	54.5	65.0	62.9	....	64.6
1986	65.3	78.1	85.8	93.8	40.4	55.5	72.4	70.8	22.1	54.7	65.5	63.3	....	65.4
1987	65.6	78.0	85.2	93.7	40.4	56.2	73.0	71.9	22.0	54.7	65.8	63.8	....	66.4
1988	65.9	77.9	85.0	93.6	39.9	56.8	72.7	72.7	22.3	55.3	66.2	63.8	....	67.4
1989	66.5	78.1	85.3	93.7	39.6	57.7	72.4	73.6	23.0	55.9	66.7	64.2	....	67.6
1990	66.5	78.2	84.4	93.4	39.4	58.0	71.3	74.0	22.9	53.7	66.9	64.0	....	67.4
1991	66.2	77.7	83.5	93.1	38.5	57.9	70.1	74.1	22.6	51.6	66.6	63.3	....	66.5
1992	66.4	77.7	83.3	93.0	38.4	58.5	70.9	74.6	22.8	51.3	66.8	63.9	....	66.8
1993	66.3	77.3	83.2	92.6	37.7	58.5	70.9	74.6	22.8	51.5	66.8	63.2	....	66.2
1994	66.6	76.8	83.1	91.7	37.8	59.3	71.0	75.3	24.0	52.7	67.1	63.4	....	66.1
1995	66.6	76.7	83.1	91.6	37.9	59.4	70.3	75.6	23.9	53.5	67.1	63.7	....	65.8
1996	66.8	76.8	82.5	91.8	38.3	59.9	71.3	76.1	23.9	52.3	67.2	64.1	....	66.5
1997	67.1	77.0	82.5	91.8	38.9	60.5	72.7	76.7	24.6	51.6	67.5	64.7	....	67.9
1998	67.1	76.8	82.0	91.8	39.1	60.4	73.0	76.5	25.0	52.8	67.3	65.6	....	67.9
1999	67.1	76.7	81.9	91.7	39.6	60.7	73.2	76.8	25.6	52.0	67.3	65.8	....	67.7
2000	67.1	76.7	82.6	91.6	40.1	60.6	73.1	76.7	26.1	52.0	67.3	65.8	67.2	69.7
2001	66.8	76.5	81.6	91.3	40.9	60.6	72.7	76.4	27.0	49.6	67.0	65.3	67.2	69.5
2002	66.6	76.3	80.7	91.0	42.0	60.5	72.1	75.9	28.5	47.4	66.8	64.8	67.2	69.1
2003	66.2	75.9	80.0	90.6	42.6	60.6	70.8	75.6	30.0	44.5	66.5	64.3	66.4	68.3
2004	66.0	75.8	79.6	90.5	43.2	60.3	70.5	75.3	30.5	43.9	66.3	63.8	65.9	68.6
2005	66.0	75.8	79.1	90.5	44.2	60.4	70.1	75.3	31.4	43.7	66.3	64.2	66.1	68.0
2006	66.2	75.9	79.6	90.6	44.9	60.5	69.5	75.5	32.3	43.7	66.5	64.1	66.2	68.7
2007	66.0	75.9	78.7	90.9	45.2	60.6	70.1	75.4	33.2	41.3	66.4	63.7	66.5	68.8
2008	66.0	75.7	78.7	90.5	46.0	60.9	70.0	75.8	33.9	40.2	66.3	63.7	67.0	68.5
2009	65.4	74.8	76.2	89.7	46.3	60.8	69.6	75.6	34.7	37.5	65.8	62.4	66.0	68.0
2010	64.7	74.1	74.5	89.3	46.4	60.3	68.3	75.2	35.1	34.9	65.1	62.2	64.7	67.5
2011	64.1	73.4	74.7	88.7	46.3	59.8	67.8	74.7	35.1	34.1	64.5	61.4	64.6	66.5
2012	63.7	73.0	74.5	88.7	46.8	59.3	67.4	74.5	35.1	34.3	64.0	61.5	63.9	66.4
2013	63.2	72.5	73.9	88.4	46.5	58.8	67.5	73.9	35.1	34.5	63.5	61.2	64.6	66.0
2014	62.9	71.9	73.9	88.2	45.9	58.5	67.7	73.9	34.9	34.0	63.1	61.2	63.6	66.1
2015	62.7	71.7	73.0	88.3	45.9	58.2	68.3	73.7	34.7	34.3	62.8	61.5	62.8	65.9
2016	62.8	71.7	73.0	88.5	46.2	58.3	68.0	74.3	34.7	35.2	62.9	61.6	63.2	65.8
2017	62.9	71.6	74.1	88.6	46.1	58.5	68.5	75.0	34.7	35.2	62.8	62.3	63.6	66.1
2018	62.9	71.6	73.2	89.0	46.2	58.5	69.0	75.3	34.7	35.1	62.8	62.3	63.5	66.3
2019	63.1	71.6	74.0	89.1	46.3	58.9	70.4	76.0	35.0	35.3	63.0	62.5	64.0	66.8
2020	61.7	70.1	71.0	87.9	45.1	57.6	67.5	75.1	34.0	34.5	61.8	60.5	62.7	65.6
2021	61.7	69.8	73.0	88.0	44.2	57.3	68.6	75.3	33.3	36.2	61.5	60.9	63.8	65.5
2020: Jan	63.4	71.7	75.1	89.3	46.5	59.2	70.8	76.9	34.8	36.3	63.3	62.8	63.9	67.8
Feb	63.4	71.6	75.0	89.2	46.6	59.3	71.4	76.9	35.0	36.6	63.3	63.2	64.2	68.0
Mar	62.7	71.0	71.4	89.0	45.6	58.5	68.6	76.1	34.5	35.8	62.6	61.8	63.7	66.9
Apr	60.2	68.6	65.1	86.4	44.6	56.3	63.7	73.5	33.4	30.0	60.3	58.5	60.9	63.3
May	60.8	69.1	67.4	87.2	44.4	56.7	65.0	74.3	33.3	33.2	61.0	59.7	61.0	64.2
June	61.4	69.7	68.4	87.8	45.1	57.4	66.7	75.3	33.7	33.2	61.6	59.9	61.6	65.5
July	61.5	69.6	69.8	87.5	45.0	57.6	66.8	75.1	34.3	33.0	61.5	60.2	63.5	64.7
Aug	61.7	70.0	71.2	87.9	45.1	57.5	65.9	74.9	34.6	34.0	61.8	60.1	63.7	65.4
Sept	61.4	69.8	71.6	87.7	44.8	56.9	66.6	74.4	33.7	35.8	61.6	59.8	62.9	64.9
Oct	61.6	70.0	73.1	87.8	44.7	57.2	68.2	74.8	33.6	36.0	61.8	60.2	62.7	65.6
Nov	61.5	69.7	72.7	87.3	44.6	57.2	68.1	74.6	33.7	35.8	61.5	60.4	62.7	65.4
Dec	61.5	69.7	72.4	87.4	44.5	57.2	68.8	74.7	33.4	35.9	61.6	59.9	61.9	65.3
2021: Jan	61.4	69.7	72.8	87.6	44.3	57.0	67.9	74.7	33.1	35.8	61.4	60.3	62.7	65.0
Feb	61.5	69.6	72.7	87.6	44.3	57.1	68.0	74.9	33.1	36.4	61.4	60.1	62.4	65.4
Mar	61.5	69.6	72.3	87.6	43.9	57.4	68.3	75.2	33.3	36.1	61.4	60.7	63.0	65.4
Apr	61.7	69.8	73.6	87.9	44.2	57.2	67.2	75.1	33.4	37.1	61.5	61.2	62.8	65.2
May	61.6	69.7	72.6	87.9	44.2	57.2	68.1	75.0	33.3	36.5	61.4	61.0	63.4	65.1
June	61.6	69.8	72.2	88.1	44.3	57.4	69.3	75.4	33.3	35.6	61.4	61.5	63.4	65.4
July	61.7	69.8	72.1	88.3	44.3	57.5	69.1	75.6	33.2	35.9	61.6	60.8	64.5	65.6
Aug	61.7	69.9	72.3	88.3	44.2	57.4	68.2	75.4	33.6	36.3	61.5	61.5	64.1	65.5
Sept	61.7	70.0	73.0	88.2	44.6	57.2	68.2	75.3	33.3	36.3	61.5	61.3	64.4	65.6
Oct	61.7	69.8	73.2	88.1	44.1	57.4	69.2	75.4	33.4	36.3	61.5	61.0	65.3	65.7
Nov	61.9	70.1	74.5	88.2	44.2	57.5	69.3	75.7	33.4	36.4	61.7	60.7	65.3	66.3
Dec	61.9	69.9	74.0	88.0	44.2	57.8	70.0	75.9	33.5	36.1	61.7	60.8	64.6	66.0

[1] Civilian labor force as percent of civilian noninstitutional population in group specified.
[2] See footnote 1, Table B–23.

Note: Data relate to persons 16 years of age and over, except as noted.
See footnote 5 and Note, Table B–22.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–26. Civilian employment/population ratio, 1976–2021

[Percent [1]; monthly data seasonally adjusted]

Year or month	All civilian workers	Men: 20 years and over	Men: 20–24 years	Men: 25–54 years	Men: 55 years and over	Women: 20 years and over	Women: 20–24 years	Women: 25–54 years	Women: 55 years and over	Both sexes 16–19 years	By race or ethnicity [2]: White	By race or ethnicity [2]: Black or African American	By race or ethnicity [2]: Asian	By race or ethnicity [2]: Hispanic or Latino ethnicity
1976	56.8	75.1	74.9	89.5	45.7	43.5	57.3	52.9	21.9	44.2	57.5	50.8	....	53.8
1977	57.9	75.6	76.3	90.1	45.5	44.8	59.0	54.8	21.9	46.1	58.6	51.4	....	55.4
1978	59.3	76.4	78.0	91.0	45.7	46.6	61.4	57.3	22.3	48.3	60.0	53.6	....	57.2
1979	59.9	76.5	78.9	91.1	45.2	47.7	62.4	59.0	22.5	48.5	60.6	53.8	....	58.3
1980	59.2	74.6	75.1	89.4	44.1	48.1	61.8	60.1	22.1	46.6	60.0	52.3	....	57.6
1981	59.0	74.0	74.2	89.0	42.9	48.6	61.8	61.2	21.9	44.6	60.0	51.3	....	57.4
1982	57.8	71.8	71.0	86.5	41.6	48.4	60.6	61.2	21.6	41.5	58.8	49.4	....	54.9
1983	57.9	71.4	71.3	86.1	40.6	48.8	60.9	62.0	21.4	41.5	58.9	49.5	....	55.1
1984	59.5	73.2	74.9	88.4	39.8	50.1	62.7	63.9	21.3	43.7	60.5	52.3	....	57.9
1985	60.1	73.3	75.3	88.7	39.3	51.0	64.1	65.3	21.1	44.4	61.0	53.4	....	57.8
1986	60.7	73.3	76.3	88.5	38.8	52.0	64.9	66.6	21.3	44.6	61.5	54.1	....	58.5
1987	61.5	73.8	76.8	89.0	39.0	53.1	66.1	68.2	21.3	45.5	62.3	55.6	....	60.5
1988	62.3	74.2	77.5	89.5	38.6	54.0	66.6	69.3	21.7	46.8	63.1	56.3	....	61.9
1989	63.0	74.5	77.8	89.9	38.3	54.9	66.4	70.4	22.4	47.5	63.8	56.9	....	62.2
1990	62.8	74.3	76.7	89.1	38.0	55.2	65.2	70.6	22.2	45.3	63.7	56.7	....	61.9
1991	61.7	72.7	73.8	87.5	36.8	54.6	63.2	70.1	21.9	42.0	62.6	55.4	....	59.8
1992	61.5	72.1	73.1	86.8	36.4	54.8	63.6	70.1	21.8	41.0	62.4	54.9	....	59.1
1993	61.7	72.3	73.8	87.0	35.9	55.0	64.0	70.4	22.0	41.7	62.7	55.0	....	59.1
1994	62.5	72.6	74.6	87.2	36.2	56.2	64.5	71.5	23.1	43.4	63.5	56.1	....	59.5
1995	62.9	73.0	75.4	87.6	36.5	56.5	64.0	72.2	23.0	44.2	63.8	57.1	....	59.7
1996	63.2	73.2	74.7	87.9	37.0	57.0	64.9	72.8	23.1	43.5	64.1	57.4	....	60.6
1997	63.8	73.7	75.2	88.4	37.7	57.8	66.8	73.5	23.8	43.4	64.6	58.2	....	62.6
1998	64.1	73.9	75.4	88.8	38.0	58.0	67.3	73.6	24.4	45.1	64.7	59.7	....	63.1
1999	64.3	74.0	75.6	89.0	38.5	58.5	68.0	74.1	24.9	44.7	64.8	60.6	....	63.4
2000	64.4	74.2	76.6	89.0	39.1	58.4	67.9	74.2	25.5	45.2	64.9	60.9	64.8	65.7
2001	63.7	73.3	74.2	87.9	39.6	58.1	67.3	73.4	26.3	42.3	64.2	59.7	64.2	64.9
2002	62.7	72.3	72.5	86.6	40.3	57.5	65.6	72.3	27.5	39.6	63.4	58.1	63.2	63.9
2003	62.3	71.7	71.5	85.9	40.7	57.5	64.2	72.0	28.9	36.8	63.0	57.4	62.4	63.1
2004	62.3	71.9	71.6	86.3	41.5	57.4	64.3	71.8	29.4	36.4	63.1	57.2	63.0	63.8
2005	62.7	72.4	71.5	86.9	42.7	57.6	64.5	72.0	30.4	36.5	63.4	57.7	63.4	64.0
2006	63.1	72.9	72.7	87.3	43.5	58.0	64.2	72.5	31.4	36.9	63.8	58.4	64.2	65.2
2007	63.0	72.8	71.7	87.5	43.7	58.2	65.0	72.5	32.2	34.8	63.6	58.4	64.3	64.9
2008	62.2	71.6	69.7	86.0	44.2	57.9	63.8	72.3	32.7	32.6	62.8	57.3	64.3	63.3
2009	59.3	67.6	63.3	81.5	43.0	56.2	61.1	70.2	32.6	28.4	60.2	53.2	61.2	59.7
2010	58.5	66.8	61.3	81.0	42.8	55.5	59.4	69.3	32.9	25.9	59.4	52.3	59.9	59.0
2011	58.4	67.0	63.0	81.4	43.1	55.0	58.7	69.0	32.9	25.8	59.4	51.7	60.0	58.9
2012	58.6	67.5	63.8	82.5	43.8	55.0	59.2	69.2	33.1	26.1	59.4	53.0	60.1	59.5
2013	58.6	67.4	63.5	82.8	43.8	54.9	59.8	69.3	33.3	26.6	59.4	53.2	61.2	60.0
2014	59.0	67.8	64.9	83.6	43.9	55.2	60.9	70.0	33.4	27.3	59.7	54.3	60.4	61.2
2015	59.3	68.1	65.1	84.4	44.1	55.4	62.5	70.3	33.5	28.5	59.9	55.7	60.4	61.6
2016	59.7	68.5	66.2	85.0	44.4	55.7	63.0	71.1	33.5	29.7	60.2	56.4	60.9	62.0
2017	60.1	68.8	67.9	85.4	44.6	56.1	64.2	72.1	33.6	30.3	60.4	57.6	61.5	62.7
2018	60.4	69.0	67.6	86.2	44.7	56.4	64.7	72.8	33.7	30.6	60.7	58.3	61.6	63.2
2019	60.8	69.2	68.3	86.4	45.1	56.9	66.4	73.7	34.0	30.9	61.0	58.7	62.3	63.9
2020	56.8	64.8	61.3	81.8	42.2	53.0	58.2	69.6	31.5	28.3	57.3	53.6	57.3	58.7
2021	58.4	66.2	65.9	83.6	42.3	54.5	63.0	71.7	31.9	32.0	58.6	55.7	60.6	61.1
2020: Jan	61.1	69.4	69.8	86.6	45.2	57.3	66.0	74.6	34.0	31.9	61.4	58.9	62.0	64.9
Feb	61.2	69.3	69.8	86.5	45.2	57.4	67.0	74.6	34.1	32.5	61.4	59.4	62.5	65.0
Mar	59.9	68.1	65.1	85.9	44.0	56.1	63.1	73.3	33.4	30.8	60.2	57.6	61.1	62.9
Apr	51.3	59.7	50.0	76.0	39.2	47.6	45.9	63.4	28.3	20.2	51.7	48.8	52.1	51.4
May	52.8	61.1	52.5	78.0	39.9	48.9	49.5	65.0	28.8	23.1	53.5	49.7	52.0	52.9
June	54.7	62.7	55.6	79.6	41.1	51.0	53.0	67.6	30.2	25.8	55.5	50.8	53.1	56.0
July	55.2	63.1	57.8	79.8	41.5	51.6	54.2	68.0	31.0	26.6	55.8	51.5	56.0	56.4
Aug	56.5	64.5	61.1	81.5	41.8	52.7	56.9	69.2	31.8	28.3	57.2	52.4	56.9	58.4
Sept	56.6	64.7	62.3	81.5	42.0	52.5	58.5	69.0	31.3	30.0	57.3	52.6	57.3	58.2
Oct	57.4	65.3	64.4	82.1	42.4	53.5	61.4	70.1	31.7	31.0	58.1	53.7	58.0	59.7
Nov	57.4	65.1	64.0	81.8	42.0	53.6	61.7	70.2	31.8	30.9	57.9	54.0	58.4	59.7
Dec	57.4	65.2	63.5	82.2	41.9	53.6	61.7	70.4	31.4	30.2	57.8	53.9	58.2	59.2
2021: Jan	57.5	65.5	65.4	82.5	41.9	53.6	61.3	70.4	31.4	30.6	57.9	54.7	58.6	59.4
Feb	57.6	65.5	65.1	82.7	41.8	53.7	61.8	70.6	31.4	31.3	58.0	54.3	59.2	59.9
Mar	57.8	65.5	64.5	82.8	41.9	54.1	61.8	71.1	31.8	31.5	58.2	54.9	59.3	60.3
Apr	57.9	65.6	65.1	83.0	41.9	54.0	61.0	71.1	31.7	32.8	58.2	55.3	59.2	60.2
May	58.0	65.6	64.7	83.1	42.2	54.2	61.8	71.4	31.7	33.0	58.3	55.5	59.9	60.5
June	58.0	65.7	64.9	83.2	42.1	54.2	63.8	71.4	31.6	31.6	58.2	55.9	59.8	60.6
July	58.4	66.1	64.8	83.9	42.3	54.6	63.7	72.0	31.8	32.0	58.6	55.8	61.2	61.4
Aug	58.5	66.4	65.5	84.0	42.5	54.7	62.1	72.0	32.3	32.2	58.7	56.1	61.2	61.5
Sept	58.8	66.7	66.4	84.2	43.0	54.8	63.8	72.1	32.2	32.2	58.9	56.5	61.7	61.6
Oct	58.9	66.9	67.3	84.6	42.6	54.9	64.8	72.2	32.2	32.1	59.1	56.3	62.5	61.9
Nov	59.3	67.3	68.6	84.8	42.9	55.3	64.7	72.9	32.2	32.4	59.4	56.8	62.8	62.9
Dec	59.5	67.4	68.3	85.0	43.0	55.7	65.4	73.2	32.4	32.1	59.7	56.5	62.2	62.7

[1] Civilian employment as percent of civilian noninstitutional population in group specified.

[2] See footnote 1, Table B–23.

Note: Data relate to persons 16 years of age and over, except as noted.
See footnote 5 and Note, Table B–22.

Source: Department of Labor (Bureau of Labor Statistics).

TABLE B–27. Civilian unemployment rate, 1976–2021

[Percent [1]; monthly data seasonally adjusted]

Year or month	All civilian workers	By sex and age: Men 20 years and over	Women 20 years and over	Both sexes 16–19	By race or ethnicity [2]: White	Black or African American	Asian	Hispanic or Latino ethnicity	U-6 measure of labor underutilization [3]	By educational attainment (25 years & over): Less than a high school diploma	High school graduates, no college	Some college or associate degree	Bachelor's degree and higher [4]
1976	7.7	5.9	7.4	19.0	7.0	14.0	.....	11.5	.....	.....	.....	.....	.....
1977	7.1	5.2	7.0	17.8	6.2	14.0	.....	10.1	.....	.....	.....	.....	.....
1978	6.1	4.3	6.0	16.4	5.2	12.8	.....	9.1	.....	.....	.....	.....	.....
1979	5.8	4.2	5.7	16.1	5.1	12.3	.....	8.3	.....	.....	.....	.....	.....
1980	7.1	5.9	6.4	17.8	6.3	14.3	.....	10.1	.....	.....	.....	.....	.....
1981	7.6	6.3	6.8	19.6	6.7	15.6	.....	10.4	.....	.....	.....	.....	.....
1982	9.7	8.8	8.3	23.2	8.6	18.9	.....	13.8	.....	.....	.....	.....	.....
1983	9.6	8.9	8.1	22.4	8.4	19.5	.....	13.7	.....	.....	.....	.....	.....
1984	7.5	6.6	6.8	18.9	6.5	15.9	.....	10.7	.....	.....	.....	.....	.....
1985	7.2	6.2	6.6	18.6	6.2	15.1	.....	10.5	.....	.....	.....	.....	.....
1986	7.0	6.1	6.2	18.3	6.0	14.5	.....	10.6	.....	.....	.....	.....	.....
1987	6.2	5.4	5.4	16.9	5.3	13.0	.....	8.8	.....	.....	.....	.....	.....
1988	5.5	4.8	4.9	15.3	4.7	11.7	.....	8.2	.....	.....	.....	.....	.....
1989	5.3	4.5	4.7	15.0	4.5	11.4	.....	8.0	.....	.....	.....	.....	.....
1990	5.6	5.0	4.9	15.5	4.8	11.4	.....	8.2	.....	.....	.....	.....	.....
1991	6.8	6.4	5.7	18.7	6.1	12.5	.....	10.0	.....	.....	.....	.....	.....
1992	7.5	7.1	6.3	20.1	6.6	14.2	.....	11.6	.....	11.5	6.8	5.6	3.2
1993	6.9	6.4	5.9	19.0	6.1	13.0	.....	10.8	.....	10.8	6.3	5.2	2.9
1994	6.1	5.4	5.4	17.6	5.3	11.5	.....	9.9	10.9	9.8	5.4	4.5	2.6
1995	5.6	4.8	4.9	17.3	4.9	10.4	.....	9.3	10.1	9.0	4.8	4.0	2.4
1996	5.4	4.6	4.8	16.7	4.7	10.5	.....	8.9	9.7	8.7	4.7	3.7	2.2
1997	4.9	4.2	4.4	16.0	4.2	10.0	.....	7.7	8.9	8.1	4.3	3.3	2.0
1998	4.5	3.7	4.1	14.6	3.9	8.9	.....	7.2	8.0	7.1	4.0	3.0	1.8
1999	4.2	3.5	3.8	13.9	3.7	8.0	.....	6.4	7.4	6.7	3.5	2.8	1.8
2000	4.0	3.3	3.6	13.1	3.5	7.6	3.6	5.7	7.0	6.3	3.4	2.7	1.7
2001	4.7	4.2	4.1	14.7	4.2	8.6	4.5	6.6	8.1	7.2	4.2	3.3	2.3
2002	5.8	5.3	5.1	16.5	5.1	10.2	5.9	7.5	9.6	8.4	5.3	4.5	2.9
2003	6.0	5.6	5.1	17.5	5.2	10.8	6.0	7.7	10.1	8.8	5.5	4.8	3.1
2004	5.5	5.0	4.9	17.0	4.8	10.4	4.4	7.0	9.6	8.5	5.0	4.2	2.7
2005	5.1	4.4	4.6	16.6	4.4	10.0	4.0	6.0	8.9	7.6	4.7	3.9	2.3
2006	4.6	4.0	4.1	15.4	4.0	8.9	3.0	5.2	8.2	6.8	4.3	3.6	2.0
2007	4.6	4.1	4.0	15.7	4.1	8.3	3.2	5.6	8.3	7.1	4.4	3.6	2.0
2008	5.8	5.4	4.9	18.7	5.2	10.1	4.0	7.6	10.5	9.0	5.7	4.6	2.6
2009	9.3	9.6	7.5	24.3	8.5	14.8	7.3	12.1	16.2	14.6	9.7	8.0	4.6
2010	9.6	9.8	8.0	25.9	8.7	16.0	7.5	12.5	16.7	14.9	10.3	8.4	4.7
2011	8.9	8.7	7.9	24.4	7.9	15.8	7.0	11.5	15.9	14.1	9.4	8.0	4.3
2012	8.1	7.5	7.3	24.0	7.2	13.8	5.9	10.3	14.7	12.4	8.3	7.1	4.0
2013	7.4	7.0	6.5	22.9	6.5	13.1	5.2	9.1	13.8	11.0	7.5	6.4	3.7
2014	6.2	5.7	5.6	19.6	5.3	11.3	5.0	7.4	12.0	9.0	6.0	5.4	3.2
2015	5.3	4.9	4.8	16.9	4.6	9.6	3.8	6.6	10.4	8.0	5.4	4.5	2.6
2016	4.9	4.5	4.4	15.7	4.3	8.4	3.6	5.8	9.6	7.4	5.2	4.1	2.5
2017	4.4	4.0	4.0	14.0	3.8	7.5	3.4	5.1	8.5	6.5	4.6	3.8	2.3
2018	3.9	3.6	3.5	12.9	3.5	6.5	3.0	4.7	7.7	5.6	4.1	3.3	2.1
2019	3.7	3.4	3.3	12.7	3.3	6.1	2.7	4.3	7.2	5.4	3.7	3.0	2.1
2020	8.1	7.4	8.0	17.9	7.3	11.4	8.7	10.4	13.6	11.7	9.0	7.8	4.8
2021	5.3	5.2	5.0	11.7	4.7	8.6	5.0	6.8	9.4	8.3	6.2	5.1	3.1
2020: Jan	3.5	3.2	3.2	12.2	3.1	6.3	3.0	4.3	6.9	5.7	3.9	2.9	2.0
Feb	3.5	3.2	3.1	11.3	3.0	6.0	2.5	4.4	7.0	5.7	3.7	3.1	1.9
Mar	4.4	4.1	4.0	14.0	3.9	6.8	4.1	5.9	8.8	6.9	4.4	3.7	2.5
Apr	14.7	13.0	15.4	32.6	14.1	16.6	14.4	18.8	22.9	21.1	17.6	15.3	8.4
May	13.2	11.5	13.8	30.5	12.3	16.8	14.8	17.6	21.2	19.5	15.8	13.8	7.4
June	11.0	10.1	11.2	22.5	10.0	15.2	13.8	14.5	18.0	16.5	12.2	10.8	6.8
July	10.2	9.3	10.4	19.3	9.2	14.4	11.9	12.8	16.5	15.1	10.7	9.5	6.7
Aug	8.4	7.9	8.3	16.5	7.4	12.8	10.6	10.6	14.3	12.6	9.7	7.7	5.2
Sept	7.9	7.4	7.8	16.1	7.0	12.1	8.9	10.4	12.8	10.6	9.1	8.1	4.7
Oct	6.9	6.7	6.5	13.9	6.0	10.9	7.6	8.9	12.1	10.0	8.2	6.6	4.2
Nov	6.7	6.7	6.2	13.8	6.0	10.4	6.8	8.6	12.0	9.3	7.9	6.5	4.2
Dec	6.7	6.4	6.3	15.8	6.1	10.0	6.1	9.4	11.7	9.8	7.9	6.5	3.8
2021: Jan	6.4	6.1	6.0	14.6	5.7	9.2	6.6	8.6	11.1	9.0	7.1	6.2	4.0
Feb	6.2	6.0	5.9	13.9	5.5	9.8	5.1	8.4	11.1	10.1	7.1	5.9	3.8
Mar	6.0	5.8	5.7	12.7	5.3	9.5	5.9	7.7	10.7	8.2	6.6	5.8	3.7
Apr	6.0	6.0	5.6	11.6	5.3	9.7	5.7	7.7	10.3	9.4	6.9	5.9	3.5
May	5.8	5.8	5.3	9.6	5.1	9.1	5.5	7.1	10.1	8.9	6.9	6.0	3.1
June	5.9	5.9	5.5	11.3	5.3	9.2	5.7	7.2	9.8	10.3	6.9	5.8	3.4
July	5.4	5.3	5.0	10.7	4.8	8.2	5.2	6.4	9.2	9.4	6.2	4.9	3.1
Aug	5.2	5.1	4.8	11.3	4.5	8.7	4.5	6.2	8.8	7.8	5.9	4.9	2.7
Sept	4.7	4.7	4.3	11.3	4.2	7.8	4.2	6.1	8.5	7.7	5.7	4.5	2.5
Oct	4.6	4.3	4.3	11.7	3.9	7.8	4.2	5.7	8.2	7.3	5.4	4.3	2.4
Nov	4.2	3.9	3.9	10.9	3.7	6.5	3.9	5.2	7.7	5.5	5.2	3.7	2.2
Dec	3.9	3.6	3.6	10.9	3.2	7.1	3.8	4.9	7.3	5.2	4.6	3.6	2.1

[1] Unemployed as percent of civilian labor force in group specified.
[2] See footnote 1, Table B–23.
[3] Total unemployed, plus all persons marginally attached to the labor force, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all persons marginally attached to the labor force.
[4] Includes persons with bachelor's, master's, professional, and doctoral degrees.

Note: Data relate to persons 16 years of age and over, except as noted.
See Note, Table B–22.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–28. Unemployment by duration and reason, 1976–2021

[Thousands of persons, except as noted; monthly data seasonally adjusted [1]]

Year or month	Un-employ-ment	Duration of unemployment: Less than 5 weeks	5–14 weeks	15–26 weeks	27 weeks and over	Average (mean) duration (weeks) [2]	Median duration (weeks)	Reason for unemployment: Job losers [3]: Total	On layoff	Other	Job leavers	Re-entrants	New entrants
1976	7,406	2,844	2,196	1,018	1,348	15.8	8.2	3,679	1,050	2,628	903	1,928	895
1977	6,991	2,919	2,132	913	1,028	14.3	7.0	3,166	865	2,300	909	1,963	953
1978	6,202	2,865	1,923	766	648	11.9	5.9	2,585	712	1,873	874	1,857	885
1979	6,137	2,950	1,946	706	535	10.8	5.4	2,635	851	1,784	880	1,806	817
1980	7,637	3,295	2,470	1,052	820	11.9	6.5	3,947	1,488	2,459	891	1,927	872
1981	8,273	3,449	2,539	1,122	1,162	13.7	6.9	4,267	1,430	2,837	923	2,102	981
1982	10,678	3,883	3,311	1,708	1,776	15.6	8.7	6,268	2,127	4,141	840	2,384	1,185
1983	10,717	3,570	2,937	1,652	2,559	20.0	10.1	6,258	1,780	4,478	830	2,412	1,216
1984	8,539	3,350	2,451	1,104	1,634	18.2	7.9	4,421	1,171	3,250	823	2,184	1,110
1985	8,312	3,498	2,509	1,025	1,280	15.6	6.8	4,139	1,157	2,982	877	2,256	1,039
1986	8,237	3,448	2,557	1,045	1,187	15.0	6.9	4,033	1,090	2,943	1,015	2,160	1,029
1987	7,425	3,246	2,196	943	1,040	14.5	6.5	3,566	943	2,623	965	1,974	920
1988	6,701	3,084	2,007	801	809	13.5	5.9	3,092	851	2,241	983	1,809	816
1989	6,528	3,174	1,978	730	646	11.9	4.8	2,983	850	2,133	1,024	1,843	677
1990	7,047	3,265	2,257	822	703	12.0	5.3	3,387	1,028	2,359	1,041	1,930	688
1991	8,628	3,480	2,791	1,246	1,111	13.7	6.8	4,694	1,292	3,402	1,004	2,139	792
1992	9,613	3,376	2,830	1,453	1,954	17.7	8.7	5,389	1,260	4,129	1,002	2,285	937
1993	8,940	3,262	2,584	1,297	1,798	18.0	8.3	4,848	1,115	3,733	976	2,198	919
1994	7,996	2,728	2,408	1,237	1,623	18.8	9.2	3,815	977	2,838	791	2,786	604
1995	7,404	2,700	2,342	1,085	1,278	16.6	8.3	3,476	1,030	2,446	824	2,525	579
1996	7,236	2,633	2,287	1,053	1,262	16.7	8.3	3,370	1,021	2,349	774	2,512	580
1997	6,739	2,538	2,138	995	1,067	15.8	8.0	3,037	931	2,106	795	2,338	569
1998	6,210	2,622	1,950	763	875	14.5	6.7	2,822	866	1,957	734	2,132	520
1999	5,880	2,568	1,832	755	725	13.4	6.4	2,622	848	1,774	783	2,005	469
2000	5,692	2,558	1,815	669	649	12.6	5.9	2,517	852	1,664	780	1,961	434
2001	6,801	2,853	2,196	951	801	13.1	6.8	3,476	1,067	2,409	835	2,031	459
2002	8,378	2,893	2,580	1,369	1,535	16.6	9.1	4,607	1,124	3,483	866	2,368	536
2003	8,774	2,785	2,612	1,442	1,936	19.2	10.1	4,838	1,121	3,717	818	2,477	641
2004	8,149	2,696	2,382	1,293	1,779	19.6	9.8	4,197	998	3,199	858	2,408	686
2005	7,591	2,667	2,304	1,130	1,490	18.4	8.9	3,667	933	2,734	872	2,386	666
2006	7,001	2,614	2,121	1,031	1,235	16.8	8.3	3,321	921	2,400	827	2,237	616
2007	7,078	2,542	2,232	1,061	1,243	16.8	8.5	3,515	976	2,539	793	2,142	627
2008	8,924	2,932	2,804	1,427	1,761	17.9	9.4	4,789	1,176	3,614	896	2,472	766
2009	14,265	3,165	3,828	2,775	4,496	24.4	15.1	9,160	1,630	7,530	882	3,187	1,035
2010	14,825	2,771	3,267	2,371	6,415	33.0	21.4	9,250	1,431	7,819	889	3,466	1,220
2011	13,747	2,677	2,993	2,061	6,016	39.3	21.4	8,106	1,230	6,876	956	3,401	1,284
2012	12,506	2,644	2,866	1,859	5,136	39.4	19.3	6,877	1,183	5,694	967	3,345	1,316
2013	11,460	2,584	2,759	1,807	4,310	36.5	17.0	6,073	1,136	4,937	932	3,207	1,247
2014	9,617	2,471	2,432	1,497	3,218	33.7	14.0	4,878	1,007	3,871	824	2,829	1,086
2015	8,296	2,399	2,302	1,267	2,328	29.2	11.6	4,063	974	3,089	819	2,535	879
2016	7,751	2,362	2,226	1,158	2,005	27.5	10.6	3,740	966	2,774	858	2,330	823
2017	6,982	2,270	2,008	1,017	1,687	25.0	10.0	3,434	956	2,479	778	2,079	690
2018	6,314	2,170	1,876	917	1,350	22.7	9.3	2,990	852	2,138	794	1,928	602
2019	6,001	2,086	1,789	860	1,266	21.6	9.1	2,786	823	1,963	814	1,810	591
2020	12,947	3,708	4,728	2,516	1,995	16.5	9.7	9,770	6,371	3,399	683	1,969	526
2021	8,623	2,140	1,981	1,164	3,337	28.7	16.5	5,099	1,582	3,516	803	2,204	518
2020: Jan	5,826	2,069	1,742	877	1,186	22.0	9.7	2,580	623	1,957	833	1,860	556
Feb	5,717	2,123	1,830	793	1,121	20.8	9.0	2,702	780	1,922	765	1,800	497
Mar	7,165	3,446	1,825	760	1,170	16.9	5.3	4,235	2,076	2,159	708	1,750	543
Apr	23,038	14,251	7,066	705	1,012	7.2	1.5	20,577	18,017	2,560	549	1,490	418
May	20,940	3,846	14,806	996	1,204	10.5	7.4	18,290	15,292	2,999	545	1,636	537
June	17,616	2,884	11,522	1,928	1,340	14.2	13.1	14,171	10,614	3,557	560	2,286	570
July	16,288	3,141	5,145	6,509	1,480	16.8	14.7	12,926	9,208	3,718	589	2,298	526
Aug	13,532	2,342	3,105	6,580	1,554	19.8	16.5	10,220	6,140	4,080	616	2,057	544
Sept	12,584	2,535	2,735	4,962	2,396	21.3	18.0	8,996	4,584	4,412	808	2,120	533
Oct	11,115	2,467	2,342	2,654	3,558	22.0	19.4	7,761	3,220	4,541	765	2,028	517
Nov	10,777	2,485	2,440	1,873	3,935	23.5	19.2	7,443	2,809	4,633	688	1,985	570
Dec	10,789	2,906	2,344	1,563	3,979	23.7	17.9	7,348	3,091	4,257	756	2,249	508
2021: Jan	10,180	2,307	2,454	1,336	4,046	26.1	16.0	6,963	2,726	4,237	653	1,998	545
Feb	9,992	2,234	2,285	1,383	4,156	27.8	17.9	6,609	2,264	4,345	706	2,138	573
Mar	9,691	2,204	1,950	1,371	4,201	29.4	19.1	6,262	2,063	4,199	768	2,248	503
Apr	9,719	2,400	1,981	1,160	4,187	28.5	19.4	6,270	2,074	4,196	818	2,132	595
May	9,251	1,974	2,218	1,230	3,765	29.4	19.3	5,822	1,820	4,001	783	2,174	526
June	9,502	1,972	2,182	1,338	3,973	31.6	19.6	5,727	1,813	3,914	945	2,283	499
July	8,671	2,246	1,794	1,203	3,411	29.4	14.4	4,907	1,212	3,695	927	2,289	468
Aug	8,339	2,110	1,927	1,248	3,105	29.4	14.2	4,441	1,206	3,234	830	2,446	514
Sept	7,666	2,227	1,727	1,047	2,664	28.3	13.7	4,002	1,083	2,919	792	2,275	491
Oct	7,375	2,051	1,876	1,001	2,339	26.9	13.0	3,700	1,041	2,659	845	2,206	537
Nov	6,802	1,985	1,703	870	2,193	29.1	13.4	3,369	875	2,493	837	2,154	452
Dec	6,319	1,977	1,571	780	2,008	28.6	12.9	3,095	812	2,283	724	2,038	513

[1] Because of independent seasonal adjustment of the various series, detail will not sum to totals.
[2] Beginning with 2011, includes unemployment durations of up to 5 years; prior data are for up to 2 years.
[3] Beginning with 1994, job losers and persons who completed temporary jobs.

Note: Data relate to persons 16 years of age and over.
See Note, Table B–22.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–29. Employees on nonagricultural payrolls, by major industry, 1976–2021

[Thousands of jobs; monthly data seasonally adjusted]

Year or month	Total nonagricultural employment	Private industries										
		Total private	Goods-producing industries						Private service-providing industries		
			Total	Mining and logging	Construction	Manufacturing			Total	Trade, transportation, and utilities [1]	
						Total	Durable goods	Nondurable goods		Total	Retail trade
1976	79,502	64,501	22,025	832	3,662	17,531	10,640	6,891	42,476	16,105	8,970
1977	82,593	67,334	22,972	865	3,940	18,167	11,132	7,035	44,362	16,741	9,363
1978	86,826	71,014	24,156	902	4,322	18,932	11,770	7,162	46,858	17,633	9,882
1979	89,933	73,865	24,997	1,008	4,562	19,426	12,220	7,206	48,869	18,276	10,185
1980	90,533	74,158	24,263	1,077	4,454	18,733	11,679	7,054	49,895	18,387	10,249
1981	91,297	75,117	24,118	1,180	4,304	18,634	11,611	7,023	50,999	18,577	10,369
1982	89,689	73,706	22,550	1,163	4,024	17,363	10,610	6,753	51,156	18,430	10,377
1983	90,295	74,284	22,110	997	4,065	17,048	10,326	6,722	52,174	18,642	10,640
1984	94,548	78,389	23,435	1,014	4,501	17,920	11,050	6,870	54,954	19,624	11,227
1985	97,532	81,000	23,585	974	4,793	17,819	11,034	6,784	57,415	20,350	11,738
1986	99,500	82,661	23,318	829	4,937	17,552	10,795	6,757	59,343	20,765	12,082
1987	102,116	84,960	23,470	771	5,090	17,609	10,767	6,842	61,490	21,271	12,422
1988	105,378	87,838	23,909	770	5,233	17,906	10,969	6,938	63,929	21,942	12,812
1989	108,051	90,124	24,045	750	5,309	17,985	11,004	6,981	66,079	22,477	13,112
1990	109,526	91,112	23,723	765	5,263	17,695	10,737	6,958	67,389	22,633	13,186
1991	108,425	89,879	22,588	739	4,780	17,068	10,220	6,848	67,291	22,247	12,900
1992	108,799	90,012	22,095	689	4,608	16,799	9,946	6,853	67,918	22,091	12,831
1993	110,931	91,942	22,219	666	4,779	16,774	9,901	6,872	69,723	22,343	13,024
1994	114,393	95,118	22,774	659	5,095	17,020	10,132	6,889	72,344	23,090	13,494
1995	117,400	97,968	23,156	641	5,274	17,241	10,373	6,868	74,812	23,793	13,900
1996	119,828	100,289	23,409	637	5,536	17,237	10,486	6,751	76,880	24,197	14,146
1997	122,941	103,278	23,886	654	5,813	17,419	10,705	6,714	79,392	24,656	14,393
1998	126,146	106,237	24,354	645	6,149	17,560	10,911	6,649	81,883	25,139	14,613
1999	129,228	108,921	24,465	598	6,545	17,322	10,831	6,491	84,456	25,722	14,974
2000	132,011	111,221	24,649	599	6,787	17,263	10,877	6,386	86,572	26,174	15,284
2001	132,073	110,955	23,873	606	6,826	16,441	10,336	6,105	87,082	25,931	15,242
2002	130,634	109,121	22,557	583	6,716	15,259	9,485	5,774	86,564	25,442	15,029
2003	130,331	108,748	21,816	572	6,735	14,509	8,964	5,546	86,931	25,228	14,922
2004	131,769	110,148	21,882	591	6,976	14,315	8,925	5,390	88,266	25,470	15,063
2005	134,034	112,230	22,190	628	7,336	14,227	8,956	5,271	90,039	25,892	15,285
2006	136,435	114,462	22,530	684	7,691	14,155	8,981	5,174	91,931	26,206	15,359
2007	137,981	115,763	22,233	724	7,630	13,879	8,808	5,071	93,530	26,556	15,526
2008	137,224	114,714	21,335	767	7,162	13,406	8,463	4,943	93,380	26,219	15,289
2009	131,296	108,741	18,558	694	6,016	11,847	7,284	4,564	90,184	24,834	14,528
2010	130,345	107,855	17,751	705	5,518	11,528	7,064	4,464	90,104	24,565	14,446
2011	131,914	109,828	18,047	788	5,533	11,726	7,273	4,453	91,781	24,990	14,674
2012	134,157	112,237	18,420	848	5,646	11,927	7,470	4,457	93,817	25,399	14,847
2013	136,364	114,511	18,738	863	5,856	12,020	7,548	4,472	95,773	25,783	15,085
2014	138,940	117,058	19,226	891	6,151	12,185	7,674	4,512	97,832	26,303	15,363
2015	141,825	119,796	19,610	813	6,461	12,336	7,765	4,571	100,186	26,806	15,611
2016	144,336	122,112	19,750	668	6,728	12,354	7,714	4,640	102,362	27,179	15,832
2017	146,608	124,258	20,084	676	6,969	12,439	7,741	4,699	104,174	27,393	15,846
2018	148,908	126,454	20,704	727	7,288	12,688	7,946	4,742	105,750	27,607	15,786
2019	150,905	128,292	21,037	727	7,493	12,817	8,039	4,778	107,254	27,723	15,620
2020	142,186	120,200	20,023	600	7,257	12,167	7,573	4,594	100,177	26,687	14,871
2021	146,124	124,119	20,325	566	7,413	12,346	7,676	4,671	103,794	27,707	15,396
2020: Jan	152,128	129,344	21,045	684	7,577	12,784	8,004	4,780	108,299	27,842	15,594
Feb	152,504	129,625	21,095	686	7,624	12,785	8,007	4,778	108,530	27,832	15,598
Mar	151,006	128,181	20,939	673	7,549	12,717	7,965	4,752	107,242	27,720	15,511
Apr	130,513	108,609	18,554	615	6,516	11,423	7,068	4,355	90,055	24,673	13,353
May	133,155	111,734	19,258	595	7,007	11,656	7,203	4,453	92,476	25,053	13,689
June	137,660	116,244	19,737	581	7,166	11,990	7,460	4,530	96,507	26,030	14,497
July	139,048	117,537	19,793	570	7,198	12,025	7,492	4,533	97,744	26,322	14,745
Aug	140,713	118,750	19,835	563	7,222	12,050	7,489	4,561	98,915	26,725	15,045
Sept	141,632	119,709	19,899	561	7,243	12,095	7,520	4,575	99,810	26,830	15,055
Oct	142,279	120,508	19,973	556	7,295	12,122	7,530	4,592	100,535	26,976	15,114
Nov	142,612	120,914	20,024	554	7,313	12,157	7,559	4,598	100,890	27,065	15,112
Dec	142,497	120,806	20,101	554	7,357	12,190	7,580	4,610	100,705	27,158	15,170
2021: Jan	143,017	121,229	20,090	546	7,360	12,184	7,572	4,612	101,139	27,279	15,244
Feb	143,727	121,922	20,072	542	7,308	12,222	7,600	4,622	101,850	27,403	15,293
Mar	144,431	122,572	20,227	551	7,408	12,268	7,626	4,642	102,345	27,503	15,329
Apr	144,694	122,784	20,187	554	7,393	12,240	7,593	4,647	102,597	27,527	15,339
May	145,141	123,165	20,209	560	7,381	12,268	7,616	4,652	102,956	27,538	15,314
June	145,698	123,673	20,232	566	7,378	12,288	7,632	4,656	103,441	27,661	15,382
July	146,387	124,311	20,314	569	7,395	12,350	7,680	4,670	103,997	27,735	15,398
Aug	146,904	124,808	20,362	574	7,397	12,391	7,710	4,681	104,446	27,807	15,435
Sept	147,328	125,217	20,416	576	7,427	12,413	7,725	4,688	104,801	27,907	15,494
Oct	148,005	125,911	20,499	578	7,455	12,466	7,766	4,700	105,412	28,013	15,537
Nov	148,652	126,538	20,598	582	7,502	12,514	7,785	4,729	105,940	28,084	15,557
Dec	149,240	127,099	20,691	590	7,546	12,555	7,816	4,739	106,408	28,163	15,595

[1] Includes wholesale trade, transportation and warehousing, and utilities, not shown separately.

