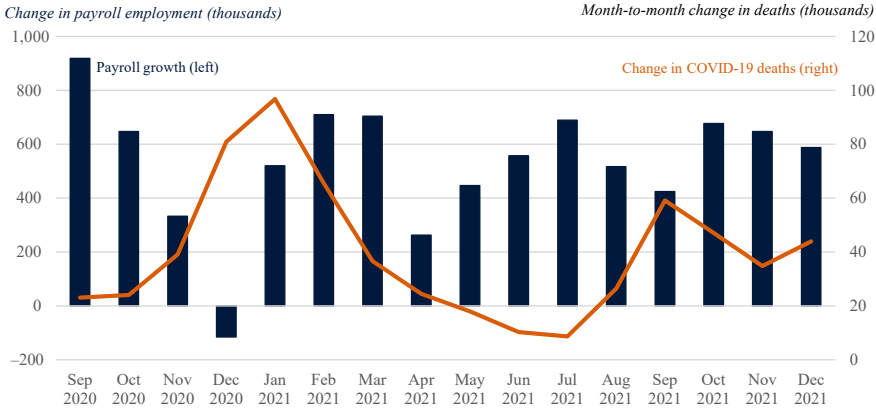


Chapter 2

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



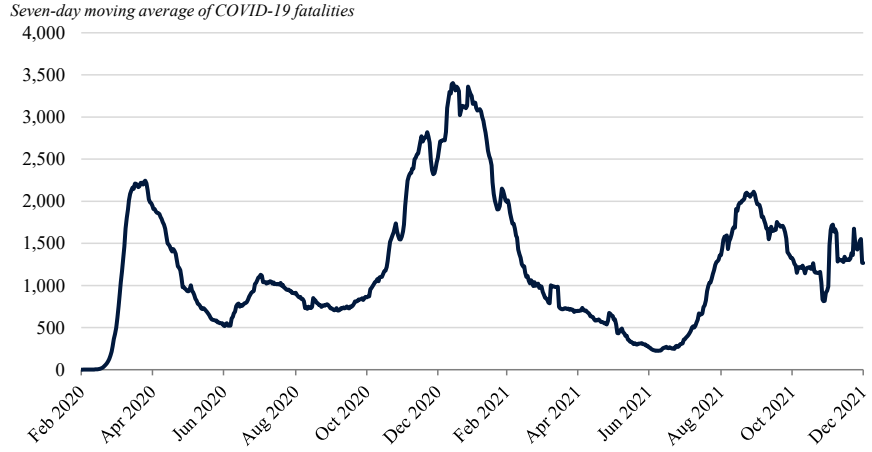
Sources: Johns Hopkins University; Bureau of Labor Statistics; Haver Analytics.

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).

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



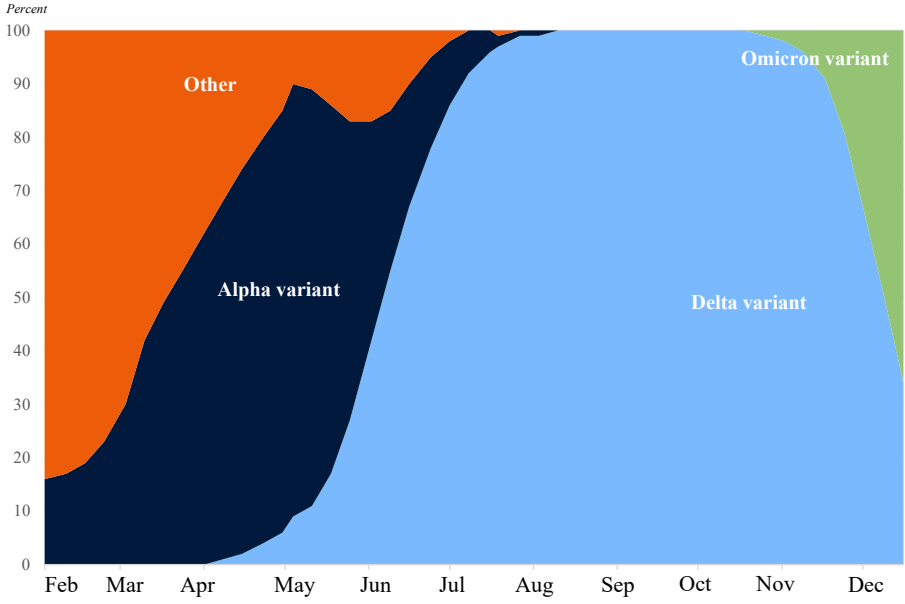
Sources: Our World in Data; CEA calculations.

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

[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

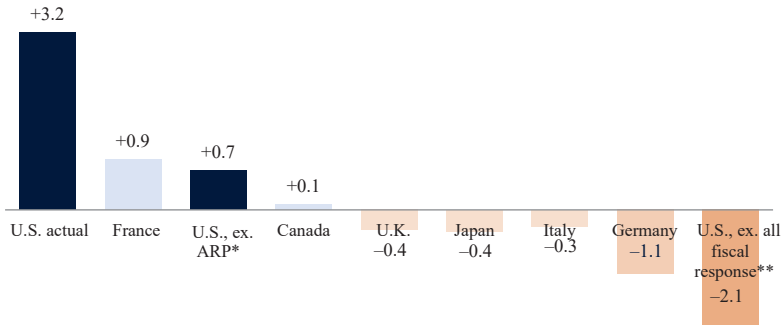
Sources: Office of Management and Budget; CEA calculations.
Note: This table shows the average annual increase in the primary deficit-to-GDP ratio, relative to the final year before the expansion (it includes both new and expanded programs).

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

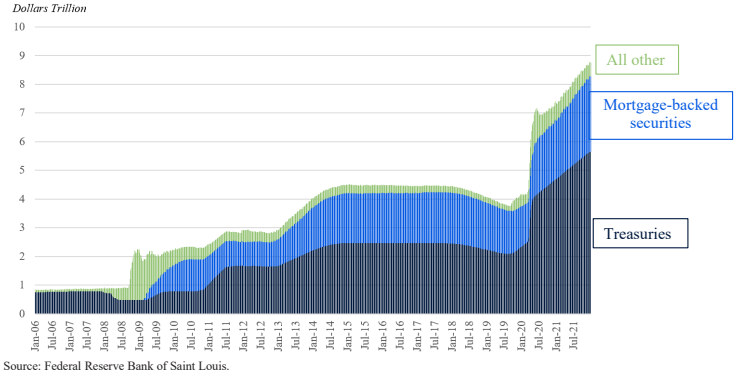
Box 2-2. Monetary Policy in 2021

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

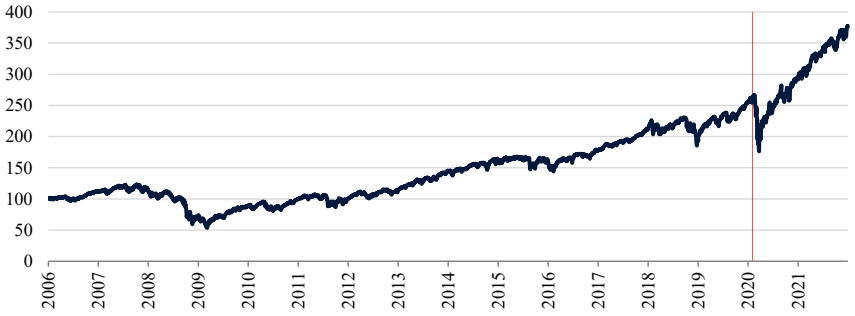
Financial markets have fully recovered since the onset of the COVID-19 pandemic, supported by strong fiscal and monetary policy interventions. With respect to equities, the Standard & Poor's 500 Index was 26.9 percent higher at the end of 2021 compared with the end of 2020; and it was 47.5

