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

October 23, 2020

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

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Domestic Economic Developments and Outlook

The recovery in economic activity is continuing, but at a more moderate clip than in the late spring and early summer. In particular, growth in household consumption and manufacturing production appears to be slowing, and the pace of gains in the labor market has eased. In all, we now estimate that GDP growth will slow from an unprecedented annual rate of 32 percent in the third quarter to a much more subdued 3.9 percent pace in the fourth quarter, leaving GDP this quarter 2.8 percent below its year-earlier level. We expect output growth of only 1.2 percent in the first half of next year as fiscal support unwinds. Thereafter, against a backdrop of highly supportive monetary policy, and given our assumption that a vaccine becomes broadly available by next fall, we expect GDP growth to exceed its potential rate and the unemployment rate to move down to 3.1 percent by the end of 2023.

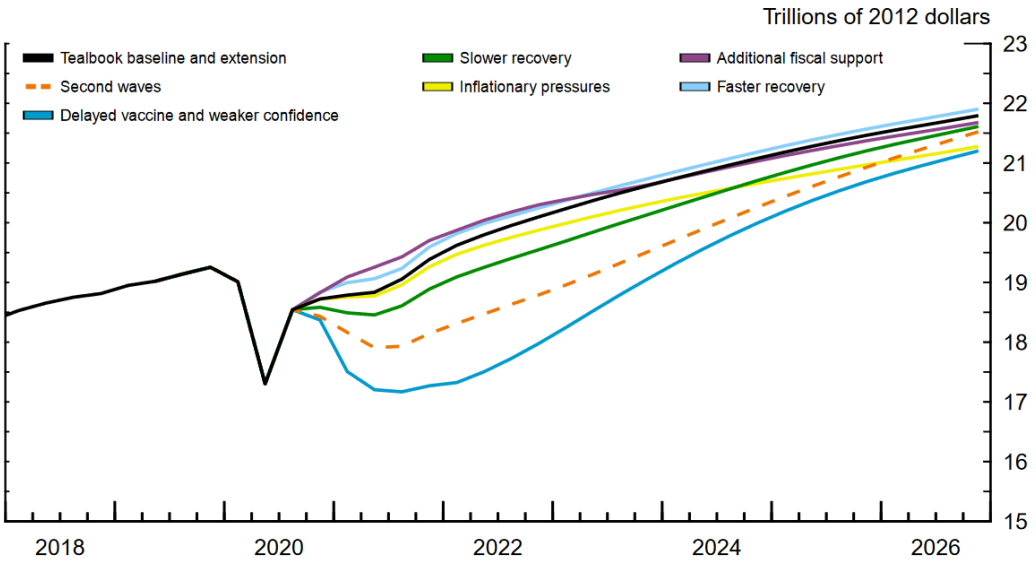
We have made a number of notable revisions to our projection. Given the absence of clear progress by fiscal policymakers, we have removed the $1 trillion in additional federal stimulus that we previously assumed would be enacted this quarter. Nonetheless, we have revised up GDP growth over the second half of this year both because the incoming data have been surprisingly strong and because we have reassessed the implications of the savings cushion held by households and now deem it sufficient for consumption to be largely maintained through year-end, even without the additional fiscal support. Thereafter, we anticipate that the savings buffer for lower-income households will dwindle rapidly, forcing these households to pare back outlays sharply. Largely as a result, we now expect overall consumer spending will decline modestly in the first half of next year. Beyond the middle of next year, our projection for GDP growth is a bit stronger than in the September Tealbook, as we have boosted our assessment of the underlying fiscal position of state and local governments and now assume that SOMA purchases will continue through 2021 rather than stopping at the end of this year. All told, the level of GDP at the end of 2023 is essentially unrevised.

Inflation has exceeded our expectations, and we now estimate that core PCE prices rose 1.7 percent over the 12 months ending in September, 0.4 percentage point above our projection in the previous Tealbook. The sharp rise in core inflation in recent months primarily reflects a surge in durable goods prices, which we think will prove transitory. As a result, we expect monthly inflation rates to taper off in the coming

months and the 12-month change in core PCE prices to edge down to 1.5 percent by year-end. Thereafter, the projected further tightening of resource utilization pushes up core inflation to 1.9 percent by 2023. Total inflation runs below core this year, reflecting the earlier declines in energy prices, but runs at a pace similar to core thereafter.

The path of the coronavirus and the measures needed to control it remain highly uncertain, and we still see the risks to our forecast as skewed appreciably to the downside. Notably, the potential emergence of second waves of COVID-19 infections in some European countries and sharply rising cases domestically suggest that the risk of a more adverse outcome has risen in recent weeks. Accordingly, the Risks and Uncertainty section includes "Second Waves" and "Delayed Vaccine and Weaker Confidence" scenarios in which economic activity is more restrained.[1]

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



The current business cycle has been atypical in terms of its cause, its likely effects going forward, and the policy actions taken in response. In this Tealbook, we further explore several unusual and related aspects of the COVID-19 recession. The box "The Unusual Resilience in Goods Spending and Housing" discusses the atypical composition of demand during this episode. In particular, this surge in demand for consumer goods

[1] As detailed in the Risks and Uncertainty section, the "Second Waves" scenario is less severe than in the September Tealbook, reflecting our view that governments and the public, both in the United States and abroad, have become more adept at preventing the spread of the virus by using targeted measures that will keep the economic costs of mitigation lower than earlier this year.

contributes to the larger-than-normal bounce-back in U.S. imports—see the box "The Recent Widening of the U.S. Trade Deficit." The box "Household Savings and Prospects for Consumer Spending" discusses the causes of the unusual spike in household savings this year and how these savings will likely support consumption spending in the months ahead. Finally, the box "Possible Long-Term Effects of the COVID-19 Recession" explores how the unusual features of the recession may affect economic growth.

KEY BACKGROUND FACTORS

COVID-19 Pandemic and Response

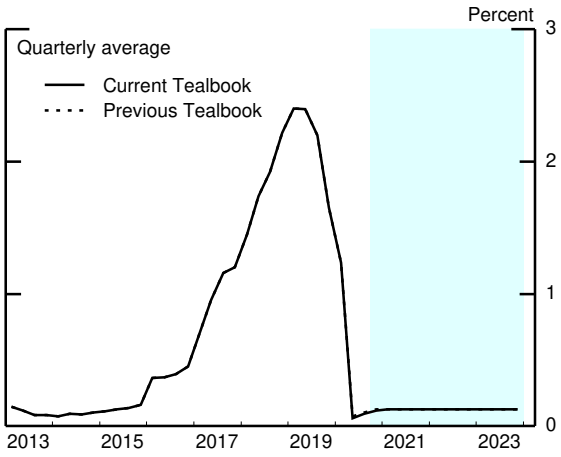
The staff's baseline forecast continues to depend most importantly on assumptions about the development of medical interventions to treat and prevent COVID-19 infections, the extent of public health measures required to limit the spread of the virus, and how households and firms react to the containment measures and to the pandemic itself. Regarding medical interventions, we continue to assume that a vaccine will be approved early next year but that it will not be widely available until the fall of 2021. We also continue to assume that many households and firms will refrain from high-contact activities even in the absence of mandates until after vaccines are broadly distributed; thus, pressure on the heath-care system remains low enough that there will not be a widespread return to the extreme social-distancing requirements of the spring.

Fiscal Policy

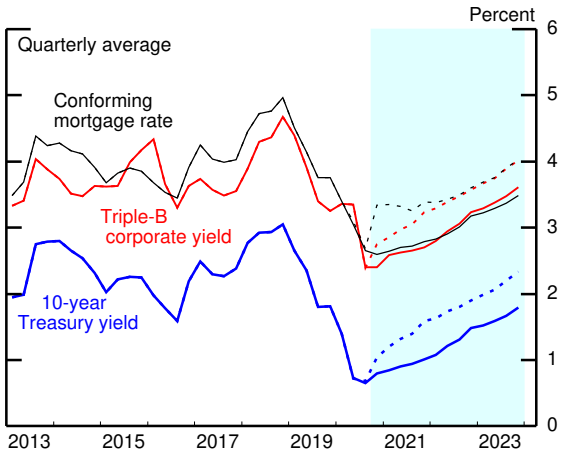
Although there is significant uncertainty over future fiscal policy, in the absence of clear progress in negotiations over a new fiscal package, we removed the assumption from the previous Tealbook that policymakers would enact an additional $1 trillion in support this quarter; this removal reduces the boost to aggregate demand from fiscal policy in 2020 by 1½ percentage points. That said, we still estimate fiscal policy is boosting GDP growth significantly in 2020 and project it will turn into a headwind next year as the effects of the stimulus begin to unwind. Alternatively, the "Additional Fiscal Support" scenario in the Risks and Uncertainty section explores an upside risk to fiscal policy.

Key Background Factors Underlying the Baseline Staff Projection

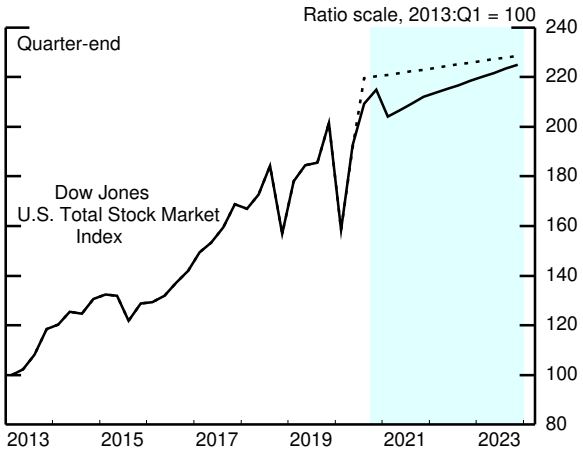
Federal Funds Rate



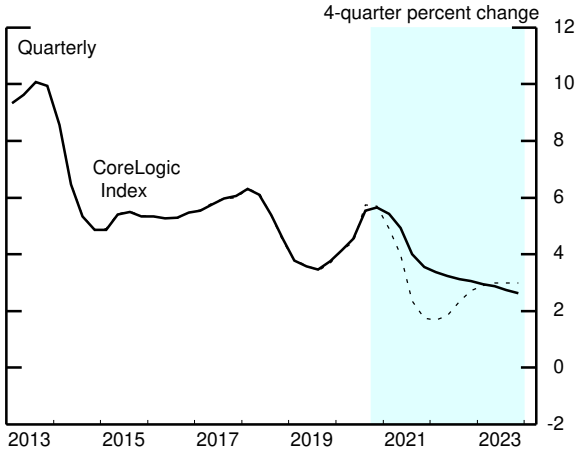
Long-Term Interest Rates



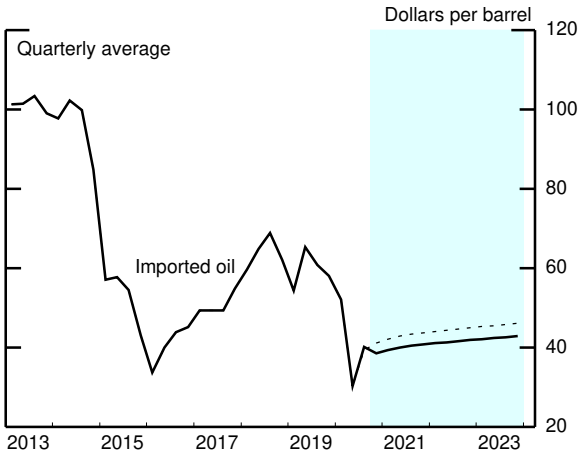
Equity Prices



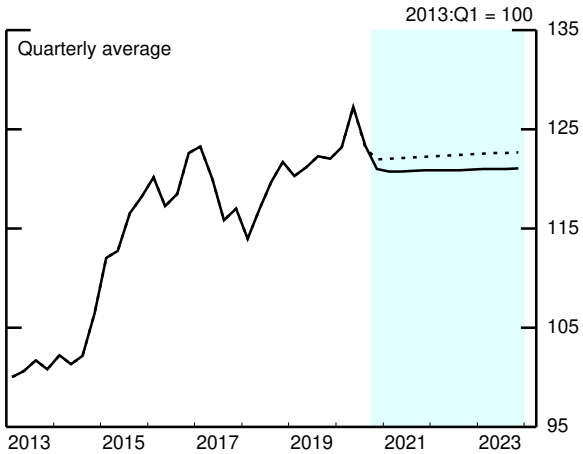
House Prices



Oil Prices



Broad Real Dollar



Effects of COVID-19 Fiscal Policies on Aggregate Demand (FI)
(Percentage point contribution to real GDP growth, annual rate)

	2020				Q4/Q4			
	Q1	Q2	Q3	Q4	2020	2021	2022	2023
(1) Total	**.0**	**14.4**	**1.8**	**.7**	**4.1**	**-3.2**	**-.4**	**-.3**
(2) September TB	*.0*	*14.8*	*1.9*	*5.4*	*5.4*	*-3.6*	*-.7*	*-.7*

Note: FI is fiscal impetus.

With the removal of the additional fiscal stimulus, federal aid to states and localities is now assumed to be much lower than in the previous forecast. At the same time, however, we have marked up our projection of state and local government tax revenues substantially, in part because of recent data on tax receipts.[2] Tallying up these offsetting revenue effects, as well as stronger-than-expected incoming data on state and local payrolls, we have revised up our forecast for state and local purchases somewhat in the second half of this year and beyond. Nevertheless, state and local government budgets remain quite strained, and even with this upward revision, purchases by those governments are anticipated to register a decline of 3 percent this year and to rise only 1 percent in 2021.

Monetary Policy

As in the previous Tealbook, the federal funds rate is assumed to follow the prescriptions of an interest rate rule that is meant to be broadly consistent with the updated Statement on Longer-Run Goals and Monetary Policy Strategy.[3] As always, our new rule is not meant to prescribe how policymakers should make decisions but merely to yield a path that provides a reasonable underpinning for our economic projection.

[2] There remains considerable uncertainty about the ultimate effect of the pandemic on state and local governments' tax revenue. Thus far, though, tax revenues appear to be holding up better to the economic downturn than previous historical experience would suggest. There are a number of potential reasons—for example, goods are more likely than services to be subject to sales taxes, and consumer spending on goods has been atypically strong relative to services spending; and unemployment benefits are taxed in most states, and the expansion of these benefits boosted tax receipts. See Alan J. Auerbach, William G. Gale, Byron Lutz, and Louise Sheiner (2020), "Fiscal Effects of COVID-19," paper presented at the Brookings Papers on Economic Activity Conference, held at the Brookings Institution, Washington, September 23, https://www.brookings.edu/bpea-articles/fiscal-effects-of-covid-19.