Note: Data in Tables B–29 and B–30 are based on reports from employing establishments and relate to full- and part-time wage and salary workers in nonagricultural establishments who received pay for any part of the pay period that includes the 12th of the month. Not comparable with labor force data (Tables B–22 through B–28), which include proprietors, self-employed persons, unpaid family workers, and private household workers; which count persons as

See next page for continuation of table.

TABLE B–29. Employees on nonagricultural payrolls, by major industry, 1976–2021—*Continued*

[Thousands of jobs; monthly data seasonally adjusted]

Year or month	Private industries—Continued						Government			
	Private service-providing industries—Continued									
	Information	Financial activities	Profes- sional and business services	Education and health services	Leisure and hospitality	Other services	Total	Federal	State	Local
1976	2,111	4,155	6,310	5,756	5,794	2,244	15,001	2,863	3,273	8,865
1977	2,185	4,348	6,611	6,052	6,065	2,359	15,258	2,859	3,377	9,023
1978	2,287	4,599	6,997	6,427	6,411	2,505	15,812	2,893	3,474	9,446
1979	2,375	4,843	7,339	6,768	6,631	2,637	16,068	2,894	3,541	9,633
1980	2,361	5,025	7,571	7,077	6,721	2,755	16,375	3,000	3,610	9,765
1981	2,382	5,163	7,809	7,364	6,840	2,865	16,180	2,922	3,640	9,619
1982	2,317	5,209	7,875	7,526	6,874	2,924	15,982	2,884	3,640	9,458
1983	2,253	5,334	8,065	7,781	7,078	3,021	16,011	2,915	3,662	9,434
1984	2,398	5,553	8,493	8,211	7,489	3,186	16,159	2,943	3,734	9,482
1985	2,437	5,815	8,900	8,679	7,869	3,366	16,533	3,014	3,832	9,687
1986	2,445	6,128	9,241	9,086	8,156	3,523	16,838	3,044	3,893	9,901
1987	2,507	6,385	9,639	9,543	8,446	3,699	17,156	3,089	3,967	10,100
1988	2,585	6,500	10,121	10,096	8,778	3,907	17,540	3,124	4,076	10,339
1989	2,622	6,562	10,588	10,652	9,062	4,116	17,927	3,136	4,182	10,609
1990	2,688	6,614	10,881	11,024	9,288	4,261	18,415	3,196	4,305	10,914
1991	2,677	6,561	10,746	11,556	9,256	4,249	18,545	3,110	4,355	11,081
1992	2,641	6,559	11,001	11,948	9,437	4,240	18,787	3,111	4,408	11,267
1993	2,668	6,742	11,527	12,362	9,732	4,350	18,989	3,063	4,488	11,438
1994	2,738	6,910	12,207	12,872	10,100	4,428	19,275	3,018	4,576	11,682
1995	2,843	6,866	12,878	13,360	10,501	4,572	19,432	2,949	4,635	11,849
1996	2,940	7,018	13,497	13,761	10,777	4,690	19,539	2,877	4,606	12,056
1997	3,084	7,255	14,371	14,185	11,018	4,825	19,664	2,806	4,582	12,276
1998	3,218	7,565	15,183	14,570	11,232	4,976	19,909	2,772	4,612	12,525
1999	3,419	7,753	15,994	14,939	11,543	5,087	20,307	2,769	4,709	12,829
2000	3,630	7,783	16,704	15,252	11,862	5,168	20,790	2,865	4,786	13,139
2001	3,629	7,900	16,514	15,814	12,036	5,258	21,118	2,764	4,905	13,449
2002	3,395	7,956	16,016	16,398	11,986	5,372	21,513	2,766	5,029	13,718
2003	3,188	8,078	16,029	16,835	12,173	5,401	21,583	2,761	5,002	13,820
2004	3,118	8,105	16,440	17,230	12,493	5,409	21,621	2,730	4,982	13,909
2005	3,061	8,197	17,003	17,676	12,816	5,395	21,804	2,732	5,032	14,041
2006	3,038	8,367	17,619	18,154	13,110	5,438	21,974	2,732	5,075	14,167
2007	3,032	8,348	17,998	18,676	13,427	5,494	22,218	2,734	5,122	14,362
2008	2,984	8,206	17,792	19,228	13,436	5,515	22,509	2,762	5,177	14,571
2009	2,804	7,838	16,634	19,630	13,077	5,367	22,555	2,832	5,169	14,554
2010	2,707	7,695	16,783	19,975	13,049	5,331	22,490	2,977	5,137	14,376
2011	2,674	7,697	17,389	20,318	13,353	5,360	22,086	2,859	5,078	14,150
2012	2,676	7,784	17,992	20,769	13,768	5,430	21,920	2,820	5,055	14,045
2013	2,706	7,886	18,575	21,086	14,254	5,483	21,853	2,769	5,046	14,037
2014	2,726	7,977	19,124	21,439	14,696	5,567	21,882	2,733	5,050	14,098
2015	2,750	8,123	19,695	22,029	15,160	5,622	22,029	2,757	5,077	14,195
2016	2,794	8,287	20,114	22,639	15,660	5,691	22,224	2,795	5,110	14,319
2017	2,814	8,451	20,508	23,188	16,051	5,770	22,350	2,805	5,165	14,379
2018	2,839	8,590	20,950	23,638	16,295	5,831	22,455	2,800	5,173	14,481
2019	2,864	8,754	21,274	24,163	16,586	5,891	22,613	2,831	5,206	14,576
2020	2,720	8,704	20,314	23,275	13,148	5,329	21,986	2,930	5,135	13,921
2021	2,831	8,777	21,250	23,673	14,101	5,456	22,005	2,886	5,207	13,912
2020: Jan	2,897	8,837	21,371	24,531	16,881	5,940	22,784	2,855	5,264	14,665
Feb	2,903	8,870	21,393	24,598	16,983	5,951	22,879	2,861	5,310	14,708
Mar	2,898	8,851	21,308	24,360	16,245	5,860	22,825	2,877	5,247	14,701
Apr	2,642	8,590	19,091	21,759	8,780	4,520	21,904	2,875	5,091	13,938
May	2,606	8,607	19,294	22,149	10,011	4,756	21,421	2,877	5,080	13,464
June	2,624	8,623	19,651	22,699	11,791	5,089	21,416	2,882	5,076	13,458
July	2,617	8,623	19,836	22,889	12,232	5,225	21,511	2,907	5,084	13,520
Aug	2,640	8,647	20,026	23,088	12,513	5,276	21,963	3,156	5,114	13,693
Sept	2,698	8,675	20,154	23,184	12,946	5,323	21,923	3,122	5,102	13,699
Oct	2,698	8,696	20,374	23,277	13,179	5,335	21,771	2,982	5,077	13,712
Nov	2,706	8,709	20,525	23,346	13,209	5,330	21,698	2,894	5,077	13,727
Dec	2,719	8,721	20,689	23,350	12,749	5,319	21,691	2,893	5,080	13,718
2021: Jan	2,745	8,732	20,800	23,378	12,877	5,328	21,788	2,886	5,154	13,748
Feb	2,758	8,724	20,902	23,454	13,270	5,339	21,805	2,888	5,157	13,760
Mar	2,768	8,733	21,021	23,541	13,423	5,356	21,859	2,888	5,170	13,801
Apr	2,788	8,747	20,943	23,582	13,631	5,379	21,910	2,895	5,173	13,842
May	2,803	8,747	21,023	23,620	13,830	5,395	21,976	2,889	5,231	13,856
June	2,820	8,745	21,084	23,640	14,054	5,437	22,025	2,885	5,251	13,889
July	2,841	8,772	21,226	23,699	14,251	5,473	22,076	2,887	5,241	13,948
Aug	2,866	8,781	21,309	23,728	14,453	5,502	22,096	2,886	5,226	13,984
Sept	2,874	8,794	21,383	23,737	14,587	5,519	22,111	2,885	5,224	14,002
Oct	2,886	8,817	21,619	23,805	14,728	5,544	22,094	2,880	5,224	13,990
Nov	2,904	8,849	21,730	23,874	14,919	5,580	22,114	2,884	5,220	14,010
Dec	2,913	8,863	21,821	23,939	15,105	5,604	22,141	2,876	5,237	14,028

Note (cont'd): employed when they are not at work because of industrial disputes, bad weather, etc., even if they are not paid for the time off; which are based on a sample of the working-age population; and which count persons only once—as employed, unemployed, or not in the labor force. In the data shown here, persons who work at more than one job are counted each time they appear on a payroll.

Establishment data for employment, hours, and earnings are classified based on the 2017 North American Industry Classification System (NAICS).

For further description and details see *Employment and Earnings*.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–30. Hours and earnings in private nonagricultural industries, 1976–2021

[Monthly data seasonally adjusted]

Year or month	All employees: Average weekly hours	All employees: Average hourly earnings: Current dollars	All employees: Average hourly earnings: 1982–84 dollars[2]	All employees: Average weekly earnings: Level: Current dollars	All employees: Average weekly earnings: Level: 1982–84 dollars[2]	All employees: Average weekly earnings: Percent change from year earlier: Current dollars	All employees: Average weekly earnings: Percent change from year earlier: 1982–84 dollars[2]	Production and nonsupervisory employees[1]: Average weekly hours	Production and nonsupervisory employees[1]: Average hourly earnings: Current dollars	Production and nonsupervisory employees[1]: Average hourly earnings: 1982–84 dollars[3]	Production and nonsupervisory employees[1]: Average weekly earnings: Level: Current dollars	Production and nonsupervisory employees[1]: Average weekly earnings: Level: 1982–84 dollars[3]	Production and nonsupervisory employees[1]: Average weekly earnings: Percent change from year earlier: Current dollars	Production and nonsupervisory employees[1]: Average weekly earnings: Percent change from year earlier: 1982–84 dollars[3]
1976	.....	.....	.....	.....	.....	.....	.....	36.0	$5.06	$8.85	$182.36	$318.81	7.0	1.2
1977	.....	.....	.....	.....	.....	.....	.....	35.9	5.44	8.93	195.34	320.76	7.1	.6
1978	.....	.....	.....	.....	.....	.....	.....	35.8	5.88	8.96	210.17	320.38	7.6	–.1
1979	.....	.....	.....	.....	.....	.....	.....	35.6	6.34	8.67	225.46	308.43	7.3	–3.7
1980	.....	.....	.....	.....	.....	.....	.....	35.2	6.84	8.25	240.83	290.51	6.8	–5.8
1981	.....	.....	.....	.....	.....	.....	.....	35.2	7.43	8.13	261.29	285.88	8.5	–1.6
1982	.....	.....	.....	.....	.....	.....	.....	34.7	7.86	8.11	272.98	281.71	4.5	–1.5
1983	.....	.....	.....	.....	.....	.....	.....	34.9	8.20	8.22	286.34	286.91	4.9	1.8
1984	.....	.....	.....	.....	.....	.....	.....	35.1	8.49	8.22	298.08	288.56	4.1	.6
1985	.....	.....	.....	.....	.....	.....	.....	34.9	8.73	8.17	304.37	284.72	2.1	–1.3
1986	.....	.....	.....	.....	.....	.....	.....	34.7	8.92	8.21	309.69	285.17	1.7	.2
1987	.....	.....	.....	.....	.....	.....	.....	34.7	9.14	8.12	317.33	282.07	2.5	–1.1
1988	.....	.....	.....	.....	.....	.....	.....	34.6	9.44	8.07	326.50	279.06	2.9	–1.1
1989	.....	.....	.....	.....	.....	.....	.....	34.5	9.81	8.00	338.42	276.04	3.7	–1.1
1990	.....	.....	.....	.....	.....	.....	.....	34.3	10.20	7.91	349.63	271.03	3.3	–1.8
1991	.....	.....	.....	.....	.....	.....	.....	34.1	10.51	7.83	358.46	266.91	2.5	–1.5
1992	.....	.....	.....	.....	.....	.....	.....	34.2	10.77	7.79	368.17	266.40	2.7	–.2
1993	.....	.....	.....	.....	.....	.....	.....	34.3	11.05	7.78	378.74	266.53	2.9	.0
1994	.....	.....	.....	.....	.....	.....	.....	34.5	11.34	7.79	391.07	268.59	3.3	.8
1995	.....	.....	.....	.....	.....	.....	.....	34.3	11.65	7.78	399.93	266.98	2.3	–.6
1996	.....	.....	.....	.....	.....	.....	.....	34.3	12.04	7.81	413.06	268.05	3.3	.4
1997	.....	.....	.....	.....	.....	.....	.....	34.5	12.51	7.94	431.75	273.95	4.5	2.2
1998	.....	.....	.....	.....	.....	.....	.....	34.5	13.01	8.15	448.47	280.82	3.9	2.5
1999	.....	.....	.....	.....	.....	.....	.....	34.3	13.48	8.26	463.09	283.76	3.3	1.0
2000	.....	.....	.....	.....	.....	.....	.....	34.3	14.01	8.29	480.90	284.72	3.8	.3
2001	.....	.....	.....	.....	.....	.....	.....	33.9	14.54	8.38	493.53	284.46	2.6	–.1
2002	.....	.....	.....	.....	.....	.....	.....	33.9	14.96	8.50	506.48	287.94	2.6	1.2
2003	.....	.....	.....	.....	.....	.....	.....	33.7	15.36	8.54	517.68	287.92	2.2	.0
2004	.....	.....	.....	.....	.....	.....	.....	33.7	15.68	8.50	528.65	286.53	2.1	–.5
2005	.....	.....	.....	.....	.....	.....	.....	33.8	16.12	8.44	543.94	284.79	2.9	–.6
2006	.....	.....	.....	.....	.....	.....	.....	33.9	16.74	8.49	566.94	287.64	4.2	1.0
2007	34.4	$20.92	$10.09	$719.74	$347.13	.....	.....	33.8	17.41	8.59	589.09	290.53	3.9	1.0
2008	34.3	21.56	10.01	738.96	343.22	2.7	–1.1	33.6	18.06	8.56	607.10	287.65	3.1	–1.0
2009	33.8	22.17	10.33	749.92	349.55	1.5	1.8	33.1	18.60	8.87	615.82	293.77	1.4	2.1
2010	34.1	22.56	10.35	769.57	352.92	2.6	1.0	33.4	19.04	8.90	636.02	297.25	3.3	1.2
2011	34.3	23.03	10.24	790.71	351.52	2.7	–.4	33.6	19.43	8.77	652.72	294.58	2.6	–.9
2012	34.5	23.49	10.23	809.46	352.56	2.4	.3	33.7	19.73	8.72	665.54	294.19	2.0	–.1
2013	34.4	23.95	10.28	824.91	354.10	1.9	.4	33.7	20.13	8.78	677.62	295.49	1.8	.4
2014	34.5	24.46	10.33	844.80	356.85	2.4	.8	33.7	20.60	8.85	694.74	298.47	2.5	1.0
2015	34.5	25.01	10.55	864.07	364.56	2.3	2.2	33.7	21.03	9.07	708.70	305.72	2.0	2.4
2016	34.4	25.64	10.68	881.09	367.11	2.0	.7	33.6	21.53	9.20	723.20	308.96	2.0	1.1
2017	34.4	26.32	10.74	906.19	369.69	2.8	.7	33.7	22.05	9.22	742.48	310.59	2.7	.5
2018	34.5	27.11	10.80	936.37	372.90	3.3	.9	33.8	22.71	9.26	766.99	312.87	3.3	.7
2019	34.4	27.99	10.95	963.06	376.70	2.9	1.0	33.6	23.51	9.43	790.44	317.16	3.1	1.4
2020	34.6	29.35	11.34	1,014.39	391.94	5.3	4.0	33.9	24.68	9.78	837.39	331.97	5.9	4.7
2021	34.7	30.59	11.29	1,062.65	392.17	4.8	.1	34.2	25.89	9.75	886.06	333.72	5.8	.5
2020: Jan	34.3	28.43	10.99	975.15	376.97	2.4	.0	33.6	23.91	9.48	803.38	318.62	2.7	.2
Feb	34.4	28.56	11.03	982.46	379.32	3.1	.8	33.7	24.03	9.52	809.81	320.89	3.8	1.5
Mar	34.1	28.79	11.15	981.74	380.28	2.4	.8	33.4	24.19	9.62	807.95	321.30	2.9	1.4
Apr	34.2	30.01	11.72	1,026.34	400.77	7.4	7.0	33.5	25.12	10.08	841.52	337.73	7.4	7.3
May	34.7	29.71	11.61	1,030.94	402.80	7.6	7.4	34.1	24.98	10.03	851.82	342.05	8.4	8.4
June	34.6	29.36	11.41	1,015.86	394.94	5.7	4.9	34.0	24.79	9.90	842.86	336.58	6.9	6.3
July	34.6	29.41	11.38	1,017.59	393.59	5.5	4.5	34.0	24.70	9.80	839.80	333.24	6.2	5.1
Aug	34.7	29.48	11.36	1,022.96	394.08	5.7	4.3	34.2	24.81	9.80	848.50	335.11	6.9	5.4
Sept	34.8	29.51	11.34	1,026.95	394.69	6.1	4.6	34.2	24.80	9.77	848.16	334.04	6.6	5.0
Oct	34.9	29.53	11.34	1,030.60	395.85	6.1	4.9	34.3	24.84	9.78	852.01	335.40	6.8	5.4
Nov	34.8	29.65	11.37	1,031.82	395.76	6.1	4.9	34.3	24.92	9.80	854.76	336.02	7.2	5.9
Dec	34.7	29.92	11.44	1,038.22	396.93	6.7	5.3	34.2	25.18	9.86	861.16	337.36	7.8	6.4
2021: Jan	35.0	29.93	11.41	1,047.55	399.52	7.4	6.0	34.4	25.18	9.84	866.19	338.36	7.8	6.2
Feb	34.6	30.04	11.41	1,039.38	394.68	5.8	4.0	34.1	25.26	9.82	861.37	334.78	6.4	4.3
Mar	34.9	30.06	11.34	1,049.09	395.84	6.9	4.1	34.4	25.35	9.78	872.04	336.53	7.9	4.7
Apr	34.9	30.20	11.32	1,053.98	395.15	2.7	–1.4	34.4	25.49	9.77	876.86	336.18	4.2	–.5
May	34.9	30.36	11.30	1,059.56	394.48	2.8	–2.1	34.3	25.67	9.76	880.48	334.87	3.4	–2.1
June	34.8	30.52	11.26	1,062.10	391.98	4.6	–.7	34.3	25.81	9.72	885.28	333.32	5.0	–1.0
July	34.8	30.67	11.27	1,067.32	392.13	4.9	–.4	34.3	25.96	9.73	890.43	333.65	6.0	.1
Aug	34.7	30.76	11.26	1,067.37	390.85	4.3	–.8	34.2	26.10	9.74	892.62	333.27	5.2	–.5
Sept	34.8	30.92	11.28	1,076.02	392.40	4.8	–.6	34.3	26.26	9.76	900.72	334.86	6.2	.2
Oct	34.8	31.11	11.25	1,082.63	391.42	5.0	–1.1	34.2	26.42	9.73	903.56	332.76	6.1	–.8
Nov	34.8	31.23	11.21	1,086.80	390.20	5.3	–1.4	34.2	26.55	9.70	908.01	331.77	6.2	–1.3
Dec	34.8	31.38	11.20	1,092.02	389.83	5.2	–1.8	34.1	26.74	9.71	911.83	331.11	5.9	–1.9

[1] Production employees in goods-producing industries and nonsupervisory employees in service-providing industries. These groups account for four-fifths of the total employment on private nonfarm payrolls.
[2] Current dollars divided by the consumer price index for all urban consumers (CPI-U) on a 1982–84=100 base.
[3] Current dollars divided by the consumer price index for urban wage earners and clerical workers (CPI-W) on a 1982–84=100 base.

Note: See Note, Table B–29.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–31. Employment cost index, private industry, 2004–2021

Year and month	Total private			Goods-producing			Service-providing [1]			Manufacturing		
	Total compen- sation	Wages and salaries	Benefits [2]	Total compen- sation	Wages and salaries	Benefits [2]	Total compen- sation	Wages and salaries	Benefits [2]	Total compen- sation	Wages and salaries	Benefits [2]
	Indexes on NAICS basis, December 2005=100; not seasonally adjusted											
December:												
2004	97.2	97.6	96.2	96.9	97.2	96.3	97.3	97.7	96.1	96.9	97.4	96.0
2005	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2006	103.2	103.2	103.1	102.5	102.9	101.7	103.4	103.3	103.7	101.8	102.3	100.8
2007	106.3	106.6	105.6	105.0	106.0	103.2	106.7	106.8	106.6	103.8	104.9	101.7
2008	108.9	109.4	107.7	107.5	109.0	104.7	109.4	109.6	108.9	105.9	107.7	102.5
2009	110.2	110.8	108.7	108.6	110.0	105.8	110.8	111.1	109.9	107.0	108.9	103.6
2010	112.5	112.8	111.9	111.1	111.6	110.1	113.0	113.1	112.6	110.0	110.7	108.8
2011	115.0	114.6	115.9	113.8	113.5	114.4	115.3	114.9	116.4	113.1	112.7	113.9
2012	117.1	116.6	118.2	115.6	115.4	116.0	117.6	117.0	119.1	114.9	114.8	115.0
2013	119.4	119.0	120.5	117.7	117.6	118.0	120.0	119.4	121.5	117.0	117.2	116.6
2014	122.2	121.6	123.5	120.3	120.1	120.7	122.8	122.1	124.6	119.8	119.8	119.8
2015	124.5	124.2	125.1	123.2	123.2	123.1	124.9	124.5	125.9	122.8	123.0	122.5
2016	127.2	127.1	127.3	125.8	126.2	124.9	127.7	127.4	128.3	125.5	126.2	124.3
2017	130.5	130.6	130.2	128.9	129.3	128.0	131.0	131.0	131.2	128.9	129.3	128.0
2018	134.4	134.7	133.6	131.9	133.0	129.6	135.2	135.2	135.1	131.6	132.9	129.1
2019	138.0	138.7	136.2	135.8	137.5	132.5	138.7	139.1	137.6	135.3	137.1	131.9
2020	141.6	142.6	139.1	138.9	141.0	134.9	142.4	143.1	140.6	138.5	140.7	134.3
2021	147.8	149.7	143.2	144.0	146.6	138.7	148.9	150.5	144.8	143.5	146.4	138.2
2021: Mar	143.3	144.6	140.3	139.9	142.0	135.8	144.3	145.3	141.9	139.4	141.8	135.0
June	144.4	145.9	140.8	141.5	144.0	136.5	145.3	146.5	142.4	140.8	143.6	135.5
Sept	146.4	148.2	142.1	142.8	145.1	138.2	147.4	149.0	143.6	142.5	145.0	137.7
Dec	147.8	149.7	143.2	144.0	146.6	138.7	148.9	150.5	144.8	143.5	146.4	138.2
	Indexes on NAICS basis, December 2005=100; seasonally adjusted											
2020: Mar	139.2	140.2	136.8	136.7	138.5	133.0	140.0	140.7	138.3	136.2	138.2	132.2
June	139.9	140.8	137.7	137.6	139.5	133.8	140.6	141.2	139.2	137.1	139.1	133.3
Sept	140.7	141.6	138.5	138.1	140.1	134.1	141.4	142.0	140.1	137.7	139.9	133.5
Dec	141.8	142.8	139.3	139.0	141.1	134.9	142.6	143.3	140.9	138.6	140.8	134.3
2021: Mar	143.2	144.4	140.2	139.9	142.0	135.8	144.1	145.1	141.9	139.3	141.7	134.9
June	144.3	145.8	140.6	141.4	143.9	136.5	145.1	146.4	142.1	140.7	143.5	135.5
Sept	146.3	148.1	142.1	142.8	145.1	138.1	147.3	148.9	143.6	142.6	145.2	137.7
Dec	148.0	149.9	143.5	144.1	146.7	138.8	149.1	150.7	145.2	143.7	146.6	138.2
	Percent change from 12 months earlier, not seasonally adjusted											
December:												
2004	3.8	2.6	6.7	4.6	2.4	9.2	3.5	2.6	5.6	4.9	2.4	10.0
2005	2.9	2.5	4.0	3.2	2.9	3.8	2.8	2.4	4.1	3.2	2.7	4.2
2006	3.2	3.2	3.1	2.5	2.9	1.7	3.4	3.3	3.7	1.8	2.3	.8
2007	3.0	3.3	2.4	2.4	3.0	1.5	3.2	3.4	2.8	2.0	2.5	.9
2008	2.4	2.6	2.0	2.4	2.8	1.5	2.5	2.6	2.2	2.0	2.7	.8
2009	1.2	1.3	.9	1.0	.9	1.1	1.3	1.4	.9	1.0	1.1	1.1
2010	2.1	1.8	2.9	2.3	1.5	4.1	2.0	1.8	2.5	2.8	1.7	5.0
2011	2.2	1.6	3.6	2.4	1.7	3.9	2.0	1.6	3.4	2.8	1.8	4.7
2012	1.8	1.7	2.0	1.6	1.7	1.4	2.0	1.8	2.3	1.6	1.9	1.0
2013	2.0	2.1	1.9	1.8	1.9	1.7	2.0	2.1	2.0	1.8	2.1	1.4
2014	2.3	2.2	2.5	2.2	2.1	2.3	2.3	2.3	2.6	2.4	2.2	2.7
2015	1.9	2.1	1.3	2.4	2.6	2.0	1.7	2.0	1.0	2.5	2.7	2.3
2016	2.2	2.3	1.8	2.1	2.4	1.5	2.2	2.3	1.9	2.2	2.6	1.5
2017	2.6	2.8	2.3	2.5	2.5	2.5	2.6	2.8	2.3	2.7	2.5	3.0
2018	3.0	3.1	2.6	2.3	2.9	1.3	3.2	3.2	3.0	2.1	2.8	.9
2019	2.7	3.0	1.9	3.0	3.4	2.2	2.6	2.9	1.9	2.8	3.2	2.2
2020	2.6	2.8	2.1	2.3	2.5	1.8	2.7	2.9	2.2	2.4	2.6	1.8
2021	4.4	5.0	2.9	3.7	4.0	2.8	4.6	5.2	3.0	3.6	4.1	2.9
2021: Mar	2.8	3.0	2.5	2.3	2.5	2.1	2.9	3.1	2.5	2.3	2.5	2.1
June	3.1	3.5	2.0	2.8	3.2	1.9	3.2	3.7	2.1	2.6	3.1	1.6
Sept	4.1	4.6	2.6	3.3	3.5	3.0	4.2	4.9	2.5	3.6	3.7	3.1
Dec	4.4	5.0	2.9	3.7	4.0	2.8	4.6	5.2	3.0	3.6	4.1	2.9
	Percent change from 3 months earlier, seasonally adjusted											
2020: Mar	0.7	0.9	0.3	0.6	0.7	0.3	0.8	1.0	0.3	0.6	0.7	0.2
June	.5	.4	.7	.7	.7	.6	.4	.4	.7	.7	.7	.8
Sept	.6	.6	.6	.4	.4	.2	.6	.6	.6	.4	.6	.2
Dec	.8	.8	.6	.7	.7	.6	.8	.9	.6	.7	.6	.6
2021: Mar	1.0	1.1	.6	.6	.6	.7	1.1	1.3	.7	.5	.6	.4
June	.8	1.0	.3	1.1	1.3	.5	.7	.9	.1	1.0	1.3	.4
Sept	1.4	1.6	1.1	1.0	.8	1.2	1.5	1.7	1.1	1.4	1.2	1.6
Dec	1.2	1.2	1.0	.9	1.1	.5	1.2	1.2	1.1	.8	1.0	.4

[1] On Standard Industrial Classification (SIC) basis, data are for service-producing industries.
[2] Employer costs for employee benefits.

Note: Changes effective with the release of March 2006 data (in April 2006) include changing industry classification to NAICS from SIC and rebasing data to December 2005=100. Historical SIC data are available through December 2005.

Data exclude farm and household workers.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–32. Productivity and related data, business and nonfarm business sectors, 1971–2021

[Index numbers, 2012=100; quarterly data seasonally adjusted]

Year or quarter	Labor productivity (output per hour)		Output [1]		Hours of all persons [2]		Compensation per hour [3]		Real compensation per hour [4]		Unit labor costs		Implicit price deflator [5]	
	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector
1971	43.9	45.2	27.8	27.8	63.4	61.6	12.8	12.9	66.2	67.0	29.1	28.6	26.0	25.6
1972	45.4	46.7	29.7	29.7	65.4	63.5	13.6	13.8	68.2	69.1	30.0	29.5	26.9	26.4
1973	46.7	48.2	31.7	31.8	67.9	66.1	14.7	14.8	69.3	70.0	31.4	30.8	28.3	27.3
1974	45.9	47.4	31.2	31.3	68.0	66.2	16.0	16.2	68.2	69.0	34.9	34.3	31.0	30.1
1975	47.6	48.7	30.9	30.8	65.0	63.3	17.8	17.9	69.2	69.9	37.3	36.8	34.0	33.3
1976	49.1	50.4	33.0	33.0	67.2	65.6	19.2	19.3	70.7	71.2	39.0	38.4	35.8	35.1
1977	50.0	51.3	34.9	34.9	69.8	68.2	20.7	20.9	71.7	72.4	41.4	40.8	37.9	37.3
1978	50.6	52.0	37.1	37.3	73.4	71.7	22.5	22.7	72.6	73.4	44.4	43.7	40.6	39.8
1979	50.7	51.9	38.5	38.5	75.9	74.3	24.6	24.9	72.7	73.4	48.6	48.0	43.9	43.1
1980	50.7	51.8	38.1	38.2	75.2	73.7	27.3	27.6	72.4	73.2	53.8	53.1	47.9	47.2
1981	51.8	52.6	39.2	39.1	75.7	74.3	29.8	30.2	72.4	73.3	57.6	57.4	52.3	51.7
1982	51.5	52.2	38.1	37.9	74.0	72.6	32.1	32.4	73.4	74.2	62.3	62.1	55.2	54.9
1983	53.3	54.3	40.1	40.2	75.3	74.0	33.5	33.9	73.5	74.3	62.9	62.3	57.2	56.8
1984	54.8	55.5	43.7	43.6	79.7	78.6	35.0	35.3	73.7	74.4	63.8	63.6	58.8	58.4
1985	56.0	56.5	45.7	45.6	81.6	80.6	36.8	37.0	74.9	75.5	65.6	65.6	60.4	60.2
1986	57.6	58.2	47.4	47.3	82.2	81.2	38.8	39.2	77.7	78.4	67.4	67.3	61.2	61.0
1987	58.0	58.5	49.1	49.0	84.7	83.7	40.3	40.7	78.0	78.7	69.5	69.5	62.4	62.2
1988	58.8	59.5	51.2	51.2	87.0	86.1	42.4	42.8	79.3	79.9	72.1	71.9	64.3	64.1
1989	59.5	60.0	53.1	53.1	89.3	88.5	43.7	44.0	78.2	78.7	73.5	73.3	66.7	66.4
1990	60.7	61.1	54.0	53.9	88.9	88.3	46.5	46.6	79.2	79.5	76.5	76.4	68.9	68.7
1991	61.7	62.1	53.7	53.6	87.0	86.3	48.6	48.9	80.0	80.4	78.8	78.7	70.9	70.8
1992	64.6	64.9	55.9	55.7	86.6	85.9	51.6	51.9	82.9	83.3	80.0	80.0	72.1	72.0
1993	64.6	64.9	57.5	57.5	89.0	88.5	52.4	52.5	82.0	82.3	81.0	80.9	73.7	73.7
1994	65.0	65.4	60.3	60.1	92.8	91.9	52.7	53.1	80.9	81.4	81.2	81.2	75.1	75.1
1995	65.5	66.1	62.1	62.2	94.9	94.1	54.0	54.4	80.9	81.5	82.5	82.3	76.4	76.4
1996	67.1	67.5	65.0	65.0	97.0	96.3	56.0	56.3	81.7	82.1	83.5	83.4	77.6	77.4
1997	68.5	68.8	68.4	68.3	99.9	99.3	58.2	58.5	83.1	83.5	85.0	85.0	78.7	78.8
1998	70.9	71.1	72.2	72.2	101.9	101.4	61.7	61.8	86.9	87.2	87.0	86.9	79.0	79.1
1999	73.8	73.9	76.4	76.3	103.5	103.3	64.6	64.7	89.2	89.3	87.6	87.5	79.4	79.6
2000	76.1	76.1	79.8	79.7	104.9	104.7	69.1	69.3	92.3	92.4	90.9	91.0	80.9	81.2
2001	78.1	78.1	80.3	80.2	102.8	102.7	72.3	72.3	93.8	93.8	92.6	92.6	82.2	82.5
2002	81.4	81.5	81.7	81.6	100.3	100.1	73.9	74.0	94.4	94.5	90.8	90.8	82.8	83.2
2003	84.5	84.4	84.2	84.1	99.7	99.6	76.7	76.7	95.8	95.8	90.8	90.9	84.1	84.3
2004	87.2	87.0	87.9	87.7	100.9	100.9	80.3	80.2	97.6	97.6	92.1	92.2	86.2	86.3
2005	89.1	88.9	91.4	91.2	102.6	102.6	83.2	83.1	97.9	97.8	93.4	93.6	88.8	89.2
2006	90.0	89.8	94.4	94.2	104.9	104.9	86.4	86.3	98.4	98.4	96.0	96.2	91.4	91.8
2007	91.4	91.2	96.4	96.3	105.5	105.6	90.3	90.1	100.0	99.8	98.8	98.8	93.5	93.7
2008	92.5	92.4	95.6	95.5	103.3	103.4	92.8	92.7	99.0	98.9	100.3	100.3	94.8	95.0
2009	95.9	95.7	92.0	91.8	96.0	96.0	93.6	93.5	100.2	100.1	97.6	97.8	94.9	95.4
2010	99.1	99.0	95.0	94.8	95.9	95.8	95.3	95.3	100.3	100.4	96.1	96.3	96.0	96.4
2011	99.1	99.0	96.9	96.8	97.8	97.8	97.3	97.4	99.4	99.5	98.2	98.4	98.2	98.2
2012	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2013	100.9	100.5	102.5	102.2	101.6	101.7	101.4	101.2	99.9	99.8	100.5	100.7	101.5	101.4
2014	101.4	101.1	105.5	105.3	104.0	104.1	104.0	104.0	100.8	100.8	102.6	102.9	103.2	103.3
2015	102.5	102.3	109.1	108.8	106.5	106.4	107.0	107.2	103.5	103.7	104.5	104.8	103.7	104.1
2016	102.9	102.7	111.1	110.8	108.0	107.9	108.2	108.4	103.3	103.5	105.2	105.6	104.5	105.0
2017	104.0	103.8	114.1	113.8	109.7	109.7	112.0	112.1	104.7	104.8	107.7	108.0	106.3	106.8
2018	105.7	105.3	118.1	117.8	111.7	111.8	115.9	116.0	105.7	105.9	109.7	110.1	108.6	109.1
2019	107.7	107.5	121.2	121.0	112.5	112.6	120.3	120.5	107.8	108.0	111.7	112.0	110.2	110.8
2020	110.3	110.1	116.0	115.7	105.2	105.1	128.6	128.9	113.8	114.1	116.5	117.1	110.6	111.3
2021 p	112.4	112.1	124.4	124.2	110.7	110.8	135.7	135.8	114.7	114.9	120.7	121.1	115.6	115.8
2018: I	105.2	104.9	116.8	116.6	111.1	111.2	114.8	114.9	105.6	105.7	109.2	109.6	107.6	108.1
II	105.7	105.3	118.0	117.7	111.6	111.8	115.1	115.2	105.2	105.3	109.0	109.4	108.6	109.1
III	105.9	105.6	118.6	118.3	112.0	112.1	116.5	116.7	106.0	106.2	110.0	110.5	108.8	109.4
IV	105.9	105.6	118.9	118.7	112.2	112.3	117.0	117.2	106.1	106.3	110.5	111.0	109.2	109.9
2019: I	106.8	106.5	119.8	119.6	112.2	112.3	119.7	119.9	108.4	108.5	112.1	112.5	109.4	110.1
II	107.7	107.5	120.8	120.7	112.2	112.3	120.0	120.1	107.7	107.8	111.3	111.7	110.2	110.8
III	108.0	107.8	121.8	121.6	112.8	112.8	120.0	120.2	107.3	107.5	111.1	111.5	110.4	111.0
IV	108.4	108.2	122.3	122.2	112.9	112.9	121.5	121.7	108.0	108.2	112.1	112.5	110.8	111.4
2020: I	107.9	107.5	120.2	119.9	111.4	111.5	124.0	124.3	109.9	110.2	115.0	115.6	110.8	111.4
II	110.3	110.1	107.2	106.9	97.2	97.0	130.0	130.5	116.2	116.6	117.9	118.5	109.5	110.3
III	112.2	111.8	117.5	117.2	104.8	104.8	128.7	128.9	113.7	113.8	114.7	115.3	110.8	111.6
IV	111.2	111.0	119.3	118.9	107.3	107.2	131.8	132.1	115.7	116.0	118.5	119.1	111.3	111.8
2021: I	111.8	111.6	121.6	121.4	108.8	108.8	131.6	131.9	114.5	114.7	117.7	118.2	112.6	113.1
II	112.7	112.5	124.1	123.9	110.1	110.2	134.7	134.9	114.8	115.0	119.5	119.9	114.6	114.8
III	111.6	111.3	124.6	124.5	111.6	111.8	136.8	136.9	114.8	114.9	122.6	123.0	116.4	116.5
IV p	113.4	113.1	127.3	127.2	112.3	112.5	139.4	139.4	114.7	114.8	122.9	123.3	118.5	118.7

[1] Output refers to real gross domestic product in the sector.

[2] Hours at work of all persons engaged in sector, including hours of employees, proprietors, and unpaid family workers. Estimates based primarily on establishment data.

[3] Wages and salaries of employees plus employers' contributions for social insurance and private benefit plans. Also includes an estimate of wages, salaries, and supplemental payments for the self-employed.

[4] Hourly compensation divided by consumer price series. The trend for 1978-2020 is based on the consumer price index research series (CPI-U-RS). The change for prior years and recent quarters is based on the consumer price index for all urban consumers (CPI-U).

[5] Current dollar output divided by the output index.

Source: Department of Labor (Bureau of Labor Statistics).

