Prefatory Note

The attached document represents the most complete and accurate version available based on original files from the FOMC Secretariat at the Board of Governors of the Federal Reserve System.

Please note that some material may have been redacted from this document if that material was received on a confidential basis. Redacted material is indicated by occasional gaps in the text or by gray boxes around non-text content. All redacted passages are exempt from disclosure under applicable provisions of the Freedom of Information Act.

Content last modified 1/16/2026.

Report to the FOMC on Economic Conditions and Monetary Policy

Book A

Economic and Financial Conditions:
Outlook, Risks, and Policy Strategies

July 17, 2020

Prepared for the Federal Open Market Committee
by the staff of the Board of Governors of the Federal Reserve System

(This page is intentionally blank.)

Domestic Economic Developments and Outlook

Economic activity rebounded sharply in May and June, as states moved to reopen their economies. Consumer spending looks to have retraced somewhat more than half of its earlier plunge, while employment and industrial production each have reversed about one-third of their declines. These increases in economic activity came earlier than we had expected in the May Tealbook, implying a smaller decline in GDP last quarter than we had projected. After moving down at a 5 percent annual rate in the first quarter, we now estimate that GDP fell at a 33 percent rate last quarter—still its largest quarterly decline on record by far.

With many states lifting social-distancing restrictions, the total number of COVID-19 cases has surged since mid-June, implicitly exceeding the periodic local flare-ups anticipated in the May Tealbook. Many states—including California, Texas, and Florida—have responded by reimposing some restrictions, while nearly all states have slowed their reopening plans to some extent. To account for a more gradual relaxation of social distancing than we had previously assumed, as well as some high-frequency indicators suggesting that the pace of recovery has slowed in recent weeks, we have marked down our projection for second-half GDP growth. We also now assume that the Congress will enact a more expansive fiscal stimulus package, which partially offsets the effects from the slower unwinding of social distancing. All told, real GDP is expected to rise at a 12 percent pace in the second half, compared with 15 percent in the previous Tealbook.

Over the full year, we now expect that GDP will contract 5.6 percent, compared with a 7.1 percent drop in our previous forecast, and the unemployment rate is projected to be 8.9 percent in the fourth quarter. Thereafter, as social distancing diminishes, monetary policy remains stimulative, and recessionary forces fade, GDP growth exceeds its potential rate over the next two years. The unemployment rate moves down to 4.7 percent by the end of 2022, in line with our assumption for the natural rate at that time.

We estimate that PCE prices moved up in both May and June, about in line with our expectations, after falling sharply in March and April. As the economy continues to recover, and assuming that longer-term inflation expectations remain reasonably well

anchored, we see both total and core inflation rising from about 1 percent this year to 1.7 percent in 2021 and 2022.

Uncertainty about both the path of the COVID-19 pandemic and its implications for economic activity is a defining feature of the current economic environment. We present a baseline economic forecast predicated on the eventual containment of the pandemic that does not assume widespread reimposition of severe lockdown restrictions. However, as described in the Risks and Uncertainty section, we consider equally plausible an alternative scenario, called "Second Waves," where the containment efforts underpinning our baseline projection are unsuccessful, thus necessitating another round of intense social distancing and leading to a more substantial and protracted impairment of economic activity.

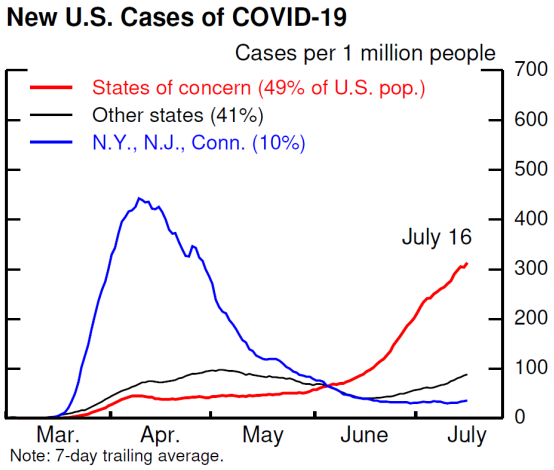
KEY BACKGROUND FACTORS

COVID-19 Pandemic and Response

The staff's baseline forecast is predicated most importantly on assumptions about the development of medical interventions to treat and prevent COVID-19 infections, about the extent of public health measures needed to slow the spread of the virus, and about how households and firms react to the containment measures and to the pandemic itself. Regarding **medical interventions**, we have, in particular, maintained our assumption that an effective vaccine emerges in the fall of 2021 and becomes widely available soon thereafter.

Following the relaxation of **public health measures** restricting economic activity and mobility, individuals reengaged in high-contact activities more intensively than we had anticipated. As a result, caseloads in many states have been rising rapidly since mid-June. In response, some states have paused reopenings, shut down some businesses, restricted in-restaurant dining, increased restrictions on large group gatherings, and mandated mask wearing. In coming weeks, we expect additional states or localities will take similar actions. Moreover, in areas where hospital systems may become overwhelmed, we think that local or state governments will need to impose lockdowns to stem the spread of the virus, but our baseline projection currently assumes that such lockdowns are not widespread. We also anticipate that many **households and firms** will pull back from risky or high-contact activities even in the absence of mandates—

especially in places with the highest infection rates (labeled on the chart below as "states of concern").[1]



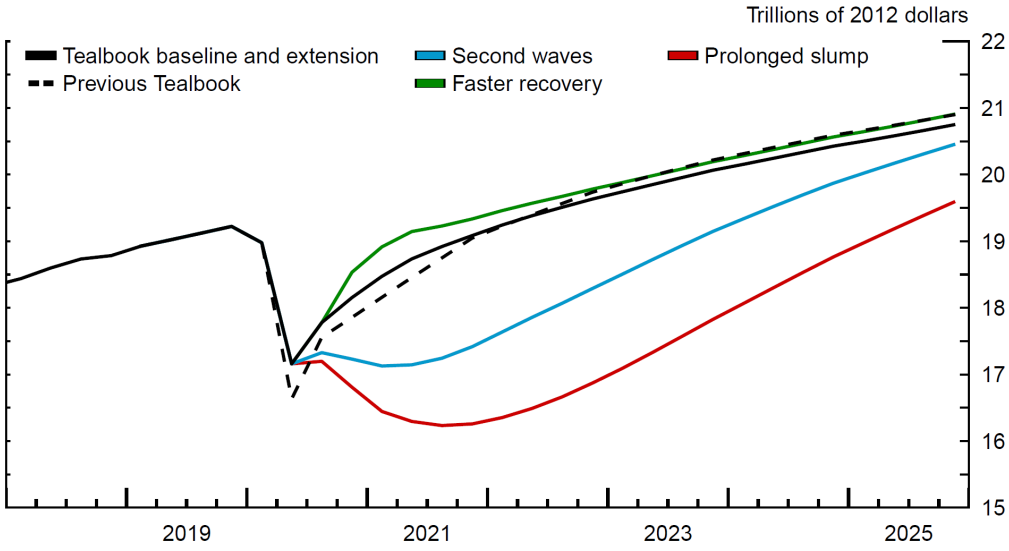
We assume that these containment efforts will eventually reduce new caseloads, at the cost of a significantly lower level of activity in sectors of the economy with substantial in-person interactions, including many consumer services. But we have also learned that some activities have been less affected by social distancing than we had anticipated, including construction, manufacturing, and vehicle sales. On net, we expect the unwinding of social distancing to contribute noticeably less to second-half GDP growth than in the May Tealbook.

Because of the uncertainty surrounding the pandemic, we view the probability of the baseline forecast coming to pass as lower than usual. In the "Second Waves" scenario, which we view as equally plausible, we assume that the containment efforts underpinning our baseline projection are less successful and that containment of the virus will necessitate a reinstatement of strict mandatory social-distancing rules across much of the country. As a result, economic activity turns down and the unemployment rate rises again in the fall, when many households and firms are still quite vulnerable financially, and the pandemic-related disruption to economic activity becomes substantially more protracted. We explore this scenario, along with the following two others, in the Risks and Uncertainty section: (1) a faster recovery as reopening proves less harmful than

[1] Includes states that, since June 15, have exhibited a 7-day trailing average of new cases that was above the national average and increasing. States consist of Alabama, Arizona, Arkansas, California, Florida, Georgia, Idaho, Iowa, Louisiana, Mississippi, Nevada, North Carolina, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, and Utah.

assumed in the baseline and (2) a prolonged slump in which relaxing social distancing repeatedly backfires and effective treatments and vaccines are slow to materialize.

The Staff's Baseline Forecast and Alternative Scenarios for the Level of Real GDP



Fiscal Policy

Thus far, approximately $3 trillion of federal COVID-19-related legislation has been enacted. We assume that another $1 trillion in stimulus legislation will be enacted by the end of July, twice as large as we had assumed in the May Tealbook. We now anticipate that this legislation will include an extension of enhanced UI benefits (though at $300 per week rather than the current $600 per week), another round of stimulus payments to households, a business payroll tax cut, and additional grants to state and local governments. In addition, we raised our estimate of the boost to demand this year from the CARES Act, because the payout of UI benefits has been larger than we expected.

As shown in the following table, we expect these policies to boost GDP growth significantly in 2020 and then to restrain output growth in 2021 and 2022 as the effects of the stimulus unwind.

Direct Effects of COVID-19 Fiscal Stimulus on GDP Growth
(Percentage point contribution to real GDP growth, annual rate)

		2020				2020	2021	2022
		Q1	Q2	Q3	Q4	Q4/Q4		
(1)	**Total**	**0**	**16.1**	**8.0**	**.1**	**5.8**	**-4.3**	**-.6**
(2)	Government purchases and grants	0	2.1	1.2	.7	.9	.5	- .3
(3)	Household support	0	11.4	4.1	.1	3.7	-3.8	-.1
(4)	Business support*	0	2.6	2.7	-.7	1.1	-1.0	-.2
(5)	***Total, May Tealbook***	***0***	***16.7***	***3.7***	***-3.3***	***4.2***	***-2.7***	***-.6***
	Memo:							
(6)	Yet to be enacted stimulus**	0	0	5.4	1.4	1.5	-.8	-.1

Note: Numbers may not sum to total due to rounding.

* Excludes the Main Street Lending Program and other Federal Reserve and Treasury lending programs to facilitate loans to businesses and state and local governments.

** Included in lines [1], [2], [3], and [4].

Despite our assumption that state and local governments will ultimately receive nearly $600 billion in federal aid, we nevertheless expect them to cut back on their purchases over each of the next several years as they face severe budget pressures.

Monetary Policy

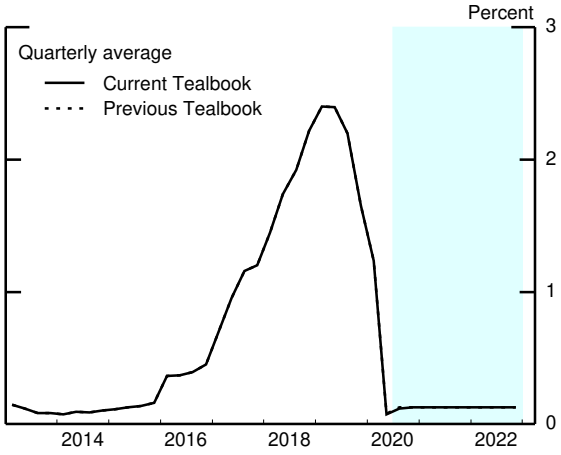
We have not changed our monetary policy assumptions through 2022 since the May Tealbook, and we continue to project that the federal funds rate will stay at its effective lower bound.[2] Our assumptions for the SOMA portfolio are detailed in Tealbook B.

The monetary policy actions taken in response to COVID-19 are expected to substantially cushion the blow to economic activity over the next few years. Gauging the effects of changes in the federal funds rate, changes in balance sheet policies, and the introduction of corporate bond facilities since the *January* Tealbook on the paths of interest rates, equity prices, house prices, and the dollar, we estimate that GDP growth will be boosted about 1½ percentage points both this year and next and about ½ percentage point in 2022.

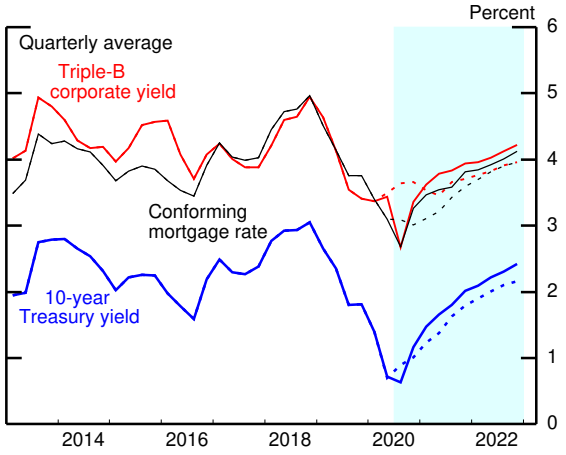
[2] Specifically, the federal funds rate follows a policy rule meant to be roughly consistent with the forward guidance provided in FOMC statements since March and departs from the effective lower bound in the quarter after the unemployment rate falls below its assumed long-run natural rate of 4.3 percent.

Key Background Factors Underlying the Baseline Staff Projection

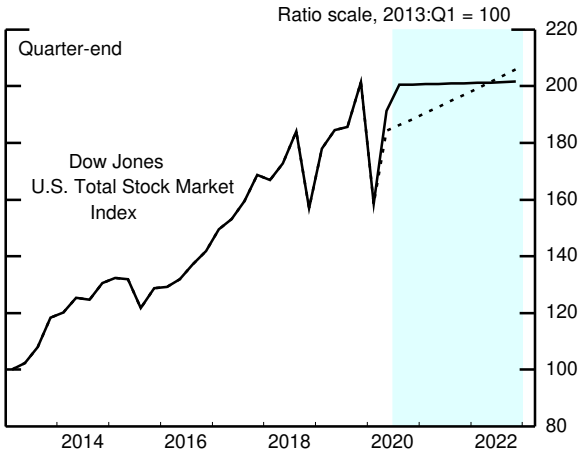
Federal Funds Rate



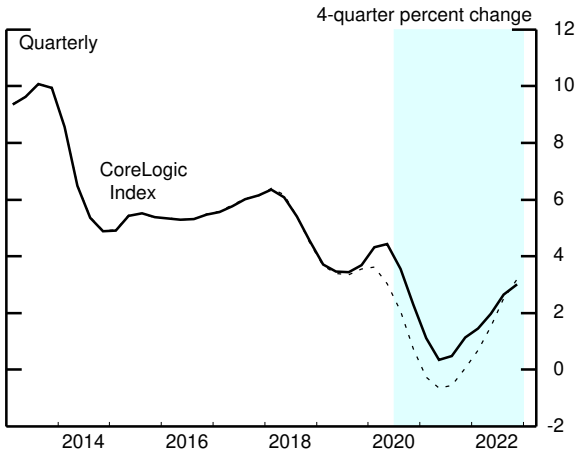
Long-Term Interest Rates



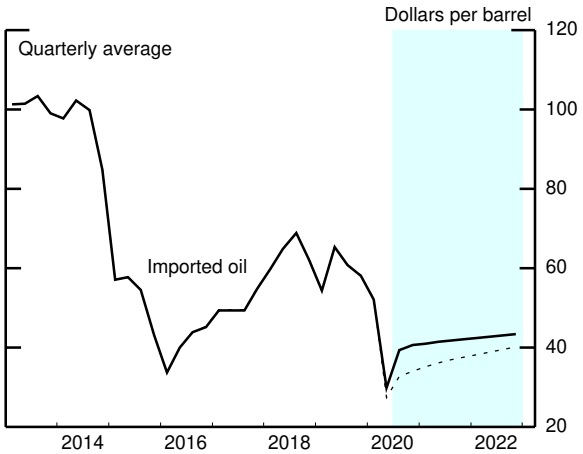
Equity Prices



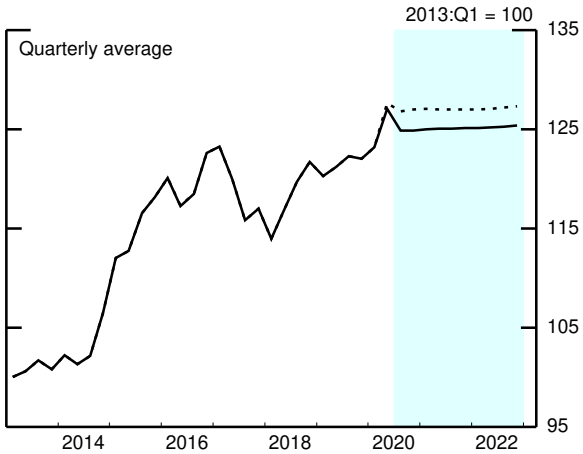
House Prices



Oil Prices



Broad Real Dollar



Revisions since the January Tealbook to GDP Forecast due to the Effect of Monetary Policy on Financial Variables
(Percentage point contribution to Q4/Q4 growth)

	2020	2021	2022	2020-22
Total	**1.4**	**1.5**	**.6**	**3.5**
Expected path for short rates	.6	.8	.4	1.9
Balance sheet policy	.5	.4	.2	1.2
Corporate bond facilities	.2	.1	-.0	.3

Note: Items may not sum to total due to rounding and nonlinearities.

- The revisions since the onset of the COVID-19 crisis to the projected path of the federal funds rate over the next 15 years broadly affect financial conditions and provide the most substantial boost to activity, accounting for 1.9 percentage points of the 3.5 percent higher level of GDP at the end of 2022. Changes in balance sheet policies are estimated to boost GDP largely through their effects on longer-term interest rates and equity prices, while the corporate bond facilities are estimated to reduce interest rates on private bonds and increase equity prices (via a lower equity premium).

- Because our estimates do not fully account for the effects of monetary policy on financial market functioning and economic uncertainty, they likely understate the total effect on real activity. It is hard to conceive of what might have happened to household and business confidence, for example, had the Federal Reserve taken no policy actions in the current economic situation.

Financial Conditions

Investor sentiment has improved since the May Tealbook in response to stronger-than-expected data on economic activity, despite the increase in COVID-19 cases in the United States and the resulting concerns about the pace and timing of the economic recovery.[3] U.S. equity prices have increased, while longer-term Treasury yields have edged down on net. Investment-grade corporate bond spreads have narrowed notably, speculative-grade bond spreads have decreased somewhat, and the dollar has depreciated about 2.0 percent.

Several Federal Reserve facilities have continued to support the issuance of corporate and municipal bonds and asset-backed securities. However, access to credit

[3] Much of this improvement occurred in response to the surprisingly strong May employment report, which was released between publication of the May Tealbook and the June FOMC meeting.

Domestic Econ Devel & Outlook

Summary of the Near-Term Outlook for GDP

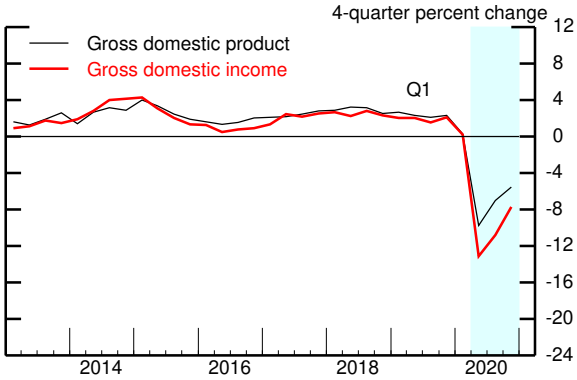
(Percent change at annual rate except as noted)

Measure	2020:Q2		2020:Q3		2020:Q4	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**-41.0**	**-33.2**	**24.1**	**15.2**	**7.0**	**8.7**
Private domestic final purchases	-45.3	-34.6	31.1	15.1	6.7	8.3
Personal consumption expenditures	-45.2	-35.2	46.4	21.4	4.6	8.4
Residential investment	-62.2	-39.6	-23.8	8.5	36.9	14.3
Nonres. private fixed investment	-39.8	-30.0	-16.4	-11.5	11.6	6.0
Government purchases	1.8	1.8	3.7	3.3	-2.4	-.6
Contributions to change in real GDP						
Inventory investment[1]	-4.7	-3.3	-1.4	1.1	1.3	2.9
Net exports[1]	2.4	-1.3	-.4	.6	.5	-1.2

1. Percentage points.

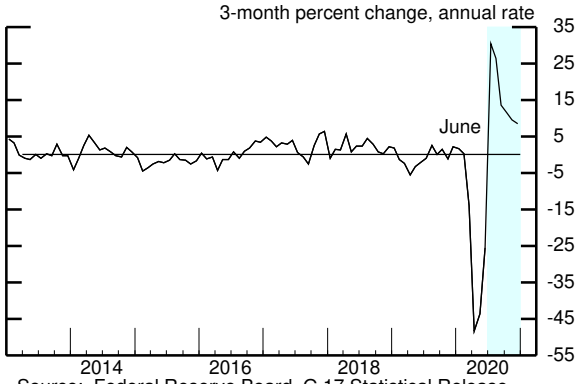
Recent Nonfinancial Developments (1)

Real GDP and GDI



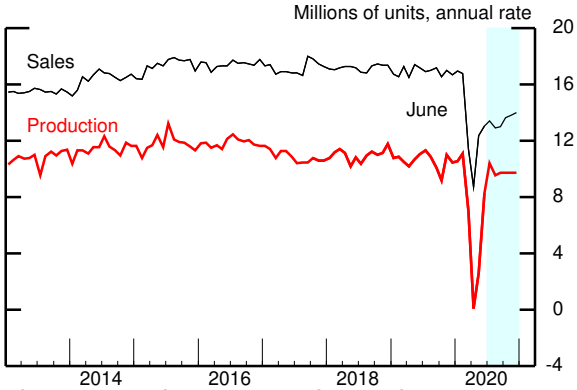
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Manufacturing IP ex. Motor Vehicles and Parts



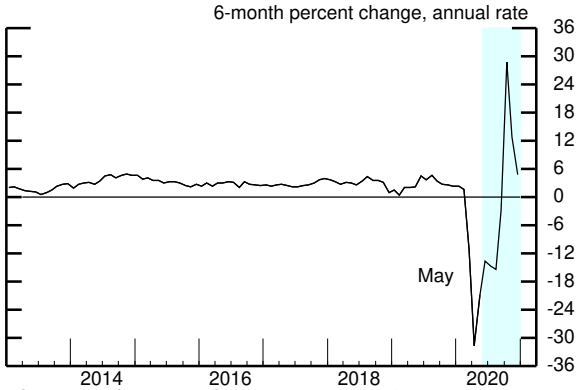
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

Sales and Production of Light Motor Vehicles



Source: Ward's Communications; Chrysler; General Motors; FRB seasonal adjustments.

Real PCE Growth



Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

from banks for businesses of all sizes and consumers with lower credit scores remains limited, in part reflecting concerns about their ability to repay debt.

- We project the 10-year Treasury yield to rise from an average of 0.6 percent this quarter to 2.4 percent by the end of 2022, reflecting an expected increase in the term premium spurred in part by increasing Treasury issuance and diminishing effects of SOMA holdings, as well as improving economic conditions over the next two years. Relative to the May Tealbook, the projected path for the Treasury yield has become steeper, mostly due to a faster increase in the term premium that is only partially offset by lower expected short rates over the valuation window (beyond 2022).
  - The steeper trajectory of the Treasury term premium primarily reflects the staff's upward revision to the projected Treasury issuance stemming from expanded fiscal stimulus. The trajectory also steepened in light of our expectation that the market will learn that SOMA asset purchases will be smaller (and of shorter maturity) than they currently expect.
- After the near term, private-sector borrowing rates are revised essentially in line with the 10-year Treasury yield.
- Stock prices are currently about 7.5 percent higher than projected in the May Tealbook. Going forward, we expect equity prices to be essentially flat, compared with the 4 percent per year appreciation in the May Tealbook, as valuation pressures are projected to increase substantially over the forecast horizon, largely reflecting the rise in the 10-year Treasury yield. All told, the level of stock prices at the end of 2022 is revised down about 2 percent.

RECENT DEVELOPMENTS AND NEAR-TERM OUTLOOK

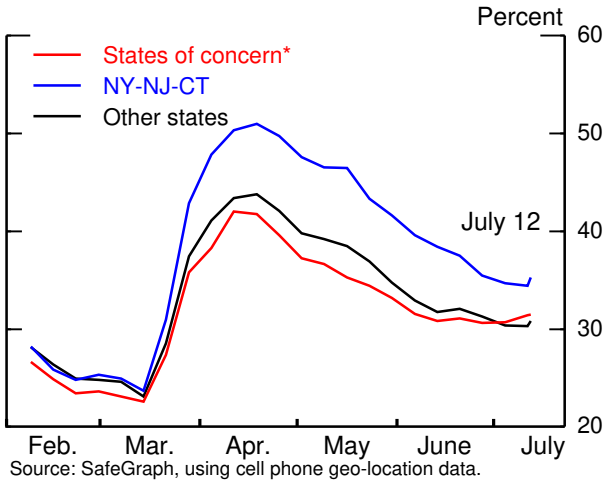
Spending and Production

A variety of indicators suggest that economic activity picked up more quickly than we had expected in May and June. In response, we reduced our estimate of the plunge in second-quarter GDP from an annual rate of 41 percent in the May Tealbook to 33 percent. However, as we now expect social distancing to unwind more slowly over the second half of the year, and with some high-frequency indicators pointing to slower growth in recent weeks, we have marked down our projection for second-half GDP

Domestic Econ Devel & Outlook

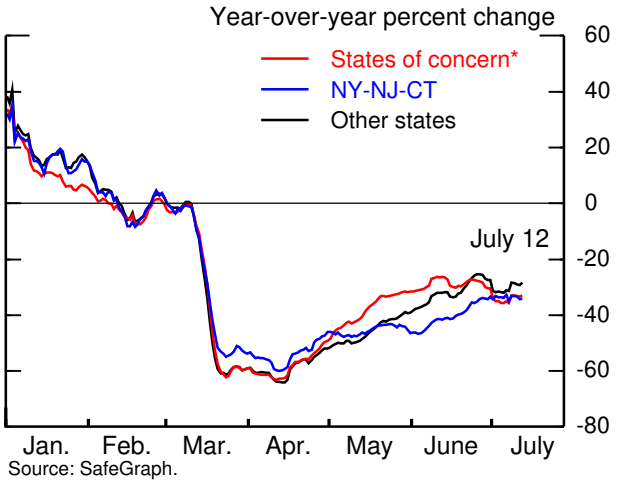
Consumer Spending

Share of the Population Staying at Home



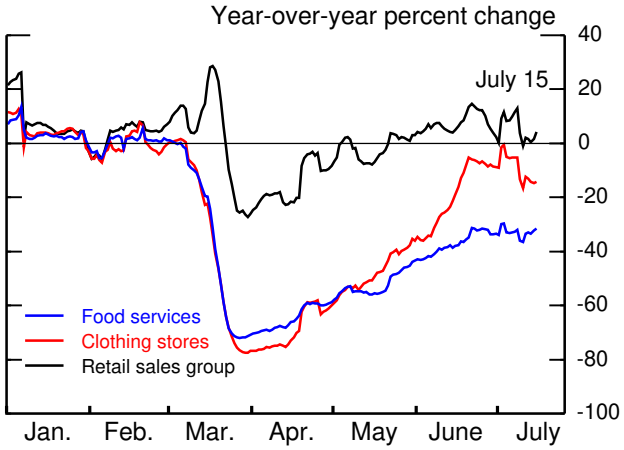
Source: SafeGraph, using cell phone geo-location data.

Visits to Restaurants



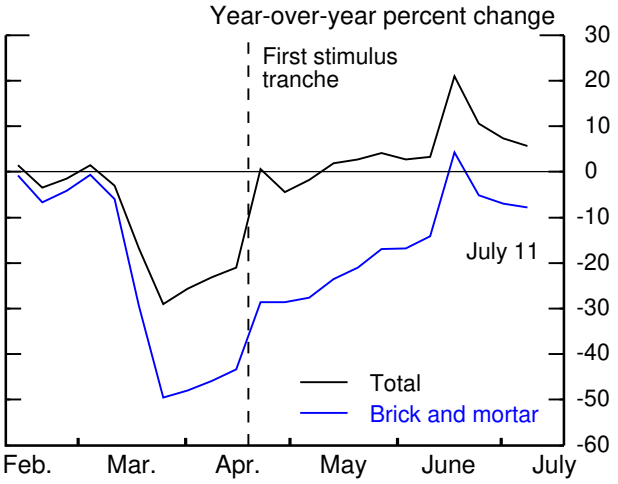
Source: SafeGraph.

Daily Credit/Debit Spending



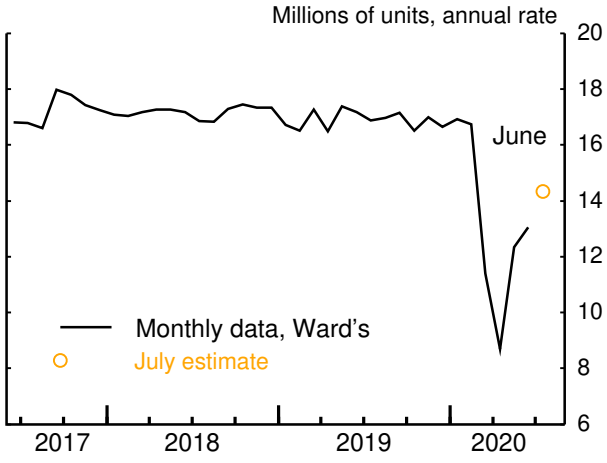
Note: 7-day moving average. Retail sales group excludes non-store merchants.
Source: Fiserv, Inc.

Spending on Non-Food Retail Goods



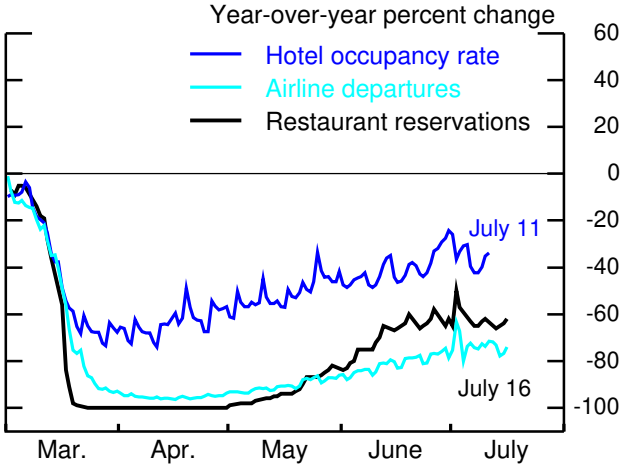
Source: NPD Group.

U.S. Light Vehicle Sales



Source: Ward's Communications and J.D. Power; adjusted using FRB seasonals.

Hotel, Restaurants, and Air Travel



Source: OpenTable.com accessed through Haver; STR; Transportation Security Administration.

* Includes states that, since June 15, have exhibited a 7-day trailing average of new cases that was above the national average and increasing. States include AL, AR, AZ, CA, FL, GA, IA, ID, LA, MS, NC, NV, OK, SC, SD, TN, TX, and UT.

growth to a still robust 12 percent. (Some of these high-frequency indicators are displayed in nearby exhibits.)

- **Consumer spending** rebounded in May by much more than we had expected, and it looks to have increased further in June, as both motor vehicle sales and retail sales rose last month. Indeed, overall PCE goods spending now appears to have retraced all of its earlier declines. In contrast, spending on discretionary services—such as hotel stays, air travel, and in-person restaurant dining—appears to have recovered much less. All told, we now project that the level of consumption in June had recovered about 60 percent of its March–April decline.

  - Consumer spending in May and June was supported importantly by recent fiscal stimulus policies. Transfer payments—including stimulus payments to households and generous supplements to UI benefits—jumped by $3 trillion (annual rate) in April before falling back by $1.1 trillion in May.[4] Indeed, in the aggregate, disposable personal income *rose* in recent months on the strength of the fiscal support despite substantial net job losses.

  - Most high-frequency indicators of consumer spending have been little changed, on net, since mid-June. Moreover, likely in response to rising cases of COVID-19, some mobility-based indicators—such as the SafeGraph measure of restaurant visits—have moved lower in recent weeks, and the Michigan measure of consumer sentiment turned down in early July. This apparent flattening out in services spending is consistent with our expectation that social distancing will ease more slowly, and we now project consumer spending to be little changed through September before picking up again in the fall—a less robust rebound than in the May Tealbook.[5]

- In the face of heightened uncertainty, depressed profit expectations, and supply chain disruptions, businesses slashed **fixed investment** an estimated

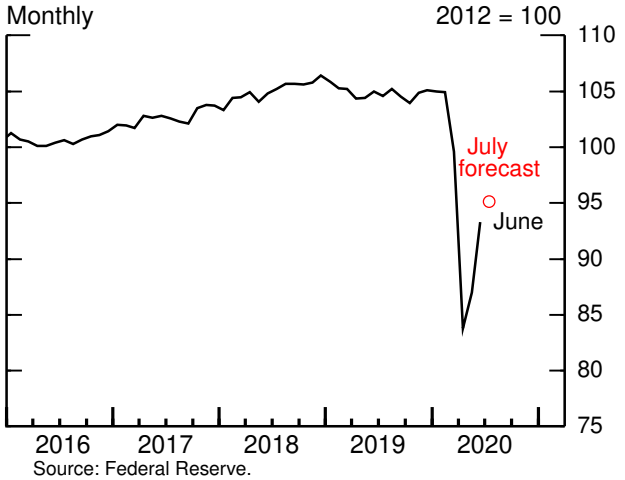
[4] Also, we think the Paycheck Protection Program supported wages and salaries of workers who otherwise would have been laid off.

[5] On a quarterly average basis, we project PCE to increase at a 21 percent rate in the third quarter, with that gain reflecting the spending increases in May and June.

Domestic Econ Devel & Outlook

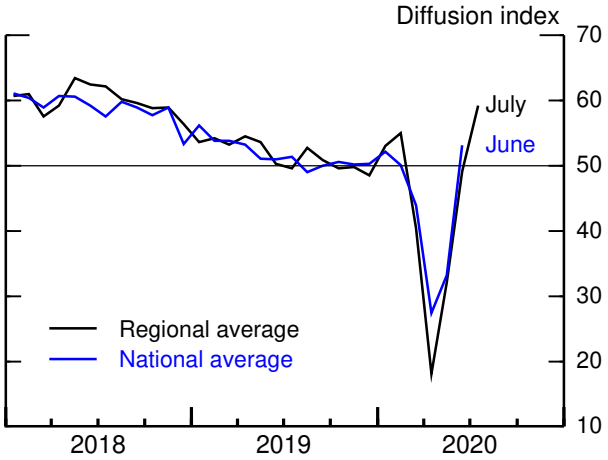
Industrial Sector & Housing

Industrial Production Index: Manufacturing



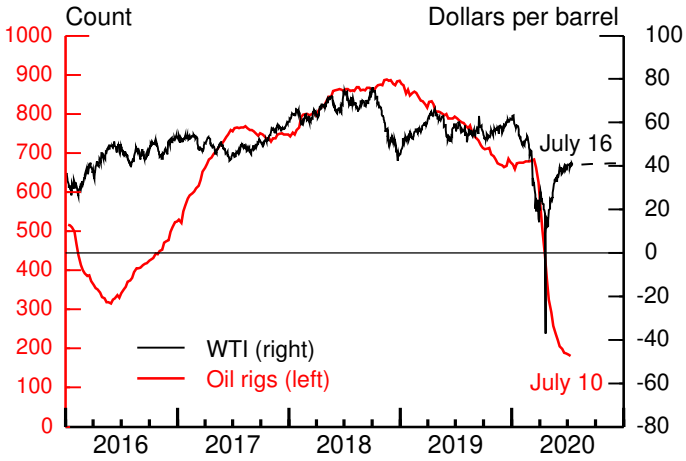
Source: Federal Reserve.

Manufacturing New Orders Indexes



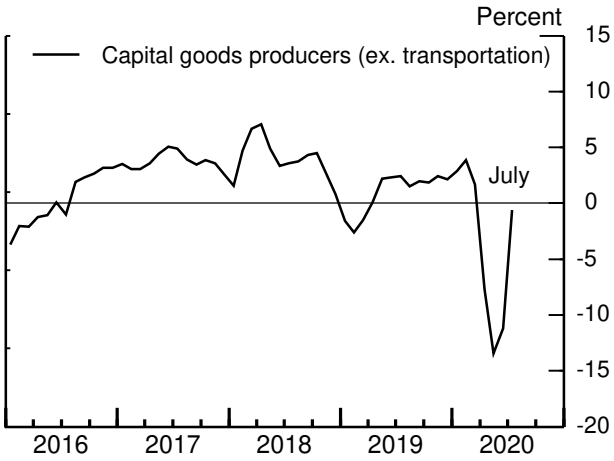
Source: ISM and Markit national surveys and six regional surveys.

Oil Price and Drilling Rigs



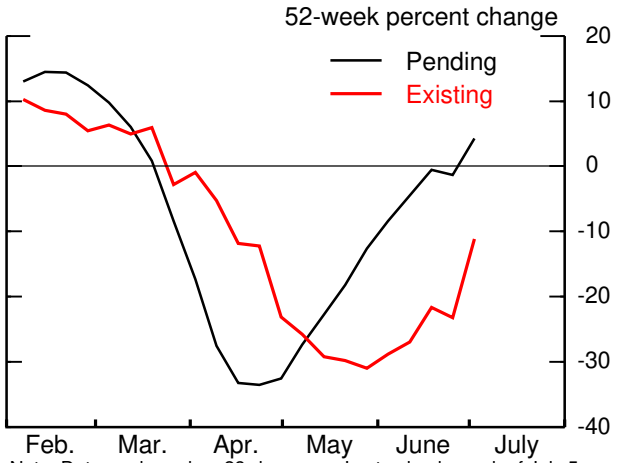
Note: Weekly oil rigs data extend through July 10. WTI data extend through July 16; dashed lines are monthly futures contracts.
Source: Baker-Hughes (drilling rigs).

Change in Expected Near-Term Profits



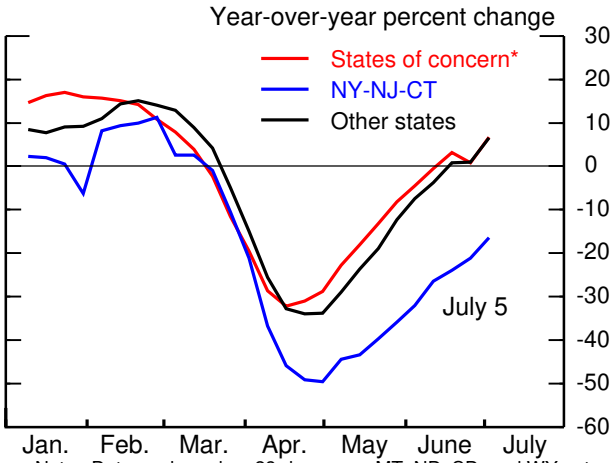
Note: Percentage change in 12-month forward earnings expectations from three months earlier. July data are as of July16th.
Source: Staff calculations from Thomson Reuters I/B/E/S.

Pending and Existing Home Sales



Note: Data are based on 28-day sums. Last value is week of July 5.
Source: Data provided by Redfin, a national real estate brokerage.

Pending Home Sales



Note: Data are based on 28-day sums. MT, ND, SD, and WY not included.
Source: Data provided by Redfin, a national real estate brokerage.

* Includes states that, since June 15, have exhibited a 7-day trailing average of new cases that was above the national average and increasing. States include AL, AR, AZ, CA, FL, GA, IA, ID, LA, MS, NC, NV, OK, SC, SD, TN, TX, and UT.

30 percent in the second quarter and are expected to trim spending further in the second half.

- The outlook for E&I spending is less bleak than in the previous Tealbook, as the data on nondefense capital goods orders and shipments (excluding aircraft) for May were generally somewhat better than expected and indicators of business sentiment improved. That said, we continue to expect that E&I will decline again in the third quarter, but at a more moderate pace than in the previous projection.

- Drilling investment has fallen off sharply in response to low oil prices. Elsewhere, available data through May show that construction activity for *ongoing* nonresidential building projects fell, though less than we had expected. That said, demand for *new projects* has collapsed, and we now project a more prolonged slump in outlays for **nonresidential structures.**

- **Manufacturing output** jumped in May and June, driven in part by the restarting of motor vehicle production following extended shutdowns in the second half of March and in April. However, even after a gain of more than 10 percent over the past two months (not at an annual rate), the level of factory production has recovered less than half its earlier losses.[6] Looking ahead, we expect that factory output in December will still be about 5 percent below its February level.

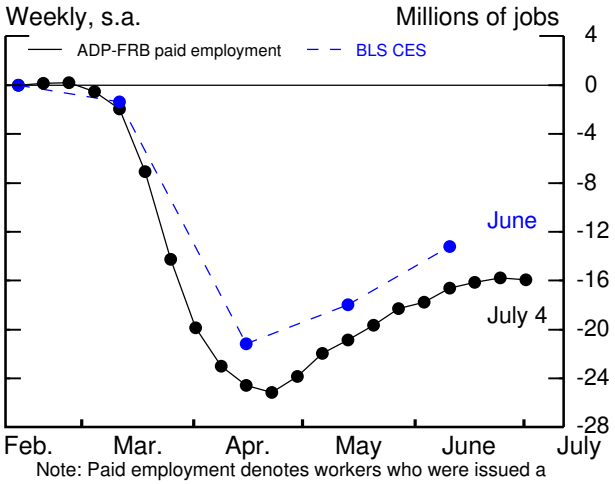
- We estimate that **residential investment** fell at an annual rate of about 40 percent in the second quarter, a noticeably smaller decline than in our previous projection, as the bottom of activity was less deep and the turnaround faster than expected. Indeed, the housing sector seems to have been more resilient to social distancing than we had thought; for example, single-family starts and permits rose sharply in June, and anecdotal reports suggest an increased use of virtual home tours and closings. Accordingly, we expect residential investment to post a sizable gain in the second half of the year.

[6] Although manufacturing output accounts for nearly three-fourths of total industrial production (IP), total IP has recovered less than manufacturing, as mining output continued to decline in May and June because of the ongoing decreases in oil well drilling and crude oil extraction.

Domestic Econ Devel & Outlook

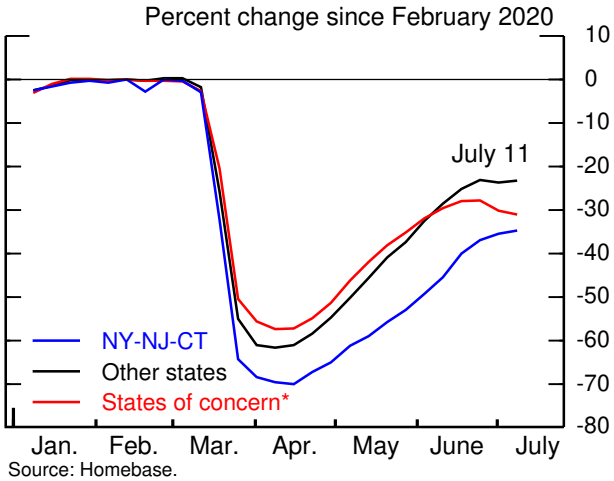
Labor Market

Cumulative Job Loss since February 15, 2020



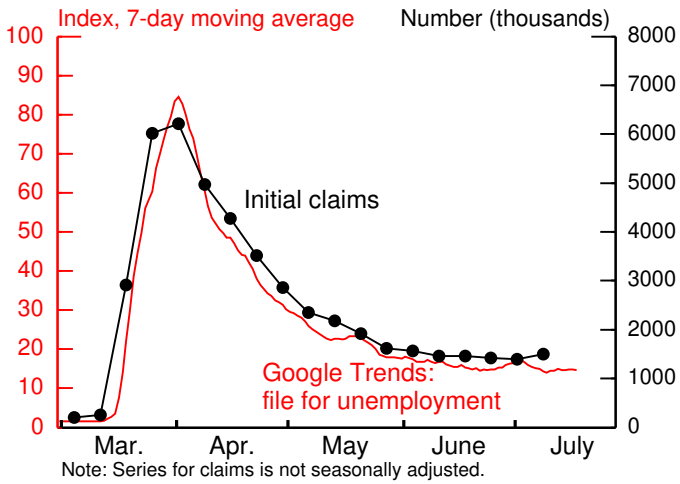
Note: Paid employment denotes workers who were issued a paycheck in a given pay period.
Source: BLS; ADP; staff estimates.

Employment at Small Businesses



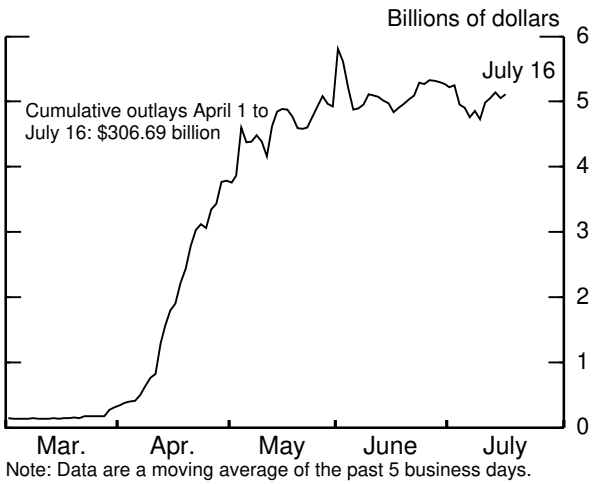
Source: Homebase.

Initial UI Claims



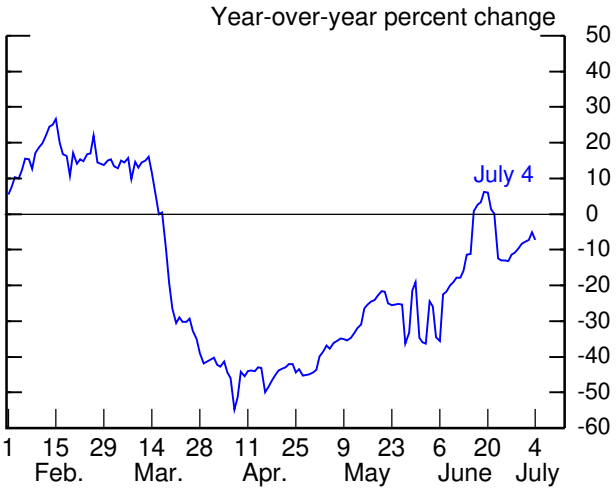
Note: Series for claims is not seasonally adjusted.
Source: Department of Labor; Google Trends.

UI Outlays



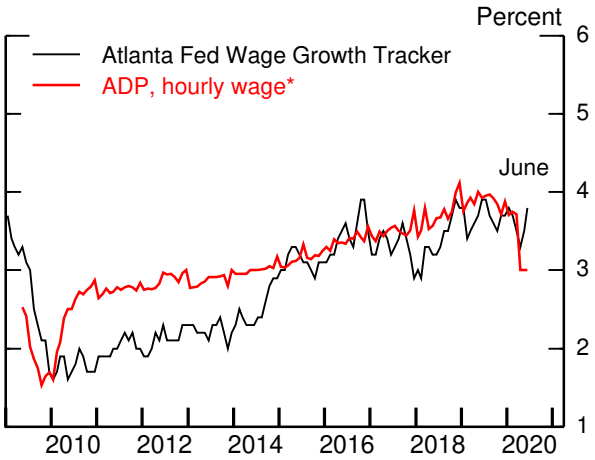
Note: Data are a moving average of the past 5 business days.
Source: Daily Treasury Statement data.

Job Postings



Source: Indeed.

Median 12-month Wage Growth



* Includes tips and commissions.
Source: Federal Reserve Bank of Atlanta; ADP; staff calculations.

* Includes states that, since June 15, have exhibited a 7-day trailing average of new cases that was above the national average and increasing. States include AL, AR, AZ, CA, FL, GA, IA, ID, LA, MS, NC, NV, OK, SC, SD, TN, TX, and UT.

- After dropping at a 9 percent annual rate in the first quarter, **real exports** are estimated to have plunged 68 percent in the second quarter amid a dramatic decline in foreign activity and global trade. The first-half weakness in exports was importantly driven by a collapse in exports of travel and transportation services, as discussed further in the box "Export Perspectives: Travel and Transport." (Please note that the boxes are placed at the end of this section of the Tealbook; people reading online can click on the hyperlink to jump to the box.) We expect real exports to recover at a 31 percent rate in the second half, as foreign economic activity picks up. Imports are estimated to have declined 54 percent last quarter but are also expected to rebound partially over the second half, in line with U.S. economic activity. The net effect of these huge swings in exports and imports is to subtract a moderate 0.3 percentage point from GDP growth in the second half after subtracting 1.3 percentage points last quarter.

The Labor Market

The labor market improved substantially in both May and June, as **payroll employment** rose very rapidly and the **unemployment rate** declined notably. The rebound in the labor market was both one month earlier and, on net, stronger than expected. However, weekly estimates of private payrolls constructed by Board staff from ADP microdata, as well as some other high-frequency measures, indicate that employment gains have slowed significantly since the mid-June reference period.

- As reported by the BLS, private employers added 8 million jobs over those two months, after having slashed payrolls by 21 million during the previous two months, similar to our measure based on ADP microdata. Job gains were widespread across nearly all sectors but were especially strong in the leisure and hospitality sector and the retail trade sector, where COVID-19-related declines in March and April had been steepest. Private payrolls were also supported by the Paycheck Protection Program, which allowed small firms to retain employees despite steep revenue losses. In contrast, government

payrolls continued to contract sharply in May, reflecting the early school shutdowns this year, before edging up in June.[7]

- After having declined steadily through mid-June, initial claims for regular state unemployment benefits have flattened out at about 1½ million per week in recent weeks. Meanwhile, job postings as measured by Indeed appear to have moved lower since mid-June.

- Taking signal from the ADP microdata as well as information on layoffs and job openings, we expect private payroll gains will step down to a still robust pace of 700,000 in July.

- The reported **unemployment rate** fell from 14.7 percent in April to 11.1 percent in June, 0.5 percentage point below our previous projection. Because of measurement problems, the true level of the unemployment rate was likely much higher than reported in April and May and still somewhat higher than reported in June. (For more information, see the box "Unemployment and Participation Rates: Recent Measurement Issues.") The unemployment rate is expected to decline more gradually over the second half and reach 8.4 percent in December.

Near-Term Labor Market Forecast

	2020							2020
Labor market indicator	Mar.	Apr.	May	June	July	Aug.	Sept.	Q4 [2]
Payroll employment [1]	-1,370	-20,790	2,700	4,800	1,450	850	620	910
Private [1]	-1,360	-19,840	3,230	4,770	680	610	860	990
Unemployment rate (percent)	4.4	14.7	13.3	11.1	10.6	10.4	10.1	8.4
LFPR (percent)	62.7	60.2	60.8	61.5	61.7	61.9	62.0	62.2
EPOP (percent)	60.0	51.3	52.8	54.6	55.2	55.4	55.8	56.9

Note: LFPR is labor force participation rate; EPOP is employment-to-population ratio.
1. Average monthly change, thousands, rounded to nearest 10,000.
2. Q4 forecasts for unemployment rate, LFPR, and EPOP are December values.
Source: Bureau of Labor Statistics; staff calculations.

[7] Given widespread school shutdowns in the spring, we expect a large increase in seasonally adjusted state and local government employment in July, as many of the typical end-of-school-year layoffs have effectively already occurred. Moreover, at the federal level, we expect temporary census hiring to ramp up over July and August. All told, we project a substantial increase in government employment of around ½ million, on average, in July and August.

- The **labor force participation rate** (LFPR) also partially recovered in May and June, reaching 61.5 percent. Taking account of the falling unemployment rate and rising participation rate, the employment-to-population ratio (**EPOP**) increased to 54.6 percent in June from 51.3 percent in April—but was still more than 6 percentage points below its pre-COVID-19 level. Both the LFPR and EPOP are expected to continue to improve during the second half but to end the year well below their February levels.

THE MEDIUM-TERM OUTLOOK FOR REAL ACTIVITY

With social distancing easing relative to April and strong support from monetary and fiscal policies, economic activity is projected to rebound in the second half of 2020 despite significant headwinds from macroeconomic and recessionary dynamics.[8] Over 2021 and 2022, activity continues to rebound, as a further assumed waning of social distancing (and its end once a vaccine becomes widely available), along with highly accommodative monetary policy, more than offsets the unwinding of fiscal stimulus.

As the recent virus outbreaks have led us to expect a slower easing in social distancing than in the May Tealbook, they also result in slightly more persistent recessionary dynamics and a slower improvement in the output gap. We now project that the output gap will be 0.2 percent at the end of 2022, compared with a 0.7 percent gap in the May Tealbook. Likewise, the unemployment rate falls to 4.7 percent at the end of 2022, 0.2 percentage point higher than our previous forecast.

We continue to assume that the COVID-19 crisis reduces the level of potential output by 2 percent at the end of 2022 and that the natural rate of unemployment returns to its pre-COVID-19 level in 2024. (See the box "Implications of COVID-19 for the Natural Rate of Unemployment" for more discussion of our natural rate assumptions.)

[8] In our accounting, macroeconomic dynamics capture the usual response of household and business spending to lower income, profits, and wealth. Recessionary dynamics capture heightened pessimism, risk aversion, and uncertainty, as well as reduced access to credit, forces that are particularly powerful in recessions. Recessionary dynamics also include the effects of preexisting imbalances—such as economic inequality and excessive corporate debt—that may compound the direct effects of this especially large economic shock.

- Because mandatory social distancing held down employment by less than expected in the second quarter, we lowered our assessment of the natural rate that quarter by nearly 1 percentage point to 9.4 percent.

The Contour of Real GDP Growth and COVID-19 Effects
(Contribution to annualized percent change)

	2020				2020	2021	2022
	Q1	Q2	Q3	Q4	Q4/Q4	Q4/Q4	Q4/Q4
Real GDP	- 5.0	-33.2	15.2	8.7	- 5.6	5.1	2.9
May Tealbook	*- 5.0*	*-41.0*	*24.1*	*7.0*	*- 7.1*	*6.7*	*3.6*
COVID-19 effects	**- 7.2**	**-35.8**	**12.5**	**6.3**	**- 8.1**	**3.1**	**1.2**
1. Social distancing and other disruptions	- 8.0	-38.6	17.2	11.0	- 6.5	6.9	- .0
2. Fiscal stimulus	.6	16.1	8.0	.1	6.0	- 4.3	- .6
3. Monetary policy	.0	1.9	1.9	1.9	1.4	1.5	.6
4. Standard macro dynamics (ex. MP)	- 1.0	- 7.7	- 6.2	- 5.3	- 5.2	1.1	- .7
5. Recessionary dynamics	1.1	- 6.7	- 7.4	- .5	- 3.1	- .9	2.1
6. Potential output	.0	- .9	- .9	- .9	- .7	- 1.2	- .2

THE OUTLOOK FOR INFLATION

We estimate that both core and total PCE prices increased in May and June after having fallen over March and April, and we expect monthly core inflation readings to remain positive in the second half of the year as economic activity continues to pick up. Nonetheless, we project core PCE price inflation to be 1.1 percent this year, well below its level before the onset of the pandemic. With energy prices rebounding some from their earlier collapse and food prices continuing to post sizable increases, we project total PCE prices to rise about in line with core this year. Importantly, we assume that the inflation expectations relevant for wage and price setting will continue to hold reasonably stable, as they appeared to do during the financial crisis, limiting the extent and persistence of this year's decline in inflation. Thus, with economic slack diminishing further after this year, we expect both total and core inflation to move back up to 1.7 percent in 2021 and 2022.

- **Core PCE price** inflation turned positive in May and (as indicated by the CPI and PPI data) also in June, as the prices of categories most affected by voluntary social distancing—accommodations, air travel, and apparel—as well as the nonmarket component of PCE prices began to reverse their sharp declines in previous months. We estimate that the 12-month change in core PCE prices was 1 percent in June and expect it will edge up to 1.1 percent by the end of the year.

- Prices for **food at home** continued to increase at a robust pace in May and June. The 12-month change in food prices has moved up from below 1 percent in February to over 5 percent in June, and we expect it to tick up further through the end of the year, as the effects of supply chain disruptions and the strong demand for food at grocery stores are not expected to ease substantially.

- **Energy** prices moved up in June following several months of steep declines. We expect these prices to rise again in July but to remain little changed, on net, over the rest of the year. In all, energy prices are projected to show a decline of about 12 percent over the 12 months ending in December.

  - Energy price inflation in June and July was higher than projected in the May Tealbook, largely reflecting higher oil prices. The spot price of Brent crude oil rose about $9, to $44 per barrel, with most of that increase occurring in early June, as OPEC and Russia announced an extension through July of their historic production cut. This week's announcement by OPEC and Russia of somewhat stronger production plans for August had little effect on prices. Consistent with the expected gradual recovery in global oil demand and continued production restraint, oil prices are expected to rise to $48 per barrel by December 2022, contributing to modest increases in consumer energy prices over the medium term.

- Lower **import prices** are another channel through which the global economic decline is expected to contribute to soft inflation this year. We project that the effective (that is, tariff-inclusive) price for imported core goods, after increasing 0.8 percent in 2019 in response to higher tariffs, will decline 0.3 percent this year, reflecting the drag from an appreciating dollar, lower commodity prices, and the reduction in some tariffs earlier this year.[9] Starting next year, effective core import price inflation is expected to pick up to a still subdued 1 percent pace, consistent with a pickup in foreign inflation and only a modest pace of dollar appreciation.

[9] This year's decline in import prices is significantly less than the one-year 5.7 percent decline that occurred starting in the third quarter of 2008, at the onset of the Global Financial Crisis (GFC). Although the current decline is consistent with recent movements in nonfuel commodity prices and the dollar, these determinants have moved much less than during the GFC.

- Despite the tumultuous economic situation, survey measures of **longer-term inflation expectations** are little changed on balance. The staff's common inflation expectations measure, which synthesizes the information from many different measures of inflation expectations, has held steady in recent months.
  - With longer-term inflation expectations reasonably stable, our estimate of underlying inflation remains constant at 1.8 percent through 2022.

Labor Compensation

Available indicators point to downward pressure on wages from the weak labor market. Accordingly, we project the employment cost index (ECI) will rise only 1.7 percent in 2020, down from 2.7 percent last year. With slack diminishing over the next two years, we expect the ECI to accelerate gradually to a 2.1 percent rate in 2022.

- We have so far received data from two wage measures that we see as relatively free from distortions caused by recent changes in the composition of workers.[10] The staff's measure of the median of 12-month wage changes based on worker-level microdata from ADP dropped from around 4 percent at the end of last year to 3 percent in June. A similar measure from the Atlanta Fed, based on the Current Population Survey, has, on balance, not shown any significant slowing during this period.
  - The ADP microdata indicate that an unusually large number of employers who typically make their annual wage adjustments between March and May cut or froze wages this year.[11]
- Consistent with the ADP microdata, wage indicators based on the Federal Reserve Bank of New York Business Leaders Survey and the National Federation of Independent Business survey show that the net percentage of

[10] We are not taking signal from the recent movements in the BLS's measure of average hourly earnings. Because the enormous employment losses and subsequent gains were largest among lower wage workers, movements in this measure of *average* wages are dominated by the changing composition of employment and do not reflect the wages of individual workers. The ECI for June, which we do not expect to be much affected by such composition effects, will be published the Friday after the FOMC meeting.

[11] See Tomaz Cajner, Leland D. Crane, Ryan A. Decker, John Grigsby, Adrian Hamins-Puertolas, Erik Hurst, Christopher Kurz, and Ahu Yildirmaz (2020), "The U.S. Labor Market during the Beginning of the Pandemic Recession," paper presented at the Brookings Papers on Economic Activity Conference, held at the Brookings Institution, Washington, June 25, https://www.brookings.edu/wp-content/uploads/2020/06/Cajner-et-al-Conference-Draft.pdf.

firms reporting an increase in worker compensation fell sharply through May and only edged up in June.

COMPARING THE STAFF PROJECTION WITH OUTSIDE FORECASTS

The staff forecast for GDP growth through 2021 is very close to the median projections of outside forecasters (these individual projections can be seen in the table and chart following the Blue Chip exhibit). However, the staff's forecast for the unemployment rate is somewhat lower than the Blue Chip consensus in the fourth quarter of this year and considerably lower than the consensus next year. For CPI inflation, the staff's forecast runs a little above the consensus in the second half of this year and in line with the consensus in 2021.[12]

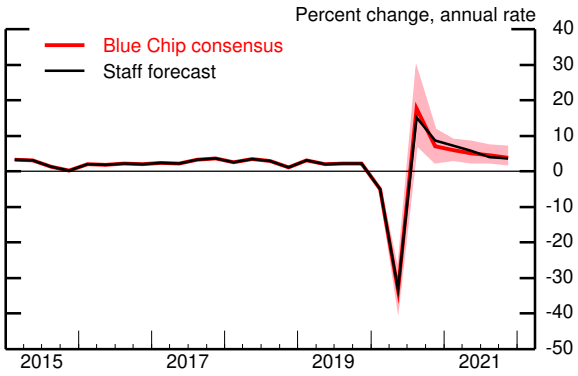
[12] For core PCE inflation, which is newly added to the Blue Chip survey, the staff's forecast runs well above the consensus in the second half of this year and somewhat above the consensus in 2021.