[3] While we think the new rule is broadly consistent with the consensus statement, it does not capture all of its features. In particular, under this rule and with term premiums still somewhat depressed by the SOMA portfolio in the coming decade, inflation modestly overshoots 2 percent by a tenth or two but more persistently than likely implied by the reference to "some time" in the FOMC consensus statement. We will continue to assess our rule in light of the Committee's communications on the new policy framework.

According to this baseline policy rule, the federal funds rate departs from the ELB in the quarter after both the unemployment rate is below 4.1 percent *and* the four-quarter inflation rate is above 2.0 percent. Thereafter, the federal funds rate follows an inertial version of the Taylor (1999) rule, but with no response to the output gap when the gap is positive. As in the September Tealbook, we include an intercept adjustment in the rule to maintain a path for the federal funds rate that is less steep after departing from the ELB than it otherwise would be.[4] In addition, we now assume that SOMA purchases will continue at their current pace through 2021 rather than stopping at the end of this year. As a result, SOMA holdings are projected to increase from $6.4 trillion at the end of September to $8.4 trillion at the end of 2023.

The monetary policy actions taken in response to COVID-19 and the revision to the monetary policy strategy are expected to provide substantial support to economic activity over the next few years. We estimate that 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 (that is, since before the pandemic) on the paths of interest rates, equity prices, house prices, and the dollar will boost GDP growth significantly, with the largest effect on growth in 2021.[5] We have revised up these effects 0.6 percentage point since the September Tealbook, primarily because of the larger projected SOMA portfolio.[6]

[4] In this Tealbook, we have made the intercept adjustment, which was particularly *ad hoc* in the September round, a function of underlying inflation—which we project to move up slowly after 2023. Specifically, as long as underlying inflation is below 2 percent, the intercept will be below its long-run value of 0.5 percent. Once underlying inflation reaches 2 percent, the intercept will remain at 0.5 percent. Although this alteration has little effect on the federal funds rate path this round, it should make changes to our federal funds rate path easier to follow from round to round and provide a better basis for our alternative simulations.

[5] 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.

[6] By itself, we estimate that the effect of the larger projected SOMA portfolio would boost GDP through 2023 by 0.7 percentage point. However, the slightly higher federal funds rate assumed in the latter half of the decade increases marginally the expected path of short-term interest rates, which shaves a tenth off the effect of the larger SOMA portfolio.

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	2023	2020–23 total
Total	**1.5**	**2.1**	**1.1**	**.1**	**4.8**
Total effect due to:					
Expected path for short rates	.6	1.1	.7	.1	2.5
Balance sheet policy	.5	.8	.5	.1	2.0
Corporate bond facilities	.3	.1	- .1	- .1	.3
Memo: Revision since Sept. Tealbook	*.0*	*.3*	*.2*	*.1*	*.6*

Note: Items may not sum to total because of rounding.

Financial Conditions

Equity prices have remained volatile, with fluctuations since the September Tealbook reflecting changing expectations for the prospect of further fiscal stimulus, uncertainty about the U.S. election, and the trajectory of the pandemic. Smoothing through the volatility, equity prices declined somewhat since the September Tealbook, while longer-term Treasury yields increased a fair bit.[7]

Amid still-low interest rates and still-high equity valuations, large corporations, municipalities, and real estate borrowers continued to benefit from generally accommodative financial conditions. By contrast, firms and households dependent on bank lending faced somewhat tighter conditions. In particular, financing conditions for small businesses remained strained, with depressed lending activity and further deterioration in loan performance. While financing remained generally available on attractive terms to consumers with strong credit histories, the supply of credit to those with lower credit scores remained tight.

- We project the 10-year Treasury rate to gradually increase from 0.8 percent in 2020:Q4 to 1.8 percent in 2023:Q4, as both expected future short-term rates and term premiums are projected to rise over the medium term. The expectations component contributes about 10 basis points to that rise, while

[7] Our September projection incorporated market prices up to Wednesday, September 2, and the discussion on market movements incorporates the changes since then. In contrast, since the FOMC meeting, market sentiment has improved more noticeably (the discussion in the Financial Market Developments section captures market movements since Tuesday, September 15).

Domestic Econ Devel & Outlook

Summary of the Near-Term Outlook for GDP

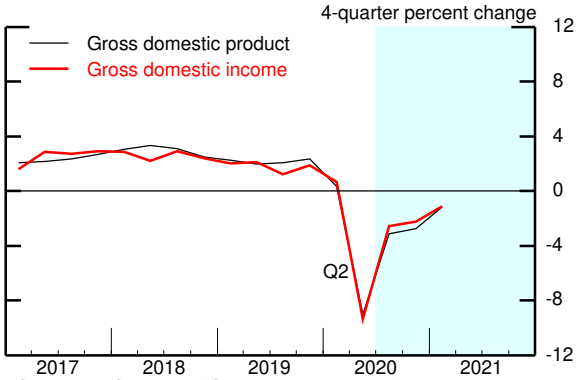
(Percent change at annual rate except as noted)

Measure	2020:Q2		2020:Q3		2020:Q4	
	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook	Previous Tealbook	Current Tealbook
Real GDP	**-31.8**	**-31.4**	**29.7**	**31.9**	**4.5**	**3.9**
Private domestic final purchases	-32.9	-32.4	32.0	36.0	4.4	4.0
Personal consumption expenditures	-34.1	-33.2	37.4	39.5	4.1	2.6
Residential investment	-36.3	-35.6	45.9	62.5	13.7	24.6
Nonres. private fixed investment	-25.7	-27.2	4.2	12.8	3.2	4.7
Government purchases	2.9	2.5	1.1	1.9	-2.7	-.6
Contributions to change in real GDP						
Inventory investment[1]	-4.2	-3.5	5.6	5.2	.8	.7
Net exports[1]	.7	.6	-3.4	-4.0	.4	-.1

1. Percentage points.

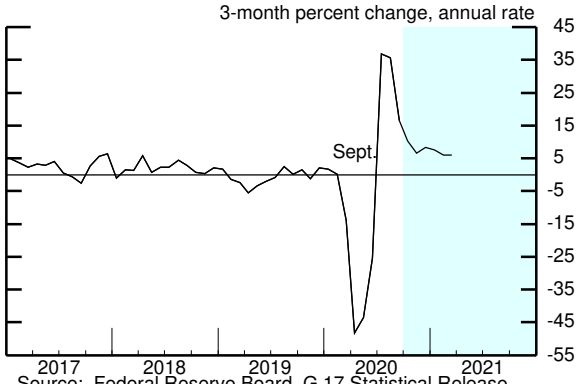
Recent Nonfinancial Developments (1)

Real GDP and GDI



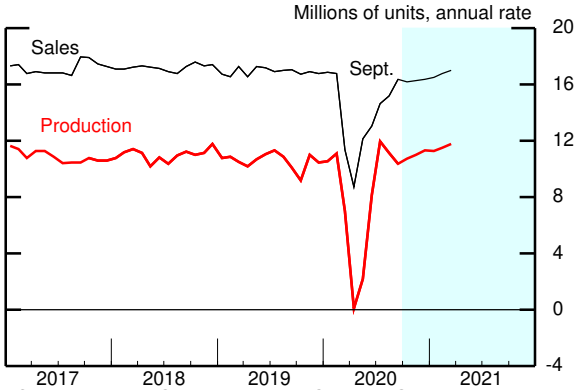
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Manufacturing IP ex. Motor Vehicles and Parts



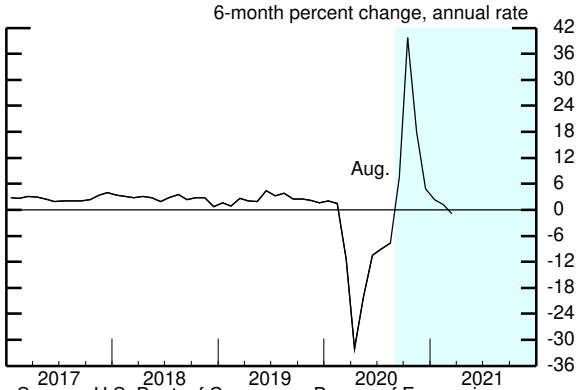
Source: Federal Reserve Board, G.17 Statistical Release, "Industrial Production and Capacity Utilization."

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.

the term premium is responsible for about 90 basis points, roughly 55 basis points of which we attribute to increased net supply of Treasury securities (that is, Treasury issuance less additional SOMA purchases).

- Financial market quotes embody some likelihood of additional fiscal stimulus and thus imply a stronger outlook for Treasury issuance than in the staff's baseline. Markets are assumed to come into alignment with the staff's fiscal policy assumptions by the first quarter of 2021, pushing yields down by about 20 basis points over the projection period.

- Relative to the September Tealbook, the projected path for the 10-year Treasury yield is about 50 basis points lower throughout the forecast period due to a substantial downward revision to the term premium. The lower term premium reflects our assumption that SOMA purchases will continue for longer than we had assumed in the September Tealbook and that there will not be additional issuance of Treasury securities to finance additional stimulus.

- Equity prices are projected to decline notably in 2021:Q1, as market participants have currently priced in significant odds of further fiscal stimulus and are projected to be disappointed. Thereafter, equity prices will appreciate modestly; by the end of 2023, they are only slightly lower than in the September Tealbook.

- We project that house prices will grow at a fairly strong pace into 2021, buoyed by high demand and a tight supply of new homes coming onto the market. On net, we now forecast a somewhat higher path of price growth than in the September Tealbook.

RECENT DEVELOPMENTS AND NEAR-TERM OUTLOOK

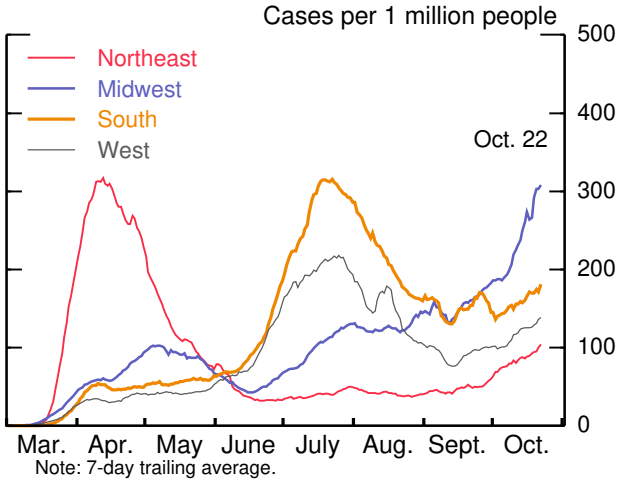
Spending and Production

We continue to project a rapid, but only partial, rebound in economic activity in the second half of this year following the unprecedented contraction in the spring. We now estimate that GDP surged at an annual rate of 32 percent in the third quarter, as the level of activity last quarter was boosted by the sizable rebound in activity in May and June; with the monthly growth rates of activity having slowed dramatically since then, we

Domestic Econ Devel & Outlook

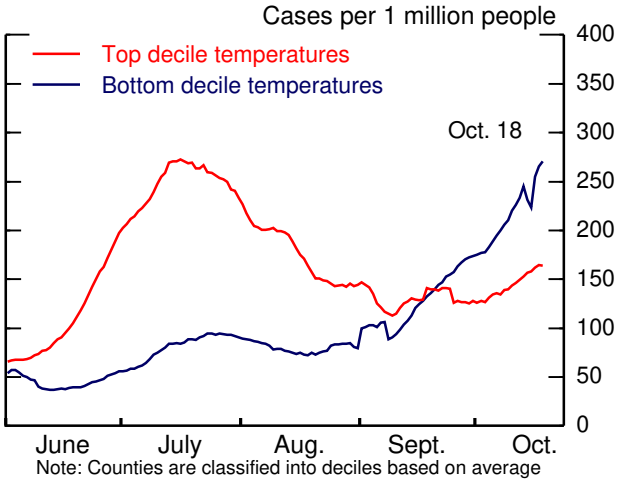
Cases and Consumer Activity

New U.S. Cases of COVID-19



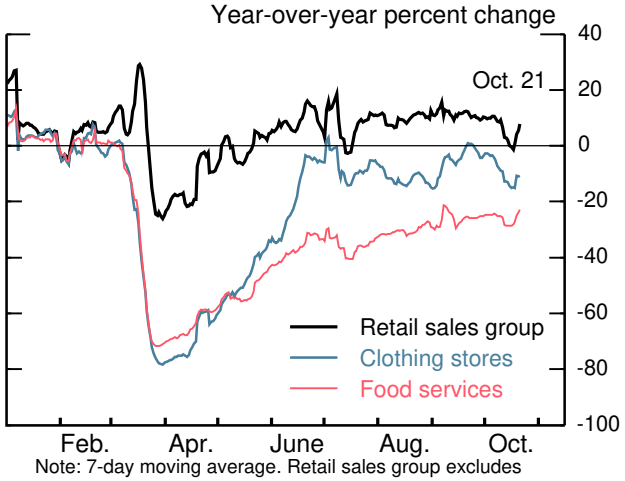
Note: 7-day trailing average.
Source: COVID Tracking Project.

New Cases and Temperatures



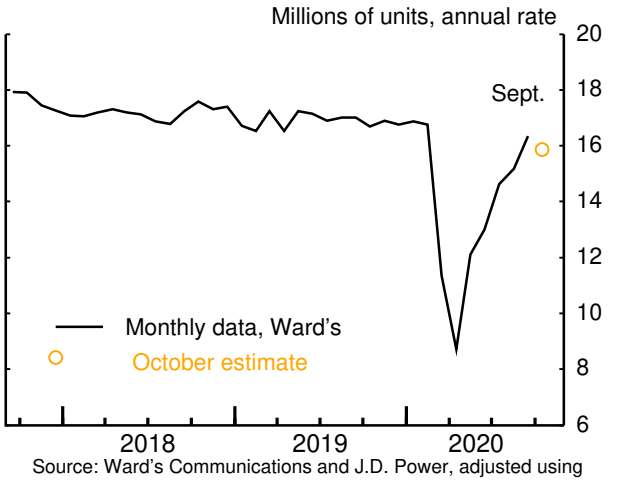
Note: Counties are classified into deciles based on average heating degree days between Sept. 6 and Oct. 4.
Source: *New York Times;* NOAA National Climatic Data Center.