Table B–33. Changes in productivity and related data, business and nonfarm business sectors, 1971–2021

[Percent change from preceding period; quarterly data at seasonally adjusted annual rates]

Year or quarter	Output per hour of all persons		Output [1]		Hours of all persons [2]		Compensation per hour [3]		Real compensation per hour [4]		Unit labor costs		Implicit price deflator [5]	
	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector	Business sector	Nonfarm business sector
1971	4.1	3.9	3.8	3.7	–0.3	–0.2	6.0	6.1	1.6	1.7	1.9	2.1	4.2	4.3
1972	3.4	3.5	6.5	6.7	3.0	3.1	6.4	6.5	3.0	3.2	2.9	2.9	3.4	3.1
1973	3.0	3.1	6.9	7.3	3.8	4.1	7.9	7.6	1.6	1.3	4.8	4.4	5.2	3.5
1974	–1.7	–1.6	–1.5	–1.5	.2	.1	9.3	9.5	–1.5	–1.4	11.2	11.3	9.8	10.4
1975	3.5	2.8	–.9	–1.6	–4.3	–4.3	10.7	10.5	1.4	1.3	6.9	7.6	9.7	10.6
1976	3.3	3.5	6.8	7.2	3.3	3.6	8.0	7.8	2.1	1.9	4.5	4.1	5.2	5.4
1977	1.8	1.7	5.7	5.7	3.8	3.9	8.0	8.2	1.4	1.6	6.1	6.4	5.9	6.2
1978	1.2	1.4	6.4	6.7	5.1	5.2	8.4	8.6	1.3	1.5	7.1	7.1	6.9	6.5
1979	.1	–.2	3.6	3.4	3.4	3.6	9.7	9.5	.2	.0	9.5	9.8	8.4	8.4
1980	.0	.0	–.9	–.9	–.9	–.8	10.7	10.8	–.4	–.4	10.8	10.8	8.9	9.5
1981	2.2	1.5	2.9	2.3	.8	.8	9.4	9.6	.0	.2	7.1	8.0	9.2	9.6
1982	–.5	–.8	–2.9	–3.1	–2.4	–2.3	7.5	7.4	1.4	1.2	8.0	8.2	5.7	6.2
1983	3.4	4.1	5.3	6.2	1.8	2.0	4.4	4.5	.1	.2	1.0	.4	3.6	3.5
1984	2.9	2.2	8.9	8.5	5.9	6.1	4.4	4.3	.2	.1	1.5	2.0	2.8	2.8
1985	2.3	1.8	4.7	4.4	2.3	2.6	5.1	4.9	1.6	1.4	2.7	3.1	2.6	3.1
1986	2.8	3.0	3.6	3.8	.8	.8	5.7	5.8	3.8	4.0	2.8	2.7	1.4	1.4
1987	.6	.6	3.6	3.6	3.0	3.0	3.8	3.8	.3	.3	3.2	3.2	1.9	1.9
1988	1.5	1.6	4.3	4.6	2.7	2.9	5.3	5.1	1.6	1.5	3.7	3.4	3.2	3.1
1989	1.2	.9	3.8	3.7	2.6	2.7	3.0	2.9	–1.3	–1.4	1.8	2.0	3.7	3.6
1990	2.0	1.7	1.6	1.5	–.4	–.2	6.3	6.0	1.3	1.0	4.2	4.2	3.3	3.4
1991	1.6	1.6	–.6	–.6	–2.2	–2.2	4.6	4.8	1.0	1.1	3.0	3.1	2.9	3.1
1992	4.7	4.5	4.2	4.1	–.4	–.4	6.2	6.2	3.6	3.6	1.4	1.7	1.6	1.7
1993	.1	.1	2.9	3.1	2.8	3.0	1.5	1.2	–1.0	–1.3	1.4	1.1	2.3	2.3
1994	.6	.7	4.8	4.6	4.2	3.9	.7	1.0	–1.3	–1.1	.1	.3	1.8	1.9
1995	.7	1.1	3.1	3.4	2.3	2.3	2.4	2.5	.0	.1	1.7	1.4	1.8	1.8
1996	2.5	2.1	4.6	4.5	2.1	2.3	3.6	3.5	.9	.8	1.1	1.3	1.6	1.4
1997	2.2	1.9	5.3	5.2	3.0	3.2	4.0	3.9	1.8	1.7	1.8	1.9	1.5	1.7
1998	3.4	3.4	5.5	5.6	2.0	2.2	5.9	5.8	4.5	4.4	2.4	2.3	.3	.4
1999	4.1	3.9	5.8	5.8	1.6	1.8	4.8	4.6	2.7	2.5	.7	.7	.5	.7
2000	3.1	3.0	4.5	4.4	1.4	1.4	6.9	7.0	3.4	3.5	3.7	3.9	1.8	2.0
2001	2.7	2.6	.6	.7	–2.0	–1.9	4.6	4.4	1.7	1.5	1.9	1.7	1.7	1.6
2002	4.2	4.3	1.7	1.7	–2.4	–2.5	2.2	2.3	.6	.7	–1.9	–1.9	.7	.8
2003	3.8	3.7	3.2	3.1	–.6	–.6	3.8	3.7	1.5	1.4	.0	.1	1.5	1.4
2004	3.1	3.0	4.4	4.3	1.2	1.3	4.7	4.6	1.9	1.8	1.5	1.5	2.5	2.3
2005	2.2	2.2	3.9	3.9	1.7	1.7	3.6	3.7	.2	.3	1.4	1.4	3.1	3.4
2006	1.0	1.0	3.3	3.3	2.2	2.3	3.9	3.8	.6	.6	2.8	2.8	2.8	2.9
2007	1.5	1.6	2.1	2.3	.6	.7	4.5	4.3	1.6	1.5	2.9	2.7	2.3	2.0
2008	1.2	1.3	–.9	–.9	–2.1	–2.1	2.8	2.9	–1.0	–.9	1.5	1.6	1.5	1.5
2009	3.6	3.6	–3.7	–3.9	–7.1	–7.1	.9	.9	1.2	1.3	–2.7	–2.5	.0	.3
2010	3.4	3.4	3.2	3.3	–.1	–.1	1.8	1.9	.2	.2	–1.5	–1.5	1.2	1.1
2011	.0	.0	2.0	2.0	2.0	2.0	2.1	2.2	–1.0	–.9	2.2	2.2	2.3	1.9
2012	.9	1.0	3.2	3.3	2.3	2.3	2.8	2.7	.6	.5	1.8	1.6	1.8	1.8
2013	.9	.5	2.5	2.2	1.6	1.7	1.4	1.2	–.1	–.2	.5	.7	1.5	1.4
2014	.5	.6	2.9	3.0	2.4	2.3	2.6	2.8	.9	1.1	2.1	2.1	1.7	1.8
2015	1.1	1.2	3.4	3.4	2.3	2.2	2.9	3.1	2.7	2.9	1.8	1.9	.5	.8
2016	.4	.3	1.9	1.8	1.5	1.5	1.1	1.1	–.2	–.2	.7	.7	.7	.9
2017	1.1	1.1	2.7	2.7	1.5	1.6	3.5	3.5	1.3	1.3	2.4	2.3	1.8	1.7
2018	1.6	1.5	3.5	3.5	1.9	2.0	3.5	3.4	1.0	1.0	1.9	1.9	2.1	2.2
2019	2.0	2.1	2.6	2.7	.7	.7	3.8	3.9	2.0	2.0	1.8	1.8	1.5	1.5
2020	2.4	2.4	–4.2	–4.4	–6.5	–6.6	6.9	7.0	5.5	5.7	4.3	4.5	.4	.4
2021 p	1.9	1.9	7.2	7.4	5.3	5.4	5.5	5.4	.8	.7	3.6	3.5	4.5	4.0
2018: I	1.7	1.3	3.7	3.6	1.9	2.3	2.9	2.5	–.2	–.6	1.2	1.2	1.7	1.7
II	1.9	1.4	4.0	3.9	2.1	2.4	1.2	1.0	–1.4	–1.5	–.7	–.4	3.7	3.8
III	.8	1.3	2.1	2.2	1.4	.9	4.6	5.2	3.0	3.5	3.9	3.8	.8	1.0
IV	.2	.1	1.0	1.1	.8	.9	1.9	1.9	.4	.3	1.7	1.7	1.7	1.6
2019: I	3.3	3.5	3.1	3.4	–.2	–.1	9.5	9.4	8.7	8.5	6.1	5.7	.7	.7
II	3.6	3.7	3.5	3.6	–.1	–.1	.8	.8	–2.6	–2.6	–2.8	–2.8	2.7	2.7
III	1.0	1.2	3.1	3.2	2.1	1.9	.2	.3	–1.1	–1.0	–.8	–.9	.8	.7
IV	1.4	1.3	1.8	1.8	.5	.5	5.1	5.2	2.4	2.5	3.7	3.8	1.4	1.3
2020: I	–1.9	–2.5	–6.8	–7.4	–5.0	–5.0	8.5	8.7	7.4	7.5	10.6	11.4	.0	.2
II	9.2	10.2	–36.8	–36.9	–42.1	–42.7	20.7	21.5	24.6	25.4	10.6	10.3	–4.6	–3.9
III	7.2	6.1	44.7	44.6	34.9	36.3	–3.9	–4.8	–8.2	–9.1	–10.4	–10.3	5.1	4.7
IV	–3.5	–2.8	6.1	6.2	9.9	9.3	9.8	10.5	7.2	7.9	13.8	13.7	1.6	.9
2021: I	2.1	2.1	8.2	8.4	6.0	6.2	–.5	–.6	–4.2	–4.4	–2.5	–2.7	5.1	4.6
II	3.4	3.2	8.2	8.5	4.7	5.1	9.6	9.2	1.3	.9	6.0	5.8	7.3	6.1
III	–3.7	–3.9	1.8	2.0	5.7	6.2	6.7	6.2	–.1	–.4	10.8	10.6	6.2	6.0
IV p	6.6	6.6	9.0	9.1	2.3	2.4	7.7	7.5	–.2	–.3	1.0	.9	7.5	7.8

[1] Output refers to real gross domestic product in the sector.
[2] Hours at work of all persons engaged in the sector. See footnote 2, Table B–32.
[3] Wages and salaries of employees plus employers' contributions for social insurance and private benefit plans. Also includes an estimate of wages, salaries, and supplemental payments for the self-employed.
[4] Hourly compensation divided by a consumer price index. See footnote 4, Table B–32.
[5] Current dollar output divided by the output index.

Note: Percent changes are calculated using index numbers to three decimal places and may differ slightly from percent changes based on indexes in Table B–32, which are rounded to one decimal place.

Source: Department of Labor (Bureau of Labor Statistics).

TABLE B–34. Industrial production indexes, major industry divisions, 1976–2021

[2012=100, except as noted; monthly data seasonally adjusted]

Year or month	Total industrial production [1]		Manufacturing					Mining	Utilities
	Index, 2012=100	Percent change from year earlier [2]	Total [1]	Percent change from year earlier [2]	Durable	Nondurable	Other (non-NAICS) [1]		
1976	44.4	7.9	42.3	9.0	26.3	68.3	141.0	84.1	52.0
1977	47.8	7.6	45.9	8.6	28.8	73.0	154.5	85.9	54.3
1978	50.4	5.5	48.7	6.1	31.1	75.6	159.9	88.4	55.7
1979	51.9	3.0	50.2	3.1	32.6	76.1	163.2	90.9	56.9
1980	50.5	–2.6	48.4	–3.6	31.2	73.7	168.8	92.7	57.2
1981	51.2	1.3	48.9	1.0	31.5	74.4	172.8	95.2	58.0
1982	48.5	–5.2	46.2	–5.5	28.8	73.3	174.9	90.5	56.2
1983	49.9	2.7	48.4	4.8	30.3	76.7	179.9	85.7	56.6
1984	54.3	8.9	53.2	9.8	34.5	80.3	188.2	91.1	59.9
1985	54.9	1.2	54.0	1.6	35.3	80.7	195.6	89.4	61.4
1986	55.5	1.0	55.2	2.2	35.9	83.0	199.6	82.9	62.0
1987	58.4	5.2	58.3	5.7	38.0	87.5	211.0	83.9	64.9
1988	61.4	5.2	61.4	5.3	40.8	90.4	210.1	86.3	68.9
1989	62.0	.9	61.9	.8	41.3	91.0	207.1	85.5	71.0
1990	62.6	1.0	62.4	.8	41.4	92.4	204.7	87.3	72.3
1991	61.7	–1.5	61.2	–1.9	40.2	92.1	196.3	85.5	74.2
1992	63.5	2.9	63.5	3.7	42.3	94.6	192.3	83.9	74.1
1993	65.6	3.3	65.8	3.5	44.6	95.9	193.6	83.6	76.8
1994	69.0	5.3	69.6	5.9	48.5	99.2	191.9	85.2	78.4
1995	72.2	4.6	73.2	5.1	52.5	100.9	191.9	85.2	81.1
1996	75.5	4.6	76.8	4.9	57.2	101.3	190.1	86.7	83.5
1997	80.9	7.2	83.2	8.4	64.1	105.0	206.1	88.4	83.2
1998	85.7	5.9	88.8	6.7	70.8	106.7	218.4	87.2	85.4
1999	89.4	4.4	93.3	5.1	76.9	107.3	224.7	83.0	88.1
2000	92.9	3.8	97.1	4.1	82.4	107.8	224.1	84.7	90.5
2001	90.0	–3.1	93.5	–3.7	78.9	104.8	209.5	84.9	90.3
2002	90.2	.3	93.9	.4	79.2	106.0	202.5	80.9	92.8
2003	91.4	1.3	95.1	1.3	81.3	106.2	196.7	81.0	94.6
2004	93.8	2.7	98.1	3.1	85.1	107.8	197.6	80.9	96.0
2005	96.9	3.4	102.1	4.1	90.2	110.6	197.0	80.0	98.1
2006	99.1	2.2	104.7	2.6	94.4	111.2	194.7	81.9	97.4
2007	101.7	2.6	107.6	2.8	99.1	112.5	183.6	82.6	100.7
2008	98.1	–3.5	102.4	–4.8	95.7	105.8	167.6	83.7	100.4
2009	86.9	–11.5	88.3	–13.8	77.8	97.7	140.1	79.1	97.4
2010	91.7	5.5	93.5	5.9	86.2	99.8	129.5	82.9	101.4
2011	94.6	3.1	96.3	2.9	91.5	100.0	123.5	88.0	100.9
2012	97.4	3.0	98.8	2.6	96.6	100.0	116.5	94.9	98.2
2013	99.3	2.0	99.6	.9	98.7	100.0	110.0	100.7	100.6
2014	102.3	3.0	100.7	1.1	101.6	99.3	108.2	111.3	102.1
2015	100.9	–1.4	100.2	–.6	100.5	99.7	103.9	104.8	101.3
2016	98.7	–2.2	99.4	–.8	98.3	100.4	100.9	91.9	100.8
2017	100.0	1.3	100.0	.6	100.0	100.0	100.0	100.0	100.0
2018	103.2	3.2	101.3	1.3	103.1	99.7	96.7	113.0	104.9
2019	102.3	–.8	99.3	–2.0	101.0	97.9	92.3	119.7	104.0
2020	95.0	–7.2	92.7	–6.6	92.7	93.7	78.7	102.7	100.5
2021 p	100.3	5.6	98.7	6.4	100.8	97.8	76.4	105.3	102.7
2020: Jan	101.1	–2.1	98.7	–1.8	99.9	98.1	89.0	119.7	97.8
Feb	101.3	–1.4	98.7	–1.3	99.9	98.1	87.7	118.4	101.5
Mar	97.4	–5.3	94.3	–5.6	93.2	96.4	81.0	119.3	97.3
Apr	84.2	–17.7	79.4	–20.0	73.4	86.6	69.5	102.9	99.3
May	85.8	–16.2	83.1	–16.3	79.0	88.3	70.6	91.3	97.5
June	91.2	–11.0	89.1	–10.4	88.3	90.9	72.7	91.9	101.5
July	94.9	–7.0	92.7	–6.4	94.4	92.0	73.6	96.7	105.2
Aug	95.9	–6.6	94.1	–5.4	95.5	93.6	78.2	97.3	103.4
Sept	95.6	–6.6	94.2	–4.8	95.6	93.4	80.9	97.4	100.4
Oct	96.6	–4.7	95.6	–2.6	96.9	94.9	82.5	96.9	100.4
Nov	97.2	–4.7	96.2	–2.8	97.9	95.2	80.3	100.3	97.8
Dec	98.3	–3.3	96.8	–2.2	98.3	96.3	78.4	100.4	103.5
2021: Jan	99.4	–1.7	98.2	–.5	100.5	96.9	78.4	103.3	100.8
Feb	96.4	–4.9	94.6	–4.2	97.3	92.4	80.3	94.2	108.3
Mar	99.2	1.8	97.8	3.7	100.1	96.2	82.1	105.4	99.0
Apr	99.2	17.9	97.6	22.9	98.7	97.5	78.6	104.9	101.7
May	99.9	16.4	98.4	18.4	99.6	98.5	75.1	106.7	100.3
June	100.5	10.2	98.2	10.2	99.4	98.4	73.1	106.8	106.3
July	101.2	6.6	99.5	7.4	101.9	98.6	73.4	106.9	103.2
Aug	101.1	5.4	99.0	5.2	101.0	98.3	76.1	106.8	106.1
Sept p	99.8	4.4	98.2	4.3	99.9	97.7	77.6	104.5	103.1
Oct p	101.2	4.7	99.9	4.5	102.0	99.0	78.5	108.5	99.6
Nov p	102.1	5.1	100.6	4.6	103.0	99.4	76.4	109.1	102.2
Dec p	102.0	3.8	100.4	3.8	102.9	99.4	74.1	110.7	100.3

[1] Total industry and total manufacturing series include manufacturing as defined in the North American Industry Classification System (NAICS) plus those industries—logging and newspaper, periodical, book, and directory publishing—that have traditionally been considered to be manufacturing and included in the industrial sector.

[2] Percent changes based on unrounded indexes.

Note: Data based on NAICS; see footnote 1.

Source: Board of Governors of the Federal Reserve System.

TABLE B–35. Capacity utilization rates, 1976–2021

[Percent [1]; monthly data seasonally adjusted]

Year or month	Total industry [2]	Manufacturing				Mining	Utilities	Stage-of-process		
		Total [2]	Durable goods	Nondurable goods	Other (non-NAICS) [2]			Crude	Primary and semi-finished	Finished
1976	79.8	78.4	76.5	81.2	77.6	89.4	85.6	86.9	80.1	76.9
1977	83.5	82.5	81.2	84.4	83.1	89.4	87.0	89.1	84.6	79.9
1978	85.2	84.5	83.9	85.3	85.0	89.4	87.3	88.6	86.3	82.4
1979	85.0	84.0	84.0	83.9	85.5	90.9	87.2	89.7	85.9	81.8
1980	80.7	78.7	77.5	79.8	86.7	91.2	85.5	89.3	78.8	79.4
1981	79.5	76.9	75.1	78.9	87.4	90.8	84.3	89.2	77.1	77.6
1982	73.6	70.9	66.5	76.4	87.3	84.0	80.0	82.3	70.5	73.2
1983	74.9	73.5	68.8	79.4	87.8	79.8	79.4	79.8	74.5	73.1
1984	80.5	79.4	77.0	82.1	89.4	85.8	81.9	85.7	81.2	77.3
1985	79.3	78.2	75.9	80.5	90.1	84.5	81.8	83.9	79.9	76.7
1986	78.6	78.5	75.5	81.8	88.7	76.5	81.0	78.4	79.7	77.2
1987	81.2	81.0	77.7	84.8	90.3	79.9	83.5	82.6	82.8	78.8
1988	84.3	84.0	82.1	86.2	88.4	83.7	86.9	86.0	85.9	81.8
1989	83.8	83.3	81.8	85.0	85.5	84.8	86.9	86.6	84.7	81.7
1990	82.4	81.6	79.4	84.2	83.6	86.8	86.4	87.9	82.6	80.6
1991	80.0	78.6	75.5	82.4	80.7	85.1	87.8	85.5	80.0	78.4
1992	80.7	79.7	77.3	82.8	80.1	84.9	86.2	85.8	81.5	78.4
1993	81.6	80.6	78.8	82.8	81.3	85.3	88.2	85.6	83.3	78.5
1994	83.6	82.9	81.7	84.6	81.4	86.4	88.5	87.6	86.3	79.3
1995	84.0	83.2	82.2	84.5	82.2	87.4	89.4	88.8	86.4	79.8
1996	83.4	82.2	81.6	83.2	80.5	90.3	90.8	88.9	85.5	79.4
1997	84.1	83.1	82.4	83.8	85.5	91.6	90.1	90.3	85.9	80.5
1998	82.9	81.7	80.9	82.2	86.7	89.2	92.5	86.9	84.2	80.5
1999	81.9	80.6	80.4	80.1	87.1	86.3	94.1	86.2	84.4	78.1
2000	81.6	79.9	79.9	78.9	87.4	90.4	94.1	88.6	84.0	77.1
2001	76.2	73.9	71.6	75.7	82.8	89.7	90.2	85.4	77.4	72.7
2002	75.0	73.1	70.2	76.0	81.5	85.9	87.5	83.2	77.5	70.6
2003	76.0	74.1	71.3	76.8	81.5	87.6	85.8	84.9	78.3	71.4
2004	78.2	76.5	74.2	78.8	82.4	88.1	84.6	86.6	80.4	73.3
2005	80.2	78.6	76.7	80.4	82.0	88.4	85.2	86.7	82.0	75.7
2006	80.5	78.8	77.8	79.9	79.6	89.9	83.6	88.1	81.5	76.3
2007	80.6	78.8	78.5	79.4	76.6	89.2	85.8	88.6	81.0	77.0
2008	77.7	74.5	74.5	74.2	78.0	89.8	84.2	87.5	76.7	73.9
2009	68.4	65.3	61.3	69.7	67.4	80.3	80.5	78.0	65.5	68.1
2010	73.4	70.4	68.7	73.1	63.5	83.8	83.1	83.1	71.5	71.2
2011	76.1	73.3	72.5	75.0	64.0	86.0	81.5	84.7	74.1	73.7
2012	76.9	74.5	75.0	74.9	62.7	87.5	78.1	85.7	74.3	75.0
2013	77.2	74.6	74.9	75.2	62.4	86.6	79.8	85.6	75.3	74.1
2014	78.6	75.7	76.4	75.7	64.7	89.1	80.8	87.3	76.7	75.4
2015	77.0	76.0	75.9	77.0	65.5	80.5	79.9	79.5	76.6	76.2
2016	75.2	75.2	74.2	77.1	66.7	71.6	78.8	74.3	75.9	74.8
2017	76.5	76.2	75.4	77.6	69.6	77.6	77.1	79.0	76.5	75.4
2018	79.2	77.7	77.5	78.4	70.4	86.8	80.4	86.2	79.1	76.1
2019	77.4	75.8	75.3	76.8	70.6	86.3	78.7	84.9	77.0	74.9
2020	71.6	71.1	69.2	73.9	63.9	71.7	74.1	73.3	71.7	70.8
2021 p	75.4	75.8	75.1	77.2	66.2	74.8	73.7	75.7	74.8	76.0
2020: Jan	76.1	75.5	74.4	77.1	70.3	83.7	73.2	82.6	75.7	74.3
Feb	76.3	75.5	74.4	77.1	69.6	82.6	75.7	82.1	76.3	74.3
Mar	73.4	72.2	69.5	75.9	64.6	83.1	72.4	82.5	72.8	71.0
Apr	63.4	60.8	54.7	68.3	55.7	71.7	73.8	72.1	64.7	59.1
May	64.7	63.7	59.0	69.6	56.9	63.5	72.3	66.2	65.7	62.9
June	68.7	68.3	65.9	71.8	58.9	64.0	75.0	67.0	69.3	68.5
July	71.5	71.2	70.5	72.7	59.9	67.4	77.5	69.4	71.7	71.9
Aug	72.3	72.3	71.3	74.0	64.0	67.9	76.0	70.1	72.1	73.1
Sept	72.1	72.4	71.5	73.8	66.5	68.1	73.7	70.2	72.2	72.5
Oct	72.9	73.5	72.5	75.0	68.1	67.9	73.4	71.0	73.2	73.2
Nov	73.3	74.0	73.2	75.3	66.6	70.3	71.4	73.0	72.8	73.9
Dec	74.1	74.4	73.5	76.1	65.4	70.6	75.4	73.2	74.1	74.5
2021: Jan	75.0	75.6	75.1	76.7	65.7	72.7	73.2	74.4	74.3	76.0
Feb	72.7	72.8	72.8	73.1	67.6	66.4	78.5	66.4	74.0	73.7
Mar	74.8	75.3	74.8	76.1	69.4	74.5	71.6	73.9	74.2	75.8
Apr	74.8	75.1	73.8	77.1	66.8	74.2	73.4	75.1	74.5	75.0
May	75.3	75.7	74.4	77.9	64.1	75.5	72.3	77.4	74.3	75.6
June	75.7	75.5	74.3	77.7	62.7	75.7	76.5	77.6	75.1	75.5
July	76.2	76.6	76.1	77.9	63.3	75.8	74.0	77.5	75.1	77.0
Aug	76.1	76.2	75.4	77.6	65.9	75.8	76.0	77.1	75.5	76.4
Sept p	75.1	75.5	74.6	77.1	67.5	74.1	73.7	74.8	74.7	75.8
Oct p	76.1	76.8	76.1	78.1	68.7	76.9	71.0	77.6	75.0	76.9
Nov p	76.7	77.3	76.8	78.4	67.1	77.4	72.7	78.0	75.8	77.4
Dec p	76.6	77.2	76.7	78.4	65.4	78.6	71.2	78.6	75.4	77.4

[1] Output as percent of capacity.
[2] See footnote 1 and Note, Table B–34.

Source: Board of Governors of the Federal Reserve System.

Table B–36. New private housing units started, authorized, and completed and houses sold, 1976–2021

[Thousands; monthly data at seasonally adjusted annual rates]

Year or month	New housing units started: Total	Started, type of structure: 1 unit	Started: 2 to 4 units [2]	Started: 5 units or more	New housing units authorized [1]: Total	Authorized, type of structure: 1 unit	Authorized: 2 to 4 units	Authorized: 5 units or more	New housing units completed	New houses sold
1976	1,537.5	1,162.4	85.8	289.2	1,296.2	893.6	93.1	309.5	1,377.2	646
1977	1,987.1	1,450.9	121.7	414.4	1,690.0	1,126.1	121.3	442.7	1,657.1	819
1978	2,020.3	1,433.3	125.1	462.0	1,800.5	1,182.6	130.6	487.3	1,867.5	817
1979	1,745.1	1,194.1	122.0	429.0	1,551.8	981.5	125.4	444.8	1,870.8	709
1980	1,292.2	852.2	109.5	330.5	1,190.6	710.4	114.5	365.7	1,501.6	545
1981	1,084.2	705.4	91.2	287.7	985.5	564.3	101.8	319.4	1,265.7	436
1982	1,062.2	662.6	80.1	319.6	1,000.5	546.4	88.3	365.8	1,005.5	412
1983	1,703.0	1,067.6	113.5	522.0	1,605.2	901.5	133.7	570.1	1,390.3	623
1984	1,749.5	1,084.2	121.4	543.9	1,681.8	922.4	142.6	616.8	1,652.2	639
1985	1,741.8	1,072.4	93.5	576.0	1,733.3	956.6	120.1	656.6	1,703.3	688
1986	1,805.4	1,179.4	84.0	542.0	1,769.4	1,077.6	108.4	583.5	1,756.4	750
1987	1,620.5	1,146.4	65.1	408.7	1,534.8	1,024.4	89.3	421.1	1,668.8	671
1988	1,488.1	1,081.3	58.7	348.0	1,455.6	993.8	75.7	386.1	1,529.8	676
1989	1,376.1	1,003.3	55.3	317.6	1,338.4	931.7	66.9	339.8	1,422.8	650
1990	1,192.7	894.8	37.6	260.4	1,110.8	793.9	54.3	262.6	1,308.0	534
1991	1,013.9	840.4	35.6	137.9	948.8	753.5	43.1	152.1	1,090.8	509
1992	1,199.7	1,029.9	30.9	139.0	1,094.9	910.7	45.8	138.4	1,157.5	610
1993	1,287.6	1,125.7	29.4	132.6	1,199.1	986.5	52.4	160.2	1,192.7	666
1994	1,457.0	1,198.4	35.2	223.5	1,371.6	1,068.5	62.2	241.0	1,346.9	670
1995	1,354.1	1,076.2	33.8	244.1	1,332.5	997.3	63.8	271.5	1,312.6	667
1996	1,476.8	1,160.9	45.3	270.8	1,425.6	1,069.5	65.8	290.3	1,412.9	757
1997	1,474.0	1,133.7	44.5	295.8	1,441.1	1,062.4	68.4	310.3	1,400.5	804
1998	1,616.9	1,271.4	42.6	302.9	1,612.3	1,187.6	69.2	355.5	1,474.2	886
1999	1,640.9	1,302.4	31.9	306.6	1,663.5	1,246.7	65.8	351.1	1,604.9	880
2000	1,568.7	1,230.9	38.7	299.1	1,592.3	1,198.1	64.9	329.3	1,573.7	877
2001	1,602.7	1,273.3	36.6	292.8	1,636.7	1,235.6	66.0	335.2	1,570.8	908
2002	1,704.9	1,358.6	38.5	307.9	1,747.7	1,332.6	73.7	341.4	1,648.4	973
2003	1,847.7	1,499.0	33.5	315.2	1,889.2	1,460.9	82.5	345.8	1,678.7	1,086
2004	1,955.8	1,610.5	42.3	303.0	2,070.1	1,613.4	90.4	366.2	1,841.9	1,203
2005	2,068.3	1,715.8	41.1	311.4	2,155.3	1,682.0	84.0	389.3	1,931.4	1,283
2006	1,800.9	1,465.4	42.7	292.8	1,838.9	1,378.2	76.6	384.1	1,979.4	1,051
2007	1,355.0	1,046.0	31.7	277.3	1,398.4	979.9	59.6	359.0	1,502.8	776
2008	905.5	622.0	17.5	266.0	905.4	575.6	34.4	295.4	1,119.7	485
2009	554.0	445.1	11.6	97.3	583.0	441.1	20.7	121.1	794.4	375
2010	586.9	471.2	11.4	104.3	604.6	447.3	22.0	135.3	651.7	323
2011	608.8	430.6	10.9	167.3	624.1	418.5	21.6	184.0	584.9	306
2012	780.6	535.3	11.4	233.9	829.7	518.7	25.9	285.1	649.2	368
2013	924.9	617.6	13.6	293.7	990.8	620.8	29.0	341.1	764.4	429
2014	1,003.3	647.9	13.7	341.7	1,052.1	640.3	29.9	382.0	883.8	437
2015	1,111.8	714.5	11.5	385.8	1,182.6	696.0	32.1	454.5	968.2	501
2016	1,173.8	781.5	11.5	380.8	1,206.6	750.8	34.8	421.1	1,059.7	561
2017	1,203.0	848.9	11.4	342.7	1,282.0	820.0	37.2	424.8	1,152.9	613
2018	1,249.9	875.8	13.9	360.3	1,328.8	855.3	39.7	433.8	1,184.9	617
2019	1,290.0	887.7	13.4	388.9	1,386.0	862.1	42.6	481.4	1,255.1	683
2020	1,379.6	990.5	12.3	376.8	1,471.1	979.4	47.2	444.5	1,286.9	822
2021 p	1,597.2	1,125.5	11.9	459.8	1,729.9	1,111.4	52.0	566.5	1,338.9	767
2020: Jan	1,589	992	………	588	1,550	980	43	527	1,288	756
Feb	1,589	1,055	………	515	1,478	1,009	48	421	1,294	730
Mar	1,277	895	………	369	1,382	895	47	440	1,267	623
Apr	938	685	………	238	1,094	673	34	387	1,191	582
May	1,046	733	………	305	1,246	753	44	449	1,178	704
June	1,273	903	………	363	1,296	850	41	405	1,243	839
July	1,497	995	………	492	1,542	993	49	500	1,340	972
Aug	1,376	1,023	………	331	1,522	1,055	53	414	1,216	977
Sept	1,448	1,105	………	338	1,589	1,121	46	422	1,426	971
Oct	1,514	1,162	………	337	1,595	1,141	60	394	1,356	969
Nov	1,551	1,182	………	353	1,696	1,155	54	487	1,244	865
Dec	1,661	1,315	………	336	1,758	1,233	49	476	1,386	943
2021: Jan	1,625	1,143	………	469	1,883	1,268	55	560	1,328	993
Feb	1,447	1,069	………	365	1,726	1,145	48	533	1,347	823
Mar	1,725	1,255	………	448	1,755	1,194	58	503	1,497	873
Apr	1,514	1,061	………	439	1,733	1,148	50	535	1,417	796
May	1,594	1,098	………	486	1,683	1,134	58	491	1,350	733
June	1,657	1,161	………	485	1,594	1,066	49	479	1,312	683
July	1,562	1,112	………	439	1,630	1,048	54	528	1,380	704
Aug	1,573	1,088	………	478	1,721	1,050	41	630	1,291	668
Sept	1,550	1,089	………	452	1,586	1,041	49	496	1,235	725
Oct	1,552	1,074	………	468	1,653	1,074	51	528	1,255	667
Nov p	1,703	1,222	………	464	1,717	1,106	48	563	1,404	749
Dec p	1,708	1,182	………	521	1,885	1,128	67	690	1,315	839

[1] Authorized by issuance of local building permits in permit-issuing places: 20,100 places beginning with 2014; 19,300 for 2004–2013; 19,000 for 1994–2003; 17,000 for 1984–93; 16,000 for 1978–83; and 14,000 for 1976–77.

[2] Monthly data do not meet publication standards because tests for identifiable and stable seasonality do not meet reliability standards.

Note: One-unit estimates prior to 1999, for new housing units started and completed and for new houses sold, include an upward adjustment of 3.3 percent to account for structures in permit-issuing areas that did not have permit authorization.

Source: Department of Commerce (Bureau of the Census).

Table B–37. Manufacturing and trade sales and inventories, 1979–2021

[Amounts in millions of dollars; monthly data seasonally adjusted]

Year or month	Total manufacturing and trade			Manufacturing			Merchant wholesalers [1]			Retail trade			Retail and food services sales
	Sales [2]	Inventories [3]	Ratio [4]	Sales [2]	Inventories [3]	Ratio [4]	Sales [2]	Inventories [3]	Ratio [4]	Sales [2, 5]	Inventories [3]	Ratio [4]	
SIC: [6]													
1979	297,701	452,640	1.52	143,936	242,157	1.68	79,051	99,679	1.26	74,713	110,804	1.48	....
1980	327,233	508,924	1.56	154,391	265,215	1.72	93,099	122,631	1.32	79,743	121,078	1.52	....
1981	355,822	545,786	1.53	168,129	283,413	1.69	101,180	129,654	1.28	86,514	132,719	1.53	....
1982	347,625	573,908	1.67	163,351	311,852	1.95	95,211	127,428	1.36	89,062	134,628	1.49	....
1983	369,286	590,287	1.56	172,547	312,379	1.78	99,225	130,075	1.28	97,514	147,833	1.44	....
1984	410,124	649,780	1.53	190,682	339,516	1.73	112,199	142,452	1.23	107,243	167,812	1.49	....
1985	422,583	664,039	1.56	194,538	334,749	1.73	113,459	147,409	1.28	114,586	181,881	1.52	....
1986	430,419	662,738	1.55	194,657	322,654	1.68	114,960	153,574	1.32	120,803	186,510	1.56	....
1987	457,735	709,848	1.50	206,326	338,109	1.59	122,968	163,903	1.29	128,442	207,836	1.55	....
1988	497,157	767,222	1.49	224,619	369,374	1.57	134,521	178,801	1.30	138,017	219,047	1.54	....
1989	527,039	815,455	1.52	236,698	391,212	1.63	143,760	187,009	1.28	146,581	237,234	1.58	....
1990	545,909	840,594	1.52	242,686	405,073	1.65	149,506	195,833	1.29	153,718	239,688	1.56	....
1991	542,815	834,609	1.53	239,847	390,950	1.65	148,306	200,448	1.33	154,661	243,211	1.54	....
1992	567,176	842,809	1.48	250,394	382,510	1.54	154,150	208,302	1.32	162,632	251,997	1.52	....
NAICS: [6]													
1992	540,199	835,800	1.53	242,002	378,609	1.57	147,261	196,914	1.31	150,936	260,277	1.67	167,842
1993	567,195	863,125	1.50	251,708	379,806	1.50	154,018	204,842	1.30	161,469	278,477	1.68	179,425
1994	609,854	926,395	1.46	269,843	399,934	1.44	164,575	221,978	1.29	175,436	304,483	1.66	194,186
1995	654,689	985,385	1.48	289,973	424,802	1.44	179,915	238,392	1.29	184,801	322,191	1.72	204,219
1996	686,923	1,004,646	1.45	299,766	430,366	1.44	190,362	241,058	1.27	196,796	333,222	1.67	216,983
1997	723,443	1,045,495	1.42	319,558	443,227	1.37	198,154	258,454	1.26	205,731	343,814	1.64	227,178
1998	742,391	1,077,183	1.44	324,984	448,373	1.39	202,260	272,297	1.32	215,147	356,513	1.62	237,746
1999	786,178	1,137,260	1.40	335,991	463,004	1.35	216,597	290,182	1.30	233,591	384,074	1.59	257,249
2000	833,868	1,195,894	1.41	350,715	480,748	1.35	234,546	309,191	1.29	248,606	405,955	1.59	273,961
2001	818,160	1,118,552	1.42	330,875	427,353	1.38	232,096	297,536	1.32	255,189	393,663	1.58	281,576
2002	823,234	1,139,523	1.36	326,227	423,028	1.29	236,294	301,310	1.26	260,713	415,185	1.55	288,256
2003	854,700	1,147,795	1.34	334,616	408,302	1.25	248,190	308,274	1.22	271,894	431,219	1.56	301,038
2004	926,002	1,241,744	1.30	359,081	441,222	1.19	277,501	340,128	1.17	289,421	460,394	1.56	320,550
2005	1,005,821	1,314,197	1.27	395,173	474,639	1.17	303,208	367,858	1.17	307,440	471,700	1.51	340,479
2006	1,069,032	1,408,628	1.28	417,963	523,476	1.20	328,438	398,740	1.17	322,631	486,412	1.49	357,863
2007	1,128,176	1,488,220	1.28	443,288	563,043	1.22	351,956	424,599	1.17	332,932	500,578	1.49	369,978
2008	1,160,778	1,465,673	1.31	455,750	543,273	1.26	377,085	445,681	1.20	327,943	476,719	1.52	365,965
2009	988,905	1,331,350	1.38	368,648	505,025	1.39	319,217	397,806	1.29	301,039	428,519	1.47	338,706
2010	1,089,044	1,449,974	1.27	409,273	553,726	1.28	361,600	442,743	1.15	318,171	453,505	1.39	357,081
2011	1,206,873	1,566,651	1.26	457,658	607,035	1.29	407,302	488,255	1.15	341,913	471,361	1.35	383,192
2012	1,267,540	1,657,094	1.28	474,727	625,216	1.30	434,294	524,721	1.17	358,519	507,157	1.38	402,199
2013	1,306,495	1,725,624	1.29	484,511	631,755	1.30	450,331	549,169	1.19	371,654	544,700	1.41	416,944
2014	1,346,667	1,788,427	1.31	490,751	642,723	1.31	469,089	584,584	1.22	386,827	561,120	1.43	434,877
2015	1,303,972	1,821,369	1.39	461,086	638,073	1.40	448,876	595,716	1.33	394,010	587,580	1.46	446,018
2016	1,295,832	1,857,671	1.42	446,966	635,921	1.42	444,848	610,731	1.35	404,018	611,019	1.50	458,845
2017	1,357,498	1,917,240	1.39	462,400	658,885	1.39	475,081	632,013	1.30	420,018	626,342	1.48	477,739
2018	1,436,971	2,002,600	1.36	490,889	677,647	1.37	508,329	671,212	1.28	437,753	653,741	1.46	498,756
2019	1,435,845	2,051,229	1.42	477,599	713,305	1.46	507,326	680,387	1.35	450,920	657,537	1.47	515,382
2020	1,397,856	1,997,146	1.43	446,400	709,607	1.58	485,324	667,477	1.38	466,133	620,062	1.34	517,923
2021 *p*	1,645,763	2,213,218	1.27	503,486	774,004	1.48	592,555	793,400	1.23	549,723	645,814	1.12	618,176
2020: Jan	1,440,957	2,043,067	1.42	468,624	711,101	1.52	511,747	674,481	1.32	460,586	657,485	1.43	526,930
Feb	1,434,116	2,031,377	1.42	468,676	707,384	1.51	505,830	668,928	1.32	459,610	655,065	1.43	525,810
Mar	1,355,057	2,025,813	1.50	443,429	700,122	1.58	477,347	663,606	1.39	434,281	662,085	1.52	480,407
Apr	1,157,954	1,997,639	1.73	380,636	698,387	1.83	397,426	663,770	1.67	379,892	635,482	1.67	409,819
May	1,255,961	1,950,824	1.55	389,858	698,049	1.79	421,472	656,147	1.56	444,631	596,628	1.34	484,295
June	1,369,040	1,930,480	1.41	432,181	702,389	1.63	461,136	649,174	1.41	475,723	578,917	1.22	526,187
July	1,420,142	1,930,238	1.36	452,585	698,776	1.54	486,254	647,811	1.33	481,303	583,651	1.21	533,517
Aug	1,432,989	1,940,739	1.35	455,568	699,708	1.54	493,999	651,231	1.32	483,422	589,800	1.22	537,980
Sept	1,445,620	1,955,881	1.35	457,690	699,720	1.53	494,519	656,215	1.33	493,411	599,946	1.22	549,211
Oct	1,463,959	1,972,965	1.35	463,216	701,183	1.51	507,805	663,723	1.31	492,938	608,059	1.23	548,930
Nov	1,465,115	1,984,864	1.35	466,345	706,402	1.51	511,753	665,154	1.30	487,017	613,308	1.26	540,495
Dec	1,481,943	1,997,146	1.35	475,283	709,607	1.49	521,119	667,477	1.28	485,541	620,062	1.28	536,629
2021: Jan	1,545,728	2,008,396	1.30	484,703	710,144	1.47	542,508	677,478	1.25	518,517	620,774	1.20	575,245
Feb	1,523,031	2,022,434	1.33	475,852	715,661	1.50	542,721	684,807	1.26	504,458	621,966	1.23	559,970
Mar	1,611,857	2,027,111	1.26	486,040	721,170	1.48	565,946	692,786	1.22	559,871	613,155	1.10	623,119
Apr	1,621,377	2,028,401	1.25	487,131	725,071	1.49	571,977	700,428	1.22	562,269	602,902	1.07	628,751
May	1,618,539	2,040,564	1.26	491,339	733,325	1.49	576,419	709,845	1.23	550,781	597,394	1.08	620,119
June	1,644,724	2,059,156	1.25	500,673	740,661	1.48	589,663	718,254	1.22	554,388	600,241	1.08	625,405
July	1,653,322	2,070,520	1.25	507,959	745,171	1.47	602,172	722,569	1.20	543,191	602,780	1.11	615,250
Aug	1,655,239	2,086,461	1.26	508,234	750,633	1.48	596,712	731,835	1.23	550,293	603,993	1.10	622,383
Sept	1,674,397	2,103,135	1.26	513,205	757,820	1.48	606,959	742,195	1.22	554,233	603,120	1.09	626,999
Oct	1,711,246	2,130,353	1.24	523,458	764,728	1.46	622,400	760,684	1.22	565,388	604,941	1.07	638,102
Nov	1,729,700	2,161,362	1.25	526,864	770,850	1.46	633,276	773,612	1.22	569,560	616,900	1.08	642,636
Dec *p*	1,722,857	2,213,218	1.28	530,726	774,004	1.46	638,510	793,400	1.24	553,621	645,814	1.17	626,289

[1] Excludes manufacturers' sales branches and offices.
[2] Annual data are averages of monthly not seasonally adjusted figures.
[3] Seasonally adjusted, end of period. Inventories beginning with January 1982 for manufacturing and December 1980 for wholesale and retail trade are not comparable with earlier periods.
[4] Inventory/sales ratio. Monthly inventories are inventories at the end of the month to sales for the month. Annual data beginning with 1982 are the average of monthly ratios for the year. Annual data for 1979–81 are the ratio of December inventories to monthly average sales for the year.
[5] Food services included on Standard Industrial Classification (SIC) basis and excluded on North American Industry Classification System (NAICS) basis. See last column for retail and food services sales.
[6] Effective in 2001, data classified based on NAICS. Data on NAICS basis available beginning with 1992. Earlier data based on SIC. Data on both NAICS and SIC basis include semiconductors.

Source: Department of Commerce (Bureau of the Census).