[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



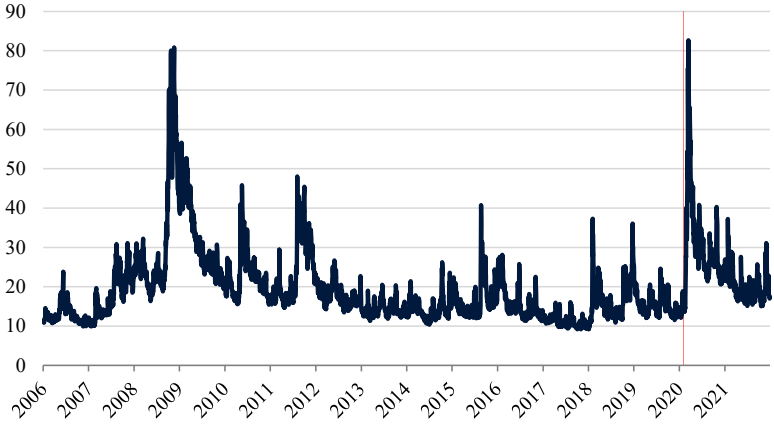
Source: Federal Reserve Economic Data from the Federal Reserve Bank of Saint Louis.
Note: This series is a proxy of U.S. corporations' borrowing costs, as measured by the Intercontinental Exchange Bank of America U.S. Corporate Index Option-Adjusted Spread. The index tracks the performance of dollar-denominated, 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

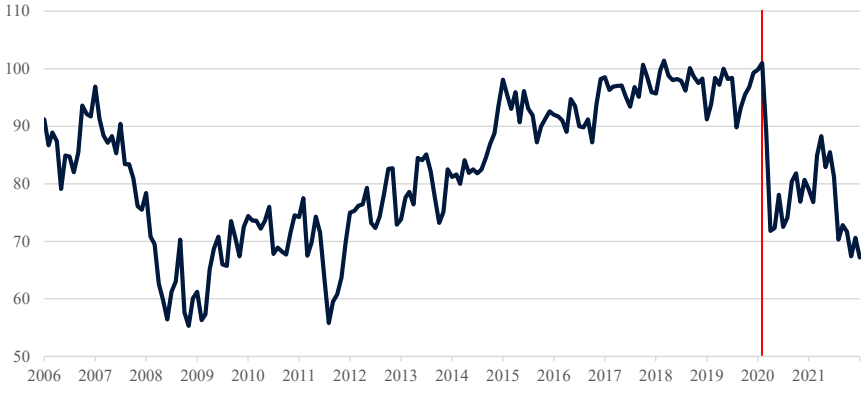
VIX level (index value)



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

Index level: 1966:Q1 = 100



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.

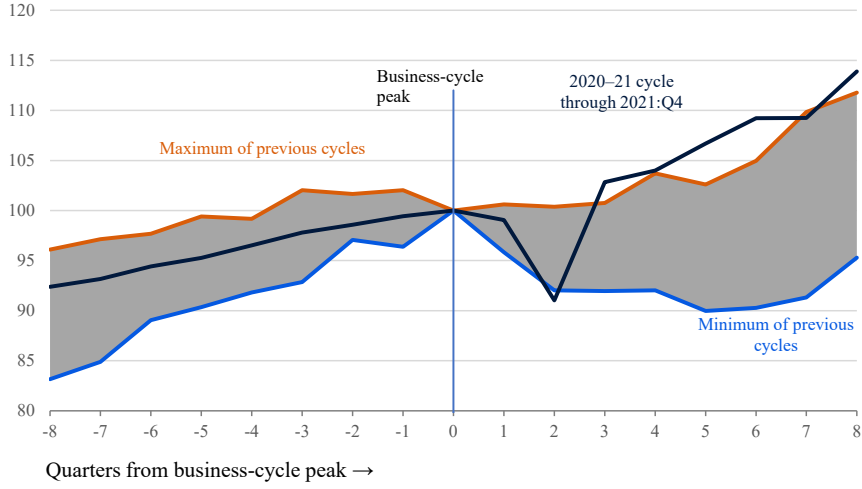
[22] The National Bureau of Economic Research's business cycle chronology names February 2020 and April 2020 as the monthly peak and trough of the 2020 recession, but in its quarterly chronology, the peak occurred in 2019:Q4, and the trough occurred in 2020:Q2. See National Bureau of Economic Research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

Index = 100 at business-cycle peak



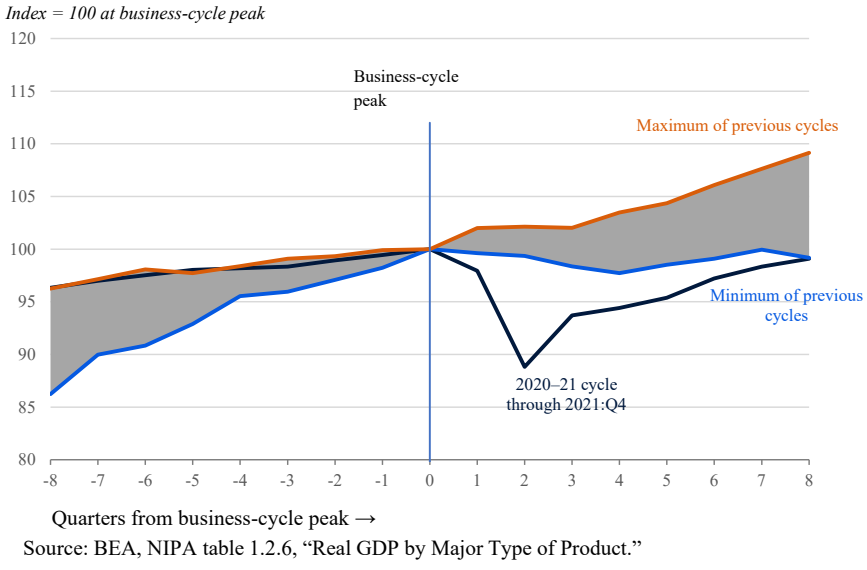
Source: BEA, NIPA table 1.2.6, "Real GDP by Major Type of Product."

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

Consumer Spending

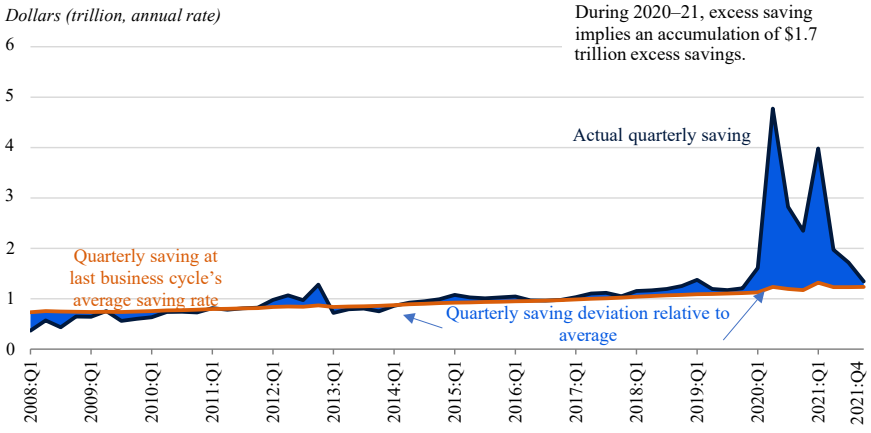
In 2021, consumer spending on goods increased rapidly, while consumer spending on services had not yet regained its peak, as shown in table 2-3.

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 (1)	Contribution[a] (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

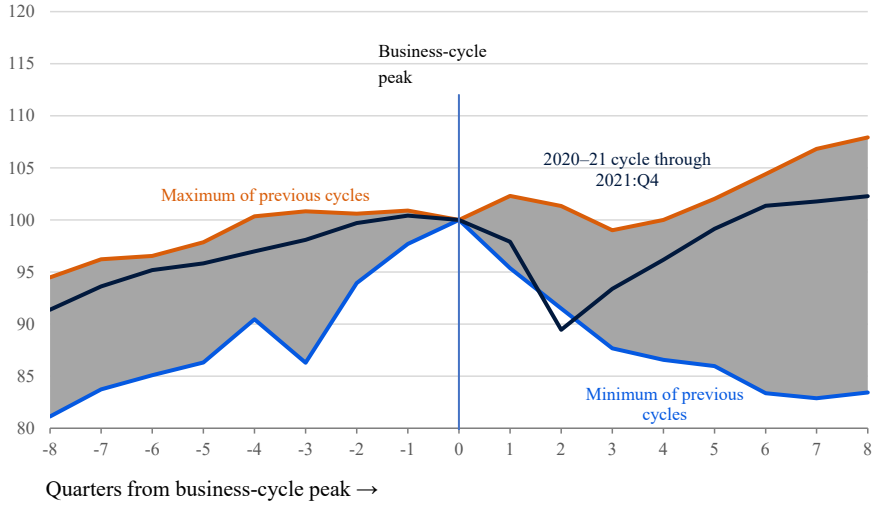
Source: Bureau of Economic Analysis, NIPA tables 1.5.6, 5.4.6U, and 5.5.6U.