Daily Credit/Debit Spending



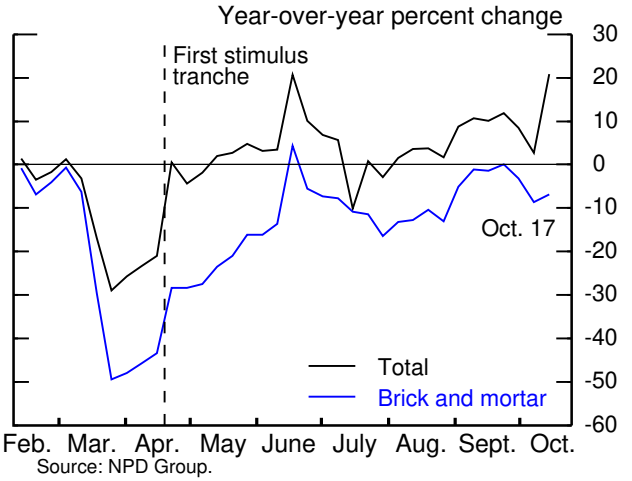
Note: 7-day moving average. Retail sales group excludes non-store merchants.
Source: Fiserv, Inc.

U.S. Light Vehicle Sales



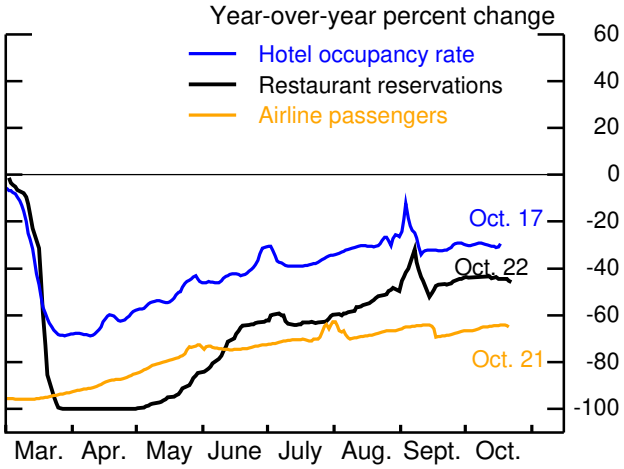
Source: Ward's Communications and J.D. Power, adjusted using FRB seasonals.

Spending on Non-food Retail Goods



Source: NPD Group.

Hotel, Restaurants, and Air Travel



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

project GDP growth to slow to 3.9 percent in the fourth quarter and to slow further to only 1.2 percent in the first half of next year. Our projection for the second half of this year is revised up relative to the projection in the previous Tealbook, as stronger-than-expected data on domestic spending and the upward reassessments of the strength of household balance sheets and the fiscal position of state and local governments are only partially offset by the drag from the removal of the additional fiscal stimulus and much-weaker-than-expected net exports. In contrast, we have revised down our projection for growth over the first half of 2021, when low-income households are now expected to exhaust their excess savings.

- Following the strong recovery in **consumer spending** in the third quarter, we expect PCE to rise only 2.6 percent in the fourth quarter as fiscal support wanes. Over the first half of 2021, we expect PCE to decline 1.1 percent, reflecting a drag from fiscal policy and the aforementioned exhaustion of excess savings among low-income households. For further analysis, see the box "Household Savings and Prospects for Consumer Spending."

  - Although retail sales in September came in well above our expectations, higher-frequency indicators of retail goods purchases—such as our daily credit card indexes from Fiserv—have been about flat in recent weeks. As a result, we have taken only a little signal from the September retail sales reading for our projection for the level of spending by the end of 2020.

  - Services spending indicators—including hotel occupancy, TSA passenger screening, and restaurant reservations—remain well below levels before the pandemic.

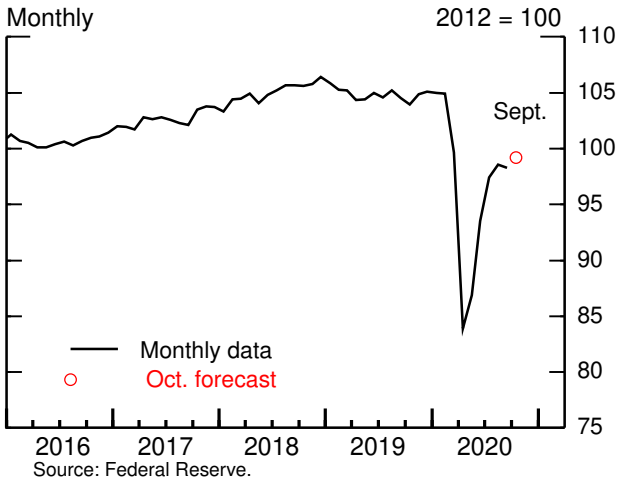
- **Residential investment** is surging in the second half of the year, as residential construction and home sales have now moved above their pre-pandemic levels, supported by low interest rates, the sector's ability to adjust business practices in response to social distancing, and pent-up demand from the spring shutdown.

- **E&I investment** also appears to be bouncing back rapidly in the second half, as social-distancing measures have eased, supply chains have recovered, and the pandemic and the move to widespread teleworking have boosted spending on medical and computer equipment. We expect this spending to regain its

Domestic Econ Devel & Outlook

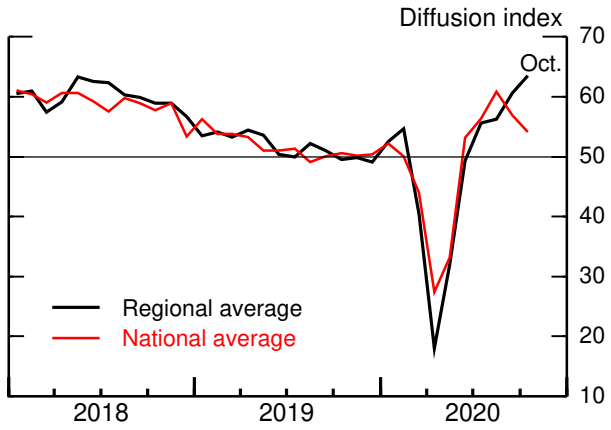
Industrial, Business, and Housing Activity

Industrial Production Index: Manufacturing



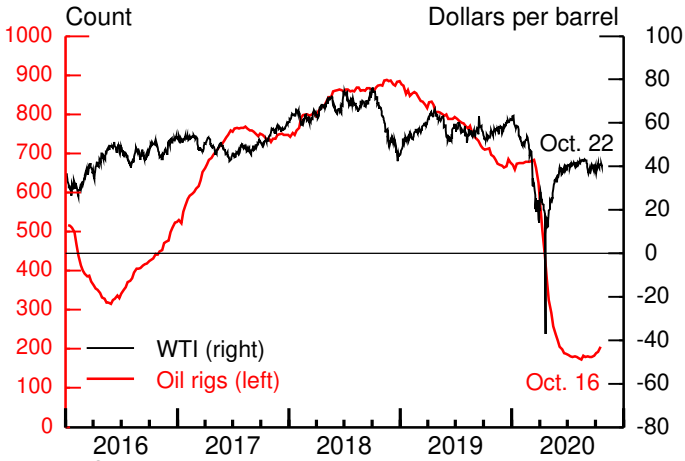
Source: Federal Reserve.

Manufacturing New Orders Indexes



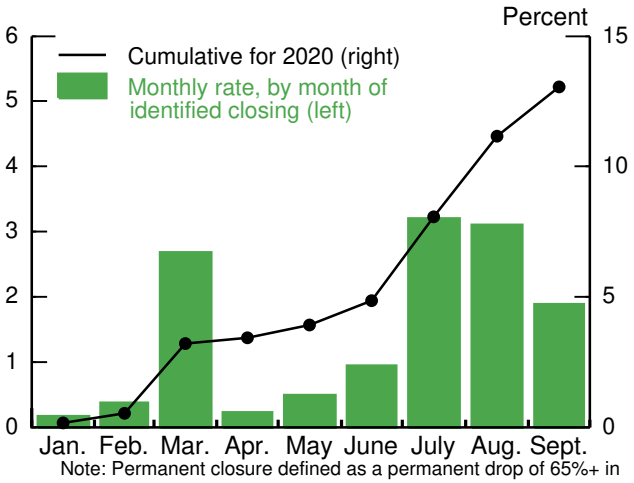
Note: The national average is composed of the ISM and Markit; the regional average contains the orders indexes from Chicago, Dallas, Kansas City, New York, Philadelphia, and Richmond.
Source: Federal Reserve; IHS Markit; ISM.

Oil Price and Drilling Rigs



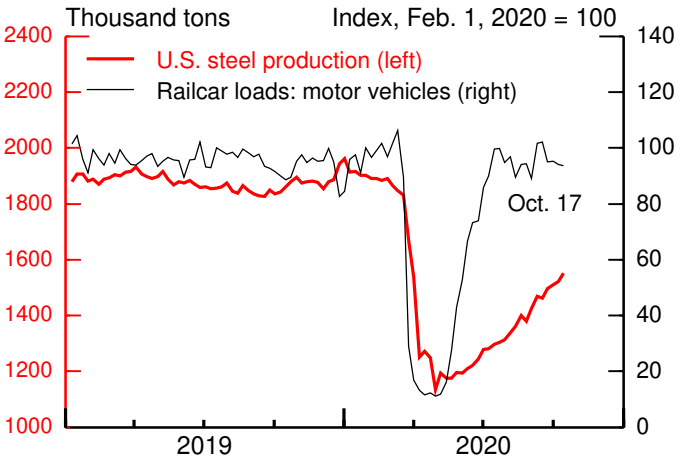
Source: Baker-Hughes (drilling rigs).

Percent of Restaurants Permanently Closed



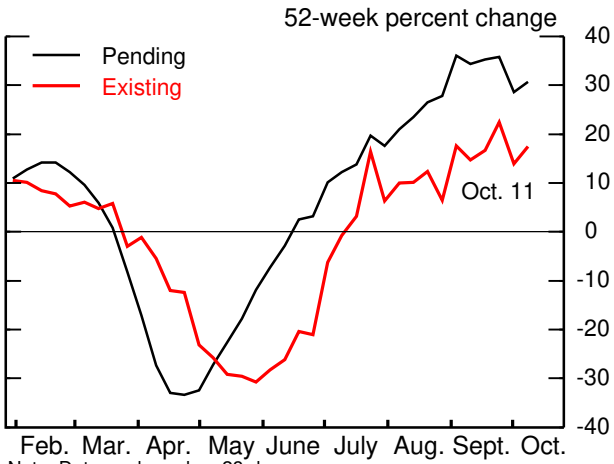
Note: Permanent closure defined as a permanent drop of 65%+ in year-over-year visits. Last 3 months are preliminary and may revise.
Source: Staff calculations based on SafeGraph microdata.

Weekly Steel and Motor Vehicle Indicators



Note: Data are seasonally adjusted.
Source: American Iron and Steel Institute; staff estimates of data from the Association of American Railroads (motor vehicles).

Pending and Existing Home Sales



Note: Data are based on 28-day sums.
Source: Data provided by Redfin, a national real estate brokerage.

pre-pandemic level in early 2021—a very brisk recovery relative to historical standards. This projection is stronger than in September, reflecting unexpected and broad-based strength in the incoming indicators.

- In contrast, investment in **nonresidential structures** has continued to decline, likely reflecting firms' hesitation to commit to projects with long build times and uncertain returns. In addition, low oil prices are substantially restraining drilling investment. We expect that structures investment will continue to recede through early next year.

- **Manufacturing output** has recovered roughly two-thirds of its 20 percent drop. However, after posting brisk gains for several months, factory output growth slowed significantly in August and moved down in September, in part because of pandemic-related delays in the model-year changeover in the motor vehicle industry. In addition, the depressed level of foreign demand and upstream effects of weakness in the oil and gas sectors continue to be headwinds for manufacturing. Nevertheless, recent positive readings on new orders and an expected upshift in motor vehicle and aircraft production point to solid gains in manufacturing output over the rest of the year.

- **Exports** have begun to recover from their unprecedented collapse in the second quarter, in line with a partial recovery in foreign activity. However, in large part because of depressed services exports (especially foreign travel to the United States), exports are not expected to return to pre-COVID-19 levels before the end of 2021.[8]

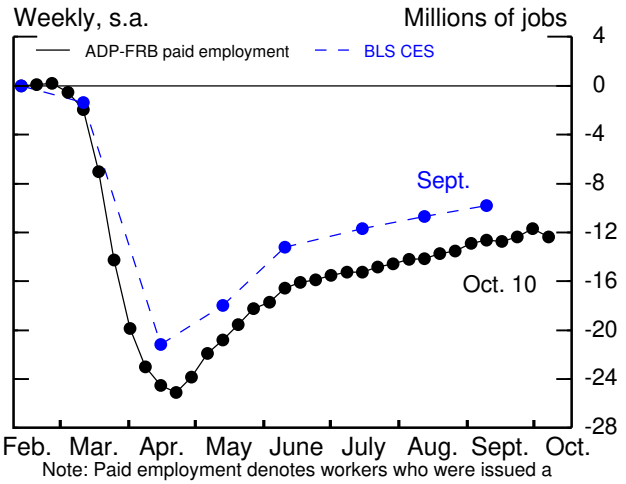
- The bounce-back in **imports** has been surprisingly sharp, reaching nearly pre-pandemic levels. The recovery has been concentrated in durable household products and electronics, reflecting strong consumer demand. Incoming data on imports continue to surprise on the upside, and we now expect net exports to subtract about 2 percentage points from U.S. GDP growth in the second half of the year. The box "The Recent Widening of the U.S. Trade Deficit"

[8] This month, a WTO ruling authorized the European Union to impose tariffs in response to U.S. subsidies to Boeing. Even if these authorized tariffs were to be imposed, the amounts in question are small and would have little effect on overall U.S. exports.