Table B–38. Changes in consumer price indexes, 1979–2021

[For all urban consumers; percent change]

Year or month	All items	All items less food and energy: Total [1]	Shelter [2]	Medical care [3]	Apparel	New vehicles	Food: Total [1]	At home	Away from home	Energy [4]: Total [1, 3]	Gasoline	C-CPI-U [5]
	December to December, NSA											
1979	13.3	11.3	17.5	10.1	5.5	7.4	10.2	9.7	11.4	37.5	52.1	....
1980	12.5	12.2	15.0	9.9	6.8	7.4	10.2	10.5	9.6	18.0	18.9	....
1981	8.9	9.5	9.9	12.5	3.5	6.8	4.3	2.9	7.1	11.9	9.4	....
1982	3.8	4.5	2.4	11.0	1.6	1.4	3.1	2.3	5.1	1.3	–6.7	....
1983	3.8	4.8	4.7	6.4	2.9	3.3	2.7	1.8	4.1	–.5	–1.6	....
1984	3.9	4.7	5.2	6.1	2.0	2.5	3.8	3.6	4.2	.2	–2.5	....
1985	3.8	4.3	6.0	6.8	2.8	3.6	2.6	2.0	3.8	1.8	3.0	....
1986	1.1	3.8	4.6	7.7	.9	5.6	3.8	3.7	4.3	–19.7	–30.7	....
1987	4.4	4.2	4.8	5.8	4.8	1.8	3.5	3.5	3.7	8.2	18.6	....
1988	4.4	4.7	4.5	6.9	4.7	2.2	5.2	5.6	4.4	.5	–1.8	....
1989	4.6	4.4	4.9	8.5	1.0	2.4	5.6	6.2	4.6	5.1	6.5	....
1990	6.1	5.2	5.2	9.6	5.1	2.0	5.3	5.8	4.5	18.1	36.8	....
1991	3.1	4.4	3.9	7.9	3.4	3.2	1.9	1.3	2.9	–7.4	–16.2	....
1992	2.9	3.3	2.9	6.6	1.4	2.3	1.5	1.5	1.4	2.0	2.0	....
1993	2.7	3.2	3.0	5.4	.9	3.3	2.9	3.5	1.9	–1.4	–5.9	....
1994	2.7	2.6	3.0	4.9	–1.6	3.3	2.9	3.5	1.9	2.2	6.4	....
1995	2.5	3.0	3.5	3.9	.1	1.9	2.1	2.0	2.2	–1.3	–4.2	....
1996	3.3	2.6	2.9	3.0	–.2	1.8	4.3	4.9	3.1	8.6	12.4	....
1997	1.7	2.2	3.4	2.8	1.0	–.9	1.5	1.0	2.6	–3.4	–6.1	....
1998	1.6	2.4	3.3	3.4	–.7	.0	2.3	2.1	2.5	–8.8	–15.4	....
1999	2.7	1.9	2.5	3.7	–.5	–.3	1.9	1.7	2.3	13.4	30.1	....
2000	3.4	2.6	3.4	4.2	–1.8	.0	2.8	2.9	2.4	14.2	13.9	2.6
2001	1.6	2.7	4.2	4.7	–3.2	–.1	2.8	2.6	3.0	–13.0	–24.9	1.3
2002	2.4	1.9	3.1	5.0	–1.8	–2.0	1.5	.8	2.3	10.7	24.8	2.0
2003	1.9	1.1	2.2	3.7	–2.1	–1.8	3.6	4.5	2.3	6.9	6.8	1.7
2004	3.3	2.2	2.7	4.2	–.2	.6	2.7	2.4	3.0	16.6	26.1	3.2
2005	3.4	2.2	2.6	4.3	–1.1	–.4	2.3	1.7	3.2	17.1	16.1	2.9
2006	2.5	2.6	4.2	3.6	.9	–.9	2.1	1.4	3.2	2.9	6.4	2.3
2007	4.1	2.4	3.1	5.2	–.3	–.3	4.9	5.6	4.0	17.4	29.6	3.7
2008	.1	1.8	1.9	2.6	–1.0	–3.2	5.9	6.6	5.0	–21.3	–43.1	.2
2009	2.7	1.8	.3	3.4	1.9	4.9	–.5	–2.4	1.9	18.2	53.5	2.5
2010	1.5	.8	.4	3.3	–1.1	–.2	1.5	1.7	1.3	7.7	13.8	1.3
2011	3.0	2.2	1.9	3.5	4.6	3.2	4.7	6.0	2.9	6.6	9.9	2.9
2012	1.7	1.9	2.2	3.2	1.8	1.6	1.8	1.3	2.5	.5	1.7	1.5
2013	1.5	1.7	2.5	2.0	.6	.4	1.1	.4	2.1	.5	–1.0	1.3
2014	.8	1.6	2.9	3.0	–2.0	.5	3.4	3.7	3.0	–10.6	–21.0	.5
2015	.7	2.1	3.2	2.6	–.9	.2	.8	–.4	2.6	–12.6	–19.7	.4
2016	2.1	2.2	3.6	4.1	–.1	.3	–.2	–2.0	2.3	5.4	9.1	1.8
2017	2.1	1.8	3.2	1.8	–1.6	–.5	1.6	.9	2.5	6.9	10.7	1.7
2018	1.9	2.2	3.2	2.0	–.1	–.3	1.6	.6	2.8	–.3	–2.1	1.5
2019	2.3	2.3	3.2	4.6	–1.2	.1	1.8	.7	3.1	3.4	7.9	1.8
2020	1.4	1.6	1.8	1.8	–3.9	2.0	3.9	3.9	3.9	–7.0	–15.2	1.5
2021	7.0	5.5	4.1	2.2	5.8	11.8	6.3	6.5	6.0	29.3	49.6	6.7
	Change from year earlier, NSA											
2020: Jan	2.5	2.3	3.3	4.5	–1.3	0.1	1.8	0.7	3.1	6.2	12.8	2.0
Feb	2.3	2.4	3.3	4.6	–.9	.4	1.8	.8	3.0	2.8	5.6	1.8
Mar	1.5	2.1	3.0	4.7	–1.6	–.4	1.9	1.1	3.0	–5.7	–10.2	1.1
Apr	.3	1.4	2.6	4.8	–5.7	–.6	3.5	4.1	2.8	–17.7	–32.0	.2
May	.1	1.2	2.5	4.9	–7.9	–.3	4.0	4.8	2.9	–18.9	–33.8	–.1
June	.6	1.2	2.4	5.1	–7.3	–.2	4.5	5.6	3.1	–12.6	–23.4	.4
July	1.0	1.6	2.3	5.0	–6.5	.5	4.1	4.6	3.4	–11.2	–20.3	.9
Aug	1.3	1.7	2.3	4.5	–5.9	.7	4.1	4.6	3.5	–9.0	–16.8	1.3
Sept	1.4	1.7	2.0	4.2	–6.0	1.0	3.9	4.1	3.8	–7.7	–15.4	1.4
Oct	1.2	1.6	2.0	2.9	–5.5	1.5	3.9	4.0	3.9	–9.2	–18.0	1.2
Nov	1.2	1.6	1.9	2.4	–5.2	1.6	3.7	3.6	3.8	–9.4	–19.3	1.2
Dec	1.4	1.6	1.8	1.8	–3.9	2.0	3.9	3.9	3.9	–7.0	–15.2	1.5
2021: Jan	1.4	1.4	1.6	1.9	–2.5	1.4	3.8	3.7	3.9	–3.6	–8.6	1.6
Feb	1.7	1.3	1.5	2.0	–3.6	1.2	3.6	3.5	3.7	2.4	1.5	1.8
Mar	2.6	1.6	1.7	1.8	–2.5	1.5	3.5	3.3	3.7	13.2	22.5	2.6
Apr	4.2	3.0	2.1	1.5	1.9	2.0	2.4	1.2	3.8	25.1	49.6	4.0
May	5.0	3.8	2.2	.9	5.6	3.3	2.2	.7	4.0	28.5	56.2	5.0
June	5.4	4.5	2.6	.4	4.9	5.3	2.4	.9	4.2	24.5	45.1	5.3
July	5.4	4.3	2.8	.3	4.2	6.4	3.4	2.6	4.6	23.8	41.8	5.1
Aug	5.3	4.0	2.8	.4	4.2	7.6	3.7	3.0	4.7	25.0	42.7	4.9
Sept	5.4	4.0	3.2	.4	3.4	8.7	4.6	4.5	4.7	24.8	42.1	5.1
Oct	6.2	4.6	3.5	1.3	4.3	9.8	5.3	5.4	5.3	30.0	49.6	6.0
Nov	6.8	4.9	3.8	1.7	5.0	11.1	6.1	6.4	5.8	33.3	58.1	6.6
Dec	7.0	5.5	4.1	2.2	5.8	11.8	6.3	6.5	6.0	29.3	49.6	6.7

[1] Includes other items not shown separately.
[2] Data beginning with 1983 incorporate a rental equivalence measure for homeowners' costs.
[3] Commodities and services.
[4] Household energy--electricity, utility (piped) gas service, fuel oil, etc.--and motor fuel.
[5] Chained consumer price index (C-CPI-U) introduced in 2002. Reflects the effect of substitution that consumers make across item categories in response to changes in relative prices. Data for 2021 are subject to revision.

Source: Department of Labor (Bureau of Labor Statistics).

TABLE B–39. Price indexes for personal consumption expenditures, and percent changes, 1972–2021

[Chain-type price index numbers, 2012=100; monthly data seasonally adjusted]

Year or month	Personal consumption expenditures (PCE)						Percent change from year earlier					
	Total	Goods	Services	Food [1]	Energy goods and services [2]	PCE less food and energy	Total	Goods	Services	Food [1]	Energy goods and services [2]	PCE less food and energy
1972	22.542	33.926	17.441	22.371	10.716	23.856	3.4	2.6	4.2	4.8	2.6	3.2
1973	23.756	35.949	18.284	25.202	11.640	24.764	5.4	6.0	4.8	12.7	8.6	3.8
1974	26.229	40.436	19.833	29.034	15.176	26.726	10.4	12.5	8.5	15.2	30.4	7.9
1975	28.415	43.703	21.533	31.217	16.672	28.958	8.3	8.1	8.6	7.5	9.9	8.4
1976	29.974	45.413	23.027	31.798	17.791	30.718	5.5	3.9	6.9	1.9	6.7	6.1
1977	31.923	47.837	24.770	33.671	19.294	32.694	6.5	5.3	7.6	5.9	8.4	6.4
1978	34.145	50.773	26.674	36.892	20.380	34.861	7.0	6.1	7.7	9.6	5.6	6.6
1979	37.178	55.574	28.911	40.516	25.414	37.403	8.9	9.5	8.4	9.8	24.7	7.3
1980	41.182	61.797	31.918	43.922	33.203	40.840	10.8	11.2	10.4	8.4	30.6	9.2
1981	44.871	66.389	35.187	47.051	37.668	44.419	9.0	7.4	10.2	7.1	13.4	8.8
1982	47.363	68.198	37.949	48.289	38.326	47.306	5.6	2.7	7.8	2.6	1.7	6.5
1983	49.378	69.429	40.280	48.844	38.684	49.727	4.3	1.8	6.1	1.1	.9	5.1
1984	51.243	70.742	42.376	50.312	39.172	51.789	3.8	1.9	5.2	3.0	1.3	4.1
1985	53.031	71.877	44.450	50.859	39.585	53.893	3.5	1.6	4.9	1.1	1.1	4.1
1986	54.184	71.541	46.276	52.056	34.685	55.752	2.2	–.5	4.1	2.4	–12.4	3.4
1987	55.855	73.842	47.660	53.699	35.069	57.548	3.1	3.2	3.0	3.2	1.1	3.2
1988	58.038	75.788	49.939	55.300	35.337	59.994	3.9	2.6	4.8	3.0	.8	4.3
1989	60.572	78.704	52.293	58.216	37.425	62.484	4.4	3.8	4.7	5.3	5.9	4.2
1990	63.231	81.927	54.690	61.060	40.589	65.016	4.4	4.1	4.6	4.9	8.5	4.1
1991	65.345	83.930	56.829	62.977	40.769	67.338	3.3	2.4	3.9	3.1	.4	3.6
1992	67.087	84.943	58.850	63.461	40.959	69.384	2.7	1.2	3.6	.8	.5	3.0
1993	68.758	85.681	60.885	64.348	41.331	71.269	2.5	.9	3.5	1.4	.9	2.7
1994	70.193	86.552	62.540	65.426	41.493	72.864	2.1	1.0	2.7	1.7	.4	2.2
1995	71.671	87.361	64.288	66.844	41.819	74.451	2.1	.9	2.8	2.2	.8	2.2
1996	73.204	88.321	66.051	68.883	43.777	75.863	2.1	1.1	2.7	3.1	4.7	1.9
1997	74.478	88.219	67.914	70.195	44.236	77.201	1.7	–.1	2.8	1.9	1.0	1.8
1998	75.070	86.893	69.351	71.077	40.502	78.183	.8	–1.5	2.1	1.3	–8.4	1.3
1999	76.164	87.349	70.731	72.241	42.143	79.210	1.5	.5	2.0	1.6	4.1	1.3
2000	78.090	89.082	72.740	73.933	49.843	80.625	2.5	2.0	2.8	2.3	18.3	1.8
2001	79.656	89.015	75.063	76.089	51.088	82.153	2.0	–.1	3.2	2.9	2.5	1.9
2002	80.702	88.166	77.004	77.239	48.110	83.526	1.3	–1.0	2.6	1.5	–5.8	1.7
2003	82.398	88.054	79.574	78.701	54.190	84.874	2.1	–.1	3.3	1.9	12.6	1.6
2004	84.443	89.292	82.018	81.157	60.339	86.544	2.5	1.4	3.1	3.1	11.3	2.0
2005	86.876	91.084	84.774	82.575	70.752	88.440	2.9	2.0	3.4	1.7	17.3	2.2
2006	89.322	92.306	87.844	83.963	78.812	90.558	2.8	1.3	3.6	1.7	11.4	2.4
2007	91.614	93.331	90.786	87.239	83.557	92.578	2.6	1.1	3.3	3.9	6.0	2.2
2008	94.325	96.122	93.458	92.552	95.464	94.393	3.0	3.0	2.9	6.1	14.3	2.0
2009	94.062	93.812	94.182	93.651	77.393	95.270	–.3	–2.4	.8	1.2	–18.9	.9
2010	95.747	95.183	96.017	93.931	85.120	96.651	1.8	1.5	1.9	.3	10.0	1.4
2011	98.170	98.773	97.875	97.682	98.601	98.184	2.5	3.8	1.9	4.0	15.8	1.6
2012	100.000	100.000	100.000	100.000	100.000	100.000	1.9	1.2	2.2	2.4	1.4	1.8
2013	101.354	99.407	102.322	100.989	99.109	101.535	1.4	–.6	2.3	1.0	–.9	1.5
2014	102.887	98.920	104.880	102.925	98.279	103.187	1.5	–.5	2.5	1.9	–.8	1.6
2015	103.116	95.896	106.796	104.086	80.641	104.487	.2	–3.1	1.8	1.1	–17.9	1.3
2016	104.148	94.332	109.197	103.009	74.784	106.138	1.0	–1.6	2.2	–1.0	–7.3	1.6
2017	106.051	94.615	111.965	102.872	81.306	107.935	1.8	.3	2.5	–.1	8.7	1.7
2018	108.318	95.281	115.100	103.411	87.836	110.096	2.1	.7	2.8	.5	8.0	2.0
2019	109.922	94.832	117.836	104.442	85.953	111.959	1.5	–.5	2.4	1.0	–2.1	1.7
2020	111.225	94.160	120.302	107.976	78.672	113.553	1.2	–.7	2.1	3.4	–8.5	1.4
2021 p	115.529	98.892	124.213	111.352	94.627	117.320	3.9	5.0	3.3	3.1	20.3	3.3
2020: Jan	111.002	94.989	119.440	105.022	88.005	113.040	1.9	.5	2.5	.9	6.8	1.8
Feb	111.071	94.818	119.649	105.471	85.710	113.215	1.9	.3	2.6	.9	3.0	1.9
Mar	110.802	93.985	119.722	105.904	80.816	113.150	1.3	–1.0	2.4	1.2	–6.1	1.7
Apr	110.213	93.009	119.386	108.340	73.487	112.628	.4	–2.4	1.7	4.0	–17.5	.9
May	110.385	92.932	119.721	109.133	71.742	112.864	.5	–2.3	1.9	4.6	–18.3	1.0
June	110.918	93.789	120.032	109.679	74.652	113.265	.9	–1.2	1.9	5.1	–12.6	1.1
July	111.221	94.129	120.306	108.773	76.264	113.610	1.0	–.8	1.9	4.3	–11.1	1.3
Aug	111.563	94.538	120.600	108.732	76.952	113.971	1.3	–.1	2.0	4.3	–9.1	1.5
Sept	111.736	94.417	120.964	108.559	77.939	114.131	1.4	–.2	2.1	3.9	–7.9	1.6
Oct	111.775	94.316	121.094	108.728	78.375	114.137	1.2	–.6	2.0	3.9	–9.6	1.4
Nov	111.790	94.331	121.109	108.606	78.967	114.134	1.1	–.6	1.9	3.7	–10.0	1.4
Dec	112.220	94.662	121.597	108.769	81.151	114.494	1.3	–.2	2.0	3.9	–7.7	1.5
2021: Jan	112.570	95.311	121.742	108.692	84.033	114.746	1.4	.3	1.9	3.5	–4.5	1.5
Feb	112.878	95.694	121.992	108.913	87.311	114.899	1.6	.9	2.0	3.3	1.9	1.5
Mar	113.518	96.365	122.594	109.102	91.594	115.383	2.5	2.5	2.4	3.0	13.3	2.0
Apr	114.161	97.153	123.120	109.485	91.364	116.100	3.6	4.5	3.1	1.1	24.3	3.1
May	114.767	97.975	123.565	109.845	91.346	116.766	4.0	5.4	3.2	.7	27.3	3.5
June	115.388	98.716	124.093	110.673	92.727	117.327	4.0	5.3	3.4	.9	24.2	3.6
July	115.847	99.150	124.557	111.384	94.255	117.704	4.2	5.3	3.5	2.4	23.6	3.6
Aug	116.290	99.711	124.913	111.822	96.066	118.073	4.2	5.5	3.6	2.8	24.8	3.6
Sept	116.693	100.210	125.243	113.000	97.309	118.357	4.4	6.1	3.5	4.1	24.9	3.7
Oct p	117.423	101.425	125.641	113.830	101.133	118.909	5.1	7.5	3.8	4.7	29.0	4.2
Nov p	118.094	102.165	126.255	114.559	103.746	119.469	5.6	8.3	4.2	5.5	31.4	4.7
Dec p	118.717	102.833	126.837	114.923	104.635	120.102	5.8	8.6	4.3	5.7	28.9	4.9

[1] Food consists of food and beverages purchased for off-premises consumption; food services, which include purchased meals and beverages, are not classified as food.

[2] Consists of gasoline and other energy goods and of electricity and gas services.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–40. Money stock and debt measures, 1982–2021

[Averages of daily figures, except debt end-of-period basis; billions of dollars, seasonally adjusted]

Year and month	M1: Sum of currency, demand deposits, travelers checks, and other checkable deposits; includes savings deposits beginning May 2020 [1]	M2: M1 plus savings deposits, retail MMMF balances, and small time deposits [2]	Debt: Debt of domestic nonfinancial sectors [3]	Percent change: From year or 6 months earlier [4]: M1	Percent change: From year or 6 months earlier [4]: M2	Percent change: From previous period [5]: Debt
December:						
1982	474.8	1,905.9	4,900.3	8.7	8.6	10.2
1983	521.4	2,123.5	5,497.7	9.8	11.4	12.1
1984	551.6	2,306.4	6,308.4	5.8	8.6	14.8
1985	619.8	2,492.1	7,341.7	12.4	8.1	16.1
1986	724.7	2,728.0	8,216.7	16.9	9.5	12.0
1987	750.2	2,826.4	8,958.2	3.5	3.6	9.0
1988	786.7	2,988.2	9,777.6	4.9	5.7	9.2
1989	792.9	3,152.5	10,527.9	.8	5.5	7.5
1990	824.7	3,271.8	11,245.9	4.0	3.8	6.6
1991	897.0	3,372.2	11,775.5	8.8	3.1	4.7
1992	1,024.9	3,424.7	12,328.5	14.3	1.6	4.7
1993	1,129.6	3,474.5	13,054.8	10.2	1.5	5.8
1994	1,150.7	3,486.4	13,739.4	1.9	.3	5.2
1995	1,127.5	3,629.5	14,428.1	–2.0	4.1	4.9
1996	1,081.3	3,818.6	15,185.3	–4.1	5.2	5.2
1997	1,072.3	4,032.9	16,029.5	–.8	5.6	5.6
1998	1,095.0	4,375.2	17,110.9	2.1	8.5	6.8
1999	1,122.2	4,638.0	18,288.7	2.5	6.0	6.7
2000	1,088.6	4,924.7	19,172.5	–3.0	6.2	4.8
2001	1,183.2	5,432.7	20,261.5	8.7	10.3	5.8
2002	1,220.2	5,770.9	21,618.5	3.1	6.2	6.7
2003	1,306.2	6,065.9	23,343.7	7.0	5.1	7.8
2004	1,376.0	6,417.2	26,256.3	5.3	5.8	9.1
2005	1,374.3	6,680.1	28,537.3	–.1	4.1	8.7
2006	1,366.6	7,069.5	30,998.1	–.6	5.8	8.6
2007	1,373.4	7,469.4	33,508.7	.5	5.7	8.2
2008	1,601.7	8,189.7	35,294.2	16.6	9.6	5.7
2009	1,692.8	8,493.1	36,263.8	5.7	3.7	3.7
2010	1,836.7	8,799.4	37,681.6	8.5	3.6	4.4
2011	2,165.7	9,657.7	38,895.8	17.9	9.8	3.6
2012	2,459.4	10,451.5	40,548.6	13.6	8.2	4.7
2013	2,662.9	11,020.3	42,144.5	8.3	5.4	4.2
2014	2,939.4	11,674.0	43,694.4	10.4	5.9	3.8
2015	3,096.3	12,340.1	45,414.8	5.3	5.7	4.4
2016	3,345.4	13,214.2	47,355.9	8.0	7.1	4.4
2017	3,618.9	13,854.8	49,459.0	8.2	4.8	4.2
2018	3,770.9	14,374.3	52,100.1	4.2	3.7	4.7
2019	4,012.1	15,325.5	54,525.2	6.4	6.6	4.7
2020	17,811.9	19,129.2	61,257.6	....	24.8	12.4
2021 p	20,484.3	21,594.9	....	15.0	12.9	....
2020: Jan	4,020.1	15,406.5	....	9.1	7.4	....
Feb	4,029.3	15,470.2	....	9.6	7.2	....
Mar	4,282.2	16,011.1	56,118.4	20.2	13.1	11.7
Apr	4,775.4	17,038.8	....	43.2	24.9	....
May	16,262.1	17,889.0	....	....	34.6	....
June	16,583.9	18,175.5	59,871.4	....	37.2	26.8
July	16,773.7	18,316.2	....	....	37.8	....
Aug	16,887.0	18,378.1	....	....	37.6	....
Sept	17,156.8	18,601.2	60,489.9	....	32.4	4.2
Oct	17,347.1	18,747.8	....	....	20.1	....
Nov	17,589.4	18,958.6	....	16.3	12.0	....
Dec	17,811.9	19,129.2	61,257.6	14.8	10.5	5.1
2021: Jan	18,093.7	19,388.0	....	15.7	11.7	....
Feb	18,376.6	19,657.5	....	17.6	13.9	....
Mar	18,651.5	19,903.1	62,286.6	17.4	14.0	6.7
Apr	18,935.9	20,156.4	....	18.3	15.0	....
May	19,219.4	20,424.2	....	18.5	15.5	....
June	19,256.2	20,443.0	63,298.6	16.2	13.7	6.5
July	19,416.0	20,592.3	....	14.6	12.4	....
Aug	19,690.3	20,851.4	....	14.3	12.1	....
Sept	19,860.1	21,010.3	63,681.1	13.0	11.1	2.4
Oct	20,027.8	21,163.6	....	11.5	10.0	....
Nov	20,281.4	21,401.6	....	11.1	9.6	....
Dec p	20,484.3	21,594.9	....	12.8	11.3	....

[1] Beginning May 2020, M1 includes savings deposits. Prior to May 2020, savings deposits were not included in M1. See the H.6 statistical release for additional details.

[2] Money market mutual fund (MMMF). Savings deposits include money market deposit accounts.

[3] Consists of outstanding debt securities and loans of the U.S. Government, State and local governments, and private nonfinancial sectors. Quarterly data shown in last month of quarter. End-of-year data are for fourth quarter.

[4] Annual changes are from December to December; monthly changes are from six months earlier at an annual rate.

[5] Debt growth of domestic nonfinancial sectors is the seasonally adjusted borrowing flow divided by the seasonally adjusted level of debt outstanding in the previous period. Annual changes are from fourth quarter to fourth quarter; quarterly changes are from previous quarter at an annual rate.

Note: For further information on the composition of M1 and M2, see the H.6 release.
For further information on the debt of domestic nonfinancial sectors and the derivation of debt growth, see the Z.1 release.

Source: Board of Governors of the Federal Reserve System.

TABLE B–41. Consumer credit outstanding, 1970–2021

[Amount outstanding (end of month); millions of dollars, seasonally adjusted]

Year and month	Total consumer credit [1]	Revolving	Nonrevolving [2]
December:			
1970	131,551.55	4,961.46	126,590.09
1971	146,930.18	8,245.33	138,684.84
1972	166,189.10	9,379.24	156,809.86
1973	190,086.31	11,342.22	178,744.09
1974	198,917.84	13,241.26	185,676.58
1975	204,002.00	14,495.27	189,506.73
1976	225,721.59	16,489.05	209,232.54
1977	260,562.70	37,414.82	223,147.88
1978	306,100.39	45,690.95	260,409.43
1979	348,589.11	53,596.43	294,992.67
1980	351,920.05	54,970.05	296,950.00
1981	371,301.44	60,928.00	310,373.44
1982	389,848.74	66,348.30	323,500.44
1983	437,068.86	79,027.25	358,041.61
1984	517,278.98	100,385.63	416,893.35
1985	599,711.23	124,465.80	475,245.43
1986	654,750.24	141,068.15	513,682.08
1987	686,318.77	160,853.91	525,464.86
1988 [3]	731,917.76	184,593.12	547,324.64
1989	794,612.18	211,229.83	583,382.34
1990	808,230.57	238,642.62	569,587.95
1991	798,028.97	263,768.55	534,260.42
1992	806,118.69	278,449.67	527,669.02
1993	865,650.58	309,908.02	555,742.56
1994	997,301.74	365,569.56	631,732.19
1995	1,140,744.36	443,920.09	696,824.27
1996	1,253,437.09	507,516.57	745,920.52
1997	1,324,757.33	540,005.56	784,751.77
1998	1,420,996.44	581,414.78	839,581.66
1999	1,531,105.96	610,696.47	920,409.49
2000	1,716,969.72	682,646.37	1,034,323.35
2001	1,867,852.87	714,840.73	1,153,012.14
2002	1,972,112.21	750,947.45	1,221,164.76
2003	2,077,360.69	768,258.31	1,309,102.38
2004	2,192,246.17	799,552.18	1,392,693.99
2005 [3]	2,290,928.13	829,518.36	1,461,409.78
2006	2,456,715.70	923,876.78	1,532,838.92
2007	2,609,476.53	1,001,625.30	1,607,851.24
2008	2,643,788.96	1,003,997.04	1,639,791.92
2009	2,555,016.64	916,076.63	1,638,940.01
2010	2,646,811.26	839,102.67	1,807,708.59
2011	2,756,224.86	840,164.23	1,916,060.63
2012	2,912,905.02	839,980.84	2,072,924.18
2013	3,090,467.78	854,138.80	2,236,328.97
2014	3,309,539.85	887,381.64	2,422,158.21
2015	3,400,223.22	898,082.65	2,502,140.57
2016	3,636,435.66	960,095.49	2,676,340.17
2017	3,830,751.60	1,016,806.60	2,813,944.99
2018	4,007,041.92	1,053,847.41	2,953,194.51
2019	4,192,191.42	1,091,988.96	3,100,202.46
2020	4,184,927.41	974,599.30	3,210,328.11
2021 p	4,434,378.33	1,042,723.73	3,391,654.60
2020: Jan	4,201,080.77	1,091,051.61	3,110,029.15
Feb	4,216,773.09	1,097,532.95	3,119,240.14
Mar	4,203,491.82	1,077,269.34	3,126,222.48
Apr	4,139,762.09	1,019,961.28	3,119,800.81
May	4,124,989.35	996,584.12	3,128,405.23
June	4,144,804.50	993,751.32	3,151,053.18
July	4,157,815.77	992,174.75	3,165,641.01
Aug	4,146,758.26	981,211.23	3,165,547.03
Sept	4,163,423.59	983,607.49	3,179,816.10
Oct	4,162,363.45	977,825.94	3,184,537.51
Nov	4,174,232.14	977,308.31	3,196,923.83
Dec	4,184,927.41	974,599.30	3,210,328.11
2021: Jan	4,184,463.92	963,273.61	3,221,190.31
Feb	4,207,489.17	969,224.55	3,238,264.63
Mar	4,222,888.61	966,403.75	3,256,484.86
Apr	4,239,525.39	965,336.40	3,274,188.99
May	4,272,611.19	974,586.70	3,298,024.49
June	4,307,134.19	992,108.59	3,315,025.60
July	4,321,026.99	997,977.40	3,323,049.59
Aug	4,332,797.36	1,001,213.81	3,331,583.55
Sept	4,358,806.45	1,011,025.79	3,347,780.66
Oct	4,372,663.36	1,017,466.74	3,355,196.62
Nov	4,411,994.49	1,038,467.38	3,373,527.11
Dec p	4,434,378.33	1,042,723.73	3,391,654.60

[1] Covers most short- and intermediate-term credit extended to individuals. Credit secured by real estate is excluded.
[2] Includes automobile loans and all other loans not included in revolving credit, such as loans for mobile homes, education, boats, trailers, or vacations. These loans may be secured or unsecured. Beginning with 1977, includes student loans extended by the Federal Government and by SLM Holding Corporation.
[3] Data newly available in January 1989 result in breaks in these series between the prior period and subsequent months.

Source: Board of Governors of the Federal Reserve System.

Table B–42. Bond yields and interest rates, 1950–2021

[Percent per annum]

Year	U.S. Treasury securities: Bills (at auction) [1]: 3-month	U.S. Treasury securities: Bills (at auction) [1]: 6-month	U.S. Treasury securities: Constant maturities [2]: 3-year	U.S. Treasury securities: Constant maturities [2]: 10-year	U.S. Treasury securities: Constant maturities [2]: 30-year	Corporate bonds (Moody's): Aaa [3]	Corporate bonds (Moody's): Baa	High-grade municipal bonds (Standard & Poor's)	Home mortgage yields [4]	Prime rate charged by banks [5]	Discount window (Federal Reserve Bank of New York) [5, 6]: Primary credit	Discount window (Federal Reserve Bank of New York) [5, 6]: Adjustment credit	Federal funds rate [7]
1950	1.218	......	......	......	......	2.62	3.24	1.98	......	2.07	......	1.59	......
1951	1.552	......	......	......	......	2.86	3.41	2.00	......	2.56	......	1.75	......
1952	1.766	......	......	......	......	2.96	3.52	2.19	......	3.00	......	1.75	......
1953	1.931	......	2.47	2.85	......	3.20	3.74	2.72	......	3.17	......	1.99	......
1954	.953	......	1.63	2.40	......	2.90	3.51	2.37	......	3.05	......	1.60	......
1955	1.753	......	2.47	2.82	......	3.06	3.53	2.53	......	3.16	......	1.89	1.79
1956	2.658	......	3.19	3.18	......	3.36	3.88	2.93	......	3.77	......	2.77	2.73
1957	3.267	......	3.98	3.65	......	3.89	4.71	3.60	......	4.20	......	3.12	3.11
1958	1.839	......	2.84	3.32	......	3.79	4.73	3.56	......	3.83	......	2.15	1.57
1959	3.405	3.832	4.46	4.33	......	4.38	5.05	3.95	......	4.48	......	3.36	3.31
1960	2.93	3.25	3.98	4.12	......	4.41	5.19	3.73	......	4.82	......	3.53	3.21
1961	2.38	2.61	3.54	3.88	......	4.35	5.08	3.46	......	4.50	......	3.00	1.95
1962	2.78	2.91	3.47	3.95	......	4.33	5.02	3.18	......	4.50	......	3.00	2.71
1963	3.16	3.25	3.67	4.00	......	4.26	4.86	3.23	......	4.50	......	3.23	3.18
1964	3.56	3.69	4.03	4.19	......	4.40	4.83	3.22	......	4.50	......	3.55	3.50
1965	3.95	4.05	4.22	4.28	......	4.49	4.87	3.27	......	4.54	......	4.04	4.07
1966	4.88	5.08	5.23	4.93	......	5.13	5.67	3.82	......	5.63	......	4.50	5.11
1967	4.32	4.63	5.03	5.07	......	5.51	6.23	3.98	......	5.63	......	4.19	4.22
1968	5.34	5.47	5.68	5.64	......	6.18	6.94	4.51	......	6.31	......	5.17	5.66
1969	6.68	6.85	7.02	6.67	......	7.03	7.81	5.81	......	7.96	......	5.87	8.21
1970	6.43	6.53	7.29	7.35	......	8.04	9.11	6.51	......	7.91	......	5.95	7.17
1971	4.35	4.51	5.66	6.16	......	7.39	8.56	5.70	7.54	5.73	......	4.88	4.67
1972	4.07	4.47	5.72	6.21	......	7.21	8.16	5.27	7.38	5.25	......	4.50	4.44
1973	7.04	7.18	6.96	6.85	......	7.44	8.24	5.18	8.04	8.03	......	6.45	8.74
1974	7.89	7.93	7.84	7.56	......	8.57	9.50	6.09	9.19	10.81	......	7.83	10.51
1975	5.84	6.12	7.50	7.99	......	8.83	10.61	6.89	9.05	7.86	......	6.25	5.82
1976	4.99	5.27	6.77	7.61	......	8.43	9.75	6.49	8.87	6.84	......	5.50	5.05
1977	5.27	5.52	6.68	7.42	7.75	8.02	8.97	5.56	8.85	6.83	......	5.46	5.54
1978	7.22	7.58	8.29	8.41	8.49	8.73	9.49	5.90	9.64	9.06	......	7.46	7.94
1979	10.05	10.02	9.70	9.43	9.28	9.63	10.69	6.39	11.20	12.67	......	10.29	11.20
1980	11.51	11.37	11.51	11.43	11.27	11.94	13.67	8.51	13.74	15.26	......	11.77	13.35
1981	14.03	13.78	14.46	13.92	13.45	14.17	16.04	11.23	16.63	18.87	......	13.42	16.39
1982	10.69	11.08	12.93	13.01	12.76	13.79	16.11	11.57	16.04	14.85	......	11.01	12.24
1983	8.63	8.75	10.45	11.10	11.18	12.04	13.55	9.47	13.24	10.79	......	8.50	9.09
1984	9.53	9.77	11.92	12.46	12.41	12.71	14.19	10.15	13.88	12.04	......	8.80	10.23
1985	7.47	7.64	9.64	10.62	10.79	11.37	12.72	9.18	12.43	9.93	......	7.69	8.10
1986	5.98	6.03	7.06	7.67	7.78	9.02	10.39	7.38	10.19	8.33	......	6.32	6.80
1987	5.82	6.05	7.68	8.39	8.59	9.38	10.58	7.73	10.21	8.21	......	5.66	6.66
1988	6.69	6.92	8.26	8.85	8.96	9.71	10.83	7.76	10.34	9.32	......	6.20	7.57
1989	8.12	8.04	8.55	8.49	8.45	9.26	10.18	7.24	10.32	10.87	......	6.93	9.21
1990	7.51	7.47	8.26	8.55	8.61	9.32	10.36	7.25	10.13	10.01	......	6.98	8.10
1991	5.42	5.49	6.82	7.86	8.14	8.77	9.80	6.89	9.25	8.46	......	5.45	5.69
1992	3.45	3.57	5.30	7.01	7.67	8.14	8.98	6.41	8.39	6.25	......	3.25	3.52
1993	3.02	3.14	4.44	5.87	6.59	7.22	7.93	5.63	7.31	6.00	......	3.00	3.02
1994	4.29	4.66	6.27	7.09	7.37	7.96	8.62	6.19	8.38	7.15	......	3.60	4.21
1995	5.51	5.59	6.25	6.57	6.88	7.59	8.20	5.95	7.93	8.83	......	5.21	5.83
1996	5.02	5.09	5.99	6.44	6.71	7.37	8.05	5.75	7.81	8.27	......	5.02	5.30
1997	5.07	5.18	6.10	6.35	6.61	7.26	7.86	5.55	7.60	8.44	......	5.00	5.46
1998	4.81	4.85	5.14	5.26	5.58	6.53	7.22	5.12	6.94	8.35	......	4.92	5.35
1999	4.66	4.76	5.49	5.65	5.87	7.04	7.87	5.43	7.44	8.00	......	4.62	4.97
2000	5.85	5.92	6.22	6.03	5.94	7.62	8.36	5.77	8.05	9.23	......	5.73	6.24
2001	3.44	3.39	4.09	5.02	5.49	7.08	7.95	5.19	6.97	6.91	......	3.40	3.88
2002	1.62	1.69	3.10	4.61	5.43	6.49	7.80	5.05	6.54	4.67	......	1.17	1.67
2003	1.01	1.06	2.10	4.01	......	5.67	6.77	4.73	5.83	4.12	2.12	......	1.13
2004	1.38	1.57	2.78	4.27	......	5.63	6.39	4.63	5.84	4.34	2.34	......	1.35
2005	3.16	3.40	3.93	4.29	......	5.24	6.06	4.29	5.87	6.19	4.19	......	3.22
2006	4.73	4.80	4.77	4.80	4.91	5.59	6.48	4.42	6.41	7.96	5.96	......	4.97
2007	4.41	4.48	4.35	4.63	4.84	5.56	6.48	4.42	6.34	8.05	5.86	......	5.02
2008	1.48	1.71	2.24	3.66	4.28	5.63	7.45	4.80	6.03	5.09	2.39	......	1.92
2009	.16	.29	1.43	3.26	4.08	5.31	7.30	4.64	5.04	3.25	.50	......	.16
2010	.14	.20	1.11	3.22	4.25	4.94	6.04	4.16	4.69	3.25	.72	......	.18
2011	.06	.10	.75	2.78	3.91	4.64	5.66	4.29	4.45	3.25	.75	......	.10
2012	.09	.13	.38	1.80	2.92	3.67	4.94	3.14	3.66	3.25	.75	......	.14
2013	.06	.09	.54	2.35	3.45	4.24	5.10	3.96	3.98	3.25	.75	......	.11
2014	.03	.06	.90	2.54	3.34	4.16	4.85	3.78	4.17	3.25	.75	......	.09
2015	.06	.17	1.02	2.14	2.84	3.89	5.00	3.48	3.85	3.26	.76	......	.13
2016	.33	.46	1.00	1.84	2.59	3.67	4.72	3.07	3.65	3.51	1.01	......	.39
2017	.94	1.05	1.58	2.33	2.89	3.74	4.44	3.36	3.99	4.10	1.60	......	1.00
2018	1.94	2.10	2.63	2.91	3.11	3.93	4.80	3.53	4.54	4.91	2.41	......	1.83
2019	2.08	2.07	1.94	2.14	2.58	3.39	4.38	3.38	3.94	5.28	2.78	......	2.16
2020	.38	.39	.42	.89	1.56	2.48	3.60	2.41	3.11	3.54	.64	......	.37
2021	.04	.06	.46	1.45	2.06	2.70	3.39	2.00	2.96	3.25	.25	......	.08

[1] High bill rate at auction, issue date within period, bank-discount basis. On or after October 28, 1998, data are stop yields from uniform-price auctions. Before that date, they are weighted average yields from multiple-price auctions.

See next page for continuation of table.

TABLE B–42. Bond yields and interest rates, 1950–2021—*Continued*

[Percent per annum]

Year and month	U.S. Treasury securities: Bills (at auction)[1]: 3-month	U.S. Treasury securities: Bills (at auction)[1]: 6-month	U.S. Treasury securities: Constant maturities[2]: 3-year	U.S. Treasury securities: Constant maturities[2]: 10-year	U.S. Treasury securities: Constant maturities[2]: 30-year	Corporate bonds (Moody's): Aaa[3]	Corporate bonds (Moody's): Baa	High-grade municipal bonds (Standard & Poor's)	Home mortgage yields[4]	Prime rate charged by banks[5]	Discount window (Federal Reserve Bank of New York)[5, 6]: Primary credit	Discount window (Federal Reserve Bank of New York)[5, 6]: Adjustment credit	Federal funds rate[7]
										High-low	High-low	High-low	
2017: Jan	0.52	0.61	1.48	2.43	3.02	3.92	4.66	3.68	4.15	3.75–3.75	1.25–1.25	...	0.65
Feb	.53	.64	1.47	2.42	3.03	3.95	4.64	3.74	4.17	3.75–3.75	1.25–1.25	...	.66
Mar	.72	.84	1.59	2.48	3.08	4.01	4.68	3.78	4.20	4.00–3.75	1.50–1.25	...	.79
Apr	.81	.94	1.44	2.30	2.94	3.87	4.57	3.54	4.05	4.00–4.00	1.50–1.50	...	.90
May	.89	1.02	1.48	2.30	2.96	3.85	4.55	3.47	4.01	4.00–4.00	1.50–1.50	...	.91
June	.99	1.09	1.49	2.19	2.80	3.68	4.37	3.06	3.90	4.25–4.00	1.75–1.50	...	1.04
July	1.08	1.12	1.54	2.32	2.88	3.70	4.39	3.03	3.97	4.25–4.25	1.75–1.75	...	1.15
Aug	1.03	1.12	1.48	2.21	2.80	3.63	4.31	3.23	3.88	4.25–4.25	1.75–1.75	...	1.16
Sept	1.04	1.15	1.51	2.20	2.78	3.63	4.30	3.27	3.81	4.25–4.25	1.75–1.75	...	1.15
Oct	1.08	1.22	1.68	2.36	2.88	3.60	4.32	3.31	3.90	4.25–4.25	1.75–1.75	...	1.15
Nov	1.23	1.35	1.81	2.35	2.80	3.57	4.27	3.03	3.92	4.25–4.25	1.75–1.75	...	1.16
Dec	1.35	1.48	1.96	2.40	2.77	3.51	4.22	3.21	3.95	4.50–4.25	2.00–1.75	...	1.30
2018: Jan	1.43	1.59	2.15	2.58	2.88	3.55	4.26	3.29	4.03	4.50–4.50	2.00–2.00	...	1.41
Feb	1.53	1.72	2.36	2.86	3.13	3.82	4.51	3.54	4.33	4.50–4.50	2.00–2.00	...	1.42
Mar	1.70	1.87	2.42	2.84	3.09	3.87	4.64	3.58	4.44	4.75–4.50	2.25–2.00	...	1.51
Apr	1.76	1.93	2.52	2.87	3.07	3.85	4.67	3.55	4.47	4.75–4.75	2.25–2.25	...	1.69
May	1.87	2.03	2.66	2.98	3.13	4.00	4.83	3.38	4.59	4.75–4.75	2.25–2.25	...	1.70
June	1.91	2.08	2.65	2.91	3.05	3.96	4.83	3.15	4.57	5.00–4.75	2.50–2.25	...	1.82
July	1.96	2.12	2.70	2.89	3.01	3.87	4.79	3.45	4.53	5.00–5.00	2.50–2.50	...	1.91
Aug	2.03	2.18	2.71	2.89	3.04	3.88	4.77	3.58	4.55	5.00–5.00	2.50–2.50	...	1.91
Sept	2.13	2.28	2.84	3.00	3.15	3.98	4.88	3.63	4.63	5.25–5.00	2.75–2.50	...	1.95
Oct	2.24	2.39	2.94	3.15	3.34	4.14	5.07	3.88	4.83	5.25–5.25	2.75–2.75	...	2.19
Nov	2.34	2.46	2.91	3.12	3.36	4.22	5.22	3.64	4.87	5.25–5.25	2.75–2.75	...	2.20
Dec	2.38	2.49	2.67	2.83	3.10	4.02	5.13	3.69	4.64	5.50–5.25	3.00–2.75	...	2.27
2019: Jan	2.41	2.47	2.52	2.71	3.04	3.93	5.12	3.61	4.46	5.50–5.50	3.00–3.00	...	2.40
Feb	2.40	2.45	2.48	2.68	3.02	3.79	4.95	3.57	4.37	5.50–5.50	3.00–3.00	...	2.40
Mar	2.41	2.45	2.37	2.57	2.98	3.77	4.84	3.43	4.27	5.50–5.50	3.00–3.00	...	2.41
Apr	2.38	2.39	2.31	2.53	2.94	3.69	4.70	3.27	4.14	5.50–5.50	3.00–3.00	...	2.42
May	2.35	2.36	2.16	2.40	2.82	3.67	4.63	3.11	4.07	5.50–5.50	3.00–3.00	...	2.39
June	2.20	2.14	1.78	2.07	2.57	3.42	4.46	2.87	3.80	5.50–5.50	3.00–3.00	...	2.38
July	2.13	2.03	1.80	2.06	2.57	3.29	4.28	3.32	3.77	5.50–5.50	3.00–3.00	...	2.40
Aug	1.97	1.91	1.51	1.63	2.12	2.98	3.87	3.61	3.62	5.50–5.25	3.00–2.75	...	2.13
Sept	1.93	1.85	1.59	1.70	2.16	3.03	3.91	3.57	3.61	5.25–5.00	2.75–2.50	...	2.04
Oct	1.68	1.66	1.53	1.71	2.19	3.01	3.93	3.67	3.69	5.00–4.75	2.50–2.25	...	1.83
Nov	1.55	1.55	1.61	1.81	2.28	3.06	3.94	3.26	3.70	4.75–4.75	2.25–2.25	...	1.55
Dec	1.54	1.55	1.63	1.86	2.30	3.01	3.88	3.26	3.72	4.75–4.75	2.25–2.25	...	1.55
2020: Jan	1.53	1.53	1.52	1.76	2.22	2.94	3.77	3.00	3.62	4.75–4.75	2.25–2.25	...	1.55
Feb	1.54	1.50	1.31	1.50	1.97	2.78	3.61	2.66	3.47	4.75–4.75	2.25–2.25	...	1.58
Mar	.46	.45	.50	.87	1.46	3.02	4.29	3.07	3.45	4.75–3.25	2.25–0.25	...	.65
Apr	.15	.17	.28	.66	1.27	2.43	4.13	2.86	3.31	3.25–3.25	0.25–0.25	...	.05
May	.12	.15	.22	.67	1.38	2.49	3.95	2.69	3.23	3.25–3.25	0.25–0.25	...	.05
June	.16	.18	.22	.73	1.49	2.41	3.65	2.69	3.16	3.25–3.25	0.25–0.25	...	.08
July	.13	.15	.17	.62	1.31	2.14	3.31	1.75	3.02	3.25–3.25	0.25–0.25	...	.09
Aug	.10	.12	.16	.65	1.36	2.25	3.27	1.88	2.94	3.25–3.25	0.25–0.25	...	.10
Sept	.11	.12	.16	.68	1.42	2.31	3.36	2.10	2.89	3.25–3.25	0.25–0.25	...	.09
Oct	.10	.11	.19	.79	1.57	2.35	3.44	2.15	2.83	3.25–3.25	0.25–0.25	...	.09
Nov	.09	.10	.22	.87	1.62	2.30	3.30	2.10	2.77	3.25–3.25	0.25–0.25	...	.09
Dec	.09	.09	.19	.93	1.67	2.26	3.16	1.97	2.68	3.25–3.25	0.25–0.25	...	.09
2021: Jan	.09	.09	.20	1.08	1.82	2.45	3.24	1.61	2.74	3.25–3.25	0.25–0.25	...	.09
Feb	.04	.06	.21	1.26	2.04	2.70	3.42	1.13	2.81	3.25–3.25	0.25–0.25	...	.08
Mar	.03	.05	.32	1.61	2.34	3.04	3.74	1.74	3.08	3.25–3.25	0.25–0.25	...	.07
Apr	.02	.04	.35	1.64	2.30	2.90	3.60	1.84	3.06	3.25–3.25	0.25–0.25	...	.07
May	.02	.03	.32	1.62	2.32	2.96	3.62	1.63	2.96	3.25–3.25	0.25–0.25	...	.06
June	.03	.04	.39	1.52	2.16	2.79	3.44	2.16	2.98	3.25–3.25	0.25–0.25	...	.08
July	.05	.05	.40	1.32	1.94	2.57	3.24	2.22	2.87	3.25–3.25	0.25–0.25	...	.10
Aug	.06	.05	.42	1.28	1.92	2.55	3.24	2.38	2.84	3.25–3.25	0.25–0.25	...	.09
Sept	.04	.05	.47	1.37	1.94	2.53	3.23	2.30	2.90	3.25–3.25	0.25–0.25	...	.08
Oct	.05	.06	.67	1.58	2.06	2.68	3.35	2.43	3.07	3.25–3.25	0.25–0.25	...	.08
Nov	.05	.07	.82	1.56	1.94	2.62	3.28	2.30	3.07	3.25–3.25	0.25–0.25	...	.08
Dec	.06	.14	.95	1.47	1.85	2.65	3.30	2.24	3.10	3.25–3.25	0.25–0.25	...	.08

[2] Yields on the more actively traded issues adjusted to constant maturities by the Department of the Treasury. The 30-year Treasury constant maturity series was discontinued on February 18, 2002, and reintroduced on February 9, 2006.
[3] Beginning with December 7, 2001, data for corporate Aaa series are industrial bonds only.
[4] Contract interest rate on commitments for 30-year first-lien prime conventional conforming home purchase mortgage with a loan-to-value of 80 percent.
[5] For monthly data, high and low for the period.
[6] Primary credit replaced adjustment credit as the Federal Reserve's principal discount window lending program effective January 9, 2003.
[7] Beginning March 1, 2016, the daily effective federal funds rate is a volume-weighted median of transaction-level data collected from depository institutions in the Report of Selected Money Market Rates (FR 2420). Between July 21, 1975 and February 29, 2016, the daily effective rate was a volume-weighted mean of rates on brokered trades. Prior to that, the daily effective rate was the rate considered most representative of the day's transactions, usually the one at which most transactions occurred.