Domestic Econ Devel & Outlook

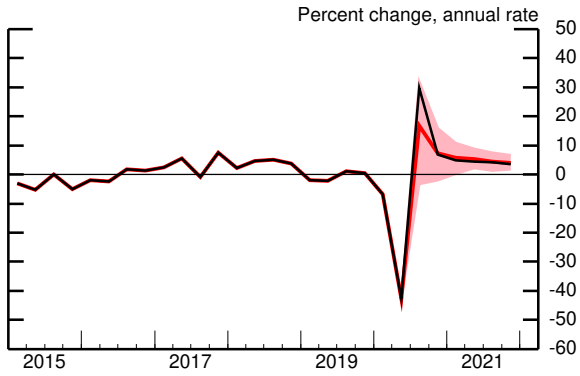
Tealbook Forecast Compared with Blue Chip

(Blue Chip survey released July 10, 2020)

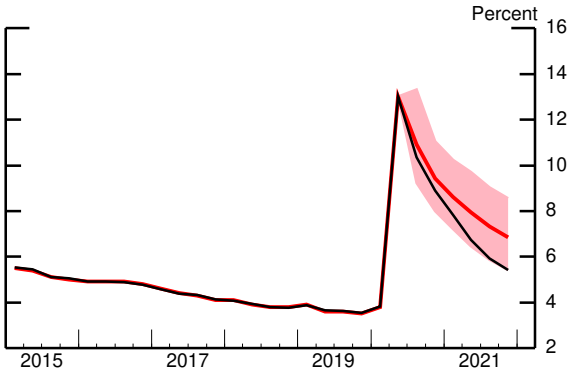
Real GDP



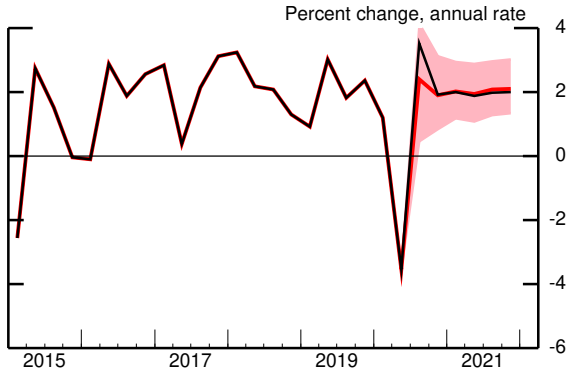
Industrial Production



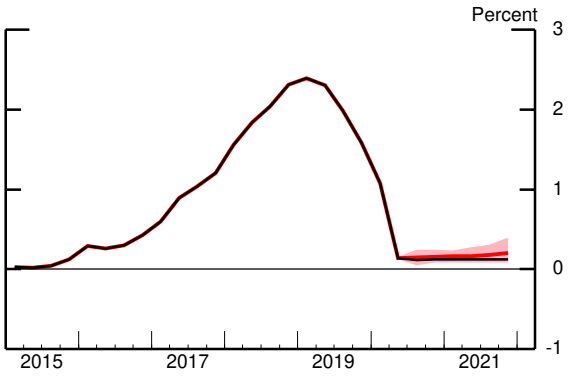
Unemployment Rate



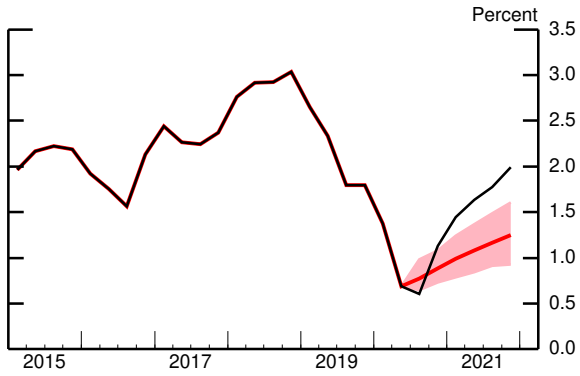
Consumer Price Index



Treasury Bill Rate



10-Year Treasury Yield



Note: The yield is for on-the-run Treasury securities. Over the forecast period, the staff's projected yield is assumed to be 3 basis points below the off-the-run yield.

Note: The shaded area represents the area between the Blue Chip top 10 and bottom 10 averages.

Comparison of Staff and Outside Forecasts for Real GDP Growth

Source	Date of forecast	2020				2020	2021
		Q1	Q2	Q3	Q4		
IHS Markit[1]	July 17	-5.0	-35.4	18.2	5.1	-6.7	4.9
Pantheon Macroeconomics[2]	July 17	-5.0	-30.0	15.0	15.0	-3.2 **	4.5 *
Goldman Sachs	July 12	-5.0	-33.0	25.0	8.0	-3.7	5.9
Blue Chip	July 10	n.a.	-33.6	17.7	7.0	-5.6	4.8
Citi	July 10	-5.0	-28.4	25.1	9.1	-1.8 *	n.a.
Morgan Stanley	July 10	-5.0	-32.4	10.6	9.2	-6.2	7.0
Nomura	July 10	-5.0	-36.5	11.7	4.3	-8.4 **	6.5 **
UBS	July 10	-5.0	-36.8	18.4	9.7	-5.7	5.1
Wells Fargo	July 9	-5.0	-36.8	18.4	9.7	-6.0 **	3.5 **
MacroPolicy Perspectives	July 6	-5.0	-38.5	14.8	9.2	-7.5	4.1
J.P. Morgan	July 2	-5.0	-31.0	20.0	4.5	-4.8 **	2.9 *
HSBC	June 29	-5.0	-37.0	17.0	9.0	-6.5 **	3.6 *
Barclays	June 26	-5.0	-40.0	27.5	7.0	-6.1 **	n.a.
International Monetary Fund	June 24	n.a.	n.a.	n.a.	n.a.	-8.2	5.4
UCLA	June 24	n.a.	n.a.	n.a.	n.a.	-8.6	5.3
Credit Suisse	June 20	n.a.	n.a.	n.a.	n.a.	-5.6 *	3.5 *
*Median of outside forecasts****		*-5.0*	*-35.4*	*18.2*	*9.0*	*-6.1*	*5.2*
July Tealbook	**July 16**	**-5.0**	**-33.2**	**15.2**	**8.7**	**-5.6**	**5.1**

Note: Quarterly rates are annualized percent change from previous quarter. Annual rates are Q4/Q4 growth rates from previous year to current year except where indicated by *.

1. Estimates from IHS Markit are as of July 17 for 2020:Q2 and 2020:Q3 and July 6 for other periods.
2. Pantheon Macroeconomics estimates are as of July 17 for 2021 and July 9 for other periods.

* Annual growth rates are on an annual average basis.

** Staff calculations using information in the forecaster's report.

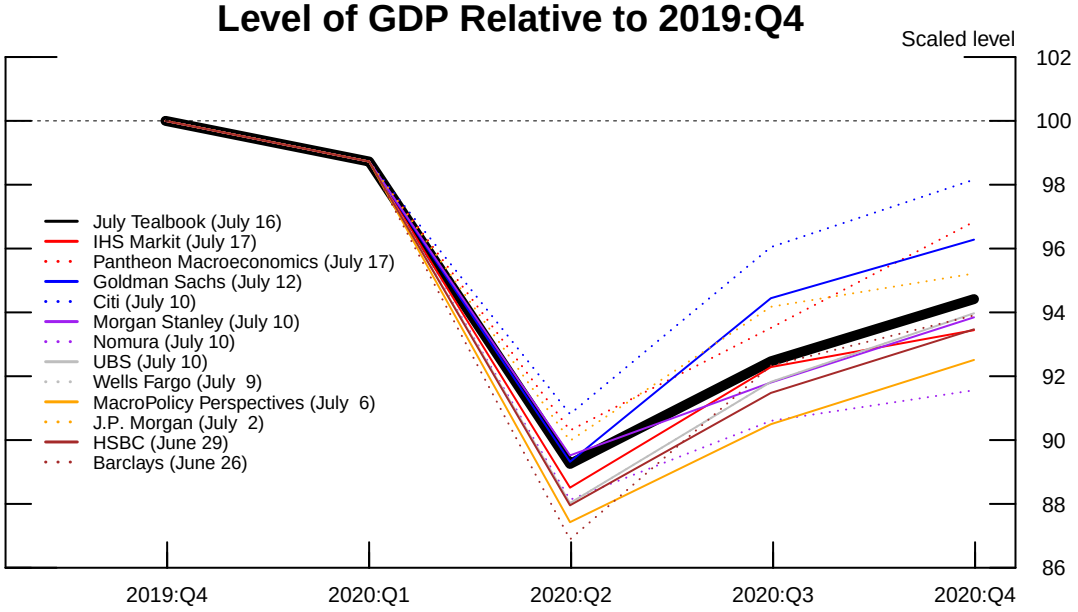
*** The median is calculated using only Q4/Q4 growth rates.

n.a. Not available.

Source: For Morgan Stanley, Morgan Stanley Research; for Nomura, Anchor Report, Global Markets Research; for all others, internal Board repository of bank and broker newsletters.

Domestic Econ Devel & Outlook

Level of GDP Relative to 2019:Q4



Source: For Morgan Stanley, Morgan Stanley Research; for Nomura, Anchor Report, Global Markets Research; for all others, internal Board repository of bank and broker newsletters.

THE LONG-TERM OUTLOOK

- We assume the natural rate of unemployment edges down from 4.7 percent in 2022 to its longer-run value of 4.3 percent by 2024. Potential output growth is 1.8 percent in early 2023, close to its long-run value of 1.7 percent.

- The real long-run equilibrium federal funds rate is still assumed to be 0.5 percent. This round, we have revised up our estimate of the longer-run 10-year Treasury yield, to 3.3 percent, reflecting the effects of greater Treasury issuance in this forecast. The 10-year yield rises gradually toward its longer-run value over the extension period, reflecting the higher level of federal debt, an assumed longer-run normalization of the size of the SOMA portfolio, and rising expected future short-term interest rates as the period of very low short-term interest rates moves into the past.

- Core PCE price inflation increases from 1.7 percent in 2022 to 1.9 percent in 2024 and 2025. Given this subdued path for core inflation, the nominal federal funds rate increases only gradually and is still just 1.9 percent in 2025.

- As monetary policy remains accommodative beyond the medium term, the unemployment rate continues to fall from 4.7 percent at the end of 2022 to 3.9 percent in 2024 before edging up to its long-run value of 4.3 percent thereafter. GDP growth slows from 2.9 percent in 2022 to a touch below its long-run value of 1.7 percent in 2025.

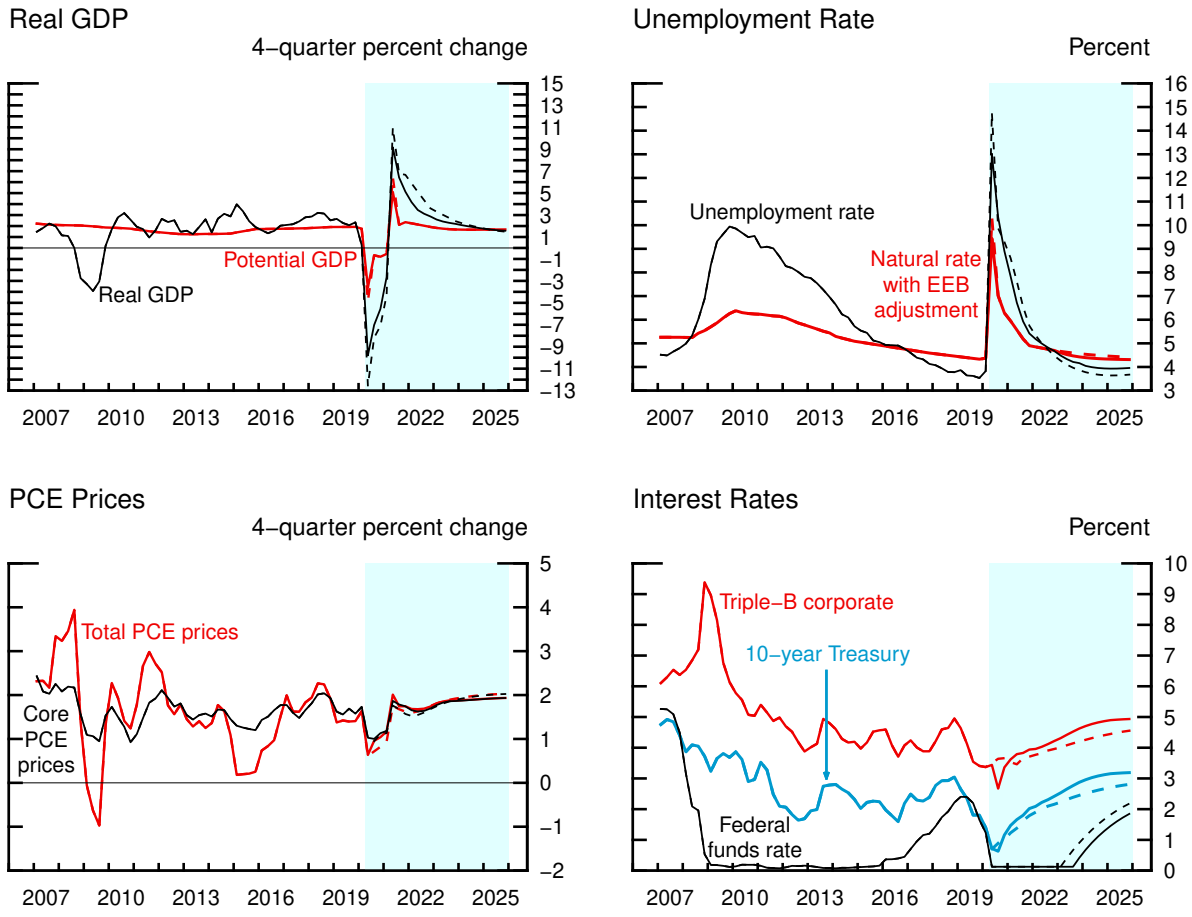
Domestic Econ Devel & Outlook

The Long–Term Outlook

(Percent change, Q4 to Q4, except as noted)

Measure	2020	2021	2022	2023	2024	2025	Longer run
Real GDP	-5.6	5.1	2.9	2.2	1.8	1.6	1.7
Previous Tealbook	*-7.1*	*6.7*	*3.6*	*2.4*	*1.8*	*1.5*	*1.7*
Civilian unemployment rate[1]	8.9	5.4	4.7	4.2	3.9	4.0	4.3
Previous Tealbook	*9.3*	*5.7*	*4.5*	*3.9*	*3.6*	*3.7*	*4.3*
PCE prices, total	1.0	1.7	1.7	1.9	1.9	1.9	2.0
Previous Tealbook	*.8*	*1.6*	*1.7*	*1.9*	*2.0*	*2.0*	*2.0*
Core PCE prices	1.1	1.7	1.7	1.9	1.9	1.9	2.0
Previous Tealbook	*1.1*	*1.6*	*1.7*	*1.9*	*2.0*	*2.0*	*2.0*
Federal funds rate[1]	.13	.13	.13	.42	1.29	1.85	2.50
Previous Tealbook	*.13*	*.13*	*.13*	*.91*	*1.67*	*2.18*	*2.50*
10-year Treasury yield[1]	1.2	2.0	2.4	2.9	3.1	3.2	3.3
Previous Tealbook	*1.0*	*1.8*	*2.2*	*2.5*	*2.7*	*2.8*	*3.0*

1. Percent, average for the final quarter of the period.



Note: In each panel, shading represents the projection period, and dashed lines are the previous Tealbook.

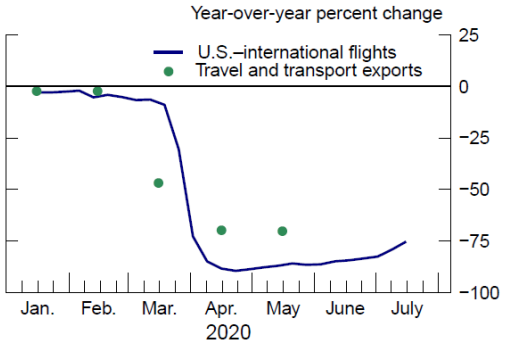
(This page is intentionally blank.)

Export Perspectives: Travel and Transport

The recent collapse in international travel has struck a major blow to U.S. exports. Travel and transport services constitute only about one-third of U.S. services exports and one-tenth of overall U.S. exports. However, the severe drop in this component reduced overall U.S. export growth by 7 percentage points at an annual rate in the first quarter and is estimated to reduce the overall export growth rate more than 18 percentage points in the second quarter. Exports of travel services represent the expenditures of international visitors to the United States for pleasure, business, and education. Exports of transport services represent the expenditures by foreigners on services associated with moving people and goods from one location to another (by any mode, including air). As shown in figure 1, most of the decline in travel and transport exports occurred in March, as the spread of the coronavirus (COVID-19) led both the U.S. and foreign governments to put in place travel restrictions and warnings, and, as a result, nearly all international travel ground to a halt.

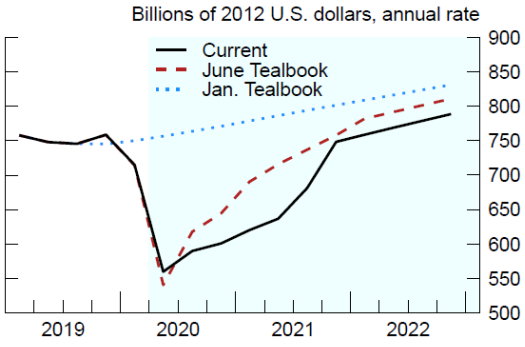
After declining precipitously in March, international flights are still down more than 75 percent from a year earlier as of the beginning of July (figure 1). With the limited pace of improvement to date, we expect international travel to return to less than half of its normal level by the end of 2020 and to recover fully only by early 2022, consistent with our baseline assumption that a coronavirus vaccine becomes available in late 2021. As a consequence, we expect real exports of services to remain deeply depressed over the coming year and to reach a new normal only in late 2021, still well below our pre-COVID-19 path (figure 2).

Figure 1: Change in U.S.–International Flights and Travel and Transport Exports



Note: Flight data extend through July 15, 2020, and are 7-day averages. Nominal export data extend through May 2020.
Source: FlightAware; U.S. Census Bureau; staff calculations.

Figure 2: Real Exports of Services



Source: U.S. Bureau of Economic Analysis; staff forecast.

Relative to the June Tealbook, the recovery in services exports has been postponed until the second half of 2021, as continued viral outbreaks in the United States are expected to weigh on travel in the near term. In particular, the United States and other countries have repeatedly extended international travel restrictions.[1]

The plunge and slow recovery in services exports has a notable effect on total U.S. GDP growth—subtracting from output growth in the first half of the year and adding to it in the second half and in 2021 (see the table). Changes in travel abroad by Americans will partially offset the contributions from changes in foreigners traveling in the United States. However, the offset is incomplete because the United States typically runs a trade surplus in travel.

One risk to our forecast arises from educational travel. Although travel for business and pleasure has collapsed, exports of travel for educational purposes (which make up about 20 percent of overall travel services) have so far held up. As such, our baseline forecast has these exports continuing at near-current levels. However, while students already studying in the United States may stay to finish their studies, coronavirus-related visa-processing delays and recently attempted changes to visa rules by the Administration could limit the number of new students that come to the United States to study. These visa issues may result in decreased educational travel exports starting in fall 2020 and pose a downside risk to our export projection. Return to Domestic text

Services Exports Contribution

Percentage point, annual rate

	2020			2021	2022
	Q1	Q2	H2	Q4/Q4	Q4/Q4
To U.S. export growth					
Current Tealbook	-7.9	-18.5	6.0	8.4	2.1
June Tealbook	-8.1	-24.5	14.4	6.0	2.6
To U.S. GDP growth					
Current Tealbook	-.9	-2.9	.5	.8	.2
June Tealbook	-1.0	-3.6	1.3	.6	.3

Note: Services exports include travel and transport as well as other categories.
Source: U.S. Bureau of Economic Analysis; staff forecast.

[1] U.S. restrictions prohibit entry by foreign nationals who have been in China, Iran, the European Schengen Area, the United Kingdom, Ireland, or Brazil during the past 14 days. In addition, the land borders with Mexico and Canada are closed to nonessential travel. The European Union recently relaxed travel restrictions on visitors from some countries, but the United States was excluded.

Unemployment and Participation Rates: Recent Measurement Issues

Estimating the unemployment and labor force participation rates has proved more challenging than usual during the COVID-19 pandemic. Some survey respondents have misunderstood questions and interviewers have incorrectly recorded answers regarding unemployment status; in addition, response rates to the household survey have been falling. Consequently, the published data on unemployment and participation rates have been subject to larger-than-usual measurement errors. Indeed, we estimate that the "true" unemployment rate was more than 20 percent in April, about 6 percentage points higher than the published value of 14.7 percent. By June, however, the measurement error appeared to have diminished significantly.

One source of measurement error is the misclassification of furloughed workers as employed. A furloughed worker should be counted as unemployed (on temporary layoff) when surveyed, but many such workers have instead been recorded as "employed but absent from work." The Bureau of Labor Statistics (BLS) indicated that if these workers had been correctly classified, the unemployment rate would have been 5 percentage points higher in April, 3 percentage points higher in May, and 1 percentage point higher in June (line 2 in the table).[1]

Another source of misclassification is an increased ambiguity between unemployment and nonparticipation. In normal times, the distinction between being unemployed and being out of the labor force depends on whether an individual actively searched for a job in the past four weeks. This distinction is inherently subjective, but it has become even more ambiguous recently, as workers who lost their jobs because of the pandemic are supposed to be classified as unemployed regardless of their job search effort.[2] We suspect that part of the recent large increase in the number of individuals who are out of the labor force but want a job—a group often regarded to be similar to the unemployed—reflects this increased ambiguity between unemployment and nonparticipation.[3] Although this surge might capture an actual reduction in the number of non-employed job searchers for other reasons related to the pandemic (for example, to take care of children or sick family members), some of this increase likely reflects a larger-than-usual misclassification of unemployment as nonparticipation due to the pandemic.

Finally, the household survey response rates between March and June have been abnormally low.[4] Research suggests that, historically, survey recipients who fail to respond to the survey are more likely to be unemployed than the average respondent, implying that lower response rates can understate both the unemployment and the participation rates.[5]

---

[1] See Bureau of Labor Statistics (2020), "Employment Situation Archived News Releases," BLS, https://www.bls.gov/bls/news-release/empsit.htm#2020.

[2] Relatedly, and in contrast to the usual requirements, individuals who lost their job because of the pandemic are not required to have searched for a job to collect unemployment insurance benefits.

[3] The average monthly job-finding probability of nonparticipants who want a job is similar to that of the long-term unemployed—much higher than that of the rest of individuals out of the labor force.

[4] Response rates averaged 69 percent in the April, May, and June surveys—far below the pre-pandemic level of 83 percent.

[5] See John M. Abowd and Arnold Zellner (1985), "Estimating Gross Labor-Force Flows," *Journal of Business & Economic Statistics,* vol. 3 (July), pp. 254–83; Hie Joo Ahn and James D. Hamilton (2020), "Measuring Labor-Force Participation and the Incidence and Duration of Unemployment," NBER Working Paper Series 27394 (Cambridge, Mass.: National Bureau of Economic Research, June), https://www.nber.org/papers/w27394.

Adjusted Unemployment Rate and Labor Force Participation Rate
(Percent)

	Unemployment rate					Labor force participation rate				
	Feb.	Mar.	Apr.	May	June	Feb.	Mar.	Apr.	May	June
(1) BLS published	3.5	4.4	14.7	13.3	11.1	63.4	62.7	60.2	60.8	61.5
(2) BLS adjusted	3.5	5.4	19.7	16.3	12.1	n.a.	n.a.	n.a.	n.a.	n.a.
(3) Benchmark adjusted	3.5	5.3	21.9	17.6	13.3	63.4	62.8	62.0	62.3	62.6
(4) Model adjusted	3.5	5.4	20.6	18.4	13.9	63.4	62.7	62.3	62.4	62.8

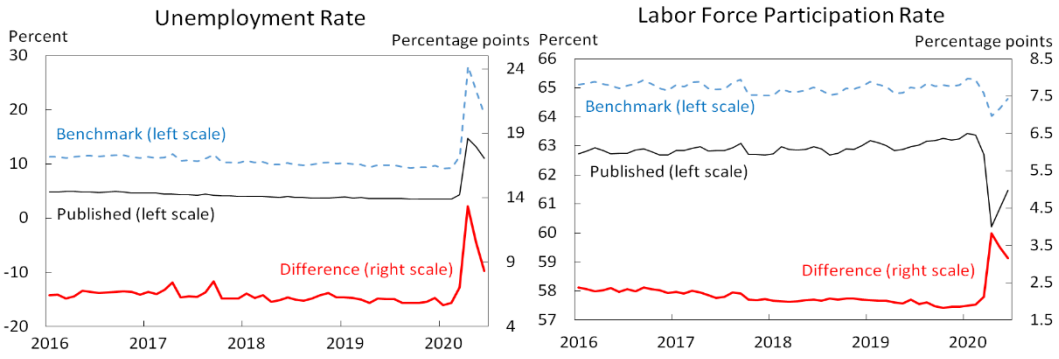
Note: BLS is Bureau of Labor Statistics.
n.a. Not applicable.
Source: Bureau of Labor Statistics; staff calculations.

We implement two different methodologies to gauge the magnitude of these measurement errors caused by the pandemic. Our first method uses benchmark indicators that are less subject to the pandemic-related misclassifications previously highlighted. In particular, unemployment includes individuals employed but absent from work, and the labor force is expanded to include individuals out of the labor force but wanting a job.

As shown by the blue and black lines in the figure, these benchmark measures run above the published data, reflecting the difference in the concepts of joblessness and the existence of "normal" misclassification errors. The differences (the red lines) were stable through February but widened in March and April before narrowing in May and June. The increases in these gaps from the relatively stable pre-pandemic levels represent the understatement of the unemployment and labor force participation rates due to pandemic-related misclassification, and we adjust the data accordingly.[6] As shown on line 3 of the table, the benchmark-adjusted unemployment rate rose more than both the published data and the unemployment rate adjusted by the BLS—reaching nearly 22 percent in April—and it fell faster in May and June. The benchmark-adjusted participation rate did not drop as much as in the published data, with the April level only 1.4 percentage points below the February level compared with 3.2 percentage points in the published data.

Our second method uses a statistical model designed to accommodate both types of measurement errors previously discussed and also to adjust for the biases introduced by lower response rates. The model indicates that misclassification accounts for most of the measurement errors during the pandemic and that the bias from lower response rates is relatively small.[7] Therefore, as can be seen by comparing lines 3 and 4 of the table, the unemployment rate and the participation rate adjusted for measurement errors based on the model are similar to those of the benchmark-adjusted rates. Return to Domestic text

Benchmark and Published Indicators



Source: Current Population Survey.

[6] We use the averages of 2018 to 2019 as the pre-pandemic values.

[7] See Hie Joo Ahn and James D. Hamilton (2020), cited in footnote 5.

Implications of COVID-19 for the Natural Rate of Unemployment

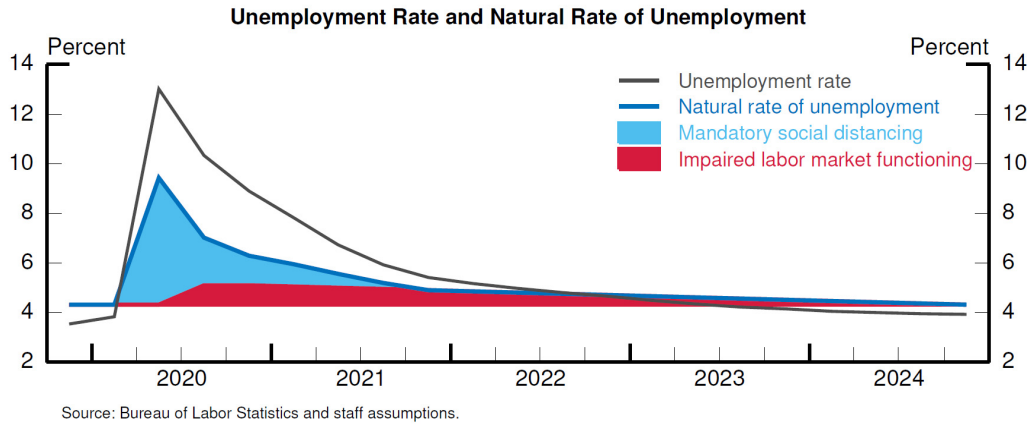
COVID-19 led to a sharp rise in the unemployment rate in early spring, reflecting, in our judgment, large contractions in both aggregate demand and aggregate supply. In this discussion, we focus on the supply changes affecting the natural rate of unemployment (NRU). We assume that the imposition and then relaxation of mandatory social-distancing restrictions causes the natural rate to temporarily increase and then decrease. In addition, we project that an increase in permanent business closures and layoffs in the wake of the pandemic will cause a longer-lasting impairment of labor market functioning, which puts upward pressure on the NRU through 2024. Over the next several years, we expect that strengthening labor demand, supported in part by monetary and fiscal policies, will facilitate the reallocation of unemployed job seekers to new jobs, and that the natural rate will eventually return to its pre-COVID-19 level of 4.3 percent.[1]

The figure plots projections for the unemployment rate (the gray line) and the NRU (the blue line) through 2024. The "longer run" NRU—that is, the rate of unemployment that is expected to prevail after the economy has fully adjusted to the COVID-19 shock—is assumed to be constant at 4.3 percent over this period. The blue shaded region shows the effects of mandatory social-distancing restrictions on the NRU. We estimate that these effects added 5 percentage points to the NRU in the second quarter, but we project them to diminish fairly quickly—to 2 percentage points this quarter and to zero by late 2021—as mandatory restrictions are lifted.[2] The red shaded region shows our assumptions for the persistent labor market damage caused by COVID-19, which adds 0.8 percentage point to the NRU in the second half of this year and then gradually declines through 2024.

Despite the steep rise in the NRU, we estimate that slack rose sharply in the first half of the year, putting substantial downward pressure on both prices and wages. Even so, core PCE price inflation in the second quarter has been much weaker than would usually be consistent with even this large of an unemployment rate gap. When setting the NRU, we consider factors such as changes in the demographic and educational composition of the workforce, changes in the efficiency of matching job seekers and job vacancies, and the behavior of price and wage inflation. It is hard to infer the natural rate from quarterly movements in prices and

[1] In terms of the concepts described in the October 2019 memo "Unemployment Rate Benchmarks," the Tealbook's NRU is best categorized as an SPU, or stable-price unemployment rate, which the memo defines as the "rate of unemployment such that there are no upward or downward pressures on price inflation apart from those stemming from underlying inflation or arising from supply shocks." In particular, we judge that if unemployment is at the NRU and inflation expectations remain stable, PCE price inflation would converge to our estimate of its underlying trend (1.8 percent) provided there are no other shocks affecting inflation. See Richard Crump, Christopher Nekarda, and Nicolas Petrosky Nadeau (2019), "Unemployment Rate Benchmarks," memorandum, Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System, Federal Reserve Bank of San Francisco, October 15.

[2] These effects were calibrated using state-by-industry estimates of jobs lost due to mandatory social distancing. In addition, the CARES Act temporarily boosted weekly unemployment insurance benefits by $600, which pushed the replacement rate above 100 percent for a majority of laid-off workers and may have provided a disincentive for some workers to seek employment in less restricted industries, contributing to the rise in the NRU in the second quarter.



Source: Bureau of Labor Statistics and staff assumptions.

wages even in normal times, and we have leaned primarily on labor market developments to inform our NRU estimate in this episode. Given the unusual situation, there is even more uncertainty than normal around estimates of the NRU.

Mandatory social distancing. The COVID-19 recession is different from other downturns, in part because the government explicitly limited business activity and individuals' mobility in order to slow the spread of COVID-19. Because mandatory social distancing temporarily restricts the operating capacity of the economy, the staff views the resulting declines in output and employment as reductions in aggregate supply that cannot be addressed by expansionary monetary and fiscal policy.

Impaired labor market functioning. We expect that the intensity of the COVID-19 recession will cause a wave of permanent business closures and layoffs that will impair labor market functioning, pushing up the NRU.[3] Specifically, starting in the second half of this year, we expect a skills mismatch to impair the process for matching job seekers with job vacancies, particularly for job losers from industries where adverse effects from the pandemic will be long lasting. The 0.8 percentage point increase in the natural rate is similar to the rise we had assumed during and after the Great Recession.[4] With labor demand projected to rebound and the passage of time allowing unemployed individuals to develop new skills, as well as possibly lower their wage demands, we expect that labor market functioning will improve gradually and that the NRU will return to its pre-COVID-19 level of 4.3 percent.[5] Of course, the amount of persistent labor market damage and the speed at which it heals will depend on the ultimate amount of reallocation necessary and the and the pace at which the economy recovers.
Return to Domestic text | Return to Monetary Policy Strategies text

[3] Policies aimed at maintaining employment relationships in the face of steep declines in revenues, such as the Paycheck Protection Program and several Federal Reserve lending facilities, have helped mitigate supply-side damage.

[4] Indeed, we expect the number of permanent job losers at the end of this year to be similar, as a share of the labor force, to that at the peak of the Great Recession.

[5] This assumption is consistent with simulations from the model of Ahn and Hamilton (2020) that take the staff's estimate of permanent job losers as a jumping-off point; see Hie Joo Ahn and James D. Hamilton (2020), "Heterogeneity and Unemployment Dynamics," *Journal of Business and Economic Statistics,* vol. 38 (July), pp. 554–69.

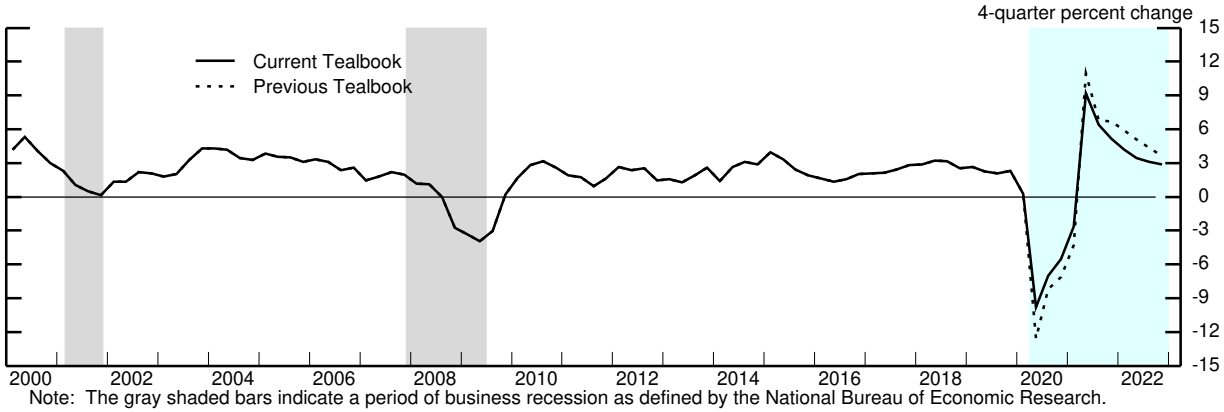
(This page is intentionally blank.)

Projections of Real GDP and Related Components

(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2019	2020 H1	2020 H2	2020	2021	2022
Real GDP	**2.3**	**-20.3**	**11.9**	**-5.6**	**5.1**	**2.9**
Previous Tealbook	*2.3*	*-25.1*	*15.3*	*-7.1*	*6.7*	*3.6*
Final sales	2.7	-18.2	9.6	-5.3	4.5	2.5
Previous Tealbook	*2.7*	*-22.6*	*15.0*	*-5.6*	*5.2*	*2.6*
Personal consumption expenditures	2.7	-22.3	14.7	-5.6	5.3	3.1
Previous Tealbook	*2.7*	*-28.5*	*23.8*	*-5.9*	*5.1*	*3.1*
Residential investment	1.7	-15.5	11.3	-3.0	5.4	3.6
Previous Tealbook	*1.7*	*-33.1*	*2.2*	*-17.3*	*20.0*	*8.3*
Nonresidential structures	-6.2	-18.4	-16.2	-17.3	9.8	3.6
Previous Tealbook	*-6.2*	*-33.8*	*1.9*	*-17.9*	*12.1*	*7.3*
Equipment and intangibles	1.3	-19.2	.5	-9.9	9.9	5.6
Previous Tealbook	*1.3*	*-23.2*	*-4.7*	*-14.5*	*15.5*	*5.8*
Federal purchases	4.3	13.6	2.6	8.0	-.6	-2.3
Previous Tealbook	*4.3*	*13.7*	*2.2*	*7.8*	*-.5*	*-2.3*
State and local purchases	2.2	-5.6	.4	-2.6	-.9	-1.0
Previous Tealbook	*2.2*	*-5.9*	*-.5*	*-3.2*	*-1.1*	*-1.3*
Exports	.3	-45.7	31.5	-15.5	12.9	4.4
Previous Tealbook	*.3*	*-42.0*	*43.8*	*-8.7*	*10.3*	*4.8*
Imports	-2.1	-38.0	26.0	-11.6	12.6	5.0
Previous Tealbook	*-2.1*	*-44.8*	*35.8*	*-13.4*	*12.8*	*6.6*
	Contributions to change in real GDP (percentage points)					
Inventory change	-.4	-2.1	2.2	-.3	.6	.4
Previous Tealbook	*-.4*	*-2.6*	*.0*	*-1.5*	*1.3*	*1.0*
Net exports	.4	.0	-.3	-.1	-.3	-.2
Previous Tealbook	*.4*	*1.7*	*.0*	*.9*	*-.5*	*-.3*

Real GDP



Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

The Outlook for the Labor Market

Measure	2019	2020 H1	2020 H2	2020	2021	2022
Nonfarm payroll employment[1]	178	-2,366	940	-713	521	244
Previous Tealbook	*178*	*-2,718*	*1,120*	*-799*	*572*	*380*
Private employment[1]	162	-2,132	849	-642	525	256
Previous Tealbook	*162*	*-2,559*	*1,056*	*-752*	*576*	*392*
Labor force participation rate[2]	63.2	60.8	62.1	62.1	62.3	62.5
Previous Tealbook	*63.2*	*60.3*	*61.9*	*61.9*	*62.2*	*62.5*
Civilian unemployment rate[2]	3.5	13.0	8.9	8.9	5.4	4.7
Previous Tealbook	*3.5*	*14.8*	*9.3*	*9.3*	*5.7*	*4.5*
Employment-to-population ratio[2]	61.0	52.9	56.6	56.6	58.9	59.6
Previous Tealbook	*61.0*	*51.4*	*56.2*	*56.2*	*58.6*	*59.7*

1. Thousands, average monthly changes.
2. Percent, average for the final quarter in the period.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Inflation Projections

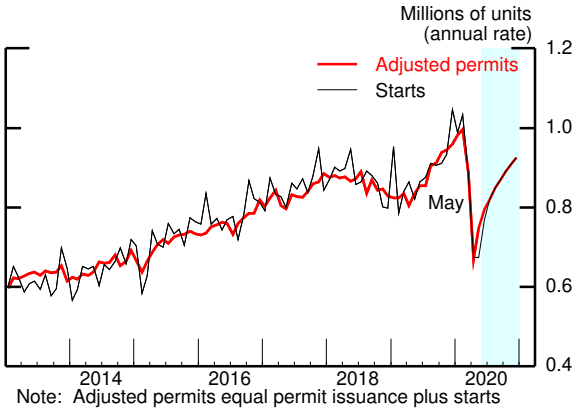
Measure	2019	2020 H1	2020 H2	2020	2021	2022
Percent change at annual rate from final quarter of preceding period						
PCE chain-weighted price index	1.4	-.2	2.2	1.0	1.7	1.7
Previous Tealbook	*1.4*	*-.2*	*1.8*	*.8*	*1.6*	*1.7*
Food and beverages	.9	9.2	2.3	5.7	1.3	2.0
Previous Tealbook	*.9*	*8.6*	*.8*	*4.6*	*1.3*	*2.0*
Energy	-1.3	-28.5	11.0	-10.9	2.9	2.2
Previous Tealbook	*-1.3*	*-27.9*	*4.2*	*-13.3*	*3.8*	*2.9*
Excluding food and energy	1.6	.4	1.9	1.1	1.7	1.7
Previous Tealbook	*1.6*	*.3*	*1.9*	*1.1*	*1.6*	*1.7*
Prices of core goods imports[1]	-1.1	-.1	.0	.0	1.2	1.0
Previous Tealbook	*-1.1*	*-.8*	*-1.2*	*-1.0*	*1.2*	*1.0*

	June 2020[2]	July 2020[2]	Aug. 2020[2]	Sept. 2020[2]	Oct. 2020[2]	Nov. 2020[2]
12-month percent change						
PCE chain-weighted price index	.8	.9	1.0	1.1	1.0	1.1
Previous Tealbook	*.7*	*.6*	*.7*	*.9*	...	...
Excluding food and energy	1.0	1.0	1.0	1.1	1.1	1.2
Previous Tealbook	*1.0*	*.9*	*.9*	*1.0*	...	...

... Not applicable.
1. Core goods imports exclude computers, semiconductors, oil, and natural gas.
2. Staff forecast.
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

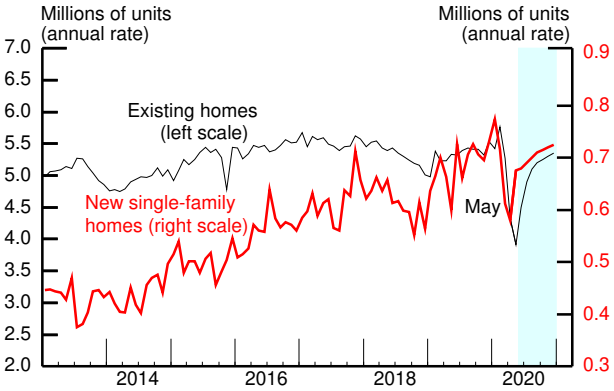
Recent Nonfinancial Developments (2)

Single-Family Housing Starts and Permits



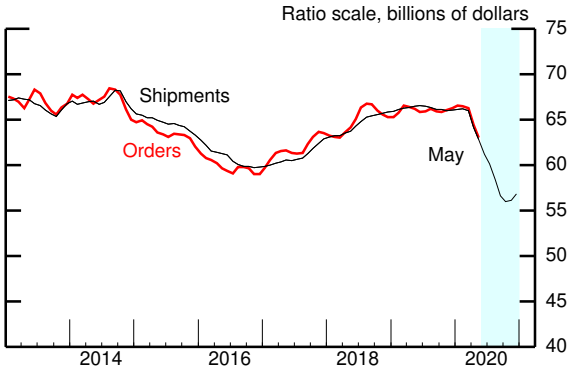
Note: Adjusted permits equal permit issuance plus starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales



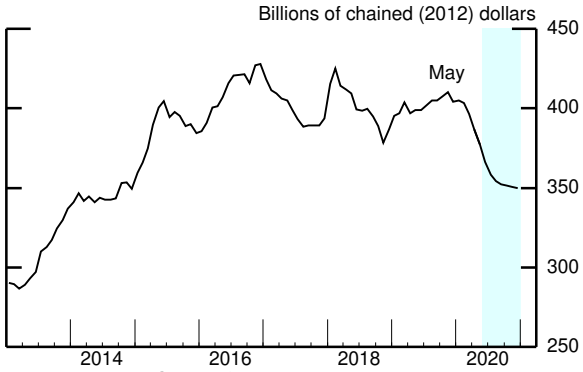
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft



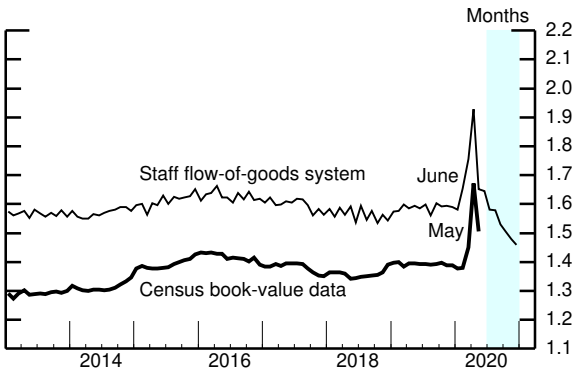
Note: Data are 3-month moving averages.
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place



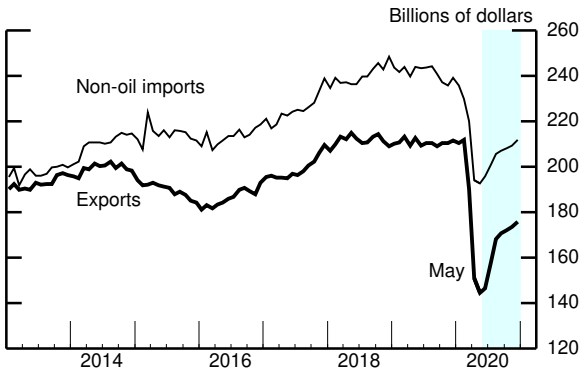
Note: Nominal CPIP deflated by BEA prices through 2020:Q1 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

Inventory Ratios



Note: Flow-of-goods system inventories include manufacturing and mining industries and are relative to consumption. Census data cover manufacturing and trade, and inventories are relative to sales.
Source: U.S. Census Bureau; staff calculations.

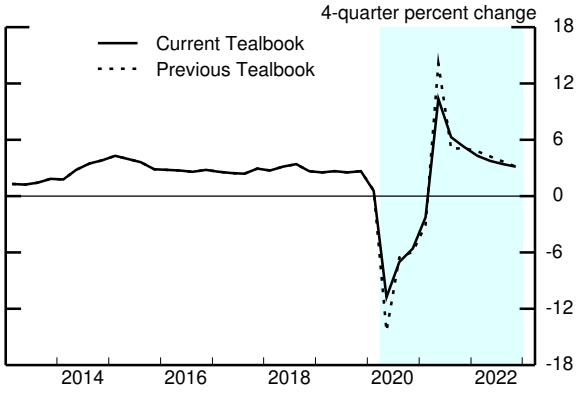
Exports and Non-oil Imports



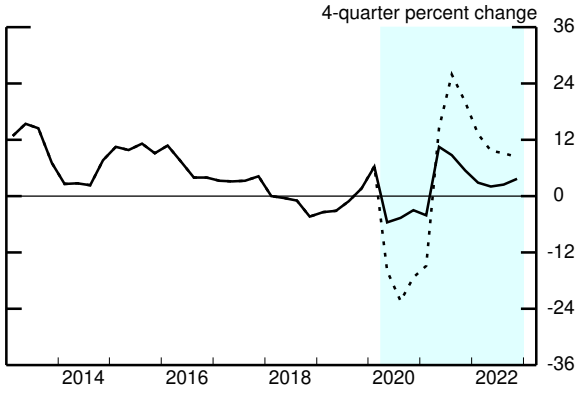
Note: Forecasts are linear interpolations of quarterly values.
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.

Components of Final Demand

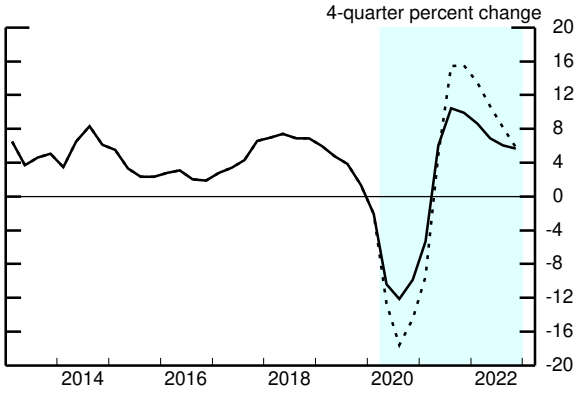
Personal Consumption Expenditures



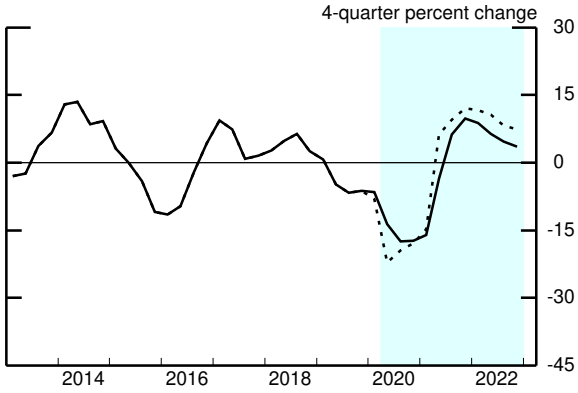
Residential Investment



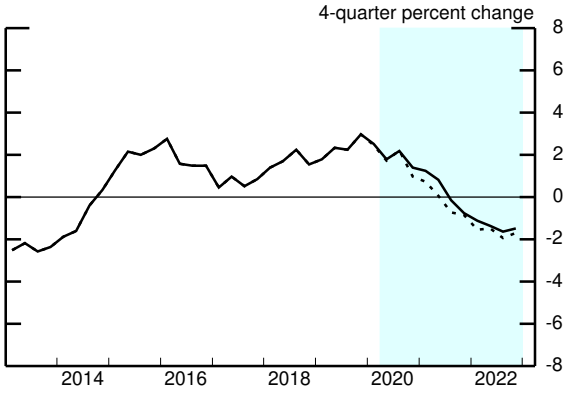
Equipment and Intangibles



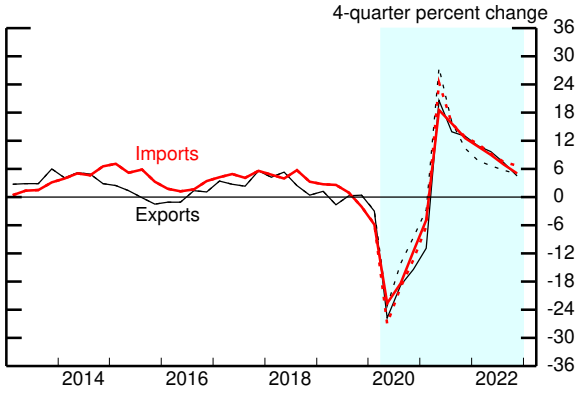
Nonresidential Structures



Government Consumption and Investment



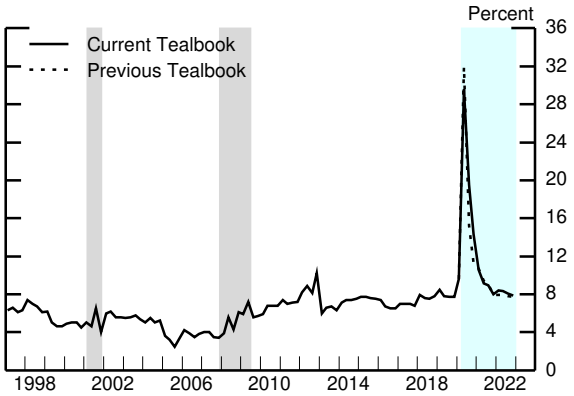
Exports and Imports



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

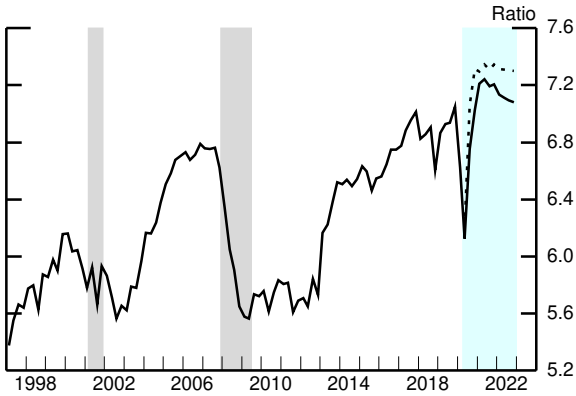
Aspects of the Medium-Term Projection

Personal Saving Rate



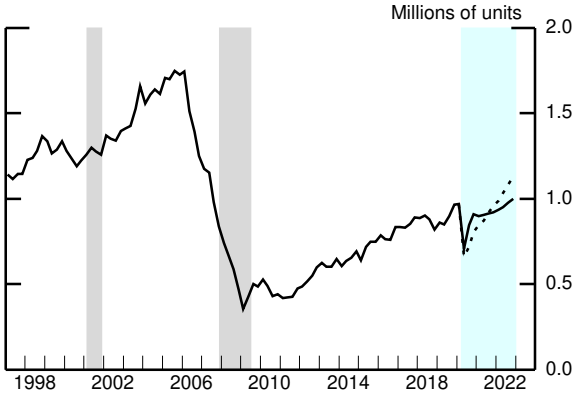
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Wealth-to-Income Ratio



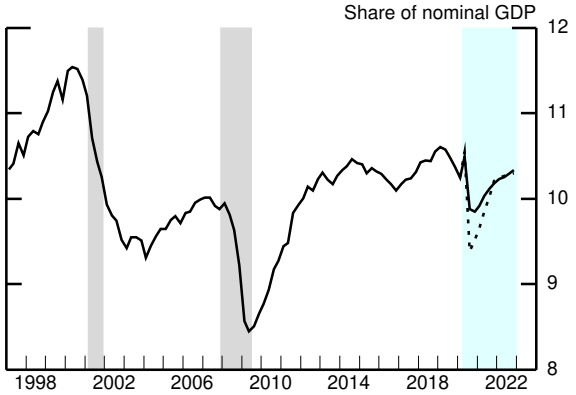
Note: Ratio of household net worth to disposable personal income.
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts



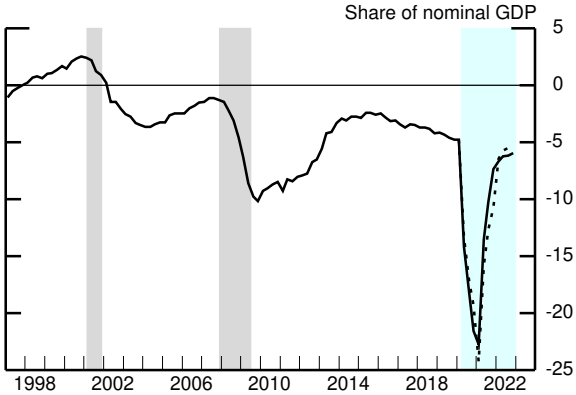
Source: U.S. Census Bureau.

Equipment and Intangibles Spending



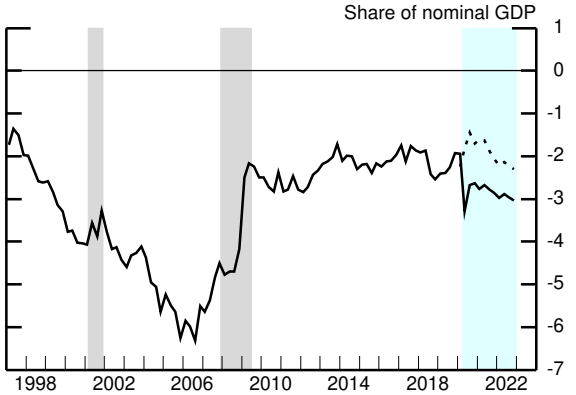
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Federal Surplus/Deficit



Note: 4-quarter moving average.
Source: Monthly Treasury Statement.

Current Account Surplus/Deficit



Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Domestic Econ Devel & Outlook

Cyclical Position of the U.S. Economy: Near-Term Perspective

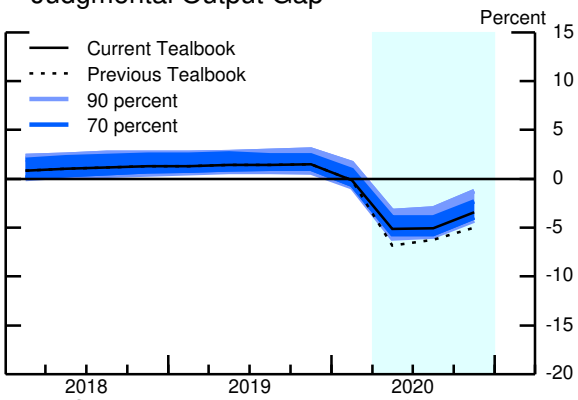
(Percent change at annual rate from final quarter of preceding period except as noted)

Measure	2019	2020	2020 Q1	2020 Q2	2020 Q3	2020 Q4
Output gap[1]	**1.5**	**-3.4**	**-.1**	**-5.1**	**-5.1**	**-3.4**
Previous Tealbook	*1.5*	*-5.0*	*-.1*	*-6.9*	*-6.2*	*-5.0*
Real GDP	2.3	-5.6	-5.0	-33.2	15.2	8.7
Previous Tealbook	*2.3*	*-7.1*	*-5.0*	*-41.0*	*24.1*	*7.0*
Measurement error in GDP	.2	.0	.0	.0	.0	.0
Previous Tealbook	*.2*	*.0*	*.0*	*.0*	*.0*	*.0*
Potential output	1.9	-.8	1.3	-18.0	14.9	1.4
Previous Tealbook	*1.9*	*-.8*	*1.3*	*-22.0*	*21.0*	*1.4*

Note: The output gap is the percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. The change in the output gap is equal to real GDP growth less the contribution of measurement error less the growth rate of potential output. For quarterly figures, the growth rates are at an annual rate, and this calculation needs to be multiplied by 1/4 to obtain the quarterly change in the output gap.

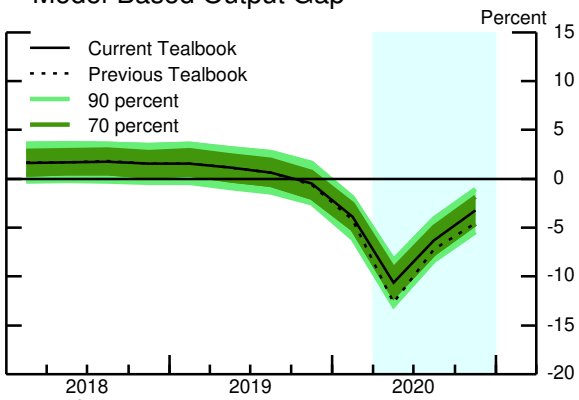
1. Percent, average for the final quarter in the period.

Judgmental Output Gap



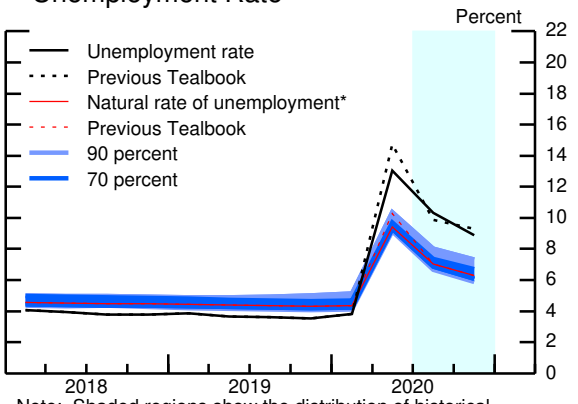
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Model-Based Output Gap



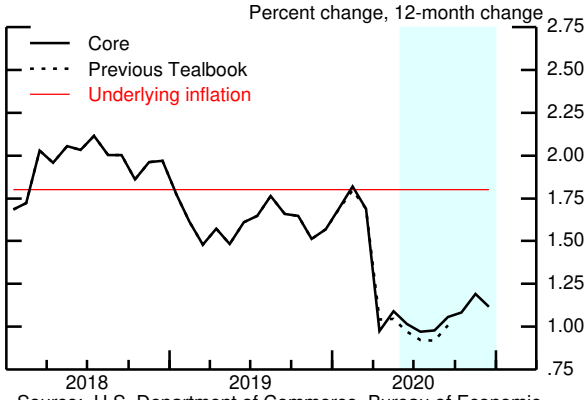
Note: Shaded regions denote model-computed uncertainty bands.
Source: Various macroeconomic data; staff assumptions.

Unemployment Rate



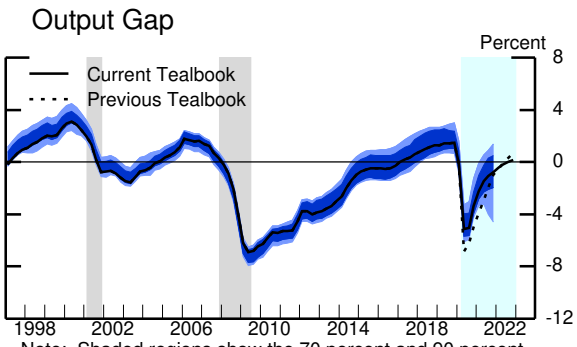
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the natural rate.
*Staff estimate including the effect of extended and emergency unemployment insurance benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Core PCE Price Inflation

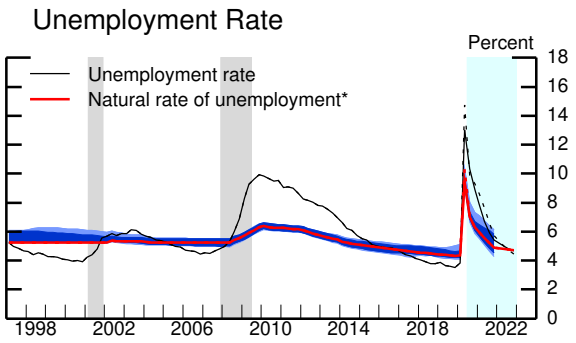


Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

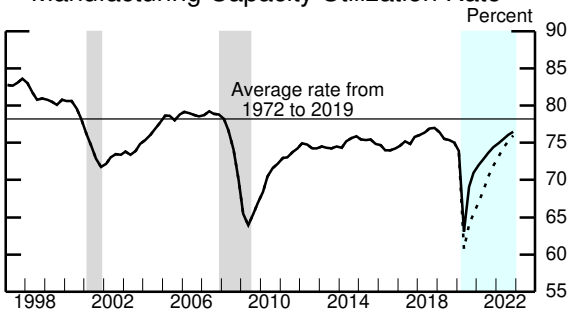
Cyclical Position of the U.S. Economy: Longer-Term Perspective



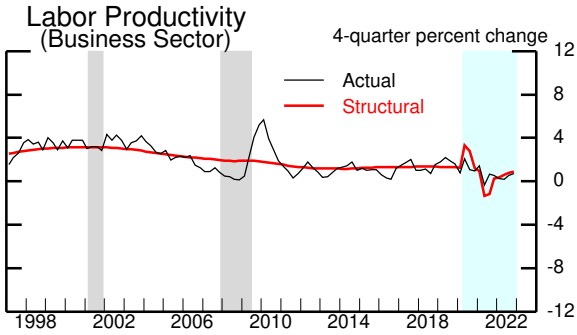
Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.



Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the natural rate.
*Staff estimate including the effect of extended and emergency unemployment insurance benefits.
Source: Various macroeconomic data; staff assumptions.



Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."



Source: U.S. Department of Labor, Bureau of Labor Statistics; U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Decomposition of Potential Output

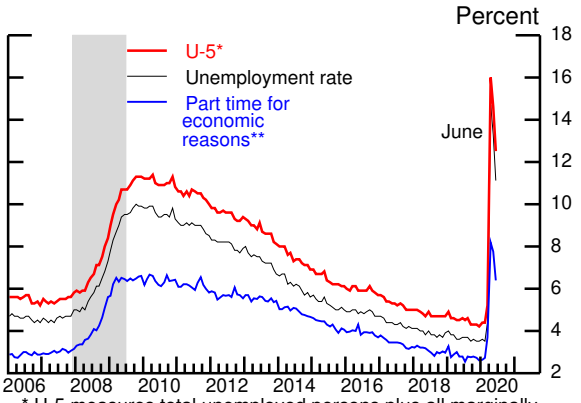
(Percent change, Q4 to Q4, except as noted)

Measure	1974-95	1996-2000	2001-07	2008-10	2011-17	2018	2019	2020	2021	2022
Potential output	3.1	3.6	2.7	1.9	1.5	1.9	1.9	-.8	2.4	1.9
Previous Tealbook	*3.1*	*3.6*	*2.7*	*1.9*	*1.5*	*1.9*	*1.9*	*-.8*	*2.4*	*1.9*
Selected contributions:[1]										
Structural labor productivity[2]	1.7	2.9	2.7	1.8	1.3	1.4	1.3	1.2	.2	.9
Previous Tealbook	*1.7*	*2.9*	*2.7*	*1.8*	*1.3*	*1.4*	*1.3*	*1.2*	*.2*	*.9*
Capital deepening	.7	1.4	1.0	.5	.8	.7	.7	1.3	-.9	.2
Multifactor productivity	.8	1.1	1.4	1.0	.2	.5	.4	-.3	1.0	.5
Structural hours	1.5	1.3	.8	.5	.4	.9	.5	-2.8	2.8	1.0
Previous Tealbook	*1.5*	*1.3*	*.8*	*.5*	*.4*	*.9*	*.5*	*-2.8*	*2.8*	*1.0*
Labor force participation	.4	-.1	-.2	-.4	-.4	-.1	.0	-1.2	.6	.1
Previous Tealbook	*.4*	*-.1*	*-.2*	*-.4*	*-.4*	*-.1*	*.0*	*-1.2*	*.6*	*.1*
Memo:										
Output gap[3]	-1.2	2.5	.3	-5.4	.6	1.3	1.5	-3.4	-.8	.2
Previous Tealbook	*-1.2*	*2.5*	*.3*	*-5.4*	*.6*	*1.3*	*1.5*	*-5.0*	*-1.0*	*.7*

Note: For multiyear periods, the percent change is the annual average from Q4 of the year preceding the first year shown to Q4 of the last year shown.
1. Percentage points.
2. Total business sector.
3. Percent difference between actual and potential output in the final quarter of the period indicated. A negative number indicates that the economy is operating below potential.

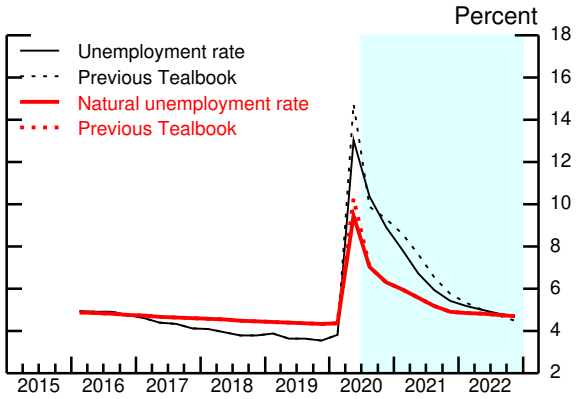
Labor Market Developments and Outlook (1)

Measures of Labor Underutilization



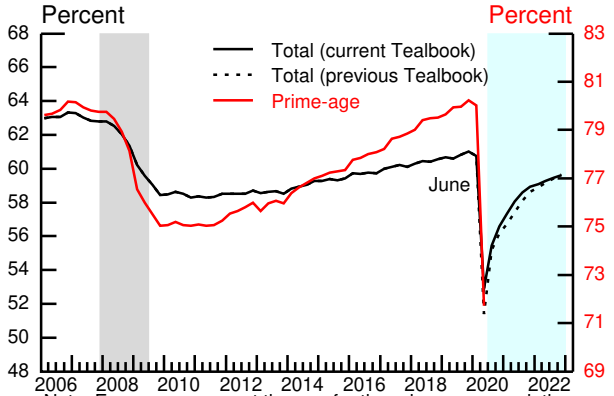
* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Unemployment Rate



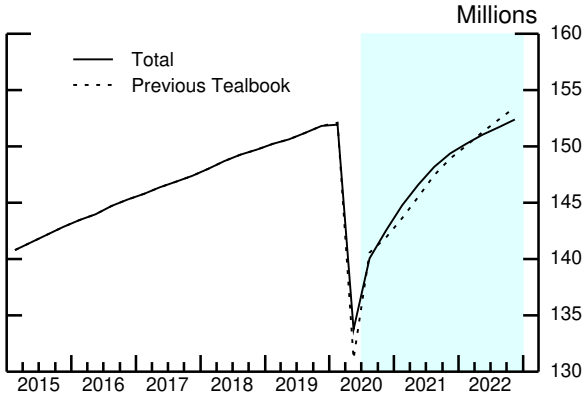
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Employment-to-Population Ratio



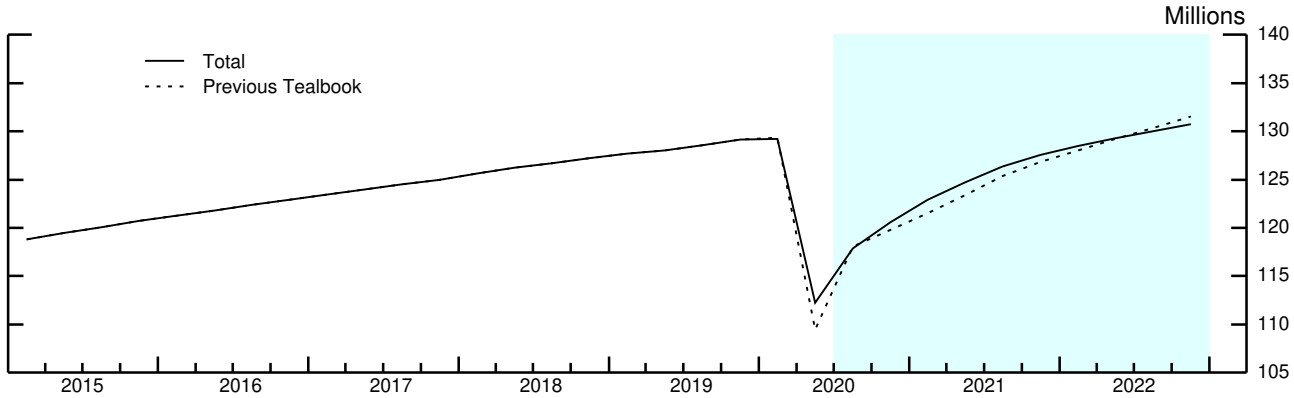
Note: Every curve except the one for the prime-age population corresponds with the left axis.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Total Payroll Employment



Source: U.S. Department of Labor, Bureau of Labor Statistics.

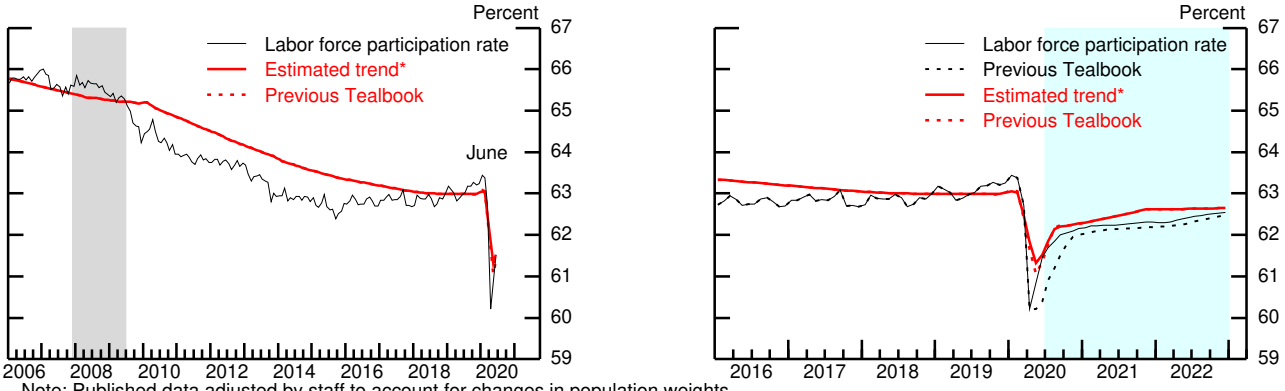
Private Payroll Employment



Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

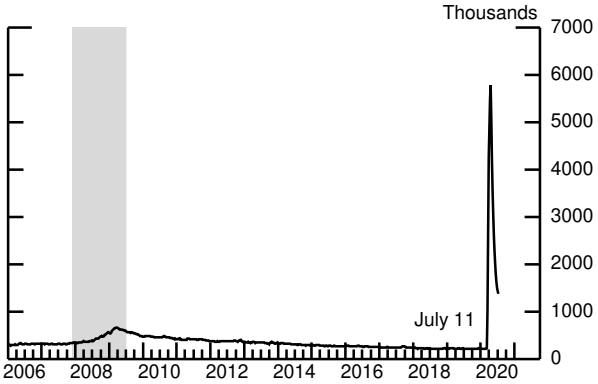
Labor Market Developments and Outlook (2)

Labor Force Participation Rate



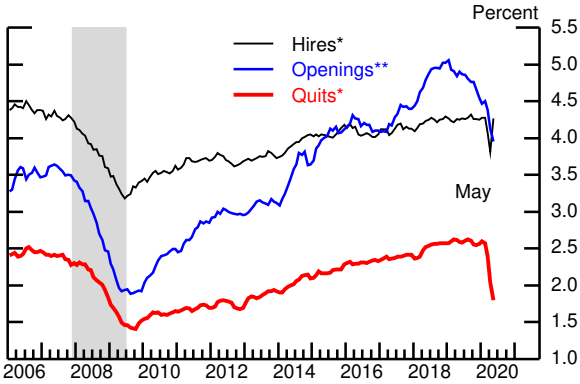
Note: Published data adjusted by staff to account for changes in population weights.
* Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Initial Unemployment Insurance Claims



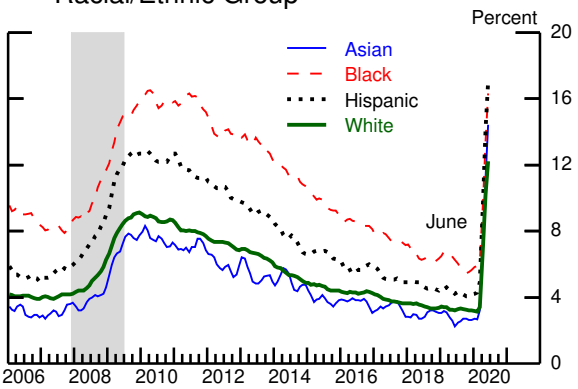
Note: 4-week moving average.
Source: U.S. Department of Labor, Employment and Training Administration.

Hires, Quits, and Job Openings



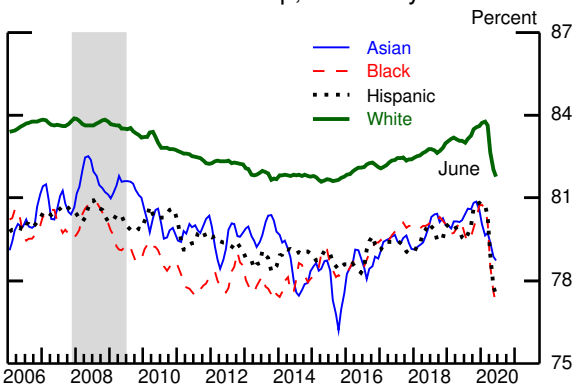
* Percent of private nonfarm payroll employment, 3-month moving average.
** Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.
Source: Job Openings and Labor Turnover Survey.

Unemployment Rate by Racial/Ethnic Group



Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey.

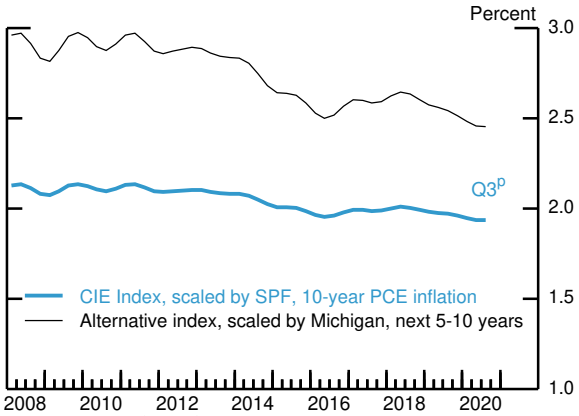
Labor Force Participation Rate by Racial/Ethnic Group, 25 to 54 years old



Note: These categories are not mutually exclusive, as the ethnicity Hispanic may include people of any race. The Current Population Survey defines Hispanic ethnicity as those who report their origin is Mexican, Puerto Rican, Cuban, Central American, or South American (and some others). 3-month moving averages.
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey.

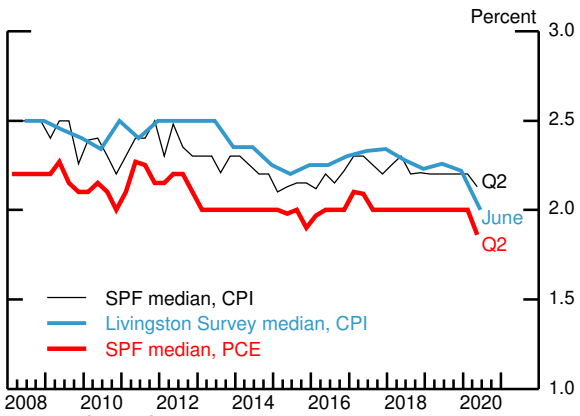
Survey Measures of Longer-Term Inflation Expectations

Index of Common Inflation Expectations



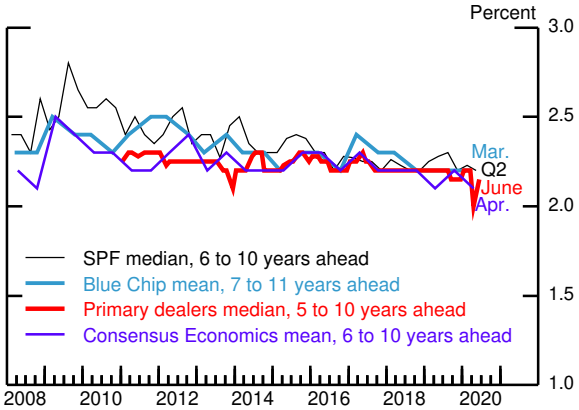
Note: Index of 21 inflation expectations indicators.
p Preliminary estimate based on data available to date.
Source: Staff calculations.

Next 10 Years



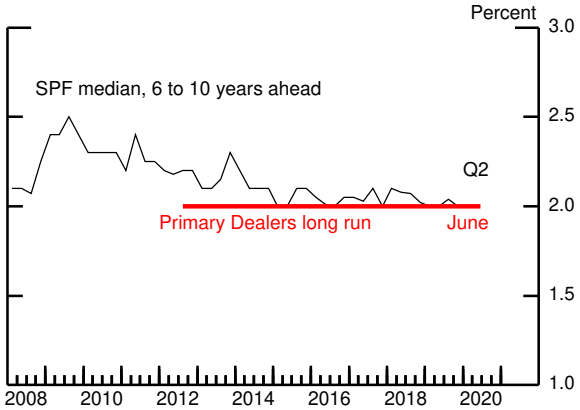
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



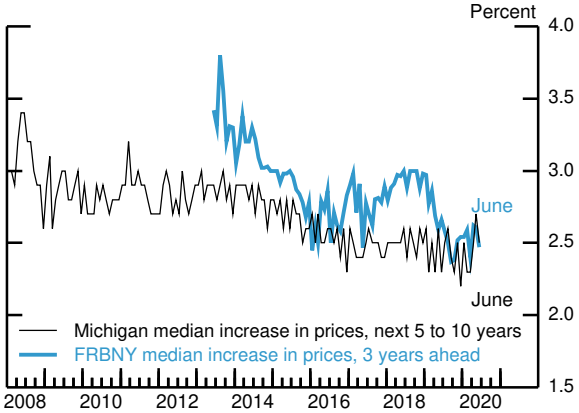
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Consensus Economics.

PCE Forward Expectations



Source: Federal Reserve Bank of Philadelphia; Federal Reserve Bank of New York.

Surveys of Consumers



Note: Federal Reserve Bank of New York (FRBNY) Survey of Consumer Expectations reports expected 12-month inflation rate 3 years from the current survey date. FRBNY data begin in June 2013.
Source: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York Survey of Consumer Expectations.

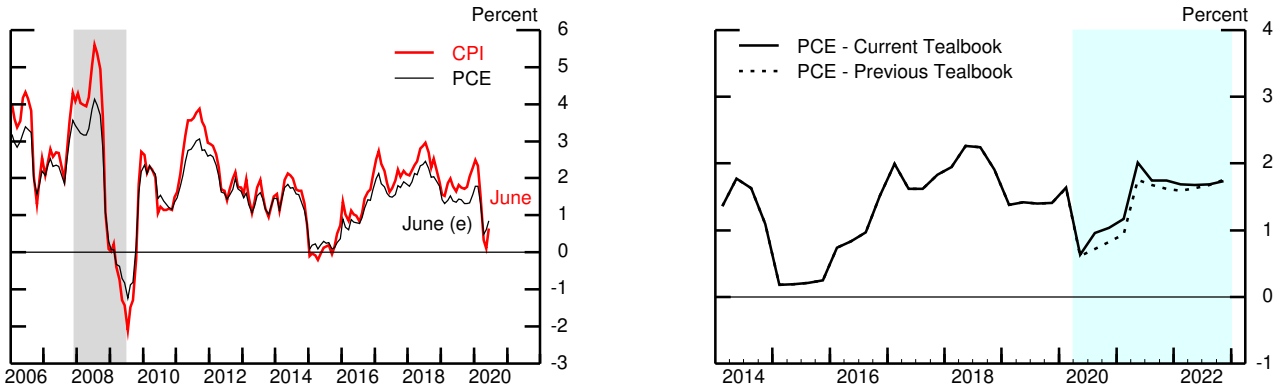
Survey of Business Inflation Expectations

Note: Survey of businesses in the Sixth Federal Reserve District. Data begin in February 2012.
Source: Federal Reserve Bank of Atlanta.

Inflation Developments and Outlook (1)

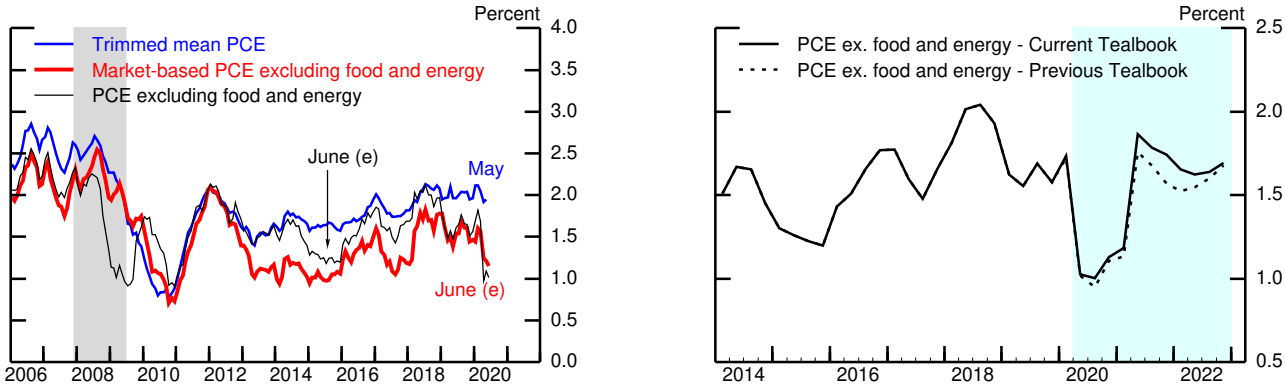
(Percent change from year-earlier period)

Headline Consumer Price Inflation



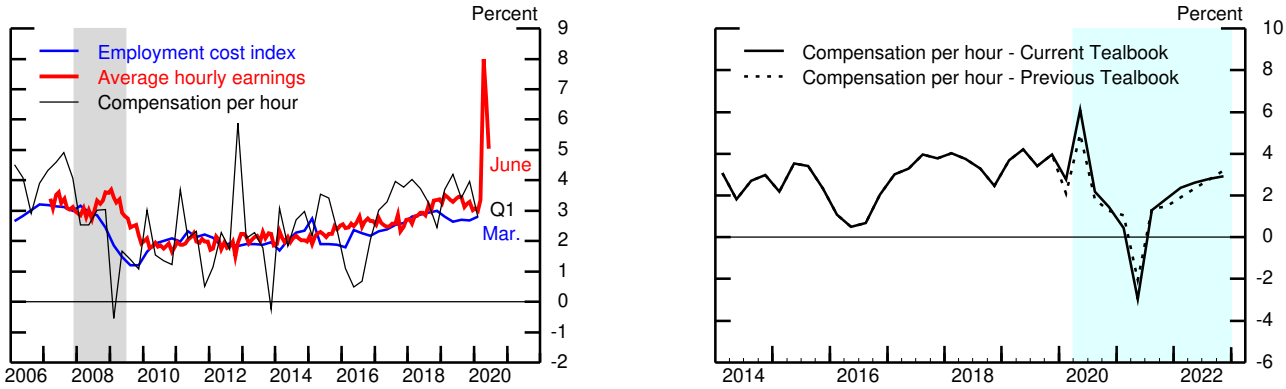
Note: PCE prices from April to June 2020 are staff estimates (e).
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

Measures of Core PCE Price Inflation



Note: Core PCE prices from April to June 2020 are staff estimates (e).
Source: For trimmed mean PCE, Federal Reserve Bank of Dallas; otherwise, U.S. Department of Commerce, Bureau of Economic Analysis.

Labor Cost Growth



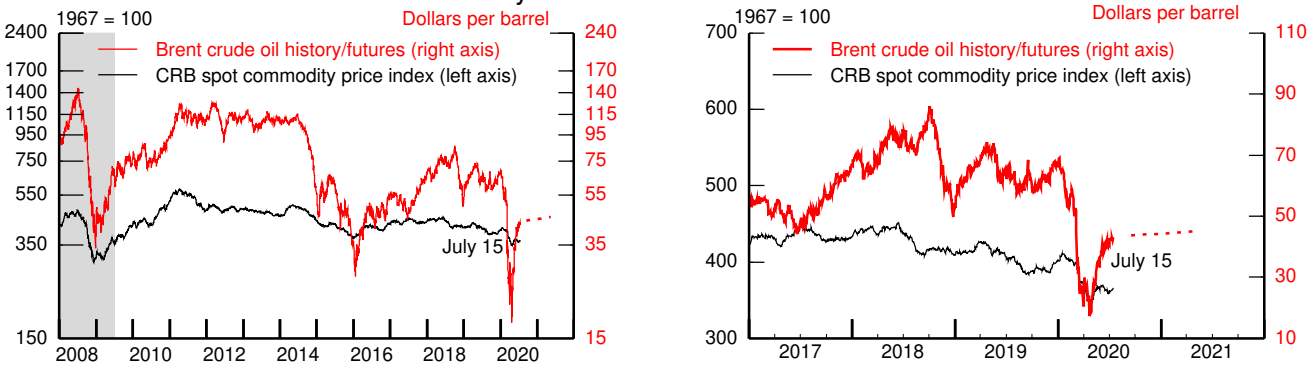
Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Inflation Developments and Outlook (2)

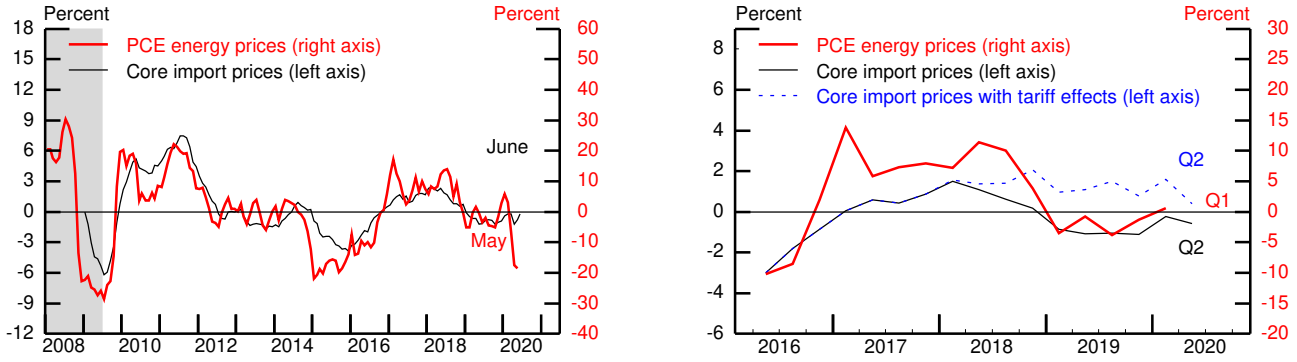
(Percent change from year-earlier period, except as noted)

Commodity and Oil Price Levels



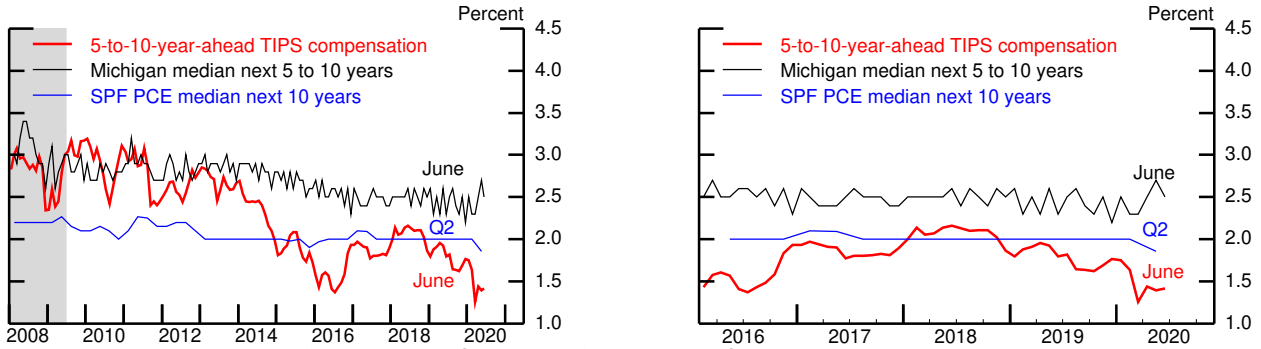
Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

Energy and Import Price Inflation



Source: For core import prices, U.S. Dept. of Labor, Bureau of Labor Statistics; for PCE, U.S. Dept. of Commerce, Bureau of Economic Analysis. For core import prices with a tariff effect, Federal Reserve Board staff calculations.

Long-Term Inflation Expectations and Compensation



Note: Based on a comparison of an estimated TIPS (Treasury Inflation-Protected Securities) yield curve with an estimated nominal off-the-run Treasury yield curve, with an adjustment for the indexation-lag effect.
SPF Survey of Professional Forecasters.
Source: For Michigan, University of Michigan Surveys of Consumers; for SPF, the Federal Reserve Bank of Philadelphia; for TIPS, Federal Reserve Board staff calculations.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

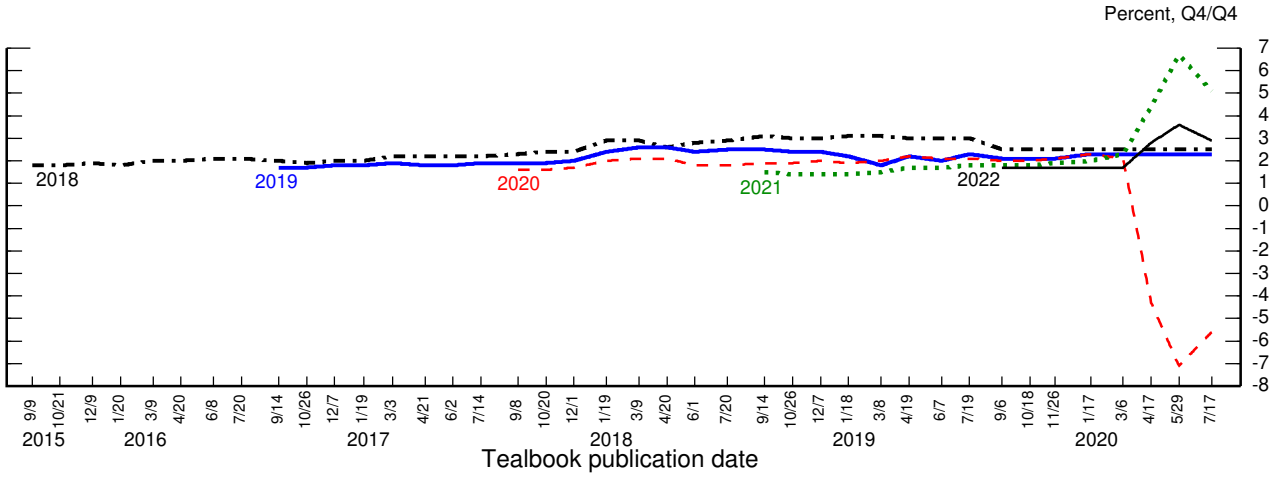
Federal Reserve System Nowcasts of 2020:Q2 Real GDP Growth
(Percent change at annual rate from previous quarter)

Federal Reserve entity	Type of model	Nowcast as of July 15, 2020
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	-6.7
New York	• Dynamic factor model	-14.6
Cleveland	• Bayesian regressions with stochastic volatility • Tracking model	-23.7 -27.7
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	-34.7
Chicago	• Dynamic factor model • Large mixed-frequency BVAR	-27.0 -30.7
St. Louis	• Dynamic factor model • News index model • Let-the-data-decide regressions	-6.3 -33.2 -33.2
Kansas City	• Accounting-based tracking estimate	-22.5
Board of Governors	• Staff judgmental estimate • Mixed-frequency dynamic factor model (DFM-BM) • Mixed-frequency dynamic factor model with small information set (DFM-SM) • Markov-switching dynamic factor model (MS-DFM)	-33.8 -5.9 -12.4 -34.4
Memo: Median of Federal Reserve System nowcasts		-25.3

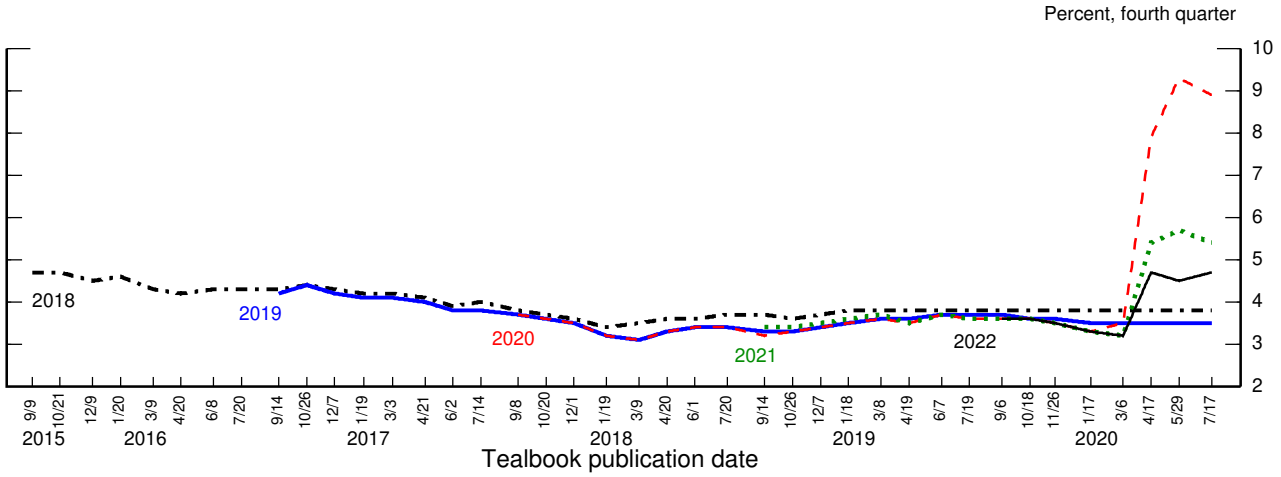
Domestic Econ Devel & Outlook

Evolution of the Staff Forecast

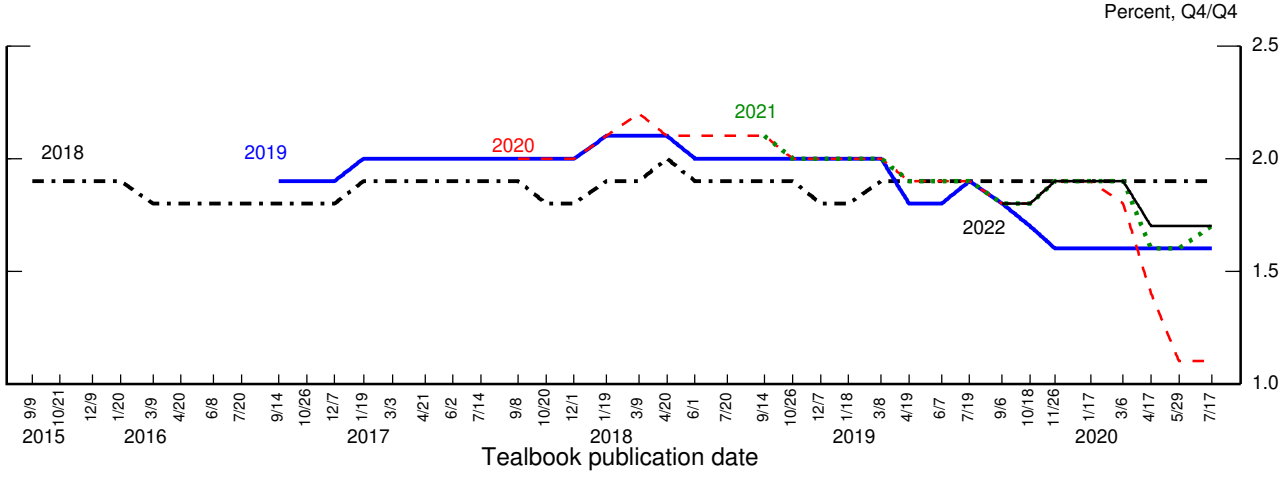
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



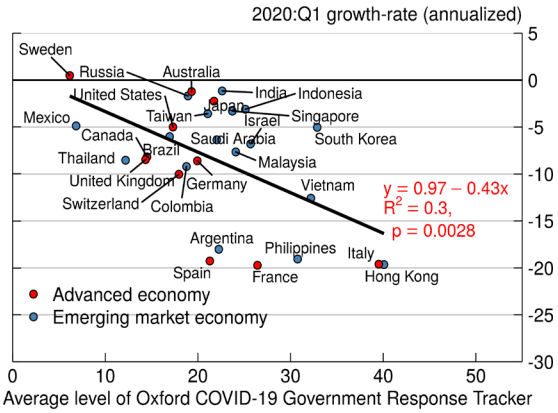
International Economic Developments and Outlook

After severe declines in GDP in the first quarter, the global pandemic has led to historic contractions in the second

The course of the coronavirus (COVID-19) continues to be the primary factor influencing the foreign economic outlook. The tight restrictions in place to control the spread of the virus have led to severe declines in economic activity. Reflecting the onset of restrictions in March, foreign real GDP fell 11 percent at an annual rate in the first quarter. As restrictions became stricter and more widespread into the second quarter, retail sales, production, and consumer confidence plunged, and we estimate that activity contracted at an unprecedented 29 percent annual rate in the second quarter. We estimate that most advanced foreign economies (AFE) and many emerging market economies (EME) fell even more than the aggregate, which was held up by the sharp second-quarter rebound in the Chinese economy from its first-quarter plunge.

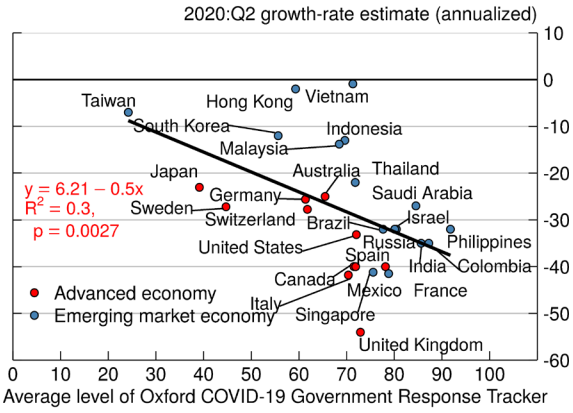
Countries that had implemented more-stringent lockdowns tended to experience the sharpest contractions. As shown in the figure, variations in the stringency of social-distancing measures across countries were reasonably well correlated with GDP growth in the first quarter and remain so with our growth estimates in the second. However, the link between the stringency of restrictions and economic activity may not stay as tight as governments ease legal restrictions and as other factors, such as voluntary social distancing and recessionary dynamics, take on more importance. (For country details, see the box "Regional Developments and Outlook.")

Government Lockdown Stringency and First-Quarter Growth



Source: Oxford University Blavatnik School of Government; Federal Reserve Board staff forecast.

Government Lockdown Stringency and Second-Quarter Growth Estimate



Source: Oxford University Blavatnik School of Government; Federal Reserve Board staff forecast.

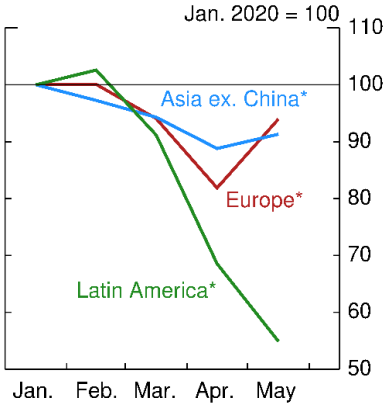
Recent data suggest that activity has begun to rebound in many foreign economies

So far, as many countries began to ease restrictions in May and June, we have seen notable improvements in activity. As shown in the left figure, retail sales rebounded in May in Europe and in several emerging Asian economies, and mobility data from cell phone tracking on retail establishments suggest that these improvements continued through the end of the second quarter (the middle figure).

Despite these gains, second-quarter data indicate that consumer spending remains depressed in most countries. Similarly, although industrial production in many foreign economies increased in May, and PMIs point to further gains in June, manufacturing remains at low levels (the right figure). An exception is China, where preliminary GDP data indicate that activity bounced back sharply in the second quarter.

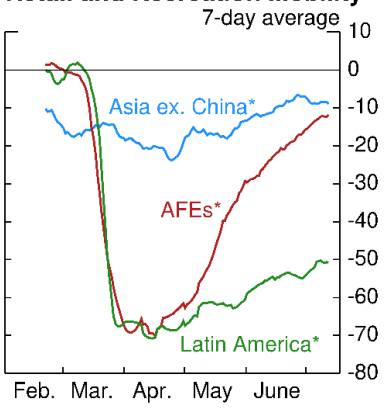
For the current quarter, we expect real GDP growth to rebound to around 25 percent in the AFEs and 16 percent in the EMEs, as activity recovers after recent easing of restrictions. Relative to the May Tealbook, we pulled forward our expected recovery, but we are not taking much signal from these data for the longer-term growth forecast. All together, the level of real GDP at the end of 2022 is around 3½ percent lower than what we had estimated in the January Tealbook. (For a review of the staff's outlook versus those of the International Monetary Fund and private forecasters, see the box "Comparing the Staff International Growth Outlook with Other Forecasts.")

Real Retail Sales



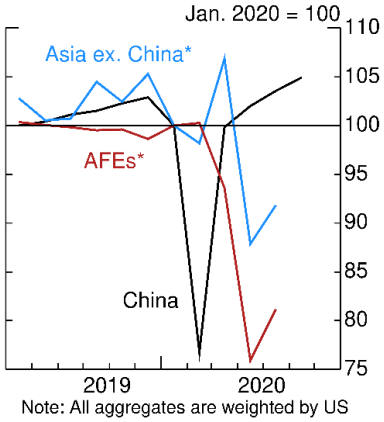
Note: All aggregates are nominal GDP weighted.
* Europe comprises the United Kingdom, France, and Germany. Asia excluding China comprises Japan, Hong Kong, Korea, and Taiwan. Latin America comprises Chile, Colombia, Brazil, Argentina, and Mexico.
Source: Haver Analytics.

Retail and Recreation Mobility



Note: All aggregates are simple averages.
* Asia excluding China comprises Hong Kong, Korea, Japan, and Taiwan. Advanced foreign economies (AFE) comprise Australia, Canada, France, Germany, Italy, New Zealand, Spain, Sweden, Switzerland, and the United Kingdom. Latin America comprises Argentina, Brazil, Chile, Colombia, and Mexico.
Source: Google Community Mobility Reports.

Industrial Production

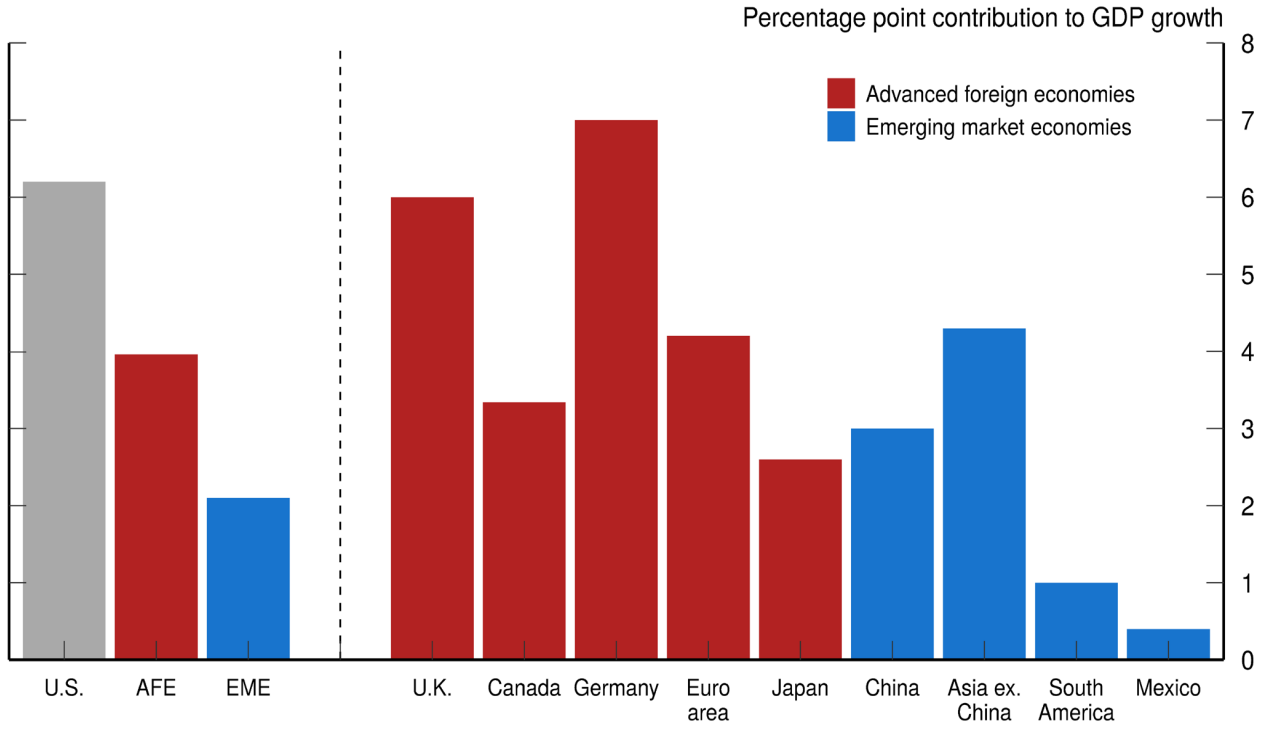


Note: All aggregates are weighted by US merchandise export shares.
* Advanced foreign economies (AFE) comprise Germany and the United Kingdom. Asia excluding China comprises India, Korea, Malaysia, Taiwan, Philippines, Singapore, Thailand, and Vietnam.
Source: Federal Reserve staff calculations, Haver Analytics

As it became clearer that the economic effect of the virus would not be short lived, authorities abroad announced additional stimulus measures

Amid relatively easy global financial conditions and subdued inflation, over the intermeeting period central banks in Brazil, Colombia, Indonesia, Mexico, the Philippines, and Russia lowered policy rates further. In Chile, the central bank unveiled a plan to buy up to $8 billion of sovereign bonds, equivalent to 3 percent of the country's GDP. Indonesian authorities announced that its central bank would continue to buy sovereign bonds in the primary market to support the government, although the central bank said that the purchases would not have implications for monetary policy.

2020 Fiscal Stimulus in Response to COVID-19



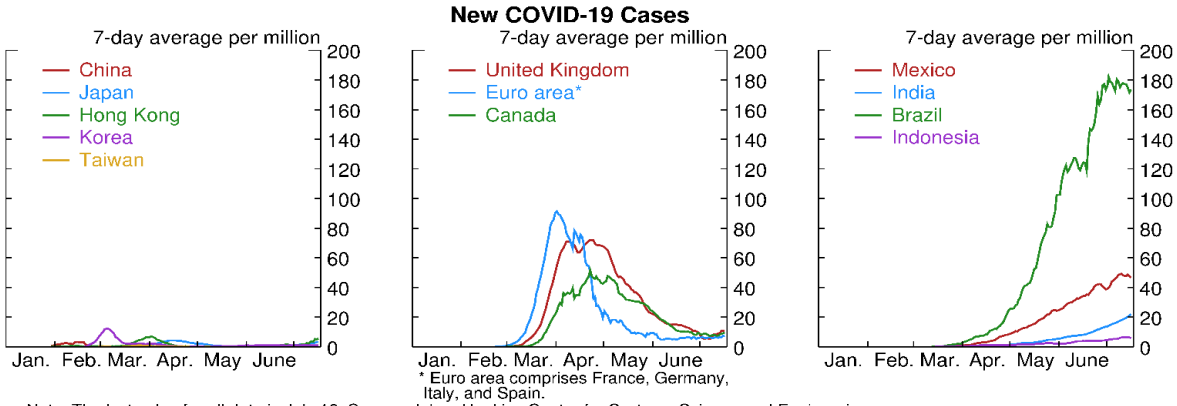
Note: GDP is gross domestic product. AFE is advanced foreign economy. EME is emerging market economy.
Source: Federal Reserve Board staff estimates.

In the AFEs, governments continued to announce supplementary spending packages to support the economy, as shown in the previous figure. The Japanese government enacted a new fiscal package in June with a direct spending component of 1.2 percent of GDP, while the U.K. government announced additional stimulus worth 1.3 percent of GDP in July. Among AFE central banks, the Bank of Japan expanded its special program to support corporate financing by 6.3 percent of GDP to a total of around 20 percent of GDP. The Bank of Canada also provided outcome-based forward guidance, stating that it would hold rates at the effective lower bound until its 2 percent target was sustainably achieved.

We continue to see divergence across countries in the spread of the virus

Broadly, we see the foreign economies falling into three groups in terms of their experience with the virus, with different implications for the path of economic recovery. The first group—which includes China and the newly industrialized economies (NIE), as well as a few AFEs like Japan and New Zealand—moved quickly to contain the spread of the virus and implemented aggressive testing and monitoring. Infection and death rates are extremely low in these economies, as shown in the left panel, and recent outbreaks have been localized and handled with contact tracing and targeted lockdowns.

In the second group, which includes most AFEs, the rates of infections and deaths are on clear declining paths, but moderate social restrictions remain in place (the middle panel). These countries generally adopted restrictions on movement later than the first group, and their technology to test and trace was not as good. Because sporadic outbreaks should take longer to control and involve more stringent measures than in the first group, we view downside risks for this group to be larger. Indeed, there have already been local outbreaks in some countries after the easing of restrictions, including in Australia, Germany, and Spain, triggering the reinstatement of some targeted restrictions.

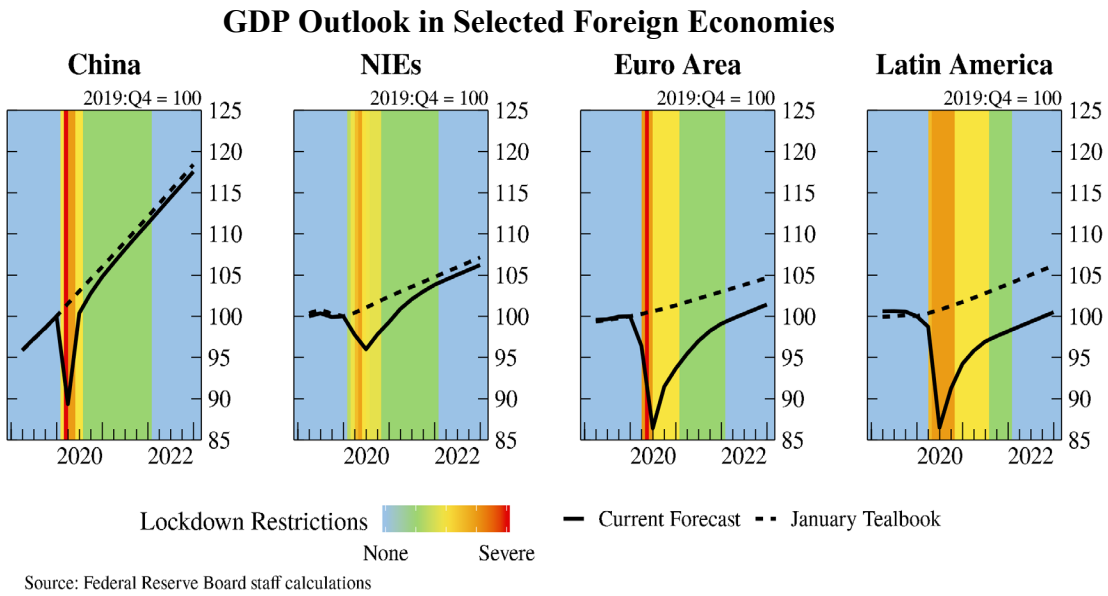


Note: The last value for all data is July 16. Source: Johns Hopkins Center for Systems Science and Engineering.

In the third group, which includes countries in Latin America, along with India and Indonesia, the rate of infections is still high or rising (the right panel). These countries generally took longer to implement restrictions on mobility and have inadequate technology to detect and track the virus, along with poor health-care systems and high population densities. Furthermore, governments in these countries have generally been less able to provide support through fiscal policy.

While we still expect economic recovery in the latter half of the year, it should be more subdued in countries where the virus is spreading vigorously

We expect the path of economic recovery for countries in these three groups to differ not only because of differences in the pace of easing restrictions, as shown in the figure on the next page, but also because of different economic conditions and structural characteristics, such as policy space and private-sector balance sheet strength. China, the NIEs, and Japan, where most social restrictions have already been eased, should be the first to rebound to pre-COVID-19 levels; indeed, China already has. That said, we expect a slightly slower recovery for some in this group because of their greater dependence on external demand. In most AFEs, we expect moderate social restrictions to remain in place through the end of this year and the lingering effects of voluntary social distancing to persist for some time. Moreover, recessionary dynamics—additional negative forces that are particularly acute during recessions, including the effects of changes to consumer behavior and of impaired firms' balance sheets and reduced credit access—will likely be a headwind to growth. These factors should result in a slower recovery and GDP reaching pre-COVID-19 levels only by 2022 in many countries. Finally, in Latin America and, to a lesser extent, India and Indonesia, we expect an even slower recovery as the virus proves difficult to contain and social distancing eases more gradually. In these countries, the uncertainty around our forecast is large, both because the spread of the virus remains unpredictable and because a slow recovery will amplify financial and economic vulnerabilities.



Source: Federal Reserve Board staff calculations

The COVID-19 pandemic should leave longer-term scars on foreign economies, lowering potential output

In the near term, forced business closures lead us to assume that much of the decline in output could be attributable to a decline in potential. The lifting of restrictions should reverse some of this decline, but we do not expect potential to return to its pre-COVID-19 level. Reduced demand—importantly for services that are not suitable for social distancing, such as tourism, restaurants, and social events—will eventually lead to scarring, including through business failures, slower entry of new firms, and reduced capacity. Lower business formation will, in turn, lead to lower capital accumulation and labor demand.

Although generous support programs have thus far contained labor market dislocations in many AFEs—particularly in Europe—we see recessionary dynamics eventually driving unemployment rates well above pre-recession levels. Sizable hiring and firing costs in some countries and persistent detachment from employment will also contribute to increases in the natural rate of unemployment. Moreover, some job-support schemes, while helpful in the short run, may impede needed reallocation of labor. (For details, see the box "The Scarring Effects of the Great Lockdown on Advanced Foreign Economy Labor Markets.")

Even though the large share of informal workers could mitigate these effects in EMEs, we nonetheless expect scarring, particularly in Latin America, where low growth and

high debt levels will likely lead to business insolvencies and constrain investment for years.

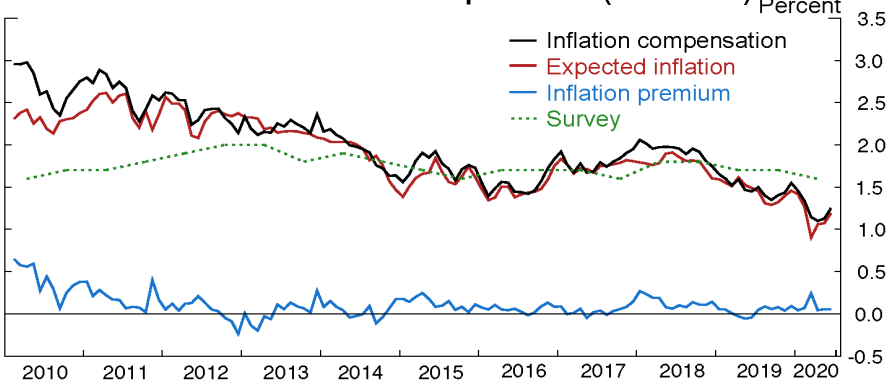
Inflation will be subdued for some time to come

Recent data showed a strong drop in inflation rates in the AFEs, to around zero percent, amid low energy prices and subdued core inflation. The deep recession, depressed energy prices, and, in some countries, falling inflation expectations are weighing on consumer prices, with both headline and core inflation projected to stay barely positive in 2020. Thereafter, inflation in the AFEs should rise to only 1.3 percent in 2022. In most EMEs, inflation has also fallen to low levels, providing room for many EME central banks to ease monetary policy.

Longer-term inflation compensation in the euro area remains notably lower since the COVID-19 outbreak, as shown by the black line of the top figure on the next page, despite moving up since the May Tealbook. Our models attribute both the decline and the recent improvement largely to movements in inflation expectations (the red line). Activity in inflation options markets for the euro area suggests that the cost of protection against deflation risk over a five-year horizon, measured by inflation floor premiums, continued to decline after its sharp rise in March.[1] That said, recent quotes remain notably higher than their pre-pandemic levels, pointing to a significant increase in market fears of deflation. In addition, the cost of protection against inflation being higher than 2 percent over a five-year horizon, measured by inflation cap premiums, remains at low levels by historical norms.

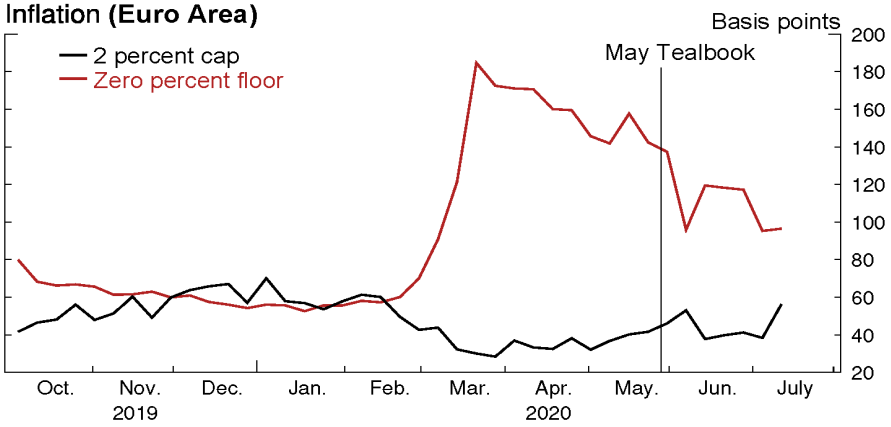
[1] An inflation cap (floor) pays the holder if the specified inflation measure moves above (drops below) a pre-determined strike level over a specified period; otherwise, there is no payment. In the case of euro-area inflation options, inflation is measured by the Harmonized Index of Consumer Prices Ex-Tobacco.

5-to-10-Year-Forward Inflation Compensation (Euro Area)



Source: Bloomberg; Consensus Economics; staff calculations.

5-Year Cap and Floor Premiums for Two Percent and Zero Percent Inflation (Euro Area)

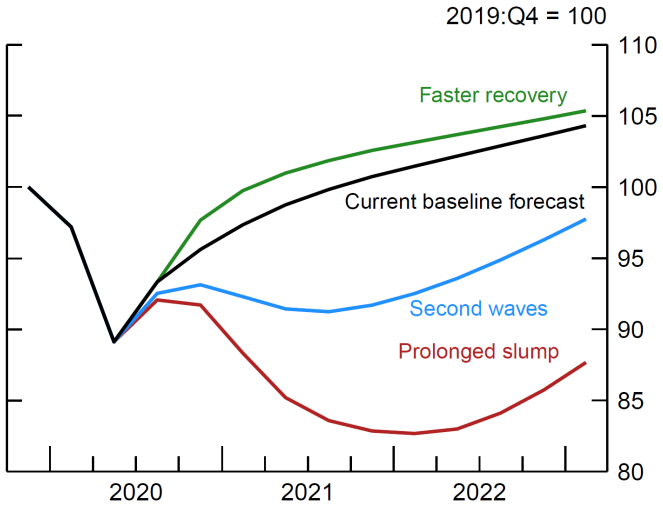


Source: Bloomberg.

Although we have learned more about the path of the virus, uncertainty remains elevated, and our baseline is only one of several plausible outcomes

The successful experience of some foreign economies in containing post-lockdown flare-ups and the economic pickup we have seen give us slightly more conviction in our baseline scenario, but the uncertainty surrounding our forecast nonetheless remains extremely high. There is considerable uncertainty about how to interpret the improvements in the recent data. We have revised up our forecast some, but the data may indicate that an even more robust recovery is in train. It is also possible that the encouraging data may just reflect a temporary boost from pent-up demand. In addition, rising cases in some key economies and more permanent shifts in demand away from some industries could suggest we are too optimistic about the magnitude of the bounceback and, consequently, on the scarring effects of the recession.

Foreign GDP: Baseline and Scenarios



Note: GDP is gross domestic product.
Source: Federal Reserve Board staff calculations.

Int'l Econ Devel & Outlook

Of course, most important is the tremendous uncertainty about the course of the virus itself. As has been the case since the March Tealbook, we see our baseline forecast as one of a number of plausible scenarios importantly linked to the outcome of the virus, and we outline three others in the Risks and Uncertainty section (also see the figure on this page). We continue to find a "second waves" scenario very plausible, where a resurgence of the pandemic (or a more prolonged first wave in countries where cases never decreased in the first place) triggers the reinstatement of broad and strict measures leading to more protracted weakness abroad. Alternatively, a somewhat earlier recovery than in our baseline is also possible, as the intensity of social distancing relaxes more quickly, possibly because of improvements in testing and contact-tracing technology, medical breakthroughs, or both. Finally, a prolonged slump remains a possibility, as breakouts become recurrent, household and business confidence collapses, and global financial conditions tighten severely. At this point, this scenario strikes us as less likely, but that may be wishful thinking.

Regional Developments and Outlook

ADVANCED FOREIGN ECONOMIES

- ***Euro Area.*** Activity indicators are consistent with gross domestic product (GDP) nosediving in the second quarter at an annual rate of about 35 percent. However, as governments began easing social-distancing restrictions, economic activity has started to recover, underscored by a rebound in retail sales and industrial production in May. Additionally, the take-up of short-time work schemes looks to have peaked in April as some firms resumed activity following the partial rollback of lockdown measures. A few euro-area countries, including Germany and Spain, experienced some regional coronavirus (COVID-19) flare-ups, which led to re-imposition of restrictions in the affected areas. Given that we expect authorities to contain the spread of new infections, we also forecast that economic activity will recover further in the second half of 2020. However, some voluntary and compulsory social distancing as well as recessionary dynamics will weigh on economic activity. As such, we forecast that GDP will reach its fourth-quarter 2019 level only in mid-2022.

  We expect fiscal and monetary policies to provide material support to the recovery. In May, the European Commission proposed that the European Union (EU) provide €750 billion in grants and loans to countries hard hit by COVID-19. However, negotiations among EU leaders, with the next summit scheduled for July 16–17, are proving contentious, with a lingering divergence of views on the size of the package, the proportion between grants and loans, and the procedure for approval of the funds. Although we anticipate that the EU rescue package will ultimately be approved, we also expect that the protracted negotiations will delay the use of these funds until 2021.