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

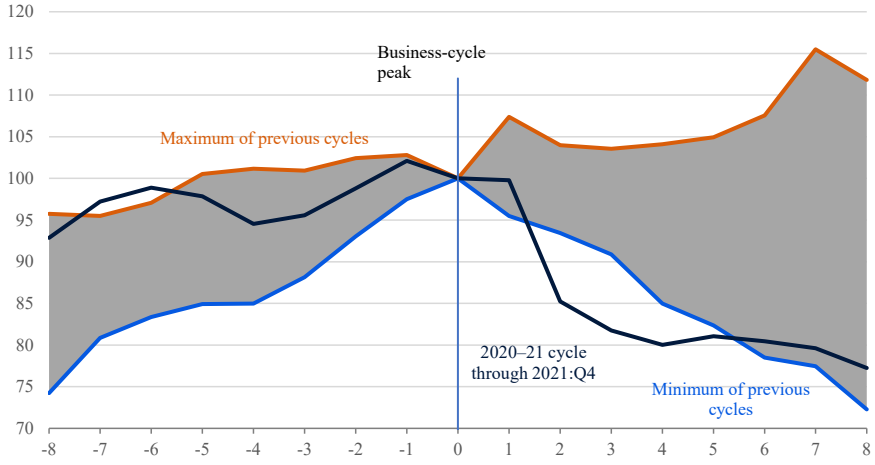
Real business fixed (nonresidential) investment edged up at a 1.3 percent annual rate from 2019:Q4 to 2021:Q4 (table 2-4). In comparison with the previous 11 post–World War II business cycles, overall business investment was stronger than the average cycle, but still within the previous range, as shown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

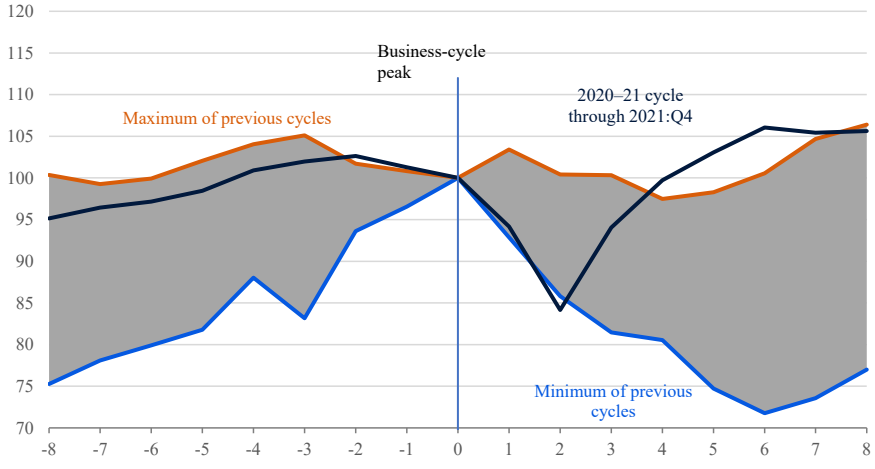
Index = 100 at business-cycle peak



Source: BEA, NIPA table 1.1.6.

Figure 2-14. Equipment Investment: Cyclical Comparison

Index = 100 at business-cycle peak



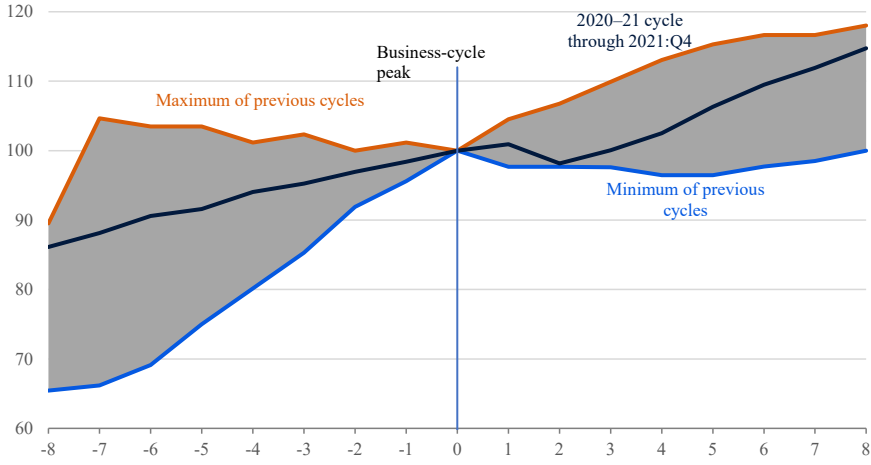
Source: BEA, NIPA table 1.1.6.

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

Index = 100 at business-cycle peak



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

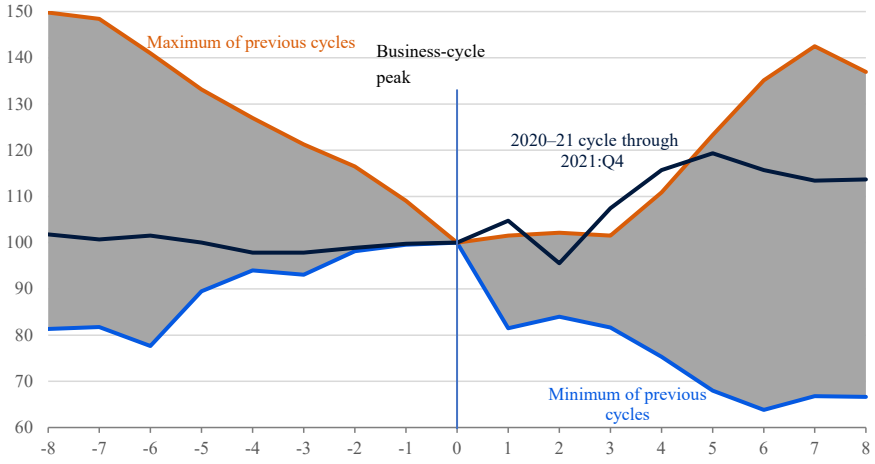
Investment in intellectual property, which made up 6.3 percent of GDP in 2019, grew 7.1 percent from 2019:Q4 to 2021:Q4, in the top half of the range experienced during the preceding cycles (figure 2-15). The subsectors of intellectual property diverged substantially: software investment skyrocketed, 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

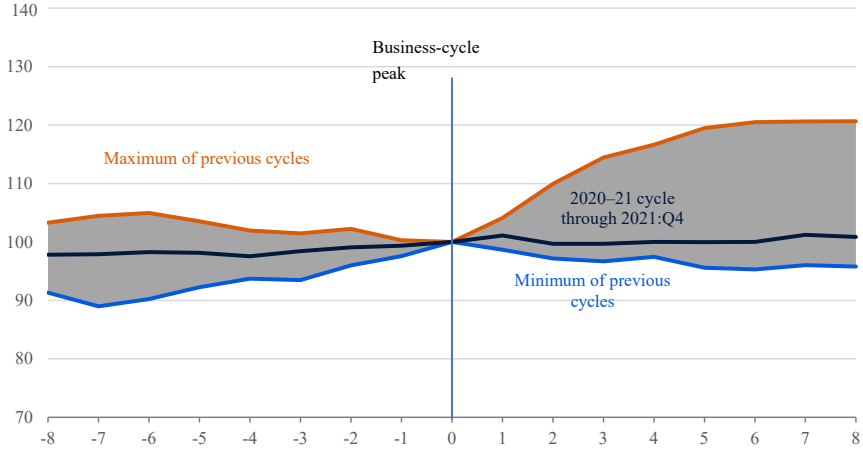
Index = 100 at business-cycle peak



Source: BEA, NIPA table 1.1.6.