Sources: Department of the Treasury, Board of Governors of the Federal Reserve System, Federal Home Loan Mortgage Corporation, Moody's Investors Service, Bloomberg, and Standard & Poor's.

Table B–43. Mortgage debt outstanding by type of property and of financing, 1960–2021

[Billions of dollars]

End of year or quarter	All properties	Farm properties	Nonfarm properties				Nonfarm properties by type of mortgage					
							Government underwritten				Conventional [2]	
								1- to 4-family houses				
			Total	1- to 4-family houses	Multi-family properties	Commercial properties	Total [1]	Total	FHA-insured	VA-guaranteed	Total	1- to 4-family houses
1960	208.4	12.8	195.6	141.4	20.8	33.4	62.3	56.4	26.7	29.7	133.2	84.9
1961	229.0	13.9	215.1	154.0	23.6	37.4	65.6	59.1	29.5	29.6	149.5	94.9
1962	252.4	15.2	237.2	168.3	26.7	42.2	69.4	62.2	32.3	29.9	167.9	106.1
1963	279.3	16.8	262.4	185.1	30.0	47.3	73.4	65.9	35.0	30.9	189.0	119.2
1964	307.0	18.9	288.1	202.3	34.6	51.2	77.2	69.2	38.3	30.9	210.9	133.1
1965	334.5	21.2	313.3	219.4	38.2	55.7	81.2	73.1	42.0	31.1	232.2	146.3
1966	358.5	23.1	335.5	232.7	41.3	61.5	84.1	76.1	44.8	31.3	251.4	156.7
1967	382.1	25.0	357.0	246.0	44.8	66.2	88.2	79.9	47.4	32.5	268.9	166.0
1968	411.4	27.2	384.2	262.9	48.3	73.0	93.4	84.4	50.6	33.8	290.8	178.5
1969	439.9	29.0	410.9	278.7	53.2	79.1	100.2	90.2	54.5	35.7	310.7	188.5
1970	469.4	30.5	438.9	292.2	60.1	86.5	109.2	97.3	59.9	37.3	329.6	195.0
1971	517.9	32.4	485.5	318.4	70.1	97.0	120.7	105.2	65.7	39.5	364.8	213.2
1972	589.8	35.4	554.4	357.4	82.9	114.2	131.1	113.0	68.2	44.7	423.3	244.4
1973	666.5	39.8	626.7	399.8	93.2	133.7	135.0	116.2	66.2	50.0	491.7	283.6
1974	728.4	44.9	683.5	435.2	100.0	148.3	140.2	121.3	65.1	56.2	543.3	313.9
1975	785.6	49.9	735.7	474.0	100.7	161.0	147.0	127.7	66.1	61.6	588.7	346.3
1976	870.5	55.4	815.1	535.0	105.9	174.2	154.0	133.5	66.5	67.0	661.1	401.5
1977	999.2	63.9	935.3	627.7	114.3	193.3	161.7	141.6	68.0	73.6	773.5	486.1
1978	1,150.7	72.8	1,077.9	738.3	125.2	214.5	176.4	153.4	71.4	82.0	901.5	584.9
1979	1,317.0	86.8	1,230.3	855.8	135.0	239.4	199.0	172.9	81.0	92.0	1,031.3	682.8
1980	1,457.8	97.5	1,360.3	957.9	142.5	259.9	225.1	195.2	93.6	101.6	1,135.3	762.7
1981	1,579.5	107.2	1,472.3	1,030.2	142.4	299.7	238.9	207.6	101.3	106.2	1,233.4	822.6
1982	1,661.3	111.3	1,550.0	1,070.2	146.1	333.7	248.9	217.9	108.0	109.9	1,301.1	852.3
1983	1,850.6	113.7	1,736.9	1,186.3	161.2	389.4	279.8	248.8	127.4	121.4	1,457.1	937.4
1984	2,092.0	112.4	1,979.6	1,321.5	186.1	471.9	294.8	265.9	136.7	129.1	1,684.7	1,055.7
1985	2,368.5	94.1	2,274.5	1,526.9	205.9	541.7	328.3	288.8	153.0	135.8	1,946.1	1,238.1
1986	2,655.6	84.1	2,571.5	1,730.1	239.4	602.0	370.5	328.6	185.5	143.1	2,201.0	1,401.5
1987	2,954.3	75.8	2,878.5	1,928.5	258.4	691.6	431.4	387.9	235.5	152.4	2,447.0	1,540.6
1988	3,271.9	70.8	3,201.1	2,162.8	274.5	763.7	459.7	414.2	258.8	155.4	2,741.4	1,748.6
1989	3,523.6	68.8	3,454.8	2,369.6	287.0	798.2	486.8	440.1	282.8	157.3	2,967.9	1,929.5
1990	3,779.5	67.6	3,711.8	2,606.8	287.4	817.6	517.9	470.9	310.9	160.0	3,193.9	2,135.9
1991	3,930.7	67.5	3,863.2	2,774.7	284.1	804.4	537.2	493.3	330.6	162.7	3,326.0	2,281.4
1992	4,040.8	67.9	3,972.9	2,942.1	270.9	759.9	533.3	489.8	326.0	163.8	3,439.6	2,452.3
1993	4,171.5	68.4	4,103.1	3,101.1	267.8	734.2	513.4	469.5	303.2	166.2	3,589.7	2,631.7
1994	4,336.3	69.9	4,266.3	3,278.6	268.5	719.2	559.3	514.2	336.8	177.3	3,707.0	2,764.4
1995	4,522.1	71.7	4,450.3	3,446.4	274.4	729.5	584.3	537.1	352.3	184.7	3,866.1	2,909.4
1996	4,802.8	74.4	4,728.4	3,682.8	286.7	758.9	620.3	571.2	379.2	192.0	4,108.1	3,111.6
1997	5,115.9	78.5	5,037.4	3,917.6	298.8	821.1	656.7	605.7	405.7	200.0	4,380.8	3,311.8
1998	5,603.2	83.1	5,520.1	4,275.8	334.5	909.8	674.0	623.8	417.9	205.9	4,846.1	3,652.0
1999	6,209.6	87.2	6,122.4	4,701.2	375.2	1,046.0	731.5	678.8	462.3	216.5	5,390.9	4,022.4
2000	6,766.6	84.7	6,681.9	5,125.0	404.5	1,152.5	773.1	719.9	499.9	220.1	5,908.8	4,405.0
2001	7,450.1	88.5	7,361.6	5,678.0	446.1	1,237.4	772.7	718.5	497.4	221.2	6,588.9	4,959.5
2002	8,358.7	95.4	8,263.3	6,434.4	486.3	1,342.6	759.3	704.0	486.2	217.7	7,504.0	5,730.4
2003	9,364.8	83.2	9,281.6	7,260.3	559.7	1,461.6	709.2	653.3	438.7	214.6	8,572.4	6,607.1
2004	10,646.7	95.7	10,551.0	8,292.1	609.3	1,649.6	660.2	604.1	398.1	206.0	9,890.8	7,688.0
2005	12,112.9	104.8	12,008.1	9,448.5	674.3	1,885.3	606.6	550.4	348.4	202.0	11,401.5	8,898.1
2006	13,525.5	108.0	13,417.5	10,530.8	717.5	2,169.2	600.2	543.5	336.9	206.6	12,817.3	9,987.3
2007	14,609.6	112.7	14,497.0	11,252.3	810.5	2,434.1	609.2	552.6	342.6	210.0	13,887.8	10,699.7
2008	14,690.0	134.7	14,555.3	11,150.9	852.9	2,551.5	807.2	750.7	534.0	216.7	13,748.1	10,400.2
2009	14,445.4	146.0	14,299.4	10,961.0	862.9	2,475.5	1,005.0	944.3	752.6	191.7	13,294.4	10,016.7
2010	13,893.0	154.1	13,738.9	10,523.4	863.0	2,352.5	1,227.6	1,156.1	934.4	221.7	12,511.2	9,367.4
2011	13,567.7	167.2	13,400.5	10,281.3	863.3	2,255.9	1,368.6	1,291.3	1,036.0	255.3	12,031.9	8,990.0
2012	13,331.3	173.4	13,157.9	10,047.7	891.2	2,219.0	1,544.8	1,459.7	1,165.4	294.2	11,613.1	8,588.1
2013	13,344.5	185.2	13,159.3	9,959.6	940.9	2,258.8	3,927.2	3,832.6	3,480.8	351.8	9,232.1	6,127.1
2014	13,486.8	196.8	13,290.0	9,936.6	1,009.1	2,344.3	4,130.9	4,028.1	3,615.3	412.8	9,159.1	5,908.5
2015	13,883.3	208.8	13,674.5	10,076.4	1,118.8	2,479.3	4,432.7	4,326.7	3,851.3	475.4	9,241.8	5,749.6
2016	14,333.6	226.0	14,107.6	10,278.8	1,236.3	2,592.4	4,764.8	4,654.9	4,106.9	548.1	9,342.8	5,623.9
2017	14,911.6	236.2	14,675.4	10,595.9	1,363.2	2,716.3	5,079.1	4,958.2	4,344.3	613.9	9,596.4	5,637.8
2018	15,463.4	245.7	15,217.7	10,897.2	1,488.4	2,832.0	5,380.0	5,246.5	4,562.3	684.2	9,837.7	5,650.7
2019	16,042.3	267.9	15,774.4	11,187.0	1,622.6	2,964.8	5,664.1	5,522.9	4,788.6	734.3	10,110.3	5,664.1
2020	16,780.7	291.7	16,489.0	11,652.7	1,755.1	3,081.2	6,053.8	5,908.0	5,108.2	799.7	10,435.2	5,744.7
2020: I	16,175.9	273.8	15,902.0	11,252.1	1,644.3	3,005.7	5,758.4	5,616.5	4,866.4	750.1	10,143.7	5,635.6
II	16,324.8	279.7	16,045.1	11,337.2	1,678.0	3,029.8	5,852.3	5,709.4	4,939.6	769.8	10,192.8	5,627.8
III	16,552.2	285.7	16,266.4	11,504.4	1,709.2	3,052.9	5,983.8	5,839.6	5,023.5	816.0	10,282.6	5,664.9
IV	16,780.7	291.7	16,489.0	11,652.7	1,755.1	3,081.2	6,053.8	5,908.0	5,108.2	799.7	10,435.2	5,744.7
2021: I	16,962.3	292.8	16,669.5	11,785.2	1,784.6	3,099.7	6,160.7	6,012.4	5,193.8	818.6	10,508.8	5,772.9
II	17,270.9	293.9	16,977.0	12,025.2	1,810.6	3,141.3	6,274.4	6,123.7	5,280.7	843.0	10,702.7	5,901.5
III p	17,598.8	295.0	17,303.8	12,271.1	1,838.2	3,194.5	6,388.6	6,235.4	5,366.4	869.1	10,915.2	6,035.6

[1] Includes Federal Housing Administration (FHA)–insured multi-family properties, not shown separately.
[2] Derived figures. Total includes multi-family and commercial properties with conventional mortgages, not shown separately.

Source: Board of Governors of the Federal Reserve System, based on data from various Government and private organizations.

Table B–44. Mortgage debt outstanding by holder, 1960–2021

[Billions of dollars]

End of year or quarter	Total	Major financial institutions			Other holders		
		Total	Depository Institutions [1, 2]	Life insurance companies	Federal and related agencies [3]	Mortgage pools or trusts [4]	Individuals and others
1960	208.4	156.4	114.6	41.8	11.3	0.2	40.5
1961	229.0	171.1	126.9	44.2	11.9	.3	45.7
1962	252.4	190.5	143.6	46.9	12.2	.4	49.3
1963	279.3	214.6	164.1	50.5	11.3	.5	52.9
1964	307.0	238.8	183.6	55.2	11.6	.6	56.0
1965	334.5	262.4	202.4	60.0	12.7	.9	58.6
1966	358.5	279.5	214.8	64.6	16.2	1.3	61.5
1967	382.1	296.4	228.9	67.5	18.9	2.0	64.7
1968	411.4	317.3	247.3	70.0	22.6	2.5	69.0
1969	439.9	336.6	264.6	72.0	27.9	3.2	72.2
1970	469.4	352.9	278.5	74.4	33.6	4.8	78.2
1971	517.9	389.2	313.7	75.5	36.8	9.5	82.3
1972	589.8	443.8	366.8	76.9	40.1	14.4	91.5
1973	666.5	500.7	419.4	81.4	46.6	18.0	101.1
1974	728.4	539.3	453.1	86.2	60.7	21.5	106.9
1975	785.6	576.1	486.9	89.2	72.6	28.5	108.4
1976	870.5	640.7	549.1	91.6	76.0	40.7	113.2
1977	999.2	735.3	638.4	96.8	83.7	56.8	123.4
1978	1,150.7	837.5	731.3	106.2	100.2	70.4	142.7
1979	1,317.0	928.6	810.2	118.4	121.2	94.8	172.4
1980	1,457.8	988.0	857.0	131.1	142.9	114.0	213.0
1981	1,579.5	1,034.1	896.4	137.7	160.4	129.0	256.0
1982	1,661.3	1,019.6	877.6	142.0	176.9	178.5	286.3
1983	1,850.6	1,108.4	957.4	151.0	188.5	244.8	309.0
1984	2,092.0	1,248.2	1,091.5	156.7	201.6	300.0	342.2
1985	2,368.5	1,368.7	1,196.9	171.8	213.0	392.4	394.4
1986	2,655.6	1,483.3	1,289.5	193.8	202.1	549.5	420.6
1987	2,954.3	1,631.5	1,419.1	212.4	188.5	700.8	433.4
1988	3,271.9	1,797.8	1,564.9	232.9	192.5	785.7	495.9
1989	3,523.6	1,897.4	1,643.2	254.2	197.8	922.2	506.1
1990	3,779.5	1,918.8	1,651.0	267.9	239.0	1,085.9	535.7
1991	3,930.7	1,846.2	1,586.7	259.5	266.0	1,269.6	549.0
1992	4,040.8	1,770.5	1,528.5	242.0	286.1	1,440.0	544.3
1993	4,171.5	1,770.1	1,546.3	223.9	326.1	1,561.1	514.2
1994	4,336.3	1,824.7	1,608.9	215.8	315.6	1,696.9	499.1
1995	4,522.1	1,900.1	1,687.0	213.1	307.9	1,812.0	502.0
1996	4,802.8	1,982.2	1,773.7	208.5	294.4	1,989.1	537.1
1997	5,115.9	2,084.2	1,877.1	207.0	285.2	2,166.5	580.1
1998	5,603.2	2,194.7	1,981.0	213.8	291.9	2,487.1	629.5
1999	6,209.6	2,394.5	2,163.5	231.0	319.8	2,832.3	663.1
2000	6,766.6	2,619.2	2,383.0	236.2	339.9	3,097.5	710.1
2001	7,450.1	2,791.0	2,547.9	243.1	372.0	3,532.4	754.7
2002	8,358.7	3,089.4	2,839.3	250.1	432.3	3,978.4	858.6
2003	9,364.8	3,387.5	3,126.4	261.2	694.1	4,330.3	952.9
2004	10,646.7	3,926.5	3,653.0	273.5	703.2	4,834.5	1,182.5
2005	12,112.9	4,396.5	4,110.8	285.7	665.4	5,710.0	1,341.1
2006	13,525.5	4,784.0	4,479.8	304.1	687.5	6,629.5	1,424.7
2007	14,609.6	5,065.5	4,738.4	327.1	725.5	7,434.4	1,384.3
2008	14,690.0	5,045.8	4,702.0	343.8	801.1	7,592.7	1,250.4
2009	14,445.4	4,779.4	4,452.0	327.4	816.1	7,649.8	1,200.1
2010	13,893.0	4,585.2	4,266.1	319.2	5,127.5	3,108.4	1,071.8
2011	13,567.7	4,450.3	4,115.7	334.6	5,033.9	3,034.3	1,049.2
2012	13,331.3	4,438.2	4,091.3	346.9	4,935.0	2,947.6	1,010.5
2013	13,344.5	4,412.3	4,046.1	366.3	4,993.2	2,773.5	1,165.5
2014	13,486.8	4,546.7	4,158.5	388.2	4,987.7	2,742.7	1,209.8
2015	13,883.3	4,804.2	4,373.6	430.7	5,036.6	2,793.6	1,248.9
2016	14,333.6	5,096.7	4,631.2	465.5	5,146.9	2,826.6	1,263.4
2017	14,911.6	5,308.0	4,801.3	506.7	5,313.6	2,971.5	1,318.5
2018	15,463.4	5,487.5	4,919.4	568.1	5,457.0	3,143.1	1,375.8
2019	16,042.3	5,709.5	5,090.3	619.2	5,634.5	3,261.5	1,436.8
2020	16,780.7	5,776.0	5,131.3	644.7	6,269.6	3,265.7	1,469.3
2020: I	16,175.9	5,752.2	5,125.6	626.6	5,692.4	3,306.5	1,424.7
II	16,324.8	5,776.1	5,145.2	630.9	5,832.5	3,279.1	1,437.0
III	16,552.2	5,794.1	5,161.5	632.6	6,017.0	3,280.0	1,461.1
IV	16,780.7	5,776.0	5,131.3	644.7	6,269.6	3,265.7	1,469.3
2021: I	16,962.3	5,738.2	5,092.2	646.0	6,480.7	3,263.2	1,480.2
II	17,270.9	5,778.1	5,122.6	655.5	6,689.8	3,291.7	1,511.3
III [p]	17,598.8	5,868.6	5,199.0	669.6	6,868.2	3,316.5	1,545.5

[1] Includes savings banks and savings and loan associations. Data reported by Federal Savings and Loan Insurance Corporation–insured institutions include loans in process for 1987 and exclude loans in process beginning with 1988.

[2] Includes loans held by nondeposit trust companies but not loans held by bank trust departments.

[3] Includes Government National Mortgage Association (GNMA or Ginnie Mae), Federal Housing Administration, Veterans Administration, Farmers Home Administration (FmHA), Federal Deposit Insurance Corporation, Resolution Trust Corporation (through 1995), and in earlier years Reconstruction Finance Corporation, Homeowners Loan Corporation, Federal Farm Mortgage Corporation, and Public Housing Administration. Also includes U.S.-sponsored agencies such as Federal National Mortgage Association (FNMA or Fannie Mae), Federal Land Banks, Federal Home Loan Mortgage Corporation (FHLMC or Freddie Mac), Federal Agricultural Mortgage Corporation (Farmer Mac, beginning 1994), Federal Home Loan Banks (beginning 1997), and mortgage pass-through securities issued or guaranteed by GNMA, FHLMC, FNMA, FmHA, or Farmer Mac. Other U.S. agencies (amounts small or current separate data not readily available) included with "individuals and others."

[4] Includes private mortgage pools.

Source: Board of Governors of the Federal Reserve System, based on data from various Government and private organizations.

TABLE B–45. Federal receipts, outlays, surplus or deficit, and debt, fiscal years 1958–2023

[Billions of dollars; fiscal years]

Fiscal year or period	Total			On-budget			Off-budget			Federal debt (end of period)		Addendum: Gross domestic product
	Receipts	Outlays	Surplus or deficit (–)	Receipts	Outlays	Surplus or deficit (–)	Receipts	Outlays	Surplus or deficit (–)	Gross Federal	Held by the public	
1958	79.6	82.4	–2.8	71.6	74.9	–3.3	8.0	7.5	0.5	279.7	226.3	473.5
1959	79.2	92.1	–12.8	71.0	83.1	–12.1	8.3	9.0	–.7	287.5	234.7	504.6
1960	92.5	92.2	.3	81.9	81.3	.5	10.6	10.9	–.2	290.5	236.8	534.3
1961	94.4	97.7	–3.3	82.3	86.0	–3.8	12.1	11.7	.4	292.6	238.4	546.6
1962	99.7	106.8	–7.1	87.4	93.3	–5.9	12.3	13.5	–1.3	302.9	248.0	585.7
1963	106.6	111.3	–4.8	92.4	96.4	–4.0	14.2	15.0	–.8	310.3	254.0	618.2
1964	112.6	118.5	–5.9	96.2	102.8	–6.5	16.4	15.7	.6	316.1	256.8	661.7
1965	116.8	118.2	–1.4	100.1	101.7	–1.6	16.7	16.5	.2	322.3	260.8	709.3
1966	130.8	134.5	–3.7	111.7	114.8	–3.1	19.1	19.7	–.6	328.5	263.7	780.5
1967	148.8	157.5	–8.6	124.4	137.0	–12.6	24.4	20.4	4.0	340.4	266.6	836.5
1968	153.0	178.1	–25.2	128.1	155.8	–27.7	24.9	22.3	2.6	368.7	289.5	897.6
1969	186.9	183.6	3.2	157.9	158.4	–.5	29.0	25.2	3.7	365.8	278.1	980.3
1970	192.8	195.6	–2.8	159.3	168.0	–8.7	33.5	27.6	5.9	380.9	283.2	1,046.7
1971	187.1	210.2	–23.0	151.3	177.3	–26.1	35.8	32.8	3.0	408.2	303.0	1,116.6
1972	207.3	230.7	–23.4	167.4	193.5	–26.1	39.9	37.2	2.7	435.9	322.4	1,216.3
1973	230.8	245.7	–14.9	184.7	200.0	–15.2	46.1	45.7	.3	466.3	340.9	1,352.7
1974	263.2	269.4	–6.1	209.3	216.5	–7.2	53.9	52.9	1.1	483.9	343.7	1,482.9
1975	279.1	332.3	–53.2	216.6	270.8	–54.1	62.5	61.6	.9	541.9	394.7	1,606.9
1976	298.1	371.8	–73.7	231.7	301.1	–69.4	66.4	70.7	–4.3	629.0	477.4	1,786.1
Transition quarter	81.2	96.0	–14.7	63.2	77.3	–14.1	18.0	18.7	–.7	643.6	495.5	471.7
1977	355.6	409.2	–53.7	278.7	328.7	–49.9	76.8	80.5	–3.7	706.4	549.1	2,024.3
1978	399.6	458.7	–59.2	314.2	369.6	–55.4	85.4	89.2	–3.8	776.6	607.1	2,273.5
1979	463.3	504.0	–40.7	365.3	404.9	–39.6	98.0	99.1	–1.1	829.5	640.3	2,565.6
1980	517.1	590.9	–73.8	403.9	477.0	–73.1	113.2	113.9	–.7	909.0	711.9	2,791.9
1981	599.3	678.2	–79.0	469.1	543.0	–73.9	130.2	135.3	–5.1	994.8	789.4	3,133.2
1982	617.8	745.7	–128.0	474.3	594.9	–120.6	143.5	150.9	–7.4	1,137.3	924.6	3,313.4
1983	600.6	808.4	–207.8	453.2	660.9	–207.7	147.3	147.4	–.1	1,371.7	1,137.3	3,536.0
1984	666.4	851.8	–185.4	500.4	685.6	–185.3	166.1	166.2	–.1	1,564.6	1,307.0	3,949.2
1985	734.0	946.3	–212.3	547.9	769.4	–221.5	186.2	176.9	9.2	1,817.4	1,507.3	4,265.1
1986	769.2	990.4	–221.2	568.9	806.8	–237.9	200.2	183.5	16.7	2,120.5	1,740.6	4,526.3
1987	854.3	1,004.0	–149.7	640.9	809.2	–168.4	213.4	194.8	18.6	2,346.0	1,889.8	4,767.7
1988	909.2	1,064.4	–155.2	667.7	860.0	–192.3	241.5	204.4	37.1	2,601.1	2,051.6	5,138.6
1989	991.1	1,143.7	–152.6	727.4	932.8	–205.4	263.7	210.9	52.8	2,867.8	2,190.7	5,554.7
1990	1,032.0	1,253.0	–221.0	750.3	1,027.9	–277.6	281.7	225.1	56.6	3,206.3	2,411.6	5,898.8
1991	1,055.0	1,324.2	–269.2	761.1	1,082.5	–321.4	293.9	241.7	52.2	3,598.2	2,689.0	6,093.2
1992	1,091.2	1,381.5	–290.3	788.8	1,129.2	–340.4	302.4	252.3	50.1	4,001.8	2,999.7	6,416.3
1993	1,154.3	1,409.4	–255.1	842.4	1,142.8	–300.4	311.9	266.6	45.3	4,351.0	3,248.4	6,775.3
1994	1,258.6	1,461.8	–203.2	923.5	1,182.4	–258.8	335.0	279.4	55.7	4,643.3	3,433.1	7,176.9
1995	1,351.8	1,515.7	–164.0	1,000.7	1,227.1	–226.4	351.1	288.7	62.4	4,920.6	3,604.4	7,560.4
1996	1,453.1	1,560.5	–107.4	1,085.6	1,259.6	–174.0	367.5	300.9	66.6	5,181.5	3,734.1	7,951.3
1997	1,579.2	1,601.1	–21.9	1,187.2	1,290.5	–103.2	392.0	310.6	81.4	5,369.2	3,772.3	8,451.0
1998	1,721.7	1,652.5	69.3	1,305.9	1,335.9	–29.9	415.8	316.6	99.2	5,478.2	3,721.1	8,930.8
1999	1,827.5	1,701.8	125.6	1,383.0	1,381.1	1.9	444.5	320.8	123.7	5,605.5	3,632.4	9,479.6
2000	2,025.2	1,789.0	236.2	1,544.6	1,458.2	86.4	480.6	330.8	149.8	5,628.7	3,409.8	10,117.1
2001	1,991.1	1,862.8	128.2	1,483.6	1,516.0	–32.4	507.5	346.8	160.7	5,769.9	3,319.6	10,525.7
2002	1,853.1	2,010.9	–157.8	1,337.8	1,655.2	–317.4	515.3	355.7	159.7	6,198.4	3,540.4	10,828.9
2003	1,782.3	2,159.9	–377.6	1,258.5	1,796.9	–538.4	523.8	363.0	160.8	6,760.0	3,913.4	11,278.8
2004	1,880.1	2,292.8	–412.7	1,345.4	1,913.3	–568.0	534.7	379.5	155.2	7,354.7	4,295.5	12,028.4
2005	2,153.6	2,472.0	–318.3	1,576.1	2,069.7	–493.6	577.5	402.2	175.3	7,905.3	4,592.2	12,840.0
2006	2,406.9	2,655.1	–248.2	1,798.5	2,233.0	–434.5	608.4	422.1	186.3	8,451.4	4,829.0	13,636.8
2007	2,568.0	2,728.7	–160.7	1,932.9	2,275.0	–342.2	635.1	453.6	181.5	8,950.7	5,035.1	14,305.4
2008	2,524.0	2,982.5	–458.6	1,865.9	2,507.8	–641.8	658.0	474.8	183.3	9,986.1	5,803.1	14,796.6
2009	2,105.0	3,517.7	–1,412.7	1,451.0	3,000.7	–1,549.7	654.0	517.0	137.0	11,875.9	7,544.7	14,467.3
2010	2,162.7	3,457.1	–1,294.4	1,531.0	2,902.4	–1,371.4	631.7	554.7	77.0	13,528.8	9,018.9	14,884.4
2011	2,303.5	3,603.1	–1,299.6	1,737.7	3,104.5	–1,366.8	565.8	498.6	67.2	14,764.2	10,128.2	15,466.5
2012	2,450.0	3,526.6	–1,076.6	1,880.5	3,019.0	–1,138.5	569.5	507.6	61.9	16,050.9	11,281.1	16,109.4
2013	2,775.1	3,454.9	–679.8	2,101.8	2,821.1	–719.2	673.3	633.8	39.5	16,719.4	11,982.7	16,665.1
2014	3,021.5	3,506.3	–484.8	2,285.9	2,800.2	–514.3	735.6	706.1	29.5	17,794.5	12,779.9	17,370.8
2015	3,249.9	3,691.9	–442.0	2,479.5	2,948.8	–469.3	770.4	743.1	27.3	18,120.1	13,116.7	18,086.1
2016	3,268.0	3,852.6	–584.7	2,457.8	3,077.9	–620.2	810.2	774.7	35.5	19,539.5	14,167.6	18,536.1
2017	3,316.2	3,981.6	–665.4	2,465.6	3,180.4	–714.9	850.6	801.2	49.4	20,205.7	14,665.4	19,250.9
2018	3,329.9	4,109.0	–779.1	2,475.2	3,260.5	–785.3	854.7	848.6	6.2	21,462.3	15,749.6	20,294.6
2019	3,463.4	4,447.0	–983.6	2,549.1	3,540.3	–991.3	914.3	906.6	7.7	22,669.5	16,800.7	21,152.3
2020	3,421.2	6,553.6	–3,132.4	2,455.7	5,598.0	–3,142.3	965.4	955.6	9.8	26,902.5	21,016.7	20,948.0
2021	4,047.1	6,822.4	–2,775.3	3,094.8	5,818.6	–2,723.8	952.3	1,003.8	–51.5	28,385.6	22,284.0	22,357.6
2022 (estimates)	4,436.6	5,851.6	–1,415.0	3,389.4	4,763.7	–1,374.3	1,047.2	1,087.9	–40.7	31,291.9	24,836.2	24,256.1
2023 (estimates)	4,638.2	5,792.0	–1,153.9	3,537.6	4,605.3	–1,067.8	1,100.6	1,186.7	–86.1	32,593.2	26,033.3	25,566.5

Note: Fiscal years through 1976 were on a July 1–June 30 basis; beginning with October 1976 (fiscal year 1977), the fiscal year is on an October 1–September 30 basis. The transition quarter is the three-month period from July 1, 1976 through September 30, 1976.

See *Budget of the United States Government, Fiscal Year 2023,* for additional information.

Sources: Department of Commerce (Bureau of Economic Analysis), Department of the Treasury, and Office of Management and Budget.

Table B–46. Federal receipts, outlays, surplus or deficit, and debt, as percent of gross domestic product, fiscal years 1953–2023

[Percent; fiscal years]

Fiscal year or period	Receipts	Outlays		Surplus or deficit (–)	Federal debt (end of period)	
		Total	National defense		Gross Federal	Held by public
1953	18.2	19.9	13.8	–1.7	69.6	57.2
1954	18.0	18.3	12.7	–.3	70.0	58.0
1955	16.1	16.8	10.5	–.7	67.5	55.8
1956	17.0	16.1	9.7	.9	62.2	50.7
1957	17.3	16.5	9.8	.7	58.8	47.3
1958	16.8	17.4	9.9	–.6	59.1	47.8
1959	15.7	18.3	9.7	–2.5	57.0	46.5
1960	17.3	17.3	9.0	.1	54.4	44.3
1961	17.3	17.9	9.1	–.6	53.5	43.6
1962	17.0	18.2	8.9	–1.2	51.7	42.3
1963	17.2	18.0	8.6	–.8	50.2	41.1
1964	17.0	17.9	8.3	–.9	47.8	38.8
1965	16.5	16.7	7.1	–.2	45.4	36.8
1966	16.8	17.2	7.4	–.5	42.1	33.8
1967	17.8	18.8	8.5	–1.0	40.7	31.9
1968	17.0	19.8	9.1	–2.8	41.1	32.3
1969	19.1	18.7	8.4	.3	37.3	28.4
1970	18.4	18.7	7.8	–.3	36.4	27.1
1971	16.8	18.8	7.1	–2.1	36.6	27.1
1972	17.0	19.0	6.5	–1.9	35.8	26.5
1973	17.1	18.2	5.7	–1.1	34.5	25.2
1974	17.8	18.2	5.4	–.4	32.6	23.2
1975	17.4	20.7	5.4	–3.3	33.7	24.6
1976	16.7	20.8	5.0	–4.1	35.2	26.7
Transition quarter	17.2	20.3	4.7	–3.1	34.1	26.3
1977	17.6	20.2	4.8	–2.7	34.9	27.1
1978	17.6	20.2	4.6	–2.6	34.2	26.7
1979	18.1	19.6	4.5	–1.6	32.3	25.0
1980	18.5	21.2	4.8	–2.6	32.6	25.5
1981	19.1	21.6	5.0	–2.5	31.8	25.2
1982	18.6	22.5	5.6	–3.9	34.3	27.9
1983	17.0	22.9	5.9	–5.9	38.8	32.2
1984	16.9	21.6	5.8	–4.7	39.6	33.1
1985	17.2	22.2	5.9	–5.0	42.6	35.3
1986	17.0	21.9	6.0	–4.9	46.8	38.5
1987	17.9	21.1	5.9	–3.1	49.2	39.6
1988	17.7	20.7	5.7	–3.0	50.6	39.9
1989	17.8	20.6	5.5	–2.7	51.6	39.4
1990	17.5	21.2	5.1	–3.7	54.4	40.9
1991	17.3	21.7	4.5	–4.4	59.1	44.1
1992	17.0	21.5	4.6	–4.5	62.4	46.8
1993	17.0	20.8	4.3	–3.8	64.2	47.9
1994	17.5	20.4	3.9	–2.8	64.7	47.8
1995	17.9	20.0	3.6	–2.2	65.1	47.7
1996	18.3	19.6	3.3	–1.4	65.2	47.0
1997	18.7	18.9	3.2	–.3	63.5	44.6
1998	19.3	18.5	3.0	.8	61.3	41.7
1999	19.3	18.0	2.9	1.3	59.1	38.3
2000	20.0	17.7	2.9	2.3	55.6	33.7
2001	18.9	17.7	2.9	1.2	54.8	31.5
2002	17.1	18.6	3.2	–1.5	57.2	32.7
2003	15.8	19.2	3.6	–3.3	59.9	34.7
2004	15.6	19.1	3.8	–3.4	61.1	35.7
2005	16.8	19.3	3.9	–2.5	61.6	35.8
2006	17.6	19.5	3.8	–1.8	62.0	35.4
2007	18.0	19.1	3.9	–1.1	62.6	35.2
2008	17.1	20.2	4.2	–3.1	67.5	39.2
2009	14.5	24.3	4.6	–9.8	82.1	52.2
2010	14.5	23.2	4.7	–8.7	90.9	60.6
2011	14.9	23.3	4.6	–8.4	95.5	65.5
2012	15.2	21.9	4.2	–6.7	99.6	70.0
2013	16.7	20.7	3.8	–4.1	100.3	71.9
2014	17.4	20.2	3.5	–2.8	102.4	73.6
2015	18.0	20.4	3.3	–2.4	100.2	72.5
2016	17.6	20.8	3.2	–3.2	105.4	76.4
2017	17.2	20.7	3.1	–3.5	105.0	76.2
2018	16.4	20.2	3.1	–3.8	105.8	77.6
2019	16.4	21.0	3.2	–4.7	107.2	79.4
2020	16.3	31.3	3.5	–15.0	128.4	100.3
2021	18.1	30.5	3.4	–12.4	127.0	99.7
2022 (estimates)	18.3	24.1	3.2	–5.8	129.0	102.4
2023 (estimates)	18.1	22.7	3.2	–4.5	127.5	101.8

Note: See Note, Table B–45.

Sources: Department of the Treasury and Office of Management and Budget.

Table B–47. Federal receipts and outlays, by major category, and surplus or deficit, fiscal years 1958–2023

[Billions of dollars; fiscal years]

Fiscal year or period	Receipts (on-budget and off-budget)					Outlays (on-budget and off-budget)										Surplus or deficit (–) (on-budget and off-budget)
	Total	Individual income taxes	Corporation income taxes	Social insurance and retirement receipts	Other	Total	National defense: Total	National defense: Department of Defense, military	International affairs	Health	Medicare	Income security	Social security	Net interest	Other	
1958	79.6	34.7	20.1	11.2	13.6	82.4	46.8	....	3.4	0.5	....	7.5	8.2	5.6	10.3	–2.8
1959	79.2	36.7	17.3	11.7	13.5	92.1	49.0	....	3.1	.7	....	8.2	9.7	5.8	15.5	–12.8
1960	92.5	40.7	21.5	14.7	15.6	92.2	48.1	....	3.0	.8	....	7.4	11.6	6.9	14.4	.3
1961	94.4	41.3	21.0	16.4	15.7	97.7	49.6	....	3.2	.9	....	9.7	12.5	6.7	15.2	–3.3
1962	99.7	45.6	20.5	17.0	16.5	106.8	52.3	50.1	5.6	1.2	....	9.2	14.4	6.9	17.2	–7.1
1963	106.6	47.6	21.6	19.8	17.6	111.3	53.4	51.1	5.3	1.5	....	9.3	15.8	7.7	18.3	–4.8
1964	112.6	48.7	23.5	22.0	18.5	118.5	54.8	52.6	4.9	1.8	....	9.7	16.6	8.2	22.6	–5.9
1965	116.8	48.8	25.5	22.2	20.3	118.2	50.6	48.8	5.3	1.8	....	9.5	17.5	8.6	25.0	–1.4
1966	130.8	55.4	30.1	25.5	19.8	134.5	58.1	56.6	5.6	2.5	0.1	9.7	20.7	9.4	28.5	–3.7
1967	148.8	61.5	34.0	32.6	20.7	157.5	71.4	70.1	5.6	3.4	2.7	10.3	21.7	10.3	32.1	–8.6
1968	153.0	68.7	28.7	33.9	21.7	178.1	81.9	80.4	5.3	4.4	4.6	11.8	23.9	11.1	35.1	–25.2
1969	186.9	87.2	36.7	39.0	23.9	183.6	82.5	80.8	4.6	5.2	5.7	13.1	27.3	12.7	32.6	3.2
1970	192.8	90.4	32.8	44.4	25.2	195.6	81.7	80.1	4.3	5.9	6.2	15.6	30.3	14.4	37.2	–2.8
1971	187.1	86.2	26.8	47.3	26.8	210.2	78.9	77.5	4.2	6.8	6.6	22.9	35.9	14.8	40.0	–23.0
1972	207.3	94.7	32.2	52.6	27.8	230.7	79.2	77.6	4.8	8.7	7.5	27.6	40.2	15.5	47.3	–23.4
1973	230.8	103.2	36.2	63.1	28.3	245.7	76.7	75.0	4.1	9.4	8.1	28.3	49.1	17.3	52.8	–14.9
1974	263.2	119.0	38.6	75.1	30.6	269.4	79.3	77.9	5.7	10.7	9.6	33.7	55.9	21.4	52.9	–6.1
1975	279.1	122.4	40.6	84.5	31.5	332.3	86.5	84.9	7.1	12.9	12.9	50.2	64.7	23.2	74.9	–53.2
1976	298.1	131.6	41.4	90.8	34.3	371.8	89.6	87.9	6.4	15.7	15.8	60.8	73.9	26.7	82.8	–73.7
Transition quarter	81.2	38.8	8.5	25.2	8.8	96.0	22.3	21.8	2.5	3.9	4.3	15.0	19.8	6.9	21.4	–14.7
1977	355.6	157.6	54.9	106.5	36.6	409.2	97.2	95.1	6.4	17.3	19.3	61.0	85.1	29.9	93.0	–53.7
1978	399.6	181.0	60.0	121.0	37.7	458.7	104.5	102.3	7.5	18.5	22.8	61.5	93.9	35.5	114.7	–59.2
1979	463.3	217.8	65.7	138.9	40.8	504.0	116.3	113.6	7.5	20.5	26.5	66.4	104.1	42.6	120.2	–40.7
1980	517.1	244.1	64.6	157.8	50.6	590.9	134.0	130.9	12.7	23.2	32.1	86.5	118.5	52.5	131.3	–73.8
1981	599.3	285.9	61.1	182.7	69.5	678.2	157.5	153.9	13.1	26.9	39.1	100.3	139.6	68.8	133.0	–79.0
1982	617.8	297.7	49.2	201.5	69.3	745.7	185.3	180.7	12.3	27.4	46.6	108.1	156.0	85.0	125.0	–128.0
1983	600.6	288.9	37.0	209.0	65.6	808.4	209.9	204.4	11.8	28.6	52.6	123.0	170.7	89.8	121.8	–207.8
1984	666.4	298.4	56.9	239.4	71.8	851.8	227.4	220.9	15.9	30.4	57.5	113.4	178.2	111.1	117.9	–185.4
1985	734.0	334.5	61.3	265.2	73.0	946.3	252.7	245.1	16.2	33.5	65.8	129.0	188.6	129.5	131.0	–212.3
1986	769.2	349.0	63.1	283.9	73.2	990.4	273.4	265.4	14.1	35.9	70.2	120.7	198.8	136.0	141.3	–221.2
1987	854.3	392.6	83.9	303.3	74.5	1,004.0	282.0	273.9	11.6	40.0	75.1	124.1	207.4	138.6	125.2	–149.7
1988	909.2	401.2	94.5	334.3	79.2	1,064.4	290.4	281.9	10.5	44.5	78.9	130.4	219.3	151.8	138.7	–155.2
1989	991.1	445.7	103.3	359.4	82.7	1,143.7	303.6	294.8	9.6	48.4	85.0	137.6	232.5	169.0	158.2	–152.6
1990	1,032.0	466.9	93.5	380.0	91.5	1,253.0	299.3	289.7	13.8	57.7	98.1	148.8	248.6	184.3	202.4	–221.0
1991	1,055.0	467.8	98.1	396.0	93.1	1,324.2	273.3	262.3	15.8	71.1	104.5	172.6	269.0	194.4	223.4	–269.2
1992	1,091.2	476.0	100.3	413.7	101.3	1,381.5	298.3	286.8	16.1	89.4	119.0	199.7	287.6	199.3	172.1	–290.3
1993	1,154.3	509.7	117.5	428.3	98.8	1,409.4	291.1	278.5	17.2	99.3	130.6	210.1	304.6	198.7	157.8	–255.1
1994	1,258.6	543.1	140.4	461.5	113.7	1,461.8	281.6	268.6	17.1	107.1	144.7	217.2	319.6	202.9	171.5	–203.2
1995	1,351.8	590.2	157.0	484.5	120.1	1,515.7	272.1	259.4	16.4	115.4	159.9	223.8	335.8	232.1	160.3	–164.0
1996	1,453.1	656.4	171.8	509.4	115.4	1,560.5	265.7	253.1	13.5	119.3	174.2	229.7	349.7	241.1	167.3	–107.4
1997	1,579.2	737.5	182.3	539.4	120.1	1,601.1	270.5	258.3	15.2	123.8	190.0	235.0	365.3	244.0	157.4	–21.9
1998	1,721.7	828.6	188.7	571.8	132.6	1,652.5	268.2	255.8	13.1	131.4	192.8	237.7	379.2	241.1	189.0	69.3
1999	1,827.5	879.5	184.7	611.8	151.5	1,701.8	274.8	261.2	15.2	141.0	190.4	242.4	390.0	229.8	218.1	125.6
2000	2,025.2	1,004.5	207.3	652.9	160.6	1,789.0	294.4	281.0	17.2	154.5	197.1	253.7	409.4	222.9	239.7	236.2
2001	1,991.1	994.3	151.1	694.0	151.7	1,862.8	304.7	290.2	16.5	172.2	217.4	269.7	433.0	206.2	243.2	128.2
2002	1,853.1	858.3	148.0	700.8	146.0	2,010.9	348.5	331.8	22.3	196.5	230.9	312.7	456.0	170.9	273.2	–157.8
2003	1,782.3	793.7	131.8	713.0	143.9	2,159.9	404.7	387.1	21.2	219.6	249.4	334.6	474.7	153.1	302.6	–377.6
2004	1,880.1	809.0	189.4	733.4	148.4	2,292.8	455.8	436.4	26.9	240.1	269.4	333.0	495.5	160.2	311.8	–412.7
2005	2,153.6	927.2	278.3	794.1	154.0	2,472.0	495.3	474.1	34.6	250.6	298.6	345.8	523.3	184.0	339.8	–318.3
2006	2,406.9	1,043.9	353.9	837.8	171.2	2,655.1	521.8	499.3	29.5	252.8	329.9	352.4	548.5	226.6	393.5	–248.2
2007	2,568.0	1,163.5	370.2	869.6	164.7	2,728.7	551.3	528.5	28.5	266.4	375.4	365.9	586.2	237.1	317.9	–160.7
2008	2,524.0	1,145.7	304.3	900.2	173.7	2,982.5	616.1	594.6	28.9	280.6	390.8	431.2	617.0	252.8	365.2	–458.6
2009	2,105.0	915.3	138.2	890.9	160.5	3,517.7	661.0	636.7	37.5	334.4	430.1	533.1	683.0	186.9	651.7	–1,412.7
2010	2,162.7	898.5	191.4	864.8	207.9	3,457.1	693.5	666.7	45.2	369.1	451.6	622.1	706.7	196.2	372.6	–1,294.4
2011	2,303.5	1,091.5	181.1	818.8	212.1	3,603.1	705.6	678.1	45.7	372.5	485.7	597.3	730.8	230.0	435.7	–1,299.6
2012	2,450.0	1,132.2	242.3	845.3	230.2	3,526.6	677.9	650.9	36.8	346.8	471.8	541.2	773.3	220.4	458.4	–1,076.6
2013	2,775.1	1,316.4	273.5	947.8	237.4	3,454.9	633.4	607.8	46.5	358.3	497.8	536.4	813.6	220.9	348.0	–679.8
2014	3,021.5	1,394.6	320.7	1,023.5	282.7	3,506.3	603.5	577.9	46.9	409.5	511.7	513.6	850.5	229.0	341.7	–484.8
2015	3,249.9	1,540.8	343.8	1,065.3	300.0	3,691.9	589.7	562.5	52.0	482.3	546.2	508.8	887.8	223.2	402.0	–442.0
2016	3,268.0	1,546.1	299.6	1,115.1	307.3	3,852.6	593.4	565.4	45.3	511.3	594.5	514.1	916.1	240.0	437.9	–584.7
2017	3,316.2	1,587.1	297.0	1,161.9	270.1	3,981.6	598.7	568.9	46.3	533.2	597.3	503.4	944.9	262.6	495.3	–665.4
2018	3,329.9	1,683.5	204.7	1,170.7	270.9	4,109.0	631.1	600.7	49.0	551.2	588.7	495.3	987.8	325.0	480.9	–779.1
2019	3,463.4	1,717.9	230.2	1,243.1	272.1	4,447.0	686.0	654.0	52.7	584.8	651.0	514.8	1,044.4	375.2	538.0	–983.6
2020	3,421.2	1,608.7	211.8	1,310.0	290.7	6,553.6	724.6	690.4	67.7	747.6	776.2	1,263.6	1,095.8	345.5	1,532.6	–3,132.4
2021	4,047.1	2,044.4	371.8	1,314.1	316.8	6,822.4	753.9	717.6	46.9	796.5	696.5	1,647.7	1,134.6	352.3	1,394.0	–2,775.3
2022 (estimates)	4,436.6	2,263.4	382.6	1,445.6	345.1	5,851.6	779.7	741.0	61.6	868.4	760.9	926.1	1,219.5	357.1	878.3	–1,415.0
2023 (estimates)	4,638.2	2,345.2	500.9	1,509.9	282.1	5,792.0	808.6	767.6	63.4	782.4	854.5	688.2	1,318.7	395.5	880.6	–1,153.9

Note: See Note, Table B–45.