  The European Central Bank (ECB) kept its policy stance on hold at its July meeting. In addition, at the press conference following the meeting, ECB President Christine Lagarde indicated that the focus of the ECB's Pandemic Emergency Purchase Programme (PEPP), after having successfully improved market functioning, would now turn to achieving its inflation objective. Accordingly, we continue to assume that the ECB will purchase the entirety of the €1.35 trillion of assets under the PEPP envelope. Even so, we expect inflation to reach only 1.3 percent in 2022, well short of the ECB's target of below, but close to, 2 percent.

- ***United Kingdom.*** The U.K. authorities struggled with containment of COVID-19 partly because of a relatively late imposition of lockdown policies in mid-March. Consequently, lockdown was partially lifted only in mid-May, which led to an unprecedented plunge in monthly GDP in April and only a mild GDP rebound in May. In line with the monthly data, we expect second-quarter GDP to fall 54 percent at an annual rate. Recent indicators, such as purchasing managers indexes (PMI) through June, point to a further rebound in economic activity in line with easing of restrictions. Notwithstanding an expected recovery in the second half, GDP should contract 10 percent in 2020.

  The Chancellor of the Exchequer announced a new fiscal package in early July worth 1.3 percent of GDP, bringing the total of fiscal stimulus in 2020 to around 6 percent. This package includes measures to fight unemployment, tax cuts for hospitality and tourism

sectors, tax holidays for home purchases, and infrastructure projects to make U.K. buildings greener.

Moreover, at its June meeting, the Bank of England (BOE) increased its asset program by £100 billion but reduced the pace of purchases. Of note, BOE Governor Andrew Bailey stated that the current level of the BOE's balance sheet should not be considered permanent, indicating the bank's willingness to reduce its balance sheet before raising rates. Many interpreted this communication as an attempt to reinforce BOE independence after initial strong support of U.K. government actions through both BOE asset purchases (the BOE bought gilts equivalent to 90 percent of newly issued bonds) and an extension of the government's Ways and Means facility. Governor Bailey clarified that these actions, intended to be temporary, were due to extraordinary circumstances.

In addition to the downside risks related to COVID-19, the possibility of a no-trade-deal Brexit looms. Failure to reach and ratify a deal by the end of this year could prove to be an important headwind to the U.K. recovery, given ongoing difficulties in negotiations with the EU and the U.K. government's rejection to extend the transition period.

- ***Japan.*** Second-quarter GDP is expected to plunge, although by less than in economies more affected by COVID-19. Tight social-distancing restrictions in April and May weighed on domestic activity but were effective in containing the virus. In addition, the global recession has curtailed external demand, with a sharp decline in exports. Indicators released more recently, such as the June PMIs, suggest that foreign demand has remained sluggish, while domestic demand has started to recover following the lifting of the state of emergency. However, a recent flare-up of new cases in Tokyo suggests that the Japanese government will take a cautious approach in relaxing social-distancing measures further. Accordingly, we see a lukewarm recovery in the second half of the year, with GDP falling 3.1 percent (Q4 over Q4) in 2020. Over the longer term, we see limited scarring effects on the economy, as Japan's GDP and employment are expected to decline less than in other countries.

  Monetary and fiscal authorities continue to support the recovery. In June, the government enacted a new fiscal package, with a direct spending component of 1.2 percent of GDP and financial support measures of 3.9 percent of GDP. The Bank of Japan also expanded its special program by ¥35 trillion (6.3 percent of GDP) to support corporate financing while maintaining its enhanced asset purchases that have been put in place since March.

  Canada. After a successful initial strategy to contain COVID-19, authorities began relaxing restrictions around mid-May, marking the start of the recovery of economic activity. Following an unprecedented 18 percent collapse in monthly GDP from February to April, compounded by the drop in oil prices, a new official flash estimate suggests that output grew 3 percent in May. In addition, the labor market recovered 1.2 million jobs over the course of May and June, about 40 percent of the employment losses in the previous two months. We expect the economy to continue its recovery in the second half of the year, supported by a further loosening of social-distancing measures and accommodative policies. Despite the progress in containing the virus to date, we expect GDP to fall more

than 6 percent in 2020 and to remain 4 percent below its pre-crisis path at the end of 2022, as the low level of oil prices continues to weigh on economic activity.

At its July meeting, the Bank of Canada (BOC) left its policy rate and its quantitative easing program (QE) unchanged. However, at this meeting, the BOC provided more specific forward guidance about its policy rate, stating that it will remain at its current level of 0.25 percent (effective lower bound) until "the 2 percent inflation target is sustainably achieved." In contrast, the BOC was less precise about its QE program, asserting that it will continue until the recovery is "well underway."

EMERGING MARKET ECONOMIES

- ***China.*** According to the preliminary GDP release, China's economy rebounded roughly 60 percent at an annual rate in the second quarter after collapsing in the first quarter. As such, China's GDP has recovered to it pre-COVID-19 level, thereby confirming its V-shaped recovery. Since bottoming out in February and bouncing back in March as factories reopened, production recovered further in the second quarter. The fulfillment of backlog export orders and robust demand for high-tech goods and medical supplies have driven, in part, the continued recovery in production. In addition, domestic demand has been boosted by government stimulus. Easier liquidity conditions and lower interest rates have helped to support a recovery in automotive demand and a rebound in the property market, while fiscal stimulus has contributed to a surge in infrastructure investment. That said, the overall recovery in consumption has been more gradual as social distancing continues to depress spending on restaurants and other services. Going forward, the pace of recovery is expected to slow to around 9 percent in the second half of this year and to step down further over the rest of the forecast period.

- ***Asia ex. China.*** Most countries in the region have contained the spread of the virus except for India, Indonesia, and the Philippines. Countries where the virus has been contained have been able to lift lockdowns gradually, which contributed to a normalization in activity, as evidenced by a rise in mobility and retail sales. However, manufacturing and exports remain weak in these countries. In India, Indonesia, and the Philippines, the number of new cases is still high or rising, despite very tight restrictions on movement that caused industrial output and mobility to collapse. These countries thus seem to be facing an especially difficult tradeoff between containing the spread of the virus and limiting the short-term hit to economic activity. As such, we expect social restrictions in these countries to remain tighter for longer, leading to a slower recovery. For the region as a whole, we now see GDP contracting around 13 percent in the second quarter, 2 percentage points less negative than expected, based on the stronger consumer data in many countries. Growth then stages a partial rebound in the second half of this year, as private consumption strengthens further and external demand picks up, albeit to still-depressed levels. Real GDP continues to rebound in 2021, rising 5.8 percent, and reaches its pre-COVID-19 level early that year.

- ***Mexico.*** Economic activity, already weak entering the pandemic episode, collapsed in April, reflecting COVID-19-related restrictions, weak demand from the United States, plunging oil prices, and tighter financial conditions. Available data—PMIs, industrial production, vehicle production, and exports—suggest that, after continuing to struggle in

May, activity rebounded in June as the government gradually lifted some restrictions. Moreover, the stronger recovery in U.S. manufacturing production should boost growth. However, the authorities have thus far been unable to control the spread of the virus, which, along with limited testing and a weak health-care infrastructure, points to prolonged pandemic-related disruptions, curtailing the rebound in activity. In addition, scant fiscal support and an inadequate social safety net will likely weigh on the recovery. All told, we see an economic contraction of around 5½ percent this year and the level of GDP to be only 0.5 percent higher at the end of 2022 relative to its end-2019 level and 5 percentage points below the level projected in the January Tealbook.

- ***Brazil.*** After a sharp contraction in April, recent data, including industrial production and PMIs, suggest that economic activity started to turn around in May, while high-frequency data on electricity consumption indicate that the gradual pickup in activity continued in June. Yet, the gradual easing of social restrictions has made containing the spread of the virus increasingly difficult and points to a slow recovery going forward. Although the government plans to extend some fiscal support, the scope for further stimulus is limited in our view, as public debt is already poised to rise above 100 percent of GDP by the end of the year. As such, we see real GDP contracting more than 6 percent this year. In addition, we expect a subdued pace of recovery, reflecting the effects of the protracted pandemic, with GDP reaching its end-2019 level only at the end of 2022, underperforming all other countries in the region except Argentina and remaining 8 percentage points below the level projected in the January Tealbook. Return to International text

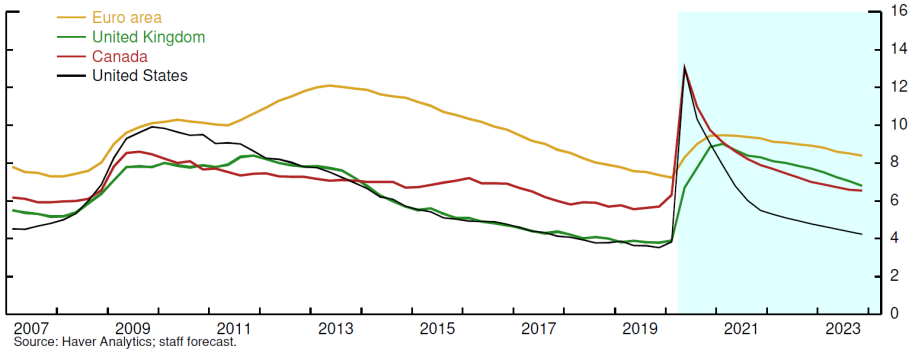
The Scarring Effects of the Great Lockdown on Advanced Foreign Economy Labor Markets

The Great Lockdown and the economic effects of the COVID-19 crisis are taking a toll on labor markets abroad, causing unemployment to rise, in some cases dramatically. We expect this damage to persist, with staff projections of the natural rate of unemployment (NRU) holding above 2019 levels in most advanced foreign economies (AFE) for years. That said, the current labor market effect of COVID-19 and the expected extent of the more long-term damage (or scarring) depend importantly on policy responses.

Amid widespread business closures and collapsing demand, most governments have provided substantial support to contain labor market dislocations. However, the effect of this support on unemployment has varied across countries (figure 1). In Europe, unemployment rates have thus far increased modestly because of government-financed "short time work" (STW) programs, which keep workers in their jobs, and structurally high firing costs, which discourage firing. In these STW programs, the government pays a large share of the firm's wage bill, providing incentives for the firm to reduce employees' hours worked rather than dismiss workers. While European governments have used these programs as automatic stabilizers for decades, many countries extended their duration and coverage following the COVID-19 outbreak.[1] Given the high participation in these STW programs, the recession has led to an unprecedented decline in hours worked but only a modest increase in job losses. In contrast, unemployment rates spiked in North America, where authorities have mainly expanded unemployment insurance.[2]

Despite these generous support programs, we see AFE unemployment rates rising well above pre-recession levels. Adherence to social-distancing norms and changes in consumers' attitudes toward certain services, such as tourism and entertainment, will restrain the recovery in these sectors. A prolonged slump in new business formation will also contribute to weak labor demand (figure 2). Deteriorating balance sheet positions will ultimately lead some businesses to fail, especially smaller, more credit-constrained firms. Limited government support for nonstandard workers—that is, workers under fixed-term contracts and those who are self employed—will also contribute to a sizable increase in unemployment rates. Countries with a higher share of such workers, as seen in figure 3, should experience more labor market deterioration.

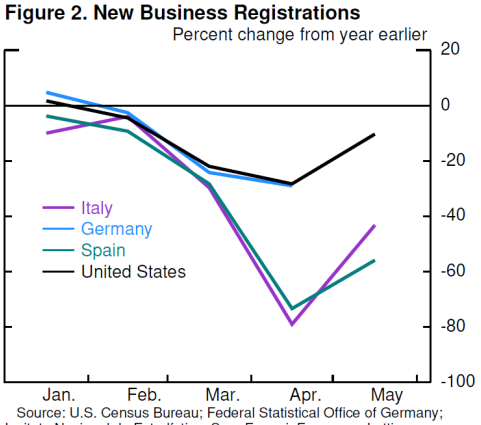
Figure 1. Unemployment Rate in Selected Advanced Economies



[1] STW subsidies have been used for decades in Germany ("Kurzarbeit"), France ("Chômage partiel"), Italy ("Cassa integrazione"), and Spain ("Expediente de Regulación Temporal de Empleo"). These programs often targeted large firms and involved large administrative costs resulting in limited usage, especially in France and Spain. The United Kingdom introduced a similar program on March 20 as the country went into lockdown.

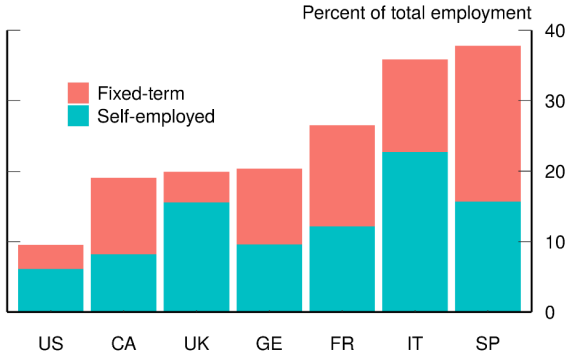
[2] Canada also introduced a European-style wage subsidy program that was operational only by the end of April, after expanding unemployment benefits early in April.

Figure 2. New Business Registrations



Source: U.S. Census Bureau; Federal Statistical Office of Germany; Insituto Nacional de Estadística; Sara Formai, Francesca Lotti, Francesco Manaresi, and Filippo Scoccianti (2020), "Entrepreneurial Lockdown," unpublished working paper, Bank of Italy.

Figure 3. Nonstandard Workers



Note: US is United States, CA is Canada, FR is France, GE is Germany, UK is United Kingdom, SP is Spain, and IT is Italy.
Source: Organisation for Economic Co-operation and Development (2020), "Self Employment Rate."

Some estimates for Germany and the United States suggest that dismissed workers lose, on average, around 15 percent of earnings over the subsequent two decades relative to nondisplaced workers and nearly 20 percent during downturns.[3] Much of the earnings loss arises from the depreciation of worker skills during unemployment. Longer unemployment spells also tend to discourage job-searching activities and reduce labor market attachment.

Even if workers remain attached to firms, if the shock is persistent or involves changes in sectoral composition of output, STW programs may ultimately contribute to persistently higher unemployment rates by reducing the efficiency in the process of matching workers to vacancies. Over time, protracted wage subsidies keep workers attached to sectors destined to shrink, and they delay the acquisition of skills in demand by expanding sectors. Indeed, unemployment rates in Europe have traditionally increased less sharply at the onset of a recession but have remained high during the recovery. With the COVID-19 shock likely to have long-lasting effects on some industries, we expect these programs to exacerbate labor market mismatch in Europe for some time.

All told, we anticipate that the scarring effects of the Great Lockdown will keep the NRU in most AFEs well above its 2019 level for several years. Nonetheless, we expect the COVID-19 shock to have heterogeneous effects across countries (see the table). Countries such as Italy and Spain should experience deeper scars because of limited fiscal space to support the recovery, weak balance sheets of private corporations, and a large hit to tourism and other services. By contrast, the labor market effect should be more limited in Germany given ample public resources to support household and firm incomes. Return to International text

Natural Rate of Unemployment Forecasts in Selected Advanced Economies (as a Percentage of Labor Force, Fourth-Quarter Level)

		2019	2020	2021	Longer run	Change between 2019 and longer run
1.	Euro area	7.5	9.2	8.8	7.8	.3
2.	Germany	3.7	4.1	3.8	3.7	0
3.	Italy	8.1	9.9	9.5	8.7	.6
4.	Spain	15.0	19.0	17.6	15.7	.7
5.	United Kingdom	4.2	6.7	5.3	4.5	.3
6.	Canada	5.9	9.2	7.4	6.2	.3
7.	United States	4.3	6.3	4.9	4.3	0

Source: Staff estimates via Division of International Finance and Division of Research and Statistics Tealbook extension.

[3] For an analysis of the United States, see Steven J. Davis and Till Von Wachter (2011), "Recessions and the Costs of Job Loss," *Brookings Papers on Economic Activity*, vol. 42 (Fall), pp. 1–72, https://www.brookings.edu/wp-content/uploads/2011/09/2011b_bpea_davis.pdf; for an analysis of Germany, see Johannes Schmieder, Joerg Heining, and Till Von Wachter (2019), "The Costs of Job Displacement over the Business Cycle and Its Sources: Evidence from Germany," working paper.

Comparing the Staff International Growth Outlook with Other Forecasts

Outside forecasters, like the Board's staff, expect the global economy to fall into a deep recession this year and to recover next year. As shown in the first row of the table, the staff sees total foreign gross domestic product in 2020 contracting at the same pace as estimated by Consensus Economics but noticeably less than projected by the International Monetary Fund (IMF). For 2021, the Board forecasts a stronger recovery than both the IMF and Consensus Economics expect, especially for emerging market economies.

Professional forecasts collected by Consensus Economics have unusually large ranges, underscoring the huge uncertainty currently surrounding the outlook. Notably, the forecasts for 2020 growth range from negative 12.0 percent to negative 6.1 percent for the euro area and run from negative 0.5 percent to positive 3.3 percent for China.

Both the staff and outside forecasters have revised their outlooks sharply since the beginning of the year. The top panel in the figure on the next page shows the evolution of foreign growth in 2020 on a year-over-year basis and highlights the enormous markdowns in the forecasts for this year for the staff, the IMF, and Consensus Economics. The bottom panel shows that outside forecasters, like the staff, expect a partial rebound in growth next year.
Return to International text

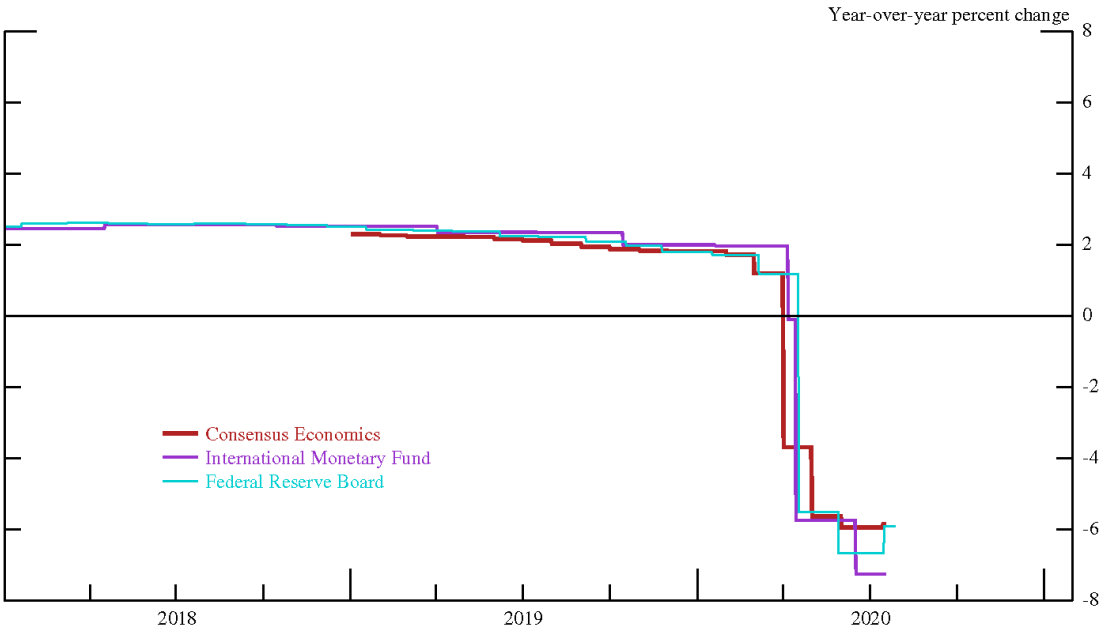
Comparison of Foreign Real GDP Forecasts

	Year-over-year percent change						Q4-over-Q4 percent change	
	2020			2021			2020	2021
	FRB	IMF	Consensus	FRB	IMF	Consensus	FRB	FRB
1. Total foreign	-5.9	-7.3	-5.9	5.7	4.9	4.8	-4.4	5.4
2. Advanced foreign economies	-7.3	-8.9	-7.0	5.5	5.1	5.1	-6.1	5.6
3. Canada	-7.3	-8.4	-6.5	6.0	4.9	5.2	-6.2	6.2
4. Euro area	-7.8	-10.5	-8.1	5.9	6.0	5.9	-6.3	5.8
5. Japan	-5.0	-5.8	-5.1	3.1	2.4	2.5	-3.1	3.2
6. United Kingdom	-10.9	-10.2	-9.2	5.6	6.3	5.9	-10.0	6.0
7. Emerging market economies	-4.4	-5.5	-4.7	5.8	4.6	4.5	-2.6	5.1
8. China	1.4	1.0	1.7	9.6	8.2	7.9	4.8	6.2
9. Emerging Asia ex. China	-2.4	-2.6	-3.0	5.4	4.5	4.6	-1.7	5.8
10. Mexico	-7.8	-10.5	-8.3	5.0	3.3	3.1	-5.6	4.2
11. Brazil	-5.8	-9.1	-6.5	2.6	3.6	3.3	-6.3	3.8
Memo								
Emerging market economies ex. China	-5.6	-6.9	-6.0	5.0	3.9	3.8	-4.1	4.9
United States	-5.5	-8.0	-5.3	4.4	4.5	4.0	-5.6	5.1

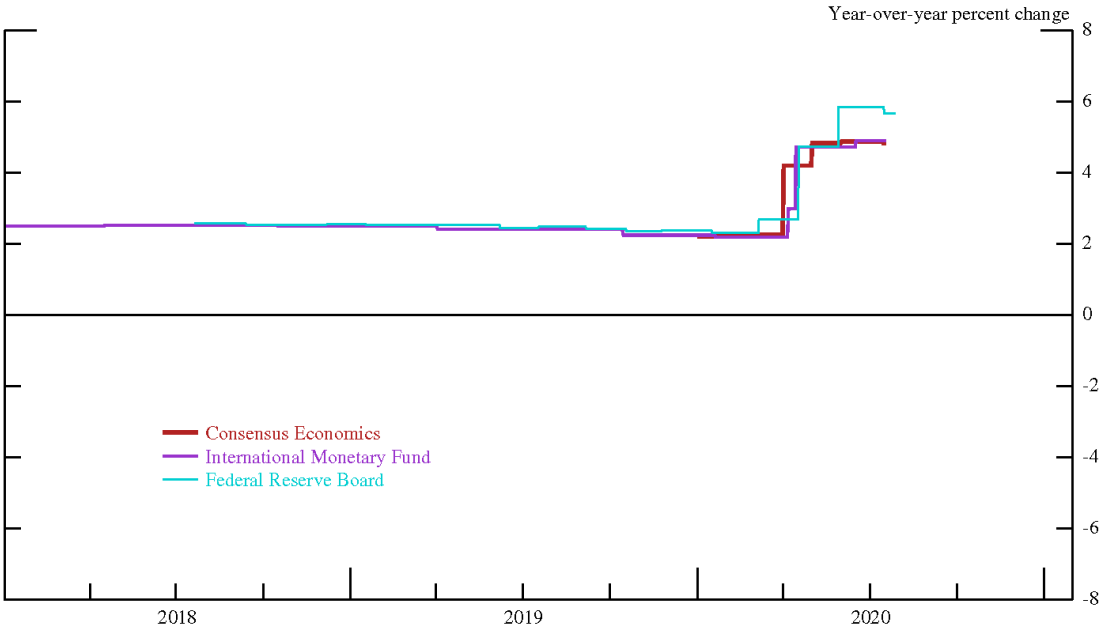
Note: Gross domestic product (GDP) aggregates are weighted by shares of U.S. nonagricultural exports. India is excluded from all year-over-year forecast aggregates, as Consensus Economics reports Indian growth on a fiscal year basis. Federal Reserve Board (FRB) forecasts are from the current Tealbook. International Monetary Fund (IMF) forecasts are from the June 2020 *World Economic Outlook* update for almost all countries. Consensus Economics' forecasts were published on June 17 for Russia, June 18 for Latin American countries, and July 16 for advanced economies and Asian countries.
Source: Federal Reserve Board Tealbook forecasts; International Monetary Fund; Consensus Economics.

Evolution of Foreign Growth Forecasts

A. Forecasts of 2020 Real GDP



B. Forecasts of 2021 Real GDP



Note: Gross domestic product (GDP) aggregates are weighted by shares of U.S. nonagricultural exports. India is excluded from all year-over-year forecast aggregates, as Consensus Economics reports Indian growth on a fiscal year basis. Federal Reserve Board (FRB) forecasts are from the current Tealbook. International Monetary Fund (IMF) forecasts for almost all individual countries are from the June 2020 World Economic Outlook update. Consensus Economics' forecasts were published on June 17 for Russia, June 18 for Latin American countries, and July 16 for advanced economies and Asian countries. Consensus Economics began forecasting 2021 only in 2020, and the FRB and IMF began forecasting 2021 earlier.
Source: Federal Reserve Board Tealbook forecasts; International Monetary Fund; Consensus Economics.

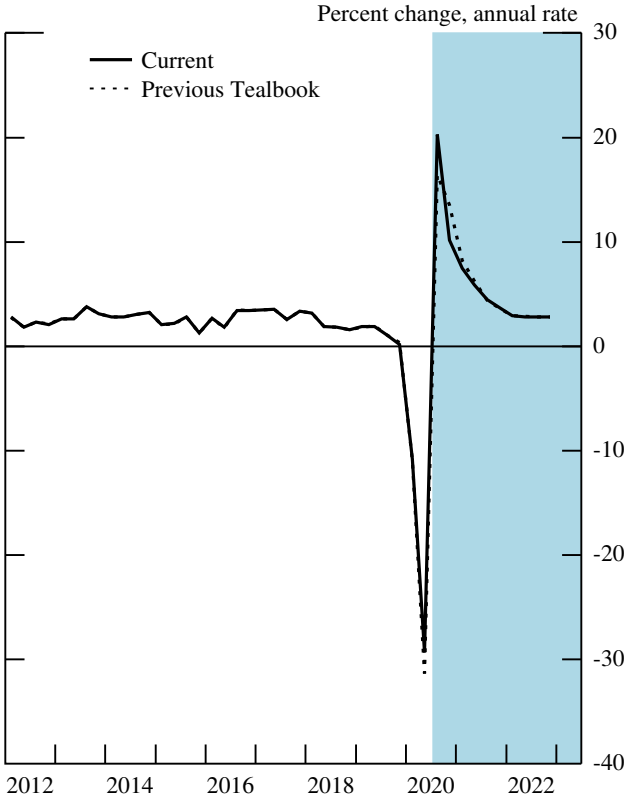
The Foreign GDP Outlook

Real GDP* Percent change, annual rate**

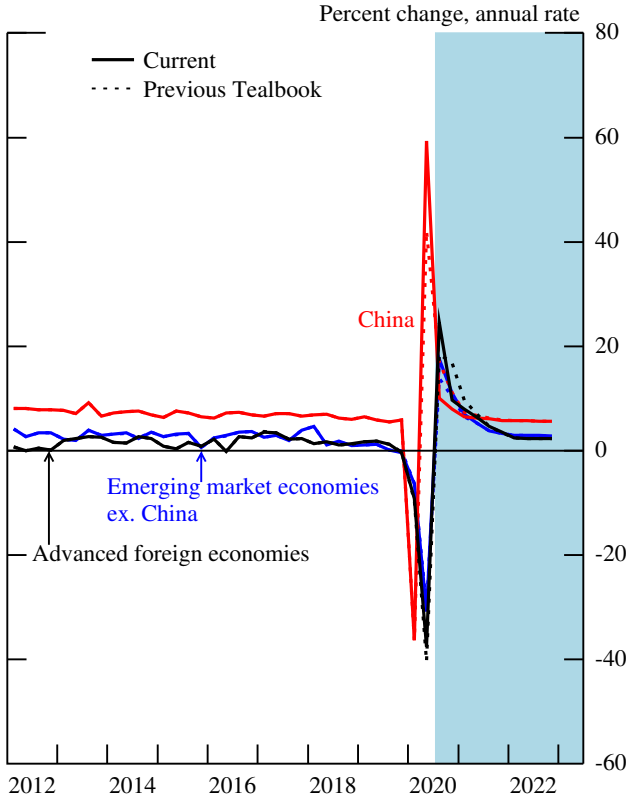
	2019			2020			2020	2021	2022
	H1	Q3	Q4	Q1	Q2	H2			
1. Total foreign	1.9	1.1	.2	-10.8	-29.3	15.1	-4.4	5.4	2.8
Previous Tealbook	*1.9*	*1.1*	*.3*	*-10.9*	*-31.3*	*15.0*	*-5.2*	*5.6*	*2.8*
2. Advanced foreign economies	1.8	1.2	-.3	-9.2	-37.5	16.9	-6.1	5.6	2.3
Previous Tealbook	*1.8*	*1.2*	*-.3*	*-9.5*	*-40.4*	*17.6*	*-7.1*	*6.2*	*2.3*
3. Canada	2.2	1.1	.6	-8.2	-40.0	18.5	-6.2	6.2	2.6
4. Euro area	1.2	1.2	.2	-13.6	-35.5	17.5	-6.3	5.8	2.3
5. Japan	2.4	.0	-7.2	-2.2	-23.0	8.2	-3.1	3.2	1.1
6. United Kingdom	1.2	2.1	-.0	-8.5	-54.0	25.0	-10.0	6.0	2.2
7. Emerging market economies	2.0	1.1	.7	-12.4	-20.1	13.3	-2.6	5.1	3.4
Previous Tealbook	*2.0*	*1.0*	*.9*	*-12.3*	*-20.8*	*12.4*	*-3.2*	*5.0*	*3.4*
8. China	6.2	5.5	5.9	-36.3	59.3	9.0	4.8	6.2	5.6
9. Emerging Asia ex. China	2.4	.3	1.7	-8.3	-13.2	8.4	-1.7	5.8	3.6
10. Mexico	.0	-.9	-2.3	-4.9	-41.5	19.5	-5.6	4.2	2.2
11. Brazil	1.6	1.9	1.5	-6.0	-32.0	9.8	-6.3	3.8	2.8
Memo									
Emerging market economies ex. China	1.2	.2	-.4	-6.4	-30.7	14.3	-4.1	4.9	2.9

* GDP aggregates weighted by shares of U.S. merchandise exports.
** Annual data are Q4 over Q4.

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices* Percent change, annual rate**

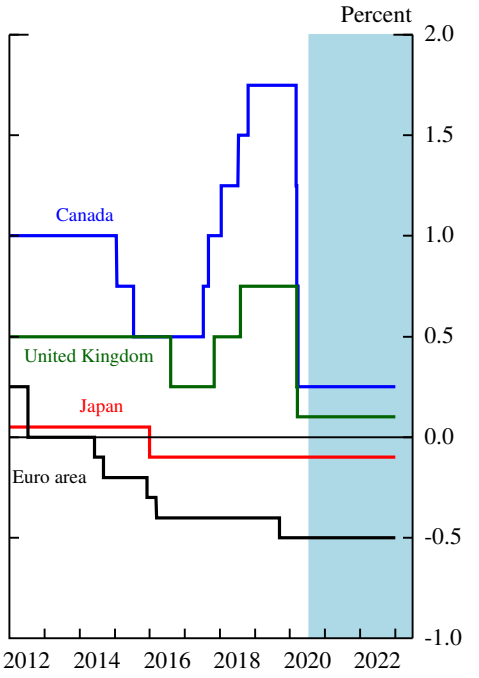
	2019			2020			2020	2021	2022
	H1	Q3	Q4	Q1	Q2	H2			
1. Total foreign	2.2	2.1	3.4	2.4	-1.8	1.6	.9	2.1	2.2
Previous Tealbook	*2.2*	*2.1*	*3.4*	*2.4*	*-1.0*	*2.0*	*1.4*	*2.1*	*2.1*
2. Advanced foreign economies	1.4	.9	1.1	.6	-2.0	1.2	.2	1.1	1.3
Previous Tealbook	*1.4*	*.9*	*1.1*	*.6*	*-1.2*	*1.0*	*.4*	*1.2*	*1.2*
3. Canada	2.5	1.6	1.7	.5	-3.0	1.6	.2	1.5	1.8
4. Euro area	1.1	.7	1.1	.7	-1.6	1.4	.5	1.1	1.3
5. Japan	.4	.4	.8	.3	-1.3	.0	-.3	.4	.6
6. United Kingdom	1.8	1.7	.4	2.1	-1.6	1.6	.9	1.6	1.7
7. Emerging market economies	2.7	2.9	4.9	3.6	-1.7	1.9	1.4	2.7	2.8
Previous Tealbook	*2.7*	*2.9*	*4.9*	*3.6*	*-.9*	*2.7*	*2.0*	*2.7*	*2.8*
8. China	2.8	4.2	7.2	4.2	-4.3	1.0	.4	2.5	2.5
9. Emerging Asia ex. China	1.7	1.2	3.3	2.7	-1.6	1.0	.7	2.4	2.6
10. Mexico	3.0	2.6	3.2	3.3	2.0	4.2	3.4	3.2	3.2
11. Brazil	4.1	2.2	3.2	4.9	-1.6	2.8	2.2	3.7	3.5
Memo									
Emerging market economies ex. China	2.5	2.0	3.4	3.1	.2	2.6	2.1	2.9	2.9

* CPI aggregates weighted by shares of U.S. non-oil imports.
** Annual data are Q4 over Q4.

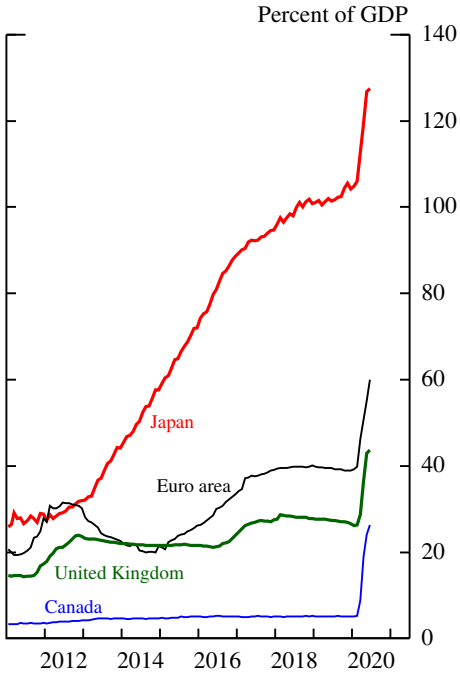
Int'l Econ Devel & Outlook

Foreign Monetary Policy

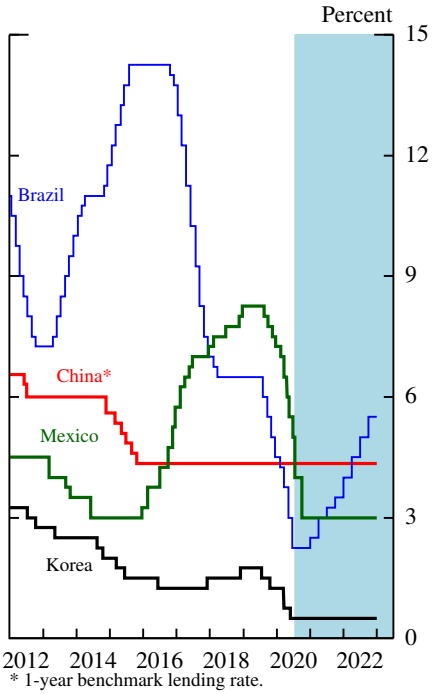
AFE Policy Rates



AFE Central Bank Balance Sheets



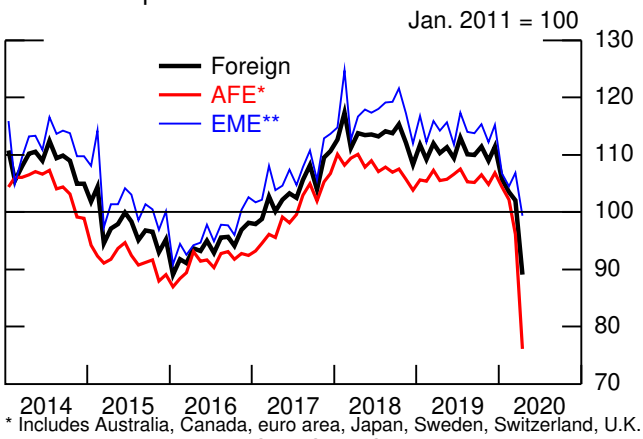
EME Policy Rates



* 1-year benchmark lending rate.

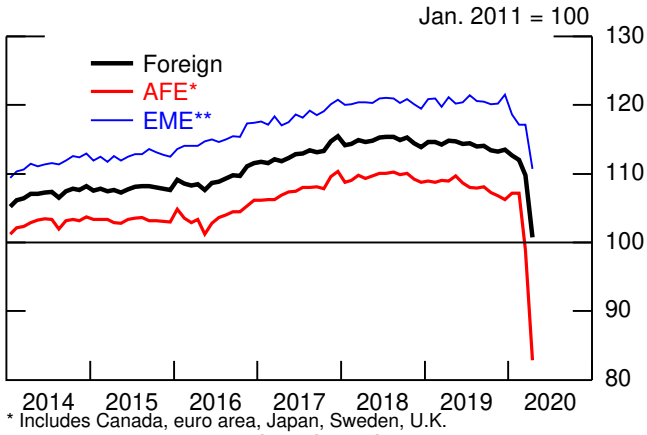
Recent Foreign Indicators

Nominal Exports



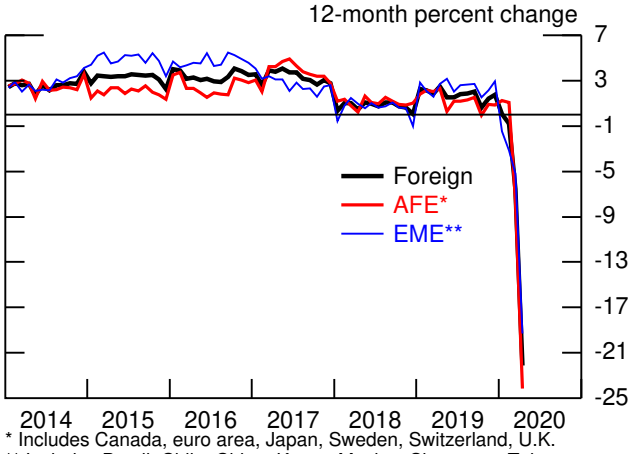
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production



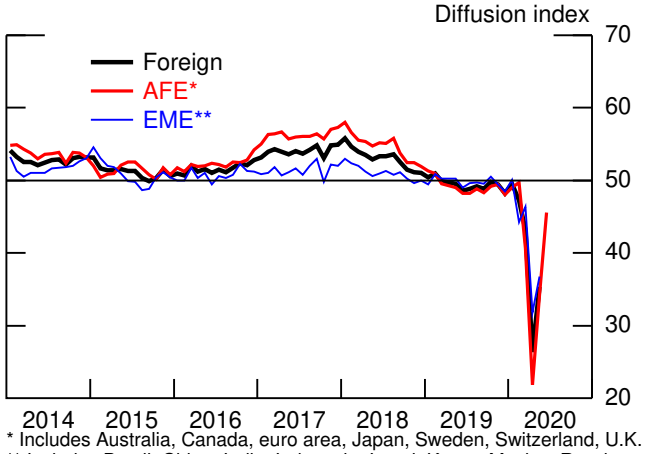
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Korea, Malaysia, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

Retail Sales



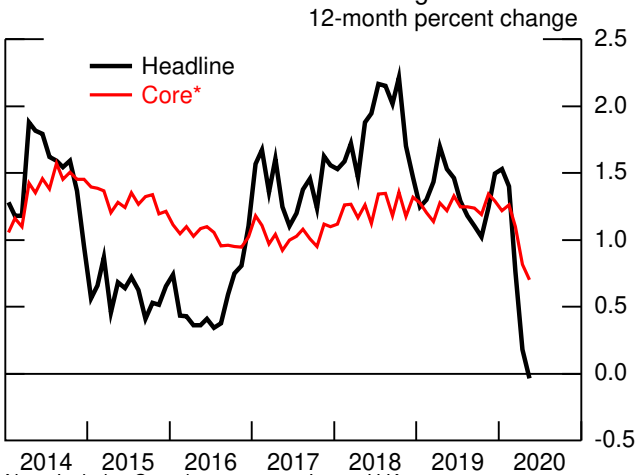
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Manufacturing PMI



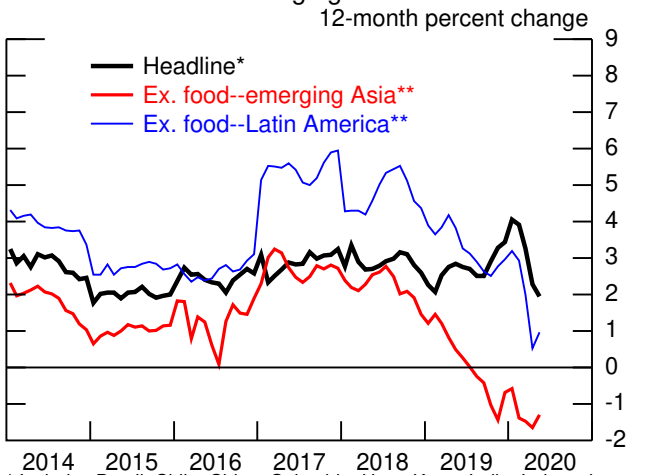
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, China, India, Indonesia, Israel, Korea, Mexico, Russia, Singapore, Taiwan, Turkey.

Consumer Prices: Advanced Foreign Economies



Note: Includes Canada, euro area, Japan, U.K.
* Excludes all food and energy; staff calculation.
Source: Haver Analytics.

Consumer Prices: Emerging Market Economies

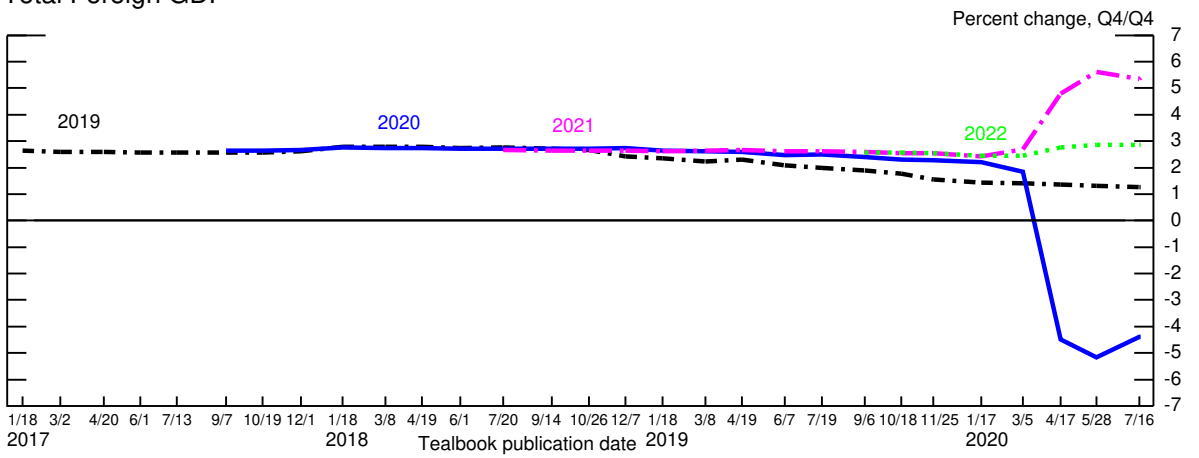


* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina and Venezuela.

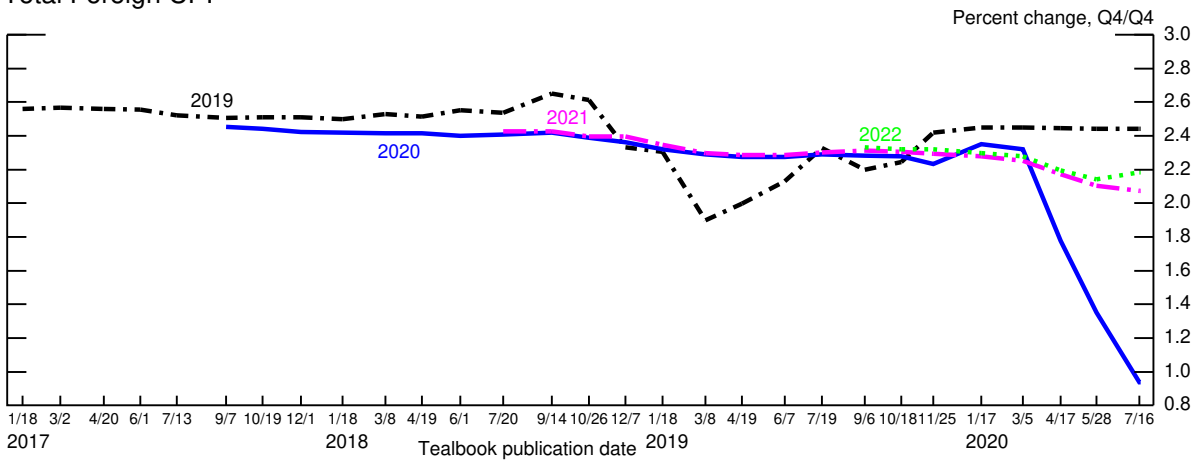
Note: Individual economies' data series may have more recent months than shown here.

Evolution of Staff's International Forecast

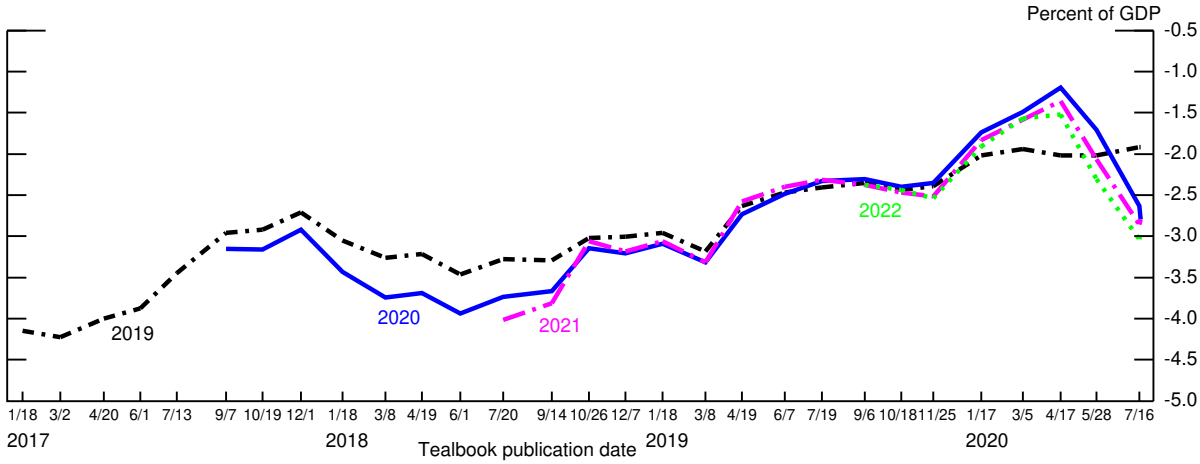
Total Foreign GDP



Total Foreign CPI



U.S. Current Account Balance



Int'l Econ Devel & Outlook

(This page is intentionally blank.)

Financial Market Developments

Amid sizable fluctuations, changes in asset prices over the intermeeting period were mixed on net. Financial market sentiment was boosted by domestic economic data releases that were more positive than market participants had expected, as well as by better-than-expected economic news from China and Europe. However, the boost to sentiment appeared to have been offset by concerns about the domestic spread of COVID-19 and its uncertain effect on the future course of the economy. On balance, broad equity price indexes were roughly unchanged, Treasury yields declined and the yield curve flattened, corporate and municipal bond spreads were mixed, and the dollar was little changed. Liquidity conditions continued to normalize but have yet to return to their levels from before the pandemic in several markets.

- Broad equity price indexes increased 0.3 percent, on net, amid notable dispersion in performance across sectors. Spreads on speculative-grade corporate bonds widened 15 basis points, and investment-grade bond spreads narrowed 11 basis points. Investment-grade municipal bonds spreads widened 15 basis points for higher-rated bonds but declined 28 basis points for lower-rated bonds.

- One-month implied volatility on the S&P 500 index (the VIX) was little changed, on net, at 28 percent, well above typical levels but notably below peak levels of roughly 80 percent in March.

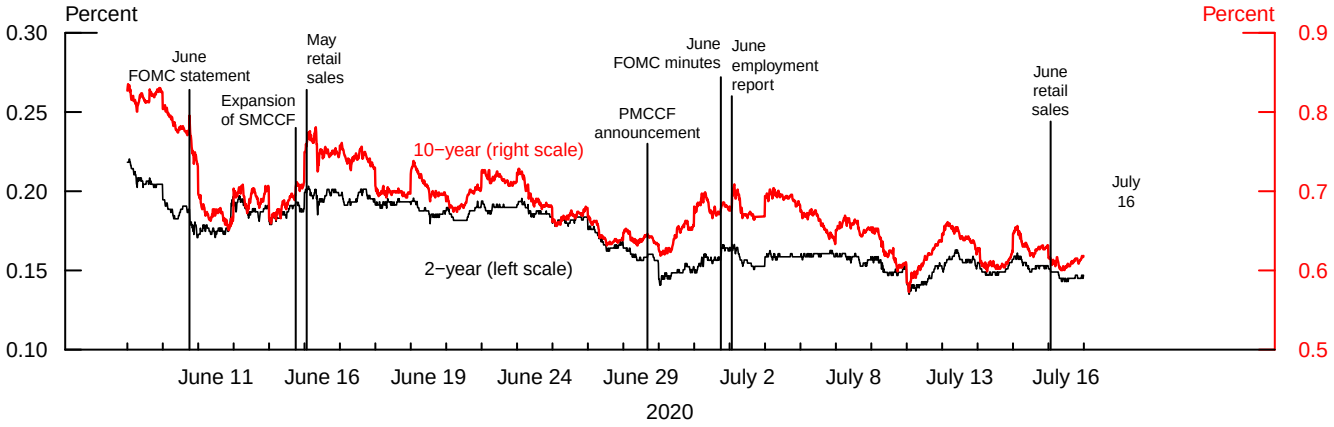
- On net, 2- and 10-year Treasury yields declined 7 basis points and 23 basis points, respectively.

- TIPS-based inflation compensation at the 5-year horizon rose 16 basis points, while 5-to-10-year inflation compensation was little changed. Both measures remain notably below pre-pandemic levels.

- The expected federal funds rate based on a straight read of OIS quotes remains near the effective lower bound (ELB) at least through the first half of 2024. Adjusted for term premiums from staff models, the path is expected to stay near the ELB at least until the end of 2021.

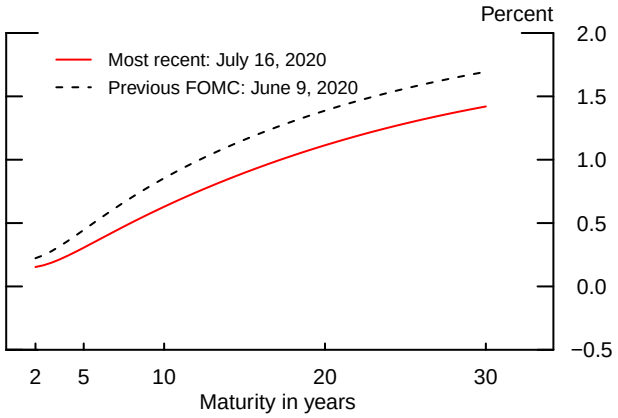
Treasury Yields and Policy Expectations

Intraday Treasury Yields



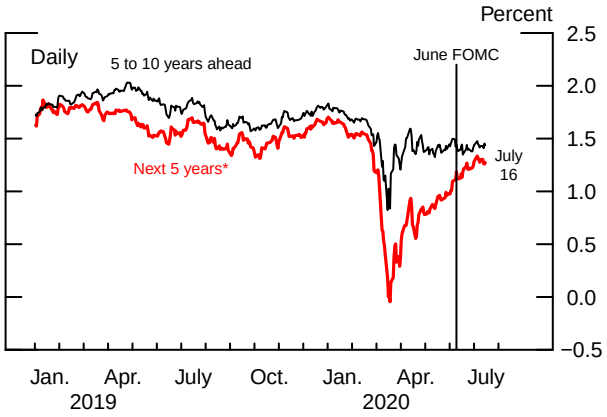
Note: Data are spaced at 5−minute intervals from 8:00 a.m. to 4:00 p.m. Markets closed on July 3.
Source: Bloomberg.

Treasury Yield Curve



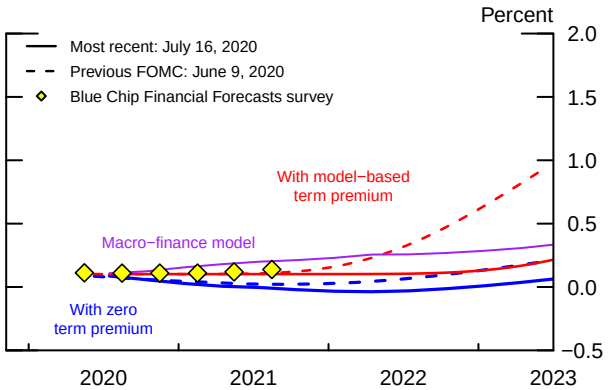
Note: Smoothed yield curve estimated from off−the−run Treasury coupon securities. Yields shown are those on notional par Treasury securities with semiannual coupons.
Source: Federal Reserve Bank of New York; Federal Reserve Board staff estimates.

TIPS−Based Inflation Compensation



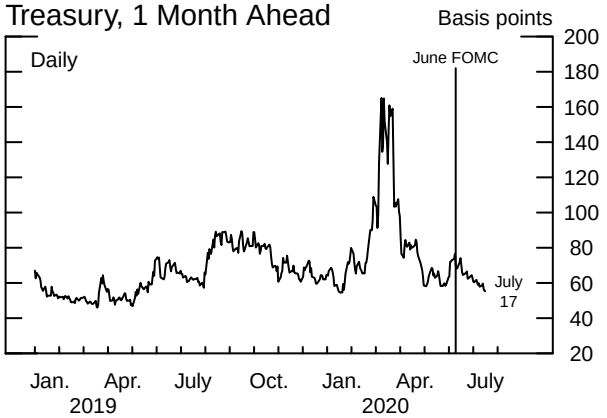
Note: Estimates based on smoothed nominal and inflation−indexed Treasury yield curves.
* Adjusted for lagged indexation of Treasury Inflation−Protected Securities (TIPS) (carry effect).
Source: Federal Reserve Bank of New York; Board staff calculations.

Implied Federal Funds Rate



Note: Zero term premium path is estimated using overnight index swap quotes with a spline approach and a term premium of 0 basis points. Model−based term premium path is estimated using a term structure model maintained by Board staff and corrects for term premiums. Macro−finance model path is estimated using regressions of survey−OIS gaps on the covariances between real and nominal variables. The Blue Chip path is the average of respondents' expectations for the federal funds rate in the survey published on July 1.
Source: Bloomberg; Board staff calculations.

Measure of Implied Volatility of 10−Year Treasury, 1 Month Ahead



Note: Implied volatility is derived from 10−year, 1−month−ahead swaptions.
Source: Barclays.

Financial Markets

- Foreign risky asset prices were mixed, and long-term sovereign yields in most AFEs decreased moderately. The staff's broad dollar index was little changed.

- The amount outstanding of the Federal Reserve's repurchase agreements fell to zero, and the aggregate outstanding amount of standing and temporary U.S. dollar swap lines declined significantly.

DOMESTIC DEVELOPMENTS

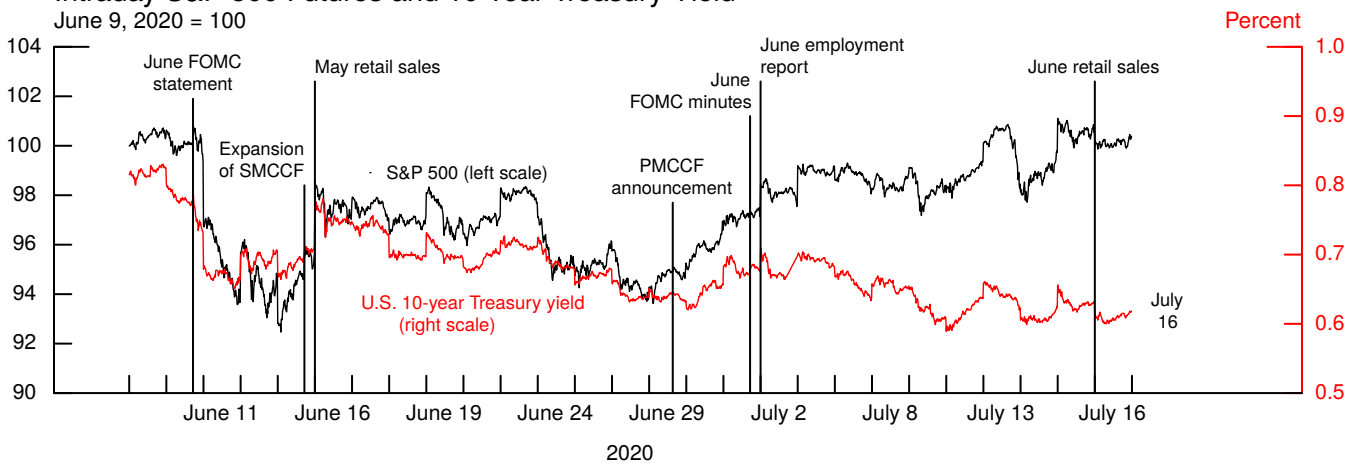
Over the intermeeting period, yields on nominal Treasury securities fell and the yield curve flattened on net. Yields declined somewhat at the start of the intermeeting period following more-accommodative-than-expected June FOMC communications, and they declined further over subsequent weeks as concerns about the surge in confirmed COVID-19 cases across many parts of the United States generally weighed on investor sentiment. The deterioration in sentiment was, in part, offset by several better-than-expected economic data releases. On net, 2-, 10-, and 30-year yields declined 7 basis points, 23 basis points, and 27 basis points to levels of 0.15 percent, 0.63 percent, and 1.42 percent, respectively.

TIPS-based measures of inflation compensation over the next few years continued to rebound from their sharp drops in mid-March. The five-year measure increased 16 basis points to 1.27 percent, which was reportedly driven primarily by investors interpreting recent economic data as suggesting that the risk of deflation had abated somewhat, as well as some improvement in liquidity conditions in the TIPS market. Despite the uptick, the five-year measure of inflation compensation remains below its typical range in recent years. The 5-to-10-year measure of longer-term inflation compensation ended the period little changed at about 1.45 percent and similarly remains notably below its pre-pandemic level (see the box "Does the Decline in Long-Horizon Inflation Compensation in 2020 Reflect a De-anchoring in Inflation Expectations?").

The expected path of the federal funds rate based on a straight read of OIS quotes declined modestly and is now below 0.25 percent at least through the first half of 2024. The staff's model-based measures that adjust for term premiums put the expected policy rate path near the ELB at least until the end of 2021. Market-implied forward rates referring to mid-2021 through 2022 remained slightly negative. However, financial market quotes reflect risk premiums and likely overstate the probability that investors

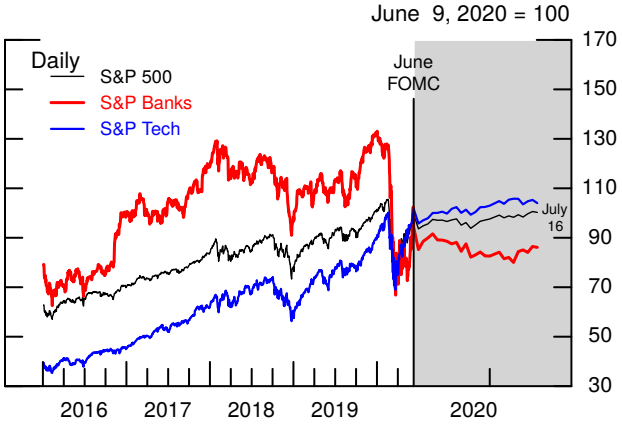
Corporate and Municipal Markets

Intraday S&P 500 Futures and 10-Year Treasury Yield



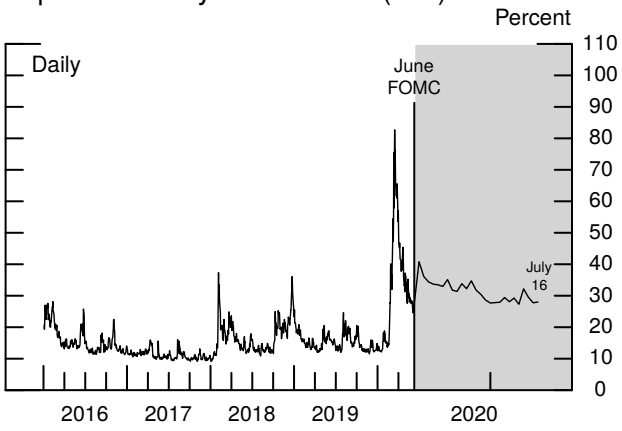
Note: Data are spaced at 5-minute intervals from 9:30 a.m. to 4:10 p.m. Markets closed on July 3.
Source: Bloomberg.