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

Index = 100 at business-cycle peak



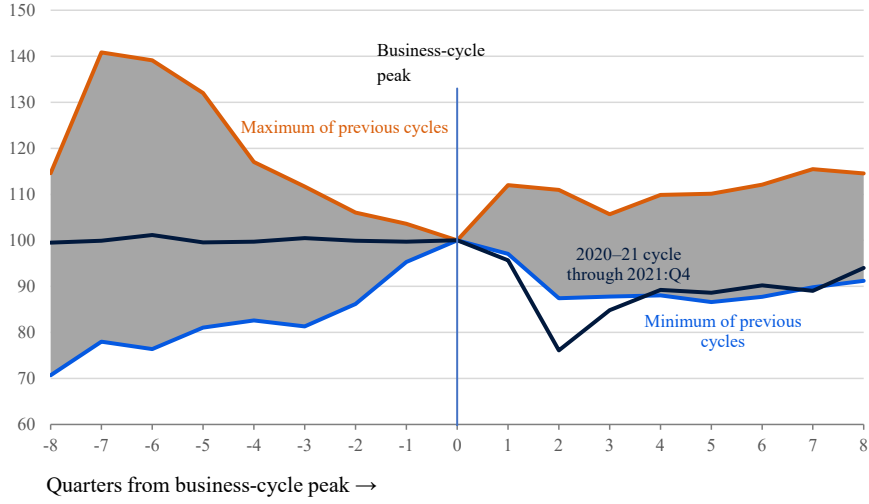
Source: BEA, NIPA table 1.1.6.

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

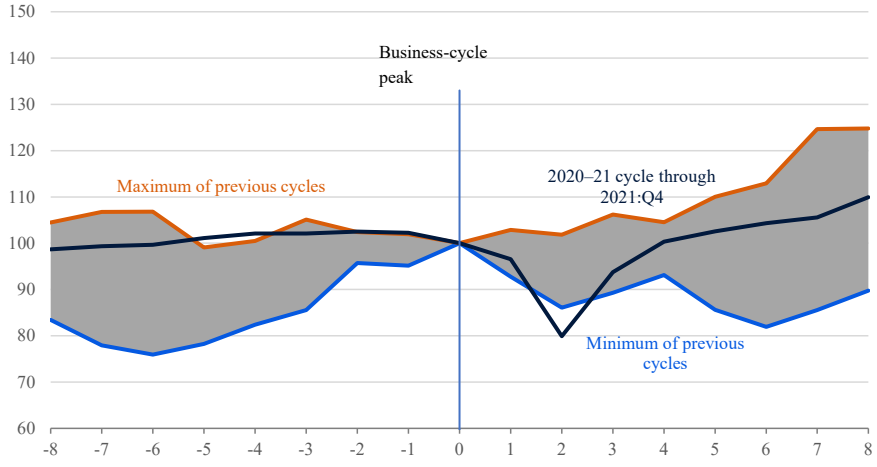
Exports have fallen at a 3 percent annual rate during the eight pandemic quarters, which places them at the lower end of the post–World War II business-cycle experience (figure 2-18). As discussed in chapter 3 of this *Report*, U.S. exports faced weak demand from abroad due to the severity of the economic 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

Index = 100 at business-cycle peak



Source: BEA, NIPA table 1.1.6.

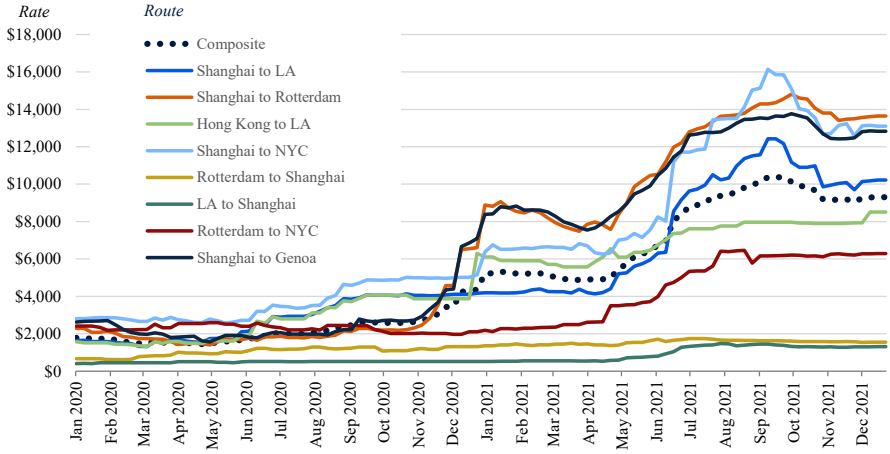
one (figure 2-19). The recovery in output was driven by an exceptionally strong domestic demand for goods; in some sectors, imports contributed to meeting that demand when supply constraints meant that domestic production could not. Because faster domestic growth pulls in more imports, the strength of 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

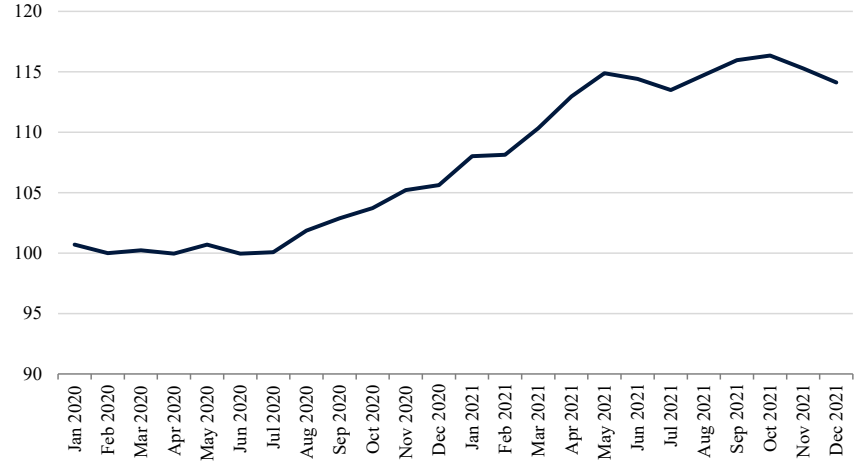
Figure 2-20. Forty-Foot Container Shipping Benchmark Rates by Route, 2020–21



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

Index level: Feb. 2020 = 100



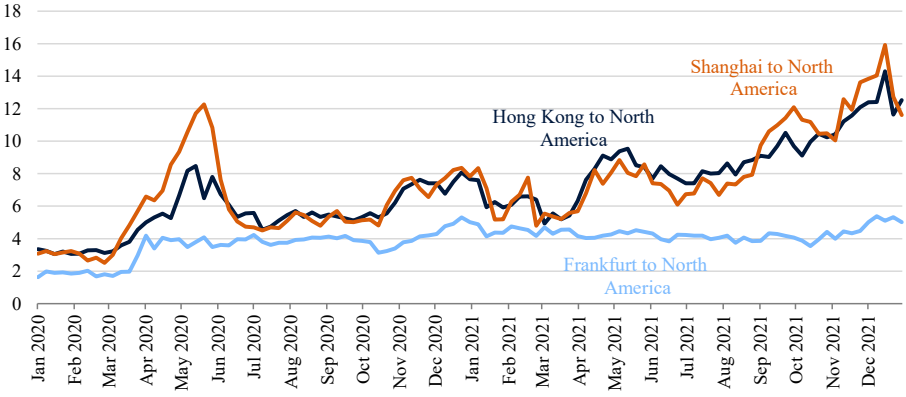
Source: Data from Bloomberg.

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

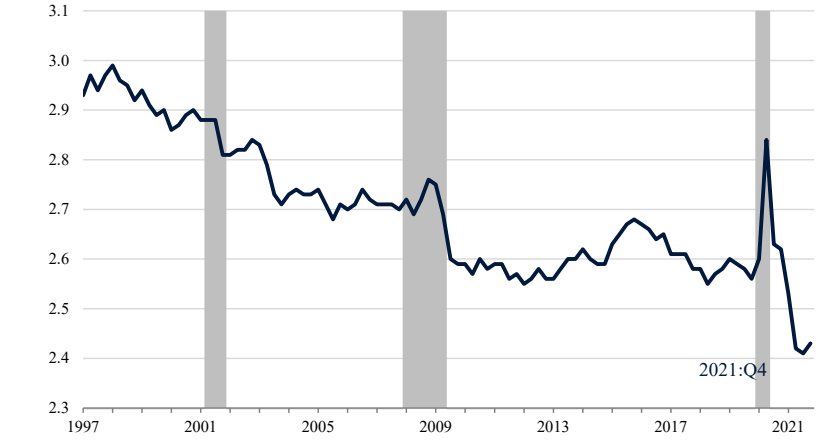
Dollars per kilogram



Source: Data from Bloomberg.