Sources: Department of the Treasury and Office of Management and Budget.

Table B–48. Federal receipts, outlays, surplus or deficit, and debt, fiscal years 2018–2023

[Millions of dollars; fiscal years]

Description	Actual				Estimates	
	2018	2019	2020	2021	2022	2023
RECEIPTS, OUTLAYS, AND SURPLUS OR DEFICIT						
Total:						
Receipts	3,329,907	3,463,364	3,421,164	4,047,112	4,436,626	4,638,192
Outlays	4,109,045	4,446,956	6,553,603	6,822,449	5,851,576	5,792,048
Surplus or deficit (–)	–779,138	–983,592	–3,132,439	–2,775,337	–1,414,950	–1,153,856
On-budget:						
Receipts	2,475,160	2,549,061	2,455,736	3,094,789	3,389,419	3,537,550
Outlays	3,260,473	3,540,339	5,598,021	5,818,602	4,763,683	4,605,306
Surplus or deficit (–)	–785,313	–991,278	–3,142,285	–2,723,813	–1,374,264	–1,067,756
Off-budget:						
Receipts	854,747	914,303	965,428	952,323	1,047,207	1,100,642
Outlays	848,572	906,617	955,582	1,003,847	1,087,893	1,186,742
Surplus or deficit (–)	6,175	7,686	9,846	–51,524	–40,686	–86,100
OUTSTANDING DEBT, END OF PERIOD						
Gross Federal debt	21,462,277	22,669,466	26,902,455	28,385,562	31,291,897	32,593,175
Held by Federal Government accounts	5,712,710	5,868,766	5,885,786	6,101,536	6,455,705	6,559,886
Held by the public	15,749,567	16,800,700	21,016,669	22,284,026	24,836,192	26,033,289
Federal Reserve System	2,313,209	2,113,329	4,445,477	5,433,156	....	....
Other	13,436,358	14,687,371	16,571,192	16,850,870	....	....
RECEIPTS BY SOURCE						
Total: On-budget and off-budget	3,329,907	3,463,364	3,421,164	4,047,112	4,436,626	4,638,192
Individual income taxes	1,683,538	1,717,857	1,608,663	2,044,377	2,263,370	2,345,210
Corporation income taxes	204,733	230,245	211,845	371,831	382,560	500,912
Social insurance and retirement receipts	1,170,701	1,243,113	1,309,955	1,314,088	1,445,596	1,509,944
On-budget	315,954	328,810	344,527	361,765	398,389	409,302
Off-budget	854,747	914,303	965,428	952,323	1,047,207	1,100,642
Excise taxes	94,986	98,914	86,780	75,274	84,113	90,661
Estate and gift taxes	22,983	16,672	17,624	27,140	25,742	25,427
Customs duties and fees	41,299	70,784	68,551	79,985	92,638	53,943
Miscellaneous receipts	111,667	85,779	117,746	134,417	142,607	112,095
Deposits of earnings by Federal Reserve System	70,750	52,793	81,880	100,054	107,749	75,625
All other	40,917	32,986	35,866	34,363	34,858	36,470
OUTLAYS BY FUNCTION						
Total: On-budget and off-budget	4,109,045	4,446,956	6,553,603	6,822,449	5,851,576	5,792,048
National defense	631,130	686,003	724,645	753,901	779,663	808,565
International affairs	48,996	52,739	67,666	46,947	61,550	63,406
General science, space, and technology	31,534	32,410	34,004	35,512	39,103	41,290
Energy	2,169	5,041	7,083	5,977	5,691	16,962
Natural resources and environment	39,141	37,844	42,450	44,160	50,485	59,552
Agriculture	21,789	38,257	47,298	47,398	35,255	35,464
Commerce and housing credit	–9,470	–25,715	572,071	307,847	–2,371	8,823
On-budget	–8,005	–24,612	574,474	310,581	–7,428	6,310
Off-budget	–1,465	–1,103	–2,403	–2,734	5,057	2,513
Transportation	92,785	95,756	145,623	154,291	141,483	147,948
Community and regional development	42,159	26,784	81,878	44,655	81,275	57,887
Education, training, employment, and social services	95,503	136,700	237,754	298,406	264,997	226,955
Health	551,219	584,816	747,582	796,450	868,442	782,435
Medicare	588,706	650,996	776,225	696,458	760,940	854,476
Income security	495,289	514,787	1,263,639	1,647,730	926,051	688,244
Social security	987,791	1,044,409	1,095,816	1,134,586	1,219,521	1,318,746
On-budget	35,752	36,130	39,893	34,862	48,556	50,963
Off-budget	952,039	1,008,279	1,055,923	1,099,724	1,170,965	1,267,783
Veterans benefits and services	178,895	199,843	218,655	234,282	273,965	295,446
Administration of justice	60,418	65,832	71,997	71,430	79,527	78,459
General government	23,885	23,488	180,109	273,941	140,711	37,772
Net interest	324,975	375,158	345,470	352,338	357,132	395,549
On-budget	408,784	457,662	424,274	425,591	424,520	457,621
Off-budget	–83,809	–82,504	–78,804	–73,253	–67,388	–62,072
Allowances	....	....	....	....	267	....
Undistributed offsetting receipts	–97,869	–98,192	–106,362	–123,860	–232,111	–125,931
On-budget	–79,676	–80,137	–87,228	–103,970	–211,370	–104,449
Off-budget	–18,193	–18,055	–19,134	–19,890	–20,741	–21,482

Note: See Note, Table B–45.

Sources: Department of the Treasury and Office of Management and Budget.

Table B–49. Federal and State and local government current receipts and expenditures, national income and product accounts (NIPA) basis, 1971–2021

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Total government: Current receipts	Total government: Current expenditures	Total government: Net government saving (NIPA)	Federal Government: Current receipts	Federal Government: Current expenditures	Federal Government: Net Federal Government saving (NIPA)	State and local government: Current receipts	State and local government: Current expenditures	State and local government: Net State and local government saving (NIPA)	Addendum: Grants-in-aid to State and local governments
1971	302.3	354.5	–52.2	190.7	241.6	–50.9	133.7	135.0	–1.3	22.1
1972	345.6	388.5	–42.9	219.0	268.0	–49.0	157.1	151.0	6.1	30.5
1973	388.8	421.5	–32.7	249.2	287.6	–38.3	173.0	167.4	5.6	33.5
1974	430.2	473.9	–43.7	278.5	319.8	–41.3	186.6	189.0	–2.3	34.9
1975	441.2	549.9	–108.7	276.8	374.8	–97.9	208.0	218.7	–10.7	43.6
1976	505.7	591.0	–85.3	322.6	403.5	–80.9	232.2	236.6	–4.4	49.1
1977	567.4	640.3	–72.9	363.9	437.3	–73.4	258.3	257.8	.5	54.8
1978	646.1	703.3	–57.2	423.8	485.9	–62.0	285.8	280.9	4.9	63.5
1979	729.3	777.9	–48.6	487.0	534.4	–47.4	306.3	307.5	–1.2	64.0
1980	799.9	894.6	–94.7	533.7	622.5	–88.8	335.9	341.8	–5.9	69.7
1981	919.1	1,017.4	–98.2	621.1	709.1	–88.1	367.5	377.6	–10.2	69.4
1982	940.9	1,131.0	–190.1	618.7	786.0	–167.4	388.5	411.3	–22.8	66.3
1983	1,002.1	1,227.7	–225.6	644.8	851.9	–207.2	425.3	443.7	–18.4	67.9
1984	1,115.0	1,311.7	–196.7	711.2	907.7	–196.5	476.1	476.3	–.2	72.3
1985	1,217.0	1,418.7	–201.7	775.7	975.0	–199.2	517.5	519.9	–2.4	76.2
1986	1,292.9	1,512.8	–219.9	817.9	1,033.8	–215.9	557.4	561.3	–4.0	82.4
1987	1,406.6	1,586.7	–180.1	899.5	1,065.2	–165.7	585.5	599.9	–14.4	78.4
1988	1,507.1	1,678.3	–171.3	962.4	1,122.4	–160.0	630.4	641.7	–11.3	85.7
1989	1,632.0	1,810.7	–178.7	1,042.5	1,201.8	–159.4	681.4	700.7	–19.3	91.8
1990	1,713.3	1,952.9	–239.5	1,087.6	1,290.9	–203.3	730.1	766.3	–36.2	104.4
1991	1,763.7	2,072.2	–308.5	1,107.8	1,356.2	–248.4	779.9	840.0	–60.1	124.0
1992	1,848.7	2,254.2	–405.5	1,154.4	1,488.9	–334.5	836.1	907.0	–71.0	141.7
1993	1,953.3	2,339.3	–386.0	1,231.0	1,544.6	–313.5	878.0	950.4	–72.5	155.7
1994	2,097.6	2,417.2	–319.6	1,329.3	1,585.0	–255.6	935.1	999.1	–63.9	166.8
1995	2,223.9	2,536.5	–312.5	1,417.4	1,659.5	–242.1	981.0	1,051.4	–70.4	174.5
1996	2,388.6	2,621.8	–233.2	1,536.3	1,715.7	–179.4	1,033.7	1,087.5	–53.8	181.5
1997	2,565.9	2,699.9	–133.9	1,667.4	1,759.4	–92.0	1,086.7	1,128.7	–42.0	188.1
1998	2,738.6	2,767.4	–28.7	1,789.8	1,788.4	1.4	1,149.6	1,179.7	–30.1	200.8
1999	2,909.7	2,879.5	30.2	1,906.0	1,836.8	69.1	1,222.9	1,261.8	–38.9	219.2
2000	3,139.0	3,019.9	119.0	2,067.8	1,908.1	159.7	1,304.3	1,345.0	–40.6	233.1
2001	3,125.2	3,229.2	–104.0	2,032.4	2,017.3	15.0	1,354.1	1,473.1	–119.0	261.3
2002	2,969.1	3,419.8	–450.7	1,870.9	2,138.7	–267.8	1,386.9	1,569.8	–182.9	288.7
2003	3,045.4	3,624.0	–578.7	1,896.1	2,293.5	–397.4	1,470.9	1,652.2	–181.3	321.7
2004	3,275.0	3,817.4	–542.5	2,028.1	2,421.6	–393.5	1,579.2	1,728.2	–149.0	332.3
2005	3,678.7	4,075.3	–396.6	2,304.7	2,598.5	–293.8	1,717.5	1,820.3	–102.8	343.5
2006	4,013.1	4,320.1	–307.0	2,538.8	2,760.7	–221.9	1,815.3	1,900.4	–85.0	341.0
2007	4,210.6	4,599.6	–389.0	2,668.3	2,928.0	–259.7	1,901.4	2,030.7	–129.3	359.1
2008	4,126.2	4,972.0	–845.8	2,582.1	3,207.0	–624.9	1,915.3	2,136.2	–220.9	371.2
2009	3,699.5	5,284.0	–1,584.5	2,242.1	3,485.2	–1,243.2	1,915.5	2,256.9	–341.3	458.1
2010	3,934.1	5,560.0	–1,625.8	2,446.3	3,764.6	–1,318.4	1,993.1	2,300.6	–307.5	505.2
2011	4,130.3	5,639.5	–1,509.2	2,573.6	3,807.8	–1,234.1	2,029.1	2,304.2	–275.1	472.5
2012	4,311.6	5,667.1	–1,355.5	2,700.8	3,773.5	–1,072.7	2,055.2	2,338.1	–282.8	444.4
2013	4,834.3	5,731.4	–897.1	3,139.6	3,771.3	–631.8	2,144.9	2,410.2	–265.3	450.1
2014	5,054.4	5,889.7	–835.3	3,293.0	3,890.4	–597.4	2,256.4	2,494.4	–237.9	495.0
2015	5,288.5	6,064.5	–776.0	3,449.0	4,009.2	–560.2	2,372.6	2,588.4	–215.8	533.1
2016	5,336.1	6,248.4	–912.3	3,463.8	4,131.4	–667.6	2,429.1	2,673.8	–244.7	556.7
2017	5,482.3	6,433.6	–951.3	3,525.2	4,245.9	–720.7	2,517.6	2,748.1	–230.6	560.5
2018	5,637.1	6,761.0	–1,123.8	3,569.0	4,497.1	–928.1	2,650.6	2,846.4	–195.8	582.5
2019	5,897.5	7,094.0	–1,196.5	3,713.7	4,761.1	–1,047.5	2,793.1	2,942.1	–149.0	609.2
2020	5,900.6	8,934.4	–3,033.9	3,684.5	6,794.5	–3,110.0	3,096.6	3,020.5	76.1	880.5
2021 *p*	....	9,170.5	....	....	7,020.4	....	....	3,242.4	....	1,092.2
2018: I	5,548.1	6,625.2	–1,077.1	3,494.3	4,404.0	–909.7	2,636.5	2,803.9	–167.4	582.7
II	5,578.0	6,727.8	–1,149.7	3,536.8	4,465.6	–928.8	2,616.9	2,837.8	–221.0	575.7
III	5,703.1	6,804.1	–1,101.1	3,619.9	4,521.3	–901.4	2,665.9	2,865.6	–199.7	582.7
IV	5,719.3	6,886.8	–1,167.5	3,625.1	4,597.5	–972.5	2,683.2	2,878.2	–195.0	588.9
2019: I	5,808.5	6,992.0	–1,183.6	3,676.4	4,691.8	–1,015.4	2,725.8	2,894.0	–168.2	593.8
II	5,906.8	7,064.4	–1,157.6	3,706.0	4,739.1	–1,033.2	2,811.4	2,935.7	–124.4	610.5
III	5,908.8	7,140.2	–1,231.4	3,708.9	4,789.8	–1,080.9	2,810.2	2,960.7	–150.5	610.4
IV	5,965.9	7,179.3	–1,213.4	3,763.4	4,823.8	–1,060.4	2,824.8	2,977.9	–153.0	622.4
2020: I	5,966.9	7,259.4	–1,292.5	3,751.2	4,909.2	–1,158.0	2,856.3	2,990.8	–134.6	640.6
II	5,631.8	10,703.8	–5,072.0	3,481.1	9,106.7	–5,625.6	3,550.7	2,997.2	553.6	1,400.0
III	5,931.2	9,513.8	–3,582.6	3,690.5	7,206.8	–3,516.3	2,979.2	3,045.5	–66.3	738.5
IV	6,072.3	8,260.6	–2,188.3	3,815.1	5,955.2	–2,140.1	3,000.2	3,048.4	–48.2	743.0
2021: I	6,301.8	10,402.5	–4,100.6	3,982.6	8,071.4	–4,088.9	3,100.7	3,112.5	–11.8	781.5
II	6,577.0	9,060.9	–2,484.0	4,177.8	7,490.5	–3,312.7	4,031.4	3,202.7	828.7	1,632.2
III	6,779.4	8,809.4	–2,030.0	4,324.8	6,560.4	–2,235.6	3,511.7	3,306.1	205.6	1,057.1
IV *p*	....	8,409.4	....	....	5,959.2	....	....	3,348.1	....	897.9

Note: Federal grants-in-aid to State and local governments are reflected in Federal current expenditures and State and local current receipts. Total government current receipts and expenditures have been adjusted to eliminate this duplication.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–50. State and local government revenues and expenditures, fiscal years 1956–2019

[Millions of dollars]

Fiscal year [1]	General revenues by source [2]							General expenditures by function [2]				
	Total	Property taxes	Sales and gross receipts taxes	Individual income taxes	Corporation net income taxes	Revenue from Federal Government	All other [3]	Total [4]	Education	Highways	Public welfare [4]	All other [4, 5]
1956	34,670	11,749	8,691	1,538	890	3,335	8,467	36,715	13,224	6,953	3,139	13,399
1957	38,164	12,864	9,467	1,754	984	3,843	9,252	40,375	14,134	7,816	3,485	14,940
1958	41,219	14,047	9,829	1,759	1,018	4,865	9,701	44,851	15,919	8,567	3,818	16,547
1959	45,306	14,983	10,437	1,994	1,001	6,377	10,514	48,887	17,283	9,592	4,136	17,876
1960	50,505	16,405	11,849	2,463	1,180	6,974	11,634	51,876	18,719	9,428	4,404	19,325
1961	54,037	18,002	12,463	2,613	1,266	7,131	12,562	56,201	20,574	9,844	4,720	21,063
1962	58,252	19,054	13,494	3,037	1,308	7,871	13,488	60,206	22,216	10,357	5,084	22,549
1963	62,891	20,089	14,456	3,269	1,505	8,722	14,850	64,815	23,776	11,135	5,481	24,423
1963–64	68,443	21,241	15,762	3,791	1,695	10,002	15,952	69,302	26,286	11,664	5,766	25,586
1964–65	74,000	22,583	17,118	4,090	1,929	11,029	17,251	74,678	28,563	12,221	6,315	27,579
1965–66	83,036	24,670	19,085	4,760	2,038	13,214	19,269	82,843	33,287	12,770	6,757	30,029
1966–67	91,197	26,047	20,530	5,825	2,227	15,370	21,198	93,350	37,919	13,932	8,218	33,281
1967–68	101,264	27,747	22,911	7,308	2,518	17,181	23,599	102,411	41,158	14,481	9,857	36,915
1968–69	114,550	30,673	26,519	8,908	3,180	19,153	26,117	116,728	47,238	15,417	12,110	41,963
1969–70	130,756	34,054	30,322	10,812	3,738	21,857	29,973	131,332	52,718	16,427	14,679	47,508
1970–71	144,927	37,852	33,233	11,900	3,424	26,146	32,372	150,674	59,413	18,095	18,226	54,940
1971–72	167,535	42,877	37,518	15,227	4,416	31,342	36,156	168,549	65,813	19,021	21,117	62,598
1972–73	190,222	45,283	42,047	17,994	5,425	39,264	40,210	181,357	69,713	18,615	23,582	69,447
1973–74	207,670	47,705	46,098	19,491	6,015	41,820	46,542	199,222	75,833	19,946	25,085	78,358
1974–75	228,171	51,491	49,815	21,454	6,642	47,034	51,735	230,722	87,858	22,528	28,156	92,180
1975–76	256,176	57,001	54,547	24,575	7,273	55,589	57,191	256,731	97,216	23,907	32,604	103,004
1976–77	285,157	62,527	60,641	29,246	9,174	62,444	61,125	274,215	102,780	23,058	35,906	112,472
1977–78	315,960	66,422	67,596	33,176	10,738	69,592	68,435	296,984	110,758	24,609	39,140	122,478
1978–79	343,236	64,944	74,247	36,932	12,128	75,164	79,822	327,517	119,448	28,440	41,898	137,731
1979–80	382,322	68,499	79,927	42,080	13,321	83,029	95,467	369,086	133,211	33,311	47,288	155,276
1980–81	423,404	74,969	85,971	46,426	14,143	90,294	111,599	407,449	145,784	34,603	54,105	172,957
1981–82	457,654	82,067	93,613	50,738	15,028	87,282	128,925	436,733	154,282	34,520	57,996	189,935
1982–83	486,753	89,105	100,247	55,129	14,258	90,007	138,008	466,516	163,876	36,655	60,906	205,080
1983–84	542,730	96,457	114,097	64,871	16,798	96,935	153,571	505,008	176,108	39,419	66,414	223,068
1984–85	598,121	103,757	126,376	70,361	19,152	106,158	172,317	553,899	192,686	44,989	71,479	244,745
1985–86	641,486	111,709	135,005	74,365	19,994	113,099	187,314	605,623	210,819	49,368	75,868	269,568
1986–87	686,860	121,203	144,091	83,935	22,425	114,857	200,350	657,134	226,619	52,355	82,650	295,510
1987–88	726,762	132,212	156,452	88,350	23,663	117,602	208,482	704,921	242,683	55,621	89,090	317,527
1988–89	786,129	142,400	166,336	97,806	25,926	125,824	227,838	762,360	263,898	58,105	97,879	342,479
1989–90	849,502	155,613	177,885	105,640	23,566	136,802	249,996	834,818	288,148	61,057	110,518	375,094
1990–91	902,207	167,999	185,570	109,341	22,242	154,099	262,955	908,108	309,302	64,937	130,402	403,467
1991–92	979,137	180,337	197,731	115,638	23,880	179,174	282,376	981,253	324,652	67,351	158,723	430,526
1992–93	1,041,643	189,744	209,649	123,235	26,417	198,663	293,935	1,030,434	342,287	68,370	170,705	449,072
1993–94	1,100,490	197,141	223,628	128,810	28,320	215,492	307,099	1,077,665	353,287	72,067	183,394	468,916
1994–95	1,169,505	203,451	237,268	137,931	31,406	228,771	330,677	1,149,863	378,273	77,109	196,703	497,779
1995–96	1,222,821	209,440	248,993	146,844	32,009	234,891	350,645	1,193,276	398,859	79,092	197,354	517,971
1996–97	1,289,237	218,877	261,418	159,042	33,820	244,847	371,233	1,249,984	418,416	82,062	203,779	545,727
1997–98	1,365,762	230,150	274,883	175,630	34,412	255,048	395,639	1,318,042	450,365	87,214	208,120	572,343
1998–99	1,434,029	239,672	290,993	189,309	33,922	270,628	409,505	1,402,369	483,259	93,018	218,957	607,134
1999–2000	1,541,322	249,178	309,290	211,661	36,059	291,950	443,186	1,506,797	521,612	101,336	237,336	646,512
2000–01	1,647,161	263,689	320,217	226,334	35,296	324,033	477,592	1,626,063	563,572	107,235	261,622	693,634
2001–02	1,684,879	279,191	324,123	202,832	28,152	360,546	490,035	1,736,866	594,694	115,295	285,464	741,413
2002–03	1,763,212	296,683	337,787	199,407	31,369	389,264	508,702	1,821,917	621,335	117,696	310,783	772,102
2003–04	1,887,397	317,941	361,027	215,215	33,716	423,112	536,386	1,908,543	655,182	117,215	340,523	795,622
2004–05	2,026,034	335,779	384,266	242,273	43,256	438,558	581,902	2,012,110	688,314	126,350	365,295	832,151
2005–06	2,197,475	364,559	417,735	268,667	53,081	452,975	640,458	2,123,663	728,917	136,502	373,846	884,398
2006–07	2,330,611	388,905	440,470	290,278	60,955	464,914	685,089	2,264,035	774,170	145,011	389,259	955,595
2007–08	2,421,977	409,540	449,945	304,902	57,231	477,441	722,919	2,406,183	826,061	153,831	408,920	1,017,372
2008–09	2,429,672	434,818	434,128	270,942	46,280	537,949	705,555	2,500,796	851,689	154,338	437,184	1,057,586
2009–10	2,510,846	443,947	435,571	261,510	44,108	623,801	701,909	2,542,231	860,118	155,912	460,230	1,065,971
2010–11	2,618,037	445,771	463,979	285,293	48,422	647,606	726,966	2,583,805	862,271	153,895	494,682	1,072,957
2011–12	2,598,745	445,854	482,172	307,897	48,877	580,604	733,341	2,595,947	870,321	159,498	491,158	1,074,971
2012–13	2,687,495	453,458	503,553	339,666	52,853	583,294	754,672	2,631,945	878,957	160,260	518,035	1,074,693
2013–14	2,768,260	465,100	522,014	343,001	54,558	602,175	781,412	2,723,022	906,016	165,051	547,889	1,104,066
2014–15	2,920,320	484,251	544,359	368,862	57,130	658,012	807,707	2,844,289	934,353	171,084	616,515	1,122,338
2015–16	3,018,372	504,593	559,625	375,310	53,581	693,989	831,274	2,964,238	973,025	177,982	655,532	1,157,699
2016–17	3,123,468	525,609	581,103	384,636	52,807	710,499	868,815	3,078,217	1,013,378	181,477	680,174	1,203,188
2017–18	3,298,797	548,045	615,927	426,169	56,134	740,591	911,932	3,206,456	1,046,585	192,830	710,567	1,256,474
2018–19	3,468,044	577,008	640,570	447,656	65,676	762,055	975,079	3,339,338	1,088,239	202,546	746,742	1,301,811

[1] Fiscal years not the same for all governments. See Note.

[2] Excludes revenues or expenditures of publicly owned utilities and liquor stores and of insurance-trust activities. Intergovernmental receipts and payments between State and local governments are also excluded.

[3] Includes motor vehicle license taxes, other taxes, and charges and miscellaneous revenues.

[4] Includes intergovernmental payments to the Federal Government.

[5] Includes expenditures for libraries, hospitals, health, employment security administration, veterans' services, air transportation, sea and inland port facilities, parking facilities, police protection, fire protection, correction, protective inspection and regulation, sewerage, natural resources, parks and recreation, housing and community development, solid waste management, financial administration, judicial and legal, general public buildings, other government administration, interest on general debt, and other general expenditures, not elsewhere classified.

Note: Except for States listed, data for fiscal years listed from 1963–64 to 2018–19 are the aggregation of data for government fiscal years that ended in the 12-month period from July 1 to June 30 of those years; Texas used August and Alabama and Michigan used September as end dates. Data for 1963 and earlier years include data for government fiscal years ending during that particular calendar year.

Source: Department of Commerce (Bureau of the Census).

TABLE B–51. U.S. Treasury securities outstanding by kind of obligation, 1980–2021

[Billions of dollars]

End of fiscal year or month	Total Treasury securities outstanding[1]	Marketable							Nonmarketable				
		Total[2]	Treasury bills	Treasury notes	Treasury bonds	Treasury inflation-protected securities			Total	U.S. savings securities[3]	Foreign series[4]	Government account series	Other[5]
						Total	Notes	Bonds					
1980	906.8	594.5	199.8	310.9	83.8	....	....	....	312.3	73.0	25.2	189.8	24.2
1981	996.8	683.2	223.4	363.6	96.2	....	....	....	313.6	68.3	20.5	201.1	23.7
1982	1,141.2	824.4	277.9	442.9	103.6	....	....	....	316.8	67.6	14.6	210.5	24.1
1983	1,376.3	1,024.0	340.7	557.5	125.7	....	....	....	352.3	70.6	11.5	234.7	35.6
1984	1,560.4	1,176.6	356.8	661.7	158.1	....	....	....	383.8	73.7	8.8	259.5	41.8
1985	1,822.3	1,360.2	384.2	776.4	199.5	....	....	....	462.1	78.2	6.6	313.9	63.3
1986	2,124.9	1,564.3	410.7	896.9	241.7	....	....	....	560.5	87.8	4.1	365.9	102.8
1987	2,349.4	1,676.0	378.3	1,005.1	277.6	....	....	....	673.4	98.5	4.4	440.7	129.8
1988	2,601.4	1,802.9	398.5	1,089.6	299.9	....	....	....	798.5	107.8	6.3	536.5	148.0
1989	2,837.9	1,892.8	406.6	1,133.2	338.0	....	....	....	945.2	115.7	6.8	663.7	159.0
1990	3,212.7	2,092.8	482.5	1,218.1	377.2	....	....	....	1,119.9	123.9	36.0	779.4	180.6
1991	3,664.5	2,390.7	564.6	1,387.7	423.4	....	....	....	1,273.9	135.4	41.6	908.4	188.5
1992	4,063.8	2,677.5	634.3	1,566.3	461.8	....	....	....	1,386.3	150.3	37.0	1,011.0	188.0
1993	4,410.7	2,904.9	658.4	1,734.2	497.4	....	....	....	1,505.8	169.1	42.5	1,114.3	179.9
1994	4,691.7	3,091.6	697.3	1,867.5	511.8	....	....	....	1,600.1	178.6	42.0	1,211.7	167.8
1995	4,953.0	3,260.4	742.5	1,980.3	522.6	....	....	....	1,692.6	183.5	41.0	1,324.3	143.8
1996	5,220.8	3,418.4	761.2	2,098.7	543.5	....	....	....	1,802.4	184.1	37.5	1,454.7	126.1
1997	5,407.6	3,439.6	701.9	2,122.2	576.2	24.4	24.4	....	1,968.0	182.7	34.9	1,608.5	141.9
1998	5,518.7	3,331.0	637.6	2,009.1	610.4	58.8	41.9	17.0	2,187.6	180.8	35.1	1,777.3	194.4
1999	5,647.3	3,233.0	653.2	1,828.8	643.7	92.4	67.6	24.8	2,414.3	180.0	31.0	2,005.2	198.1
2000	5,622.1	2,992.8	616.2	1,611.3	635.3	115.0	81.6	33.4	2,629.4	177.7	25.4	2,242.9	183.3
2001[1]	5,807.5	2,930.7	734.9	1,433.0	613.0	134.9	95.1	39.7	2,876.7	186.5	18.3	2,492.1	179.9
2002	6,228.2	3,136.7	868.3	1,521.6	593.0	138.9	93.7	45.1	3,091.5	193.3	12.5	2,707.3	178.4
2003	6,783.2	3,460.7	918.2	1,799.5	576.9	166.1	120.0	46.1	3,322.5	201.6	11.0	2,912.2	197.7
2004	7,379.1	3,846.1	961.5	2,109.6	552.0	223.0	164.5	58.5	3,533.0	204.2	5.9	3,130.0	192.9
2005	7,932.7	4,084.9	914.3	2,328.8	520.7	307.1	229.1	78.0	3,847.8	203.6	3.1	3,380.6	260.5
2006	8,507.0	4,303.0	911.5	2,447.2	534.7	395.6	293.9	101.7	4,203.9	203.7	3.0	3,722.7	274.5
2007	9,007.7	4,448.1	958.1	2,458.0	561.1	456.9	335.7	121.2	4,559.5	197.1	3.0	4,026.8	332.6
2008	10,024.7	5,236.0	1,489.8	2,624.8	582.9	524.5	380.2	144.3	4,788.7	194.3	3.0	4,297.7	293.8
2009	11,909.8	7,009.7	1,992.5	3,773.8	679.8	551.7	396.2	155.5	4,900.1	192.5	4.9	4,454.3	248.4
2010	13,561.6	8,498.3	1,788.5	5,255.9	849.9	593.8	421.1	172.7	5,063.3	188.7	4.2	4,645.3	225.1
2011	14,790.3	9,624.5	1,477.5	6,412.5	1,020.4	705.7	509.4	196.3	5,165.8	185.1	3.0	4,793.9	183.8
2012	16,066.2	10,749.7	1,616.0	7,120.7	1,198.2	807.7	584.7	223.0	5,316.5	183.8	3.0	4,939.3	190.4
2013	16,738.2	11,596.2	1,530.0	7,758.0	1,366.2	936.4	685.5	250.8	5,142.0	180.0	3.0	4,803.1	156.0
2014	17,824.1	12,294.2	1,411.0	8,167.8	1,534.1	1,044.7	765.2	279.5	5,529.9	176.7	3.0	5,212.5	137.7
2015	18,150.6	12,853.8	1,358.0	8,372.7	1,688.3	1,135.4	832.1	303.3	5,296.9	172.8	.3	5,013.5	110.3
2016	19,573.4	13,660.6	1,647.0	8,631.0	1,825.5	1,210.0	881.6	328.3	5,912.8	167.5	.3	5,604.1	141.0
2017	20,244.9	14,199.8	1,801.9	8,805.5	1,951.7	1,286.5	933.3	353.2	6,045.1	161.7	.3	5,771.1	112.0
2018	21,516.1	15,278.0	2,239.9	9,154.4	2,127.8	1,376.4	993.4	383.0	6,238.0	156.8	.3	5,977.6	103.4
2019	22,719.4	16,347.3	2,377.0	9,762.8	2,319.1	1,455.7	1,044.9	410.8	6,372.1	152.3	.3	6,133.7	85.8
2020	26,945.4	20,374.9	5,028.9	10,663.8	2,673.5	1,523.2	1,092.7	430.5	6,570.5	148.6	.3	6,196.3	225.3
2021	28,428.9	21,878.7	3,714.1	12,578.9	3,347.6	1,652.7	1,180.2	472.5	6,550.2	143.6	.3	6,243.3	163.0
2020: Jan	23,223.8	16,720.0	2,404.3	9,998.7	2,395.6	1,499.6	1,087.7	411.9	6,503.8	150.7	.3	6,251.6	101.3
Feb	23,410.0	16,918.5	2,564.6	9,994.3	2,413.5	1,506.3	1,086.8	419.5	6,491.4	150.3	.3	6,236.6	104.3
Mar	23,686.9	17,162.8	2,657.4	10,092.5	2,429.6	1,525.5	1,104.4	421.0	6,524.1	150.0	.3	6,261.8	112.0
Apr	24,974.2	18,535.6	4,001.8	10,163.7	2,446.6	1,492.9	1,070.7	422.2	6,438.6	150.1	.3	6,173.0	115.2
May	25,746.3	19,232.0	4,629.9	10,176.7	2,472.7	1,502.2	1,080.8	421.4	6,514.2	150.0	.3	6,192.1	171.8
June	26,477.4	19,906.0	5,079.6	10,314.5	2,533.4	1,509.5	1,090.9	418.6	6,571.4	149.8	.3	6,208.6	212.8
July	26,525.0	20,007.9	5,078.9	10,427.6	2,573.0	1,486.7	1,068.2	418.5	6,517.1	149.4	.3	6,157.0	210.4
Aug	26,728.8	20,190.7	5,076.7	10,524.0	2,624.5	1,501.9	1,073.5	428.4	6,538.1	149.0	.3	6,174.3	214.5
Sept	26,945.4	20,374.9	5,028.9	10,663.8	2,673.5	1,523.2	1,092.7	430.5	6,570.5	148.6	.3	6,196.3	225.3
Oct	27,135.6	20,442.4	4,985.3	10,729.2	2,697.1	1,545.1	1,113.2	431.9	6,693.2	148.2	.3	6,314.1	230.7
Nov	27,446.3	20,692.4	4,943.7	10,919.1	2,786.6	1,561.2	1,128.7	432.5	6,753.9	147.8	.3	6,375.7	230.1
Dec	27,747.8	20,980.4	4,964.1	11,091.9	2,839.3	1,579.3	1,146.5	432.7	6,767.4	147.1	.3	6,390.3	229.7
2021: Jan	27,784.6	21,049.0	4,955.0	11,172.8	2,865.7	1,549.8	1,117.3	432.5	6,735.6	146.6	.3	6,418.2	170.5
Feb	27,902.4	21,158.6	4,859.0	11,312.3	2,919.7	1,560.0	1,118.2	441.9	6,743.8	146.3	.3	6,424.3	173.1
Mar	28,132.6	21,388.1	4,669.0	11,597.2	3,006.3	1,582.0	1,138.3	443.7	6,744.5	145.7	.3	6,420.9	177.6
Apr	28,174.7	21,456.9	4,540.1	11,783.3	3,062.6	1,562.2	1,116.1	446.1	6,717.9	145.2	.3	6,392.6	179.7
May	28,199.4	21,421.7	4,377.1	11,830.4	3,093.8	1,585.7	1,136.6	449.0	6,777.7	144.9	.3	6,451.1	181.4
June	28,529.4	21,739.0	4,275.1	12,106.4	3,179.9	1,618.1	1,165.2	452.9	6,790.4	144.6	.3	6,475.1	170.4
July	28,428.1	21,699.0	4,142.1	12,185.0	3,207.9	1,604.4	1,147.8	456.6	6,729.2	144.3	.3	6,401.5	183.1
Aug	28,427.3	21,932.2	4,038.1	12,411.9	3,294.1	1,628.6	1,158.5	470.2	6,495.1	144.0	.3	6,173.7	177.2
Sept	28,428.9	21,878.7	3,714.1	12,578.9	3,347.6	1,652.7	1,180.2	472.5	6,550.2	143.6	.3	6,243.3	163.0
Oct	28,908.9	22,132.2	3,852.1	12,646.2	3,373.4	1,675.1	1,201.7	473.5	6,776.7	143.5	.3	6,476.6	156.3
Nov	28,908.0	22,351.6	3,786.1	12,854.6	3,433.5	1,695.3	1,220.5	474.8	6,556.4	144.1	.3	6,266.3	145.7
Dec	29,617.2	22,590.1	3,770.1	13,000.5	3,481.5	1,728.6	1,249.9	478.7	7,027.1	146.2	.3	6,739.1	141.6

[1] Data beginning with January 2001 are interest-bearing and non-interest-bearing securities; prior data are interest-bearing securities only.

[2] Data from 1986 to 2002 and 2005 forward include Federal Financing Bank securities, not shown separately. Beginning with data for January 2014, includes Floating Rate Notes, not shown separately.

[3] Through 1996, series is U.S. savings bonds. Beginning 1997, includes U.S. retirement plan bonds, U.S. individual retirement bonds, and U.S. savings notes previously included in "other" nonmarketable securities.

[4] Nonmarketable certificates of indebtedness, notes, bonds, and bills in the Treasury foreign series of dollar-denominated and foreign-currency-denominated issues.

[5] Includes depository bonds; retirement plan bonds through 1996; Rural Electrification Administration bonds; State and local bonds; special issues held only by U.S. Government agencies and trust funds and the Federal home loan banks; for the period July 2003 through February 2004, depositary compensation securities; and for the period August 2008 through April 2016, Hope bonds for the HOPE For Homeowners Program.

Note: The fiscal year is on an October 1–September 30 basis.

Source: Department of the Treasury.