Stock Price Indexes



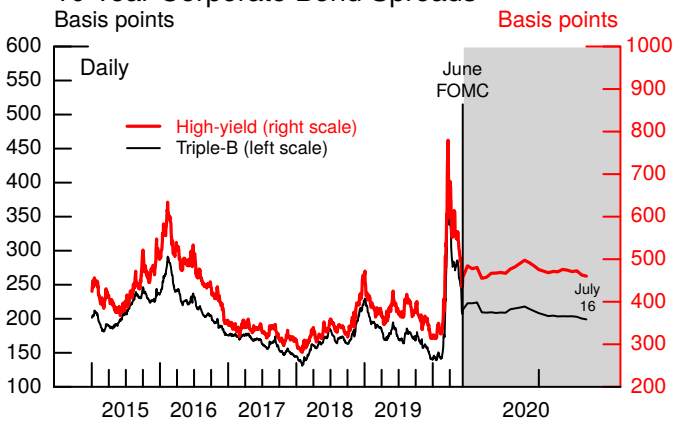
Note: The shaded gray area zooms in on the period since the previous FOMC meeting.
Source: Bloomberg.

Implied Volatility on S&P 500 (VIX)



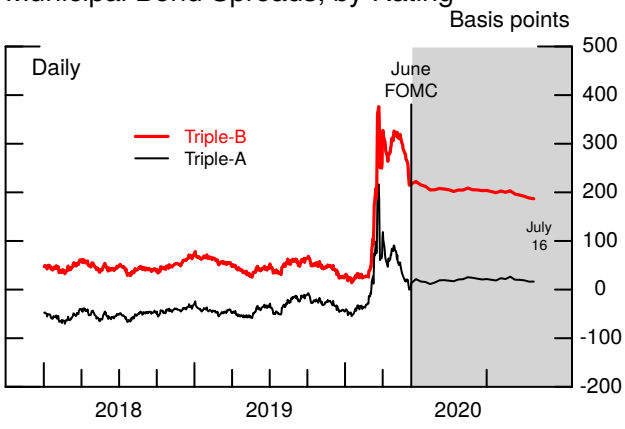
Note: The shaded gray area zooms in on the period since the previous FOMC meeting.
Source: Chicago Board Options Exchange.

10-Year Corporate Bond Spreads



Note: The shaded gray area zooms in on the period since the previous FOMC meeting.
Source: Merrill Lynch; Federal Reserve Bank of New York; Board staff calculations.

Municipal Bond Spreads, by Rating



Note: Spreads on municipal bonds are relative to comparable-maturity Treasury yields. The shaded gray area zooms in on the period since the previous FOMC meeting.
Source: ICE Data Indices, LLC.

Financial Markets

attach to these negative federal funds rate outcomes. Indeed, market commentary suggests that most investors continue to place little probability on the FOMC adopting negative rates. Following recent FOMC communications, strengthening forward guidance is viewed as the most likely policy tool for the Committee to adopt next; market participants generally do not expect the Committee to adopt yield curve caps or targets, at least not anytime soon.

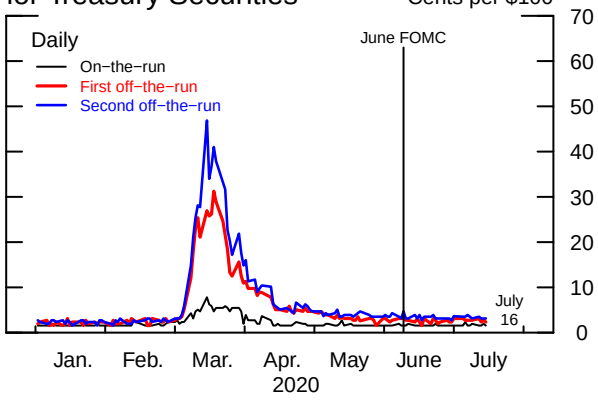
Broad stock price indexes have fluctuated substantially since the June FOMC meeting and ended the period roughly unchanged, on net, largely reacting to news about the COVID-19 pandemic and economic activity. Overall, aggregate indexes stand about 5 percent below their record-high levels reached around mid-February. Early in the period, equity prices declined notably as a sharp increase in COVID-19 cases in several U.S. states raised concerns about the pace of reopening the economy. Prices subsequently retraced some of this decline, in part as a result of positive data on May retail sales, but remained volatile, largely moving with COVID-19-related developments. Multiple sectors experienced net declines, with the largest drops seen for firms in the financial and energy sectors. In particular, bank equity prices have fallen about 14 percent since the June FOMC meeting, reportedly on concerns about credit losses, the flattening of the Treasury yield curve, and the Federal Reserve's decision following the release of the CCAR 2020 stress test results to suspend banks' share buybacks and to limit bank dividends through the third quarter.[1] Technology stocks experienced moderate gains and continued to outperform the broader market during the pandemic, as investors seemed to view the earnings of technology firms as less affected by pandemic-related disruptions. The VIX rose notably earlier in the period but subsequently declined. The VIX ended the period little changed, and equity market volatility remained elevated relative to its normal range over the past several years.

Spreads on investment-grade corporate bond yields over comparable-maturity Treasury yields narrowed somewhat, on net, while spreads on speculative-grade bonds widened moderately. Investment- and speculative-grade spreads have retraced about 80 percent and 70 percent, respectively, of their pandemic-related surge. Corporate bond spreads declined with the June 15 announcement that the Secondary Market Corporate Credit Facility (SMCCF) would begin purchasing individual corporate bonds. Over the

[1] Meanwhile, bank CDS spreads, despite some volatility, ended the intermeeting period little changed, on net, suggesting that the pressure on bank equities had been related to earnings and potential capital distributions, not to solvency concerns.

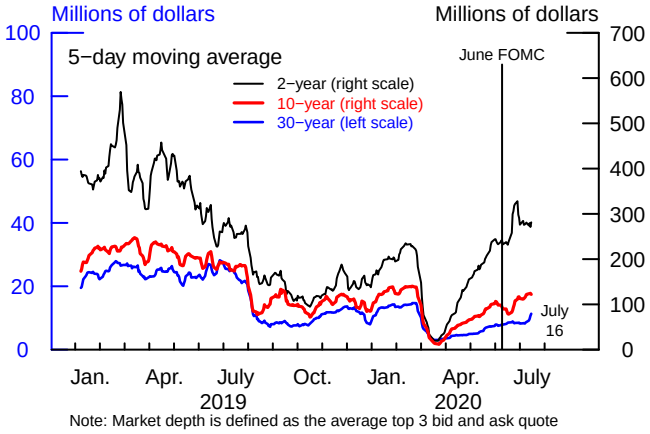
Liquidity Conditions in Domestic Markets

10−Year Indicative Bid−Ask Spreads for Treasury Securities



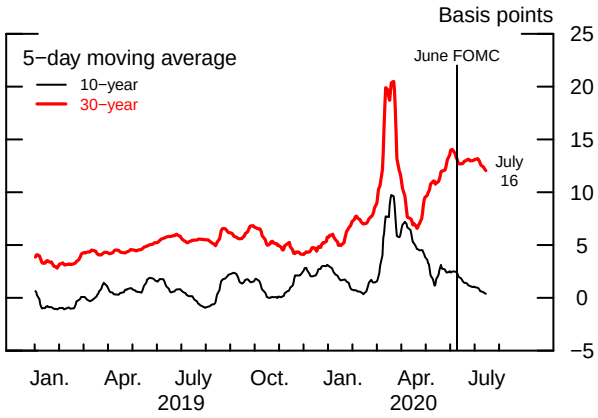
Source: Federal Reserve Bank of New York.

Treasury Market Depth



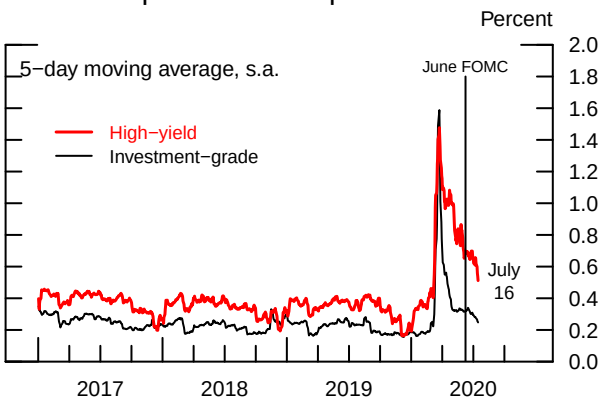
Note: Market depth is defined as the average top 3 bid and ask quote sizes for on−the−run Treasury securities. The tick size of the 2−year is one−fourth of the tick size of the 10−year security.
Source: Repo Inter Dealer Broker community.

On−the−Run Treasury Liquidity Premium



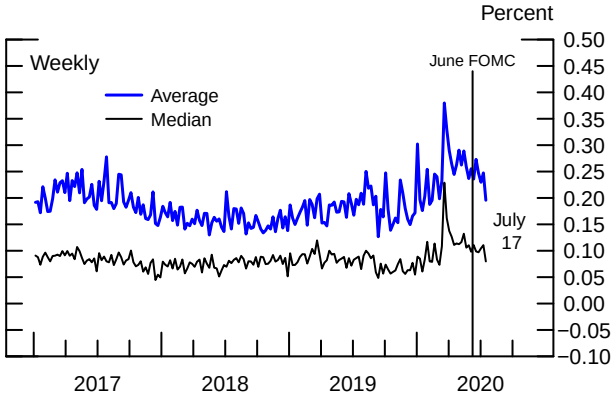
Note: Premium is calculated as spread between regular yields and predicted yields using off−the−run Svensson coefficients.
Source: Federal Reserve Bank of New York; Board staff calculations.

Bid−Ask Spreads for Corporate Bonds



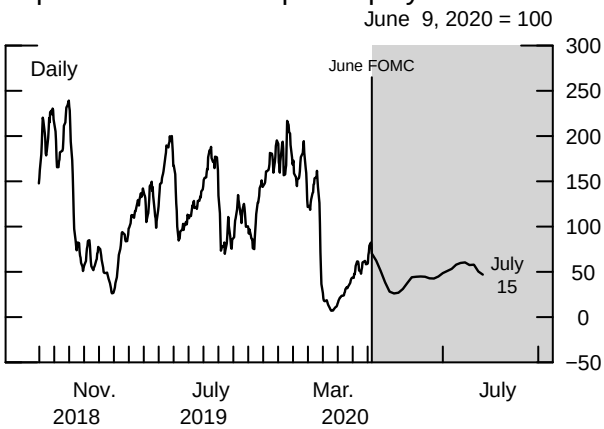
Source: FINRA.

Round−Trip Transaction Costs for Large Municipal Bond Trades (Par Value >= 500K)



Note: Round−trip transactions are pairs of trades that start with a dealer−buy from a customer and are immediately followed by a dealer−sell to the customer in trades of the same par value. Round−trip transaction cost is the percentage change from dealer−sell price to dealer−buy price. Only fixed−coupon bonds that are at least 90 days after issuance and traded between the hours of 8:00 a.m. and 6:00 p.m. on weekdays are included.
Source: Municipal Securities Rulemaking Board; Board staff calculations.

Top−of−the−Book Depth: Equity Index Futures



Note: Figure is based on the E−mini S&P 500. The shaded gray area zooms in on the period since the previous FOMC meeting. Average depth: (Avg. bid size + avg. ask size) / 2.
Source: Tick History.

Financial Markets

remainder of the intermeeting period, spreads of investment-grade bonds declined moderately, while spreads of high-yield bonds widened modestly, on net, as risk sentiment fluctuated and the credit outlook deteriorated somewhat. The announcement on June 29 that the Primary Market Corporate Credit Facility (PMCCF) was operational had little contemporaneous market effect. To date, the SMCCF has purchased $11.4 billion in securities at par value—with purchases consisting of about 75 percent ETFs and 25 percent corporate bonds. The PMCCF has had no transactions to date.

Secondary-market spreads on investment-grade municipal bonds over comparable-maturity Treasury yields widened 15 basis points for higher-rated bonds but declined 28 basis points for lower-rated investment-grade bonds. Spreads for speculative-grade bonds were little changed. Spreads for higher-rated municipal bonds have retraced about 80 percent of their pandemic-related spike, while lower-rated spreads have retraced about 55 percent of the spike. The Municipal Liquidity Facility has not seen any further borrowers since June 2, when the State of Illinois became the facility's first—and so far only—borrower.

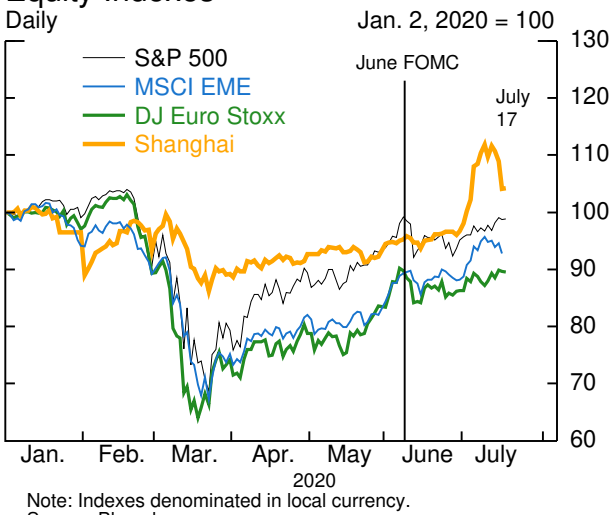
LIQUIDITY CONDITIONS IN DOMESTIC MARKETS

In the Treasury market, measures of liquidity for on-the-run securities continued to recover, especially for shorter maturities. Bid-ask spreads were generally little changed at near-pre-pandemic levels, and market depth rebounded further. Nevertheless, market depth generally remained below pre-pandemic levels for longer tenors, with levels for the 30-year security particularly low. Bid-ask spreads for 30-year on-the-run and off-the-run Treasury securities remained somewhat wider than pre-pandemic levels. Agency MBS market functioning has largely moved back to pre-pandemic levels, although liquidity in some portions of the market—notably, for those securities excluded from Federal Reserve open market purchases—remained below pre-pandemic levels.

Liquidity conditions in the corporate bond market have largely normalized, though bid-ask spreads remained somewhat elevated for speculative-grade bonds. In the municipal bond market, liquidity conditions improved somewhat, as round-trip transaction costs for trades declined. Liquidity conditions in the equity market deteriorated a bit, as measures of market depth declined and the price impact of trades increased. Although equity market liquidity conditions remained quite strained compared

Foreign Developments

Equity Indexes

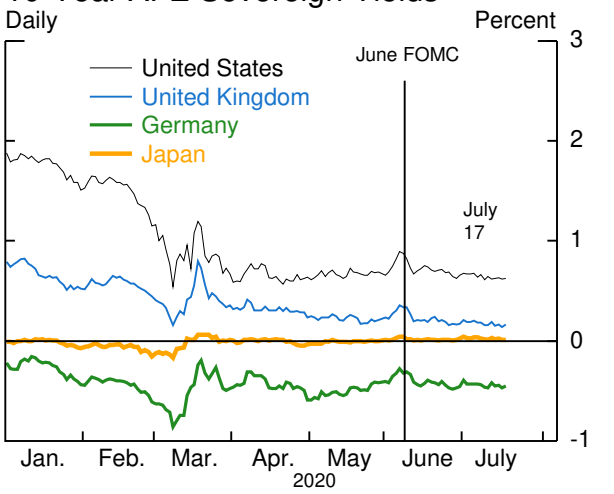


Note: Indexes denominated in local currency.
Source: Bloomberg.

Equity Implied Volatilities

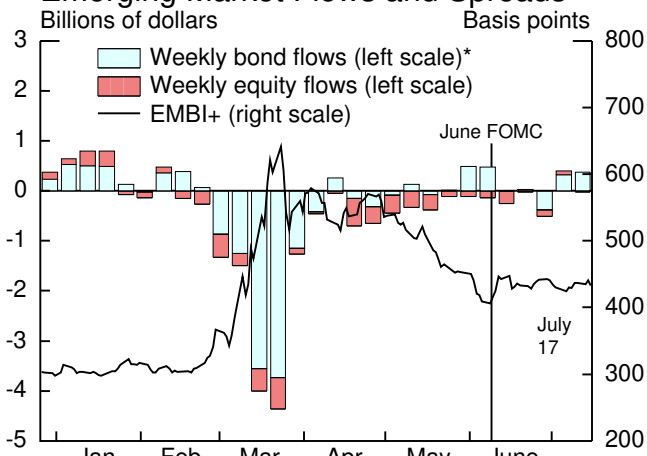
Source: Bloomberg.

10-Year AFE Sovereign Yields



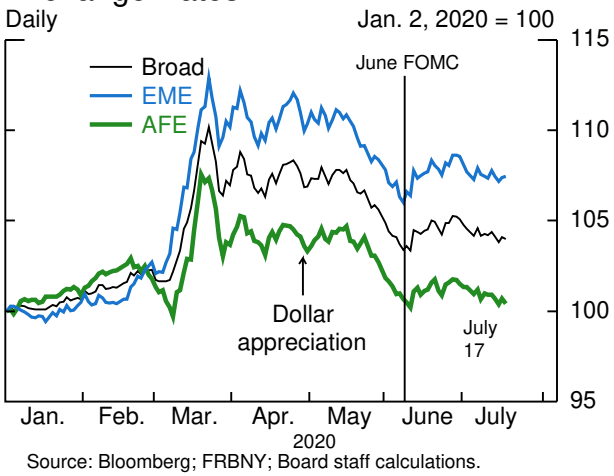
Source: Bloomberg.

Emerging Market Flows and Spreads



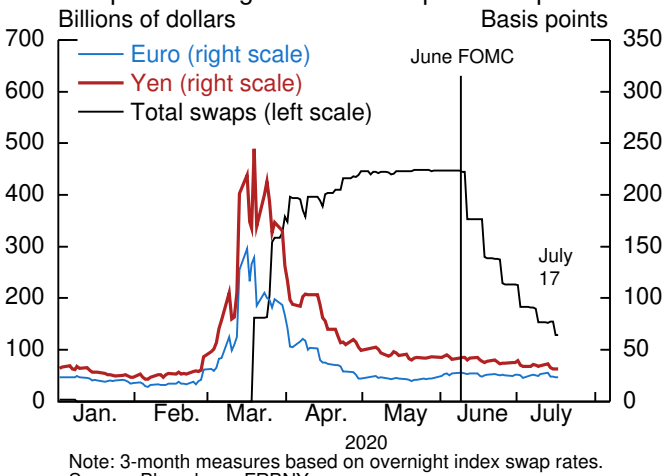
Note: EMBI+ refers to emerging market bond spreads to Treasury securities. Excludes intra-China flows.
* Average weekly flow by month.
Source: Emerging Portfolio Fund Research; J.P. Morgan EMBI+.

Exchange Rates



Source: Bloomberg; FRBNY; Board staff calculations.

Swap Line Usage and FX Swap Basis Spreads



Note: 3-month measures based on overnight index swap rates.
Source; Bloomberg: FRBNY.

Financial Markets

with pre-pandemic levels, they have improved from the extreme lows observed in March and April.[2]

FOREIGN DEVELOPMENTS

As in the United States, risk sentiment abroad fluctuated over the intermeeting period. Economic data abroad showed signs of recovery even as COVID-19 cases accelerated in parts of the United States and several other countries. A resurgence of trade and geopolitical tensions between the United States and China weighed on sentiment at times.

Foreign risky asset prices showed a mixed performance, with AFE bank equity prices generally declining. Emerging Asia equities outperformed, including an 8.5 percent rise in the Shanghai Composite index. Chinese equity performance was supported by statements in the Chinese media promoting stock investment, better-than-expected Chinese economic data, and possibly purchases by state-linked firms. The response to the increase in U.S.-China tensions appeared to have little effect on Chinese equity prices. Measures of emerging market corporate and sovereign bond spreads widened slightly and capital flows were muted, with small equity outflows and small bond inflows on net.

Long-term sovereign yields in most AFEs ended the period moderately lower, as some improvement in economic data was more than offset by flight-to-safety demand amid concerns about the spread of COVID-19. Several AFE central banks reaffirmed their accommodative policy stances and expanded asset purchase programs during the intermeeting period. At its June meeting, the Bank of England left its key policy rate unchanged and increased the size of its asset purchases by £100 billion, as was widely expected. Because asset purchases will be conducted at a slower pace, however, market participants interpreted the actions as less accommodative than expected, and longer-dated gilt yields increased notably following the decision. Nonetheless, because of the deterioration in risk sentiment, 10-year gilt yields declined 20 basis points, on net, over the intermeeting period. In its June-end refinancing statement, the Bank of Japan (BOJ) announced an increase in the size of its purchases of Japanese government bonds up to the 10-year tenor, while purchases allocated to tenors greater than 10 years were

[2] Note that measures of liquidity across the various markets are not necessarily expected to fully return to pre-pandemic levels in the near term given the enormous change in the macroeconomic outlook and related uncertainties remaining.

unchanged. The BOJ subsequently maintained its policy stance at its July policy meeting, including its enhanced purchases of corporate bonds and other assets in place since March. Japanese 10-year sovereign yields ended the intermeeting period unchanged. In Europe, the ECB left its policy rates and asset purchase program parameters unchanged at its July meeting as widely expected, prompting negligible reaction in financial markets. Additionally, the Bank of Canada introduced outcome-based forward guidance at its July meeting, stating that it will hold its policy rate at the effective lower bound until its 2 percent inflation target is sustainably achieved. This statement was reportedly perceived as more accommodative than expected by market participants. Nonetheless, declines in Canadian yields over the intermeeting period were about in line with other AFEs.

The staff's broad dollar index was little changed, on net, as sizable depreciation of several Latin American currencies was offset by appreciation of the Chinese renminbi. The Brazilian *real* depreciated about 9 percent against the U.S. dollar, on net, amid escalating COVID-19 cases, continued rate cuts from the Central Bank of Brazil, and domestic political turmoil. Tensions between the United States and China over the situation in Hong Kong continued to escalate following China's imposition of a new security law. However, the increase in tension had little effect on the Hong Kong dollar, and available indicators suggest that market participants are not expecting a destabilization of the peg to occur in the near term.

There was little pressure in global dollar funding markets over the intermeeting period. FX swap basis spreads in most currencies remained at or near the low levels that have prevailed since the full implementation of the enhancements to the central bank dollar liquidity swap lines in mid-March. The June quarter-end passed somewhat smoother than expected, resulting in only a modest temporary uptick in short-term FX swap basis spreads. Accordingly, the total amount of U.S. dollar swaps outstanding in the central bank dollar swap lines has declined from a peak level of about $450 billion in late May to the current level of about $130 billion as the first wave of 84-day operations from March and April matured and were only partially rolled over. The cost of obtaining dollars via FX swaps remains higher for Japanese yen collateral and most of the outstanding amount remains with the BOJ in the 84-day swap maturity, likely because of larger funding needs and precautionary demand from Japanese banks.

SHORT-TERM FUNDING MARKETS AND FEDERAL RESERVE OPERATIONS

Conditions in short-term funding markets have generally been stable; the June quarter-end and July personal tax deadline were uneventful. Spreads for overnight A2/P2 commercial paper (CP) continued to decline, while those for other CP categories and negotiable certificates of deposit (NCDs) were little changed on net. Spreads and issuance volumes for CP and NCDs are now comparable to their pre-pandemic levels. Since the June FOMC meeting, assets under management for prime money market funds (MMFs) have been little changed, whereas government MMFs have experienced moderate outflows. Amid heavy Treasury issuance, government MMFs have continued to increase their holdings of Treasury securities while reducing their holdings of repurchase agreements. The Commercial Paper Funding Facility (CPFF) has not conducted any trades since May 13, and the Money Market Liquidity Facility has not originated any new loans since April 23.[3] In the short-term municipal market, the SIFMA seven-day municipal swap index yield was little changed on net.

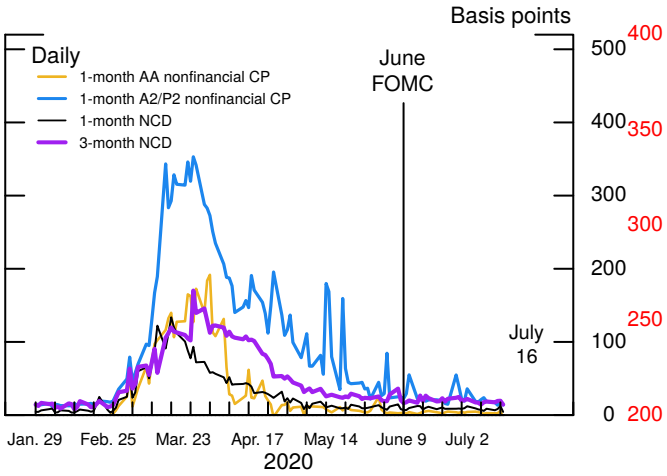
Since the June meeting, the effective federal funds rate (EFFR) and secured overnight financing rate have both increased 4 basis points. The EFFR published between 8 to 10 basis points throughout the intermeeting period. Outstanding Federal Reserve repo operations declined from $185 billion to zero, which was attributed to an increase in minimum offer rates at the Federal Reserve's overnight and term repo operations. Between June 12 and July 13, the Federal Reserve purchased $80 billion of Treasury securities, $96 billion of agency residential MBS (including reinvestments), and $62 million of agency commercial MBS.[4] The outstanding balance of discount window primary credit advances continued to decline over the intermeeting period. Credit outstanding fell from $8 billion to $5 billion as the volume of new advances remained muted. In contrast, the outstanding balance of the Paycheck Protection Program Liquidity Facility advances continued to grow, reaching nearly $70 billion. A majority of these advances, both in terms of number and dollar value, were made to community banking depository institutions.

[3] The bulk of the CPFF's purchases of CP occurred in its first few weeks of operation, and most of this CP is set to mature before the end of July. With current CP market rates more attractive than the CPFF rate, usage of the CPFF is expected to remain minimal.

[4] Amid further normalization in Treasury market liquidity conditions, Federal Reserve purchases of Treasury securities declined to $4 billion a day just before the June FOMC meeting and remained at around this level through the intermeeting period. Meanwhile, the purchase pace of agency residential MBS remained at around $4.7 billion a day.

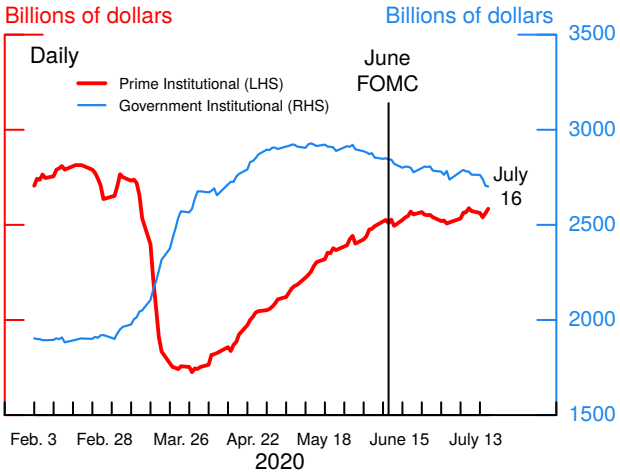
Short-Term Funding Markets and Federal Reserve Operations

Short-Term Funding Market Spreads



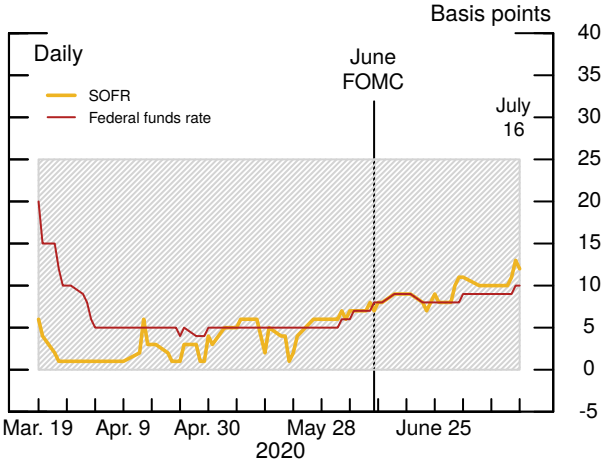
Note: CP is commercial paper; NCD is negotiable certificate of deposit. All spreads are to the overnight index swap rate of the same tenor.
Source: Depository Trust & Clearing Corporation.

MMF Assets under Management



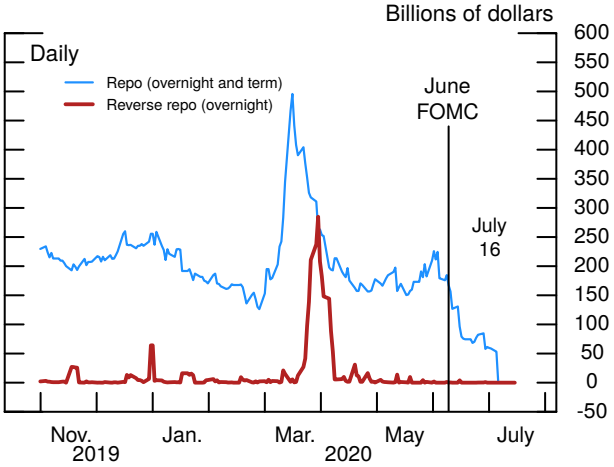
Note: MMF is money market fund.
Source: iMoneyNet.

Overnight Funding Rates



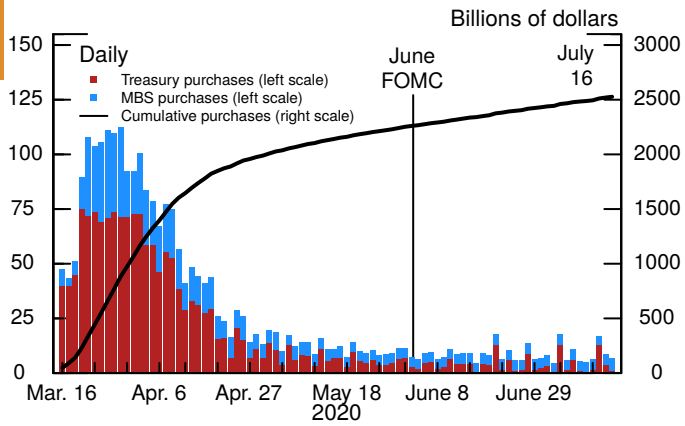
Note: Shaded area is the target range for the federal funds rate. SOFR is Secured Overnight Financing Rate.
Source: Federal Reserve Bank of New York; Federal Reserve Board.

Fed Repo and Reverse Repo Operations



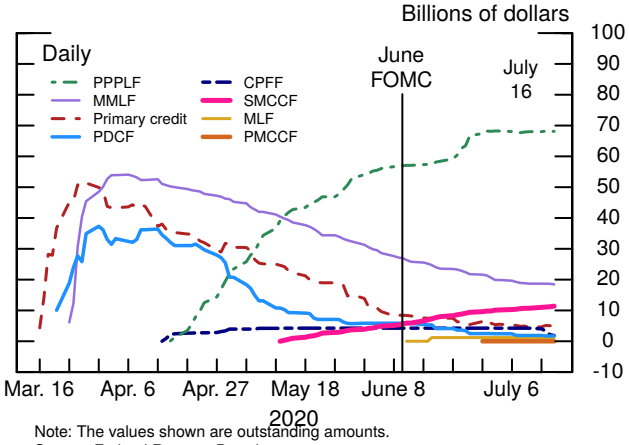
Note: The values shown are outstanding amounts.
Source: Federal Reserve Bank of New York

Outright Security Purchases



Note: Cumulative purchases are from March 16.
Source: Federal Reserve Bank of New York.

Usage of Liquidity and Credit Facilities



Note: The values shown are outstanding amounts.
Source: Federal Reserve Board.

Financial Markets

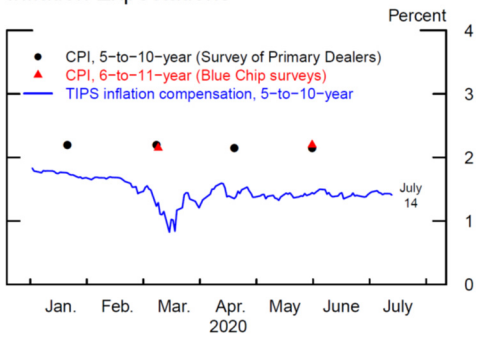
(This page is intentionally blank.)

Does the Decline in Long-Horizon Inflation Compensation in 2020 Reflect a De-anchoring in Inflation Expectations?

Market-based measures of long-horizon U.S. inflation compensation began to decline at the start of the year following the outbreak of the COVID-19 pandemic. This decline accelerated in March, with inflation compensation reaching an illiquidity-induced trough in mid-month. Although it has recovered substantially since then, 5-to-10-year TIPS-based inflation compensation (the blue line in figure 1) remains about 40 basis points lower year-to-date. This discussion assesses whether this decline in inflation compensation since the start of the year is indicative of a de-anchoring in long-horizon inflation expectations. We find that, on balance, inflation expectations have declined only a touch, and uncertainty about future inflation has increased notably.

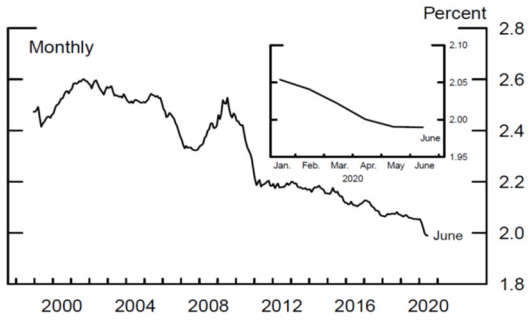
TIPS-based inflation compensation includes risk premiums that compensate for inflation uncertainty and the relative illiquidity of TIPS, so it does not provide a clean measure of inflation expectations. In contrast, long-horizon survey measures, which should be free of risk premiums, have been relatively stable over 2020. (The red triangles and black circles in figure 1 show long-horizon expectations from Blue Chip surveys and the Survey of Primary Dealers, respectively.) To help improve our understanding of inflation expectations, the staff has developed a new state-space model that uses data on realized inflation and information from a wide range of inflation surveys to generate estimates for inflation expectations as well as for uncertainty about future inflation.[1] This model also points to only a small decline in long-horizon CPI inflation expectations since the beginning of 2020 (figure 2). The model suggests that, following two decades of declines, long-horizon CPI inflation expectations now stand close to 2 percent, implying

Figure 1: Measures of Long-Horizon Inflation Expectations



Note: Expectations from the Survey of Primary Dealers represent the median of the modal forecasts.
Source: Federal Reserve Bank of New York; Wolters Kluwer, Blue Chip Economic Indicators and Financial Forecasts; Board staff calculations. TIPS inflation compensation estimates are based on smoothed nominal and inflation-indexed Treasury yield curves.

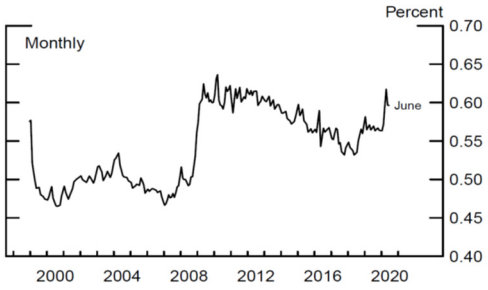
Figure 2: Model-Implied Expectation of 5-to-10-Year-Ahead CPI Inflation



Note: Data based on the model in Olesya Grishchenko, Sarah Mouabbi, and Jean-Paul Renne (2019), "Measuring Inflation Anchoring and Uncertainty: A U.S. and Euro Area Comparison," *Journal of Money, Credit, and Banking*, vol. 51 (August), pp. 1053–96.
Source: Board staff calculations.

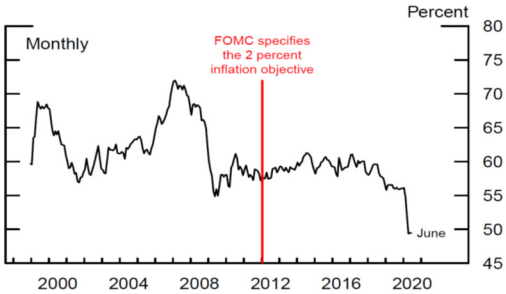
[1] The various surveys differ in the horizons over which inflation expectations and uncertainties are measured; for example, some surveys ask about inflation over 5 to 10 years ahead, and some ask about inflation over the next year. An advantage of the state-space model is that it takes in the disparate surveys (the Blue Chip surveys, the Survey of Professional Forecasters, the Survey of Primary Dealers, and Consensus Economics surveys) in a consistent modeling framework. Details of the model and the method are given in Olesya Grishchenko, Sarah Mouabbi, and Jean-Paul Renne (2019), "Measuring Inflation Anchoring and Uncertainty: A U.S. and Euro Area Comparison," *Journal of Money, Credit, and Banking,* vol. 51 (August), pp. 1053–96.

Figure 3: Model-Implied Standard Deviation of 5-to-10-Year-Ahead CPI Inflation



Note: Data based on the model in Olesya Grishchenko, Sarah Mouabbi, and Jean-Paul Renne (2019), "Measuring Inflation Anchoring and Uncertainty: A U.S. and Euro Area Comparison," *Journal of Money, Credit, and Banking*, vol. 51 (August), pp. 1053-96.
Source: Board staff calculations.

Figure 4: Probability of 5-to-10-Year-Ahead CPI Inflation Being in the Range of 1.8 to 2.8 Percent



Note: Data based on the model in Olesya Grishchenko, Sarah Mouabbi, and Jean-Paul Renne (2019), "Measuring Inflation Anchoring and Uncertainty: A U.S. and Euro Area Comparison," *Journal of Money, Credit, and Banking*, vol. 51 (August), pp. 1053-96.
Source: Board staff calculations.

that, based on the typical gap between CPI and PCE inflation, PCE inflation expectations are modestly below the Committee's 2 percent PCE inflation objective. Meanwhile, the staff's term structure model (not shown)—which takes into account nominal and TIPS yield data but only considers a smaller set of surveys—suggests that 5-to-10-year-ahead expected CPI inflation has declined a little more this year (around 30 basis points), to a level similar to the new model.[2]

Even though long-horizon inflation expectations appear to have fallen only modestly, uncertainty around future inflation, as implied by the new staff model, appears to have risen of late. An innovation of the new model is that it incorporates survey information about the uncertainty of inflation derived from questions in the Survey of Professional Forecasters and the Survey of Primary Dealers about the distribution of future inflation. Figure 3 suggests that the uncertainty about future inflation 5 to 10 years ahead has risen sharply this year, to levels previously seen in 2011, although that increase retraced some in June.

Given the elevated inflation uncertainty, it seems helpful to consider an alternative measure of how well anchored inflation expectations are: the probability of future inflation being in a certain range around the Committee's inflation objective. Figure 4 displays the probability of CPI inflation averaging between 1.8 and 2.8 percent from 5 to 10 years ahead (that is, within ½ percentage point of the Committee's 2 percent inflation objective, accounting for the typical difference between CPI and PCE inflation). Since the FOMC's statement of an explicit inflation objective in January 2012 (the red vertical line), this probability largely remained range bound, but in the past couple of years, the probability declined some. The noticeable drop in this probability since the outbreak of the pandemic reflects both the modest decline in inflation expectations and the rise in inflation uncertainty. Return to Financial Markets text

[2] The staff's term structure model is described in Don Kim, Cait Walsh, and Min Wei (2019), "Tips from TIPS: Update and Discussions," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, May 21), https://www.federalreserve.gov/econres/notes/feds-notes/tips-from-tips-update-and-discussions-20190521.htm. An alternative version of this model that imposes that some shocks have more persistent effects currently implies a 5-to-10-year-ahead CPI inflation expectation of 1.5 percent, substantially below the level corresponding to the Committee's objective.

(This page is intentionally blank.)

Financing Conditions for Businesses and Households

Financing conditions intermediated through capital markets remained generally accommodative over the intermeeting period. However, bank lending conditions tightened notably. Banks reported that current levels of lending standards sit at the tighter end of their historical range across all loan categories. The credit quality of businesses deteriorated further, particularly for speculative-grade firms, small businesses, and some parts of the commercial real estate (CRE) market, while that of households remained little changed.

- Gross issuance of investment-grade corporate bonds was solid in June, and issuance of speculative-grade bonds was robust. Institutional leveraged loan issuance picked up in June from subdued levels in April and May.

- Growth of commercial and industrial (C&I) loans at banks turned negative in June amid a reported tightening of bank lending standards and terms for firms of all sizes. Conditions for small businesses, where the majority of financing is intermediated by banks, remained very tight.

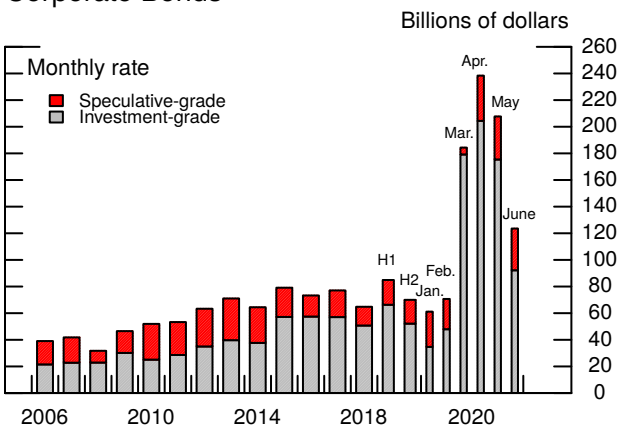
- Financing conditions for state and local governments improved in June. Municipal bond issuance was robust for higher-rated municipalities and picked up a bit for lower-rated and unrated ones.

- Residential mortgage refinancing activity remained strong, and home-purchase mortgage activity recovered significantly. Yet conditions remained strained for borrowers who do not fit into standard conforming loan criteria and, hence, are likely to involve bank financing.

- Credit card and auto financing conditions at banks reportedly tightened further. Credit card balances continued to contract significantly through June, whereas auto loan balances held stable, reflecting potentially more accommodative conditions for auto loans at nonbank lenders.

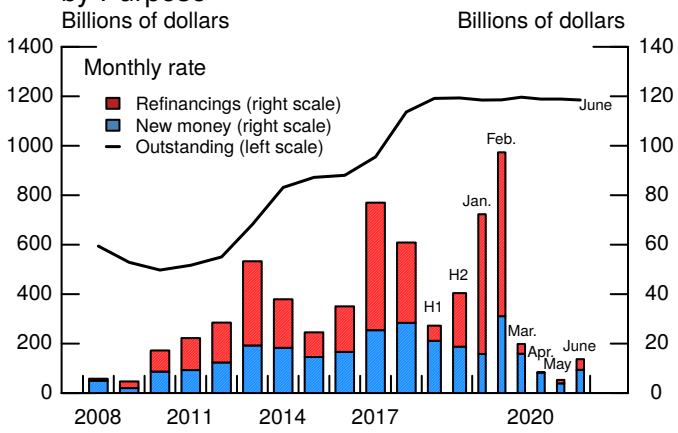
Business Finance

Gross Issuance of Nonfinancial Corporate Bonds



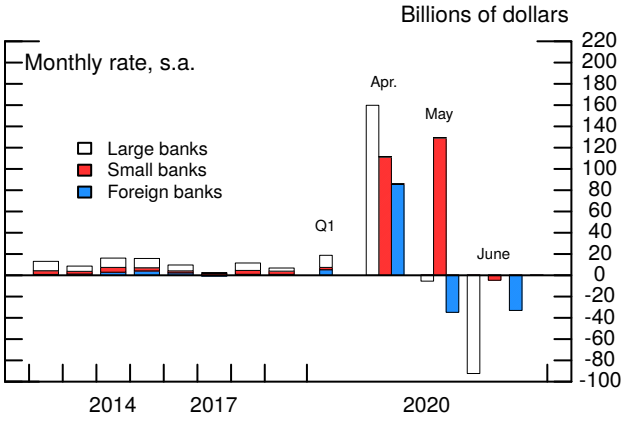
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.
Source: Mergent Fixed Income Securities Database.

Institutional Leveraged Loan Issuance, by Purpose



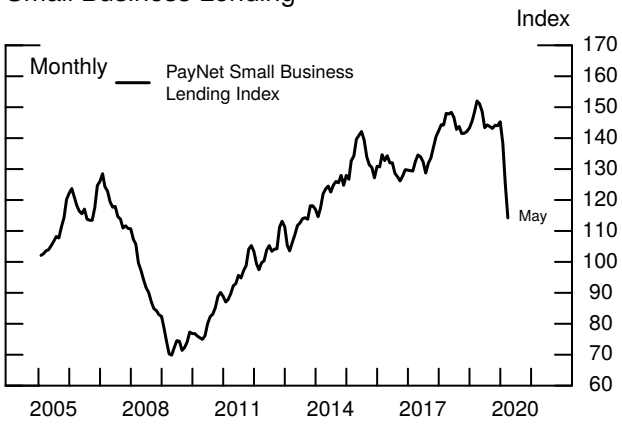
Source: Thomson Reuters LPC LoanConnector.

Commercial and Industrial Loans



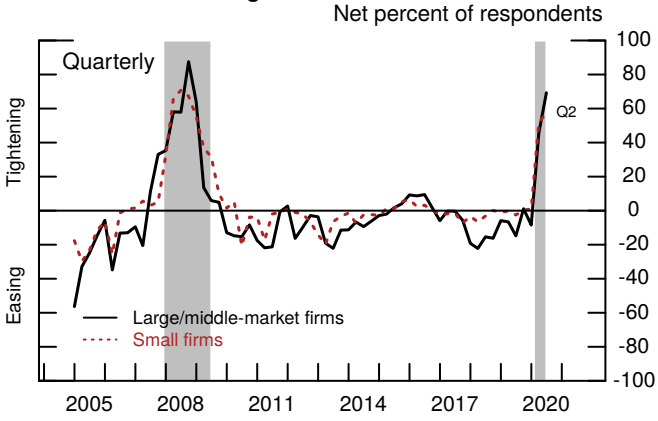
Source: Federal Reserve Board (FRB) staff calculations; FRB, Form FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks.

Small Business Lending



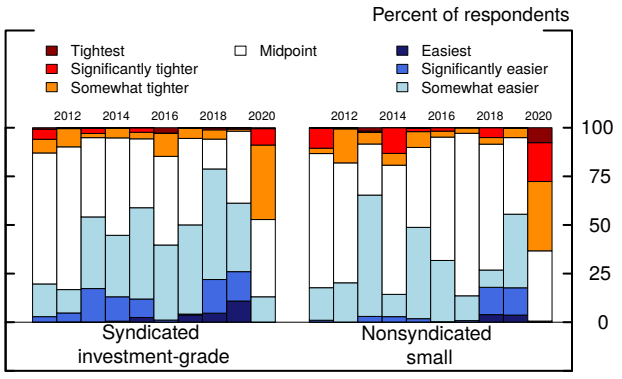
Note: Small business lending index is a 3-month rolling average.
Source: PayNet.

C&I Loans: Changes in Standards



Note: Responses are weighted by survey respondents' holdings of relevant loan types as reported on the 2020:Q1 Call Reports where relevant. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

C&I Loans: Level of Standards at Domestic Banks



Note: Banks were asked to describe their current level of standards in relation to the midpoint of the range of standards at their bank between 2005 and the present. Responses are weighted by survey respondents' holdings of relevant loan types as reported on the Q1 Call Reports from 2011 to 2020 where relevant.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Financing Conditions

BUSINESS FINANCING CONDITIONS

Nonfinancial Business

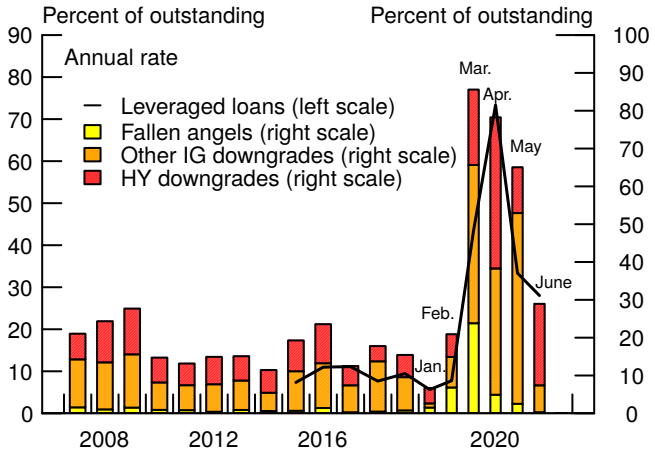
Financing conditions for nonfinancial firms intermediated through capital markets eased somewhat further over the intermeeting period, with yields on both long-term investment-grade and speculative-grade bonds remaining near historical lows. Investment-grade corporate bond issuance was solid in June and speculative-grade issuance remained robust, supported by the Federal Reserve's June 15 announcement that it would be purchasing individual corporate bonds through the SMCCF to create an index-tracking portfolio. Gross institutional leveraged loan issuance picked up in June from its subdued levels in April and May.

Banks' lending standards on C&I loans to firms of all sizes tightened further in the second quarter and are at the tighter end of the range since 2005, according to the July SLOOS; a year ago, banks reported that their C&I lending standards were at the easier end of their historical range. Banks cited an unfavorable economic and sector-specific outlook, reduced risk tolerance, and less liquidity in the secondary market for those loans as reasons for tightening. C&I loans on banks' balance sheets contracted significantly in June, reflecting paydowns and low originations. The contraction in C&I lending in June followed record surges in March, April, and May, which reflected credit-line drawdowns and borrowing under the Paycheck Protection Program (PPP). Meanwhile, the Main Street Lending Program (MSLP), which aims to support lending to small and medium-sized businesses, recently became fully operational (see the box "The Main Street Lending Program").

Credit quality of nonfinancial corporations deteriorated further over the intermeeting period, particularly for speculative-grade firms. Downgrades for speculative-grade debt increased notably in June, while those for investment-grade debt decreased substantially. The six-month trailing corporate bond default rate picked up further in May and June. Defaults in May reached their highest single-month volume since 2009, and June defaults were high as well. Market indicators of future default expectations also deteriorated somewhat: The KMV expected year-ahead default rate increased moderately, as did spreads on the CDX speculative-grade index. The earnings outlook remains bleak, with analysts projecting earnings to be down substantially this year relative to last year. Earnings are forecast to have declined substantially in the second quarter but are projected to pick up in the second half of this year.

Credit Quality

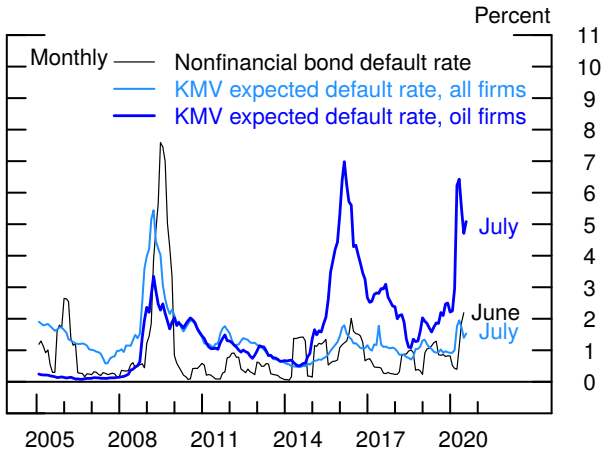
Downgrades of Nonfinancial Corporate Bonds and Leveraged Loans



Note: Computed as a percent of nonfinancial bonds outstanding and reported at an annual rate. Fallen angels are bonds downgraded from investment grade to speculative grade. IG is investment grade; HY is high yield.

Source: For corporate bonds, Federal Reserve Board staff calculations using composite ratings from Mergent Fixed Income Securities Database; for leveraged loans, S&P Leveraged Commentary & Data.

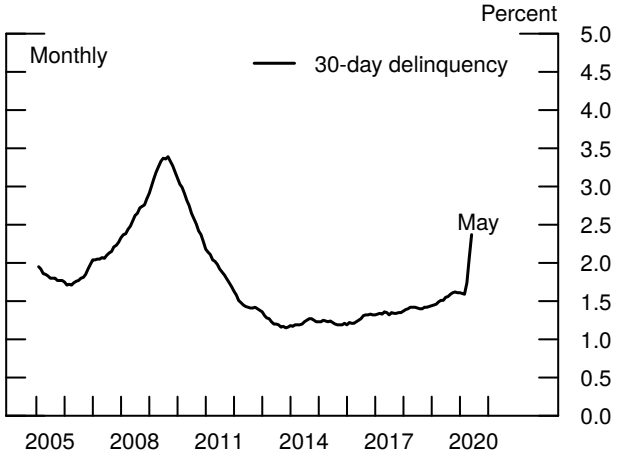
Realized and Expected Nonfinancial Bond Default Rates



Note: For realized default rate, 6-month trailing defaults divided by beginning-of-period outstanding, at an annual rate. For expected default rate, firm-level estimates of default weighted by firm liabilities as a percent of total liabilities, excluding defaulted firms.

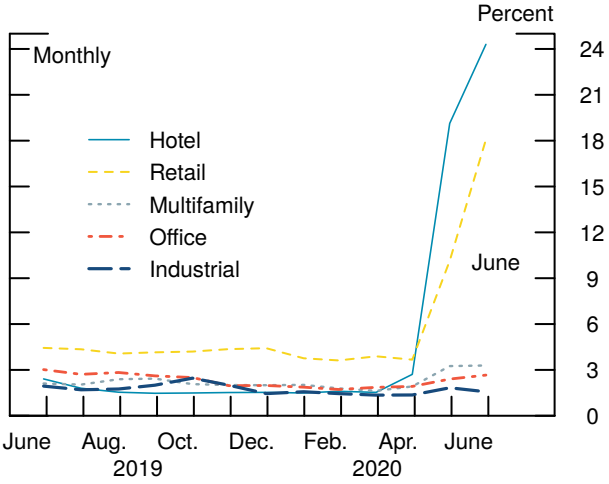
Source: For realized default rate, Moody's Investors Service; for expected default rate, calculated using firm-level data from Moody's KMV.

Small Business Delinquency



Source: PayNet.

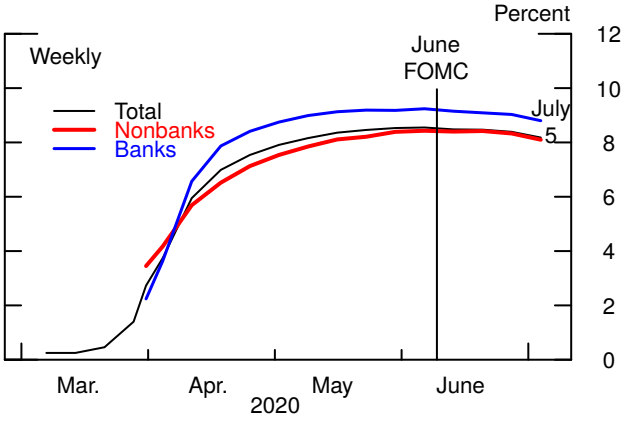
Delinquency on Mortgages in CMBS



Note: The first observation is June 2019. Delinquency rate includes 30-plus days delinquent. CMBS is commercial mortgage-backed securities.

Source: Trepp.

Percent of Mortgages in Forbearance



Source: Mortgage Bankers Association.

Financing Conditions

Gross equity issuance hit a record level in June, as the volume of seasoned equity offerings reached a new record—following May's previous record—and initial public offerings rebounded from very low levels in the previous three months.

Small Businesses

Financing conditions for small businesses, where the majority of financing is through banks, remained tight. Lending activity remained depressed, with the PayNet Small Business Lending Index (SBLI) showing that small business loan originations in May were about two-thirds of their level in May 2019. In the July SLOOS, banks reported that the level of standards for small businesses is at the tighter end of the range since 2005. At the same time, the credit needs of small businesses are high and likely to increase, as many businesses may shut down operations again in response to rising COVID-19 cases.

Small business loan performance has deteriorated significantly. In particular, payment delinquencies have risen noticeably in recent months, with PayNet's measure of short-term delinquencies rising by 50 percent between February and May. The current level is comparable to the level in January 2008.

Commercial Real Estate

Financing conditions for CRE, particularly those through capital markets, recovered further over the intermeeting period. Spreads on triple-A and triple-B non-agency CMBS continued to decline in June, perhaps supported in part by TALF becoming operational. The triple-A spread is close to its pre-pandemic level, but the triple-B spread remains elevated. Issuance of non-agency CMBS continued to show signs of moderate recovery in May and June. Spreads on agency CMBS that are eligible for Fed purchase remain at pre-pandemic levels, and agency CMBS issuance has been strong. In contrast, bank lending standards for CRE loans tightened further, according to the July SLOOS, and CRE loan growth at banks slowed in June and July.

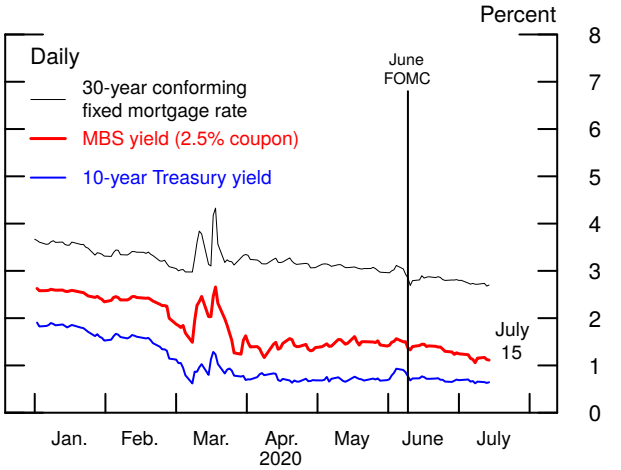
Available data indicate that credit quality of CRE loans continued to deteriorate. Delinquency rates rose in May and June, especially in the lodging and retail sectors.

State and Local Government Financing Conditions

Municipal market financing conditions through capital markets improved a bit more over the intermeeting period. Issuance of state and local government debt was

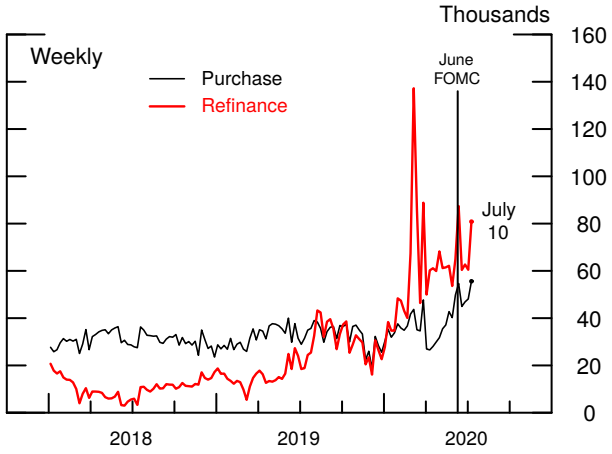
Household Finance

Mortgage Rate and MBS Yield



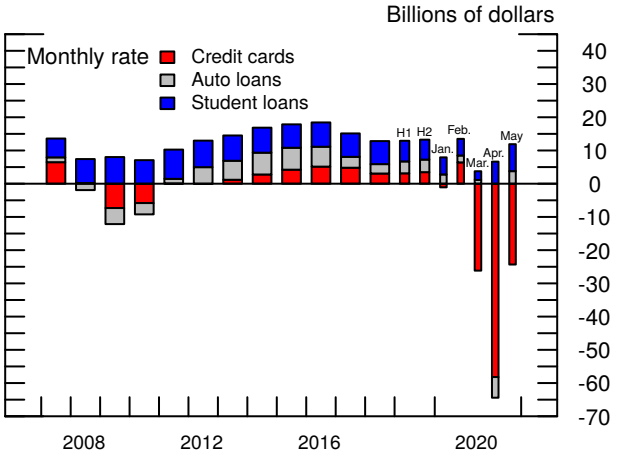
Source: For mortgage rate, Optimal Blue; for mortgage-backed securities (MBS) yield, Barclays.

Number of Rate Locks



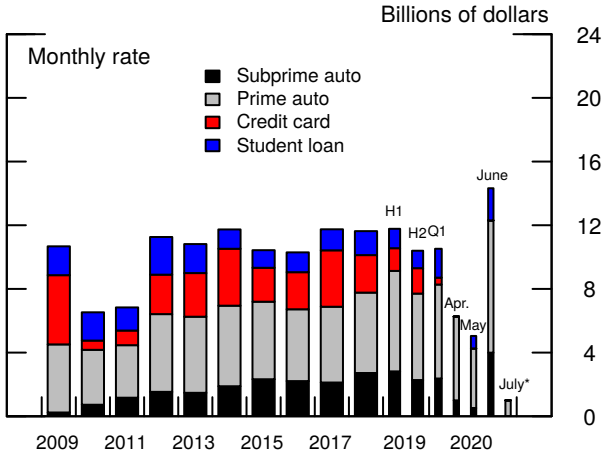
Note: Seasonally adjusted by Board staff.
Source: Optimal Blue.

Consumer Credit Flows



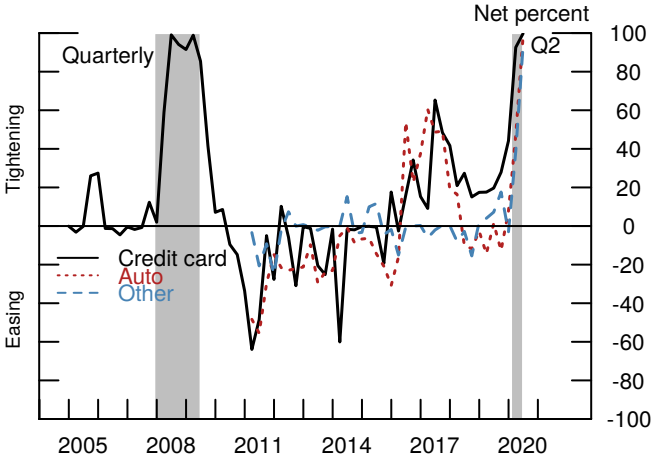
Note: The data are seasonally adjusted by Federal Reserve Board staff.
Source: Federal Reserve Board.