Domestic Econ Devel & Outlook

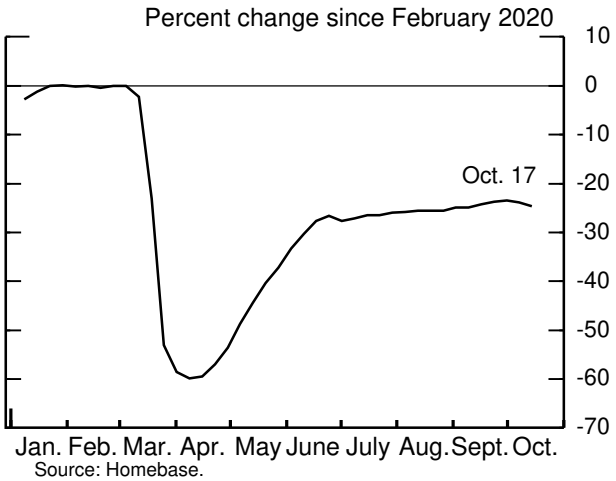
Labor Market

Cumulative Job Loss since February 15, 2020



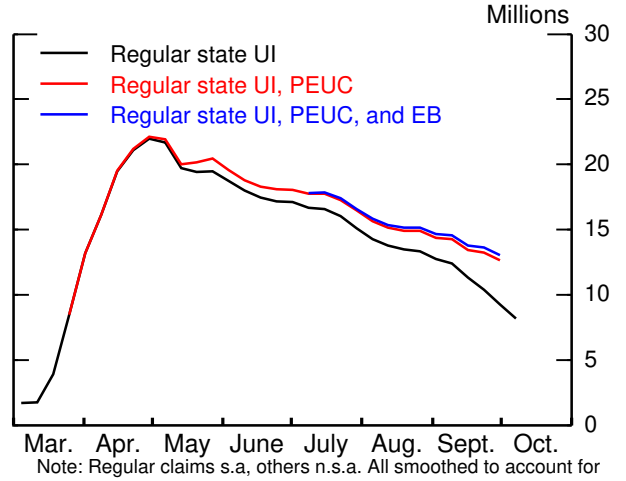
Note: Paid employment denotes workers who were issued a paycheck in a given pay period.
Source: BLS; ADP; staff estimates.

U.S. Employment at Small Businesses



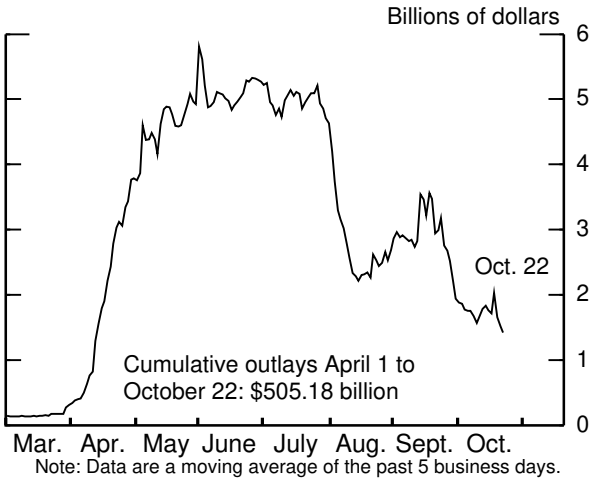
Source: Homebase.

Continued Unemployment Claims



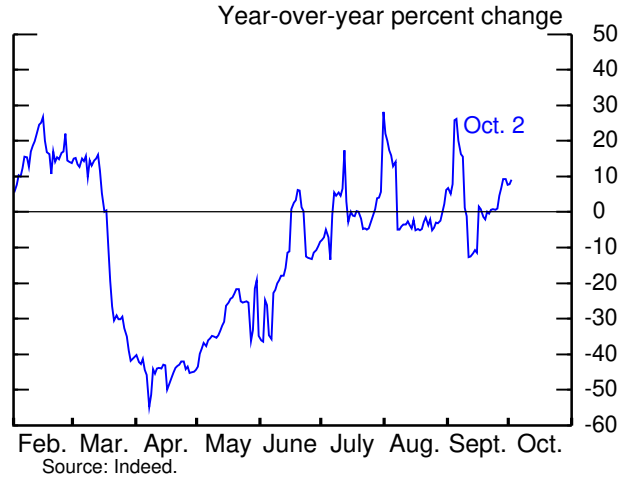
Note: Regular claims s.a, others n.s.a. All smoothed to account for biweekly filing. Regular UI through Oct. 10, others through Oct. 3.
Source: DOL ETA; staff calculations.

Unemployment Insurance Outlays



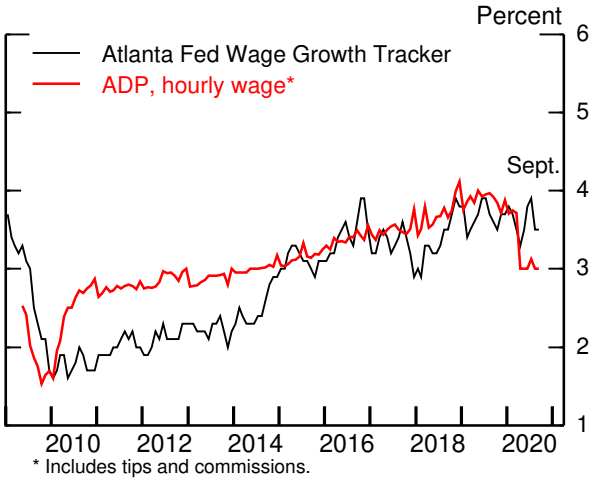
Note: Data are a moving average of the past 5 business days.
Source: Daily Treasury Statement data.

Job Postings



Source: Indeed.

Median 12-month Wage Growth



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

examines the causes and effects of the stronger recovery in imports than exports.

The Labor Market

The information received since the September Tealbook indicates that the labor market continues to improve, but at a slowing pace. Looking ahead, we expect the pace of improvement to moderate further as the boost from recall hiring continues to fade and the public health crisis stymies recovery in the hardest-hit service industries.

- The BLS estimates that private employers added 877,000 jobs in September, about 100,000 less than we anticipated in the previous Tealbook. The ADP-FRB measure of paid employment rose by a much more sizable 1.5 million between the August and September reference weeks. Going forward, we expect private payroll gains—as measured by the BLS—will slow from an average monthly pace of roughly 1.1 million in the third quarter to a pace of around 800,000 in the fourth quarter. The expected deceleration is consistent with the shrinking pool of workers on temporary layoff (which likely portends a diminishing boost from recall hiring) and reports of significant layoffs in the airlines, tourism, and entertainment industries.

- In the government sector, payrolls fell 216,000 in September, held down by a decline in state and local education employees—as fewer than normal of these workers returned at the start of the school year, likely because of virtual learning—and the paring down of temporary census workers. Looking ahead, we expect government employment to decline a bit, on net, in the fourth quarter because of further reductions in census workers.

- The **unemployment rate** declined 0.5 percentage point to 7.9 percent in September—a larger drop than we had expected—and we anticipate a further decline to 6.9 percent by the end of the year.[9] While the expected pace of improvement is very rapid by historical standards, it is still slower than earlier in the year, consistent with our slowing payroll gain projection.

[9] Due to measurement problems, the true unemployment rate was still likely higher than reported in September. However, according to the BLS, the extent of the misclassification has abated significantly, from an estimated 5 percentage points in April to less than ½ percentage point in September.

	2020					
	July	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Total payroll employment[1]	1,761	1,489	661	743	708	791
September Tealbook	*1,734*	*1,371*	*863*	*646*	*796*	*846*
Private payroll employment[1]	1,526	1,022	877	825	790	750
September Tealbook	*1,481*	*1,027*	*975*	*950*	*925*	*900*
Unemployment rate (percent)	10.2	8.4	7.9	7.6	7.3	6.9
September Tealbook	*10.2*	*8.4*	*8.1*	*7.8*	*7.4*	*7.0*
LFPR (percent)	61.4	61.7	61.4	61.5	61.7	61.8
September Tealbook	*61.4*	*61.7*	*61.7*	*61.8*	*61.9*	*62.0*
EPOP (percent)	55.1	56.5	56.6	56.9	57.2	57.6
September Tealbook	*55.1*	*56.5*	*56.7*	*57.0*	*57.3*	*57.7*

Note: LFPR is labor force participation rate; EPOP is employment-to-population ratio.
1. Monthly change, thousands.

- The downward surprise in the unemployment rate in September was accompanied by an even larger downward surprise to the **labor force participation rate** (LFPR), which fell 0.3 percentage point in September. The decline in participation was concentrated among prime-age workers and reflected, in part, a reported increase in caregiving; thus, we attribute some of the downward surprise to a larger-than-expected imprint on participation from childcare responsibilities associated with schools moving to virtual learning. Combining the falling unemployment rate and participation rate, the **employment-to-population ratio** (EPOP) increased 0.1 percentage point in September—a touch less than we had expected. Even with virtual education continuing to weigh on parental labor supply, we expect that improvements in labor demand will push up both the LFPR and the EPOP in coming months.

- Despite the decline in total unemployment, **long-term unemployment** rose sharply in September, as many workers laid off in the spring have now been jobless for 27 weeks or more. Many such workers exhausted regular state unemployment benefits in mid-September and are now drawing on emergency and extended benefit programs; these claimants could lose access to

unemployment insurance early next year as these supplemental benefit programs phase out.[10]

THE MEDIUM-TERM OUTLOOK FOR REAL ACTIVITY

Over the medium term, we expect that output will rise at a pace somewhat above our estimate of its potential growth. The recovery is supported by highly accommodative monetary policy and a further easing of the drag from social distancing, which more than offset significant headwinds from recessionary dynamics and the unwinding of fiscal stimulus.[11]

The level of GDP at the end of the medium term is about the same as in our previous projection due to a number of offsetting revisions. On the upside, financial conditions are more supportive, principally reflecting the lower path for interest rates, and state and local government purchases are higher given our improved assessment of their underlying fiscal position. On the downside, we removed the additional fiscal stimulus and project greater drag from net exports.[12] Similar to the September Tealbook projection, we expect the output gap to widen gradually, reaching 2.4 percent at the end of 2023, and the unemployment rate to move down to 3.1 percent by the end of 2023.

[10] In particular, the Pandemic Emergency Unemployment Compensation program, which provides an additional 13 weeks of benefits to claimants who have exhausted regular benefits, expires at the end of December. Extended benefit (EB) programs, which provide 13 to 20 weeks of additional benefits, have already triggered off in several states as their insured unemployment rates fell below statutory thresholds. Additional states will likely trigger off EB if insured unemployment continues to decline in the coming months.

[11] We use the term "recessionary dynamics" to denote forces that are particularly active during recessions, including heightened pessimism, risk aversion, and reduced access to credit; they are distinct from standard macro dynamics—the usual response of household and business spending to changes in income, profits, and wealth.

[12] As the reassessment of the strength of household balance sheets largely led us to pull forward household consumption into 2020 from 2021, the effect of this revision on the level of GDP in 2023 is neutral.

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

	2020				2021				2020	2021	2022	2023
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q4/Q4	Q4/Q4	Q4/Q4	Q4/Q4
Real GDP	- 5.0	-31.4	31.9	3.9	1.4	1.0	4.8	7.1	- 2.8	3.5	3.7	2.6
September Tealbook	*- 5.0*	*-31.8*	*29.7*	*4.5*	*1.6*	*2.8*	*6.3*	*6.3*	*- 3.2*	*4.2*	*3.2*	*2.8*
COVID-19 effects	**- 7.2**	**-34.0**	**29.2**	**1.5**	**- .8**	**- .9**	**2.8**	**5.0**	**- 5.2**	**1.5**	**2.0**	**1.2**
1. Social distancing and other disruptions[1]	- 7.2	-46.3	34.9	4.3	5.0	5.7	5.8	5.8	- 6.4	5.4	.9	.5
2. Fiscal policy	.0	15.4	4.0	.3	- 6.1	- 6.2	- 2.0	- 1.2	4.8	- 3.9	- .4	- .3
3. Monetary policy	.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	1.5	2.1	1.1	.1
4. Standard macro dynamics	.0	- .9	- 5.6	- .2	.4	.1	- .0	.4	- 1.7	.2	.7	.4
5. Recessionary dynamics	.0	- 2.6	- 4.5	- 3.3	- 1.8	- 2.3	- 2.9	- 1.8	- 2.2	- 2.1	- .4	.5
6. Potential output	.0	- 1.6	- 1.6	- 1.6	- .3	- .3	- .3	- .3	- 1.2	- .3	.1	.1

1. Includes effect of foreign growth on U.S. exports.

THE OUTLOOK FOR INFLATION

Following large declines in the spring, PCE prices increased at a robust pace over the summer, buoyed by unusual strength in durable goods prices that is consistent with the surge in demand for these goods. With the CPI and PPI in hand, we estimate that PCE prices increased at a much more moderate pace in September as core goods inflation turned negative and services inflation stepped down. Still, the incoming readings on inflation were higher than projected, and we now expect core PCE price inflation to be 1.5 percent this year (on a 12-month change basis), about 0.2 percentage point higher than projected in the September Tealbook.[13]

Over the medium term, given our assumption that inflation expectations hold stable and with slack diminishing, we expect core inflation to move up to 1.9 percent by 2023.[14] With energy prices recovering only partially from their earlier collapse, we project total PCE prices to rise 1.2 percent this year and to increase roughly in line with core prices thereafter.

- We now estimate that **core PCE prices** rose 1.7 percent over the 12 months ending in September. Durable goods price inflation has now moved above its pre-pandemic trend; in contrast, service price inflation remains soft, and prices for the categories most affected by social distancing—for example, accommodations and airfare—remain very depressed. We expect the

[13] Our forecast for the 12-month change in core PCE prices through December is slightly lower than the 1.6 percent for the four-quarter change though 2020:Q4.

[14] As the low inflation readings from last spring due to COVID-19 effects drop out from the 12-month window next spring, the 12-month change in core consumer prices is projected to temporarily rise above 2 percent before returning to 1.6 percent by the end of 2021.

12-month change in core prices to drift down through December as durable goods inflation normalizes and resource utilization remains low.