Table B–52. Estimated ownership of U.S. Treasury securities, 2007–2021

[Billions of dollars]

End of month	Total public debt [1]	Federal Reserve and Intra-governmental holdings [2]	Held by private investors: Total privately held	Depository institutions [3]	U.S. savings bonds [4]	Pension funds: Private [5]	Pension funds: State and local governments	Insurance companies	Mutual funds [6]	State and local governments	Foreign and international [7]	Other investors [8]
2007: Mar	8,849.7	4,576.6	4,273.1	119.8	200.3	139.7	156.3	185.4	263.2	608.3	2,194.8	405.2
June	8,867.7	4,715.1	4,152.6	110.4	198.6	139.9	162.3	168.9	257.6	637.8	2,192.0	285.1
Sept	9,007.7	4,738.0	4,269.7	119.7	197.1	140.5	153.2	155.1	292.7	643.1	2,235.3	332.9
Dec	9,229.2	4,833.5	4,395.7	129.8	196.5	141.0	144.2	141.9	343.5	647.8	2,353.2	297.8
2008: Mar	9,437.6	4,694.7	4,742.9	125.0	195.4	143.7	135.4	152.1	466.7	646.4	2,506.3	371.9
June	9,492.0	4,685.8	4,806.2	112.7	195.0	145.0	135.5	159.4	440.3	635.1	2,587.4	395.9
Sept	10,024.7	4,692.7	5,332.0	130.0	194.3	147.0	136.7	163.4	631.4	614.0	2,802.4	512.9
Dec	10,699.8	4,806.4	5,893.4	105.0	194.1	147.4	129.9	171.4	758.2	601.4	3,077.2	708.9
2009: Mar	11,126.9	4,785.2	6,341.7	125.7	194.0	155.4	137.0	191.0	721.1	588.2	3,265.7	963.7
June	11,545.3	5,026.8	6,518.5	140.8	193.6	164.1	144.6	200.0	711.8	588.5	3,460.8	914.2
Sept	11,909.8	5,127.1	6,782.7	198.2	192.5	167.2	145.6	210.2	668.5	583.6	3,570.6	1,046.3
Dec	12,311.3	5,276.9	7,034.4	202.5	191.3	175.6	151.4	222.0	668.8	585.6	3,685.1	1,152.1
2010: Mar	12,773.1	5,259.8	7,513.3	269.3	190.2	183.0	153.6	225.7	678.5	585.0	3,877.9	1,350.1
June	13,201.8	5,345.1	7,856.7	266.1	189.6	190.8	150.1	231.8	676.8	584.4	4,070.0	1,497.1
Sept	13,561.6	5,350.5	8,211.1	322.8	188.7	198.2	145.2	240.6	671.0	586.0	4,324.2	1,534.4
Dec	14,025.2	5,656.2	8,368.9	319.3	187.9	206.8	153.7	248.4	721.7	595.7	4,435.6	1,499.9
2011: Mar	14,270.0	5,958.9	8,311.1	321.0	186.7	215.8	157.9	253.5	749.4	585.3	4,481.4	1,360.1
June	14,343.1	6,220.4	8,122.7	279.4	186.0	251.8	158.0	254.8	753.7	572.2	4,690.6	976.1
Sept	14,790.3	6,328.0	8,462.4	293.8	185.1	373.6	155.7	259.6	788.7	557.9	4,912.1	935.8
Dec	15,222.8	6,439.6	8,783.3	279.7	185.2	391.9	160.7	297.3	927.9	562.2	5,006.9	971.4
2012: Mar	15,582.3	6,397.2	9,185.1	317.0	184.8	406.6	169.4	298.1	1,015.4	567.4	5,145.1	1,081.2
June	15,855.5	6,475.8	9,379.7	303.2	184.7	427.4	171.2	293.6	997.8	585.4	5,310.9	1,105.4
Sept	16,066.2	6,446.8	9,619.4	338.2	183.8	453.9	181.7	292.6	1,080.7	596.9	5,476.1	1,015.4
Dec	16,432.7	6,523.7	9,909.1	347.7	182.5	468.0	183.6	292.7	1,031.8	599.6	5,573.8	1,229.4
2013: Mar	16,771.6	6,656.8	10,114.8	338.9	181.7	463.4	193.4	284.3	1,066.7	615.6	5,725.0	1,245.7
June	16,738.2	6,773.3	9,964.9	300.2	180.9	444.5	187.7	281.3	1,000.1	612.6	5,595.0	1,362.6
Sept	16,738.2	6,834.2	9,904.0	293.2	180.0	347.8	187.5	276.6	986.1	624.3	5,652.8	1,355.7
Dec	17,352.0	7,205.3	10,146.6	321.1	179.2	464.9	181.3	274.5	983.3	633.6	5,792.6	1,316.2
2014: Mar	17,601.2	7,301.5	10,299.7	368.4	178.3	474.3	184.3	280.1	1,060.4	632.0	5,948.3	1,173.7
June	17,632.6	7,461.0	10,171.6	409.5	177.6	482.6	198.3	291.0	986.2	638.8	6,018.7	968.8
Sept	17,824.1	7,490.8	10,333.2	471.1	176.7	490.7	198.7	301.4	1,075.8	628.7	6,069.2	920.8
Dec	18,141.4	7,578.9	10,562.6	516.8	175.9	507.1	199.2	310.5	1,121.8	654.5	6,157.7	919.0
2015: Mar	18,152.1	7,521.3	10,630.8	518.1	174.9	447.8	176.7	308.5	1,170.4	663.3	6,172.6	998.4
June	18,152.0	7,536.5	10,615.5	518.5	173.9	373.8	185.7	307.7	1,139.8	652.8	6,163.1	1,100.1
Sept	18,150.6	7,488.7	10,661.9	519.1	172.8	305.3	171.0	310.0	1,195.1	646.0	6,105.9	1,236.8
Dec	18,922.2	7,711.2	11,211.0	547.4	171.6	504.7	174.5	310.1	1,318.3	680.9	6,146.2	1,357.1
2016: Mar	19,264.9	7,801.4	11,463.6	562.9	170.3	524.4	170.4	319.1	1,404.1	694.9	6,284.4	1,333.0
June	19,381.6	7,911.2	11,470.4	580.6	169.0	537.9	185.0	333.7	1,434.2	712.6	6,279.1	1,238.3
Sept	19,573.4	7,863.5	11,709.9	626.8	167.5	545.6	203.8	345.2	1,600.4	710.9	6,155.9	1,353.8
Dec	19,976.9	8,005.6	11,971.3	663.1	165.8	538.0	218.8	334.2	1,705.4	717.3	6,006.3	1,622.4
2017: Mar	19,846.4	7,941.1	11,905.3	657.4	164.2	444.2	239.5	342.6	1,669.1	724.6	6,075.3	1,588.4
June	19,844.6	7,943.4	11,901.1	620.5	162.8	425.9	262.8	352.8	1,608.5	710.1	6,151.9	1,605.8
Sept	20,244.9	8,036.9	12,208.0	610.5	161.7	570.8	266.5	364.3	1,697.8	704.0	6,301.9	1,530.5
Dec	20,492.7	8,132.1	12,360.6	636.7	160.4	432.1	289.4	377.9	1,797.5	735.0	6,211.3	1,720.4
2018: Mar	21,089.9	8,086.6	13,003.3	637.8	159.0	589.7	300.1	366.9	1,977.1	715.8	6,223.4	2,033.6
June	21,195.3	8,106.9	13,088.5	663.1	157.8	605.0	307.3	360.2	1,843.4	726.8	6,225.0	2,199.9
Sept	21,516.1	8,068.1	13,447.9	682.0	156.8	615.3	301.7	361.3	1,898.2	730.7	6,225.9	2,476.0
Dec	21,974.1	8,095.0	13,879.1	769.7	155.7	637.3	367.9	360.5	2,023.3	713.2	6,270.1	2,581.5
2019: Mar	22,028.0	7,999.1	14,028.9	769.5	154.5	443.6	357.6	361.0	2,058.3	752.7	6,474.0	2,657.7
June	22,023.5	7,945.2	14,078.4	808.2	153.4	470.4	382.0	363.4	1,951.2	751.4	6,625.9	2,572.6
Sept	22,719.4	8,023.6	14,695.8	909.4	152.3	691.1	346.4	366.5	2,217.3	766.8	6,923.5	2,322.4
Dec	23,201.4	8,359.9	14,841.5	935.1	151.3	705.3	344.2	368.7	2,350.6	793.1	6,844.2	2,349.0
2020: Mar	23,686.9	9,279.7	14,407.2	947.6	150.0	787.5	336.8	396.3	2,384.6	862.1	6,949.5	1,592.8
June	26,477.4	10,157.7	16,319.6	1,157.9	149.8	818.1	306.3	402.6	3,559.4	1,032.8	7,052.1	1,840.6
Sept	26,945.4	10,371.9	16,573.5	1,240.9	148.6	846.1	327.0	413.3	3,531.8	1,057.7	7,069.2	1,938.9
Dec	27,747.8	10,809.2	16,938.6	1,264.9	147.1	864.6	354.2	398.2	3,552.9	1,111.9	7,070.7	2,174.1
2021: Mar	28,132.6	11,095.5	17,037.1	1,347.6	145.7	841.0	346.4	388.1	3,665.1	1,112.1	7,038.3	2,152.7
June	28,529.4	11,382.9	17,146.5	1,432.6	144.6	869.4	430.2	416.2	3,515.7	1,326.2	7,518.9	1,492.6
Sept	28,428.9	11,579.1	16,849.8	1,539.6	143.6	700.7	424.0	417.7	2,988.8	1,397.1	7,570.9	1,667.4
Dec	29,617.2	12,125.9	17,491.3	....	146.2	....	....	....	....	....	7,739.4	....

[1] Face value.
[2] Federal Reserve holdings exclude Treasury securities held under repurchase agreements.
[3] Includes U.S. chartered depository institutions, foreign banking offices in U.S., banks in U.S. affiliated areas, credit unions, and bank holding companies.
[4] Current accrual value includes myRA.
[5] Includes Treasury securities held by the Federal Employees Retirement System Thrift Savings Plan "G Fund."
[6] Includes money market mutual funds, mutual funds, and closed-end investment companies.
[7] Includes nonmarketable foreign series, Treasury securities, and Treasury deposit funds. Excludes Treasury securities held under repurchase agreements in custody accounts at the Federal Reserve Bank of New York. Estimates reflect benchmarks to this series at differing intervals; for further detail, see *Treasury Bulletin* and http://www.treasury.gov/resource-center/data-chart-center/tic/pages/index.aspx.
[8] Includes individuals, Government-sponsored enterprises, brokers and dealers, bank personal trusts and estates, corporate and noncorporate businesses, and other investors.

Source: Department of the Treasury.

TABLE B–53. Corporate profits with inventory valuation and capital consumption adjustments, 1971–2021

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Corporate profits with inventory valuation and capital consumption adjustments	Taxes on corporate income	Corporate profits after tax with inventory valuation and capital consumption adjustments		
			Total	Net dividends	Undistributed profits with inventory valuation and capital consumption adjustments
1971	100.6	34.8	65.8	28.4	37.5
1972	117.2	39.1	78.1	30.1	48.0
1973	133.4	45.6	87.8	34.2	53.5
1974	125.7	47.2	78.5	38.8	39.7
1975	138.9	46.3	92.6	38.3	54.3
1976	174.3	59.4	114.9	44.9	70.0
1977	205.8	68.5	137.3	50.7	86.6
1978	238.6	77.9	160.7	57.8	102.9
1979	249.0	80.7	168.2	66.8	101.4
1980	223.6	75.5	148.1	75.8	72.3
1981	247.5	70.3	177.2	87.8	89.4
1982	229.9	51.3	178.6	92.9	85.6
1983	279.8	66.4	213.3	97.7	115.7
1984	337.9	81.5	256.4	106.9	149.5
1985	354.5	81.6	272.9	115.3	157.5
1986	324.4	91.9	232.5	124.0	108.5
1987	366.0	112.7	253.3	130.1	123.2
1988	414.5	124.3	290.2	147.3	142.9
1989	414.3	124.4	289.9	179.6	110.3
1990	417.7	121.8	295.9	192.7	103.2
1991	452.6	117.8	334.8	201.3	133.5
1992	477.2	131.9	345.3	206.3	139.0
1993	524.6	155.0	369.5	221.3	148.2
1994	624.8	172.7	452.1	256.4	195.7
1995	706.2	194.4	511.8	282.3	229.4
1996	789.5	211.4	578.1	323.6	254.5
1997	869.7	224.8	645.0	360.1	284.9
1998	808.5	221.8	586.6	383.6	203.0
1999	834.9	227.4	607.5	373.5	234.0
2000	786.6	233.4	553.1	410.2	142.9
2001	758.7	170.1	588.6	397.9	190.7
2002	911.7	160.7	751.0	424.9	326.2
2003	1,056.3	213.8	842.5	456.0	386.5
2004	1,289.3	278.5	1,010.8	582.2	428.6
2005	1,488.6	379.7	1,108.9	602.0	506.9
2006	1,646.3	430.1	1,216.1	755.1	461.1
2007	1,533.2	391.8	1,141.4	853.5	287.9
2008	1,285.8	255.9	1,029.9	840.3	189.6
2009	1,386.8	203.9	1,182.9	622.1	560.8
2010	1,728.7	272.3	1,456.5	643.2	813.3
2011	1,809.8	280.8	1,529.0	779.1	749.9
2012	1,997.4	334.6	1,662.8	948.7	714.1
2013	2,010.7	362.6	1,648.1	1,009.0	639.1
2014	2,120.2	407.1	1,713.1	1,096.1	617.1
2015	2,060.5	396.3	1,664.2	1,164.9	499.3
2016	2,037.7	376.2	1,661.5	1,189.4	472.1
2017	2,128.9	312.3	1,816.6	1,264.1	552.5
2018	2,305.0	281.5	2,023.4	1,338.4	685.0
2019	2,367.8	302.2	2,065.6	1,386.4	679.2
2020	2,243.8	275.6	1,968.1	1,394.9	573.3
2021 p	....	....	....	1,415.8	....
2018: I	2,240.1	256.8	1,983.3	1,288.6	694.7
II	2,264.4	282.9	1,981.4	1,314.5	666.9
III	2,320.3	287.2	2,033.1	1,355.7	677.3
IV	2,395.0	299.2	2,095.9	1,394.8	701.1
2019: I	2,297.2	297.4	1,999.8	1,367.5	632.3
II	2,387.0	303.8	2,083.2	1,393.7	689.5
III	2,381.8	291.5	2,090.3	1,387.0	703.2
IV	2,405.1	316.0	2,089.2	1,397.4	691.8
2020: I	2,169.5	245.4	1,924.0	1,417.7	506.3
II	1,942.6	241.2	1,701.5	1,395.7	305.8
III	2,435.4	300.3	2,135.1	1,368.6	766.5
IV	2,427.5	315.6	2,111.9	1,397.5	714.4
2021: I	2,551.4	343.7	2,207.7	1,359.7	848.0
II	2,819.2	378.6	2,440.6	1,411.0	1,029.6
III	2,916.1	393.3	2,522.7	1,438.7	1,084.0
IV p	....	....	....	1,453.7	....

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–54. Corporate profits by industry, 1971–2021

[Billions of dollars; quarterly data at seasonally adjusted annual rates]

Year or quarter	Corporate profits with inventory valuation adjustment and without capital consumption adjustment													
	Total	Domestic industries												Rest of the world
		Total	Financial			Nonfinancial								
			Total	Federal Reserve banks	Other	Total	Manu-facturing	Transportation [1]	Utilities	Whole-sale trade	Retail trade	Infor-mation	Other	
SIC: [2]														
1971	94.7	86.8	17.9	3.3	14.6	68.9	40.0	9.6	....	5.4	7.3	....	6.7	7.9
1972	109.3	99.7	19.5	3.3	16.1	80.3	47.6	10.4	....	7.2	7.5	....	7.6	9.5
1973	126.6	111.7	21.1	4.5	16.6	90.6	55.0	10.2	....	8.8	7.0	....	9.6	14.9
1974	123.3	105.8	20.8	5.7	15.1	85.1	51.0	9.1	....	12.2	2.8	....	10.0	17.5
1975	144.2	129.6	20.4	5.6	14.8	109.2	63.0	11.7	....	14.3	8.4	....	11.8	14.6
1976	182.1	165.6	25.6	5.9	19.7	140.0	82.5	17.5	....	13.7	10.9	....	15.3	16.5
1977	212.8	193.7	32.6	6.1	26.5	161.1	91.5	21.2	....	16.4	12.8	....	19.2	19.1
1978	246.7	223.8	40.8	7.6	33.1	183.1	105.8	25.5	....	16.7	13.1	....	22.0	22.9
1979	261.0	226.4	41.8	9.4	32.3	184.6	107.1	21.6	....	20.0	10.7	....	25.2	34.6
1980	240.6	205.2	35.2	11.8	23.5	169.9	97.6	22.2	....	18.5	7.0	....	24.6	35.5
1981	252.0	222.3	30.3	14.4	15.9	192.0	112.5	25.1	....	23.7	10.7	....	20.1	29.7
1982	224.8	192.2	27.2	15.2	12.0	165.0	89.6	28.1	....	20.7	14.3	....	12.3	32.6
1983	256.4	221.4	36.2	14.6	21.6	185.2	97.3	34.3	....	21.9	19.3	....	12.3	35.1
1984	294.3	257.7	34.7	16.4	18.3	223.0	114.2	44.7	....	30.4	21.5	....	12.1	36.6
1985	289.7	251.6	46.5	16.3	30.2	205.1	107.1	39.1	....	24.6	22.8	....	11.4	38.1
1986	273.3	233.8	56.4	15.5	40.8	177.4	75.6	39.3	....	24.4	23.4	....	14.7	39.5
1987	314.6	266.5	60.3	16.2	44.1	206.2	101.8	42.0	....	18.9	23.3	....	20.3	48.0
1988	366.2	309.2	66.9	18.1	48.8	242.3	132.8	46.8	....	20.4	19.8	....	22.5	57.0
1989	373.1	305.9	78.3	20.6	57.6	227.6	122.3	41.9	....	22.0	20.9	....	20.5	67.1
1990	391.2	315.1	89.6	21.8	67.8	225.5	120.9	43.5	....	19.4	20.3	....	21.3	76.1
1991	434.2	357.8	120.4	20.7	99.7	237.3	109.3	54.5	....	22.3	26.9	....	24.3	76.5
1992	459.7	386.6	132.4	18.3	114.1	254.2	109.8	57.7	....	25.3	28.1	....	33.4	73.1
1993	501.9	425.0	119.9	16.7	103.2	305.1	122.9	70.1	....	26.5	39.7	....	45.8	76.9
1994	589.3	511.3	125.9	18.5	107.4	385.4	162.6	83.9	....	31.4	46.3	....	61.2	78.0
1995	667.0	574.0	140.3	22.9	117.3	433.7	199.8	89.0	....	28.0	43.9	....	73.1	92.9
1996	741.8	639.8	147.9	22.5	125.3	492.0	220.4	91.2	....	39.9	52.0	....	88.5	102.0
1997	811.0	703.4	162.2	24.3	137.9	541.2	248.5	81.0	....	48.1	63.4	....	100.3	107.6
1998	743.8	641.1	138.9	25.6	113.3	502.1	220.4	72.6	....	50.6	72.3	....	86.3	102.8
1999	761.9	640.2	154.6	26.7	127.9	485.6	219.4	49.3	....	46.8	72.5	....	97.6	121.7
2000	729.8	584.1	149.7	31.2	118.5	434.4	205.9	33.8	....	50.4	68.9	....	75.4	145.7
NAICS: [2]														
1998	743.8	641.1	138.9	25.6	113.3	502.1	193.5	12.8	33.3	57.3	62.5	33.1	109.7	102.8
1999	761.9	640.2	154.6	26.7	127.9	485.6	184.5	7.2	34.4	55.6	59.5	20.8	123.5	121.7
2000	729.8	584.1	149.7	31.2	118.5	434.4	175.6	9.5	24.3	59.5	51.3	–11.9	126.1	145.7
2001	697.1	528.3	195.0	28.9	166.1	333.3	75.1	–.7	22.5	51.1	71.3	–26.4	140.2	168.8
2002	797.4	640.6	265.3	23.5	241.9	375.3	78.3	–6.5	10.5	53.5	83.3	5.0	151.2	156.8
2003	955.7	796.7	302.8	20.0	282.7	494.0	123.9	4.4	13.2	56.6	87.9	28.1	179.9	158.9
2004	1,217.5	1,022.4	346.0	20.0	326.0	676.3	186.2	12.0	21.1	72.7	94.0	61.6	228.8	195.1
2005	1,629.2	1,403.4	409.5	26.5	383.0	993.9	279.7	28.4	32.4	96.0	123.3	100.7	333.5	225.7
2006	1,812.2	1,572.5	413.1	33.8	379.3	1,159.4	352.9	40.8	55.2	105.0	133.6	115.2	356.8	239.7
2007	1,708.3	1,370.5	300.2	36.0	264.2	1,070.3	321.1	23.3	49.6	102.8	119.4	120.5	333.6	337.8
2008	1,344.5	954.3	94.6	35.1	59.5	859.7	240.0	29.3	30.4	92.7	82.2	98.8	286.3	390.2
2009	1,470.1	1,121.3	362.7	47.3	315.3	758.7	164.7	21.7	23.4	88.9	107.9	87.0	265.1	348.8
2010	1,786.4	1,400.6	405.8	71.6	334.3	994.8	281.8	44.6	30.6	99.3	115.9	102.3	320.4	385.8
2011	1,750.2	1,337.7	378.4	76.0	302.4	959.3	296.0	30.6	10.2	97.2	115.1	95.7	314.5	412.6
2012	2,144.7	1,739.3	482.4	71.7	410.6	1,256.9	403.0	54.4	13.8	137.9	155.7	112.0	380.1	405.4
2013	2,165.9	1,767.1	430.7	79.7	351.1	1,336.3	446.9	45.2	28.3	146.4	153.3	137.6	378.6	398.8
2014	2,266.6	1,861.7	483.1	103.5	379.6	1,378.6	458.7	55.7	32.8	150.6	157.3	126.6	397.0	404.9
2015	2,184.6	1,789.4	447.2	100.7	346.5	1,342.1	427.2	61.0	20.2	152.4	169.3	135.5	376.4	395.2
2016	2,138.8	1,718.9	457.4	92.0	365.4	1,261.5	336.8	64.6	9.4	127.9	175.2	157.8	389.8	419.9
2017	2,147.9	1,649.0	435.7	78.2	357.4	1,213.3	316.8	59.4	14.0	123.3	149.6	139.1	411.2	498.9
2018	2,211.3	1,689.6	450.3	68.0	382.3	1,239.3	346.7	48.6	22.0	114.5	148.1	140.3	419.1	521.7
2019	2,254.6	1,741.2	533.2	64.1	469.0	1,208.0	355.7	37.6	7.7	117.8	159.1	127.8	402.3	513.4
2020	2,165.9	1,711.2	502.5	92.9	409.6	1,208.7	328.8	19.2	10.4	123.7	218.5	134.9	373.1	454.7
2019: I	2,214.9	1,716.8	522.2	61.1	461.1	1,194.6	339.5	38.3	16.4	117.6	144.5	133.7	404.7	498.0
II	2,279.6	1,750.6	540.1	68.0	472.0	1,210.5	350.6	35.2	13.5	110.7	153.6	139.0	408.0	528.9
III	2,255.3	1,732.8	532.2	64.0	468.1	1,200.6	365.6	39.2	4.3	123.4	158.2	104.9	404.9	522.5
IV	2,268.6	1,764.5	538.3	63.3	475.0	1,226.2	367.1	37.6	–3.3	119.6	180.3	133.4	391.5	504.2
2020: I	2,081.9	1,602.8	486.0	81.6	404.5	1,116.8	340.9	22.8	0.6	131.9	171.2	126.5	322.9	479.1
II	1,864.0	1,455.7	500.6	89.7	410.9	955.1	246.9	6.5	11.1	101.4	209.7	112.0	267.6	408.3
III	2,360.5	1,906.0	502.4	106.1	396.4	1,403.6	362.3	22.7	10.4	125.4	250.2	143.4	489.2	454.5
IV	2,357.2	1,880.1	521.0	94.4	426.6	1,359.1	365.3	24.8	19.6	136.2	242.9	157.7	412.5	477.0
2021: I	2,461.8	1,995.4	519.9	83.9	436.0	1,475.6	401.9	34.5	20.9	112.6	280.2	161.0	464.4	466.4
II	2,747.7	2,287.6	576.9	114.4	462.5	1,710.7	450.5	64.4	11.9	137.6	307.6	175.5	563.3	460.2
III	2,873.9	2,362.6	597.5	128.7	468.8	1,765.1	500.4	47.4	20.4	155.4	270.2	176.8	594.5	511.3

[1] Data on Standard Industrial Classification (SIC) basis include transportation and public utilities. Those on North American Industry Classification System (NAICS) basis include transporation and warehousing. Utilities classified separately in NAICS (as shown beginning 1998).

[2] SIC-based industry data use the 1987 SIC for data beginning in 1987 and the 1972 SIC for prior data. NAICS-based data use 2002 NAICS.

Note: Industry data on SIC basis and NAICS basis are not necessarily the same and are not strictly comparable.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–55. Historical stock prices and yields, 1949–2003

End of year	Common stock prices (end of period) [1]									Common stock yields (Standard & Poor's) (percent) [5]	
	New York Stock Exchange (NYSE) indexes [2]						Dow Jones industrial average [2]	Standard & Poor's composite index (1941–43=10) [2]	Nasdaq composite index (Feb. 5, 1971=100) [2]	Dividend-price ratio [6]	Earnings-price ratio [7]
	Composite (Dec. 31, 2002=5,000) [3]	December 31, 1965=50									
		Composite	Industrial	Transportation	Utility [4]	Finance					
1949	....	....	....	....	....	....	200.52	16.76	....	6.59	15.48
1950	....	....	....	....	....	....	235.42	20.41	....	6.57	13.99
1951	....	....	....	....	....	....	269.23	23.77	....	6.13	11.82
1952	....	....	....	....	....	....	291.90	26.57	....	5.80	9.47
1953	....	13.60	....	....	....	....	280.90	24.81	....	5.80	10.26
1954	....	19.40	....	....	....	....	404.39	35.98	....	4.95	8.57
1955	....	23.71	....	....	....	....	488.40	45.48	....	4.08	7.95
1956	....	24.35	....	....	....	....	499.47	46.67	....	4.09	7.55
1957	....	21.11	....	....	....	....	435.69	39.99	....	4.35	7.89
1958	....	28.85	....	....	....	....	583.65	55.21	....	3.97	6.23
1959	....	32.15	....	....	....	....	679.36	59.89	....	3.23	5.78
1960	....	30.94	....	....	....	....	615.89	58.11	....	3.47	5.90
1961	....	38.93	....	....	....	....	731.14	71.55	....	2.98	4.62
1962	....	33.81	....	....	....	....	652.10	63.10	....	3.37	5.82
1963	....	39.92	....	....	....	....	762.95	75.02	....	3.17	5.50
1964	....	45.65	....	....	....	....	874.13	84.75	....	3.01	5.32
1965	528.69	50.00	50.00	50.00	50.00	50.00	969.26	92.43	....	3.00	5.59
1966	462.28	43.72	43.13	47.56	90.38	44.91	785.69	80.33	....	3.40	6.63
1967	569.18	53.83	56.59	49.66	86.76	53.80	905.11	96.47	....	3.20	5.73
1968	622.79	58.90	61.69	56.27	91.64	76.48	943.75	103.86	....	3.07	5.67
1969	544.86	51.53	54.74	37.85	77.54	67.87	800.36	92.06	....	3.24	6.08
1970	531.12	50.23	52.91	35.70	81.64	64.34	838.92	92.15	....	3.83	6.45
1971	596.68	56.43	60.53	49.56	78.78	73.83	890.20	102.09	114.12	3.14	5.41
1972	681.79	64.48	70.33	47.69	84.34	83.34	1,020.02	118.05	133.73	2.84	5.50
1973	547.93	51.82	56.60	37.53	68.66	64.51	850.86	97.55	92.19	3.06	7.12
1974	382.03	36.13	39.15	26.36	53.30	39.84	616.24	68.56	59.82	4.47	11.59
1975	503.73	47.64	52.73	32.98	66.94	45.20	852.41	90.19	77.62	4.31	9.15
1976	612.01	57.88	63.36	42.57	82.54	59.23	1,004.65	107.46	97.88	3.77	8.90
1977	555.12	52.50	56.43	40.50	81.08	53.85	831.17	95.10	105.05	4.62	10.79
1978	566.96	53.62	58.87	41.58	75.38	55.01	805.01	96.11	117.98	5.28	12.03
1979	655.04	61.95	70.24	50.64	73.80	63.45	838.74	107.94	151.14	5.47	13.46
1980	823.27	77.86	91.52	76.19	76.90	70.83	963.99	135.76	202.34	5.26	12.66
1981	751.90	71.11	80.89	66.85	80.10	73.68	875.00	122.55	195.84	5.20	11.96
1982	856.79	81.03	93.02	73.63	86.94	85.00	1,046.54	140.64	232.41	5.81	11.60
1983	1,006.41	95.18	111.35	98.09	92.48	94.32	1,258.64	164.93	278.60	4.40	8.03
1984	1,013.91	96.38	110.58	90.61	103.14	97.63	1,211.57	167.24	247.35	4.64	10.02
1985	1,285.66	121.59	139.27	113.97	126.38	131.29	1,546.67	211.28	324.93	4.25	8.12
1986	1,465.31	138.59	160.11	117.65	147.54	140.05	1,895.95	242.17	348.83	3.49	6.09
1987	1,461.61	138.23	167.04	118.57	134.62	114.57	1,938.83	247.08	330.47	3.08	5.48
1988	1,652.25	156.26	189.42	146.60	149.38	128.19	2,168.57	277.72	381.38	3.64	8.01
1989	2,062.30	195.04	232.76	178.33	204.00	156.15	2,753.20	353.40	454.82	3.45	7.42
1990	1,908.45	180.49	223.60	141.49	182.60	122.06	2,633.66	330.22	373.84	3.61	6.47
1991	2,426.04	229.44	285.82	201.87	204.26	172.68	3,168.83	417.09	586.34	3.24	4.79
1992	2,539.92	240.21	294.39	214.72	209.66	200.83	3,301.11	435.71	676.95	2.99	4.22
1993	2,739.44	259.08	315.26	270.48	229.92	216.82	3,754.09	466.45	776.80	2.78	4.46
1994	2,653.37	250.94	318.10	222.46	198.41	195.80	3,834.44	459.27	751.96	2.82	5.83
1995	3,484.15	329.51	413.29	301.96	252.90	274.25	5,117.12	615.93	1,052.13	2.56	6.09
1996	4,148.07	392.30	494.38	352.30	259.91	351.17	6,448.27	740.74	1,291.03	2.19	5.24
1997	5,405.19	511.19	630.38	466.25	335.19	495.96	7,908.25	970.43	1,570.35	1.77	4.57
1998	6,299.94	595.81	743.65	482.38	445.94	521.42	9,181.43	1,229.23	2,192.69	1.49	3.46
1999	6,876.10	650.30	828.21	466.70	511.15	516.61	11,497.12	1,469.25	4,069.31	1.25	3.17
2000	6,945.57	656.87	803.29	462.76	440.54	646.95	10,786.85	1,320.28	2,470.52	1.15	3.63
2001	6,236.39	589.80	735.71	438.81	329.84	593.69	10,021.50	1,148.08	1,950.40	1.32	2.95
2002	5,000.00	472.87	583.95	395.81	233.08	510.46	8,341.63	879.82	1,335.51	1.61	2.92
2003 [3]	6,440.30	572.56	735.50	519.58	265.58	655.12	10,453.92	1,111.92	2,003.37	1.77	3.84

[1] End of period.

[2] Includes stocks as follows: for NYSE, all stocks listed; for Dow Jones industrial average, 30 stocks; for Standard & Poor's (S&P) composite index, 500 stocks; and for Nasdaq composite index, over 5,000.

[3] The NYSE relaunched the composite index on January 9, 2003, incorporating new definitions, methodology, and base value. (The composite index based on December 31, 1965=50 was discontinued.) Subset indexes on financial, energy, and health care were released by the NYSE on January 8, 2004 (see Table B–56). NYSE indexes shown in this table for industrials, utilities, transportation, and finance were discontinued.

[4] Effective April 1993, the NYSE doubled the value of the utility index to facilitate trading of options and futures on the index. Indexes prior to 1993 reflect the doubling.

[5] Based on 500 stocks in the S&P composite index.

[6] Aggregate cash dividends (based on latest known annual rate) divided by aggregate market value based on Wednesday closing prices. Monthly data are averages of weekly figures; annual data are averages of monthly figures.

[7] Quarterly data are ratio of earnings (after taxes) for four quarters ending with particular quarter-to-price index for last day of that quarter. Annual data are averages of quarterly ratios.

Sources: New York Stock Exchange, Dow Jones & Co., Inc., Standard & Poor's, and Nasdaq Stock Market.

Table B–56. Common stock prices and yields, 2000–2021

End of year or month	Common stock prices (end of period)[1]							Common stock yields (Standard & Poor's) (percent)[4]	
	New York Stock Exchange (NYSE) indexes (December 31, 2002=5,000)[2, 3]				Dow Jones industrial average[2]	Standard & Poor's composite index (1941–43=10)[2]	Nasdaq composite index (Feb. 5, 1971=100)[2]	Dividend-price ratio[5]	Earnings-price ratio[6]
	Composite	Financial	Energy	Health care					
2000	6,945.57	...	...	...	10,786.85	1,320.28	2,470.52	1.15	3.63
2001	6,236.39	...	...	...	10,021.50	1,148.08	1,950.40	1.32	2.95
2002	5,000.00	5,000.00	5,000.00	5,000.00	8,341.63	879.82	1,335.51	1.61	2.92
2003	6,440.30	6,676.42	6,321.05	5,925.97	10,453.92	1,111.92	2,003.37	1.77	3.84
2004	7,250.06	7,493.92	7,934.49	6,119.07	10,783.01	1,211.92	2,175.44	1.72	4.89
2005	7,753.95	7,996.94	10,109.61	6,458.20	10,717.50	1,248.29	2,205.32	1.83	5.36
2006	9,139.02	9,552.22	11,967.88	6,958.64	12,463.15	1,418.30	2,415.29	1.87	5.78
2007	9,740.32	8,300.68	15,283.81	7,170.42	13,264.82	1,468.36	2,652.28	1.86	5.29
2008	5,757.05	3,848.42	9,434.01	5,340.73	8,776.39	903.25	1,577.03	2.37	3.54
2009	7,184.96	4,721.02	11,415.03	6,427.27	10,428.05	1,115.10	2,269.15	2.40	1.86
2010	7,964.02	4,958.62	12,520.29	6,501.53	11,577.51	1,257.64	2,652.87	1.98	6.04
2011	7,477.03	4,062.88	12,409.61	7,045.61	12,217.56	1,257.60	2,605.15	2.05	6.77
2012	8,443.51	5,114.54	12,606.06	7,904.06	13,104.14	1,426.19	3,019.51	2.24	6.20
2013	10,400.33	6,353.68	14,557.54	10,245.31	16,576.66	1,848.36	4,176.59	2.14	5.57
2014	10,839.24	6,707.16	12,533.54	11,967.04	17,823.07	2,058.90	4,736.05	2.04	5.25
2015	10,143.42	6,305.68	9,343.81	12,385.19	17,425.03	2,043.94	5,007.41	2.10	4.59
2016	11,056.89	6,961.56	11,503.76	11,907.20	19,762.60	2,238.83	5,383.12	2.19	4.17
2017	12,808.84	8,235.89	11,470.58	14,220.58	24,719.22	2,673.61	6,903.39	1.97	4.22
2018	11,374.39	6,969.48	9,341.44	15,158.38	23,327.46	2,506.85	6,635.28	1.90	4.66
2019	13,913.03	8,700.11	10,037.30	18,070.10	28,538.44	3,230.78	8,972.60	1.93	4.53
2020	14,524.80	8,292.85	6,502.78	20,045.67	30,606.48	3,756.07	12,888.28	1.89	3.28
2021	17,164.13	10,175.36	9,146.18	24,345.65	36,338.30	4,766.18	15,644.97	1.38	...
2019: Jan	12,299.03	7,613.43	10,351.36	15,655.94	24,999.67	2,704.10	7,281.74	2.07	...
Feb	12,644.81	7,770.10	10,560.79	15,932.89	25,916.00	2,784.49	7,532.53	1.98	...
Mar	12,696.88	7,685.02	10,679.94	16,182.85	25,928.68	2,834.40	7,729.32	1.96	4.74
Apr	13,060.65	8,138.15	10,699.48	15,706.22	26,592.91	2,945.83	8,095.39	1.90	...
May	12,264.49	7,663.98	9,679.30	15,380.82	24,815.04	2,752.06	7,453.15	1.95	...
June	13,049.71	8,064.09	10,334.74	16,347.65	26,599.96	2,941.76	8,006.24	1.94	4.60
July	13,066.60	8,130.16	9,973.03	16,209.28	26,864.27	2,980.38	8,175.42	1.88	...
Aug	12,736.88	7,824.31	9,138.41	16,119.87	26,403.28	2,926.46	7,962.88	1.96	...
Sept	13,004.74	8,115.96	9,564.95	15,990.79	26,916.83	2,976.74	7,999.34	1.92	4.46
Oct	13,171.81	8,293.63	9,423.40	16,716.08	27,046.23	3,037.56	8,292.36	1.93	...
Nov	13,545.21	8,516.89	9,445.81	17,407.66	28,051.41	3,140.98	8,665.47	1.87	...
Dec	13,913.03	8,700.11	10,037.30	18,070.10	28,538.44	3,230.78	8,972.60	1.84	4.32
2020: Jan	13,614.10	8,535.85	9,007.57	17,753.73	28,256.03	3,225.52	9,150.94	1.80	...
Feb	12,380.97	7,701.35	7,770.44	16,364.87	25,409.36	2,954.22	8,567.37	1.84	...
Mar	10,301.87	5,972.42	5,319.36	15,554.24	21,917.16	2,584.59	7,700.10	2.30	4.50
Apr	11,372.34	6,467.31	6,190.56	17,500.36	24,345.72	2,912.43	8,889.55	2.20	...
May	11,802.95	6,612.69	6,262.28	18,041.17	25,383.11	3,044.31	9,489.87	2.08	...
June	11,893.78	6,709.21	6,242.11	17,505.30	25,812.88	3,100.29	10,058.77	1.95	3.20
July	12,465.05	6,849.26	6,024.80	18,380.12	26,428.32	3,271.12	10,745.27	1.89	...
Aug	13,045.60	7,181.16	6,014.26	18,853.66	28,430.05	3,500.31	11,775.46	1.78	...
Sept	12,701.88	6,860.62	5,161.75	18,559.43	27,781.70	3,363.00	11,167.51	1.79	2.92
Oct	12,429.28	6,761.94	4,912.48	17,847.94	26,501.60	3,269.96	10,911.59	1.76	...
Nov	14,006.46	7,887.93	6,232.84	19,390.40	29,638.64	3,621.63	12,198.74	1.69	...
Dec	14,524.80	8,292.85	6,502.78	20,045.67	30,606.48	3,756.07	12,888.28	1.62	2.51
2021: Jan	14,397.20	8,072.62	6,733.84	20,208.09	29,982.62	3,714.24	13,070.69	1.55	...
Feb	15,010.47	8,853.18	7,774.59	19,760.30	30,932.37	3,811.15	13,192.35	1.49	...
Mar	15,601.74	9,240.02	7,995.97	20,388.89	32,981.55	3,972.89	13,246.87	1.48	3.23
Apr	16,219.33	9,773.10	8,005.80	21,141.32	33,874.85	4,181.17	13,962.68	1.39	...
May	16,555.66	10,112.15	8,440.17	21,494.66	34,529.45	4,204.11	13,748.74	1.38	...
June	16,555.35	9,889.35	8,787.30	21,796.88	34,502.51	4,297.50	14,503.95	1.37	3.69
July	16,602.29	9,923.19	8,163.13	22,679.73	34,935.47	4,395.26	14,672.68	1.34	...
Aug	16,806.44	10,162.18	8,052.76	23,180.04	35,360.73	4,522.68	15,259.24	1.32	...
Sept	16,144.92	9,934.02	8,784.79	21,846.16	33,843.92	4,307.54	14,448.58	1.33	4.07
Oct	17,016.41	10,455.70	9,460.44	23,131.46	35,819.56	4,605.38	15,498.39	1.33	...
Nov	16,318.97	9,756.72	8,829.04	22,267.26	34,483.72	4,567.00	15,537.69	1.29	...
Dec	17,164.13	10,175.36	9,146.18	24,345.65	36,338.30	4,766.18	15,644.97	1.29	...

[1] End of year or month.

[2] Includes stocks as follows: for NYSE, all stocks listed (in 2021, over 2,800); for Dow Jones industrial average, 30 stocks; for Standard & Poor's (S&P) composite index, 500 stocks; and for Nasdaq composite index, in 2021, over 3,600.

[3] The NYSE relaunched the composite index on January 9, 2003, incorporating new definitions, methodology, and base value. Subset indexes on financial, energy, and health care were released by the NYSE on January 8, 2004.

[4] Based on 500 stocks in the S&P composite index.

[5] Aggregate cash dividends (based on latest known annual rate) divided by aggregate market value based on Wednesday closing prices. Monthly data are averages of weekly figures, annual data are averages of monthly figures.

[6] Quarterly data are ratio of earnings (after taxes) for four quarters ending with particular quarter-to-price index for last day of that quarter. Annual data are averages of quarterly ratios.

Sources: New York Stock Exchange, Dow Jones & Co., Inc., Standard & Poor's, and Nasdaq Stock Market.

Table B–57. U.S. international transactions, 1971–2021

[Millions of dollars; quarterly data seasonally adjusted]

Year or quarter	Current Account [1]												Current account balance as a percentage of GDP
	Goods [2]			Services			Balance on goods and services	Primary income receipts and payments			Balance on secondary Income [3]	Balance on current account	
	Exports	Imports	Balance on goods	Exports	Imports	Balance on services		Receipts	Payments	Balance on primary income			
1971	43,319	45,579	−2,260	16,358	15,401	959	−1,301	12,706	5,436	7,270	−7,402	−1,433	−0.1
1972	49,381	55,797	−6,416	17,842	16,867	973	−5,443	14,764	6,572	8,192	−8,544	−5,796	−.5
1973	71,410	70,499	911	19,832	18,843	989	1,900	21,809	9,656	12,153	−6,914	7,140	.5
1974	98,306	103,811	−5,505	22,591	21,378	1,212	−4,293	27,587	12,084	15,503	−9,248	1,961	.1
1975	107,088	98,185	8,903	25,497	21,996	3,500	12,403	25,351	12,565	12,786	−7,076	18,117	1.1
1976	114,745	124,228	−9,483	27,971	24,570	3,402	−6,082	29,374	13,312	16,062	−5,686	4,296	.2
1977	120,816	151,907	−31,091	31,486	27,640	3,845	−27,247	32,355	14,218	18,137	−5,227	−14,336	−.7
1978	142,075	176,002	−33,927	36,353	32,189	4,164	−29,763	42,087	21,680	20,407	−5,788	−15,143	−.6
1979	184,439	212,007	−27,568	39,693	36,689	3,003	−24,566	63,835	32,961	30,874	−6,593	−285	.0
1980	224,250	249,750	−25,500	47,585	41,492	6,093	−19,407	72,605	42,533	30,072	−8,349	2,318	.1
1981	237,044	265,067	−28,023	57,355	45,503	11,851	−16,172	86,529	53,626	32,903	−11,702	5,029	.2
1982	211,157	247,642	−36,485	64,078	51,750	12,330	−24,156	96,522	61,359	35,163	−16,545	−5,537	−.2
1983	201,799	268,901	−67,102	64,307	54,973	9,335	−57,767	96,031	59,643	36,388	−17,311	−38,691	−1.1
1984	219,926	332,418	−112,492	71,168	67,748	3,418	−109,074	115,639	80,574	35,065	−20,334	−94,344	−2.3
1985	215,915	338,088	−122,173	73,156	72,863	294	−121,879	105,046	79,324	25,722	−21,999	−118,155	−2.7
1986	223,344	368,425	−145,081	86,690	80,147	6,543	−138,539	102,798	87,304	15,494	−24,131	−147,176	−3.2
1987	250,208	409,765	−159,557	98,661	90,788	7,874	−151,683	113,603	99,309	14,294	−23,265	−160,655	−3.3
1988	320,230	447,189	−126,959	110,920	98,525	12,394	−114,566	141,666	122,981	18,685	−25,274	−121,153	−2.3
1989	359,916	477,665	−117,749	127,087	102,480	24,607	−93,142	166,384	146,560	19,824	−26,169	−99,487	−1.8
1990	387,401	498,438	−111,037	147,833	117,660	30,173	−80,865	176,894	148,345	28,549	−26,654	−78,969	−1.3
1991	414,083	491,020	−76,937	164,260	118,459	45,802	−31,136	155,327	131,198	24,129	9,904	2,897	.0
1992	439,631	536,528	−96,897	177,251	119,566	57,685	−39,212	139,082	114,845	24,237	−36,635	−51,613	−.8
1993	456,943	589,394	−132,451	185,920	123,780	62,141	−70,311	141,606	116,287	25,319	−39,811	−84,805	−1.2
1994	502,859	668,690	−165,831	200,395	133,057	67,338	−98,493	169,447	152,302	17,145	−40,265	−121,612	−1.7
1995	575,204	749,374	−174,170	219,183	141,397	77,786	−96,384	213,661	192,771	20,890	−38,074	−113,567	−1.5
1996	612,113	803,113	−191,000	239,489	152,554	86,935	−104,065	229,530	207,212	22,318	−43,017	−124,764	−1.5
1997	678,366	876,794	−198,428	256,087	165,932	90,155	−108,273	261,357	248,750	12,607	−45,062	−140,726	−1.6
1998	670,416	918,637	−248,221	262,758	180,677	82,081	−166,140	266,244	261,978	4,266	−53,187	−215,062	−2.4
1999	698,524	1,035,592	−337,068	278,001	196,742	81,258	−255,809	302,540	292,566	9,974	−40,777	−286,612	−3.0
2000	784,940	1,231,722	−446,783	298,023	220,927	77,096	−369,686	365,612	350,980	14,632	−46,863	−401,918	−3.9
2001	731,331	1,153,701	−422,370	284,035	222,039	61,997	−360,373	311,364	288,120	23,244	−56,953	−394,082	−3.7
2002	698,036	1,173,281	−475,245	288,059	233,480	54,579	−420,666	306,391	288,886	17,506	−52,949	−456,110	−4.2
2003	730,446	1,272,089	−541,643	297,740	252,340	45,401	−496,243	346,931	317,677	29,254	−55,300	−522,289	−4.6
2004	823,584	1,488,349	−664,766	344,536	290,609	53,927	−610,838	432,839	386,256	46,583	−71,634	−635,890	−5.2
2005	913,016	1,695,820	−782,804	378,487	312,225	66,262	−716,542	536,294	492,108	44,186	−76,876	−749,232	−5.7
2006	1,040,905	1,878,194	−837,289	423,086	349,329	73,756	−763,533	669,919	653,945	15,974	−69,088	−816,646	−5.9
2007	1,165,151	1,986,347	−821,196	495,664	385,464	110,199	−710,997	816,938	752,582	64,356	−89,910	−736,550	−5.1
2008	1,308,795	2,141,287	−832,492	540,791	420,650	120,142	−712,350	820,244	708,225	112,019	−96,192	−696,523	−4.7
2009	1,070,331	1,580,025	−509,694	522,461	407,538	114,923	−394,771	653,222	537,684	115,539	−100,496	−379,729	−2.6
2010	1,290,279	1,938,950	−648,671	582,041	436,456	145,584	−503,087	723,223	553,311	169,911	−98,834	−432,009	−2.9
2011	1,498,887	2,239,886	−740,999	644,665	458,188	186,477	−554,522	791,469	589,038	202,431	−103,211	−455,302	−2.9
2012	1,562,630	2,303,749	−741,119	684,823	469,610	215,213	−525,906	791,679	593,754	197,925	−90,134	−418,115	−2.6
2013	1,593,708	2,294,247	−700,539	719,413	465,736	253,678	−446,861	811,561	616,041	195,520	−88,115	−339,456	−2.0
2014	1,635,563	2,385,480	−749,917	757,051	491,086	265,965	−483,952	845,926	645,623	200,303	−86,339	−369,987	−2.1
2015	1,511,381	2,273,249	−761,868	768,660	498,213	270,447	−491,421	825,100	639,724	185,376	−102,843	−408,889	−2.2
2016	1,457,393	2,207,195	−749,801	780,944	512,617	268,326	−481,475	857,819	660,798	197,021	−113,116	−397,571	−2.1
2017	1,557,003	2,356,345	−799,343	833,775	547,172	286,603	−512,739	997,044	737,500	259,544	−108,510	−361,705	−1.9
2018	1,676,913	2,555,662	−878,749	861,725	563,926	297,799	−580,950	1,106,417	847,286	259,131	−116,417	−438,236	−2.1
2019	1,652,072	2,513,587	−861,515	876,295	591,121	285,174	−576,341	1,124,929	893,009	231,920	−127,725	−472,146	−2.2
2020	1,428,798	2,350,825	−922,026	705,643	460,301	245,342	−676,684	957,857	769,397	188,460	−127,871	−616,095	−2.9
2018: I	411,655	630,764	−219,109	216,302	137,379	78,923	−140,186	269,450	199,076	70,374	−27,457	−97,269	−1.9
II	428,067	633,677	−205,610	214,908	140,460	74,448	−131,162	278,850	212,434	66,417	−28,839	−93,584	−1.8
III	420,290	645,479	−225,189	215,380	141,215	74,166	−151,023	274,704	215,574	59,131	−27,982	−119,874	−2.3
IV	416,901	645,743	−228,842	215,135	144,872	70,263	−158,579	283,412	220,203	63,209	−32,139	−127,508	−2.5
2019: I	417,154	634,762	−217,608	215,879	144,898	70,981	−146,627	276,324	221,827	54,497	−34,977	−127,106	−2.4
II	414,021	638,383	−224,362	220,817	148,822	71,995	−152,367	287,245	226,977	60,267	−31,815	−123,915	−2.3
III	411,772	630,143	−218,372	218,947	149,184	69,762	−148,609	283,354	223,022	60,332	−29,208	−117,485	−2.2
IV	409,126	610,299	−201,174	220,652	148,216	72,436	−128,737	278,006	221,183	56,823	−31,725	−103,640	−1.9
2020: I	398,143	598,403	−200,260	199,257	133,246	66,011	−134,248	253,442	201,978	51,464	−32,004	−114,788	−2.1
II	289,779	513,050	−223,271	165,208	100,485	64,723	−158,549	212,111	177,587	34,524	−29,841	−153,866	−3.2
III	356,826	602,196	−245,370	166,433	108,163	58,270	−187,101	240,265	192,008	48,257	−33,519	−172,362	−3.3
IV	384,050	637,175	−253,125	174,745	118,406	56,339	−196,787	252,040	197,824	54,216	−32,508	−175,079	−3.3
2021: I	408,344	677,232	−268,889	181,461	118,670	62,791	−206,097	262,922	212,732	50,190	−33,516	−189,424	−3.4
II	436,766	706,381	−269,614	190,879	128,327	62,552	−207,062	263,988	225,160	38,827	−30,084	−198,319	−3.5
III p	441,594	716,421	−274,827	190,829	140,966	49,863	−224,964	281,908	233,746	48,162	−37,972	−214,774	−3.7

[1] Current and capital account statistics in the international transactions accounts differ slightly from statistics in the National Income and Product Accounts (NIPAs) because of adjustments made to convert the international statistics to national accounting concepts. A reconciliation can be found in NIPA table 4.3B.