Gross Consumer ABS Issuance



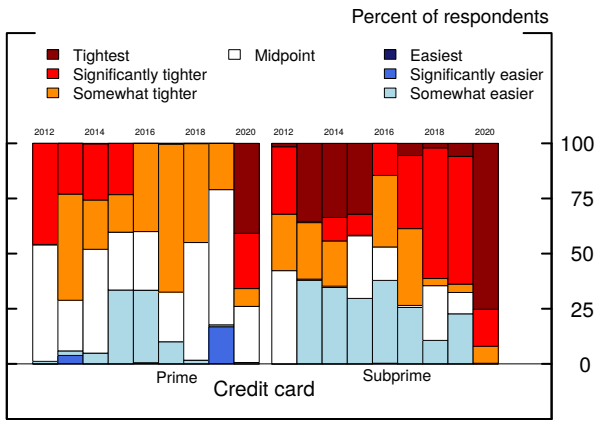
Note: Before 2013, the black bar represents subprime auto issuance, and in 2013 and thereafter, it represents nonprime auto issuance. ABS is asset-backed security.
* Month to date.
Source: For data before 2013, Merrill Lynch and Bloomberg; for data from 2013 to present, JPMorgan Chase.

Consumer Loans: Changes in Standards



Note: Responses are weighted by survey respondents' holdings of relevant loan types as reported on the 2020:Q1 Call Reports where relevant. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.
Source:Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Consumer Loans: Level of Standards



Note: Banks were asked to describe their current level of standards in relation to the midpoint of the range of standards at their bank between 2005 and the present. Responses are weighted by survey respondents' holdings of relevant loan types as reported on the Q1 Call Reports from 2011 to 2020 where relevant.
Source: Source:Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

robust for higher-rated municipalities (triple-A and double-A) amid further declines in yields, which are near record lows. Issuance of speculative-grade and unrated municipal bonds picked up in June but remained very low by historical standards.

The credit quality of municipal debt continued to show signs of weakness since the June FOMC meeting. Although the volume of credit rating upgrades outpaced downgrades in June, market commentary continued to emphasize a projected deterioration of credit quality for states and municipalities over the remainder of the year, particularly for those already at the lower end of the credit quality spectrum.

HOUSEHOLD FINANCING CONDITIONS

Residential Real Estate

Financing conditions in the residential mortgage market were generally unchanged over the intermeeting period. Mortgage rates declined somewhat to near historical lows. Nonetheless, the spread between the primary mortgage rate and the MBS yield remained wide, reflecting capacity constraints at loan originators, increases in origination costs, and decreases in the value of servicing rights.

Credit continues to flow to higher-credit-score borrowers who meet standard conforming loan criteria. Low mortgage rates have supported elevated refinancing activity through June. Additionally, home-purchase activity has recovered significantly since April. Credit remained tight, however, for mortgages to potential borrowers with lower credit scores and for nonstandard mortgage products such as jumbo loans. These mortgages are less likely to be securitized and guaranteed by government agencies and, hence, are likely to involve bank financing. Evidence from the SLOOS and the Fannie Mae Mortgage Lender Sentiment Survey suggests that both bank and nonbank lenders tightened standards in the second quarter. For banks, the July SLOOS indicates that the current level of lending standards is at the tighter end of the range since 2005.

The credit quality of mortgages did not appear to deteriorate further. The fraction of mortgages in forbearance has flattened out, and many borrowers in forbearance have made their payments. Moreover, the fraction of mortgages transitioning from current to delinquent declined in May, although it remained at an elevated level.

Consumer Credit

Conditions in consumer credit markets tightened a bit further in recent months, particularly for the credit card market, which primarily involves bank financing. Credit card lenders reportedly continued to cut credit limits on existing accounts and to close some in May. The July SLOOS indicated a further tightening of credit card lending standards. Credit card lenders also sharply reduced solicitation mail volume and slashed their offerings of balance transfers and of introductory interest rates on purchases. Meanwhile, credit card balances contracted further through June.

In contrast, conditions in the auto loan market, where financing is intermediated by banks and nonbanks, appeared to be little changed, on balance, with those for subprime borrowers remaining tight. The July SLOOS indicated that auto lending standards at banks tightened further. However, interest rates, which are near historical lows, are increasingly cited as a favorable factor for vehicle purchases by the respondents of the University of Michigan Surveys of Consumers. In addition, auto loan balances edged up a bit in May, driven by loan originations at finance companies affiliated with auto manufacturers, and are expected to have grown moderately in June.

Conditions in the consumer ABS markets were stable during the intermeeting period. ABS yield spreads remained largely flat, amid TALF becoming operational in mid-June, and spreads of certain triple-A-rated credit card and auto loan ABS have stabilized at pre-pandemic levels. Student and auto loan ABS issuance recovered to pre-pandemic levels in June. Consumer credit quality remained stable, partly due to forbearance programs.

Financing and Financial Conditions Indexes

A staff index that provides a measure of financing conditions for nonfinancial corporations fully recovered from the level reached in mid-March. Nearly all of the indexes the staff track, including several publicly available financial conditions indexes that are largely based on market prices, indicate slightly less accommodative financial conditions currently than were evident before the onset of the COVID-19 outbreak in the United States. The exception is the SLOOS Bank Lending Standards index from the July survey, showing that standards tightened considerably across all loan categories over the second quarter. It now stands at the levels last seen in the acute phase of the Global Financial Crisis.

(This page is intentionally blank.)

The Main Street Lending Program

Financing conditions for small and midsized businesses have been severely disrupted by the COVID-19 crisis. As revenue streams for many firms came to an abrupt halt in March, demand for loans soared to meet funding needs and to shore up liquidity for precautionary motives. However, many lenders limited the supply of loans amid a highly uncertain economic outlook. Banks' responses in the April and July Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS) show substantial tightening in lending standards for commercial and industrial (C&I) loans to firms of all sizes, including small and midsized firms.

To support lending to small and midsized businesses, the Federal Reserve and the U.S. Treasury established the Main Street Lending Program (MSLP), which began accepting submissions of loans on July 6.[1] The MSLP includes three facilities for U.S. business borrowers with at most 15,000 employees in the 12 months before the origination of a Main Street loan or at most $5 billion in revenues in 2019: the Main Street New Loan Facility (MSNLF), the Main Street Priority Loan Facility (MSPLF), and the Main Street Expanded Loan Facility (MSELF).[2] Through a special purpose vehicle (SPV), these facilities purchase 95 percent participations in loans to U.S. businesses from the lenders, which retain the remaining 5 percent.[3] The eligible loans at all three facilities must have an adjustable interest rate of LIBOR plus 300 basis points, a five-year maturity, deferral periods for principal and interest payments, and an allowance for early repayments without penalty. The three MSLP facilities differ with respect to the size of eligible loans, limits on borrowers' leverage, and conditions for security and priority relative to a borrower's other debt. The MSNLF and MSPLF purchase participations in smaller new loans, which can range from a minimum of $250,000 to a maximum of $35 million for the MSNLF and to a maximum of $50 million for the MSPLF. The MSELF purchases participations in the incremental portions of preexisting loans that the lender and borrower agree to expand, with the incremental portions ranging from $10 million to $300 million.

The MSLP aims to facilitate the extension of new credit to small and midsized firms that were financially sound before the COVID-19 outbreak but took a hit during the crisis, thus helping them maintain operations and payroll until conditions normalize. Key program design features aim to achieve these goals. First, the MSLP targets firms that are often too large to qualify for Paycheck Protection Program (PPP) loans but are not large enough to issue bonds or syndicated loans and thus do not benefit from the Primary Market Corporate

[1] Details are available at https://www.federalreserve.gov/monetarypolicy/mainstreetlending.htm.

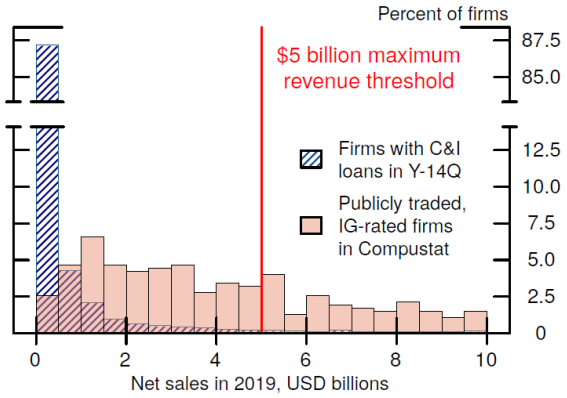
[2] In addition, efforts to include nonprofit organizations as eligible borrowers in the MSLP are under way.

[3] The SPV will purchase up to $600 billion in participations, backed with $75 billion in equity from the U.S. Treasury.

Credit Facility (PMCCF). At the same time, the MSLP is designed to ensure overlap in eligibility across the PPP and corporate credit facilities, thus avoiding sizable gaps in government support for credit access. For example, the $5 billion cap on borrowers' revenue allows MSLP eligibility for up to the 95th percentile of the size distribution of U.S. nonfinancial firms with outstanding C&I loans at the largest banks (see the vertical line labeled "$5 billion maximum revenue threshold" and the blue-striped bars in figure 1). Moreover, the larger borrowers with revenues close to the threshold for MSLP eligibility may have access to capital markets, as shown by the substantial fraction of publicly traded companies with investment-grade ratings and 2019 revenues resting just below $5 billion (the orange bars in figure 1).[4]

Second, the MSLP encourages the extension of new credit to affected firms by removing most of the lenders' exposure to credit risk associated with program loans. The combination of limited exposure with origination and servicing fees paid to the lender increases a lender's return for a given level of risk and thereby enhances the lender's incentives to extend credit to borrowers, including to firms that otherwise would not provide a sufficient return. The lenders' retention rate of 5 percent also opens up capacity on their balance sheets. At the same time, the program aims to limit the potential losses to the SPV through requirements on borrowers' leverage and financial creditworthiness and the seniority status of

Figure 1: Distributions by Revenue Size of Potential MSLP Borrowers, End-2019



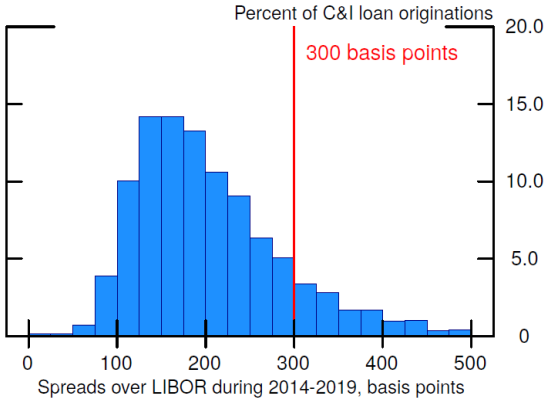
Note: The blue-striped bars show the size distribution of firms with C&I loans in 2019:Q4 in the Y-14Q data set, and the orange bars show the distribution of publicly traded firms with investment-grade (IG) credit ratings from S&P in fiscal year 2019 in the Compustat data set.
Source: Y-14Q schedule H.1, Compustat; staff calculations.

[4] The Board's staff estimates the potential credit demand to offset the cash shortfall due to COVID-19 disruptions at midsized firms to be around $400 billion through December 2020. However, MSLP take-up is highly uncertain and depends on the program's eligibility criteria as well as firms' heterogeneous responses to the crisis. See Ryan Decker, Robert Kurtzman, Byron Lutz, and Chris Nekarda (2020), "Coverage Gaps of Direct Lending Programs," memorandum, Board of Governors of the Federal Reserve System, Division of Research and Statistics, June 11.

eligible loans. For example, loan amounts within each Main Street facility are limited to levels that would bring a borrower's debt-to-EBITDA ratio up to either 4 (in the MSNLF) or 6 (in the MSPLF and MSELF).[5] In addition, loans purchased by the MSPLF or MSELF cannot be subordinated in terms of collateral coverage and priority to a borrower's other debt (excluding mortgage debt). Finally, as lenders retain nontrivial participation shares in MSLP loans, they are expected to exercise due diligence in screening borrowers.

Third, the MSLP aims to direct new credit specifically at firms otherwise unable to obtain credit rather than providing loans to firms that could access bank loans even without the program. For example, the interest rate for MSLP loans is set at a premium relative to normal market conditions while still providing liquidity to affected businesses, as mandated by section 13(3) of the Federal Reserve Act. Indeed, the spread of 300 basis points above LIBOR corresponds to the 85th percentile of the historical distribution of spreads for C&I loan originations during 2014–19 in the Y-14Q data set that comply with MSLP criteria (see figure 2). In addition, the existence of a premium over historical market rates should encourage borrowers to repay loans early once market conditions normalize. Because the MSLP is structured to provide credit on terms that are supportive but less generous than normal market conditions, loan originations under the program will likely be higher if economic conditions fail to improve as expected—thereby providing an important backstop function should the recovery be cut short. Return to Financing Conditions text

Figure 2: Distribution of Historical Spreads on LIBOR-Based C&I Loans during 2014-2019



Note: The figure covers spreads on new originations of C&I loans during 2014–19 in the Y-14Q data set that satisfy the MSLP criteria for eligible loan size and maturity as well as those for borrower revenue size, leverage, and rating.
Source: Y-14Q schedule H.1; staff calculations.

[5] MSLP borrowers must have had an internal risk rating equivalent to a "pass" in the FFIEC system before the crisis.

Appendix

Technical Note on Financial Conditions Indexes

The table "Overview of Selected FCIs" provides a summary of various financial conditions indexes (FCIs) that have been developed at the Federal Reserve Board and elsewhere. The historical evolution of these indexes is reported in the exhibit "Selected Financial Conditions Indexes."

Overview of Selected FCIs

Index	Frequency	Sample start	Methodology	Components
Staff FCI for nonfinancial corporations	Daily	1973	Difference in equity returns between two portfolios of firms with credit ratings above and just below investment grade	Nonfinancial firms' stock returns and credit ratings; five Fama-French factors, plus momentum and quality minus junk factors
SLOOS Bank Lending Standards Index	Quarterly	1991	Weighted average of the net percentage of domestic banks tightening standards for 11 loan categories, with weights given by the size of each loan category on banks' balance sheets	Lending standards for 11 loan categories
Goldman Sachs Financial Conditions Index	Daily	1990	Weighted average of financial variables with weights pinned down by the contribution of each financial variable on real GDP growth over the following year using a VAR model	5 financial variables: the federal funds rate, the 10-year Treasury yield, the triple-B yield spreads to Treasury, the S&P price-to-earnings ratio, and the broad value of the U.S. dollar
Chicago Fed National Financial Conditions Index	Weekly	1971	Dynamic factor model	100 financial variables related to money markets (28 indicators), debt and equity markets (27 indicators), and the banking system (45 indicators)
St. Louis Fed Financial Stress Index	Weekly	1993	Principal component analysis	18 variables, including short- and long-term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index
Kansas City Fed Financial Stress Index	Monthly	1990	Principal component analysis	11 financial variables, including short- and long-term interest rates, corporate and consumer yield spreads, the VIX, and the volatility of bank stock prices

Source: CRSP; Yahoo Finance; Moody's Bond Ratings; Ken French website; AQR Capital Management website; Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices; Bloomberg; Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

The first index in the table, the staff FCI for nonfinancial corporations, measures financing conditions for nonfinancial corporations.[1] This index is constructed as the difference in equity returns between two portfolios of firms with credit ratings above and just below investment grade. To the extent that speculative-grade firms are more sensitive to changes in financing conditions than investment-grade firms but have similar exposure to other shocks, movements in this index provide a measure of changes in financing conditions for nonfinancial corporations.

The second index in the table measures the net share of domestic banks reporting tighter lending standards across all core loan categories in the Senior Loan Officer Opinion Survey on Bank Lending Practices. Banks' responses for a given loan category are weighted by banks' holdings of those loans on their balance sheets.[2]

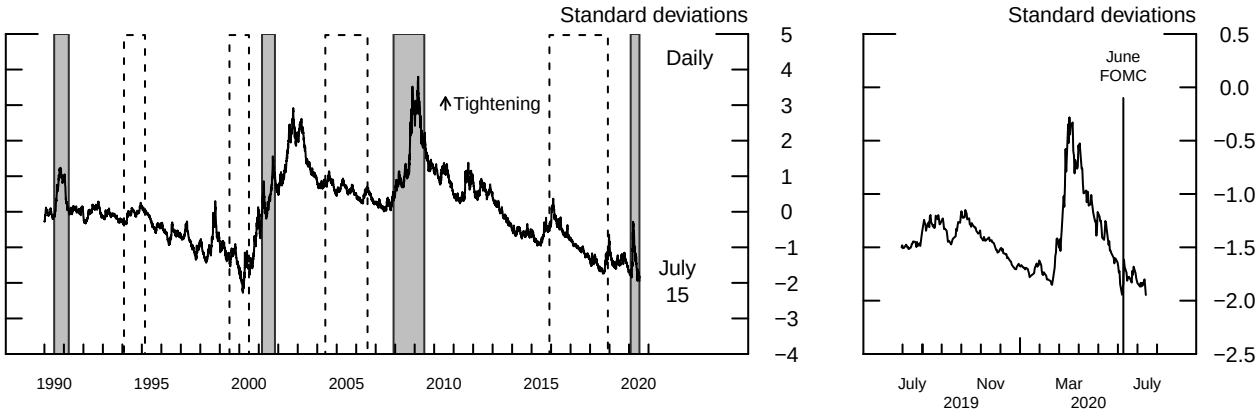
The other FCIs are constructed by aggregating a large set of financial variables into a summary series using various statistical methods. While these indexes provide a useful summary of broad financial market developments, the movements in these indexes may reflect both changes in financing conditions and other shocks to the economy.

[1] This index was first discussed in the box "Financial Conditions Indexes" in the Financing Conditions for Businesses and Households section of the September 2018 Tealbook A.

[2] This index is an updated version of the index developed in William F. Bassett, Mary Beth Chosak, John C. Driscoll, and Egon Zakrajsek (2014), "Changes in Bank Lending Standards and the Macroeconomy," *Journal of Monetary Economics,* vol. 62 (March), pp. 23–40. The current index uses a new weighting approach for each loan category.

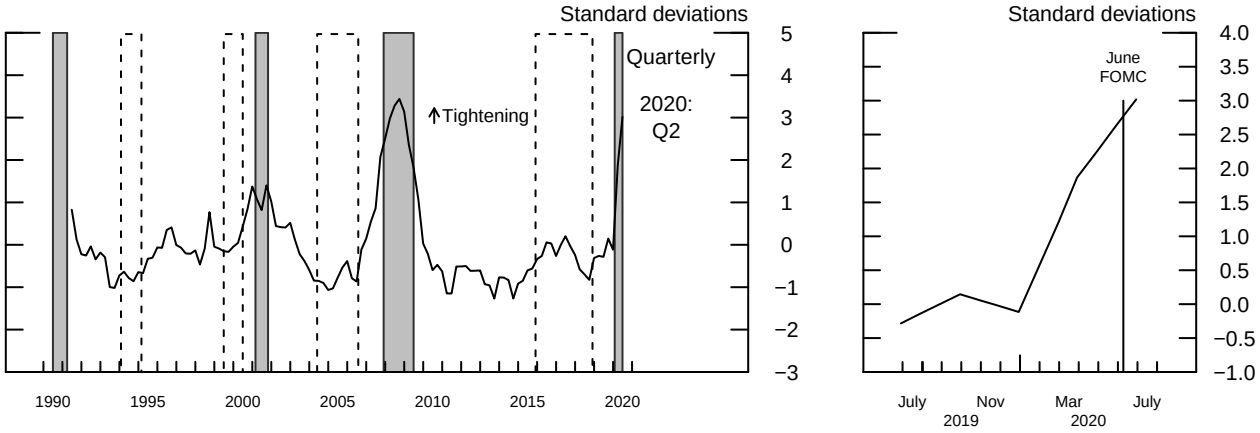
Selected Financial Conditions Indexes

Staff FCI for Nonfinancial Corporations



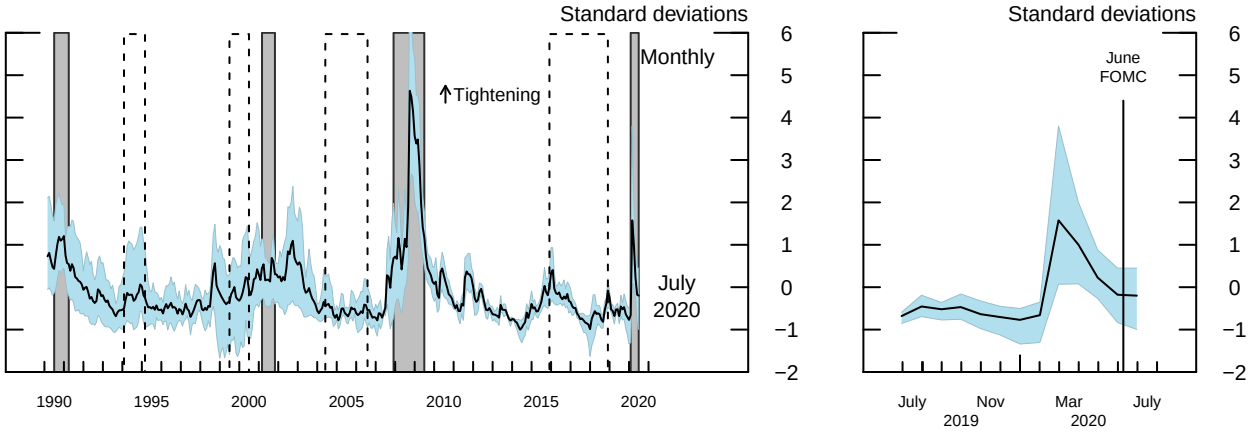
Note: The financial conditions index (FCI) is the deviation from the long−run relation between the systematic components of the cumulative log returns of 2 portfolios of firms with credit ratings above and just below investment grade. The systematic components are derived from the 5−factor Fama−French asset pricing model, augmented with the momentum and quality minus junk factors.
Source: CRSP; Yahoo Finance; Moody's Bond Ratings; Ken French website; AQR Capital Management website.

SLOOS Bank Lending Standards Index



Note: The index is a weighted average of the net percentage of domestic banks tightening standards for 11 loan categories, with weights given by the size of each loan category on banks' balance sheets.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Mean and Range of External FCIs

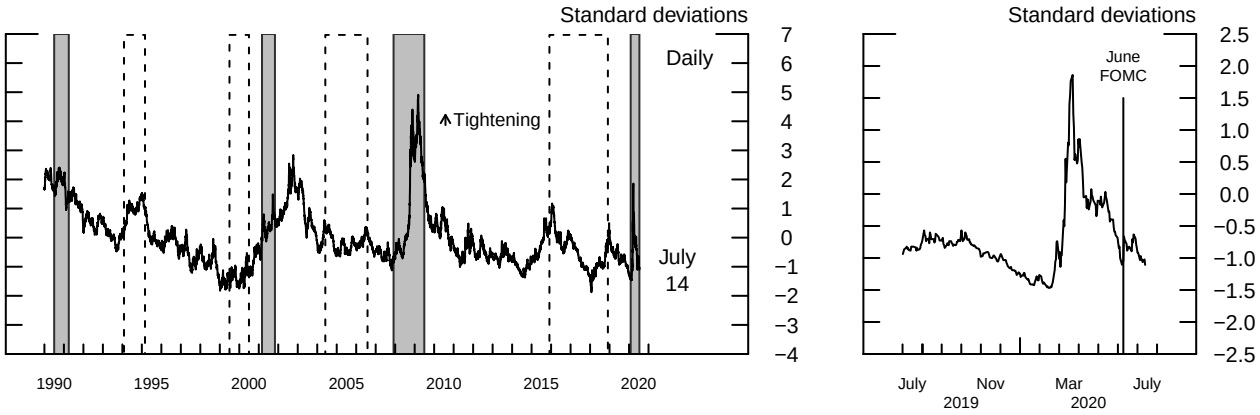


Note: Mean FCI represents the mean of FCIs developed by Goldman Sachs and the Federal Reserve Banks of Chicago, St. Louis, and Kansas City. The blue shaded region represents the range of these 4 standardized FCIs.
Source: Bloomberg; Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.

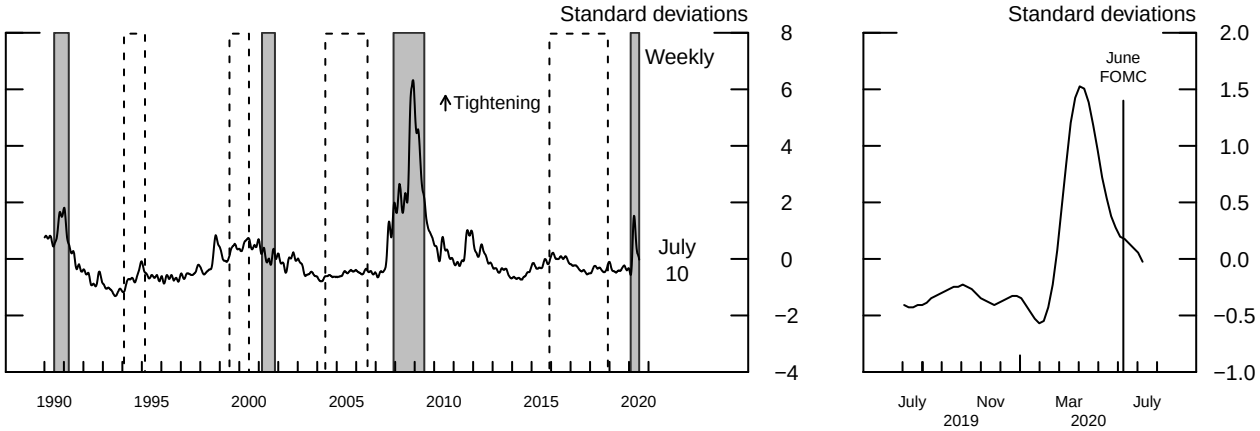
Selected Financial Conditions Indexes (continued)

Goldman Sachs FCI



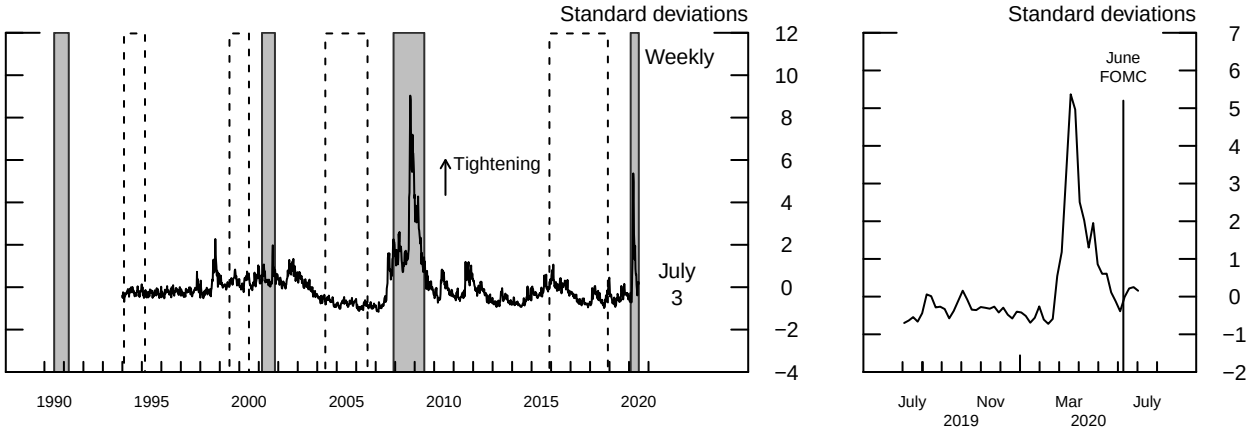
Note: The index is a weighted average of 5 financial variables: the federal funds rate, the 10−year Treasury yield, the triple−B yield spreads to Treasury, the S&P price−to−earnings ratio, and the broad value of the U.S. dollar. Weights are pinned down by the contribution of each financial variable on real gross domestic product growth over the following year using a vector autoregression model.
Source: Bloomberg.

Chicago Fed NFCI



Note: The index is based on 100 financial variables related to money markets (28 indicators), debt and equity markets (27 indicators), and the banking system (45 indicators). The index is weekly and is derived using a dynamic factor model.
Source: Federal Reserve Bank of Chicago.

St. Louis Fed Financial Stress Index

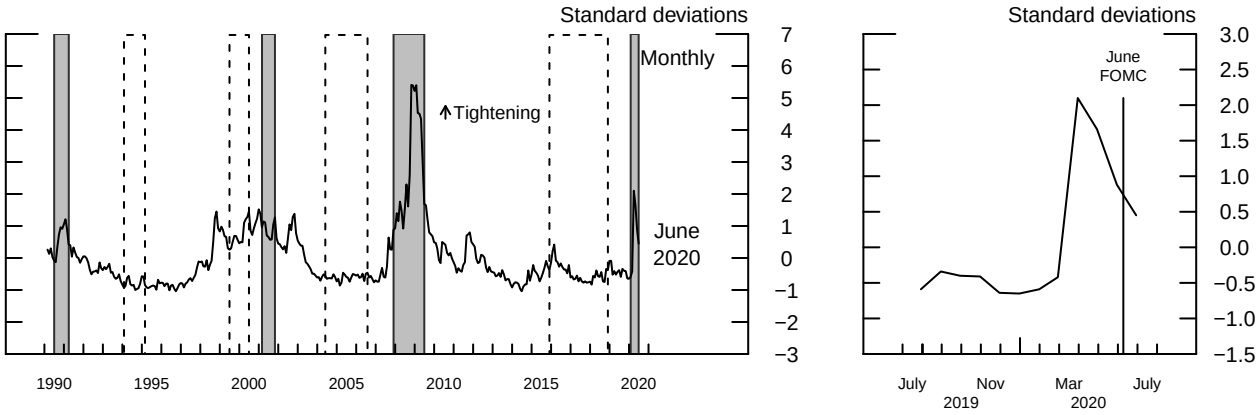


Note: The index is the principal component of 18 variables, including short− and long−term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index.
Source: Federal Reserve Bank of St. Louis.

For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.

Selected Financial Conditions Indexes (continued)

Kansas City Fed Financial Stress Index



Note: The index is the principal component of 11 financial variables, including short− and long−term interest rates, corporate and consumer yield spreads, the VIX, and the volatility of bank stock prices.
Source: Federal Reserve Bank of Kansas City.

For all panels: Indexes are standardized. Values above (below) zero represent tighter (easier) than average financial conditions. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. The dashed boxes denote monetary policy tightening cycles.

(This page is intentionally blank.)

Risks and Uncertainty

Assessment of Risks

The incoming data have done little to reduce the uncertainty about the future course of the disease and its consequences for the economy. The data for the second quarter suggest that the economic costs associated with the pandemic and the measures undertaken to contain it have been lower than we had estimated. At the same time, the spread of the disease has taken a turn for the worse; moreover, public policy approaches to containment have varied, and we have little information upon which to judge the consequences of these various strategies—both for the spread of the disease and for the economy. Consequently, the staff judges the uncertainty around the economic projection to remain very high.

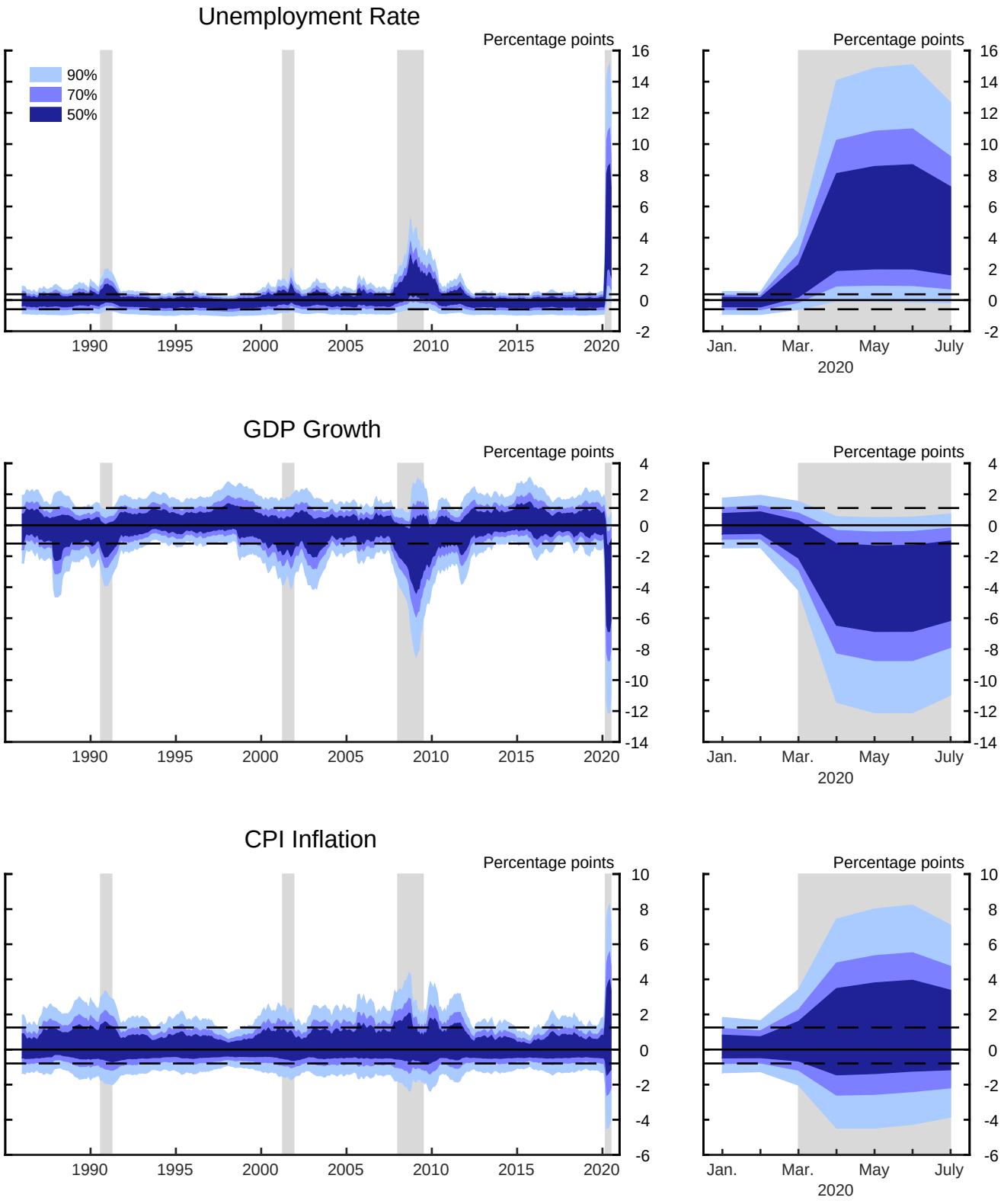
The diverse developments since the previous Tealbook highlight the possibility of upside and downside risks relative to our baseline projection, both domestically and abroad. On the positive side, a number of countries have managed to reopen their economies while also containing the spread of the virus at low rates, and the economic damage caused by the virus and social-distancing measures in the second quarter proved to be less severe than we had assumed. However, the sharp increase in new cases in the United States in the past few weeks suggests that similarly good containment of the virus domestically is unlikely in the near term and that the economic normalization will probably be slower going forward—and may even reverse if severe social-distancing measures become broadly necessary in the United States.

The main upside and downside risks to the projection are correspondingly linked to uncertainty about the pandemic and the public and private response to it. On the upside, it is possible that relatively targeted forms of social distancing and isolation prove more effective than we assume. In addition, new and recently introduced therapeutic treatments may lower the incidence of the virus's most severe effects, while a vaccine may become available sooner than we have assumed. It is also possible that, even under our baseline assumptions about the extent of social distancing, the resulting economic damage will not be as severe as forecast.

Overall, however, the probability of highly adverse events appears to be much larger than the probability of more favorable outcomes, and we view the risks around the baseline forecast as skewed to the downside. As noted earlier, an outcome that the staff judges equally as

Risks & Uncertainty

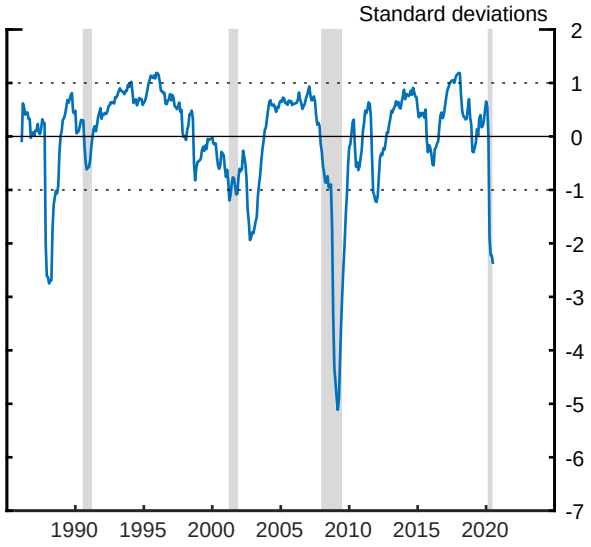
Conditional Distributions of Staff Forecast Errors 1 Year Ahead



Note: The exhibit shows estimates of quantiles of the distribution of errors for 4-quarter-ahead staff forecasts. The estimates are conditioned on indicators of real activity, inflation, financial market conditions, and the volatility of high-frequency macroeconomic indicators. Dashed lines denote the median 15th and 85th percentiles. Gray shaded bars indicate recession periods as defined by the National Bureau of Economic Research.

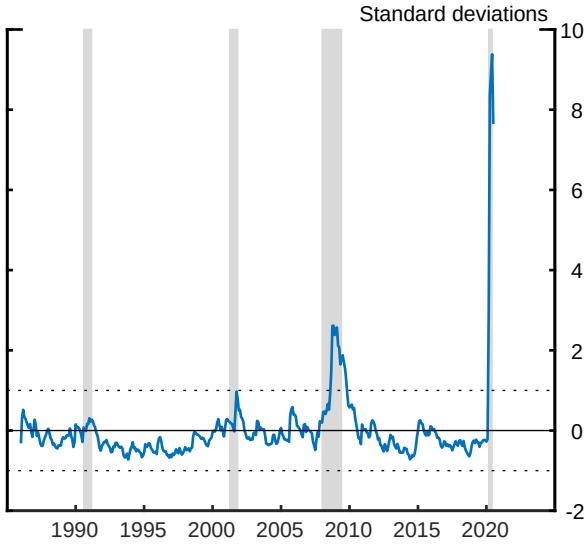
Macroeconomic Indexes Underlying the Conditional Distributions of Staff Forecast Errors 1 Year Ahead

Financial Market Conditions



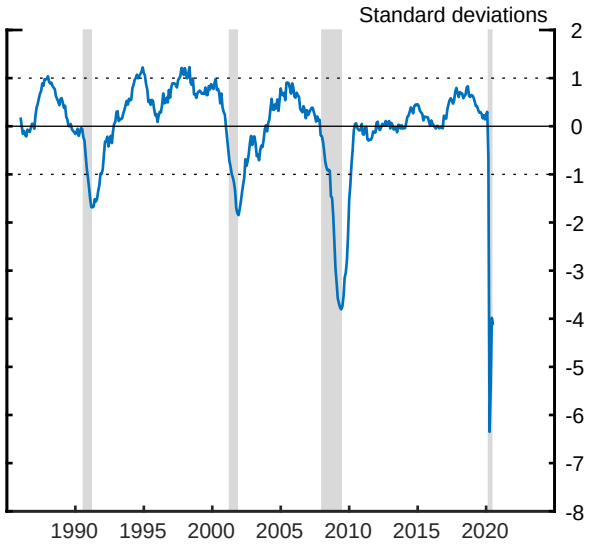
Source: Staff estimates.

Macroeconomic Uncertainty



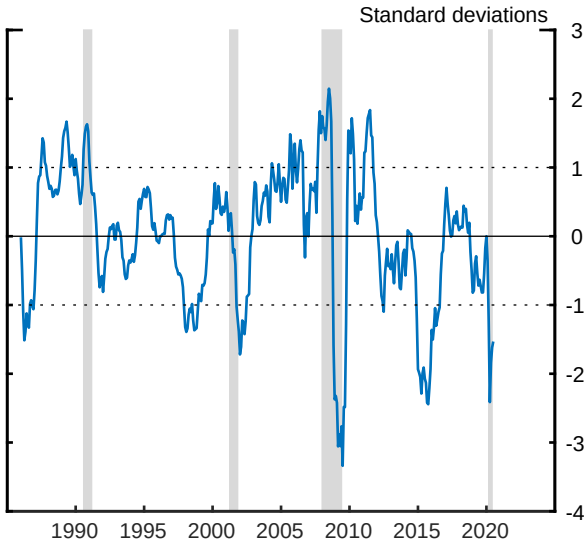
Source: Staff estimates.

Real Activity



Source: Staff estimates.

Inflation



Source: Staff estimates.

Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

plausible as the baseline is one in which a resurgent pandemic forces a return to severe and widespread mandatory restrictions on economic activity and a substantial increase in voluntary social distancing. The recent spike in cases in the United States, along with the moves toward greater mandatory restrictions in some states, could be an indication that such an outcome may be under way. Moreover, even the relatively successful reopenings experienced by some other countries may prove not to be robust.

In addition to the uncertainty surrounding the spread of COVID-19, there is also considerable uncertainty about how the economy will respond to the pandemic and to the measures that have been and will be undertaken to control it. Even assuming the outbreak is managed roughly as envisioned in the baseline, the degree to which protracted recessionary dynamics are triggered by a temporary—but acute—economic contraction is uncertain. For example, many businesses will have ceased to exist and the entry of new firms may be slow. While these dynamics exert a drag on activity in the baseline, the effects may be larger and more persistent than we have projected. Likewise, behavioral changes by consumers and businesses due to heightened uncertainty could weigh more heavily on economic growth throughout the medium term than assumed in the baseline. Moreover, a strained financial system could significantly limit firms' and households' access to credit. Such economic factors along with adverse developments regarding the course of the pandemic could contribute to a severely adverse outcome that would leave the economy in a prolonged slump.

The dominant source of current uncertainty—the COVID-19 pandemic—is without parallel in the data used to estimate our quantitative risk models. The validity of these models relies on an assumption that forecast uncertainty remains related to the data in a way that is similar to what has occurred in the past. With that important caveat in mind, we show our usual exhibit that provides some perspective on the distribution of forecast errors one year ahead, conditional on measures of real economic activity, inflation, financial market conditions, and an index of overall macroeconomic uncertainty.[1] Considering the unprecedented declines in spending, production, and employment, it is not surprising that the model views macroeconomic

[1] This exhibit is based on a framework similar in spirit to quantile regressions using past forecast errors as the dependent variable, and the variables that the estimates are conditioned on are shown in the exhibit "Macroeconomic Indexes Underlying the Conditional Distributions of Staff Forecast Errors 1 Year Ahead." Relative to the May Tealbook, we have further improved the model's ability to condition on high-frequency data. (We continue to not show our two-year-ahead risk exhibit in this Tealbook because the model mapped the exceptional configuration of available data into estimated distributions of outcomes that we do not find to be reliable in the current situation.)

uncertainty as much larger than even during the Great Recession and thus infers unusually wide distributions for staff forecast errors over the next year.[2] In addition, the conditional distribution for forecast errors one year ahead is skewed adversely for GDP growth and the unemployment rate.

Our view of the risks to the economic outlook is informed by the staff's quarterly quantitative surveillance (QS) assessment, which currently judges the overall vulnerabilities in the U.S. financial system as "notable." This assessment represents a deterioration from the "moderate" assessment in January, as the pandemic shock has increased financial-sector vulnerabilities. Business debt, which was already historically high before the pandemic outbreak, has risen sharply, while profits have dropped and credit quality has deteriorated. Although households entered the downturn in a strong position, wages and salaries have fallen significantly because of job losses. These declines in business profits and labor income will imply less-resilient borrowers. Vulnerabilities stemming from the leverage of financial intermediaries increased to moderate because of a decline in bank capital ratios in the first quarter. Funding risk vulnerability continues to be moderate. By contrast, asset valuation pressures have diminished to levels that the QS report judges as notable.

ALTERNATIVE SCENARIOS

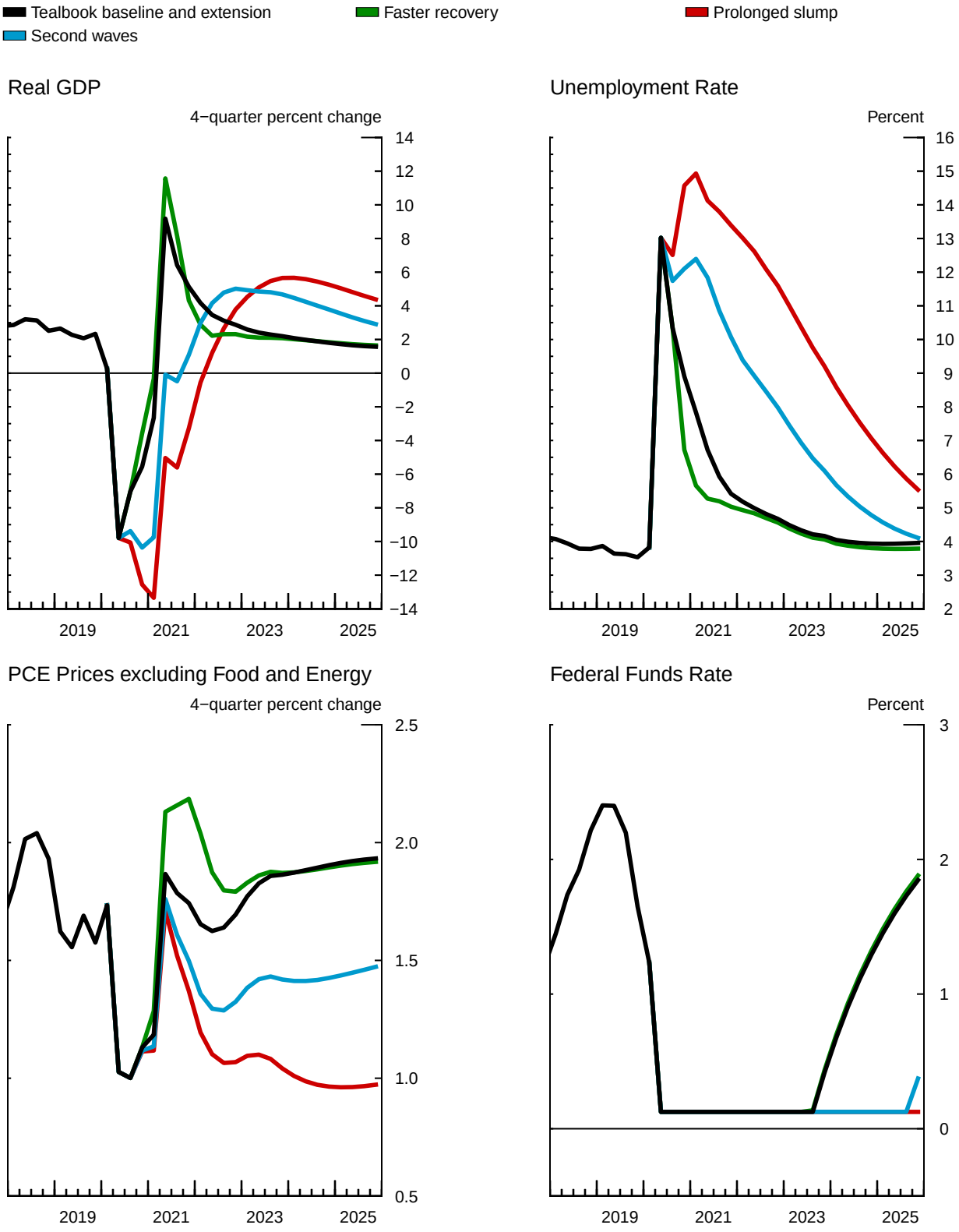
This section describes several alternative scenarios focusing on the uncertainty and risks surrounding the course of the COVID-19 pandemic and the associated macroeconomic disruptions both at home and abroad. These scenarios use simulations from the FRB/US and SIGMA models. In all scenarios, the federal funds rate follows a policy rule meant to be roughly consistent with the forward guidance provided in FOMC statements since March and rises from the effective lower bound (ELB) in the quarter after the unemployment rate falls below its assumed long-run natural rate of 4.3 percent.[3]

[2] Conditional time-varying variances from stochastic volatility models estimated on a large number of macroeconomic observables are inputs to the index of macroeconomic uncertainty, which, in turn, is responsible for the dramatic increase in the volatility of the adverse tail of the risk distribution shown in the exhibit. The conditional volatilities of indicators linked to economic activity have been the major drivers of the surge in macroeconomic uncertainty.

[3] In addition, all scenarios assume that the Federal Reserve's balance sheet policies and federal fiscal policies are the same as in the baseline. The Monetary Policy Strategies section of this Tealbook considers the effects of alternative interest rate policies in the first two of the following scenarios.

Risks & Uncertainty

Alternative Scenarios



Note: Events such as the COVID−19 pandemic are unprecedented in the data used to construct the confidence intervals usually shown in this exhibit. We judge that our usual methodology is not currently reliable, particularly for the near−term projections, and thus confidence intervals are not presented.

Alternative Scenarios

(Percent change, annual rate, from end of preceding period except as noted)

Measure and scenario	2020		2020	2021	2022	2023	2024-25
	H1	H2					
Real GDP							
Tealbook baseline and extension	-20.3	11.9	-5.6	5.1	2.9	2.2	1.7
Second waves	-20.3	.8	-10.4	1.1	5.0	4.7	3.3
Faster recovery	-20.3	16.7	-3.6	4.3	2.3	2.1	1.7
Prolonged slump	-20.3	-4.0	-12.6	-3.3	3.8	5.7	4.8
Unemployment rate[1]							
Tealbook baseline and extension	13.0	8.9	8.9	5.4	4.7	4.2	4.0
Second waves	13.0	12.1	12.1	10.1	8.0	6.1	4.1
Faster recovery	13.0	6.7	6.7	5.0	4.6	4.1	3.8
Prolonged slump	13.0	14.6	14.6	13.4	11.6	9.2	5.5
Total PCE prices							
Tealbook baseline and extension	-.2	2.2	1.0	1.7	1.7	1.9	1.9
Second waves	-.2	1.7	.7	1.0	1.5	1.6	1.6
Faster recovery	-.2	2.6	1.2	2.3	1.8	1.9	1.9
Prolonged slump	-.2	1.5	.7	.6	1.1	1.4	1.2
Core PCE prices							
Tealbook baseline and extension	.4	1.9	1.1	1.7	1.7	1.9	1.9
Second waves	.4	1.9	1.1	1.5	1.3	1.4	1.4
Faster recovery	.4	1.9	1.1	2.2	1.8	1.9	1.9
Prolonged slump	.4	1.9	1.1	1.4	1.1	1.0	1.0
Federal funds rate[1]							
Tealbook baseline and extension	.1	.1	.1	.1	.1	.4	1.8
Second waves	.1	.1	.1	.1	.1	.1	.4
Faster recovery	.1	.1	.1	.1	.1	.4	1.9
Prolonged slump	.1	.1	.1	.1	.1	.1	.1

1. Percent, average for the final quarter of the period.

Second Waves (FRB/US, SIGMA)

The staff assumes that social-distancing measures both in the United States and in the foreign economies will have been relaxed materially by early next year. However, there is considerable uncertainty about the effectiveness of various social-distancing measures, and it is possible that the recent rise in cases could intensify and become more widespread, bringing about a second wave of severe social distancing and an associated erosion in economic conditions both at home and abroad. Indeed, in recent weeks, the rapid growth of infections in a number of U.S. states has already disrupted plans for reopening the economy and led some authorities to reimpose restrictions. Similarly, in several emerging market economies (EMEs)—such as Brazil, Mexico, and India—virus containment policies continue to be ineffective, and flare-ups have also started to appear in some advanced foreign economies (AFEs) that had initially been successful in keeping the pandemic under control. Consequently, in the face of an increasing number of deaths per day and as rising hospitalization rates put health-care systems under additional stress, reinstatement of extensive mitigation measures may become unavoidable. With financial-sector vulnerabilities having risen as a result of the initial pandemic shock, the reinstatement of these measures could be particularly damaging to the economy as firms' and households' access to financing becomes increasingly impaired. Additionally, consistent with the staff's assumptions in the baseline, the resumption of rigorous social distancing might damage the supply side of the economy because of greater permanent job loss, a spike in firm exits, and reduced investment.

In this scenario, we illustrate the effects of a resurgent pandemic. Specifically, a continuation of the surge in new cases in many U.S. states leads to a widespread and more persistent resumption of intense social distancing starting in the current quarter, one quarter earlier than in the previous Tealbook. Similar renewed outbreaks—not necessarily synchronized with those in the United States—emerge in many foreign economies over the rest of this year and in the next, also necessitating a revival of strict social-distancing measures. However, because we believe governments and private agents have learned how to better deal with these disruptions, the social-distancing measures are somewhat less damaging to the economy in the near term than in the first wave.[4] Foreign GDP contracts 7 percent in 2020 and 1 percent in

[4] Because the economic deterioration in the first wave is now expected to be less severe than in the previous Tealbook, the outcomes under this scenario are also less severe than before.

2021, about 5 percentage points below baseline, on average, while flight-to-safety flows to the United States lead to a 7 percent appreciation of the dollar.

In the United States, the broader reinstatement of social distancing causes both consumption and investment to weaken, and the slump in foreign demand—together with the appreciation of the dollar—leads to lower exports. The unemployment rate falls this quarter but remains almost 1.5 percentage points above the baseline. In subsequent quarters, the unemployment rate rises, peaking at 12.4 percent in the first half of 2021 and remaining at an elevated level until the end of next year—in part because the natural rate is higher.[5] By the end of 2021, the level of U.S. GDP is more than 9 percent below its pre-recession peak and foreign GDP is 7.5 percent lower. The decline in aggregate demand and core import prices causes core inflation to remain around 1.5 percent in 2021.

Compared with the baseline, the disruption to economic activity is more protracted. Indeed, at the end of 2023, the unemployment rate is 6.1 percent, 1.7 percentage points above its assumed natural rate at that time. The persistent weakness of aggregate demand and a slight downward drift of long-term inflation expectations depress inflation, which averages around 1.5 percent between 2021 and 2025. The stubbornly high unemployment rate and low inflation cause the federal funds rate to remain at the ELB until 2025.

Faster Recovery (FRB/US, SIGMA)

In the United States, recent data on spending, labor markets, and production suggest that the economic effects of social distancing have been fading more rapidly than we had assumed. Similarly, spending and manufacturing data have surprised to the upside in both Europe and emerging Asia, pointing to the possibility that a global recovery may already be under way. Notwithstanding the recent increase in cases in the United States, this scenario considers the consequences of even faster economic normalization than projected in the current Tealbook both at home and in some advanced and emerging economies.

A quicker recovery might come from a number of sources. For example, it is possible that the greater resilience in economic activity seen in recent data will continue. In addition, the

[5] This scenario assumes that, over much of the medium term, the natural rate of unemployment averages 1.4 percentage points above the baseline, consistent with the staff's estimate of the extent to which mandatory social distancing and associated impairments in labor market functioning temporarily raise the natural rate of unemployment. In addition, the labor force participation rate averages 0.7 percentage point below the baseline over this period. Both the natural rate of unemployment rate and the participation rate converge to the baseline thereafter.

course of the pandemic itself may be less severe than we expect as a result of several factors, including more effective treatments, timely adoption of narrowly targeted social-distancing and isolation strategies, and even the possibility that some common strains of the virus turn out to be less harmful than anticipated. Moreover, a vaccine could become widely available sooner than the fourth quarter of 2021, as assumed in the baseline. In this scenario, we assume that some combination of these factors materializes, allowing social distancing to wind down faster and to have faded out almost completely by the end of the year both in the United States and abroad. In particular, the level of foreign GDP increases to 2.5 percent above baseline by the first quarter of next year, while a reversal of flight-to-safety flows contributes to a 3 percent depreciation of the dollar.

Stronger foreign demand, a weaker dollar, and the faster moderation of social distancing by the end of the year do not fully make up for the massive decline in U.S. economic activity in the first half; U.S. GDP still drops 3.6 percent over this year as a whole. The unemployment rate averages 6.7 percent in the fourth quarter, 2.2 percentage points lower than in the baseline, reflecting both the direct effect on activity of more moderate social-distancing measures and a reduction of some of the recessionary dynamics in the baseline. The unemployment rate declines rapidly toward the natural rate of unemployment, falling to 5.7 percent by the first quarter of 2021. Because of the stronger demand and some continued supply constraints, core inflation reaches 2.2 percent in 2021, 0.4 percentage point above the baseline. After 2021, the outcomes in this scenario are slightly better than in the baseline, and, as a result, the federal funds rate exits from the ELB in the fourth quarter of 2023, the same quarter as in the staff projection.

Prolonged Slump (FRB/US, SIGMA)

Highly adverse outcomes associated with the course of the pandemic and the recessionary dynamics caused by it could lead to a prolonged slump in the United States and abroad. The search for a vaccine may drag on for a long time, therapies to alleviate the effects of the virus may not be as successful as hoped, and strategies for containing the virus without widespread economic dislocations may not be implemented or may be overwhelmed by severe localized outbreaks.

Under these circumstances, the start-and-stop approach to controlling the virus described earlier in the "Second Waves" scenario may become the only option for several years, with policymakers repeatedly resorting to sporadic and uncoordinated bouts of intense social distancing when local epidemics cause deaths to spike and threaten to overwhelm health-care

systems. With most people still susceptible to the virus, many will continue to shun activities that carry an appreciable risk of infection, even in periods without formal restrictions in place, while the threat of recurrent severe restrictions on activity will discourage investment and hiring by firms. Moreover, firms and households may have difficulty accessing financial resources that permit them to ride out the resulting turbulence, amplifying and prolonging the downturn. For example, while banks seem to have adequate levels of capital and bank lending has been supportive to economic activity until recently, capital ratios at a significant number of banks could be expected to fall near or below the required minimum in a scenario like the one considered here, creating a widespread curtailment of credit.

In the foreign economies, underlying financial and fiscal vulnerabilities may magnify the economic disruptions. Many of the vulnerable EMEs could plunge into financial crises amid renewed capital outflow pressures. With significant strains on their fiscal capacity, countries in the euro-area periphery might default, raising serious questions about the viability of the euro. The spread of the disease, financial stresses, and the economic downturn could interact to generate social and political instability in many of these regions.

In this scenario, the continued threat of infection and escalating pessimism about efforts to contain the pandemic at an acceptable social cost lead to a broad economic slump. The U.S. unemployment rate rises and averages 14.6 percent in the second half of this year. Corporate borrowing spreads jump about 250 basis points in the United States, 350 basis points in the AFEs, and 600 basis points in the EMEs, relative to the baseline. Flight-to-safety flows lead the dollar to appreciate 10 percent and household and business sentiment to drop around the world. At the trough of the contraction, the level of GDP in the United States is more than 15 percent below its peak; the drop is about 19 percent in both the AFEs and the EMEs.

With a sluggish recovery from a very high starting point, the unemployment rate remains above 10 percent until mid-2023 and above the assumed longer-run natural rate of unemployment until 2027.[6] Correspondingly, core inflation drops to 1.1 percent in 2020 and remains roughly between 1 and 1.5 percent over the next decade, held down by persistently weak demand, lower import prices, and a downward drift of long-term inflation expectations. The federal funds rate does not rise from the ELB until 2027.

[6] This scenario also incorporates greater supply-side damage than in the baseline. The natural rate of unemployment rises 1.7 percentage points above the baseline, on average, in 2021, whereas the labor force participation rate is lower by 0.5 percentage point.

ALTERNATIVE MODEL FORECASTS

Given the unusual circumstances of the pandemic, the FRB/US and EDO model forecasts condition on the staff judgmental projection through the end of 2020. As shown in the exhibit "Alternative Model Forecasts," the FRB/US model projects that GDP will grow 5.1 percent in 2021 and 3.1 percent in 2022, just slightly faster than in the Tealbook baseline outlook.[7] The FRB/US model projects that private consumption growth and investment will rebound strongly in 2021 as low interest rates provide favorable financing conditions and the effects of temporary shocks fade. Weighing against private domestic demand is the model's negative outlook for net exports: The model predicts a sizable rebound in imports beginning next year from lower readings in 2020.

With GDP growth in the FRB/US model's projection for 2021 and 2022 stronger than its potential pace of 2 percent, the output gap narrows over the projection period. The unemployment rate moves down slowly and reaches 7.2 percent by the end of 2022, considerably higher than the staff projection of 4.7 percent. One key reason for FRB/US's higher unemployment rate projection is the model's estimate of the natural rate of unemployment, which is 5.8 percent in 2020:Q4.[8] Importantly, unlike the staff assumption, which has the natural rate falling to 4.7 percent at the end of the medium term, the FRB/US model mechanically assumes a constant natural rate over the entire forecast period. Core inflation increases from 1.1 percent in 2020 to 1.4 percent, on average, over the next two years.

The EDO model projects GDP growth of 6.3 percent in 2021 and 4.2 percent in 2022, well above the model's 2.4 percent average potential output growth over those years.[9] Core inflation averages 1.4 percent in 2021 and 2022. The model predicts unemployment will decline rapidly to 4.9 percent by the end of 2023 as economic activity recovers. The federal funds rate rises to 3.1 percent at the end of the forecast horizon.

[7] We condition the FRB/US forecast on staff projections for federal government spending and tax policies, foreign GDP growth, foreign inflation, and the paths of the U.S. dollar and oil prices. The federal funds rate is governed by the same policy rule as in the baseline.

[8] The natural rate of unemployment for the FRB/US projection is inferred from a small-scale statistical filtering model.

[9] In the case of the EDO model forecast, the federal funds rate is governed by the model's estimated rule.