- Following sharp increases in the spring, the PCE price index for **food at home** continued to decline in August, and we estimate it fell further in September, driven in part by further declines in meat prices as production continues to normalize. Despite these recent declines, we estimate that the 12-month change in food prices in September was 3.9 percent—still well above its pre-pandemic pace—and we expect it will hold close to this rate through the end of the year as demand for food at grocery stores remains strong.

- **Energy** prices edged up in August and September. We expect these prices to move sideways over the remainder of the year, culminating in a decline of about 13 percent over the 12 months ending in December.

  - The spot price of Brent crude oil is currently $42 per barrel, $3 less than at the time of the September Tealbook and still well below January's average of $64 per barrel, as recovering global oil demand has been offset by the gradual easing of supply cuts by OPEC and its partners. Oil prices are expected to rise to $48 per barrel by December 2023, consistent with the expected slow recovery in global oil demand and continued production restraint. This subdued rise in oil prices contributes to only modest increases in consumer energy prices over the medium term.

- The effective (that is, tariff-inclusive) **price for imported core goods** fell at a 1.2 percent pace in the first half of 2020, reflecting downward pressure from tariff cuts in February, dollar appreciation, and a drop in commodity prices. We expect import price inflation to temporarily run at an elevated 4.6 percent pace in the second half in response to more-recent dollar declines and rebounding commodity prices. In the third quarter, prices for imported capital and consumer goods rose at a pace that was above average but also well below that of domestic durable goods price inflation. In 2021, import price inflation moderates to 1.7 percent, which is still elevated relative to historical averages owing to continued upward pressure from the recent rebound in commodity prices.

- Despite the tumultuous economic situation, measures of **longer-term inflation expectations** have remained fairly stable, on balance, this year. The staff's common inflation expectations measure, which synthesizes the information from many different measures of inflation expectations, has held steady this year.

Labor Compensation

We have received little information on labor compensation since the September Tealbook. The available indicators continue to point to downward pressure on wages from the weak labor market, and thus we have maintained our projection that the employment cost index (ECI) will rise only 1.9 percent in 2020, down from 2.7 percent last year. With slack diminishing over the next two years, we expect ECI growth to pick up gradually to 2.7 percent in 2023.

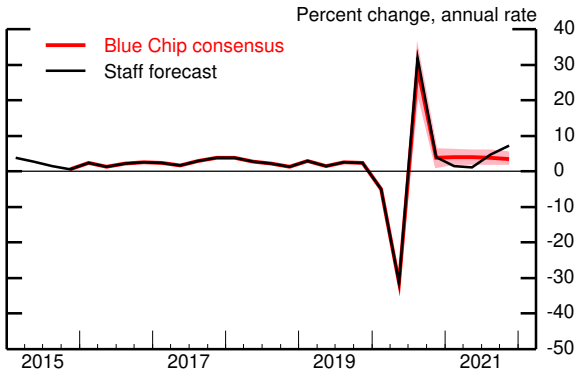
COMPARING THE STAFF PROJECTION WITH OUTSIDE FORECASTS

The staff forecast for GDP growth this year and next is in the middle of the range of outside forecasts (these individual projections can be seen in the table following the Blue Chip exhibit). For total and core PCE inflation, the staff's forecast also runs in the middle of the range of outside projections for these years, though by 2023 it is on the high side. The staff forecast for the unemployment rate is lower than the Blue Chip consensus in the fourth quarter of this year and considerably lower than the consensus for next year.

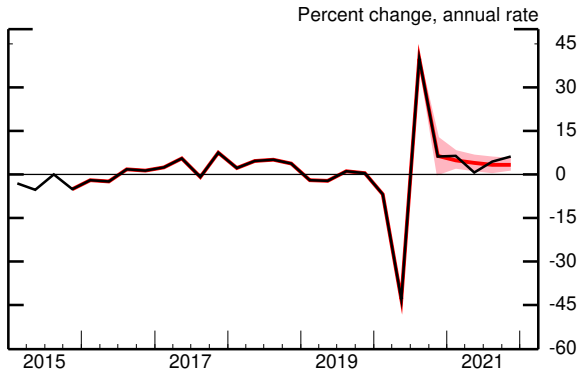
Tealbook Forecast Compared with Blue Chip

(Blue Chip survey released October 10, 2020)

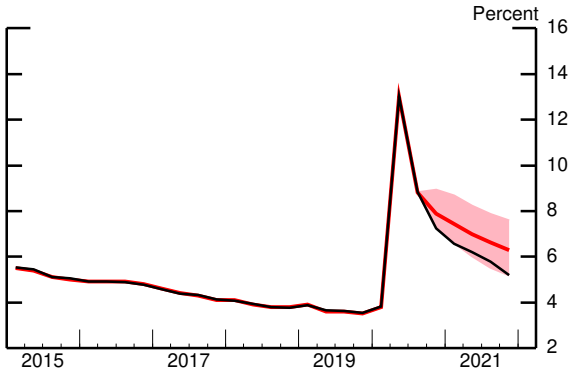
Real GDP



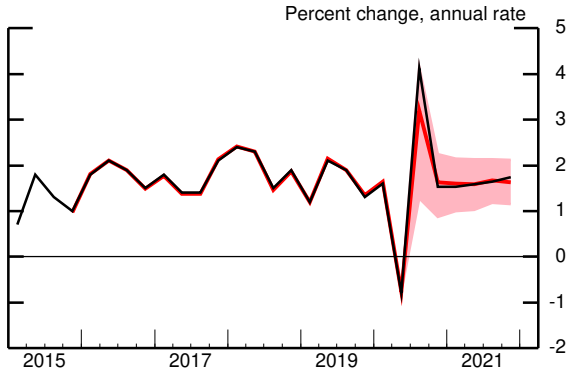
Industrial Production



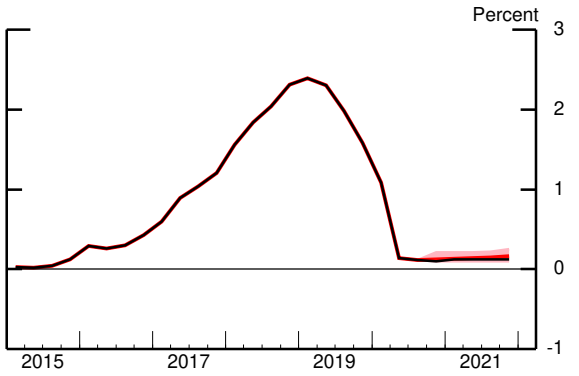
Unemployment Rate



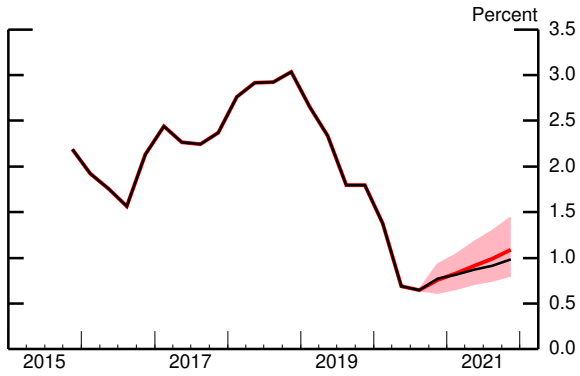
Core PCE Prices



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
		Q2	Q3	Q4		
October Tealbook	**Oct. 22**	**-31.4**	**31.9**	**3.9**	**-2.8**	**3.5**
Median of outside forecasts		–	*32.4*	*3.0*	*-2.7*	*4.0*
IHS Markit[1]	Oct. 22	–	33.0	4.9	-2.6	2.8
Pantheon Macroeconomics	Oct. 22	–	35.0	4.0	-2.2 *	n.a.
Barclays	Oct. 20	–	30.0	2.5	-3.5 *	n.a.
Goldman Sachs	Oct. 19	–	34.8	3.0	-2.4	5.5
Citi	Oct. 16	–	31.7	5.8	-2.4 *	3.7 *
J.P. Morgan	Oct. 16	–	34.5	3.0	-2.5	1.8
Morgan Stanley	Oct. 16	–	37.1	3.5	-2.7	5.8
Nomura	Oct. 16	–	34.2	2.9	-2.6 *	4.2 *
UBS	Oct. 16	–	30.0	2.7	-3.4	4.1
MacroPolicy Perspectives	Oct. 15	–	30.0	3.0	-3.4	4.0
Scotiabank	Oct. 14	–	30.0	1.9	-3.6 *	4.1 *
Blue Chip	Oct. 10	–	29.1	3.8	-3.3	3.8

Note: Quarterly rates are annualized percent change from previous quarter. Annual rates are Q4/Q4 growth rates from previous year to current year.
1. Estimates from IHS Markit are as of October 22 (for 2020:Q3 and 2020:Q4) and October 5 (for all other periods).
* Data represent staff calculations based on forecaster's quarterly forecast.
n.a. Not available.
– All values in 2020:Q2 are negative 31.4 percent, reflecting the third GDP estimate for that quarter by the Bureau of Economic Analysis.
Source: For Blue Chip, monthly release; for IHS Markit, tracking update emails; for MacroPolicy Perspectives, company website; for all others, internal Board repository of bank and broker newsletters.

Outside Forecasts for Price Inflation

	Date of forecast	2020	2021	2022	2023
PCE Price Index					
October Tealbook	**Oct. 22**	**1.3**	**1.6**	**1.7**	**1.9**
Median of outside forecasts		*1.3*	*1.6*	*1.8*	*1.6*
UBS	Oct. 16	1.3	1.5	1.8	n.a.
IHS Markit	Oct. 16	1.3	2.2	1.7	1.6
MacroPolicy Perspectives	Oct. 15	1.4	1.0	n.a.	n.a.
Blue Chip	Oct. 10	1.2	1.8	n.a.	n.a.
Core PCE Price Index					
October Tealbook	**Oct. 22**	**1.6**	**1.6**	**1.8**	**1.9**
Median of outside forecasts		*1.6*	*1.5*	*1.7*	*1.7*
Goldman Sachs†	Oct. 19	1.5	1.6	1.6	1.7
UBS	Oct. 16	1.6	1.4	1.8	n.a.
IHS Markit	Oct. 16	1.7	1.7	1.6	1.6
Citi Bank†	Oct. 16	1.5	1.9	n.a.	n.a.
MacroPolicy Perspectives	Oct. 15	1.7	1.0	n.a.	n.a.
Blue Chip	Oct. 10	1.4	1.6	n.a.	n.a.

Note: Rates are Q4/Q4 growth rates from previous year to current year unless otherwise noted.
n.a. Not available.
† Year-over-year percent change.

THE LONG-TERM OUTLOOK

- The federal funds rate remains at the ELB until 2025:Q2, the quarter in which the four-quarter change in PCE prices reaches the 2 percent objective. After departure from the ELB, the federal funds rate rises to 1.4 percent at the end of 2027 and toward its long-run value of 2.5 percent thereafter.

- With monetary policy still accommodative beyond 2023, the unemployment rate falls to 2.8 percent in 2025 before rising slowly to its long-run value of 4.3 percent. GDP growth slows from 2.6 percent in 2023 to 1.5 percent in 2027 and moves up to its long-run value of 1.7 percent thereafter.

- As in the September Tealbook, we assume the real long-run equilibrium federal funds rate is 0.5 percent. This round, we have revised down our estimate of the long-term federal debt-to-GDP ratio by 5 percentage points and our estimate of the long-run 10-year Treasury yield by 20 basis points, reflecting the effects of lower Treasury issuance in this forecast. The assumed expansion of the SOMA portfolio exerts further downward pressure on the term premium over much of the extension period, and the 10-year Treasury yield stays below its longer-run value throughout this decade.

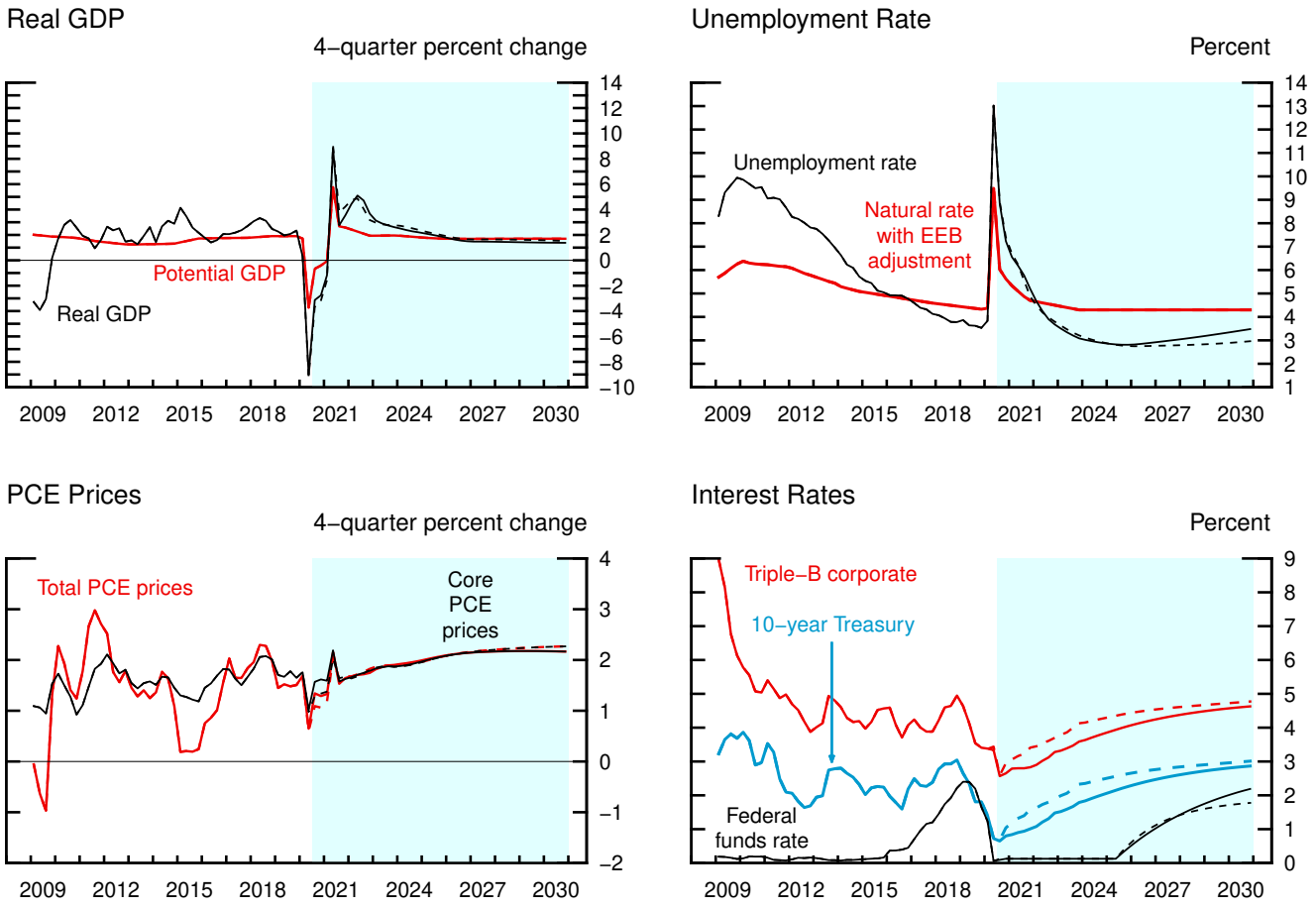
- Core PCE price inflation gradually increases from 1.9 percent at the end of the medium term to 2.2 percent in 2027. Inflation stays at about that level for a while before gradually coming back to its long-run value of 2 percent.