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

Months' supply of inventory



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

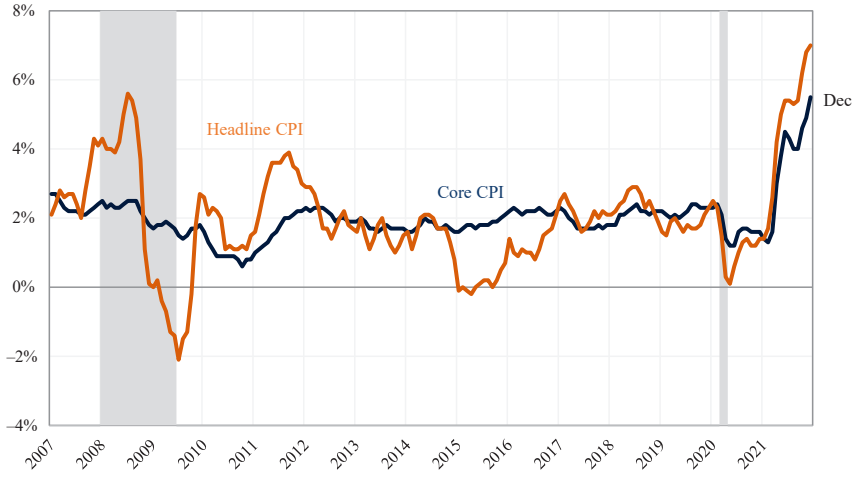
The concentrated demand for goods and the limited supply of these goods, along with supply chain delays, elevated consumer price inflation. Headline inflation—according to the Consumer Price Index (CPI)—rose to 7.0 percent during the 12 months of 2021, up from the prepandemic rate of 2.3 percent during 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

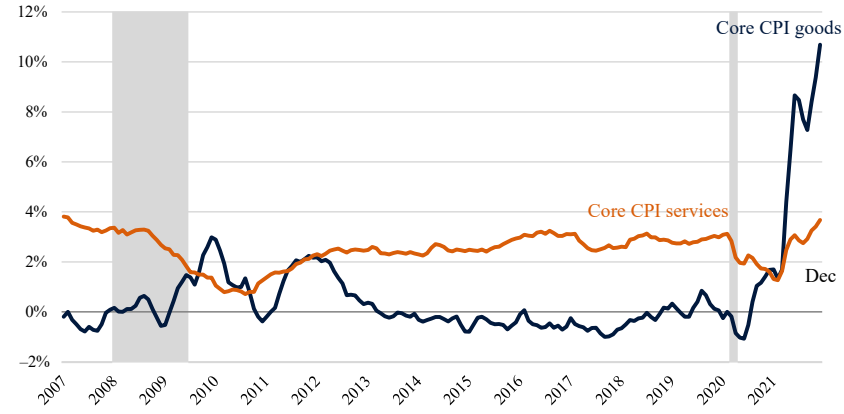
Twelve-month inflation rate



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

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

Twelve-month change



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		Increase
			2019 Avg.	Nov.–Dec. 2021	
	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]

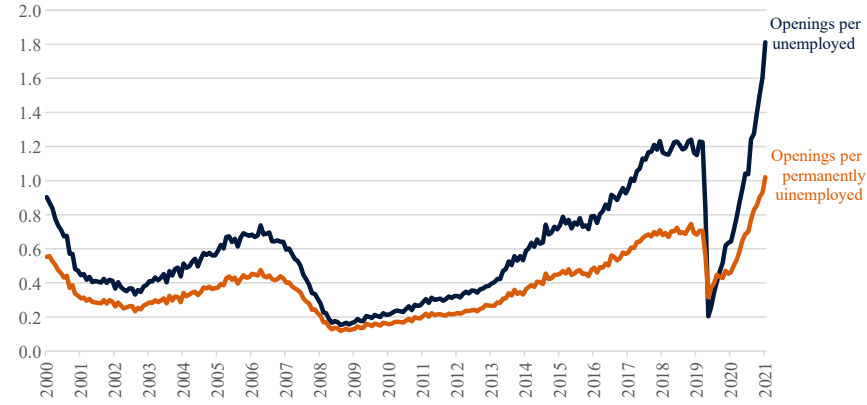
Even relative to the number of workers actively searching for a job, vacancies were elevated. On average, in December 2021, there were 1.81 job openings per unemployed person, the highest in the history of the JOLTS data and about 48 percent higher than just before the pandemic, in February 2020 (figure 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

Ratio of job openings per unemployed worker



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

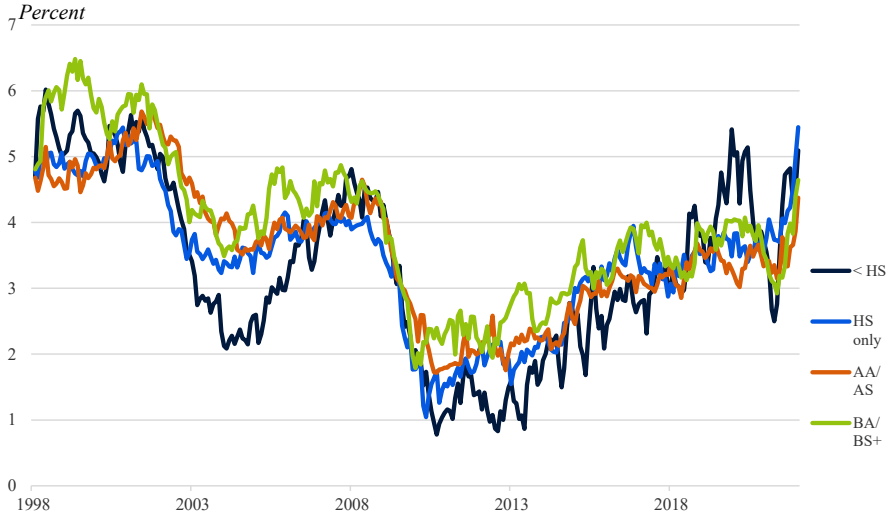
principle, a company is not supposed to count a furloughed worker's job as a job opening in JOLTS—and by adding workers who are out of the labor force but saying they want a job. This shifts the ratio to 1.02 openings per permanent unemployed worker, still a record, and 45 percent above where it was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

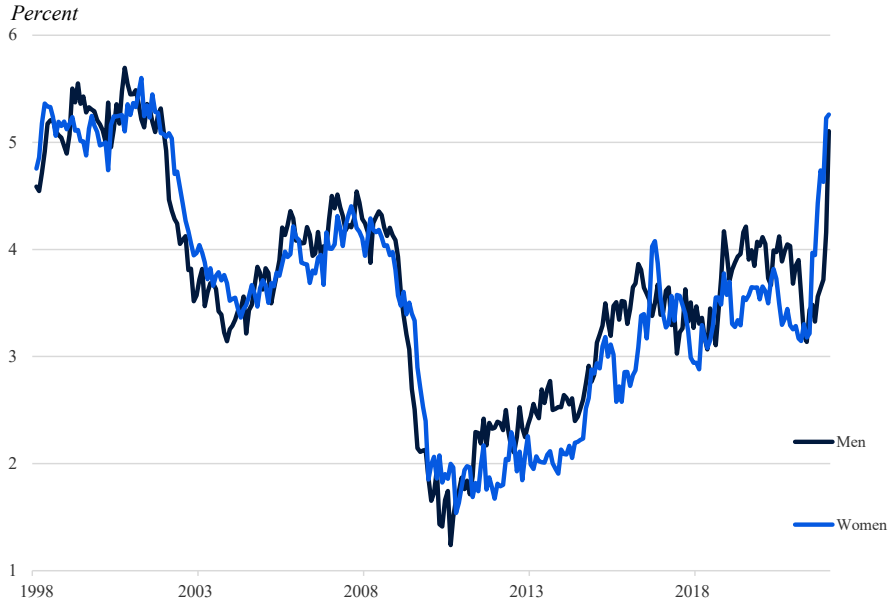
the same 12 months.[29] Before the pandemic, one needs to look all the way back to 1981 to find a single year when wage growth was so high. These and other data suggest that the pandemic has driven particularly strong wage growth for lower-wage workers, given that production and nonsupervisory workers 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



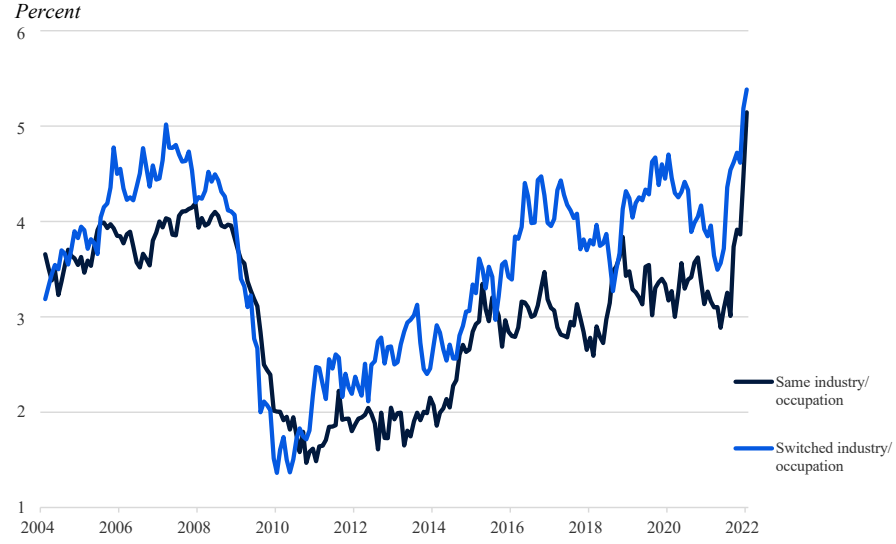
Sources: CPS; CEA calculations.
Note: Values are Kalman smoothed monthly values.