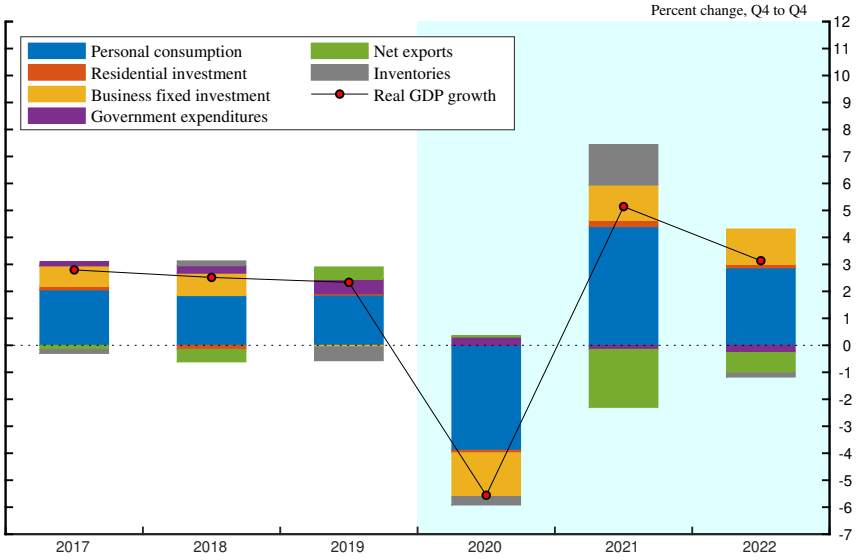
Alternative Model Forecasts

(Percent change, Q4 to Q4, except as noted)

Measure and projection	2020		2021		2022	
	Previous Tealbook	Current Tealbook	*Previous Tealbook*	Current Tealbook	*Previous Tealbook*	Current Tealbook
Real GDP						
Staff	*-7.1*	-5.6	*6.7*	5.1	*3.6*	2.9
FRB/US[1]	*-7.1*	-5.6	*7.1*	5.1	*4.0*	3.1
EDO[1]	*-7.1*	-5.6	*5.4*	6.3	*4.0*	4.2
Unemployment rate[2]						
Staff	*9.3*	8.9	*5.7*	5.4	*4.5*	4.7
FRB/US[1]	*9.3*	8.9	*7.1*	7.8	*6.0*	7.2
EDO[1]	*11.3*	10.7	*6.5*	5.9	*5.3*	4.9
Total PCE prices						
Staff	*.8*	1.0	*1.6*	1.7	*1.7*	1.7
FRB/US[1]	*.8*	1.0	*1.6*	1.5	*1.4*	1.4
EDO[1]	*.8*	1.0	*1.5*	1.3	*1.7*	1.5
Core PCE prices						
Staff	*1.1*	1.1	*1.6*	1.7	*1.7*	1.7
FRB/US[1]	*1.1*	1.1	*1.6*	1.6	*1.4*	1.4
EDO[1]	*1.1*	1.1	*1.5*	1.3	*1.7*	1.5
Federal funds rate[2]						
Staff	*.1*	.1	*.1*	.1	*.1*	.1
FRB/US[1]	*.1*	.1	*.1*	.1	*.1*	.1
EDO[1]	*.1*	.1	*1.9*	2.1	*2.9*	3.1

1. The FRB/US and EDO forecasts condition on the staff forecast for 2020. The EDO projections integrate over the posterior distribution of model parameters. Projections labeled "*Previous Tealbook*" are forecasts conditional on information available at the close of the May Tealbook.
2. Percent, average for Q4.

Decomposition of FRB/US Real GDP Growth Forecast



Note: Shading represents the projection period.
Source: Staff calculations.

(This page is intentionally blank.)

Monetary Policy Strategies

This section discusses a range of strategies for setting the federal funds rate and compares the associated interest rate paths and macroeconomic outcomes with those in the Tealbook baseline projection. Compared with the May Tealbook, the near-term prescriptions of simple policy rules are little changed or revised up, mainly reflecting a narrower output gap. Over the medium term, the simple rules and optimal control strategies generally call for departure dates from the effective lower bound (ELB) that are similar to their counterparts in the previous Tealbook and, thereafter, for policy rate settings that are lower than these counterparts.

An additional exhibit uses optimal control simulations to explore the sensitivity of policy prescriptions and macroeconomic outcomes to alternative assumptions about the amount of slack in the labor market that policymakers seek to eliminate through their policy actions. That assumed amount of slack is alternatively defined as the deviation of the unemployment rate from the staff's estimate of its short-run natural rate or as the deviation from the corresponding longer-run estimate. As in the previous two Tealbooks, a further exhibit shows optimal control simulations under the "Faster Recovery" and "Second Waves" alternative scenarios featured in the Risks and Uncertainty section of this Tealbook.

NEAR-TERM PRESCRIPTIONS OF SELECTED SIMPLE POLICY RULES

The top panel of the first exhibit shows the near-term prescriptions for the federal funds rate implied by four simple policy rules: the inertial version of the Taylor (1999) rule, the Taylor (1993) rule, a first-difference rule, and a flexible price-level targeting (FPLT) rule.[1] The simple rule prescriptions in this panel are not subject to the ELB on the policy rate and take as given the Tealbook baseline projections of the output gap and core inflation, which are shown in the middle panels.[2] The middle-left panel provides the

[1] Except for the first-difference rule, which has no intercept term, the simple rules examined herein use intercept terms that are consistent with a real federal funds rate of 50 basis points in the longer run. The appendix in this Tealbook section provides technical details on these simple policy rules.

[2] The Tealbook baseline and dynamic simulations presented later in this section of the Tealbook embed the assumption that the federal funds rate is subject to an ELB of 12½ basis points, a value that corresponds to the midpoint of the current target range. In addition, all dynamic simulations incorporate

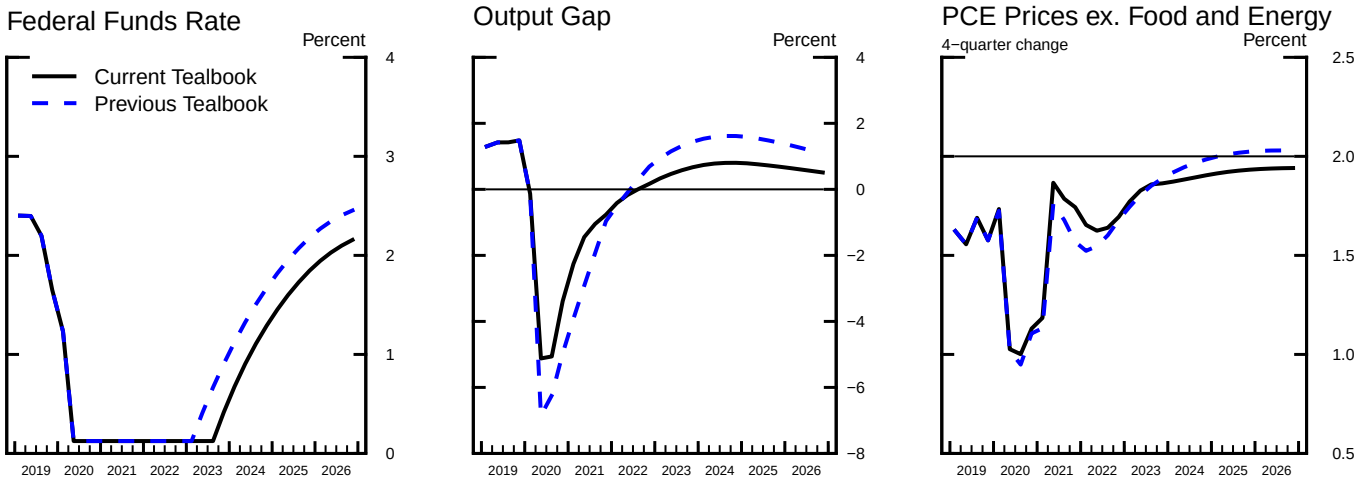
Policy Rules and the Staff Projection

Near−Term Prescriptions of Selected Simple Policy Rules[1]

(Percent)

	2020:Q3	2020:Q4
Inertial Taylor (1999) rule	**−.50**	**−.76**
Previous Tealbook projection	*−.69*	*−1.16*
Taylor (1993) rule	**−1.54**	**−.51**
Previous Tealbook projection	*−2.20*	*−1.33*
First−difference rule	**1.90**	**3.80**
Previous Tealbook projection	*1.97*	*3.96*
Flexible price−level targeting rule	**−.76**	**−1.40**
Previous Tealbook projection	*−.71*	*−1.42*
Addendum:		
Tealbook baseline	**.13**	**.13**

Key Elements of the Staff Projection



A Medium−Term Notion of the Equilibrium Real Federal Funds Rate[2]

(Percent)

	Current Value	*Current−Quarter Estimate Based on Previous Tealbook*	*Previous Tealbook*
Tealbook baseline			
FRB/US *r**	−1.12	*−.60*	*−.69*
Average projected real federal funds rate	−1.44	*−1.35*	*−1.31*
SEP−consistent baseline			
FRB/US *r**	−2.65		
Average projected real federal funds rate	−1.28		

1. The lines denoted "Previous Tealbook projection" report prescriptions based on the previous Tealbook's staff outlook for inflation and resource slack.

2. The "FRB/US *r**" is the level of the real federal funds rate that, if maintained over a 12−quarter period (beginning in the current quarter) in the FRB/US model, sets the output gap equal to zero in the final quarter of that period given a baseline Tealbook or SEP−consistent projection. The SEP−consistent baseline corresponds to the June 2020 median SEP responses. The "Average projected real federal funds rate" is calculated under the Tealbook and SEP−consistent baseline projection over the same 12−quarter period as FRB/US *r**.

staff's baseline path for the federal funds rate, which embeds the assumption that the federal funds rate departs from the ELB in the quarter after the unemployment rate falls below its assumed longer-run natural rate of 4.3 percent.

- As in the May Tealbook, all but one of the simple policy rules prescribe negative values for the federal funds rate in the second half of this year. The exception is the first-difference rule, which responds to the projected rebound, rather than the current depressed level, of resource utilization.

- The near-term prescriptions of the inertial Taylor (1999) rule and the Taylor (1993) rule are revised up in both 2020:Q3 and 2020:Q4 from their corresponding prescriptions in the previous Tealbook. These revisions reflect the fact that the current Tealbook's near-term output gap is narrower than that in the previous Tealbook. The near-term prescriptions of the first-difference rule and FPLT rule are roughly unrevised.

- The Taylor (1993) rule prescribes a federal funds rate of negative 1.54 percent in 2020:Q3 and negative 0.51 percent in 2020:Q4, with the increase between the two quarters reflecting the projected narrowing of the output gap. The inertial Taylor (1999) rule, which reacts more slowly to economic developments, prescribes a decrease in the policy rate from negative 0.50 percent in the third quarter to negative 0.76 percent in the fourth quarter.

- The FPLT rule calls for decreasing values of the federal funds rate over the second half of the year. These prescriptions reflect the high level of the unemployment rate relative to its natural rate, as well as the rule's effort to eliminate a cumulative shortfall in the core PCE price index of around 4 percent compared with its target path since the end of 2011.

the staff's baseline estimates of the macroeconomic effects of the Federal Reserve's balance sheet policies and of federal fiscal policies.

Because the FPLT rule responds to the gap between the unemployment rate and the staff's short-run estimate of the natural rate of unemployment, this rule takes as given the Tealbook baseline projections of these variables instead of the projection of the output gap.

A MEDIUM-TERM NOTION OF THE EQUILIBRIUM REAL FEDERAL FUNDS RATE

The bottom panel of the first exhibit reports estimates of a medium-term concept of the equilibrium real federal funds rate (r^*) generated under two baselines: the Tealbook baseline and a projection consistent with the medians in the June 2020 Summary of Economic Projections (SEP).[3] This concept of r^*, labeled "FRB/US r^*," corresponds to the level of the real federal funds rate that, if maintained over a 12-quarter period starting in the current quarter, would bring the output gap to zero in the final quarter of that period in the FRB/US model. This measure is a summary of the projected underlying strength of the real economy and does not take into account considerations such as achieving the inflation objective or avoiding sharp changes in the federal funds rate.

- At negative 1.12 percent, the current value of the Tealbook-consistent FRB/US r^* is about 50 basis points lower than the corresponding current-quarter estimate based on the previous Tealbook because, although the current Tealbook forecast is stronger in the short run, it is weaker from 2022 onward. The Tealbook-consistent FRB/US r^* is similar to the average projected real federal funds rate in the Tealbook baseline because, in the Tealbook baseline, the output gap is very nearly closed in three years.

- At negative 2.65 percent, the June 2020 SEP-consistent FRB/US r^* is about 1½ percentage points lower than the Tealbook-consistent FRB/US r^* because, in the SEP-consistent baseline, the amount of resource slack does not decrease as rapidly as in the Tealbook baseline, resulting in a persistently wider output gap.

SIMPLE POLICY RULE SIMULATIONS

The second exhibit reports the Tealbook baseline projection and results obtained from dynamic simulations of the FRB/US model under the inertial Taylor (1999) rule, the

[3] To construct a baseline projection consistent with median SEP responses for the FRB/US model, the staff interpolated annual SEP information to a quarterly frequency and assumed that, beyond 2022 (the final year covered by the June 2020 SEP), the economy transitions to the longer-run values in a smooth and monotonic way. The staff also postulated economic relationships to project variables not covered in the SEP. For example, the staff assumed an Okun's law relationship to recover an output gap from the deviation of the median SEP unemployment rate from the median SEP estimate of its longer-run value.

Taylor (1993) rule, the first-difference rule, and the FPLT rule. The simple policy rules prescribe notably different departure dates from the ELB. These simulations reflect the endogenous responses of resource utilization and inflation to the different federal funds rate paths implied by the policy rules, subject to the ELB constraint. The simulations of each rule are carried out under the assumptions that policymakers commit to following that rule in the future and that financial market participants, price setters, and wage setters correctly anticipate that monetary policy will follow through on this commitment and are aware of the implications for interest rates and the economy.

- Under the Tealbook baseline, the federal funds rate departs from the ELB in 2023:Q4, two quarters later than in the previous Tealbook, after the unemployment rate falls below 4.3 percent. Thereafter, the policy rate follows the prescriptions of the conditional attenuated policy rule, rising gradually to 2 percent in 2026.

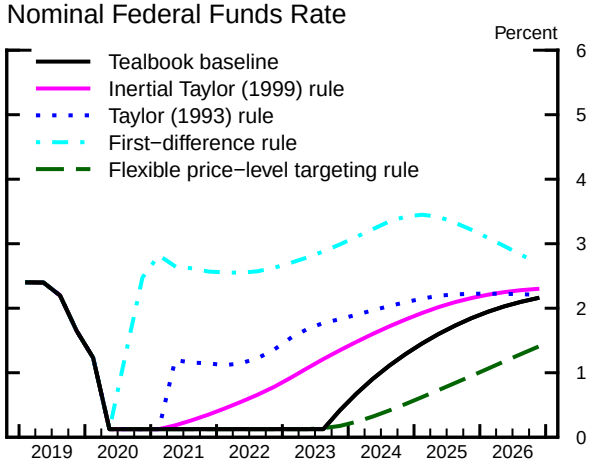
- The inertial Taylor (1999) rule calls for the federal funds rate to depart from the ELB in mid-2021, about two years sooner than in the Tealbook baseline and at a time when the unemployment rate is 6 percent. Because of this more restrictive policy stance, the unemployment rate and the real 10-year Treasury yield are higher, and the inflation rate is lower, than in the Tealbook baseline over the period shown.

- The Taylor (1993) rule also calls for the federal funds rate to depart from the ELB around mid-2021, when the unemployment rate is nearly 7 percent. Because the Taylor (1993) rule does not feature inertia, it prescribes a more rapid initial increase in the federal funds rate and a more restrictive policy stance overall than both the Tealbook baseline and the inertial Taylor (1999) rule. Relative to those prescriptions, the higher path of the federal funds rate under the Taylor (1993) rule results in a higher unemployment rate, a lower output gap, and lower inflation.

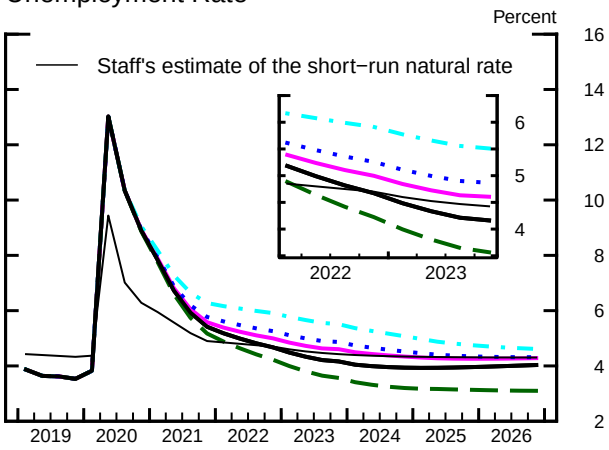
- The first-difference rule calls for a substantial initial increase in the federal funds rate in the near term because it ignores the current low level of resource utilization and instead reacts to the projected narrowing of the output gap. The federal funds rate continues to rise as the economy recovers, peaking at nearly 3.5 percent in 2025. This relatively tight policy results in a prolonged period of high unemployment and low inflation.

Simple Policy Rule Simulations

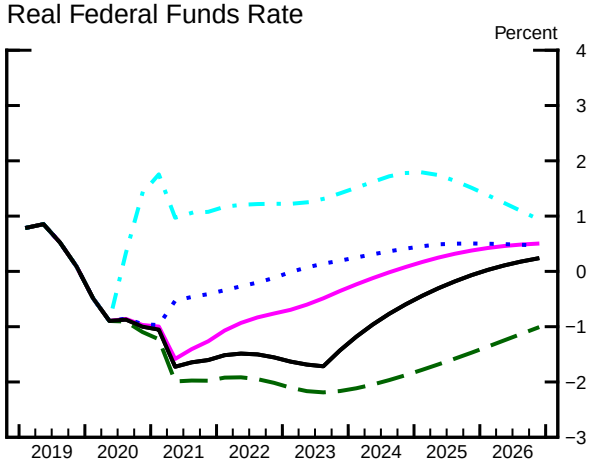
Nominal Federal Funds Rate



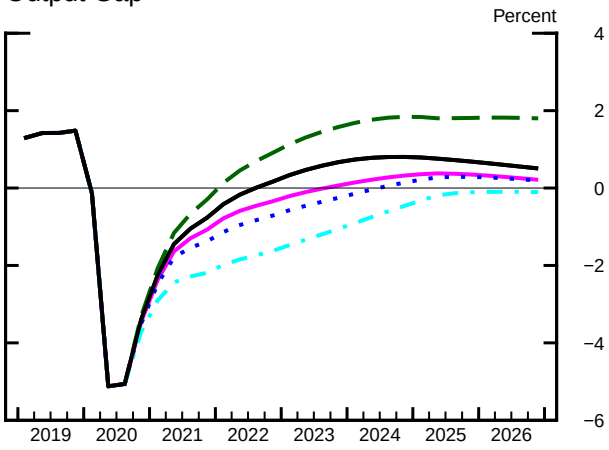
Unemployment Rate



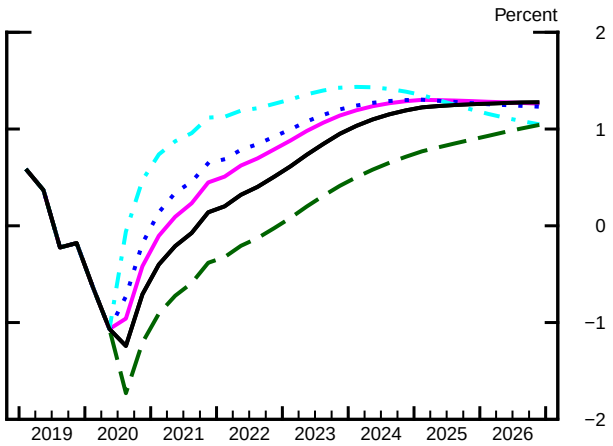
Real Federal Funds Rate



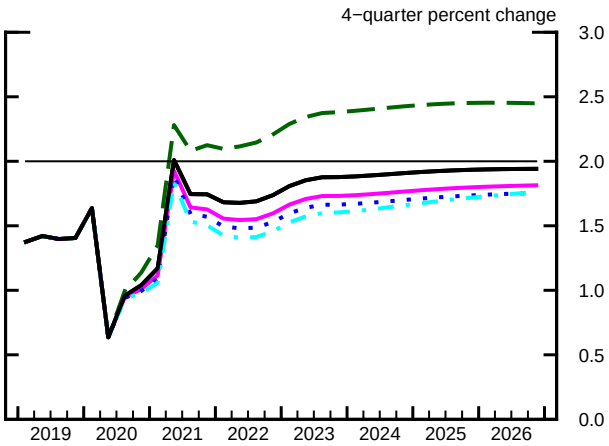
Output Gap



Real 10−Year Treasury Yield



PCE Inflation



Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation rather than to headline inflation. This choice of rule specification was made in light of a tendency for current and near−term core inflation rates to outperform headline inflation rates as predictors of the medium−term behavior of headline inflation. All the rules with the exception of FPLT rule also respond to the output gap presented in the middle−right panel.

- The FPLT rule responds to, and seeks to eliminate, the cumulative shortfall of the level of core PCE prices from a target path that is defined by the growth of that price level at an annual rate of 2 percent starting from the end of 2011. Eliminating the current shortfall of nearly 4 percent requires inflation to run above 2 percent over the coming decade by maintaining accommodative financial conditions through that period. As a result, the federal funds rate departs from the ELB in mid-2024 and rises only slowly thereafter. The real 10-year Treasury rate slides to negative 1¾ percent in 2020:Q3, remaining below the corresponding Tealbook baseline path throughout the period shown.[4] The unemployment rate is lower under the FPLT rule than in the Tealbook baseline and all other simulations, leveling off near 3 percent in 2024. Inflation exceeds 2 percent by about 30 basis points, on average, from 2021 through the end of 2026.

- Compared with the May Tealbook, the narrower output gap in the staff's projection raises the federal funds rate prescriptions from simple policy rules over the next two years, all else being equal. However, these policy rules generally call for departure dates from the ELB similar to those in the May Tealbook and somewhat lower paths for the federal funds rate beyond the next two years. This latter revision reflects the smaller projected overshooting of output relative to its potential level and the lower projected path of inflation after 2022 in the current Tealbook.

OPTIMAL CONTROL SIMULATIONS UNDER COMMITMENT

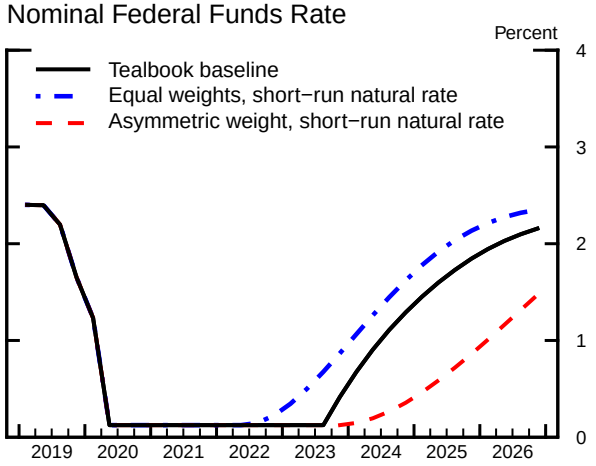
The third exhibit displays optimal control simulations conditional on the Tealbook baseline under two different assumptions about policymakers' preferences, as captured by alternative specifications of the loss function.[5] The concept of optimal control employed here is one in which current policymakers are able to commit future

[4] Even though the real 10-year Treasury rate is sometimes negative in the near term, the nominal 10-year Treasury rate remains positive and higher than the ELB imposed on short-term interest rates.

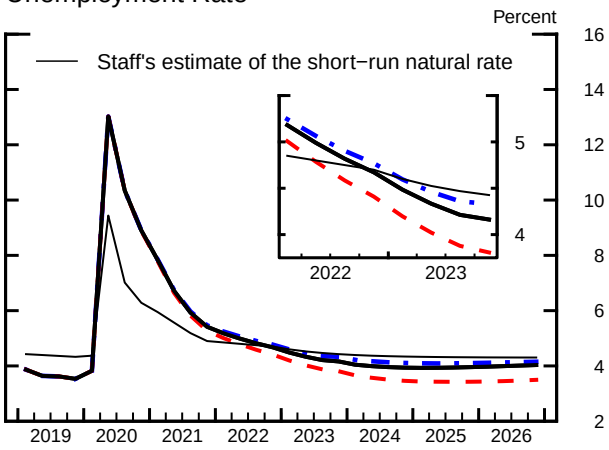
[5] The box "Optimal Control and the Loss Function" in the Monetary Policy Strategies section of Tealbook B for June 2016 offers motivations for these specifications.

Optimal Control Simulations under Commitment

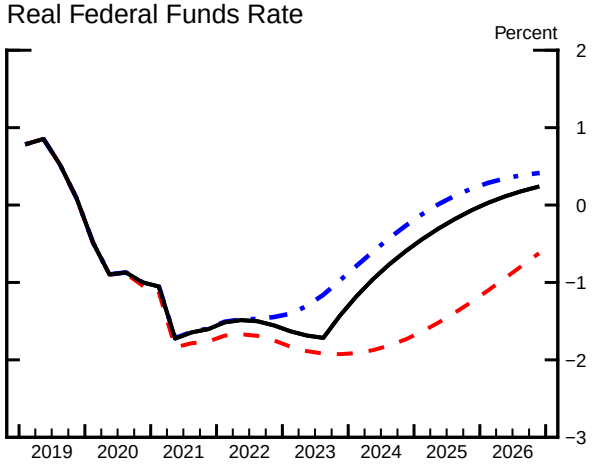
Nominal Federal Funds Rate



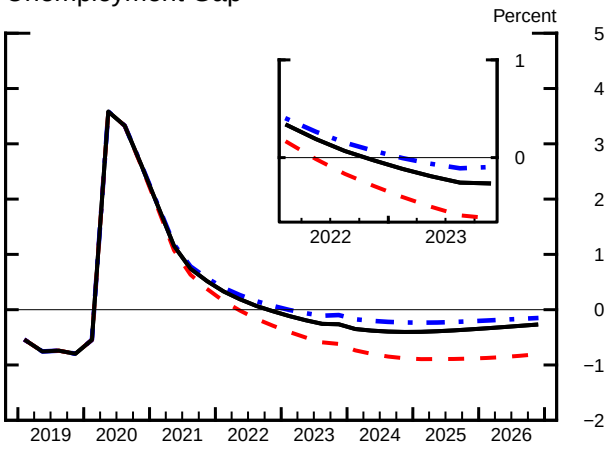
Unemployment Rate



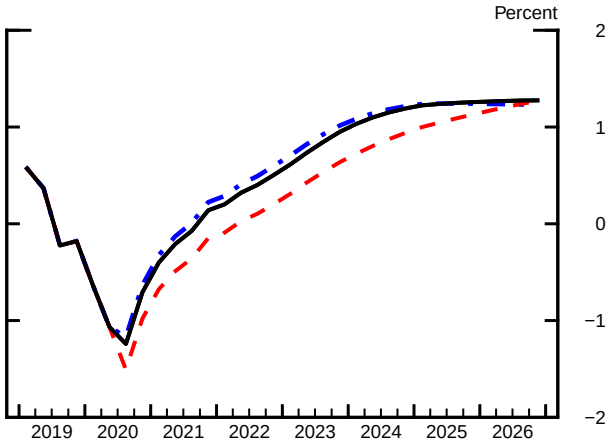
Real Federal Funds Rate



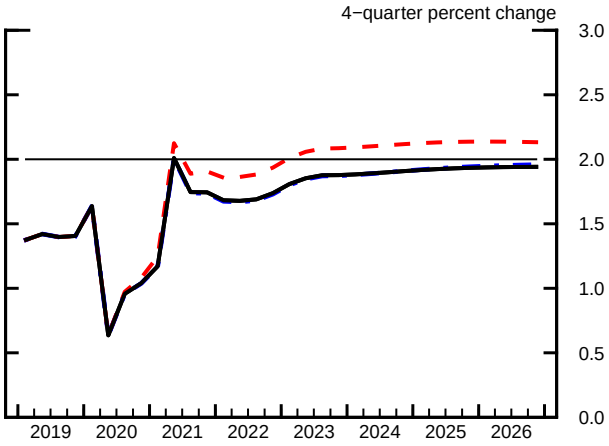
Unemployment Gap



Real 10−Year Treasury Yield



PCE Inflation



Note: Each set of lines corresponds to an optimal control policy under commitment in which policymakers minimize a discounted weighted sum of squared deviations of 4−quarter headline PCE inflation from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's estimate of the short−run natural rate, and of squared changes in the federal funds rate. The weights vary across simulations. See the appendix for technical details and the box "Optimal Control and the Loss Function" in the June 2016 Tealbook B for a motivation.

policymakers to their plans; such a commitment, when feasible, may lead to improved economic outcomes.[6]

- The simulation labeled "Equal weights, short-run natural rate" presents the case in which policymakers are assumed to place equal weights on keeping headline PCE inflation close to the Committee's objective of 2 percent, on keeping the unemployment rate close to the staff's estimate of the short-run natural rate of unemployment, and on keeping the federal funds rate close to its previous value. Under this strategy, the federal funds rate departs from the ELB in 2023:Q1, three quarters earlier than in the baseline path. However, the increase in the federal funds rate under this strategy is more gradual than in the Tealbook baseline so that, overall, the path of the 10-year real rate is similar to its counterpart in the baseline. As a result, the optimal control path for the federal funds rate in this simulation leads to projections for the unemployment rate and inflation similar to those in the baseline.

- The simulation labeled "Asymmetric weight, short-run natural rate" uses a loss function that assigns no cost to deviations of the unemployment rate from the short-run natural rate when the unemployment rate is below its short-run natural value but is otherwise identical to the specification with equal weights. Under this strategy, policymakers' desire to hasten the labor market recovery and raise inflation to 2 percent does not have to be balanced against a preference to prevent the unemployment rate from eventually running below its natural rate. The federal funds rate remains at the ELB until 2024:Q3, three quarters later than in the Tealbook baseline projection. This more accommodative stance leads to a slightly higher path of inflation and, eventually, a somewhat stronger labor market than in the Tealbook baseline.

- The federal funds rate prescriptions under both optimal control simulations are lower than those prescriptions in the May Tealbook, reflecting the smaller overshoot by output of its potential level and the lower projected path of inflation after 2022 in the Tealbook baseline projection.

[6] Under the optimal control policies, policymakers achieve the displayed economic outcomes by making promises that bind future policymakers to take actions that may not be optimal from the perspective of those future policymakers (that is, the promises are time inconsistent). It is assumed that these promises are taken as credible by wage and price setters and by financial market participants.

Optimal Control Simulations with Alternative Unemployment Rate Objectives

In the optimal control simulations described in the previous section, policymakers in the model seek to eliminate deviations of the unemployment rate from the staff's estimate of the natural rate of unemployment. As described in the box "Implications of COVID-19 for the Natural Rate of Unemployment" in the Domestic Economic Developments and Outlook section of this Tealbook, the natural rate of unemployment in the staff projection captures the level of unemployment consistent with price stability in the short run and is based on the assumption that the imposition, and then relaxation, of mandatory social-distancing restrictions causes the natural rate to exhibit a temporary increase.

However, deviations of the unemployment rate from the staff's estimate of its short-run natural rate need not correspond to the deviations from maximum employment that policymakers seek to eliminate through their policy actions. This special exhibit examines how the optimal control policy under the equal-weights loss function differs when policymakers respond to the deviations of the unemployment rate from its estimated longer-run natural rate rather than the staff's short-run estimate. The simulation labeled "Equal weights, short-run natural rate" is identical to the corresponding simulation in the previous exhibit. The simulation labeled "Equal weights, longer-run natural rate" differs in that the unemployment rate gap is expressed in terms of deviations of the unemployment rate from the estimate of the longer-run natural rate.[7]

- As shown in the middle-right panel, the deviations of the unemployment rate from its assumed longer-run value of 4.3 percent are about twice as large in the near term as the deviations from estimates of the short-run natural rate.

- As shown in the upper-left panel, a policy of responding to deviations from the longer-run estimate extends the period during which the federal funds rate is at the ELB by about three quarters compared with the case in which policymakers respond to deviations from the short-run estimates.

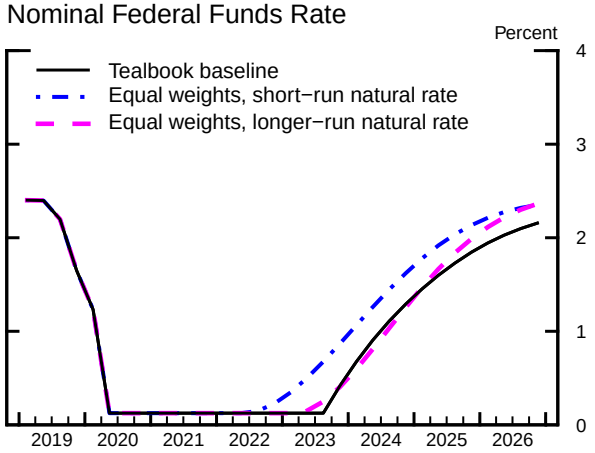
- In the model, the macroeconomic implications of using the longer-run natural rate of unemployment in the loss function are small because the difference

[7] In both simulations, the wage Phillips curve in the FRB/US model depends on the deviation of the unemployment rate from the staff's estimate of the short-run natural rate.

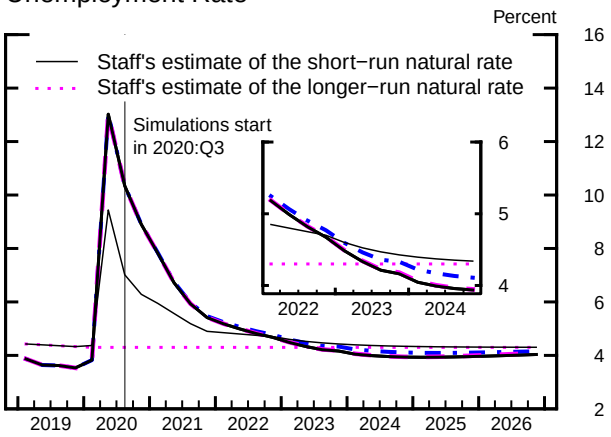
Optimal Control Simulations under Commitment

Alternative Unemployment Rate Objectives

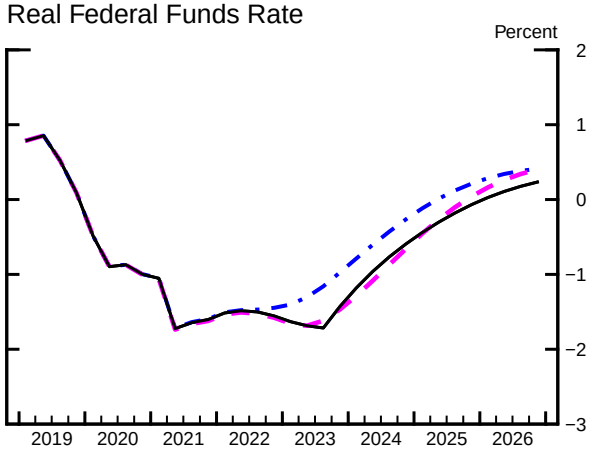
Nominal Federal Funds Rate



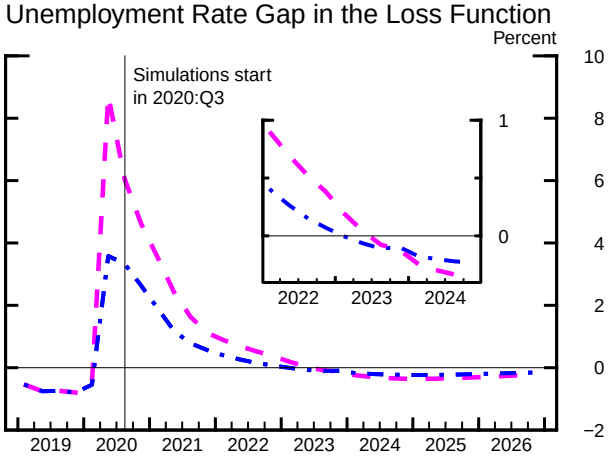
Unemployment Rate



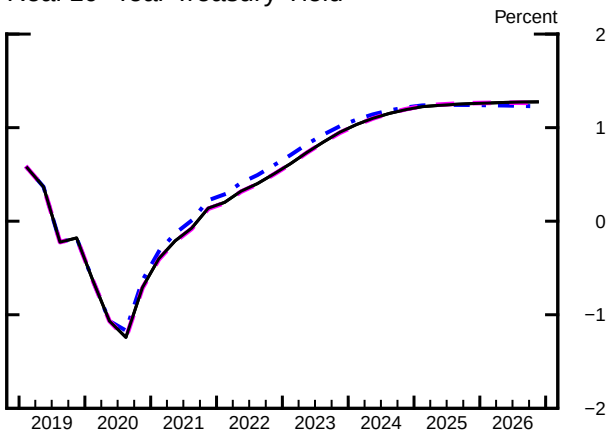
Real Federal Funds Rate



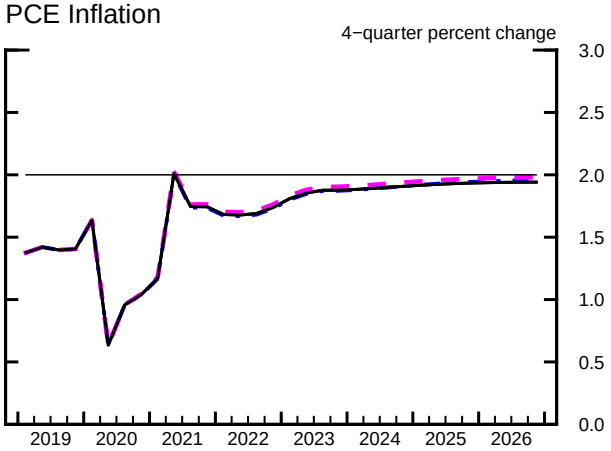
Unemployment Rate Gap in the Loss Function



Real 10−Year Treasury Yield



PCE Inflation



between the estimates of the short- and longer-run natural rates are short-lived and monetary policy affects economic outcomes with considerable lags. As noted above, the federal funds rate departs from the ELB a few quarters later when policymakers seek to eliminate deviations from the longer-run estimate of the natural rate rather than from its short-run value. However, the effects of this later departure from the ELB are offset by a higher path for the policy rate in the years beyond the period shown, leaving overall financial conditions little changed. Accordingly, the projected paths of the unemployment rate and inflation are roughly the same as in the earlier simulations.

- The equal-weights loss function, penalizing deviations from the longer-run estimate of the natural rate of unemployment, prescribes a departure of the federal funds rate from the ELB in 2023:Q4, the same date as in the Tealbook baseline.

- As always, policy prescriptions and macroeconomic outcomes depend on specific features of the FRB/US model—such as the slope of the Phillips curve, the interest rate sensitivity of output and the unemployment rate, and the assumption that key private-sector agents are forward-looking.

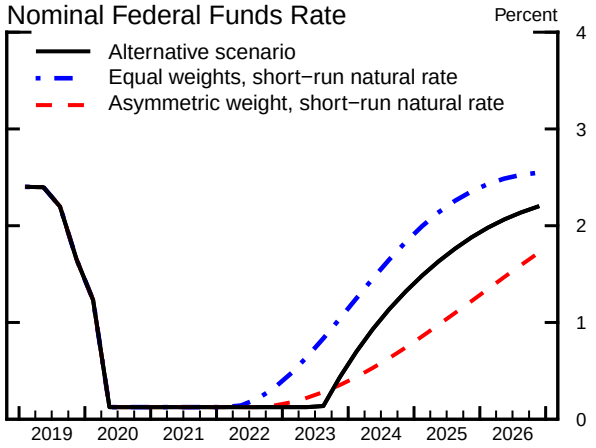
OPTIMAL CONTROL SIMULATIONS IN TWO ALTERNATIVE SCENARIOS

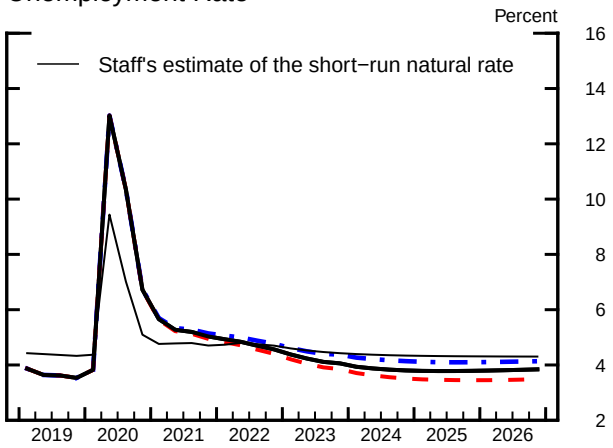
The economic outlook depends crucially on the course of the COVID-19 outbreak and the extent to which this outbreak inflicts lasting damage to the economy—factors about which there is considerable uncertainty. The next exhibit reports results of optimal control simulations under two alternative scenarios detailed in the Risks and Uncertainty section of this Tealbook: the "Faster Recovery" scenario and the "Second Waves" scenario. The policy prescriptions and macroeconomic outcomes are similar to those shown in analogous exhibits in the previous two Tealbooks.

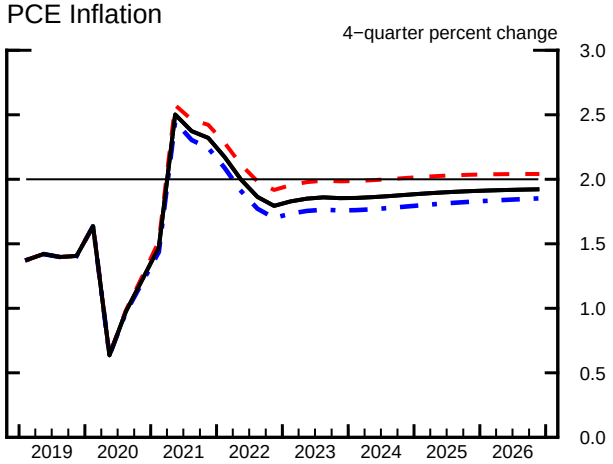
The final four exhibits tabulate the simulation results under the Tealbook baseline for key variables under the policy rules shown in the exhibit "Simple Policy Rule Simulations" and the optimal control simulations shown in the exhibit "Optimal Control Simulations under Commitment."

Optimal Control Simulations in Two Alternative Scenarios

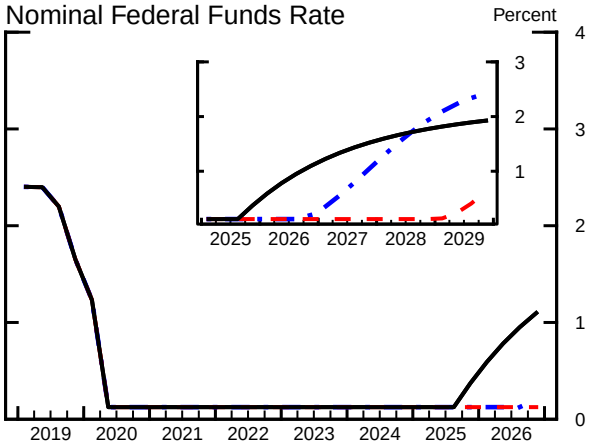
Faster Recovery

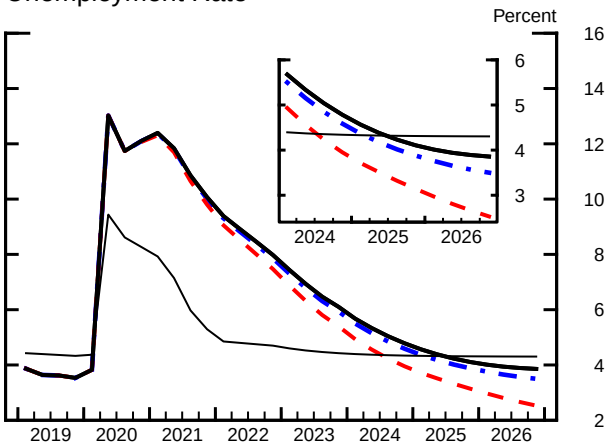


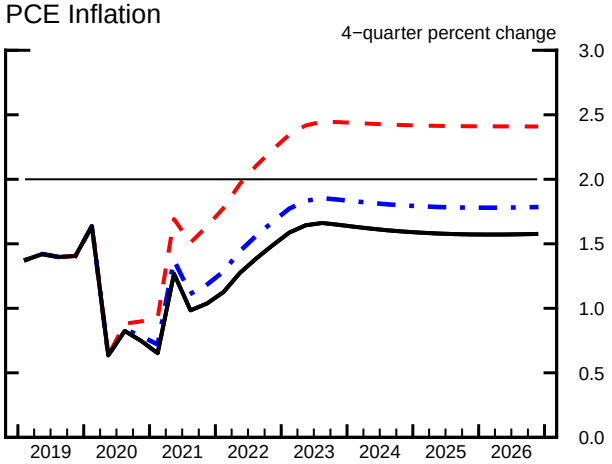




Second Waves







Outcomes of Simple Policy Rule Simulations

(Percent change, annual rate, from end of preceding period, except as noted)

Outcome and strategy	2020	2021	2022	2023	2024	2025	2026
Nominal federal funds rate[1]							
Inertial Taylor (1999)	.1	.3	.8	1.3	1.8	2.2	2.3
Taylor (1993)	.1	1.1	1.4	1.8	2.1	2.2	2.2
First-difference	2.5	2.6	2.6	3.0	3.4	3.2	2.7
Flexible price-level targeting	.1	.1	.1	.2	.5	1.0	1.4
Extended Tealbook baseline	.1	.1	.1	.4	1.3	1.8	2.2
Real GDP							
Inertial Taylor (1999)	-5.6	4.8	2.6	2.0	1.9	1.7	1.5
Taylor (1993)	-5.7	4.6	2.5	2.1	2.0	1.8	1.6
First-difference	-5.9	3.9	2.4	2.1	2.1	2.0	1.7
Flexible price-level targeting	-5.5	5.6	3.2	2.4	2.0	1.8	1.8
Extended Tealbook baseline	-5.6	5.1	2.9	2.2	1.8	1.6	1.5
Unemployment rate[1]							
Inertial Taylor (1999)	8.9	5.6	5.0	4.6	4.3	4.3	4.3
Taylor (1993)	8.9	5.8	5.3	4.9	4.5	4.3	4.3
First-difference	9.0	6.3	5.9	5.5	5.1	4.8	4.6
Flexible price-level targeting	8.9	5.2	4.2	3.6	3.2	3.1	3.1
Extended Tealbook baseline	8.9	5.4	4.7	4.2	3.9	4.0	4.0
Total PCE prices							
Inertial Taylor (1999)	1.0	1.6	1.6	1.7	1.8	1.8	1.8
Taylor (1993)	1.0	1.6	1.5	1.7	1.7	1.7	1.8
First-difference	1.0	1.5	1.5	1.6	1.7	1.7	1.8
Flexible price-level targeting	1.1	2.1	2.2	2.4	2.4	2.5	2.4
Extended Tealbook baseline	1.0	1.7	1.7	1.9	1.9	1.9	1.9
Core PCE prices							
Inertial Taylor (1999)	1.1	1.6	1.6	1.7	1.8	1.8	1.8
Taylor (1993)	1.1	1.6	1.5	1.7	1.7	1.7	1.8
First-difference	1.1	1.5	1.4	1.6	1.7	1.7	1.8
Flexible price-level targeting	1.2	2.1	2.2	2.4	2.4	2.5	2.4
Extended Tealbook baseline	1.1	1.7	1.7	1.9	1.9	1.9	1.9

1. Percent, average for the final quarter of the period.

Outcomes of Simple Policy Rule Simulations, Quarterly

(4-quarter percent change, except as noted)

Outcome and strategy	2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Nominal federal funds rate[1]								
Inertial Taylor (1999)	1.2	.1	.1	.1	.1	.2	.3	.3
Taylor (1993)	1.2	.1	.1	.1	.1	1.2	1.2	1.1
First-difference	1.2	.1	1.3	2.5	2.8	2.6	2.6	2.6
Flexible price-level targeting	1.2	.1	.1	.1	.1	.1	.1	.1
Extended Tealbook baseline	1.2	.1	.1	.1	.1	.1	.1	.1
Real GDP								
Inertial Taylor (1999)	.3	-9.8	-7.0	-5.6	-2.8	9.0	6.1	4.8
Taylor (1993)	.3	-9.8	-7.0	-5.7	-2.9	8.8	5.9	4.6
First-difference	.3	-9.8	-7.0	-5.9	-3.3	8.0	5.0	3.9
Flexible price-level targeting	.3	-9.8	-7.0	-5.5	-2.5	9.5	6.9	5.6
Extended Tealbook baseline	.3	-9.8	-7.0	-5.6	-2.7	9.2	6.4	5.1
Unemployment rate[1]								
Inertial Taylor (1999)	3.8	13.0	10.3	8.9	7.9	6.8	6.1	5.6
Taylor (1993)	3.8	13.0	10.3	8.9	7.9	6.9	6.2	5.8
First-difference	3.8	13.0	10.3	9.0	8.2	7.3	6.6	6.3
Flexible price-level targeting	3.8	13.0	10.3	8.9	7.8	6.6	5.7	5.2
Extended Tealbook baseline	3.8	13.0	10.3	8.9	7.8	6.7	5.9	5.4
Total PCE prices								
Inertial Taylor (1999)	1.6	.6	.9	1.0	1.1	1.9	1.6	1.6
Taylor (1993)	1.6	.6	.9	1.0	1.1	1.9	1.6	1.6
First-difference	1.6	.6	.9	1.0	1.1	1.8	1.5	1.5
Flexible price-level targeting	1.6	.6	1.0	1.1	1.3	2.3	2.1	2.1
Extended Tealbook baseline	1.6	.6	1.0	1.0	1.2	2.0	1.7	1.7
Core PCE prices								
Inertial Taylor (1999)	1.7	1.0	1.0	1.1	1.1	1.8	1.7	1.6
Taylor (1993)	1.7	1.0	1.0	1.1	1.1	1.7	1.6	1.6
First-difference	1.7	1.0	1.0	1.1	1.1	1.7	1.6	1.5
Flexible price-level targeting	1.7	1.0	1.0	1.2	1.4	2.1	2.1	2.1
Extended Tealbook baseline	1.7	1.0	1.0	1.1	1.2	1.9	1.8	1.7

1. Percent, average for the quarter.

Outcomes of Optimal Control Simulations under Commitment

(Percent change, annual rate, from end of preceding period, except as noted)

Outcome and strategy	2020	2021	2022	2023	2024	2025	2026
Nominal federal funds rate[1]							
Equal weights	.1	.1	.2	.9	1.6	2.1	2.4
Asymmetric weight on *ugap*	.1	.1	.1	.1	.4	.9	1.5
Extended Tealbook baseline	.1	.1	.1	.4	1.3	1.8	2.2
Real GDP							
Equal weights	-5.6	5.0	2.8	2.1	1.8	1.6	1.6
Asymmetric weight on *ugap*	-5.5	5.4	3.1	2.4	2.0	1.7	1.6
Extended Tealbook baseline	-5.6	5.1	2.9	2.2	1.8	1.6	1.5
Unemployment rate[1]							
Equal weights	8.9	5.5	4.8	4.3	4.1	4.1	4.2
Asymmetric weight on *ugap*	8.9	5.3	4.4	3.8	3.5	3.4	3.5
Extended Tealbook baseline	8.9	5.4	4.7	4.2	3.9	4.0	4.0
Total PCE prices							
Equal weights	1.0	1.7	1.7	1.9	1.9	1.9	2.0
Asymmetric weight on *ugap*	1.1	1.9	1.9	2.1	2.1	2.1	2.1
Extended Tealbook baseline	1.0	1.7	1.7	1.9	1.9	1.9	1.9
Core PCE prices							
Equal weights	1.1	1.7	1.7	1.9	1.9	1.9	2.0
Asymmetric weight on *ugap*	1.2	1.9	1.9	2.1	2.1	2.1	2.1
Extended Tealbook baseline	1.1	1.7	1.7	1.9	1.9	1.9	1.9

1. Percent, average for the final quarter of the period.

Outcomes of Optimal Control Simulations under Commitment, Quarterly

(4-quarter percent change, except as noted)

Outcome and strategy	2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Nominal federal funds rate[1]								
Equal weights	1.2	.1	.1	.1	.1	.1	.1	.1
Asymmetric weight on *ugap*	1.2	.1	.1	.1	.1	.1	.1	.1
Extended Tealbook baseline	1.2	.1	.1	.1	.1	.1	.1	.1
Real GDP								
Equal weights	.3	-9.8	-7.0	-5.6	-2.7	9.1	6.3	5.0
Asymmetric weight on *ugap*	.3	-9.8	-7.0	-5.5	-2.5	9.4	6.7	5.4
Extended Tealbook baseline	.3	-9.8	-7.0	-5.6	-2.7	9.2	6.4	5.1
Unemployment rate[1]								
Equal weights	3.8	13.0	10.3	8.9	7.9	6.8	6.0	5.5
Asymmetric weight on *ugap*	3.8	13.0	10.3	8.9	7.8	6.6	5.8	5.3
Extended Tealbook baseline	3.8	13.0	10.3	8.9	7.8	6.7	5.9	5.4
Total PCE prices								
Equal weights	1.6	.6	1.0	1.0	1.2	2.0	1.7	1.7
Asymmetric weight on *ugap*	1.6	.6	1.0	1.1	1.2	2.1	1.9	1.9
Extended Tealbook baseline	1.6	.6	1.0	1.0	1.2	2.0	1.7	1.7
Core PCE prices								
Equal weights	1.7	1.0	1.0	1.1	1.2	1.9	1.8	1.7
Asymmetric weight on *ugap*	1.7	1.0	1.0	1.2	1.3	2.0	1.9	1.9
Extended Tealbook baseline	1.7	1.0	1.0	1.1	1.2	1.9	1.8	1.7

1. Percent, average for the quarter.

Appendix

Implementation of the Simple Rules and Optimal Control Simulations

The monetary policy strategies considered in this section of Tealbook A typically fall into one of two categories. Under simple policy rules, policymakers set the federal funds rate according to a reaction function that includes a small number of macroeconomic factors. Under optimal control policies, policymakers compute a path for the federal funds rate that minimizes a loss function meant to capture policymakers' preferences over macroeconomic outcomes. Both approaches recognize the Federal Reserve's dual mandate. Unless otherwise noted, the simulations embed the assumption that policymakers will adhere to the policy strategy in the future and that financial market participants, price setters, and wage setters not only believe that policymakers will follow through with their strategy, but also fully understand the macroeconomic implications of policymakers doing so. Such policy strategies are described as commitment strategies.

The two approaches have different merits and limitations. The parsimony of simple rules makes them relatively easy to communicate to the public, and, because they respond only to variables that are central to a range of models, proponents argue that they may be more robust to uncertainty about the structure of the economy. However, simple rules omit, by construction, other potential influences on policy decisions; thus, strict adherence to such rules may, at times, lead to unsatisfactory outcomes. By comparison, optimal control policies respond to a broader set of economic factors; their prescriptions optimally balance various policy objectives. And, although this section focuses on policies under commitment, optimal control policies can more generally be derived under various assumptions about the degree to which policymakers can commit. That said, optimal control policies assume substantial knowledge on the part of policymakers and are sensitive to the assumed loss function and the specifics of the particular model.

Given the different strengths and weaknesses of the two approaches, they are probably best considered together as a means to assess the various tradeoffs policymakers may face when pursuing their mandated objectives.

POLICY RULES USED IN THE MONETARY POLICY STRATEGIES SECTION

The table "Simple Rules" that follows gives expressions for four simple policy rules reported in the first two exhibits of the Monetary Policy Strategies section. It also reports the expression for the conditional attenuated rule that the staff uses in the construction of the Tealbook baseline projection.[1] R_t denotes the nominal federal funds rate prescribed by a strategy for quarter *t*. The right-hand-side variables of the first four rules include the staff's projection of trailing four-quarter core PCE price inflation for the current quarter and three quarters ahead

[1] In the staff's construction of the baseline projection, the federal funds rate is assumed to remain at the effective lower bound until the unemployment rate falls below its longer-run value of 4.3 percent. Thereafter, the policy rate follows the prescriptions of the conditional attenuated policy rule.

(π_t and $\pi_{t+3|t}$), the output gap estimate for the current period ($ygap_t$), and the forecast of the three-quarter-ahead annual change in the output gap ($ygap_{t+3|t} - ygap_{t-1}$). The value of policymakers' longer-run inflation objective, denoted π^{LR}, is 2 percent. In the case of the flexible price-level targeting rule, the right-hand-side variables include an unemployment rate gap and a price-level gap. The unemployment gap is defined as the difference between the unemployment rate, u_t, and the staff's estimate of its short-run natural rate, u_t^*. The price gap is defined as 100 times the difference between the log of the core PCE price level, p_t, and the log of the target price-level path, p_t^*. The 2011:Q4 value of p_t^* is set to the 2011:Q4 value of the core PCE price index, and, subsequently, p_t^* is assumed to grow at a 2 percent annual rate.

Simple Rules

Taylor (1993) rule	$R_t = r^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 0.5ygap_t$
Inertial Taylor (1999) rule	$R_t = 0.85R_{t-1} + 0.15(r^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + ygap_t)$
Conditional attenuated rule	$R_t = 0.85R_{t-1} + 0.15(r_t^* + \pi_t + 0.5(\pi_t - \pi^{LR}) + 0.2ygap_t)$
First-difference rule	$R_t = R_{t-1} + 0.5(\pi_{t+3\|t} - \pi^{LR}) + 0.5\Delta^4 ygap_{t+3\|t}$
Flexible price-level targeting rule	$R_t = 0.85R_{t-1} + 0.15(r^{LR} + \pi_t + (p_t - p_t^*) - (u_t - u_t^*))$

The first rule in the table was studied by Taylor (1993). The inertial Taylor (1999) rule features more inertia and a stronger response to resource slack over time compared with the Taylor (1993) rule. Taylor-type rules and rules that depend on a price gap, like the flexible price-level targeting (FPLT) rule, have been featured prominently in analysis by Board staff.[2] The conditional attenuated rule has the same form as the inertial Taylor (1999) rule but responds less strongly to the output gap. The intercepts of the Taylor (1993), inertial Taylor (1999), and FPLT rules, denoted r^{LR}, are constant and chosen so that they are consistent with a 2 percent longer-run inflation objective and an equilibrium real federal funds rate in the longer run of 0.5 percent. The intercept of the conditional attenuated rule, denoted r_t^*, is 0 percent over the next few years and then rises to 0.5 percent over time. The prescriptions of the first-difference rule do not depend on the level of the output gap or the longer-run real interest rate; see Orphanides (2003).

NEAR-TERM PRESCRIPTIONS OF SELECTED POLICY RULES

The "Near-Term Prescriptions of Selected Policy Rules" reported in the first exhibit are calculated taking as given the Tealbook projections for inflation, the output gap, and the unemployment rate gap (measured as the difference between the unemployment rate and the staff's estimate of its short-run natural rate). When the Tealbook is published early in a quarter, the prescriptions are shown for the current and next quarters. When the Tealbook is published late in a quarter, the prescriptions are shown for the next two quarters. In both cases, rules that include a lagged policy rate as a right-hand-side variable use the midpoint of the current target

[2] For applications, see, for example, Erceg and others (2012). An FPLT rule similar to the one above is also analyzed by Chung and others (2015).

range of the federal funds rate as that value in the first quarter shown and then condition on their simulated lagged federal funds rate for the second quarter shown.

A MEDIUM-TERM NOTION OF THE EQUILIBRIUM REAL FEDERAL FUNDS RATE

The bottom panel of the exhibit "Policy Rules and the Staff Projection" provides estimates of one notion of the equilibrium real federal funds rate that uses alternative baseline economic projections: the Tealbook baseline and another one consistent with median responses to the latest Summary of Economic Projections (SEP). The simulations are conducted using the FRB/US model, the staff's large-scale econometric model of the U.S. economy. "FRB/US r^*" is the real federal funds rate that, if maintained over a 12-quarter period (beginning in the current quarter), makes the output gap equal to zero in the final quarter of that period, given either the Tealbook or the SEP-consistent economic projection. This measure depends on a broad array of economic factors, some of which take the form of projected values of the model's exogenous variables.[3] The measure is derived under the assumption that agents in the model form VAR-based expectations—that is, agents use small-scale statistical models so that their expectations of future variables are determined solely by historical relationships.

The "Average projected real federal funds rate" for the Tealbook baseline and the SEP-consistent baseline reported in the panel are the corresponding averages of the real federal funds rate under the Tealbook baseline projection and SEP-consistent projection, respectively, calculated over the same 12-quarter period as the Tealbook-consistent and SEP-consistent FRB/US r^*. For a given economic projection, the average projected real federal funds rates and the FRB/US r^* may be associated with somewhat different macroeconomic outcomes even when their values are identical. The reason is that, in the FRB/US r^* simulation, the real federal funds rate is held constant over the entire 12-quarter period, whereas, in the economic projection, the real federal funds rate can vary over time.

FRB/US MODEL SIMULATIONS

The results presented in the exhibits "Simple Policy Rule Simulations" and "Optimal Control Simulations under Commitment" are derived from dynamic simulations of the FRB/US model. Each simulated policy strategy is assumed to be in force over the whole period covered by the simulation; this period extends several decades beyond the time horizon shown in the exhibits. The simulations are conducted under the assumption that market participants as well as price and wage setters form model-consistent expectations and are predicated on the staff's extended Tealbook projection, which includes the macroeconomic effects of the Committee's balance sheet policies. When the Tealbook is published early in a quarter, all of the simulations begin in that quarter; when the Tealbook is published late in a quarter, all of the simulations begin in the subsequent quarter.