The Long–Term Outlook

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

Measure	2020	2021	2022	2023	2024	2025	2026	2027	Longer run
Real GDP	-2.8	3.5	3.7	2.6	2.2	1.8	1.5	1.5	1.7
Previous Tealbook	*-3.2*	*4.2*	*3.2*	*2.8*	*2.4*	*2.0*	*1.7*	*1.6*	*1.7*
Civilian unemployment rate[1]	7.2	5.2	3.7	3.1	2.9	2.8	2.9	3.0	4.3
Previous Tealbook	*7.4*	*4.9*	*3.8*	*3.2*	*2.9*	*2.8*	*2.8*	*2.8*	*4.3*
PCE prices, total	1.3	1.6	1.7	1.9	2.0	2.1	2.1	2.2	2.0
Previous Tealbook	*1.1*	*1.7*	*1.8*	*1.9*	*1.9*	*2.1*	*2.2*	*2.2*	*2.0*
Core PCE prices	1.6	1.6	1.8	1.9	2.0	2.1	2.1	2.2	2.0
Previous Tealbook	*1.3*	*1.7*	*1.8*	*1.9*	*1.9*	*2.1*	*2.2*	*2.2*	*2.0*
Federal funds rate[1]	.13	.13	.13	.13	.13	.44	.96	1.38	2.50
Previous Tealbook	.13	.13	.13	.13	.13	.52	*1.06*	*1.39*	*2.50*
10-year Treasury yield[1]	.8	1.0	1.5	1.8	2.0	2.3	2.4	2.6	3.1
Previous Tealbook	*1.0*	*1.6*	*1.9*	*2.3*	*2.5*	*2.6*	*2.8*	*2.8*	*3.3*

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.

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The Unusual Resilience in Goods Spending and Housing

In most recessions, household spending on goods—particularly durables—and housing tends to fall sharply and remain weak for many quarters, whereas services spending has generally responded little to business cycles. This time, however, the opposite has occurred: After an initial large drop, goods spending and housing activity have quickly rebounded to levels similar to or higher than last year. In contrast, many services remain quite weak. Social distancing plays a key role in explaining the recent shift in the composition of spending, not only by reducing spending on many services, but also by likely boosting demand for housing and related durables as consumers spend more time at home. In addition, the decline in interest rates has provided important support for housing and durables.

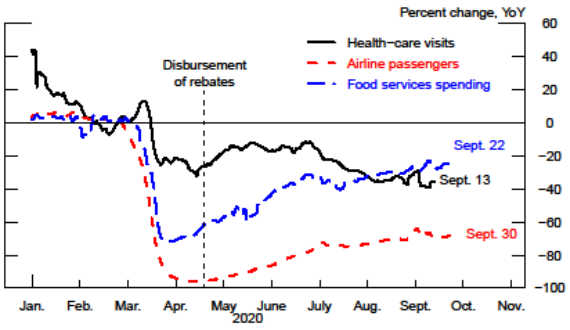
Social distancing changes the mix of consumer spending

Since March 2020, states have imposed restrictions on retailers and restaurants, and many activities that households previously engaged in—such as air travel—have become riskier even if they are not explicitly prohibited. Daily data shown in figure 1 indicate that health-care services, air travel, and food services spending remain well below levels last year.

Social distancing has had a smaller effect on goods spending, as it often requires less in-person interaction and retailers and consumers are adjusting to safer shopping practices, including more online sales. Indeed, figure 2 shows online sales mitigated the initial drop in spending at brick-and-mortar stores (dotted line) for retail goods. Many goods spending categories retraced their initial drop by the summer, particularly as the one-time recovery rebates and enhanced unemployment benefits flowed to households, offsetting the fall in market incomes. The rebound has been particularly strong in durables—including new car sales, which have nearly recovered to pre-COVID-19 levels. We attribute this strength in durables to a combination of fiscal support, low interest rates, substitution away from services, and a transitory boost from households making up for foregone spending from the spring shutdown.

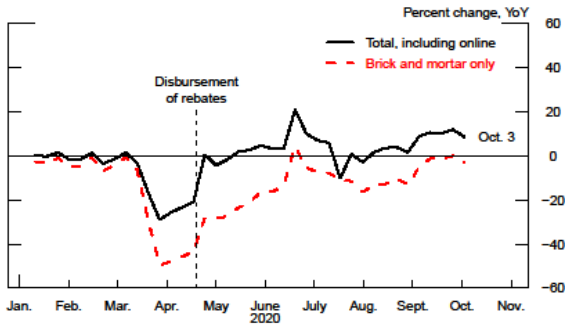
For the next few quarters, we expect goods spending to remain above pre-COVID-19 levels but do not anticipate further large gains as increased demand from rising market incomes is offset by less fiscal support and a declining boost from makeup spending. More generally, we will not see a full rebound of PCE to pre-COVID-19 levels until households feel safe enough to return to spending on services and precautionary motives wane.

Figure 1. Spending on Services



Note: Year−over−year (YoY) changes in food services are calculated from 7−day moving averages.
Source: For health−care visits, Safegraph; for airline passengers, TSA checkpoint throughput; for food services, Fiserv.

Figure 2. Spending on Nonfood Retail Goods



Note: Year−over−year (YoY) changes are calculated using 7−day moving averages.
Source: NPD Group.

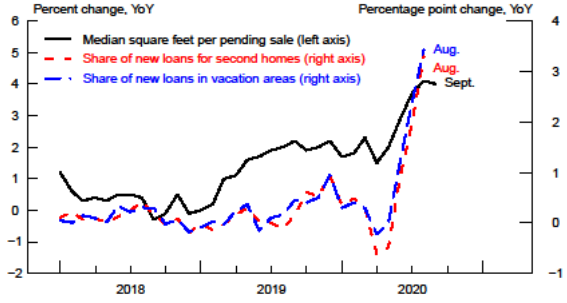
The resilience in housing

Housing activity has also rebounded quickly, partly reflecting pent-up spending from the spring shutdown. In addition, record-low mortgage rates are a primary factor boosting the sector.[1] As with goods retailers, the housing sector has also adjusted toward safer business practices during the pandemic. For many, the home sale process—from the house search to the closing itself—has moved online or toward limited-contact options.[2] Moreover, the sector has been less affected by recent job losses, as new homebuyers tend to have relatively high incomes, and high-income workers have experienced less unemployment.[3]

Moreover, as households adapt to spending more time at and working more from home, changes in preferences caused by the pandemic appear to be boosting housing demand. Homebuyers are purchasing larger homes, as shown in figure 3 (left axis). Also, relatively more purchases are for second homes, many located in vacation areas (right axis).[4] Lastly, home improvements are moving up amid spending booms at furniture as well as building materials and supplies stores (figure 4).

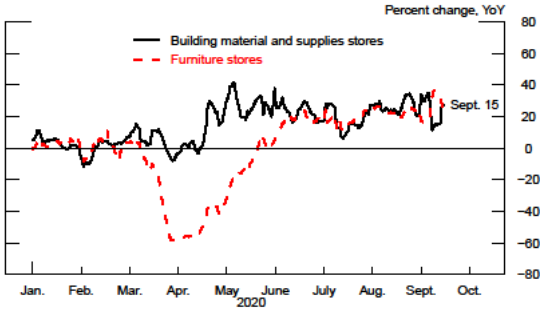
For the next few quarters, we expect residential investment to keep rising, with continued support from low mortgage rates. That said, residential investment is expected to decelerate substantially—and hence boost GDP growth less going forward—given that we estimate residential investment has already exceeded pre-COVID-19 levels in the third quarter. Return to Domestic text

Figure 3. Median Square Feet per Pending Sale and Composition of New Home Purchase Loans



Note: New home purchase loans include single-family residences and condos. Vacation areas are defined as those where the vacation share of housing in the property's zipcode was larger than 10 percent in the 2010 Decennial Census. YoY is year-over-year change.
Source: For new home purchase loans, Black Knight McDash data and authors' calculations; for median square feet, Redfin, a national real estate broker.

Figure 4. Housing-Related Spending



Note: Year-over-year (YoY) changes are calculated using 7-day moving averages.
Source: Fiserv.

[1] Other policy responses such as mortgage forbearance (which will likely prevent some foreclosures) and the Paycheck Protection Program (of which the construction industry was a top recipient) have also helped.

[2] According to Redfin, 45 percent of homebuyers made sight-unseen offers in June, compared with 28 percent last year, as discussed in Lily Katz (2020), "Survey: Almost Half of Recent Homebuyers Made an Offer Sight-Unseen, the Highest Share on Record," *Redfin News*, July 30, https://www.redfin.com/news/buying-house-sight-unseen-increases.

[3] For example, in 2018, median household income for recent homebuyers was about $20,000 higher than the overall median, according to estimates from the American Community Survey.

[4] In addition to preference changes, compositional changes—as demand from lower-income households has fallen sharply—likely explain some of the recent shift toward larger homes and second-home purchases.

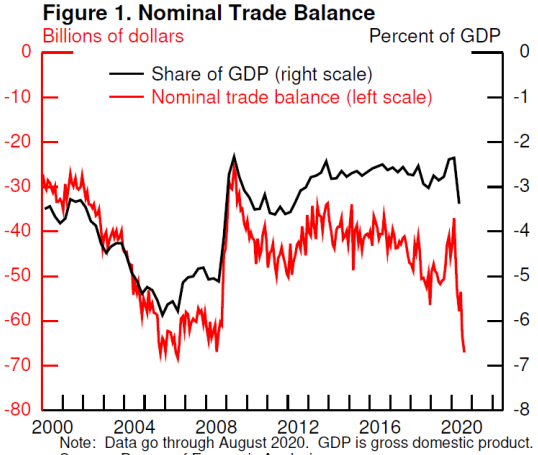
The Recent Widening of the U.S. Trade Deficit

Since the beginning of the pandemic, the U.S. trade deficit has widened significantly, reaching $67 billion in August. As shown in figure 1, this trade deficit is the largest in more than a decade in dollar terms and is sizable as a percentage of gross domestic product (GDP). This discussion analyzes the determinants of this widening: a surge in demand for consumer goods leading to a larger-than-normal bounceback in U.S. imports and, in line with the partial recovery in foreign demand, a more incomplete recovery of U.S. exports.

U.S. imports have bounced back surprisingly sharply, recovering nearly to their pre-pandemic levels. Although imports typically respond more than one for one to changes in U.S. GDP, figure 2 shows that the recent surge in goods imports (the blue line) is even stronger than what would be expected given the current rebound in U.S. GDP (the black line). Indeed, import growth has also rebounded faster than industrial production (the dashed red line), which normally tracks import growth well and did so in early 2020.

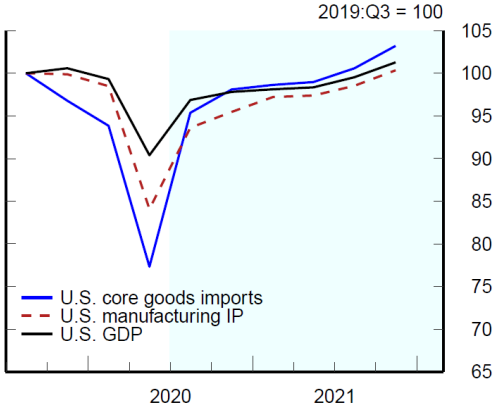
This disconnect from industrial production is consistent with the fact that the current import recovery is driven more by imports of consumer goods than by goods that are inputs to U.S. manufacturing. The sharp rise in imports of durable household products and electronics likely reflects greater demand for products related to spending time at home and lines up with the very solid durable goods consumption in the United States. In addition, the continuing risk of more U.S. tariffs being imposed on consumer goods imports from emerging market trading partners such as China and Vietnam may also be encouraging precautionary purchases of such products.

Figure 1. Nominal Trade Balance



Note: Data go through August 2020. GDP is gross domestic product.
Source: Bureau of Economic Analysis.

Figure 2. Real Core Goods Imports and GDP



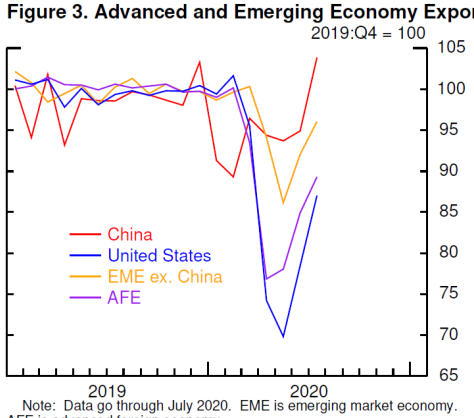
Note: IP is industrial production. GDP is gross domestic product.
Source: Federal Reserve Board staff forecast.

Indeed, the rapid overall rise in imports reflects a major increase in goods imports from China. Earlier, U.S.–China trade tensions and the ongoing decoupling of the two economies had led the share of electronics imports from China to fall from 40 percent in 2018 to nearly 20 percent at the start of 2020. However, in the most recently available data (July and August), China's share of electronics imports had climbed to 30 percent. Supporting the pickup in trade with China are China's specialization in many of the types of products that the United States is importing in great numbers and the relatively faster recovery of Chinese production in the wake of the COVID-19 pandemic. As a result, the bilateral trade deficit with China has widened to nearly $350 billion, reversing much of the narrowing trend observed since 2018.