[2] Adjusted from Census data to align with concepts and definitions used to prepare the international and national economic accounts. The adjustments are necessary to supplement coverage of Census data, to eliminate duplication of transactions recorded elsewhere in the international accounts, to value transactions according to a standard definition, and for earlier years, to record transactions in the appropriate period.

See next page for continuation of table.

TABLE B–57. U.S. international transactions, 1971–2021—*Continued*

[Millions of dollars; quarterly data seasonally adjusted]

Year or quarter	Balance on capital account [1]	Financial account											Statistical discrepancy
		Net U.S. acquisition of financial assets excluding financial derivatives [net increase in assets / financial outflow (+)]					Net U.S. incurrence of liabilities excluding financial derivatives [net increase in liabilities / financial inflow (+)]				Financial derivatives other than reserves, net transactions	Net lending (+) or net borrowing (–) from financial account transactions [5]	
		Total	Direct investment assets	Portfolio investment assets	Other investment assets	Reserve assets [4]	Total	Direct investment liabilities	Portfolio investment liabilities	Other investment liabilities			
1971	....	12,474	7,618	1,113	6,092	–2,349	23,687	368	28,835	–5,516	....	–11,213	–9,779
1972	....	14,497	7,747	619	6,127	4	22,171	948	13,123	8,100	....	–7,674	–1,879
1973	....	22,874	11,353	672	11,007	–158	18,388	2,800	4,790	10,798	....	4,486	–2,654
1974	....	34,745	9,052	1,853	22,373	1,467	35,228	4,761	5,500	24,967	....	–483	–2,444
1975	....	39,703	14,244	6,247	18,363	849	16,870	2,603	12,761	1,506	....	22,833	4,717
1976	....	51,269	11,949	8,885	27,877	2,558	37,840	4,347	16,165	17,328	....	13,429	9,134
1977	....	34,785	11,891	5,459	17,060	375	52,770	3,728	37,615	11,427	....	–17,985	–3,651
1978	....	61,130	16,057	3,626	42,179	–732	66,275	7,896	30,083	28,296	....	–5,145	9,997
1979	....	66,053	25,223	12,430	27,267	1,133	40,693	11,876	–13,502	42,319	....	25,360	25,647
1980	....	86,968	19,222	6,042	53,550	8,154	62,036	16,918	23,825	21,293	....	24,932	22,614
1981	....	114,147	9,624	15,650	83,697	5,176	85,684	25,196	17,509	42,979	....	28,463	23,433
1982	....	142,722	19,397	12,395	105,965	4,965	109,897	27,475	19,695	62,727	....	32,825	38,362
1983	....	74,690	20,844	2,063	50,588	1,195	95,715	18,688	18,382	58,645	....	–21,025	17,666
1984	....	50,740	26,770	3,498	17,340	3,132	126,413	34,832	38,695	52,886	....	–75,673	18,673
1985	....	47,064	21,241	3,008	18,957	3,858	146,544	22,057	68,004	56,483	....	–99,480	18,677
1986	....	107,252	19,524	8,984	79,057	–313	223,854	30,946	104,497	88,411	....	–116,602	30,570
1987	....	84,058	39,795	7,903	45,508	–9,148	251,863	63,232	79,631	109,000	....	–167,805	–7,149
1988	....	105,747	21,701	4,589	75,544	3,913	244,008	56,910	86,786	100,312	....	–138,261	–17,108
1989	–207	182,908	50,973	31,166	75,476	25,293	230,302	75,801	74,852	79,649	....	–47,394	52,299
1990	–7,221	103,985	59,934	30,557	11,336	2,158	162,109	71,247	25,767	65,095	....	–58,124	28,066
1991	–5,129	75,753	49,253	32,053	210	–5,763	119,586	34,535	72,562	12,489	....	–43,833	–41,601
1992	1,449	84,899	58,755	50,684	–20,639	–3,901	178,842	30,315	92,199	56,328	....	–93,943	–43,776
1993	–714	199,399	82,799	137,917	–22,696	1,379	278,607	50,211	174,387	54,009	....	–79,208	6,313
1994	–1,112	188,758	89,988	54,088	50,028	–5,346	312,995	55,942	131,849	125,204	....	–124,237	–1,514
1995	–221	363,555	110,041	143,506	100,266	9,742	446,393	69,067	254,431	122,895	....	–82,838	30,951
1996	–8	424,548	103,024	160,179	168,013	–6,668	559,027	97,644	392,107	69,276	....	–134,479	–9,706
1997	–256	502,024	121,352	121,036	258,626	1,010	720,999	122,150	311,105	287,744	....	–218,975	–77,995
1998	–7	385,936	174,751	132,186	72,216	6,783	452,901	211,152	225,878	15,871	....	–66,965	148,106
1999	–6,428	526,612	247,484	141,007	146,868	–8,747	765,215	312,449	278,697	174,069	....	–238,603	54,437
2000	–4,217	587,682	186,371	159,713	241,308	290	1,066,074	349,124	441,966	274,984	....	–478,392	–72,257
2001	12,170	386,313	146,041	106,919	128,442	4,911	788,345	172,496	431,492	184,357	....	–402,032	–20,120
2002	–3,825	319,175	178,984	79,532	56,978	3,681	821,844	111,056	504,155	206,634	....	–502,668	–42,734
2003	–8,499	371,104	195,218	133,059	44,351	–1,524	911,660	117,107	550,163	244,390	....	–540,556	–9,768
2004	–4,344	1,058,661	374,006	191,956	495,505	–2,806	1,600,881	213,642	867,340	519,899	....	–542,220	98,014
2005	950	562,996	52,591	267,290	257,210	–14,094	1,277,056	142,345	832,037	302,673	....	–714,059	34,223
2006	–7,439	1,324,623	283,800	493,366	549,830	–2,373	2,120,480	298,464	1,126,735	695,280	–29,710	–825,567	–1,482
2007	–6,057	1,563,467	523,889	380,807	658,649	122	2,190,087	346,615	1,156,612	686,860	–6,222	–632,841	109,765
2008	–172	–317,592	343,584	–284,269	–381,754	4,848	462,408	341,091	523,683	–402,367	32,947	–747,053	–50,358
2009	–5,877	131,082	312,597	375,883	–609,654	52,256	325,644	161,082	357,352	–192,789	–44,816	–239,379	146,227
2010	–6,891	958,737	349,829	199,620	407,454	1,835	1,391,042	264,039	820,434	306,569	–14,076	–446,381	–7,481
2011	–9,020	492,556	436,615	85,365	–45,301	15,877	983,522	263,499	311,626	408,397	–35,006	–525,972	–61,650
2012	931	176,937	377,239	248,760	–453,522	4,460	632,034	250,343	747,017	–365,327	7,064	–448,032	–30,849
2013	–6,559	649,753	392,796	481,298	–221,242	–3,099	1,052,068	288,131	511,987	251,949	2,222	–400,093	–54,079
2014	–6,535	866,702	387,528	582,676	–99,920	–3,583	1,109,443	251,857	697,607	159,979	–54,335	–297,076	79,447
2015	–7,940	197,359	302,072	160,410	–258,831	–6,292	503,468	511,434	213,910	–221,876	–27,035	–333,144	83,685
2016	–6,606	335,233	299,814	36,283	–2,955	2,090	706,693	474,388	231,265	1,040	7,827	–363,633	40,544
2017	12,394	1,190,633	409,413	569,376	213,533	–1,690	1,559,219	380,823	790,810	387,586	23,998	–344,588	4,722
2018	–4,261	383,815	–130,015	335,263	173,578	4,989	711,777	214,315	303,075	194,387	–20,404	–348,366	94,131
2019	–6,443	317,017	122,191	–13,479	203,647	4,659	755,724	302,200	177,157	276,368	–41,670	–480,377	–1,788
2020	–5,487	809,323	311,692	220,026	268,632	8,974	1,456,528	211,298	710,151	535,079	–5,780	–652,985	–31,403
2018: I	–1,347	341,438	–40,859	289,989	92,315	–7	429,953	50,094	301,122	78,737	29,139	–59,376	39,241
II	–2,937	–190,765	–72,528	–17,704	–103,601	3,068	–150,144	–5,686	–18,368	–126,090	–15,723	–56,343	40,177
III	–449	105,371	69,930	83,451	–47,833	–177	107,065	129,080	12,157	–34,172	–11,505	–13,199	107,124
IV	472	127,770	–86,559	–20,473	232,697	2,105	324,903	40,827	8,164	275,912	–22,315	–219,448	–92,412
2019: I	–2,732	89,908	–15,960	–43,770	149,430	208	157,817	100,081	–16,702	74,437	–21,383	–89,292	40,547
II	–865	84,405	83,302	28,019	–29,275	2,359	284,314	94,756	145,861	43,698	–9,642	–209,551	–84,771
III	–899	149,826	3,716	25,943	118,285	1,882	247,576	66,559	98,171	82,845	–6,382	–104,132	14,253
IV	–1,947	–7,122	51,133	–23,671	–34,793	210	66,018	40,804	–50,173	75,387	–4,263	–77,402	28,184
2020: I	–2,867	805,505	28,801	55,209	721,740	–245	934,491	44,716	–27,944	917,719	–25,136	–154,122	–36,467
II	–946	–253,779	63,839	–10,340	–312,239	4,960	–181,226	–46,832	272,485	–406,879	–11,702	–84,255	70,556
III	–550	29,307	122,349	121,217	–216,078	1,820	201,141	111,589	114,935	–25,383	28,425	–143,408	29,504
IV	–1,124	228,289	96,702	53,940	75,209	2,438	502,122	101,824	350,675	49,623	2,633	–271,199	–94,997
2021: I	–2,743	395,838	76,945	294,204	26,788	–2,100	574,400	70,558	323,752	180,090	–2,216	–180,778	11,388
II	–863	236,949	165,005	126,195	–54,728	477	445,166	85,858	198,105	161,204	–8,612	–216,829	–17,648
III p	3,005	494,066	98,228	311,733	–28,498	112,603	613,299	149,122	146,205	317,971	–7,980	–127,213	84,556

[3] Includes U.S. government and private transfers, such as U.S. government grants and pensions, fines and penalties, withholding taxes, personal transfers, insurance-related transfers, and other current transfers.

[4] Consists of monetary gold, special drawing rights (SDRs), the U.S. reserve position in the International Monetary Fund (IMF), and other reserve assets, including foreign currencies.

[5] Net lending means that U.S. residents are net suppliers of funds to foreign residents, and net borrowing means the opposite.

Source: Department of Commerce (Bureau of Economic Analysis).

Table B–58. U.S. international trade in goods on balance of payments (BOP) and Census basis, and trade in services on BOP basis, 1992–2021

[Billions of dollars; monthly data seasonally adjusted]

Year or month	Goods: Exports (f.a.s. value) [1, 2]							Goods: Imports (customs value) [6]							Services (BOP basis)	
	Total, BOP basis [3, 4]	Census basis (by end-use category)						Total, BOP basis [4]	Census basis (by end-use category)							
		Total, Census basis [3, 5]	Foods, feeds, and beverages	Industrial supplies and materials	Capital goods except automotive	Automotive vehicles, parts, and engines	Consumer goods (nonfood) except automotive		Total, Census basis [5]	Foods, feeds, and beverages	Industrial supplies and materials	Capital goods except automotive	Automotive vehicles, parts, and engines	Consumer goods (nonfood) except automotive	Exports [4]	Imports [4]
1992	439.6	448.2	40.3	109.1	175.9	47.0	51.4	536.5	532.7	27.6	138.6	134.3	91.8	122.7	177.3	119.6
1993	456.9	465.1	40.6	111.8	181.7	52.4	54.7	589.4	580.7	27.9	145.6	152.4	102.4	134.0	185.9	123.8
1994	502.9	512.6	42.0	121.4	205.0	57.8	60.0	668.7	663.3	31.0	162.1	184.4	118.3	146.3	200.4	133.1
1995	575.2	584.7	50.5	146.2	233.0	61.8	64.4	749.4	743.5	33.2	181.8	221.4	123.8	159.9	219.2	141.4
1996	612.1	625.1	55.5	147.7	253.0	65.0	70.1	803.1	795.3	35.7	204.5	228.1	128.9	172.0	239.5	152.6
1997	678.4	689.2	51.5	158.2	294.5	74.0	77.4	876.8	869.7	39.7	213.8	253.3	139.8	193.8	256.1	165.9
1998	670.4	682.1	46.4	148.3	299.4	72.4	80.3	918.6	911.9	41.2	200.1	269.5	148.7	217.0	262.8	180.7
1999	698.5	695.8	46.0	147.5	310.8	75.3	80.9	1,035.6	1,024.6	43.6	221.4	295.7	179.0	241.9	278.0	196.7
2000	784.9	781.9	47.9	172.6	356.9	80.4	89.4	1,231.7	1,218.0	46.0	299.0	347.0	195.9	281.8	298.0	220.9
2001	731.3	729.1	49.4	160.1	321.7	75.4	88.3	1,153.7	1,141.0	46.6	273.9	298.0	189.8	284.3	284.0	222.0
2002	698.0	693.1	49.6	156.8	290.4	78.9	84.4	1,173.3	1,161.4	49.7	267.7	283.3	203.7	307.8	288.1	233.5
2003	730.4	724.8	55.0	173.0	293.7	80.6	89.9	1,272.1	1,257.1	55.8	313.8	295.9	210.1	333.9	297.7	252.3
2004	823.6	814.9	56.6	203.9	327.5	89.2	103.2	1,488.3	1,469.7	62.1	412.8	343.6	228.2	372.9	344.5	290.6
2005	913.0	901.1	59.0	233.0	358.4	98.4	115.3	1,695.8	1,673.5	68.1	523.8	379.3	239.4	407.2	378.5	312.2
2006	1,040.9	1,026.0	66.0	276.0	404.0	107.3	129.1	1,878.2	1,853.9	74.9	602.0	418.3	256.6	442.6	423.1	349.3
2007	1,165.2	1,148.2	84.3	316.4	433.0	121.3	146.0	1,986.3	1,957.0	81.7	634.7	444.5	256.7	474.6	495.7	385.5
2008	1,308.8	1,287.4	108.3	388.0	457.7	121.5	161.3	2,141.3	2,103.6	89.0	779.5	453.7	231.2	481.6	540.8	420.7
2009	1,070.3	1,056.0	93.9	296.5	391.2	81.7	149.5	1,580.0	1,559.6	81.6	462.4	370.5	157.7	427.3	522.5	407.5
2010	1,290.3	1,278.5	107.7	391.7	447.5	112.0	165.2	1,939.0	1,913.9	91.7	603.1	449.4	225.1	483.2	582.0	436.5
2011	1,498.9	1,482.5	126.2	501.1	494.0	133.0	175.3	2,239.9	2,208.0	107.5	755.8	510.8	254.6	514.1	644.7	458.2
2012	1,562.6	1,545.8	133.0	501.2	527.2	146.2	181.7	2,303.7	2,276.3	110.3	730.6	548.7	297.8	516.9	684.8	469.6
2013	1,593.7	1,578.5	136.2	508.2	534.4	152.7	188.8	2,294.2	2,268.0	115.1	681.5	555.7	308.8	531.7	719.5	465.8
2014	1,635.6	1,621.9	143.7	505.8	551.5	159.8	199.0	2,385.5	2,356.4	125.9	667.0	594.1	328.6	557.1	756.7	490.9
2015	1,511.4	1,503.3	127.7	427.0	539.5	151.9	197.7	2,273.2	2,248.8	127.8	486.0	602.5	349.2	594.2	768.4	497.8
2016	1,457.4	1,451.5	130.5	397.3	519.7	150.4	193.7	2,207.2	2,186.8	130.0	443.3	589.7	349.9	583.1	780.9	512.6
2017	1,557.0	1,547.2	132.8	465.2	533.4	157.9	197.7	2,356.3	2,339.6	137.8	507.0	639.8	358.2	601.4	833.8	547.2
2018	1,676.9	1,665.8	133.1	541.2	563.2	158.8	206.0	2,555.7	2,536.1	147.3	574.6	690.9	371.1	645.4	861.7	563.9
2019	1,652.1	1,642.8	131.0	529.5	547.7	162.8	205.6	2,513.6	2,493.7	150.5	520.8	675.6	375.2	653.2	876.3	591.1
2020	1,428.8	1,424.9	139.3	465.9	460.3	127.9	174.8	2,350.8	2,336.0	154.3	479.5	645.3	310.6	639.9	705.6	460.3
2021 [p]	1,761.7	1,754.5	165.2	635.5	519.6	143.6	222.1	2,853.1	2,833.1	182.1	649.4	762.8	347.4	766.7	771.2	541.2
2020: Jan	135.6	134.9	11.0	44.8	44.3	13.2	16.4	203.4	202.0	13.0	41.6	55.3	29.4	53.0	69.5	47.1
Feb	135.7	135.1	11.3	44.4	44.4	13.3	16.0	199.4	197.6	12.5	40.8	52.3	30.6	51.6	69.1	47.1
Mar	126.9	126.5	11.1	41.6	42.7	11.3	14.7	195.6	194.3	12.9	41.4	54.0	28.1	48.0	60.6	39.1
Apr	95.0	94.9	11.2	32.9	32.4	3.7	10.4	169.6	168.6	12.1	41.6	48.6	13.5	45.2	55.0	33.4
May	91.1	91.0	10.7	30.4	31.8	3.3	11.0	167.7	166.9	12.1	43.9	48.0	9.0	46.5	55.1	33.3
June	103.7	103.5	10.4	33.0	35.4	8.3	12.3	175.7	174.6	12.4	35.7	50.0	18.6	50.7	55.1	33.8
July	115.9	115.6	10.7	35.5	37.8	12.0	14.8	196.7	195.6	12.7	39.9	54.3	26.1	54.0	55.0	35.0
Aug	119.0	118.7	11.6	39.0	36.5	12.0	15.0	201.9	200.9	13.4	38.2	54.5	27.8	57.3	55.3	36.1
Sept	122.0	121.7	12.5	39.3	37.6	12.4	15.2	203.6	202.0	13.4	37.1	55.3	31.0	56.2	56.1	37.1
Oct	125.8	125.5	12.6	40.6	39.0	12.6	16.0	207.9	206.6	13.3	38.2	56.8	32.0	57.5	57.0	38.5
Nov	126.8	126.5	12.7	41.4	38.7	12.5	16.4	213.0	211.9	13.4	39.4	57.8	31.3	60.5	58.4	39.5
Dec	131.5	131.2	13.6	43.0	39.7	13.2	16.6	216.3	215.0	13.1	41.7	58.3	33.1	59.4	59.4	40.4
2021: Jan	134.6	134.3	14.0	45.3	41.3	12.6	15.9	220.6	219.3	13.7	42.6	59.7	31.8	62.9	59.9	39.1
Feb	130.5	130.2	13.8	45.6	38.9	11.7	15.1	219.2	217.8	13.1	46.3	59.8	28.2	60.8	60.1	39.0
Mar	143.8	143.3	13.9	51.4	42.2	12.9	17.1	236.2	234.6	14.1	50.5	63.4	30.4	66.0	61.6	40.6
Apr	145.3	144.8	14.1	52.2	44.3	11.8	16.9	231.7	230.1	14.5	49.6	63.7	29.3	63.4	62.4	41.4
May	145.9	145.3	14.4	52.3	43.8	11.3	17.8	234.6	232.8	15.4	52.3	62.5	29.2	63.6	63.8	42.5
June	146.2	145.5	13.1	53.5	43.7	11.5	17.9	238.8	236.9	16.0	56.8	63.4	28.5	62.0	64.8	44.4
July	148.9	148.1	13.2	53.7	44.7	12.1	18.7	236.0	234.4	15.9	55.3	63.3	29.5	59.9	64.5	47.1
Aug	150.0	149.4	12.5	57.3	43.9	11.1	19.0	238.6	236.7	15.7	57.0	63.1	28.0	62.9	64.5	48.4
Sept	143.0	142.4	12.4	51.6	42.3	10.9	19.7	240.4	238.8	15.6	57.9	65.6	25.8	62.8	65.0	48.7
Oct	159.0	158.2	14.5	58.0	45.4	12.5	21.3	242.3	240.7	15.9	57.5	65.2	27.3	63.8	65.7	49.4
Nov	156.3	155.4	15.2	57.2	44.1	12.2	20.7	254.6	252.7	16.5	63.4	65.4	28.5	66.7	68.8	50.5
Dec [p]	158.2	157.6	14.1	57.6	45.0	13.0	21.9	260.0	258.2	15.7	60.3	67.7	30.9	71.9	70.1	50.3

[1] Department of Defense shipments of grant-aid military supplies and equipment under the Military Assistance Program are excluded from total exports through 1985 and included beginning 1986.
[2] F.a.s. (free alongside ship) value basis at U.S. port of exportation for exports.
[3] Beginning with data for 1989, exports have been adjusted for undocumented exports to Canada and are included in the appropriate end-use categories. For prior years, only total exports include this adjustment.
[4] Beginning with data for 1999, exports of goods under the U.S. Foreign Military Sales program and fuel purchases by foreign air and ocean carriers in U.S. ports are included in goods exports (BOP basis) and excluded from services exports. Beginning with data for 1999, imports of petroleum abroad by U.S. military agencies and fuel purchases by U.S. air and ocean carriers in foreign ports are included in goods imports (BOP basis) and excluded from services imports.
[5] Total includes "other" exports or imports, not shown separately.
[6] Total arrivals of imported goods other than in-transit shipments.
[7] Total includes revisions not reflected in detail.
[8] Total exports are on a revised statistical month basis; end-use categories are on a statistical month basis.

Note: Goods on a Census basis are adjusted to a BOP basis by the Bureau of Economic Analysis, in line with concepts and definitions used to prepare international and national accounts. The adjustments are necessary to supplement coverage of Census data, to eliminate duplication of transactions recorded elsewhere in international accounts, to value transactions according to a standard definition, and for earlier years, to record transactions in the appropriate period.

Data include international trade of the U.S. Virgin Islands, Puerto Rico, and U.S. Foreign Trade Zones.

Source: Department of Commerce (Bureau of the Census and Bureau of Economic Analysis).

Table B–59. U.S. international trade in goods and services by area and country, 2000–2020

[Millions of dollars]

Item	2000	2005	2010	2015	2016	2017	2018	2019	2020
EXPORTS									
Total, all countries	1,082,963	1,291,503	1,872,320	2,280,041	2,238,337	2,390,778	2,538,638	2,528,367	2,134,441
Europe	298,654	366,823	510,935	608,005	615,214	654,469	704,757	725,954	622,494
Euro area [1]	174,591	214,207	292,815	350,168	356,859	377,257	403,193	425,023	367,407
France	30,821	35,241	45,279	50,085	51,429	53,907	58,238	60,152	42,794
Germany	45,379	55,246	75,023	81,207	82,775	88,598	93,257	96,254	86,858
Italy	16,666	18,557	22,787	24,623	25,051	27,245	32,504	33,248	25,665
United Kingdom	73,995	83,456	104,891	126,721	125,259	131,204	145,638	147,165	121,093
Canada	204,237	246,292	307,571	341,375	328,017	348,848	369,374	363,170	309,791
Latin America and Other Western Hemisphere	228,633	259,832	416,623	550,722	516,706	553,919	590,392	576,772	466,552
Brazil	22,112	21,574	53,766	58,680	52,506	63,894	65,895	66,883	49,362
Mexico	127,581	141,856	187,487	267,819	261,559	275,654	299,189	289,357	235,005
Venezuela	9,476	9,396	15,918	14,212	9,976	7,478	9,163	3,622	2,273
Asia and Pacific	301,451	342,228	523,350	633,883	641,133	697,203	731,444	717,413	624,232
China	21,862	50,685	113,577	163,343	169,385	187,891	180,595	167,302	165,427
India	6,730	13,294	29,243	38,836	41,208	47,923	55,828	57,875	43,394
Japan	101,554	93,383	104,991	106,612	107,815	114,249	122,547	124,779	101,935
Korea, Republic of	35,106	37,866	56,700	66,244	65,379	73,640	80,747	80,888	69,247
Singapore	24,557	26,657	39,743	43,038	45,211	50,507	57,120	56,299	51,202
Taiwan	30,604	29,103	36,896	39,013	38,931	37,209	41,886	42,326	39,451
Middle East	28,616	48,702	70,477	102,171	98,936	97,248	98,271	100,287	74,943
Africa	17,203	22,890	40,278	41,220	35,667	36,476	41,500	41,689	32,949
IMPORTS									
Total, all countries	1,452,649	2,008,045	2,375,406	2,771,462	2,719,812	2,903,517	3,119,588	3,104,708	2,811,126
Europe	359,220	493,562	566,372	705,006	698,963	743,200	807,042	853,137	775,897
Euro area [1]	216,802	304,574	341,235	444,209	440,177	464,951	506,045	538,004	467,481
France	41,344	47,725	56,563	66,220	64,554	68,596	72,388	78,287	56,998
Germany	75,709	110,076	114,861	158,870	149,268	153,743	160,075	163,726	146,927
Italy	31,593	39,768	37,779	53,787	55,174	60,543	66,247	69,491	53,978
United Kingdom	70,963	84,200	96,034	115,143	108,861	113,911	123,645	126,709	102,911
Canada	253,313	319,543	310,340	334,268	317,112	341,366	362,920	363,431	305,153
Latin America and Other Western Hemisphere	255,760	362,652	468,191	528,237	516,398	545,042	588,252	597,396	509,531
Brazil	15,340	26,401	30,095	35,153	32,718	35,732	36,636	37,413	27,916
Mexico	148,493	188,384	248,695	327,767	325,707	345,888	378,372	393,117	347,413
Venezuela	19,192	34,662	33,394	16,217	11,451	12,689	13,478	2,151	324
Asia and Pacific	507,527	682,521	841,359	1,091,787	1,078,864	1,152,077	1,225,821	1,181,180	1,141,688
China	103,340	251,791	377,619	499,677	479,711	524,010	558,308	471,129	450,392
India	12,480	23,426	44,940	69,771	72,569	76,882	83,976	87,587	77,121
Japan	164,972	162,613	147,993	164,742	167,207	172,489	178,589	180,728	151,087
Korea, Republic of	45,726	51,175	59,292	82,526	79,646	80,164	85,322	89,219	86,449
Singapore	21,837	19,242	23,668	25,191	25,060	27,644	35,706	37,023	41,830
Taiwan	44,272	40,690	41,740	47,635	46,066	49,644	53,215	61,727	66,749
Middle East	44,500	81,361	95,039	79,370	72,943	79,635	88,633	70,066	49,825
Africa	31,075	69,516	93,001	32,719	34,233	42,119	45,385	39,414	28,967
BALANCE (excess of exports +)									
Total, all countries	–369,687	–716,542	–503,087	–491,421	–481,475	–512,740	–580,950	–576,341	–676,684
Europe	–60,566	–126,739	–55,436	–97,000	–83,750	–88,730	–102,286	–127,183	–153,404
Euro area [1]	–42,211	–90,367	–48,420	–94,041	–83,318	–87,695	–102,851	–112,980	–100,075
France	–10,523	–12,484	–11,284	–16,135	–13,124	–14,689	–14,149	–18,135	–14,203
Germany	–30,331	–54,830	–39,838	–77,665	–66,492	–65,145	–66,817	–67,471	–60,069
Italy	–14,928	–21,211	–14,991	–29,164	–30,123	–33,298	–33,744	–36,243	–28,313
United Kingdom	3,033	–744	8,856	11,578	16,398	17,292	21,993	20,456	18,183
Canada	–49,076	–73,252	–2,770	7,106	10,906	7,481	6,454	–262	4,639
Latin America and Other Western Hemisphere	–27,127	–102,820	–51,567	22,487	307	8,877	2,140	–20,624	–42,978
Brazil	6,772	–4,826	23,672	23,527	19,787	28,163	29,259	29,471	21,446
Mexico	–20,912	–46,528	–61,208	–59,948	–64,150	–70,234	–79,183	–103,760	–112,407
Venezuela	–9,716	–25,266	–17,476	–2,005	–1,474	–5,211	–4,317	1,470	1,947
Asia and Pacific	–206,077	–340,293	–318,009	–457,904	–437,731	–454,874	–494,378	–463,766	–517,457
China	–81,478	–201,106	–264,042	–336,336	–310,327	–336,120	–377,714	–303,828	–284,964
India	–5,749	–10,132	–15,698	–30,935	–31,360	–28,958	–28,149	–29,712	–33,726
Japan	–63,419	–69,230	–43,002	–58,130	–59,392	–58,240	–56,041	–55,949	–49,153
Korea, Republic of	–10,620	–13,308	–2,593	–16,282	–14,267	–6,524	–4,576	–8,329	–17,203
Singapore	2,719	7,415	16,076	17,847	20,151	22,863	21,415	19,275	9,373
Taiwan	–13,668	–11,587	–4,843	–8,622	–7,136	–12,435	–11,329	–19,401	–27,297
Middle East	–15,883	–32,659	–24,561	22,801	25,993	17,613	9,638	30,221	25,118
Africa	–13,872	–46,625	–52,723	8,502	1,436	–5,644	–3,885	2,276	3,982

[1] Euro area consists of Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and Greece (beginning in 2001), Slovenia (2007), Cyprus and Malta (2008), Slovakia (2009), Estonia (2011), Latvia (2014), and Lithuania (2015).

Note: Data are on a balance of payments basis. For further details, and additional data by country, see *Survey of Current Business*, October 2021.

Source: Department of Commerce (Bureau of Economic Analysis).

TABLE B–60. Foreign exchange rates, 2000–2021

[Foreign currency units per U.S. dollar, except as noted; certified noon buying rates in New York]

Period	Australia (dollar) [1]	Brazil (real)	Canada (dollar)	China, P.R. (yuan)	EMU Members (euro) [1, 2]	India (rupee)	Japan (yen)	Mexico (peso)	South Korea (won)	Sweden (krona)	Switzerland (franc)	United Kingdom (pound) [1]
March 1973	1.4129	....	0.9967	2.2401	....	7.55	261.90	0.013	398.85	4.4294	3.2171	2.4724
2000	.5815	1.8301	1.4855	8.2784	0.9232	45.00	107.80	9.459	1,130.90	9.1735	1.6904	1.5156
2001	.5169	2.3527	1.5487	8.2770	.8952	47.22	121.57	9.337	1,292.01	10.3425	1.6891	1.4396
2002	.5437	2.9213	1.5704	8.2771	.9454	48.63	125.22	9.663	1,250.31	9.7233	1.5567	1.5025
2003	.6524	3.0750	1.4008	8.2772	1.1321	46.59	115.94	10.793	1,192.08	8.0787	1.3450	1.6347
2004	.7365	2.9262	1.3017	8.2768	1.2438	45.26	108.15	11.290	1,145.24	7.3480	1.2428	1.8330
2005	.7627	2.4352	1.2115	8.1936	1.2449	44.00	110.11	10.894	1,023.75	7.4710	1.2459	1.8204
2006	.7535	2.1738	1.1340	7.9723	1.2563	45.19	116.31	10.906	954.32	7.3718	1.2532	1.8434
2007	.8391	1.9461	1.0734	7.6058	1.3711	41.18	117.76	10.928	928.97	6.7550	1.1999	2.0020
2008	.8537	1.8326	1.0660	6.9477	1.4726	43.39	103.39	11.143	1,098.71	6.5846	1.0816	1.8545
2009	.7927	1.9976	1.1412	6.8307	1.3935	48.33	93.68	13.498	1,274.63	7.6539	1.0860	1.5661
2010	.9200	1.7600	1.0298	6.7696	1.3261	45.65	87.78	12.624	1,155.74	7.2053	1.0432	1.5452
2011	1.0332	1.6723	.9887	6.4630	1.3931	46.58	79.70	12.427	1,106.94	6.4878	.8862	1.6043
2012	1.0359	1.9535	.9995	6.3093	1.2859	53.37	79.82	13.154	1,126.16	6.7721	.9377	1.5853
2013	.9683	2.1570	1.0300	6.1478	1.3281	58.51	97.60	12.758	1,094.67	6.5124	.9269	1.5642
2014	.9034	2.3512	1.1043	6.1620	1.3297	61.00	105.74	13.302	1,052.29	6.8576	.9147	1.6484
2015	.7522	3.3360	1.2791	6.2827	1.1096	64.11	121.05	15.874	1,130.96	8.4350	.9628	1.5284
2016	.7445	3.4839	1.3243	6.6400	1.1072	67.16	108.66	18.667	1,159.34	8.5541	.9848	1.3555
2017	.7671	3.1910	1.2984	6.7569	1.1301	65.07	112.10	18.884	1,129.04	8.5430	.9842	1.2890
2018	.7481	3.6513	1.2957	6.6090	1.1817	68.37	110.40	19.218	1,099.29	8.6945	.9784	1.3363
2019	.6952	3.9440	1.3269	6.9081	1.1194	70.38	109.02	19.247	1,165.80	9.4604	.9937	1.2768
2020	.6899	5.1587	1.3422	6.9042	1.1410	74.14	106.78	21.546	1,180.56	9.2167	.9389	1.2829
2021	.7515	5.3958	1.2533	6.4508	1.1830	73.94	109.84	20.284	1,144.89	8.5812	.9144	1.3764
2020: I	.6569	4.4720	1.3459	6.9786	1.1022	72.52	108.93	20.085	1,194.01	9.6829	.9680	1.2788
II	.6578	5.3736	1.3854	7.0841	1.1016	75.85	107.52	23.331	1,219.13	9.6838	.9634	1.2418
III	.7154	5.3790	1.3321	6.9153	1.1698	74.35	106.10	22.091	1,187.62	8.8608	.9194	1.2927
IV	.7310	5.4040	1.3031	6.6235	1.1925	73.78	104.47	20.571	1,117.97	8.6162	.9036	1.3204
2021: I	.7729	5.4845	1.2656	6.4817	1.2045	72.90	106.17	20.374	1,114.81	8.4031	.9067	1.3798
II	.7701	5.2944	1.2285	6.4594	1.2050	73.79	109.43	20.013	1,121.30	8.4177	.9110	1.3981
III	.7344	5.2299	1.2600	6.4699	1.1784	74.10	110.07	20.030	1,160.08	8.6499	.9182	1.3779
IV	.7289	5.5889	1.2604	6.3914	1.1437	74.94	113.64	20.748	1,183.29	8.8557	.9216	1.3486

Period	Trade-weighted value of the U.S. dollar					
	Nominal			Real [6]		
	Broad index (January 2006=100) [3]	Advanced foreign economies index (January 2006=100) [4]	Emerging market economies index (January 2006=100) [5]	Broad index (January 2006=100) [3]	Advanced foreign economies index (January 2006=100) [4]	Emerging market economies index (January 2006=100) [5]
2000	....	....	....	....	....	....
2001	....	....	....	....	....	....
2002	....	....	....	....	....	....
2003	....	....	....	....	....	....
2004	....	....	....	....	....	....
2005	....	....	....	....	....	....
2006	98.6005	97.6833	99.8103	98.9351	98.3159	99.7506
2007	93.8100	92.0715	96.1170	94.2692	93.6198	95.1219
2008	90.8801	88.4517	94.1271	90.9832	90.8430	91.2074
2009	96.7509	92.8232	101.9953	95.3406	94.7210	96.1176
2010	93.0541	90.1336	97.1416	90.8034	92.0378	89.6153
2011	88.7767	84.8522	93.9916	86.3067	87.3424	85.2990
2012	91.6361	88.0233	96.5231	88.5174	90.8682	86.1934
2013	92.7611	90.6492	96.0311	88.7288	93.8590	83.8214
2014	95.5873	93.4346	98.9388	90.7228	97.0273	84.7823
2015	108.1699	108.1487	109.5240	101.1920	111.8321	91.5849
2016	113.0656	109.3608	118.1861	105.4098	114.0169	97.3969
2017	112.8097	108.9491	118.0912	104.8583	114.1601	96.2888
2018	112.0058	106.4890	119.0088	104.0912	112.2323	96.4653
2019	115.7335	110.2570	122.7253	107.1944	116.7141	98.3783
2020	117.7882	109.0487	128.4041	108.7684	116.3891	101.4917
2021	113.1306	104.5709	123.4915	106.3105	114.2478	98.7821
2020: I	117.7588	111.3475	125.8124	108.7546	118.5421	99.7080
II	121.8531	112.3496	133.3297	112.0767	119.2242	105.1512
III	117.3701	107.2112	129.5725	108.5435	114.7760	102.4197
IV	113.9288	105.1122	124.5817	105.6988	113.0140	98.6879
2021: I	112.3734	103.4456	123.1424	104.2083	111.2686	97.4222
II	111.8587	102.9010	122.6586	104.8621	112.2696	97.7820
III	113.3343	104.9837	123.4589	106.9804	115.3431	99.0937
IV	114.9960	106.9966	124.7428	109.1913	118.1100	100.8303

1 U.S. dollars per foreign currency unit.
2 European Economic and Monetary Union (EMU) members consists of Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and Greece (beginning in 2001), Slovenia (2007), Cyprus and Malta (2008), Slovakia (2009), Estonia (2011), Latvia (2014), and Lithuania (2015).
3 Weighted average of the foreign exchange value of the U.S. dollar against the currencies of a broad group of major U.S. trading partners.
4 Subset of the broad index. Consists of currencies of the Euro area, Australia, Canada, Japan, Sweden, Switzerland, and the United Kingdom.
5 Subset of the broad index currencies that are emerging market economies. For details, see *Revisions to the Federal Reserve Dollar Indexes*, January 2019.
6 Adjusted for changes in consumer price indexes for the United States and other countries.

Source: Board of Governors of the Federal Reserve System.

Table B–61. Growth rates in real gross domestic product by area and country, 2003–2022

[Percent change]

Area and country	2003-2012 annual average	2013	2014	2015	2016	2017	2018	2019	2020	2021 [1]	2022 [1]
World	4.2	3.4	3.5	3.4	3.3	3.8	3.6	2.8	–3.1	5.9	4.4
Advanced economies	1.7	1.4	2.0	2.3	1.8	2.5	2.3	1.7	–4.5	5.0	3.9
Of which:											
United States	1.9	1.8	2.3	2.7	1.7	2.3	2.9	2.3	–3.4	5.6	4.0
Euro area [2]	0.9	–.2	1.4	2.0	1.9	2.6	1.9	1.5	–6.4	5.2	3.9
Germany	1.1	.4	2.2	1.5	2.2	2.7	1.1	1.1	–4.6	2.7	3.8
France	1.2	.6	1.0	1.0	1.0	2.4	1.8	1.8	–8.0	6.7	3.5
Italy	–0.1	–1.8	.0	.8	1.3	1.7	.9	.3	–8.9	6.2	3.8
Spain	1.1	–1.4	1.4	3.8	3.0	3.0	2.3	2.1	–10.8	4.9	5.8
Japan	0.7	2.0	.3	1.6	.8	1.7	.6	.0	–4.5	1.6	3.3
United Kingdom	1.4	2.2	2.9	2.4	1.7	1.7	1.3	1.4	–9.4	7.2	4.7
Canada	1.9	2.3	2.9	.7	1.0	3.0	2.4	1.9	–5.2	4.7	4.1
Other advanced economies	3.5	2.6	3.0	2.3	2.6	3.1	2.8	1.9	–1.9	4.7	3.6
Emerging market and developing economies	6.6	5.0	4.7	4.3	4.5	4.8	4.6	3.7	–2.0	6.5	4.8
Regional groups:											
Emerging and Developing Asia	8.7	6.9	6.9	6.8	6.8	6.6	6.4	5.4	–.9	7.2	5.9
China	10.5	7.8	7.4	7.0	6.9	6.9	6.8	6.0	2.3	8.1	4.8
India [3]	7.9	6.4	7.4	8.0	8.3	6.8	6.5	4.0	–7.3	9.0	9.0
ASEAN-5 [4]	5.5	5.0	4.7	5.0	5.1	5.5	5.4	4.9	–3.4	3.1	5.6
Emerging and Developing Europe	4.6	3.1	1.8	1.0	1.9	4.1	3.4	2.5	–1.8	6.5	3.5
Russia	4.8	1.8	.7	–2.0	.2	1.8	2.8	2.0	–2.7	4.5	2.8
Latin America and the Caribbean	3.9	2.9	1.3	.4	–.6	1.4	1.2	.1	–6.9	6.8	2.4
Brazil	3.8	3.0	.5	–3.5	–3.3	1.3	1.8	1.4	–3.9	4.7	.3
Mexico	2.2	1.4	2.8	3.3	2.6	2.1	2.2	–.2	–8.2	5.3	2.8
Middle East and Central Asia	5.8	3.0	3.3	2.7	4.6	2.5	2.2	1.5	–2.8	4.2	4.3
Saudi Arabia	5.3	2.7	3.7	4.1	1.7	–.7	2.4	.3	–4.1	2.9	4.8
Sub-Saharan Africa	5.7	4.9	5.0	3.2	1.5	3.0	3.3	3.1	–1.7	4.0	3.7
Nigeria	7.7	5.4	6.3	2.7	–1.6	.8	1.9	2.2	–1.8	3.0	2.7
South Africa	3.4	2.5	1.4	1.3	.7	1.2	1.5	.1	–6.4	4.6	1.9

[1] All figures are forecasts as published by the International Monetary Fund. For the United States, the second estimate by the Department of Commerce shows that real GDP rose 5.7 percent in 2021.
[2] Euro area consists of Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and Greece (beginning in 2001), Slovenia (2007), Cyprus and Malta (2008), Slovakia (2009), Estonia (2011), Latvia (2014), and Lithuania (2015).
[3] Data and forecasts are presented on a fiscal year basis and output growth is based on GDP at market prices.
[4] Consists of Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

Note: For details on data shown in this table, see *World Economic Outlook*, October 2021, and *World Economic Outlook Update*, January 2022, published by the International Monetary Fund.

Sources: International Monetary Fund and Department of Commerce (Bureau of Economic Analysis).