[3] For a discussion of the equilibrium real federal funds rates in the longer run and other concepts of equilibrium interest rates, see Gust and others (2016).

COMPUTATION OF OPTIMAL CONTROL POLICIES UNDER COMMITMENT

The optimal control simulations posit that policymakers choose a path for the federal funds rate to minimize a discounted weighted sum of squared inflation gaps (measured as the difference between four-quarter headline PCE price inflation, π_t^{PCE}, and the Committee's 2 percent objective), squared unemployment gaps ($ugap_t$, measured as the difference between the unemployment rate and the staff's estimate of the short-run natural rate), and squared changes in the federal funds rate R_t. In the following equation, the resulting loss function embeds the assumption that policymakers discount the future using a quarterly discount factor, $\beta = 0.9963$:

$$\boldsymbol{L_t} = \sum_{\boldsymbol{\tau=0}}^{T} \boldsymbol{\beta^{\tau}} \left\{ \lambda_{\pi} \left(\pi_{t+\tau}^{PCE} - \pi^{LR} \right)^{\mathbf{2}} + \lambda_{u,t+\tau} (ugap_{t+\tau})^{\mathbf{2}} + \lambda_R (R_{t+\boldsymbol{\tau}} - R_{t+\boldsymbol{\tau-1}})^{\mathbf{2}} \right\}.$$

The exhibit "Optimal Control Simulations under Commitment" considers two specifications of the weights on the inflation gap, the unemployment gap, and the rate change components of the loss function. The box "Optimal Control and the Loss Function" in the Monetary Policy Strategies section of the June 2016 Tealbook B provides motivations for the specifications of the loss function. The table "Loss Functions" shows the weights used in the two specifications.

Loss Functions

	λ_{π}	$\lambda_{u,t+\tau}$		λ_R
		$ugap_{t+\tau} < 0$	$ugap_{t+\tau} \geq 0$	
Equal weights, short-run natural rate	1	1	1	1
Asymmetric weight, short-run natural weight	1	0	1	1

The first specification, "Equal weights, short-run natural rate," assigns equal weights to all three components at all times. The second specification, "Asymmetric weight, short-run natural rate," uses the same weights as the equal-weights specification whenever the unemployment rate is above the staff's estimate of the short-run natural rate, but it assigns no penalty to the unemployment rate falling below the short-run natural rate. The optimal control policy and associated outcomes depend on the relative (rather than the absolute) values of the weights.

For each of these specifications of the loss function, the optimal control policy is subject to the effective lower bound constraint on nominal interest rates. Policy tools other than the federal funds rate are taken as given and subsumed within the Tealbook baseline. The path chosen by policymakers today is assumed to be credible, meaning that the public sees this path as a binding commitment on policymakers' future decisions; the optimal control policy takes as given the initial lagged value of the federal funds rate but is otherwise unconstrained by policy decisions made before the simulation period.

REFERENCES

Chung, Hess, Edward Herbst, and Michael T. Kiley (2015). "Effective Monetary Policy Strategies in New Keynesian Models: A Reexamination," *NBER Macroeconomics Annual,* vol. 29 (July), pp. 289–344.

Erceg, Christopher, Jon Faust, Michael Kiley, Jean-Philippe Laforte, David López-Salido, Stephen Meyer, Edward Nelson, David Reifschneider, and Robert Tetlow (2012). "An Overview of Simple Policy Rules and Their Use in Policymaking in Normal Times and under Current Conditions," memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, Divisions of International Finance, Monetary Affairs, and Research and Statistics, July 18.

Gust, Christopher, Benjamin K. Johannsen, David López-Salido, and Robert Tetlow (2016). "*r**: Concepts, Measures, and Uses," memorandum to the Federal Open Market Committee, Board of Governors of the Federal Reserve System, Division of Monetary Affairs, October 13.

Orphanides, Athanasios (2003). "Historical Monetary Policy Analysis and the Taylor Rule," *Journal of Monetary Economics,* vol. 50 (July), pp. 983–1022.

Taylor, John B. (1993). "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy,* vol. 39 (December), pp. 195–214.

——— (1999). "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules.* Chicago: University of Chicago Press, pp. 319–41.

Changes in GDP, Prices, and Unemployment
(Percent, annual rate except as noted)

	Nominal GDP		Real GDP		PCE price index		Core PCE price index		Unemployment rate[1]	
Interval	05/29/20	07/16/20	05/29/20	07/16/20	05/29/20	07/16/20	05/29/20	07/16/20	05/29/20	07/16/20
Quarterly										
2019:Q1	3.9	3.9	3.1	3.1	.4	.4	1.1	1.1	3.9	3.9
Q2	4.7	4.7	2.0	2.0	2.4	2.4	1.9	1.9	3.6	3.6
Q3	3.8	3.8	2.1	2.1	1.5	1.5	2.1	2.1	3.6	3.6
Q4	3.5	3.5	2.1	2.1	1.4	1.4	1.3	1.3	3.5	3.5
2020:Q1	-3.9	-3.4	-5.0	-5.0	1.3	1.3	1.6	1.7	3.8	3.8
Q2	-41.5	-34.1	-41.0	-33.2	-1.6	-1.6	-.9	-.9	14.8	13.0
Q3	25.8	17.4	24.1	15.2	1.9	2.8	1.8	2.0	9.9	10.3
Q4	8.9	10.4	7.0	8.7	1.8	1.7	1.9	1.8	9.3	8.9
2021:Q1	8.7	9.1	6.9	7.2	1.7	1.8	1.8	1.9	8.6	7.8
Q2	8.5	7.7	6.7	5.8	1.6	1.7	1.5	1.8	7.6	6.7
Q3	8.3	5.9	6.6	4.0	1.6	1.7	1.5	1.7	6.6	5.9
Q4	8.2	5.3	6.5	3.5	1.6	1.7	1.5	1.6	5.7	5.4
Two-quarter[2]										
2019:Q2	4.3	4.3	2.6	2.6	1.4	1.4	1.5	1.5	-.2	-.2
Q4	3.7	3.7	2.1	2.1	1.4	1.4	1.7	1.7	-.1	-.1
2020:Q2	-25.0	-20.2	-25.1	-20.3	-.2	-.2	.3	.4	11.3	9.5
Q4	17.1	13.9	15.3	11.9	1.8	2.2	1.9	1.9	-5.5	-4.1
2021:Q2	8.6	8.4	6.8	6.5	1.7	1.8	1.6	1.8	-1.7	-2.2
Q4	8.3	5.6	6.5	3.8	1.6	1.7	1.5	1.7	-1.9	-1.3
Four-quarter[3]										
2018:Q4	4.9	4.9	2.5	2.5	1.9	1.9	1.9	1.9	-.3	-.3
2019:Q4	4.0	4.0	2.3	2.3	1.4	1.4	1.6	1.6	-.3	-.3
2020:Q4	-6.3	-4.7	-7.1	-5.6	.8	1.0	1.1	1.1	5.8	5.4
2021:Q4	8.4	7.0	6.7	5.1	1.6	1.7	1.6	1.7	-3.6	-3.5
2022:Q4	5.5	4.7	3.6	2.9	1.7	1.7	1.7	1.7	-1.2	-.7
Annual										
2018	5.4	5.4	2.9	2.9	2.1	2.1	1.9	1.9	3.9	3.9
2019	4.1	4.1	2.3	2.3	1.4	1.4	1.6	1.6	3.7	3.7
2020	-6.0	-4.5	-6.9	-5.5	.9	1.1	1.2	1.2	9.4	9.0
2021	6.3	6.0	4.8	4.4	1.5	1.7	1.5	1.6	7.1	6.5
2022	6.5	5.2	4.7	3.4	1.7	1.7	1.6	1.7	4.9	4.9

1. Level, except for two-quarter and four-quarter intervals.
2. Percent change from two quarters earlier; for unemployment rate, change is in percentage points.
3. Percent change from four quarters earlier; for unemployment rate, change is in percentage points.

Changes in Real Gross Domestic Product and Related Items
(Percent, annual rate except as noted)

Item	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2019[1]	2020[1]	2021[1]	2022[1]
Real GDP	2.0	2.1	2.1	-5.0	-33.2	15.2	8.7	7.2	5.8	4.0	3.5	2.3	-5.6	5.1	2.9
Previous Tealbook	*2.0*	*2.1*	*2.1*	*-5.0*	*-41.0*	*24.1*	*7.0*	*6.9*	*6.7*	*6.6*	*6.5*	*2.3*	*-7.1*	*6.7*	*3.6*
Final sales	3.0	2.1	3.1	-3.5	-30.7	13.8	5.6	6.3	5.0	3.6	3.2	2.7	-5.3	4.5	2.5
Previous Tealbook	*3.0*	*2.1*	*3.1*	*-3.6*	*-37.7*	*25.3*	*5.5*	*6.0*	*5.4*	*5.0*	*4.6*	*2.7*	*-5.6*	*5.2*	*2.6*
Priv. dom. final purch.	3.3	2.3	1.3	-5.7	-34.6	15.1	8.3	7.9	6.4	4.9	4.5	2.1	-6.4	5.9	3.5
Previous Tealbook	*3.3*	*2.3*	*1.3*	*-5.9*	*-45.3*	*31.1*	*6.7*	*7.5*	*7.4*	*6.9*	*6.7*	*2.1*	*-7.9*	*7.1*	*3.8*
Personal cons. expend.	4.6	3.1	1.8	-6.8	-35.2	21.4	8.4	7.1	5.3	4.4	4.3	2.7	-5.6	5.3	3.1
Previous Tealbook	*4.6*	*3.1*	*1.8*	*-6.8*	*-45.2*	*46.4*	*4.6*	*5.2*	*5.3*	*5.0*	*5.1*	*2.7*	*-5.9*	*5.1*	*3.1*
Durables	13.0	8.1	2.8	-13.8	-9.7	54.2	5.3	-1.0	-3.5	-5.0	-4.0	5.9	6.0	-3.4	1.1
Nondurables	6.5	3.9	-.6	8.0	-19.5	25.6	5.7	-1.4	-4.6	-7.1	-5.1	3.0	3.7	-4.6	3.4
Services	2.8	2.2	2.4	-9.8	-42.5	15.3	9.8	11.5	10.2	9.7	8.5	2.1	-10.0	10.0	3.3
Residential investment	-3.0	4.6	6.5	18.2	-39.6	8.5	14.3	13.0	6.4	1.9	.8	1.7	-3.0	5.4	3.6
Previous Tealbook	*-3.0*	*4.6*	*6.5*	*18.5*	*-62.2*	*-23.8*	*36.9*	*33.4*	*23.4*	*11.8*	*12.8*	*1.7*	*-17.3*	*20.0*	*8.3*
Nonres. priv. fixed invest.	-1.0	-2.3	-2.4	-6.4	-30.0	-11.5	6.0	11.0	12.5	9.0	7.2	-.4	-11.5	9.9	5.2
Previous Tealbook	*-1.0*	*-2.3*	*-2.4*	*-7.8*	*-39.8*	*-16.4*	*11.6*	*13.7*	*15.6*	*15.8*	*14.1*	*-.4*	*-15.2*	*14.8*	*6.1*
Equipment & intangibles	2.1	-.1	-1.1	-8.7	-28.5	-7.6	9.3	11.4	12.4	8.7	7.2	1.3	-9.9	9.9	5.6
Previous Tealbook	*2.1*	*-.1*	*-1.1*	*-8.9*	*-35.3*	*-20.9*	*14.9*	*14.2*	*17.2*	*15.5*	*15.1*	*1.3*	*-14.5*	*15.5*	*5.8*
Nonres. structures	-11.1	-9.9	-7.2	2.6	-35.1	-25.0	-6.3	9.3	12.9	10.5	6.9	-6.2	-17.3	9.8	3.6
Previous Tealbook	*-11.1*	*-9.9*	*-7.2*	*-3.9*	*-54.5*	*3.8*	*.2*	*11.8*	*9.7*	*17.0*	*10.0*	*-6.2*	*-17.9*	*12.1*	*7.3*
Net exports[2]	-981	-990	-901	-817	-836	-819	-894	-924	-953	-985	-1000	-954	-841	-966	-1038
Previous Tealbook[2]	*-981*	*-990*	*-901*	*-816*	*-623*	*-671*	*-660*	*-675*	*-716*	*-769*	*-803*	*-954*	*-692*	*-740*	*-863*
Exports	-5.7	1.0	2.1	-9.0	-67.6	43.6	20.3	12.2	8.9	14.0	16.4	.3	-15.5	12.9	4.4
Imports	.0	1.8	-8.4	-15.7	-54.5	25.7	26.4	12.8	10.2	14.0	13.3	-2.1	-11.6	12.6	5.0
Gov't. cons. & invest.	4.8	1.7	2.5	1.1	1.8	3.3	-.6	.5	.1	-.7	-3.0	3.0	1.4	-.8	-1.5
Previous Tealbook	*4.8*	*1.7*	*2.5*	*.8*	*1.8*	*3.7*	*-2.4*	*-.1*	*-.9*	*.5*	*-2.9*	*3.0*	*1.0*	*-.9*	*-1.7*
Federal	8.3	3.3	3.4	2.0	26.5	8.7	-3.1	-.8	-.1	1.1	-2.4	4.3	8.0	-.6	-2.3
Defense	3.3	2.2	4.4	1.1	2.4	2.1	2.1	.8	.8	.8	.1	4.4	1.9	.6	.7
Nondefense	16.1	5.0	1.9	3.3	68.7	17.6	-9.2	-2.8	-1.2	1.5	-5.5	4.1	16.8	-2.0	-6.1
State & local	2.7	.7	2.0	.5	-11.4	-.3	1.1	1.4	.3	-1.9	-3.4	2.2	-2.6	-.9	-1.0
Change in priv. inventories[2]	69	69	13	-75	-248	-196	-49	-6	34	55	74	67	-142	39	138
Previous Tealbook[2]	*69*	*69*	*13*	*-67*	*-313*	*-377*	*-313*	*-275*	*-215*	*-139*	*-41*	*67*	*-267*	*-167*	*90*

1. Change from fourth quarter of previous year to fourth quarter of year indicated.
2. Billions of chained (2012) dollars; annual values show annual averages.

Changes in Real Gross Domestic Product and Related Items
(Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise noted)

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Real GDP	2.6	2.9	1.9	2.0	2.8	2.5	2.3	-5.6	5.1	2.9
Previous Tealbook	*2.6*	*2.9*	*1.9*	*2.0*	*2.8*	*2.5*	*2.3*	*-7.1*	*6.7*	*3.6*
Final sales	2.0	3.2	1.8	2.2	2.9	2.2	2.7	-5.3	4.5	2.5
Previous Tealbook	*2.0*	*3.2*	*1.8*	*2.2*	*2.9*	*2.2*	*2.7*	*-5.6*	*5.2*	*2.6*
Priv. dom. final purch.	2.6	4.5	2.5	2.8	3.4	2.8	2.1	-6.4	5.9	3.5
Previous Tealbook	*2.6*	*4.5*	*2.5*	*2.8*	*3.4*	*2.8*	*2.1*	*-7.9*	*7.1*	*3.8*
Personal cons. expend.	1.9	3.8	2.9	2.8	2.9	2.6	2.7	-5.6	5.3	3.1
Previous Tealbook	*1.9*	*3.8*	*2.9*	*2.8*	*2.9*	*2.6*	*2.7*	*-5.9*	*5.1*	*3.1*
Durables	5.0	9.2	5.8	7.3	7.7	3.8	5.9	6.0	-3.4	1.1
Nondurables	2.8	3.2	2.8	1.8	3.7	2.5	3.0	3.7	-4.6	3.4
Services	1.1	3.2	2.5	2.4	2.0	2.5	2.1	-10.0	10.0	3.3
Residential investment	7.1	7.7	9.1	3.9	4.2	-4.4	1.7	-3.0	5.4	3.6
Previous Tealbook	*7.1*	*7.7*	*9.1*	*3.9*	*4.2*	*-4.4*	*1.7*	*-17.3*	*20.0*	*8.3*
Nonres. priv. fixed invest.	5.4	6.9	-.9	2.4	5.4	5.9	-.4	-11.5	9.9	5.2
Previous Tealbook	*5.4*	*6.9*	*-.9*	*2.4*	*5.4*	*5.9*	*-.4*	*-15.2*	*14.8*	*6.1*
Equipment & intangibles	5.1	6.1	2.3	1.9	6.6	6.8	1.3	-9.9	9.9	5.6
Previous Tealbook	5.1	6.1	2.3	1.9	6.6	6.8	1.3	-14.5	15.5	5.8
Nonres. structures	6.7	9.3	-10.9	4.3	1.5	2.6	-6.2	-17.3	9.8	3.6
Previous Tealbook	*6.7*	*9.3*	*-10.9*	*4.3*	*1.5*	*2.6*	*-6.2*	*-17.9*	*12.1*	*7.3*
Net exports[1]	-533	-577	-722	-784	-850	-920	-954	-841	-966	-1038
Previous Tealbook[1]	*-533*	*-577*	*-722*	*-784*	*-850*	*-920*	*-954*	*-692*	*-740*	*-863*
Exports	6.0	2.9	-1.5	1.1	5.5	.4	.3	-15.5	12.9	4.4
Imports	3.0	6.5	3.2	3.4	5.6	3.2	-2.1	-11.6	12.6	5.0
Gov't. cons. & invest.	-2.4	.3	2.3	1.5	.8	1.5	3.0	1.4	-.8	-1.5
Previous Tealbook	*-2.4*	*.3*	*2.3*	*1.5*	*.8*	*1.5*	*3.0*	*1.0*	*-.9*	*-1.7*
Federal	-6.1	-1.1	1.1	.1	1.7	2.7	4.3	8.0	-.6	-2.3
Defense	-6.5	-3.4	-.4	-.8	1.9	4.0	4.4	1.9	.6	.7
Nondefense	-5.5	2.7	3.4	1.5	1.4	.7	4.1	16.8	-2.0	-6.1
State & local	.2	1.2	3.0	2.3	.4	.9	2.2	-2.6	-.9	-1.0
Change in priv. inventories[1]	109	86	132	23	32	48	67	-142	39	138
Previous Tealbook[1]	*109*	*86*	*132*	*23*	*32*	*48*	*67*	*-267*	*-167*	*90*

1. Billions of chained (2012) dollars; annual values show annual averages.

Contributions to Changes in Real Gross Domestic Product
(Percentage points, annual rate except as noted)

Item	2019			2020				2021				2019[1]	2020[1]	2021[1]	2022[1]
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Real GDP	2.0	2.1	2.1	-5.0	-33.2	15.2	8.7	7.2	5.8	4.0	3.5	2.3	-5.6	5.1	2.9
Previous Tealbook	*2.0*	*2.1*	*2.1*	*-5.0*	*-41.0*	*24.1*	*7.0*	*6.9*	*6.7*	*6.6*	*6.5*	*2.3*	*-7.1*	*6.7*	*3.6*
Final sales	2.9	2.1	3.1	-3.4	-29.8	14.2	5.8	6.4	5.0	3.6	3.2	2.7	-5.3	4.5	2.5
Previous Tealbook	*2.9*	*2.1*	*3.1*	*-3.6*	*-36.3*	*25.6*	*5.7*	*6.2*	*5.5*	*5.1*	*4.7*	*2.7*	*-5.6*	*5.3*	*2.6*
Priv. dom. final purch.	2.8	2.0	1.2	-4.9	-29.8	12.8	7.0	6.7	5.4	4.2	3.8	1.8	-5.4	5.0	2.9
Previous Tealbook	*2.8*	*2.0*	*1.2*	*-5.1*	*-40.5*	*25.0*	*5.7*	*6.3*	*6.2*	*5.8*	*5.7*	*1.8*	*-6.7*	*6.0*	*3.2*
Personal cons. expend.	3.0	2.1	1.2	-4.7	-24.3	13.9	5.7	4.8	3.6	3.0	2.9	1.8	-3.8	3.6	2.1
Previous Tealbook	*3.0*	*2.1*	*1.2*	*-4.7*	*-32.2*	*27.9*	*3.3*	*3.7*	*3.6*	*3.5*	*3.5*	*1.8*	*-4.0*	*3.5*	*2.1*
Durables	.9	.6	.2	-1.0	-.3	3.4	.4	-.1	-.3	-.4	-.3	.4	.4	-.3	.1
Nondurables	.9	.5	-.1	1.1	-2.2	3.6	.9	-.2	-.7	-1.0	-.7	.4	.5	-.7	.5
Services	1.3	1.0	1.1	-4.8	-21.8	6.9	4.4	5.1	4.6	4.4	3.9	1.0	-4.7	4.5	1.6
Residential investment	-.1	.2	.2	.7	-1.7	.4	.5	.5	.3	.1	.0	.1	-.1	.2	.1
Previous Tealbook	*-.1*	*.2*	*.2*	*.7*	*-3.1*	*-.9*	*1.0*	*1.0*	*.8*	*.4*	*.5*	*.1*	*-.7*	*.7*	*.3*
Nonres. priv. fixed invest.	-.1	-.3	-.3	-.9	-3.8	-1.5	.8	1.3	1.5	1.1	.9	.0	-1.5	1.2	.7
Previous Tealbook	*-.1*	*-.3*	*-.3*	*-1.1*	*-5.1*	*-2.1*	*1.3*	*1.6*	*1.8*	*1.9*	*1.7*	*.0*	*-2.0*	*1.8*	*.8*
Equipment & intangibles	.2	.0	-.1	-.9	-2.8	-.7	.9	1.1	1.2	.8	.7	.1	-1.0	1.0	.6
Previous Tealbook	*.2*	*.0*	*-.1*	*-.9*	*-3.3*	*-2.2*	*1.3*	*1.3*	*1.6*	*1.5*	*1.5*	*.1*	*-1.5*	*1.5*	*.6*
Nonres. structures	-.4	-.3	-.2	.1	-1.0	-.8	-.2	.2	.3	.3	.2	-.2	-.5	.2	.1
Previous Tealbook	*-.4*	*-.3*	*-.2*	*-.1*	*-1.8*	*.1*	*.0*	*.3*	*.2*	*.4*	*.3*	*-.2*	*-.5*	*.3*	*.2*
Net exports	-.7	-.1	1.5	1.3	-1.3	.6	-1.2	-.4	-.4	-.4	-.1	.4	-.1	-.3	-.2
Previous Tealbook	*-.7*	*-.1*	*1.5*	*1.3*	*2.4*	*-.4*	*.5*	*-.1*	*-.6*	*-.8*	*-.5*	*.4*	*.9*	*-.5*	*-.3*
Exports	-.7	.1	.2	-1.1	-10.6	3.5	1.9	1.2	.9	1.3	1.6	.0	-1.8	1.3	.5
Imports	.0	-.3	1.3	2.4	9.3	-2.9	-3.0	-1.6	-1.3	-1.8	-1.7	.3	1.6	-1.6	-.7
Gov't. cons. & invest.	.8	.3	.4	.2	1.4	.8	-.1	.1	.0	-.1	-.5	.5	.2	-.1	-.3
Previous Tealbook	*.8*	*.3*	*.4*	*.2*	*2.0*	*1.1*	*-.4*	*.0*	*-.1*	*.1*	*-.5*	*.5*	*.2*	*-.2*	*-.3*
Federal	.5	.2	.2	.1	2.1	.7	-.2	.0	.0	.1	-.2	.3	.5	.0	-.2
Defense	.1	.1	.2	.1	.3	.1	.1	.0	.0	.0	.0	.2	.1	.0	.0
Nondefense	.4	.1	.1	.1	1.7	.6	-.3	-.1	.0	.1	-.2	.1	.5	-.1	-.2
State & local	.3	.1	.2	.1	-.7	.1	.2	.2	.0	-.2	-.4	.2	-.3	-.1	-.1
Change in priv. inventories	-.9	.0	-1.0	-1.6	-3.3	1.1	2.9	.9	.8	.4	.4	-.4	-.3	.6	.4
Previous Tealbook	*-.9*	*.0*	*-1.0*	*-1.4*	*-4.7*	*-1.4*	*1.3*	*.7*	*1.2*	*1.4*	*1.8*	*-.4*	*-1.5*	*1.3*	*1.0*

1. Change from fourth quarter of previous year to fourth quarter of year indicated.

Changes in Prices and Costs
(Percent, annual rate except as noted)

Item	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2019[1]	2020[1]	2021[1]	2022[1]
GDP chain-wt. price index	2.4	1.8	1.3	1.4	-.9	1.9	1.6	1.8	1.8	1.8	1.7	1.6	1.0	1.8	1.8
Previous Tealbook	*2.4*	*1.8*	*1.3*	*1.4*	*-.8*	*1.3*	*1.8*	*1.6*	*1.7*	*1.7*	*1.6*	*1.6*	*.9*	*1.6*	*1.8*
PCE chain-wt. price index	2.4	1.5	1.4	1.3	-1.6	2.8	1.7	1.8	1.7	1.7	1.7	1.4	1.0	1.7	1.7
Previous Tealbook	*2.4*	*1.5*	*1.4*	*1.3*	*-1.6*	*1.9*	*1.8*	*1.7*	*1.6*	*1.6*	*1.6*	*1.4*	*.8*	*1.6*	*1.7*
Energy	18.4	-8.2	4.9	-10.0	-43.3	21.2	1.7	3.5	3.0	2.8	2.4	-1.3	-10.9	2.9	2.2
Previous Tealbook	*18.4*	*-8.2*	*4.9*	*-10.1*	*-42.2*	*7.0*	*1.5*	*4.4*	*4.3*	*3.6*	*2.8*	*-1.3*	*-13.3*	*3.8*	*2.9*
Food	.6	-.5	.5	3.1	15.8	4.0	.6	.5	.7	1.9	2.0	.9	5.7	1.3	2.0
Previous Tealbook	*.6*	*-.5*	*.5*	*3.1*	*14.4*	*1.2*	*.3*	*.5*	*.7*	*1.9*	*2.0*	*.9*	*4.6*	*1.3*	*2.0*
Ex. food & energy	1.9	2.1	1.3	1.7	-.9	2.0	1.8	1.9	1.8	1.7	1.6	1.6	1.1	1.7	1.7
Previous Tealbook	*1.9*	*2.1*	*1.3*	*1.6*	*-.9*	*1.8*	*1.9*	*1.8*	*1.5*	*1.5*	*1.5*	*1.6*	*1.1*	*1.6*	*1.7*
Ex. food & energy, market based	1.4	1.8	1.1	1.8	.1	1.7	1.6	1.8	1.6	1.5	1.5	1.5	1.3	1.6	1.6
Previous Tealbook	*1.4*	*1.8*	*1.1*	*1.7*	*-.1*	*1.7*	*1.7*	*1.6*	*1.4*	*1.4*	*1.3*	*1.5*	*1.2*	*1.4*	*1.5*
CPI	3.0	1.8	2.4	1.2	-3.5	3.5	1.9	2.0	1.9	2.0	2.0	2.0	.7	2.0	2.0
Previous Tealbook	*3.0*	*1.8*	*2.4*	*1.2*	*-3.4*	*2.5*	*2.2*	*1.8*	*1.7*	*1.7*	*1.7*	*2.0*	*.6*	*1.7*	*2.0*
Ex. food & energy	2.2	2.8	2.0	2.0	-1.6	2.1	2.0	2.0	1.9	1.9	1.9	2.3	1.1	1.9	2.0
Previous Tealbook	*2.2*	*2.8*	*2.0*	*2.0*	*-1.4*	*2.4*	*2.4*	*1.7*	*1.6*	*1.5*	*1.5*	*2.3*	*1.3*	*1.6*	*1.9*
ECI, hourly compensation[2]	2.4	3.0	2.6	3.2	1.0	1.2	1.3	1.7	2.0	2.1	2.1	2.7	1.7	2.0	2.1
Previous Tealbook[2]	*2.4*	*3.0*	*2.6*	*3.2*	*1.0*	*1.2*	*1.3*	*1.7*	*1.7*	*1.8*	*1.8*	*2.7*	*1.7*	*1.8*	*2.2*
Business sector															
Output per hour	3.0	-.4	1.0	-.6	8.7	-4.4	.6	1.3	1.4	-.6	.1	1.9	1.0	.5	.7
Previous Tealbook	*3.0*	*-.4*	*1.0*	*-5.5*	*8.0*	*.1*	*-.6*	*.8*	*.1*	*.2*	*1.9*	*1.9*	*.4*	*.7*	*1.1*
Compensation per hour	3.0	.0	3.2	5.0	17.0	-14.0	.2	.9	1.9	2.3	2.4	4.0	1.4	1.9	2.9
Previous Tealbook	*3.0*	*.0*	*3.2*	*2.3*	*15.0*	*-11.5*	*1.0*	*1.5*	*1.5*	*1.5*	*1.5*	*4.0*	*1.3*	*1.5*	*3.2*
Unit labor costs	.1	.3	2.2	5.6	7.7	-10.0	-.4	-.4	.5	2.9	2.3	2.0	.5	1.3	2.2
Previous Tealbook	*.1*	*.3*	*2.2*	*8.2*	*6.5*	*-11.6*	*1.6*	*.7*	*1.4*	*1.3*	*-.4*	*2.0*	*.8*	*.7*	*2.1*
Core goods imports chain-wt. price index[3]	-.6	-1.0	-1.2	1.9	-2.1	-1.6	1.7	1.3	1.3	1.0	1.0	-1.1	.0	1.2	1.0
Previous Tealbook[3]	*-.6*	*-1.0*	*-1.2*	*1.9*	*-3.4*	*-3.2*	*.9*	*1.0*	*1.3*	*1.2*	*1.2*	*-1.1*	*-1.0*	*1.2*	*1.0*

1. Change from fourth quarter of previous year to fourth quarter of year indicated.
2. Private-industry workers.
3. Core goods imports exclude computers, semiconductors, oil, and natural gas.

Changes in Prices and Costs

(Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise noted)

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
GDP chain-wt. price index	1.8	1.5	.9	1.5	2.0	2.3	1.6	1.0	1.8	1.8
Previous Tealbook	*1.8*	*1.5*	*.9*	*1.5*	*2.0*	*2.3*	*1.6*	*.9*	*1.6*	*1.8*
PCE chain-wt. price index	1.2	1.1	.3	1.5	1.8	1.9	1.4	1.0	1.7	1.7
Previous Tealbook	*1.2*	*1.1*	*.3*	*1.5*	*1.8*	*1.9*	*1.4*	*.8*	*1.6*	*1.7*
Energy	-2.9	-7.1	-16.4	2.0	8.0	3.9	-1.3	-10.9	2.9	2.2
Previous Tealbook	*-2.9*	*-7.1*	*-16.4*	*2.0*	*8.0*	*3.9*	*-1.3*	*-13.3*	*3.8*	*2.9*
Food	.7	2.8	.3	-1.8	.7	.5	.9	5.7	1.3	2.0
Previous Tealbook	*.7*	*2.8*	*.3*	*-1.8*	*.7*	*.5*	*.9*	*4.6*	*1.3*	*2.0*
Ex. food & energy	1.6	1.5	1.2	1.8	1.7	1.9	1.6	1.1	1.7	1.7
Previous Tealbook	*1.6*	*1.5*	*1.2*	*1.8*	*1.7*	*1.9*	*1.6*	*1.1*	*1.6*	*1.7*
Ex. food & energy, market based	1.1	1.1	1.1	1.4	1.2	1.7	1.5	1.3	1.6	1.6
Previous Tealbook	*1.1*	*1.1*	*1.1*	*1.4*	*1.2*	*1.7*	*1.5*	*1.2*	*1.4*	*1.5*
CPI	1.2	1.2	.4	1.8	2.1	2.2	2.0	.7	2.0	2.0
Previous Tealbook	*1.2*	*1.2*	*.4*	*1.8*	*2.1*	*2.2*	*2.0*	*.6*	*1.7*	*2.0*
Ex. food & energy	1.7	1.7	2.0	2.2	1.8	2.2	2.3	1.1	1.9	2.0
Previous Tealbook	*1.7*	*1.7*	*2.0*	*2.2*	*1.8*	*2.2*	*2.3*	*1.3*	*1.6*	*1.9*
ECI, hourly compensation[1]	2.0	2.3	1.9	2.2	2.6	3.0	2.7	1.7	2.0	2.1
Previous Tealbook[1]	*2.0*	*2.3*	*1.9*	*2.2*	*2.6*	*3.0*	*2.7*	*1.7*	*1.8*	*2.2*
Business sector										
Output per hour	1.8	.3	.7	1.3	1.1	1.4	1.9	1.0	.5	.7
Previous Tealbook	*1.8*	*.3*	*.7*	*1.3*	*1.1*	*1.4*	*1.9*	*.4*	*.7*	*1.1*
Compensation per hour	-.3	3.0	2.4	2.0	3.8	2.4	4.0	1.4	1.9	2.9
Previous Tealbook	*-.3*	*3.0*	*2.4*	*2.0*	*3.8*	*2.4*	*4.0*	*1.3*	*1.5*	*3.2*
Unit labor costs	-2.0	2.7	1.7	.8	2.6	1.0	2.0	.5	1.3	2.2
Previous Tealbook	*-2.0*	*2.7*	*1.7*	*.8*	*2.6*	*1.0*	*2.0*	*.8*	*.7*	*2.1*
Core goods imports chain-wt. price index[2]	-2.2	-.4	-4.3	-.9	.9	.2	-1.1	.0	1.2	1.0
Previous Tealbook[2]	*-2.2*	*-.4*	*-4.3*	*-.9*	*.9*	*.2*	*-1.1*	*-1.0*	*1.2*	*1.0*

1. Private-industry workers.
2. Core goods imports exclude computers, semiconductors, oil, and natural gas.

Other Macroeconomic Indicators

Item	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2019[1]	2020[1]	2021[1]	2022[1]
Employment and production															
Nonfarm payroll employment[2]	159	203	210	-303	-4,429	974	905	657	566	527	334	178	-713	521	244
Unemployment rate[3]	3.6	3.6	3.5	3.8	13.0	10.3	8.9	7.8	6.7	5.9	5.4	3.5	8.9	5.4	4.7
Previous Tealbook[3]	*3.6*	*3.6*	*3.5*	*3.8*	*14.8*	*9.9*	*9.3*	*8.6*	*7.6*	*6.6*	*5.7*	*3.5*	*9.3*	*5.7*	*4.5*
Natural rate of unemployment[3]	4.4	4.4	4.3	4.4	9.4	7.0	6.3	5.9	5.6	5.2	4.9	4.3	6.3	4.9	4.7
Previous Tealbook[3]	*4.4*	*4.4*	*4.3*	*4.4*	*10.3*	*7.0*	*6.3*	*5.9*	*5.6*	*5.2*	*4.9*	*4.3*	*6.3*	*4.9*	*4.7*
Employment-to-Population Ratio[3]	60.6	60.8	61.0	60.8	52.9	55.5	56.6	57.3	58.1	58.6	58.9	61.0	56.6	58.9	59.6
Employment-to-Population Trend[3]	60.2	60.3	60.3	60.1	55.7	57.7	58.3	58.6	58.9	59.3	59.5	60.3	58.3	59.5	59.7
Output gap[4]	1.4	1.4	1.5	-.1	-5.1	-5.1	-3.4	-2.3	-1.4	-1.0	-.8	1.5	-3.4	-.8	.2
Previous Tealbook[4]	*1.4*	*1.4*	*1.5*	*-.1*	*-6.9*	*-6.2*	*-5.0*	*-3.9*	*-2.9*	*-1.9*	*-1.0*	*1.5*	*-5.0*	*-1.0*	*.7*
Industrial production[5]	-2.3	1.1	.4	-6.8	-42.6	29.7	6.9	4.8	4.5	4.2	3.5	-.7	-7.2	4.2	2.7
Previous Tealbook[5]	*-2.3*	*1.1*	*.4*	*-7.1*	*-47.8*	*14.3*	*6.9*	*7.4*	*8.7*	*8.3*	*7.4*	*-.7*	*-12.2*	*7.9*	*4.9*
Manufacturing industr. prod.[5]	-3.3	.7	-.5	-5.5	-47.0	43.3	10.8	6.0	5.3	4.6	4.1	-1.2	-5.6	5.0	3.1
Previous Tealbook[5]	*-3.3*	*.7*	*-.5*	*-6.2*	*-53.2*	*23.5*	*10.5*	*9.6*	*9.9*	*9.9*	*8.5*	*-1.2*	*-12.0*	*9.5*	*5.6*
Capacity utilization rate - mfg.[3]	75.5	75.4	75.0	73.9	63.1	69.1	71.0	72.0	72.9	73.7	74.4	75.0	71.0	74.4	76.5
Previous Tealbook[3]	*75.5*	*75.4*	*75.0*	*73.6*	*60.8*	*64.0*	*65.5*	*67.1*	*68.7*	*70.4*	*71.9*	*75.0*	*65.5*	*71.9*	*76.0*
Housing starts[6]	1.3	1.3	1.4	1.5	1.0	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3
Light motor vehicle sales[6]	17.0	17.0	16.7	15.0	11.4	13.1	13.8	14.2	14.4	14.8	15.2	17.0	13.3	14.6	16.2
Income and saving															
Nominal GDP[5]	4.7	3.8	3.5	-3.4	-34.1	17.4	10.4	9.1	7.7	5.9	5.3	4.0	-4.7	7.0	4.7
Real disposable pers. income[5]	1.5	2.1	2.1	.9	79.3	-29.3	-15.7	-10.2	-1.4	3.2	.1	2.6	1.9	-2.2	2.8
Previous Tealbook[5]	*1.5*	*2.1*	*2.1*	*.8*	*75.1*	*-40.2*	*-12.6*	*2.2*	*-.7*	*3.5*	*-.3*	*2.6*	*-2.0*	*1.2*	*2.8*
Personal saving rate[3]	7.8	7.7	7.7	9.6	29.6	19.5	14.4	10.6	9.1	8.9	8.0	7.7	14.4	8.0	7.9
Previous Tealbook[3]	*7.8*	*7.7*	*7.7*	*9.6*	*31.9*	*15.2*	*11.3*	*10.7*	*9.4*	*9.1*	*8.0*	*7.7*	*11.3*	*8.0*	*7.7*
Corporate profits[7]	16.0	-.9	10.6	-40.9	1.8	-63.6	53.9	44.8	1.9	9.8	5.3	2.2	-23.8	14.3	8.0
Profit share of GNP[3]	9.6	9.5	9.7	8.6	9.6	7.1	7.8	8.3	8.2	8.3	8.3	9.7	7.8	8.3	8.6
Gross national saving rate[3]	17.9	17.5	17.7	17.8	12.8	11.7	14.0	15.2	15.6	15.6	15.7	17.7	14.0	15.7	16.1
Net national saving rate[3]	2.3	1.9	2.1	1.8	-5.8	-6.6	-3.4	-1.9	-1.1	-.9	-.7	2.1	-3.4	-.7	-.1

1. Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise indicated.
2. Average monthly change, thousands.
3. Percent; annual values are for the fourth quarter of the year indicated.
4. Percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. Annual values are for the fourth quarter of the year indicated.
5. Percent change, annual rate.
6. Level, millions; annual values are annual averages.
7. Percent change, annual rate, with inventory valuation and capital consumption adjustments.

Other Macroeconomic Indicators

(Change from fourth quarter of previous year to fourth quarter of year indicated, unless otherwise noted)

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Employment and production										
Nonfarm payroll employment[1]	192	250	227	195	176	193	178	-713	521	244
Unemployment rate[2]	7.0	5.7	5.0	4.8	4.1	3.8	3.5	8.9	5.4	4.7
Previous Tealbook[2]	*7.0*	*5.7*	*5.0*	*4.8*	*4.1*	*3.8*	*3.5*	*9.3*	*5.7*	*4.5*
Natural rate of unemployment[2]	5.4	5.1	4.9	4.8	4.6	4.5	4.3	6.3	4.9	4.7
Previous Tealbook[2]	*5.4*	*5.1*	*4.9*	*4.8*	*4.6*	*4.5*	*4.3*	*6.3*	*4.9*	*4.7*
Employment-to-Population Ratio[2]	58.5	59.3	59.4	59.7	60.1	60.6	61.0	56.6	58.9	59.6
Employment-to-Population Trend[2]	60.4	60.3	60.2	60.2	60.2	60.2	60.3	58.3	59.5	59.7
Output gap[3]	-3.0	-1.0	-.5	-.3	.6	1.3	1.5	-3.4	-.8	.2
Previous Tealbook[3]	*-3.0*	*-1.0*	*-.5*	*-.3*	*.6*	*1.3*	*1.5*	*-5.0*	*-1.0*	*.7*
Industrial production	2.3	3.4	-3.4	-.3	3.6	4.0	-.7	-7.2	4.2	2.7
Previous Tealbook	*2.3*	*3.4*	*-3.4*	*-.3*	*3.6*	*4.0*	*-.7*	*-12.2*	*7.9*	*4.9*
Manufacturing industr. prod.	1.1	1.4	-1.7	.3	2.5	2.2	-1.2	-5.6	5.0	3.1
Previous Tealbook	*1.1*	*1.4*	*-1.7*	*.3*	*2.5*	*2.2*	*-1.2*	*-12.0*	*9.5*	*5.6*
Capacity utilization rate - mfg.[2]	74.5	75.8	74.9	74.2	75.8	77.0	75.0	71.0	74.4	76.5
Previous Tealbook[2]	*74.5*	*75.8*	*74.9*	*74.2*	*75.8*	*77.0*	*75.0*	*65.5*	*71.9*	*76.0*
Housing starts[4]	.9	1.0	1.1	1.2	1.2	1.2	1.3	1.2	1.3	1.3
Light motor vehicle sales[4]	15.5	16.5	17.4	17.5	17.1	17.2	17.0	13.3	14.6	16.2
Income and saving										
Nominal GDP	4.4	4.5	2.8	3.5	4.9	4.9	4.0	-4.7	7.0	4.7
Real disposable pers. income	-2.5	5.3	3.0	1.6	3.4	3.9	2.6	1.9	-2.2	2.8
Previous Tealbook	*-2.5*	*5.3*	*3.0*	*1.6*	*3.4*	*3.9*	*2.6*	*-2.0*	*1.2*	*2.8*
Personal saving rate[2]	6.3	7.5	7.5	6.5	6.8	7.8	7.7	14.4	8.0	7.9
Previous Tealbook[2]	*6.3*	*7.5*	*7.5*	*6.5*	*6.8*	*7.8*	*7.7*	*11.3*	*8.0*	*7.7*
Corporate profits[5]	3.9	6.7	-10.8	3.3	-.6	4.2	2.2	-23.8	14.3	8.0
Profit share of GNP[2]	11.8	12.1	10.5	10.5	9.9	9.9	9.7	7.8	8.3	8.6
Gross national saving rate[2]	19.2	20.3	19.6	18.1	18.0	17.9	17.7	14.0	15.7	16.1
Net national saving rate[2]	4.0	5.3	4.5	2.7	2.7	2.4	2.1	-3.4	-.7	-.1

1. Average monthly change, thousands.
2. Percent; values are for the fourth quarter of the year indicated.
3. Percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. Values are for the fourth quarter of the year indicated.
4. Level, millions; values are annual averages.
5. Percent change, with inventory valuation and capital consumption adjustments.

Staff Projections of Government-Sector Accounts and Related Items

Item	2017	2018	2019	2020	2021	2022	2020 Q1	2020 Q2	2020 Q3	2020 Q4
Unified federal budget[1]				Nominal dollars, billions						
Receipts	3,316	3,330	3,462	3,090	3,138	3,656	797	657	830	632
Outlays	3,982	4,109	4,447	6,852	5,330	5,052	1,184	2,657	1,847	1,644
Surplus/deficit	-665	-779	-984	-3,762	-2,192	-1,397	-387	-2,001	-1,018	-1,012
				Percent of GDP						
Surplus/deficit	-3.5	-3.8	-4.6	-18.2	-10.3	-6.2	-7.2	-38.0	-19.6	-19.8
Previous Tealbook	*-3.5*	*-3.8*	*-4.6*	*-17.1*	*-12.7*	*-5.5*	*-7.2*	*-34.2*	*-18.7*	*-14.5*
Primary surplus/deficit	-2.1	-2.2	-2.9	-16.5	-8.8	-4.7	-5.3	-36.5	-18.6	-17.9
Net interest	1.4	1.6	1.8	1.6	1.5	1.5	1.9	1.5	1.1	1.8
Cyclically adjusted surplus/deficit	-3.5	-4.2	-5.2	-17.5	-9.0	-5.9	-7.6	-36.7	-17.1	-18.4
Federal debt held by public	76.0	77.5	79.2	98.7	106.7	107.7	82.0	97.5	98.7	104.8
Government in the NIPA[2]				Real percent change, annual rate						
Purchases	.8	1.5	3.0	1.4	-.8	-1.5	1.1	1.8	3.3	-.6
Consumption	.6	1.6	2.3	1.6	-.7	-1.6	.8	3.0	3.6	-.9
Investment	2.0	1.5	6.0	.6	-.8	-.8	2.3	-2.6	1.9	.8
State and local construction	-1.8	-1.5	7.2	1.9	-5.0	-5.0	11.1	-5.0	2.0	.0
Real disposable personal income	3.5	3.9	2.6	1.9	-2.2	2.8	.9	79.5	-29.4	-15.8
Contribution from transfers[3]	.2	.4	1.1	5.9	-4.7	.9	1.8	53.2	-9.0	-20.0
Contribution from taxes[3]	-.9	.4	-.9	2.3	-1.7	-.9	-.1	7.4	6.4	-5.4
Government employment				Average net change in monthly payrolls, thousands						
Federal	-2	1	3	2	1	1	13	-0	94	-100
State and local	8	8	12	-73	-5	-13	3	-484	167	20
Fiscal indicators[2]				Percentage point contribution to change in real GDP, annual rate						
Fiscal effect (FE)[4]	.2	.4	1.0	6.6	-4.5	-.5	.8	17.5	8.9	-.8
Discretionary policy actions (FI)	.3	.6	.8	5.0	-4.0	-.5	.6	13.6	5.6	.1
Previous Tealbook	*.3*	*.6*	*.8*	*3.6*	*-2.8*	*-.6*	*.6*	*14.1*	*2.3*	*-2.6*
Federal purchases	.1	.2	.3	.5	.0	-.2	.1	2.0	.7	-.2
State and local purchases	.0	.1	.2	-.3	-.1	-.1	.1	-.7	.1	.2
Taxes and transfers	.1	.3	.3	4.7	-3.9	-.3	.4	13.1	5.0	.3
Cyclical	-.1	-.1	-.1	1.2	-.5	-.3	.1	2.7	2.0	.1
Other	.0	-.1	.3	.4	.1	.3	.1	1.2	1.3	-1.1

1. Annual values stated on a fiscal year basis. Quarterly values not seasonally adjusted.
2. Annual values refer to the change from fourth quarter of previous year to fourth quarter of year indicated.
3. Percentage point contribution to change in real disposable personal income, annual basis.
4. The FE measure captures the total contribution of the government sector to the growth of aggregate demand (excluding any multiplier effects and financial offsets). It equals the sum of the direct contributions to aggregate demand growth from all changes in federal purchases and state and local purchases, plus the estimated contribution to real household consumption and business investment that is induced by changes in transfer and tax policies. FI (fiscal impetus) is the portion of FE attributable to discretionary fiscal policy actions (for example, a legislated change in tax revenues).

Foreign Real GDP and Consumer Prices: Selected Countries
(Quarterly percent changes at an annual rate)

Measure and country	2019 Q1	2019 Q2	2019 Q3	2019 Q4	Projected 2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4
***Real GDP*[1]**												
Total foreign	1.9	1.9	1.1	.2	-10.8	-29.3	20.3	10.1	7.4	5.9	4.4	3.7
Previous Tealbook	*1.9*	*1.9*	*1.1*	*.3*	*-10.9*	*-31.3*	*16.4*	*13.5*	*8.2*	*6.2*	*4.4*	*3.6*
Advanced foreign economies	1.7	1.8	1.2	-.3	-9.2	-37.5	24.5	9.7	8.0	6.3	4.7	3.6
Canada	1.2	3.2	1.1	.6	-8.2	-40.0	27.0	10.5	9.0	6.7	5.1	4.1
Japan	2.6	2.1	.0	-7.2	-2.2	-23.0	10.8	5.7	5.3	3.9	2.0	1.7
United Kingdom	2.7	-.2	2.1	.0	-8.5	-54.0	37.7	13.5	8.8	7.0	5.1	3.1
Euro area	2.0	.4	1.2	.2	-13.6	-35.5	25.6	9.9	7.8	6.7	5.1	3.7
Germany	1.9	-1.0	1.1	-.4	-8.6	-25.6	17.0	9.3	7.3	4.3	3.6	3.2
Emerging market economies	2.0	2.0	1.1	.7	-12.4	-20.1	16.2	10.6	6.9	5.5	4.2	3.8
Asia	3.4	4.0	2.1	3.1	-19.1	7.0	9.6	7.6	7.0	6.1	5.5	5.0
Korea	-1.4	4.1	1.5	5.4	-5.0	-12.0	10.0	8.0	5.0	4.0	3.5	3.0
China	6.5	5.9	5.5	5.9	-36.3	59.3	10.0	8.0	6.5	6.3	6.1	5.8
Latin America	.7	.1	-.2	-2.2	-5.0	-41.1	23.8	13.8	6.8	4.8	2.8	2.4
Mexico	.6	-.6	-.9	-2.3	-4.9	-41.5	25.6	13.7	7.1	4.9	2.5	2.2
Brazil	1.0	2.2	1.9	1.5	-6.0	-32.0	16.0	4.0	4.1	4.0	3.8	3.2
Addendum												
Emerging market economies ex. China	1.1	1.2	.2	-.4	-6.4	-30.7	17.5	11.1	7.0	5.3	3.8	3.3
***Consumer prices*[2]**												
Total foreign	1.1	3.3	2.1	3.4	2.4	-1.8	1.3	1.9	2.0	2.1	2.1	2.2
Previous Tealbook	*1.1*	*3.3*	*2.1*	*3.4*	*2.4*	*-1.0*	*2.2*	*1.9*	*2.0*	*2.1*	*2.1*	*2.1*
Advanced foreign economies	.7	2.1	.9	1.1	.6	-2.0	1.0	1.4	1.0	1.0	1.2	1.2
Canada	1.7	3.3	1.6	1.7	.5	-3.0	.9	2.4	1.3	1.4	1.6	1.8
Japan	.3	.5	.4	.8	.3	-1.3	-.1	.1	.2	.3	.4	.5
United Kingdom	1.1	2.5	1.7	.4	2.1	-1.6	1.8	1.4	1.6	1.6	1.6	1.6
Euro area	.3	2.0	.7	1.1	.7	-1.6	1.3	1.5	1.0	1.1	1.2	1.2
Germany	.2	2.4	.3	1.8	1.8	-1.3	1.5	1.6	1.4	1.5	1.5	1.5
Emerging market economies	1.3	4.0	2.9	4.9	3.6	-1.7	1.6	2.3	2.6	2.8	2.8	2.8
Asia	1.0	3.8	3.0	5.6	3.6	-3.2	.1	1.9	2.4	2.5	2.6	2.6
Korea	-2.0	1.9	-.5	1.7	1.6	-3.2	2.4	1.2	1.8	2.1	2.1	2.1
China	1.3	4.3	4.2	7.2	4.2	-4.3	-.1	2.1	2.5	2.5	2.5	2.5
Latin America	2.0	4.9	3.0	3.7	3.8	1.9	5.3	3.2	3.4	3.3	3.3	3.3
Mexico	1.5	4.5	2.6	3.2	3.3	2.0	5.5	2.9	3.2	3.2	3.2	3.2
Brazil	2.9	5.2	2.2	3.2	4.9	-1.6	2.1	3.6	3.7	3.7	3.7	3.7
Addendum												
Emerging market economies ex. China	1.3	3.8	2.0	3.4	3.1	.2	2.8	2.4	2.7	2.9	2.9	2.9

1. Foreign GDP aggregates calculated using shares of U.S. exports.
2. Foreign CPI aggregates calculated using shares of U.S. non-oil imports.

Foreign Real GDP and Consumer Prices: Selected Countries
(Percent change, Q4 to Q4)

Measure and country	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
								----------Projected----------		
***Real GDP*[1]**										
Total foreign	3.0	3.0	2.1	2.8	3.2	2.1	1.3	-4.4	5.4	2.8
Previous Tealbook	*3.0*	*3.0*	*2.1*	*2.8*	*3.2*	*2.1*	*1.3*	*-5.2*	*5.6*	*2.8*
Advanced foreign economies	2.4	2.0	.9	1.8	2.9	1.4	1.1	-6.1	5.6	2.3
Canada	3.4	2.8	-.4	1.7	3.2	1.8	1.5	-6.2	6.2	2.6
Japan	2.8	-.4	1.0	1.2	2.6	-.3	-.7	-3.1	3.2	1.1
United Kingdom	2.7	2.5	2.4	1.8	1.6	1.4	1.1	-10.0	6.0	2.2
Euro area	.7	1.6	2.0	2.1	3.0	1.2	1.0	-6.3	5.8	2.3
Germany	1.5	2.3	1.3	1.9	3.4	.6	.4	-3.4	4.6	2.2
Emerging market economies	3.7	3.9	3.2	3.8	3.6	2.9	1.4	-2.6	5.1	3.4
Asia	5.5	5.2	4.7	5.3	5.4	4.4	3.1	.5	5.9	4.3
Korea	3.8	2.6	3.5	2.6	2.9	3.2	2.4	-.2	3.9	2.3
China	7.6	7.3	6.9	6.9	6.9	6.5	5.9	4.8	6.2	5.6
Latin America	1.7	2.7	1.8	2.3	1.9	1.1	-.4	-5.8	4.2	2.4
Mexico	1.2	3.4	2.7	3.1	1.8	1.2	-.8	-5.6	4.2	2.2
Brazil	2.6	-.1	-5.5	-2.2	2.4	1.2	1.6	-6.3	3.8	2.8
Addendum										
Emerging market economies ex. China	2.7	3.1	2.4	3.1	2.8	2.1	.5	-4.1	4.9	2.9
***Consumer prices*[2]**										
Total foreign	2.4	2.0	1.4	1.9	2.5	2.4	2.4	.9	2.1	2.2
Previous Tealbook	*2.4*	*2.0*	*1.4*	*1.9*	*2.5*	*2.4*	*2.4*	*1.4*	*2.1*	*2.1*
Advanced foreign economies	1.0	1.2	.5	.9	1.5	1.8	1.2	.2	1.1	1.3
Canada	1.0	2.0	1.3	1.4	1.8	2.1	2.1	.2	1.5	1.8
Japan	1.4	2.5	.1	.3	.6	.8	.5	-.3	.4	.6
United Kingdom	2.1	.9	.1	1.2	3.0	2.3	1.4	.9	1.6	1.7
Euro area	.8	.2	.3	.7	1.4	1.9	1.0	.5	1.1	1.3
Germany	1.4	.4	.5	1.0	1.6	2.1	1.2	.9	1.5	1.5
Emerging market economies	3.4	2.6	2.0	2.6	3.2	2.9	3.3	1.4	2.7	2.8
Asia	3.2	1.8	1.5	2.1	2.0	2.0	3.3	.6	2.5	2.6
Korea	1.1	1.0	.9	1.4	1.4	1.7	.3	.5	2.0	2.1
China	2.9	1.5	1.4	2.1	1.7	2.1	4.2	.4	2.5	2.5
Latin America	4.0	4.7	3.2	4.0	6.3	5.0	3.3	3.5	3.3	3.2
Mexico	3.6	4.2	2.3	3.2	6.6	4.8	2.9	3.4	3.2	3.2
Brazil	5.8	6.5	10.4	7.1	2.8	4.1	3.4	2.2	3.7	3.5
Addendum										
Emerging market economies ex. China	3.8	3.5	2.3	3.0	4.2	3.4	2.6	2.1	2.9	2.9

1. Foreign GDP aggregates calculated using shares of U.S. exports.
2. Foreign CPI aggregates calculated using shares of U.S. non-oil imports.

U.S. Current Account

Quarterly Data

	2019				2020				Projected 2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Billions of dollars, s.a.a.r.											
U.S. current account balance	**-506.5**	**-510.8**	**-486.4**	**-417.3**	**-416.8**	**-639.7**	**-541.0**	**-545.4**	**-584.8**	**-577.1**	**-608.4**	**-633.8**
Previous Tealbook	*-547.6*	*-505.0*	*-501.5*	*-439.3*	*-483.0*	*-343.9*	*-288.7*	*-346.9*	*-334.4*	*-344.5*	*-406.1*	*-456.3*
Current account as percent of GDP	-2.4	-2.4	-2.3	-1.9	-1.9	-3.3	-2.7	-2.6	-2.8	-2.7	-2.8	-2.9
Previous Tealbook	*-2.6*	*-2.4*	*-2.3*	*-2.0*	*-2.2*	*-1.8*	*-1.4*	*-1.7*	*-1.6*	*-1.6*	*-1.9*	*-2.1*
Net goods & services	-581.0	-608.8	-598.6	-519.0	-476.2	-666.7	-569.5	-553.5	-575.5	-593.7	-616.5	-625.6
Investment income, net	224.8	249.8	258.6	260.4	221.8	173.0	179.1	165.7	153.2	162.4	158.7	149.4
Direct, net	312.8	327.8	335.5	341.0	297.4	227.7	230.6	214.4	204.3	217.1	218.6	216.4
Portfolio, net	-88.0	-78.1	-76.9	-80.6	-75.6	-54.7	-51.6	-48.7	-51.1	-54.6	-59.9	-67.0
Other income and transfers, net	-150.3	-151.7	-146.3	-158.7	-162.4	-145.9	-150.5	-157.6	-162.4	-145.9	-150.5	-157.6

Annual Data

	2013	2014	2015	2016	2017	2018	2019	Projected 2020	2021	2022
	Billions of dollars									
U.S. current account balance	**-336.9**	**-367.8**	**-407.4**	**-394.9**	**-365.3**	**-449.7**	**-480.2**	**-535.7**	**-601.0**	**-676.2**
Previous Tealbook	*-348.8*	*-365.2*	*-407.8*	*-428.3*	*-439.6*	*-491.0*	*-498.3*	*-365.6*	*-385.3*	*-506.3*
Current account as percent of GDP	-2.0	-2.1	-2.2	-2.1	-1.9	-2.2	-2.2	-2.6	-2.8	-3.0
Previous Tealbook	*-2.1*	*-2.1*	*-2.2*	*-2.3*	*-2.3*	*-2.4*	*-2.3*	*-1.8*	*-1.8*	*-2.2*
Net goods & services	-446.8	-484.1	-491.3	-481.2	-513.8	-579.9	-576.9	-566.5	-602.8	-656.0
Investment income, net	204.1	209.7	195.5	208.0	268.3	261.6	248.4	184.9	155.9	133.9
Direct, net	283.3	284.2	277.3	289.7	350.3	342.5	329.3	242.6	214.1	218.1
Portfolio, net	-79.2	-74.5	-81.8	-81.7	-82.0	-80.8	-80.9	-57.7	-58.2	-84.2
Other income and transfers, net	-94.1	-93.4	-111.6	-121.7	-119.8	-131.4	-151.8	-154.1	-154.1	-154.1

Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BLS	Bureau of Labor Statistics
BOC	Bank of Canada
BOE	Bank of England
BOJ	Bank of Japan
CARES Act	Coronavirus Aid, Relief, and Economic Security Act
CCAR	Comprehensive Capital Analysis and Review
C&I	commercial and industrial
CMBS	commercial mortgage-backed securities
COVID-19	coronavirus disease 2019
CP	commercial paper
CPFF	Commercial Paper Funding Facility
CPI	consumer price index
CRE	commercial real estate
EBITDA	earnings before interest, taxes, depreciation, and amortization
ECB	European Central Bank
ECI	employment cost index
EFFR	effective federal funds rate
E&I	equipment and intellectual property products
ELB	effective lower bound
EME	emerging market economy
EPOP	employment-to-population ratio
ETF	exchange-traded fund
EU	European Union

FCI	financial conditions index
FFIEC	Federal Financial Institutions Examination Council
FOMC	Federal Open Market Committee; also, the Committee
FPLT	flexible price-level targeting
FRB/US	A large-scale macroeconometric model of the U.S. economy
FX	foreign exchange
GDP	gross domestic product
GFC	Global Financial Crisis
IG	investment grade
IMF	International Monetary Fund
IP	industrial production
LFPR	labor force participation rate
LIBOR	London interbank offered rate
MBS	mortgage-backed securities
MMF	money market fund
MSELF	Main Street Expanded Loan Facility
MSLP	Main Street Lending Program
MSNLF	Main Street New Loan Facility
MSPLF	Main Street Priority Loan Facility
NCD	negotiable certificate of deposit
NIE	newly industrialized economy
NRU	natural rate of unemployment
OIS	overnight index swap
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PEPP	Pandemic Emergency Purchase Programme
PMCCF	Primary Market Corporate Credit Facility

PMI	purchasing managers index
PPI	producer price index
PPP	Paycheck Protection Program
QE	quantitative easing
QS	quantitative surveillance
SBLI	Small Business Lending Index
SEP	Summary of Economic Projections
SIFMA	Securities Industry and Financial Markets Association
SIGMA	A calibrated multicountry DSGE model
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SMCCF	Secondary Market Corporate Credit Facility
SOMA	System Open Market Account
S&P	Standard & Poor's
SPU	stable-price unemployment rate
SPV	special purpose vehicle
STW	short-time work
TALF	Term Asset-Backed Securities Loan Facility
TIPS	Treasury Inflation-Protected Securities
UI	unemployment insurance
VAR	vector autoregression
VIX	one-month-ahead option-implied volatility on the S&P 500 index

(This page is intentionally blank.)