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).

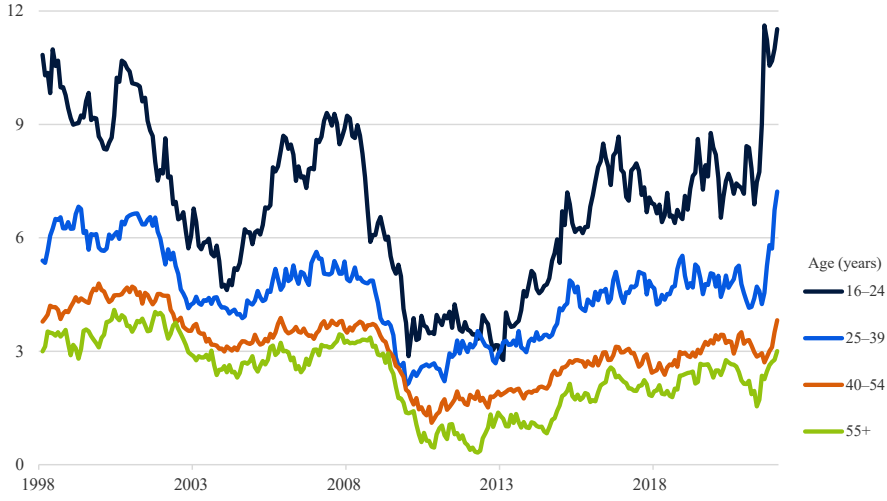
Adjusting for inflation is the final factor to consider. While nominal hourly wage growth increased in 2021, so did inflation. Real (inflation-adjusted) average hourly earnings continued growing earlier in the pandemic but fell on a year-on-year basis in the aggregate toward the end of 2021.[32]

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

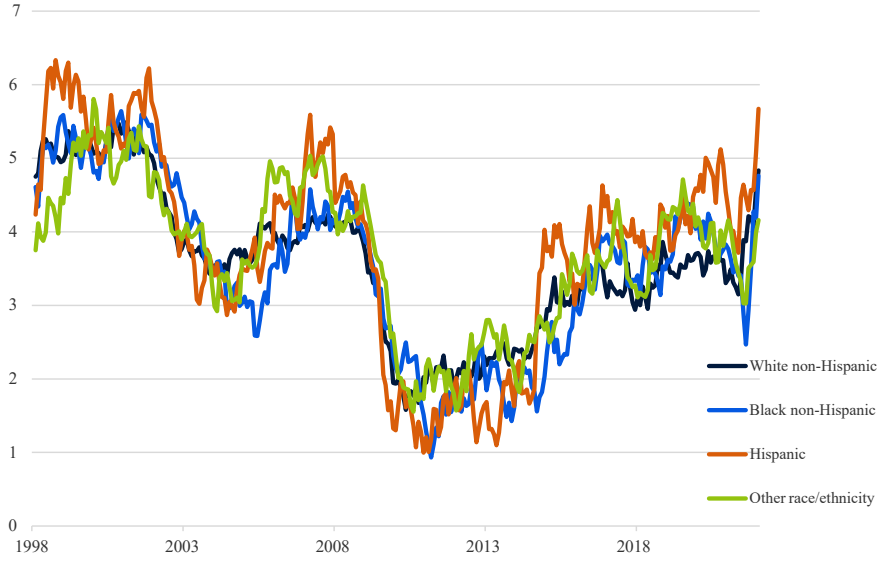
Percent



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

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

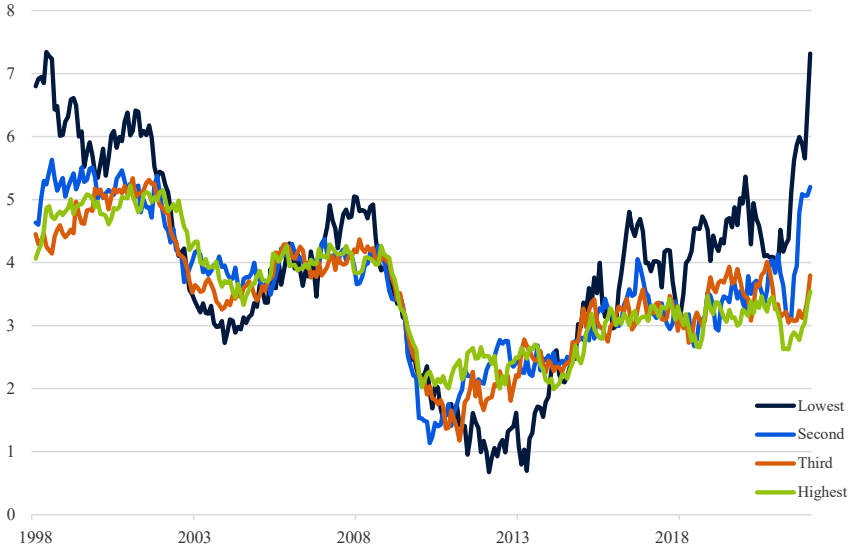
Percent



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

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

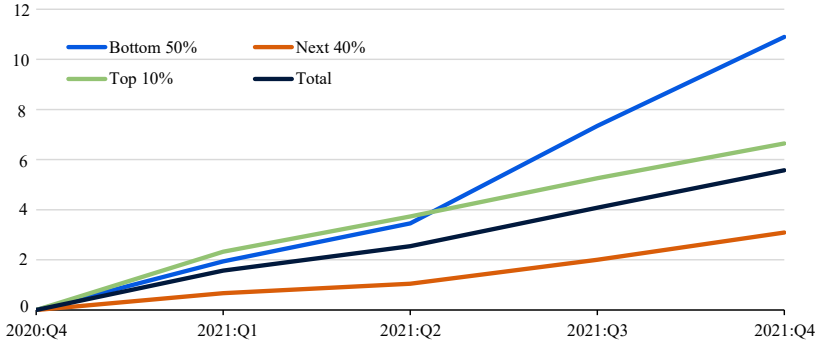
Percent



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

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

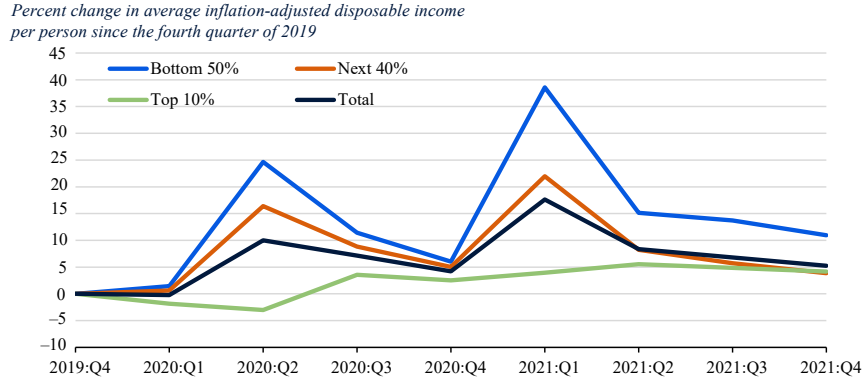
Percent change in average inflation-adjusted market income per person since the fourth quarter of 2020