U.S. real goods exports, in contrast, have only somewhat recovered from their plunge this spring and remain about 10 percent below pre-COVID levels. The net decline in U.S. exports is much larger than the decline in emerging market economy exports but comparable with advanced foreign economy exports (figure 3). The path for U.S. exports has closely tracked the decline and partial recovery in foreign GDP (figure 4). In particular, foreign GDP (weighted by U.S. goods exports) fell by more than U.S. GDP in the first half of 2020 and is estimated to have bounced back by less in the third quarter. Because we expect foreign GDP to recover further over the next few quarters, U.S. exports should also continue to strengthen.

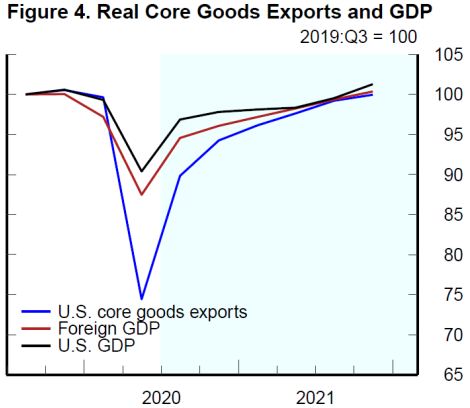
As exports rebound and the pace of import growth moderates to be more in line with U.S. domestic activity, the trade deficit should narrow. Indeed, the unusual resilience of U.S. spending on goods relative to services during the pandemic has likely disproportionately bolstered goods imports, and, given that we do not anticipate further large gains in goods spending, import growth should moderate. That said, especially with rising COVID case counts both in the United States and abroad, the unusual degree of uncertainty surrounding the forecast could presage further unexpected shifts in the trade deficit. Return to Domestic text (Introduction) | Return to Domestic text (Recent Developments, "Spending and Production")

Figure 3. Advanced and Emerging Economy Exports



Note: Data go through July 2020. EME is emerging market economy. AFE is advanced foreign economy.
Source: Netherlands CPB Bureau for Economic Policy Analysis.

Figure 4. Real Core Goods Exports and GDP



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

Household Savings and Prospects for Consumer Spending

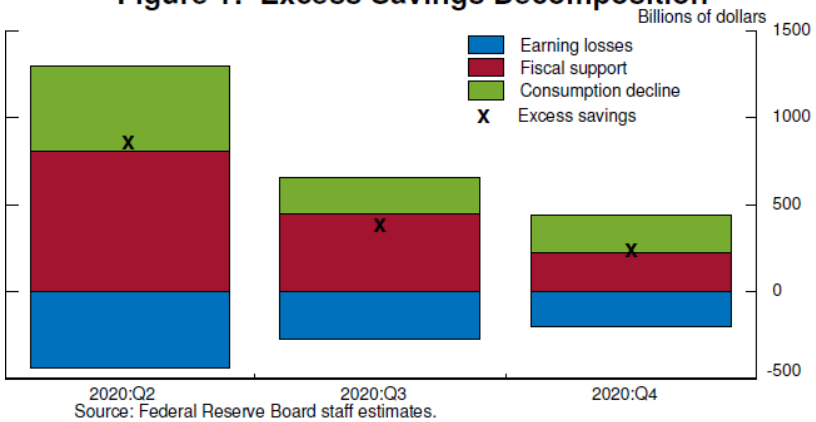
Household savings have shot up this year, despite high unemployment and lost earnings, because of the combination of unprecedented fiscal support and the sharp drop in spending due to social distancing. This discussion provides estimates of the relative importance of these factors and the distribution of the rise in savings across income groups. We then discuss the implications for aggregate consumption.

One method for analyzing the rise in the saving rate is to compare it with the staff's forecast before the pandemic. Figure 1 decomposes the flow of "excess savings"—defined as the extra money that households save in each quarter above what we projected in the January Tealbook—into the contribution from three factors. Fiscal support (red bars, which includes both automatic stabilizers and discretionary policies) has more than offset earnings losses (wages and proprietors' income, blue bars), while households cut spending (green bars). Excess savings cumulated to $1.2 trillion by the end of Q3, a figure consistent with recent increases in household liquid assets in the Flow of Funds accounts. We expect the flow of excess savings to remain positive in Q4 but, with fiscal support having diminished, to be somewhat lower than the previous quarters.

The implications of the excess savings for aggregate spending will depend on who holds the cumulated savings. Low-income consumers tend to have high marginal propensity to consume out of liquid assets and may spend their stock of savings quite quickly, while higher-income consumers may be less responsive to their increased wealth, especially while their spending is constrained by social distancing. In order to explore these distributional issues, we decompose earnings losses, consumption declines, and fiscal support for each quartile of the income distribution.[1]

The left panel of figure 2 shows our estimates of cumulative excess savings as of September for each income quartile. Surprisingly, aggregate excess savings appear to be distributed fairly

Figure 1: Excess Savings Decomposition



Source: Federal Reserve Board staff estimates.

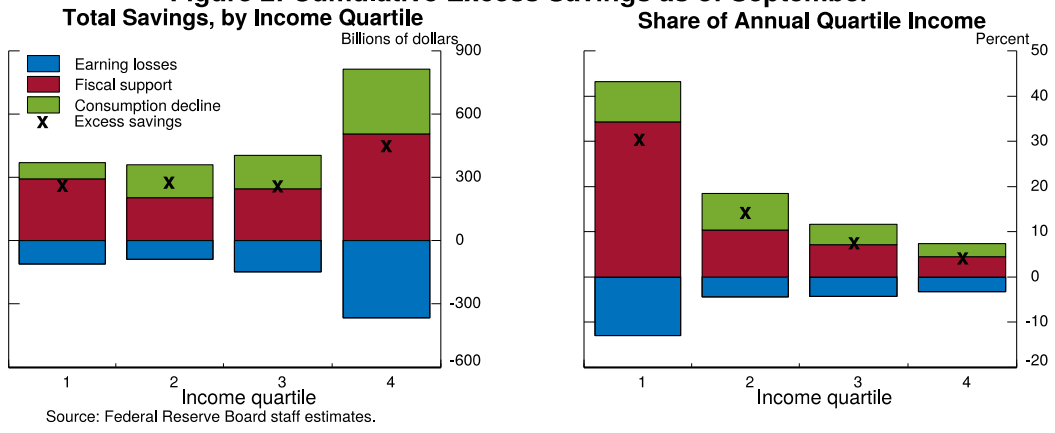
[1] We rely on data from the payroll processing firm ADP to allocate wage income and unemployment benefits across income quartiles, and we assume changes in proprietors' income are concentrated in the top quartile. Other fiscal transfers and consumption are allocated based on microdata, research studies, and details of legislation. While our estimates are based on preliminary aggregate data and distributional assumptions that may be wrong, the qualitative story is robust to reasonable alternative assumptions and data sources. Our results differ from the Distributional Financial Accounts, which do not account for specific distributional effects of the CARES Act or other factors affecting savings during the pandemic.

evenly across the income quartiles.[2] However, because incomes vary drastically across quartiles, excess savings accrued by the lowest quartile are a much larger share of their typical income than for the top quartile (right panel).

For the *average* low-income household (quartile 1), fiscal support more than offset earnings losses, reflecting the enhanced unemployment benefits and the recovery rebates, and many households have accrued enough liquid assets to maintain their spending levels for some time. This result masks the fact that some low-income households—particularly those ineligible for unemployment insurance—are struggling financially.[3] Looking ahead, in the absence of additional fiscal support, we estimate that spending for the bottom quartile as a whole—which accounts for approximately 12 percent of PCE—will fall in early to mid-2021 as they exhaust their savings, leaving a negative imprint on aggregate spending growth next year.[4]

Among high-income households, earnings losses have been roughly offset by fiscal support such as the PPP, which boosts proprietors' income largely received by high-income households. Consequently, spending cuts have been an important driver of the excess saving among these households. Their discretionary spending has been heavily curtailed by social distancing and will fully recover only when restrictions and fears of the virus ease, which we project will occur fully only in early 2022. Even so, we expect that spending for this group—which accounts for almost half of PCE—will remain depressed through 2022 as precautionary motives hold up the saving rate. We expect the saving rate to fall back to pre-COVID-19 levels by 2023 as precautionary motives wane, but we expect high-income households will not spend their stock of excess savings by 2023. Return to Domestic text (Introduction) | Return to Domestic text (Recent Developments, "Spending and Production") | Return to International text | Return to Risks and Uncertainty text

Figure 2: Cumulative Excess Savings as of September



Source: Federal Reserve Board staff estimates.

[2] Survey results from the July SHED also show that 77 percent of households reported "doing okay" or "living comfortably," an improvement even over pre-pandemic readings.

[3] See Marianne Bitler, Hilary W. Hoynes, and Diane Whitmore Schanzenbach (2020), "The Social Safety Net in the Wake of COVID-19," NBER Working Paper Series 27796 (Cambridge, Mass.: National Bureau of Economic Research, September), https://www.nber.org/papers/w27796, which finds that many low-income households suffered elevated food insecurity over the summer, and this rise in food insecurity reflects delays in receiving benefits as well as holes in the safety net such that some households were unable to receive benefits.

[4] This finding is consistent with a separate analysis by Board colleagues using the Survey of Consumer Finances, which finds that job losers in the bottom quartile would have received sufficient funds from unemployment insurance and stimulus to finance their regular pre-COVID-19 consumption through early next year. See Neil Bhutta, Jacqueline Blair, Lisa Dettling, and Kevin Moore (2020), "COVID-19, the CARES Act, and Families' Finances," *National Tax Journal*, vol. 73 (3), pp. 645–72.

Possible Long-Term Effects of the COVID-19 Recession

Deep recessions often have a long-lasting negative effect on economic activity. The baseline projection assumes that the pandemic recession will persistently lower the level of potential output by about 1 percent, largely because of lower levels of multifactor productivity and capital services caused by the destruction of intangible capital and the decrease in investment. In contrast, the staff assumes that the natural rate of unemployment will have returned to its pre-pandemic level by the end of 2023. In this note, we discuss additional channels—both negative and positive—through which this recession may give rise to further longer-run effects on the level of real activities.

A larger rise in long-term unemployment: Although the labor market has recovered robustly for a few months, recent data indicate a risk of a sizable increase in long-term unemployment. Job gains are slowing down, and the number of unemployed workers on temporary layoff has declined significantly, while the number of permanently laid-off workers has been steadily increasing.[1] The share of the labor force unemployed for at least six months is now at levels comparable with the peaks during the recessions of 1990 and 2001, which were followed by slow recoveries in the labor market. A significantly larger increase in long-term unemployment than implicitly assumed in our baseline projection could imply a slower decline in the unemployment rate and weaker productivity growth than we project, given that workers in long-term unemployment find jobs at a lower rate and their labor productivity depreciates more than workers in short-term unemployment.

Disruptions in human capital accumulation: In contrast to recent recessions, the COVID-19 recession could have a negative and persistent effect on human capital that could leave a long-lasting effect on output. Because of strict lockdowns in the spring, schools were forced to close temporarily. A recent working paper estimates that human capital could decline 1.7 percent over the next decade as a consequence of schools being closed for six months.[2] Moreover, recent numbers point to a decline in college enrollment, which seems to be disproportionally affecting low-income families. A back-of-the-envelope calculation indicates that a 1.7 percent decrease in human capital could make GDP per capita decline between 0.5 and 1 percent over the next decade. However, the decline in human capital could be even larger because of possibly longer school closures and negative effects on children's noncognitive skills.[3]

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[1] Conditioning on an unemployment rate path that is more pessimistic than in the staff baseline forecast, Chodorow-Reich and Coglianese (2020) estimate that the total number of workers unemployed for more than six months could increase to 5.1 million by 2021. The same number had reached 6.8 million at the peak of the Great Recession. See Gabriel Chodorow-Reich and John Coglianese (2020), "Projecting Unemployment Durations: A Factor-Flows Simulation Approach with Application to the COVID-19 Recession," NBER Working Paper Series 27566 (Cambridge, Mass.: National Bureau of Economic Research, July), https://www.nber.org/papers/w27566.

[2] See Nicola Fuchs-Schündeln, Dirk Krueger, Alexander Ludwig, and Irina Popova (2020), "The Long-Term Distributional and Welfare Effects of Covid-19 School Closures," NBER Working Paper Series 27773 (Cambridge, Mass.: National Bureau of Economic Research, September), https://www.nber.org/papers/w27773.

[3] Schools that have reopened are mostly operating in an online format. Given the challenges with online education, the OECD has called for policy responses to prevent school disengagement that could lower future education outcomes. See Organisation for Economic Co-operation and Development (2020), "Education and COVID-19: Focusing on the Long-Term Impact of School Closures," OECD Policy Responses (Paris: OECD Publishing, June), https://www.oecd.org/coronavirus/policy-responses/education-and-covid-19-focusing-on-the-long-term-impact-of-school-closures-2cea926e.

Scarring effects on long-run expectations: A recent study finds that real interest rates have historically remained depressed for several decades after pandemics.[4] One reason may be that pandemic recessions like this one may lead to belief scarring, a persistent increase in the perceived probability of future extreme adverse outcomes.[5] Belief scarring could increase the precautionary savings motive more than in our baseline and make risky investment less attractive, resulting in substantial and persistent decreases in investment and output and a prolonged decline in the natural rate of interest.

Acceleration in automation: The COVID-19 pandemic and the possibility of recurring future waves of the pandemic have created incentives for firms to accelerate investment in automation because, unlike workers, robots can perform their tasks without infection risk. Automation increases labor productivity by increasing the amount of capital per worker. However, because automation replaces workers in routine-task occupations, it may reduce aggregate employment and labor force participation. Therefore, the rise in automation may cause employment to recover at a substantially slower pace, while labor productivity and output may grow relatively rapidly over the next several years.