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

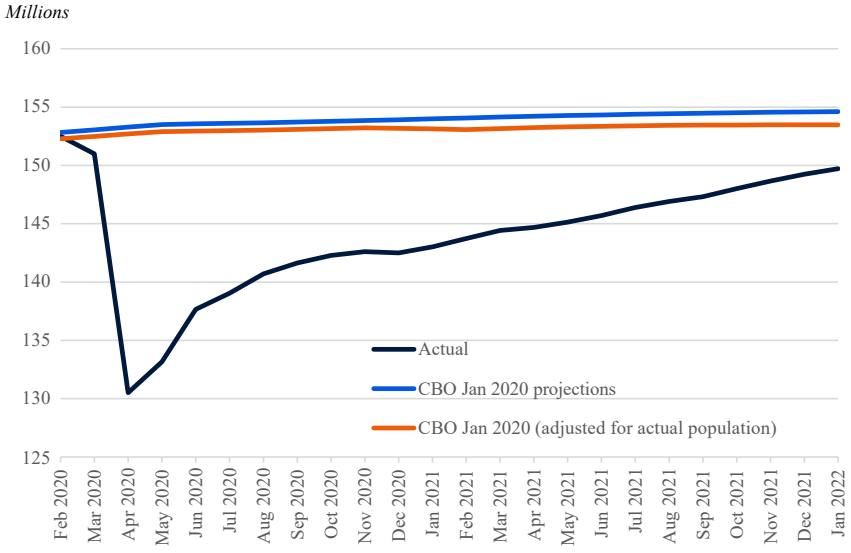
Our unfrozen economist would see much to suggest a tight labor market in 2021. But she would also quickly see several important measures suggesting a meaningful amount of room for further growth.

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.

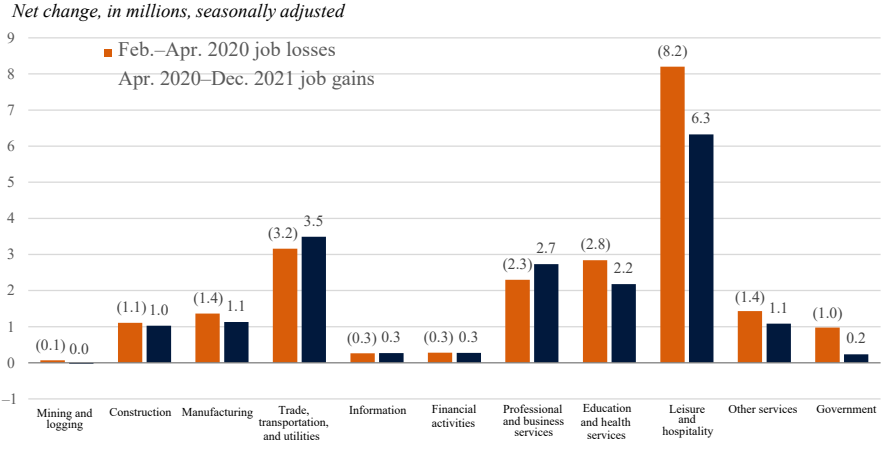
[33] CBO (2020).

Figure 2-35. Payroll Employment, 2020–22



Sources: BLS; CBO.

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



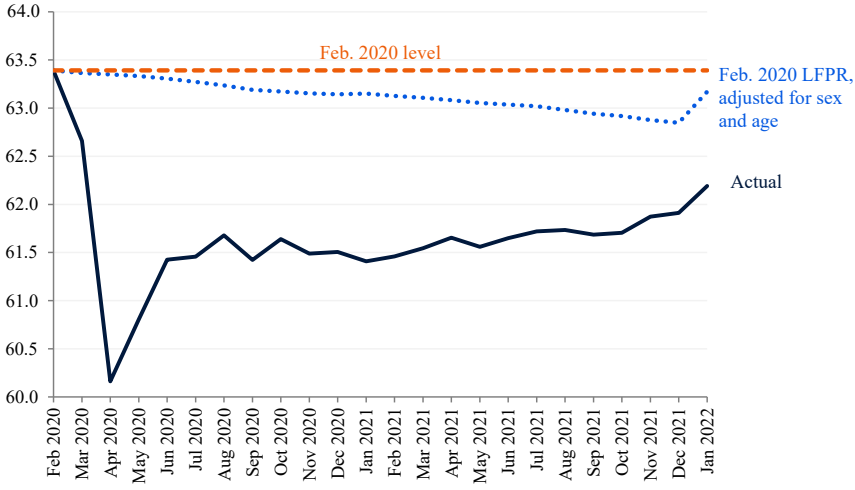
Sources: Bureau of Labor Statistics; CEA calculations.
Note: Parentheses denote negative values.

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

Percentage of population 16+ years of age



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

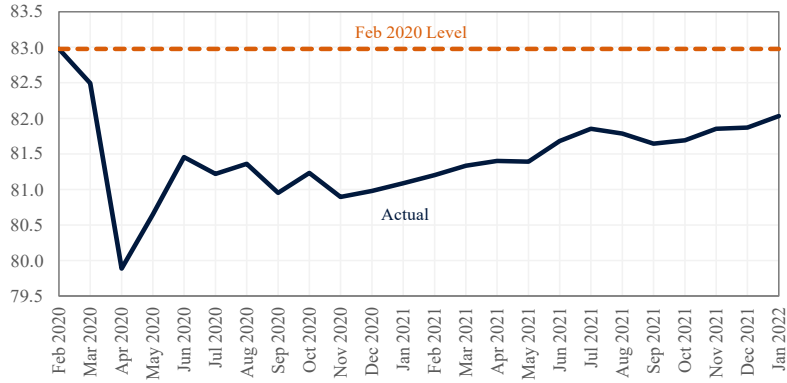
force as a share of the population age 16 and older—called the labor force participation rate or LFPR, as mentioned above—fell by an unprecedented 3.2 percentage points in just two months. Since then, the LFPR has partially recovered, and it rose by 0.4 percentage point over the course of 2021 alone. 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

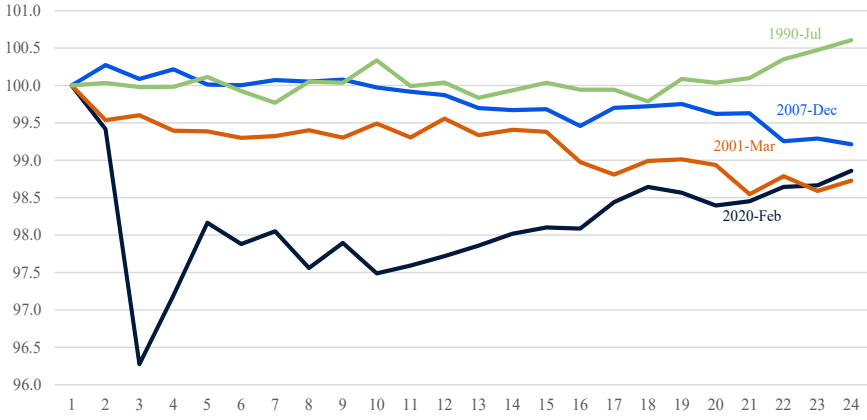
Percentage of population age 25–54



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

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

Index: 100 = cycle peak

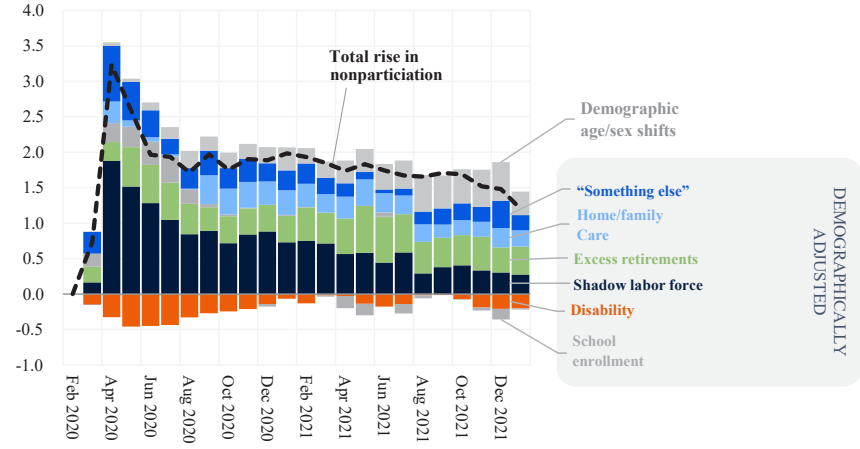


Source: Data from Haver Analytics.
Note: The date denotes a month out from the monthly business-cycle peak (index level = 100).

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

Percentage points of population, seasonally adjusted



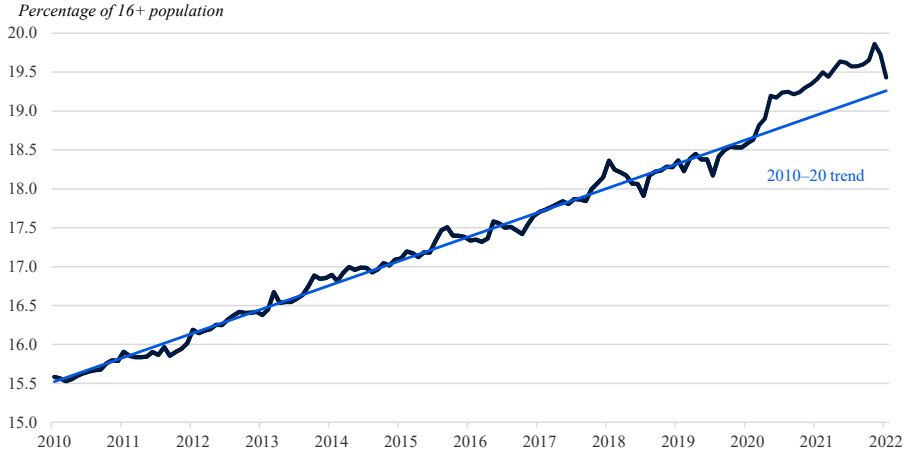
Sources: CPS; CEA calculations.

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):

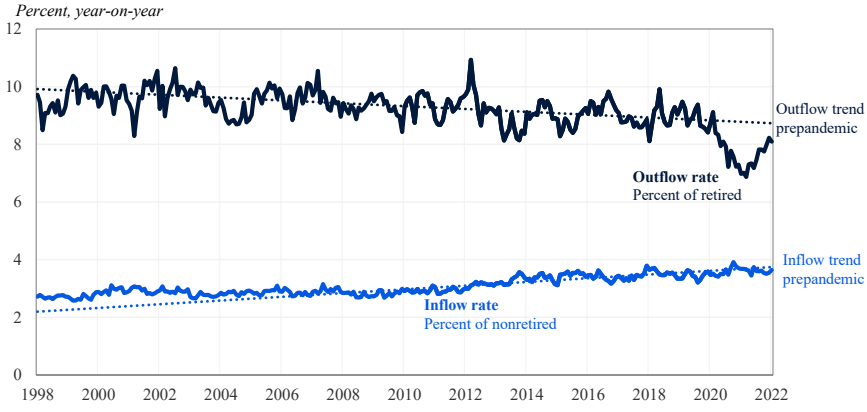
- *Aging of the population:* 880,000, explains 28 percent of the actual LFPR decline (none of the adjusted decline). As noted above, the aging of the population and retirement of the baby boomers is an ongoing force putting downward pressure on the LFPR (see, e.g., Cooper et al. 2021). Other population 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.

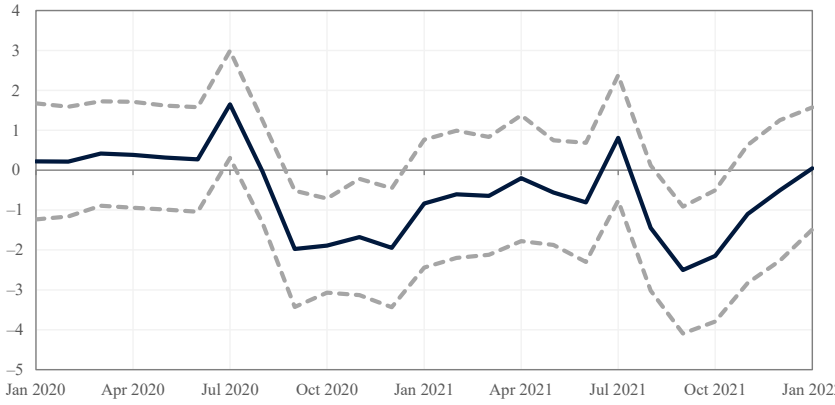
In one sense, this difference between the pandemic recovery and that of the Great Recession is not too surprising. The GDP and unemployment—and, to some extent, job growth—all bounced back faster in 2021 compared with slower, and initially more "jobless," recoveries after other recent downturns.

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

Percentage points, 95% confidence intervals



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

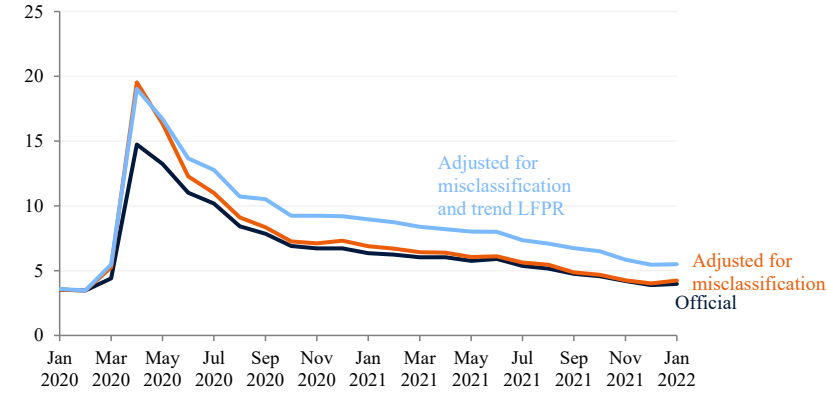
Just before the pandemic, the unemployment rate stood at 3.5 percent. The official rate then peaked at 14.7 percent in April 2020, before beginning a steady decline. Over the 12 months of 2021, it declined 2.8 percentage points, the largest December–December fall on record.

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

Percentage of the labor force



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

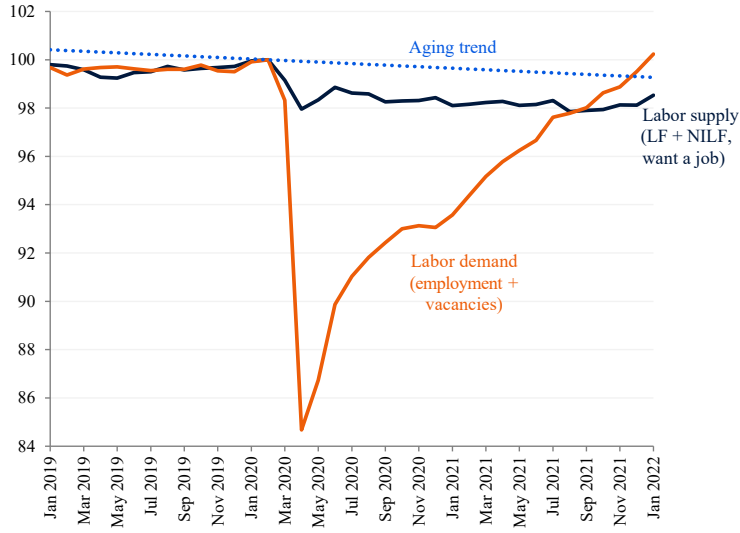
How, then, does the unfrozen economist imagined earlier in the chapter reconcile these facts? How did the labor market seem to recover fully while also being more than 5 million jobs short of the prepandemic trend? Like so many other economic dynamics during the pandemic, a large part of the answer is 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

Percentage of population 16+
Index: Feb. 2020 = 100



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.)

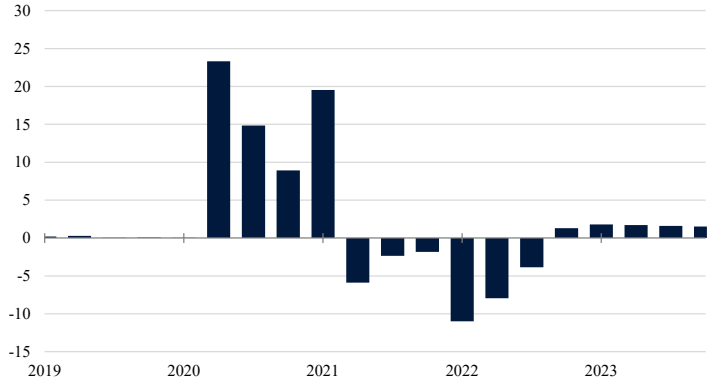
The Administration's inflation forecast focuses on two of the many price indices produced by the U.S. statistical agencies: the CPI and the price index for GDP. The CPI is important because it measures prices faced directly by consumers and because versions of it are used to escalate Social Security 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.