Surprisingly strong start-up dynamics: While the steep decline and sluggish restoration of business start-up rates following the Great Recession were important drivers of the slow recovery, recent data suggest that start-up dynamics in this recession may be different. The share of start-ups in all firms declined from 9.5 percent to 7.6 percent from 2007 to 2009 and had only recovered to 8.1 percent in 2018. Surprisingly, high-frequency data on business formation indicate that the number of new business applications has been rising rapidly since April, bringing the cumulative number of applications submitted until September this year to levels higher than those seen in the past three years. The causes behind this rise are not well understood yet, and it remains to be seen whether the recent improvements will become persistent enough to prevent sluggish recovery this time. The rise might have been caused by the pandemic-induced structural changes creating new business opportunities or lowering start-up costs through less need for retail and office spaces, or better credit availability for businesses than in the Great Recession.

Increase in remote work: Remote work has increased substantially in response to the pandemic, and the Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta shows that firms expect the share of working days spent at home to triple after the COVID-19 crisis ends compared with before the pandemic hit. In the short run, an abrupt increase in remote work is likely to put downward pressure on labor productivity, as balancing work and childcare is challenging, some tasks cannot be done efficiently at home, and many workers have limited workspaces and unstable internet connections. Over time, however, schools will reopen, many workers who cannot work efficiently at home will return to their original workplaces, and IT infrastructure is likely to improve. The increase in remote work has enabled individuals to spend less time commuting and more time on work or other economic activities. In addition, firms will be able to save on business travel and office space and may face fewer geographic constraints in recruiting talent. Therefore, the increase in remote work may have a positive effect on labor hours and productivity in the long run. Return to Domestic text

[4] See Òscar Jordà, Sanjay R. Singh, and Alan M. Taylor (2020), "Longer-Run Economic Consequences of Pandemics," Working Paper Series 2020-09 (San Francisco: Federal Reserve Bank of San Francisco, June), https://www.frbsf.org/economic-research/publications/working-papers/2020/09/.

[5] See Julian Kozlowski, Laura Veldkamp, and Venky Venkateswaran (2020), "Scarring Body and Mind: The Long-Term Belief-Scarring Effects of Covid-19," Working Paper Series 2020-009 (St. Louis: Federal Reserve Bank of St. Louis, April), https://research.stlouisfed.org/wp/more/2020-009.

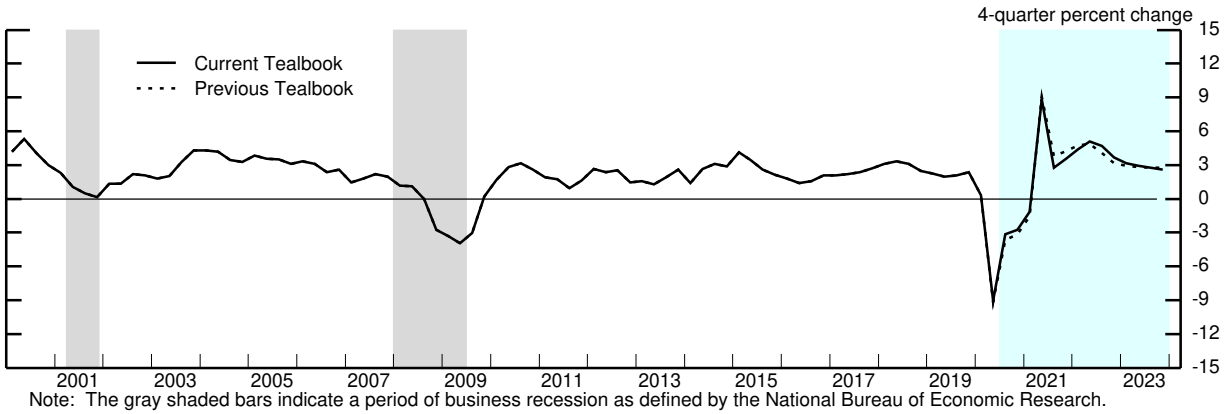
Domestic Econ Devel & Outlook

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	2023
Real GDP	**2.3**	**-19.2**	**17.1**	**-2.8**	**3.5**	**3.7**	**2.6**
Previous Tealbook	*2.3*	*-19.5*	*16.4*	*-3.2*	*4.2*	*3.2*	*2.8*
Final sales	2.8	-16.8	13.7	-2.7	3.1	3.7	2.5
Previous Tealbook	*2.8*	*-17.0*	*12.7*	*-3.3*	*4.1*	*3.1*	*2.7*
Personal consumption expenditures	2.5	-21.1	19.7	-2.8	3.0	4.5	3.1
Previous Tealbook	*2.5*	*-21.7*	*19.6*	*-3.2*	*4.2*	*3.4*	*3.0*
Residential investment	1.6	-12.4	42.3	11.6	6.9	5.3	-1.6
Previous Tealbook	*1.6*	*-13.0*	*28.8*	*5.9*	*9.6*	*5.6*	*3.0*
Nonresidential structures	1.9	-20.0	-15.7	-17.9	.2	4.7	7.9
Previous Tealbook	*1.9*	*-19.1*	*-16.7*	*-17.9*	*4.4*	*4.3*	*7.3*
Equipment and intangibles	1.3	-16.8	16.1	-1.7	6.5	6.7	4.7
Previous Tealbook	*1.3*	*-16.0*	*9.9*	*-3.9*	*7.3*	*6.7*	*5.1*
Federal purchases	4.8	8.7	7.0	7.9	.7	-2.0	-2.0
Previous Tealbook	*4.8*	*9.3*	*7.2*	*8.2*	*.6*	*-2.0*	*-2.0*
State and local purchases	1.9	-2.2	-3.4	-2.8	1.1	1.0	1.0
Previous Tealbook	*1.9*	*-2.2*	*-5.9*	*-4.1*	*1.0*	*.9*	*1.0*
Exports	.4	-43.2	35.3	-12.4	10.8	4.8	4.5
Previous Tealbook	*.4*	*-42.9*	*38.6*	*-11.1*	*11.3*	*4.5*	*4.4*
Imports	-1.9	-37.5	46.1	-4.5	8.9	6.2	4.6
Previous Tealbook	*-1.9*	*-37.5*	*42.9*	*-5.5*	*10.1*	*5.5*	*4.8*
	Contributions to change in real GDP (percentage points)						
Inventory change	-.4	-2.5	3.2	.0	.5	.0	.1
Previous Tealbook	*-.4*	*-2.5*	*3.5*	*.1*	*.2*	*.1*	*.1*
Net exports	.3	.3	-2.1	-.8	-.1	-.4	-.2
Previous Tealbook	*.3*	*.3*	*-1.5*	*-.5*	*-.2*	*-.3*	*-.2*

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	2023
Nonfarm payroll employment[1]	178	-2,365	1,026	-670	467	362	271
Previous Tealbook	*178*	*-2,365*	*1,043*	*-661*	*499*	*311*	*266*
Private employment[1]	162	-2,138	965	-586	427	323	234
Previous Tealbook	*162*	*-2,138*	*1,043*	*-547*	*470*	*281*	*239*
Labor force participation rate[2]	63.2	60.8	61.7	61.7	62.3	62.7	62.9
Previous Tealbook	*63.2*	*60.8*	*61.9*	*61.9*	*62.5*	*62.7*	*62.8*
Civilian unemployment rate[2]	3.5	13.0	7.2	7.2	5.2	3.7	3.1
Previous Tealbook	*3.5*	*13.0*	*7.4*	*7.4*	*4.9*	*3.8*	*3.2*
Employment-to-population ratio[2]	61.0	52.9	57.2	57.2	59.1	60.4	60.9
Previous Tealbook	*61.0*	*52.9*	*57.3*	*57.3*	*59.4*	*60.3*	*60.8*

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

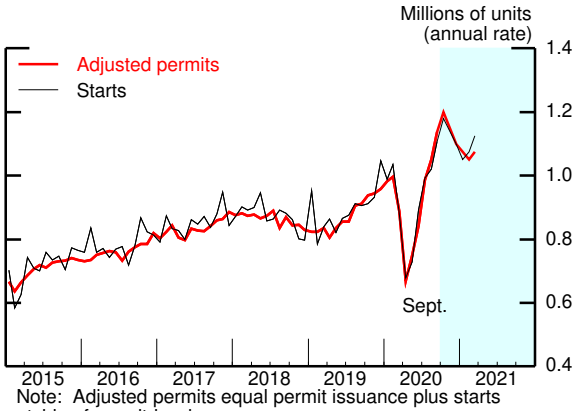
Measure	2019	2020 H1	2020 H2	2020	2021	2022	2023
Percent change at annual rate from final quarter of preceding period							
PCE chain-weighted price index	1.5	-.2	2.8	1.3	1.6	1.7	1.9
Previous Tealbook	*1.5*	*-.3*	*2.4*	*1.1*	*1.7*	*1.8*	*1.9*
Food and beverages	.9	9.1	-1.2	3.8	1.6	1.4	2.3
Previous Tealbook	*.9*	*9.1*	*-1.3*	*3.8*	*1.3*	*2.0*	*2.0*
Energy	-.6	-29.5	12.0	-11.2	2.2	1.6	1.8
Previous Tealbook	*-.6*	*-29.6*	*12.9*	*-10.8*	*3.2*	*1.8*	*1.9*
Excluding food and energy	1.6	.4	2.8	1.6	1.6	1.8	1.9
Previous Tealbook	*1.6*	*.3*	*2.4*	*1.3*	*1.7*	*1.8*	*1.9*
Prices of core goods imports[1]	-1.4	-.6	4.6	2.0	1.7	.9	.9
Previous Tealbook	*-1.4*	*-.6*	*2.7*	*1.0*	*1.4*	*1.0*	*1.0*

	Sept. 2020[2]	Oct. 2020[2]	Nov. 2020[2]	Dec. 2020[2]	Jan. 2021[2]	Feb. 2021[2]	Mar. 2021[2]
12-month percent change							
PCE chain-weighted price index	1.5	1.4	1.3	1.2	1.2	1.2	1.6
Previous Tealbook	*1.2*	*1.1*	*1.1*	*1.0*	*...*	*...*	*...*
Excluding food and energy	1.7	1.6	1.7	1.5	1.5	1.5	1.8
Previous Tealbook	*1.3*	*1.3*	*1.4*	*1.3*	*...*	*...*	*...*

... 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.

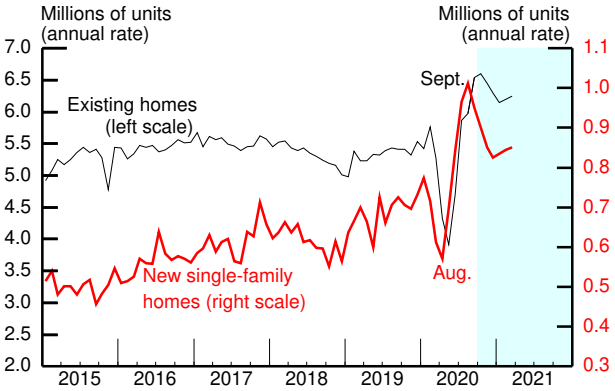
Recent Nonfinancial Developments (2)

Single-Family Housing Starts and Permits



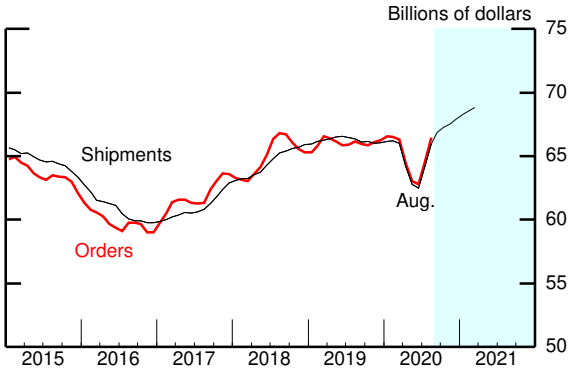
Note: Adjusted permits equal permit issuance plus starts outside of permit-issuing areas.
Source: U.S. Census Bureau.

Home Sales



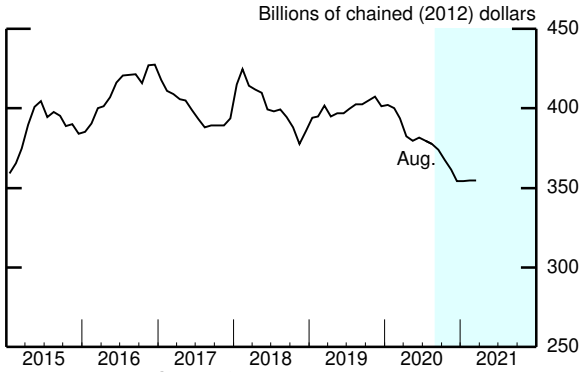
Source: For existing, National Association of Realtors; for new, U.S. Census Bureau.

Nondefense Capital Goods ex. Aircraft



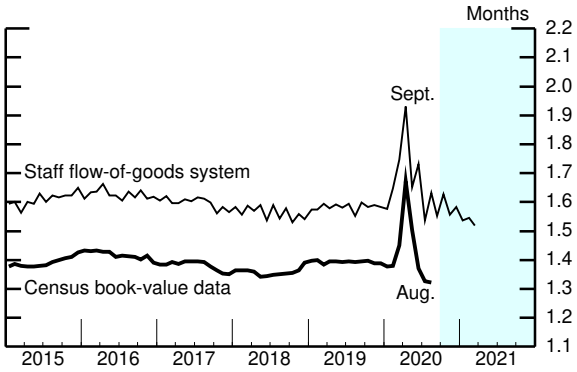
Note: Data are 3-month moving averages.
Source: U.S. Census Bureau.

Nonresidential Construction Put in Place



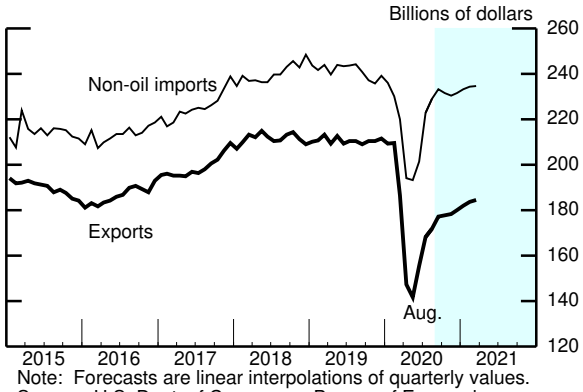
Note: Nominal CPIP deflated by BEA prices through 2020:Q2 and by the staff's estimated deflator thereafter.
Source: U.S. Census Bureau.

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.

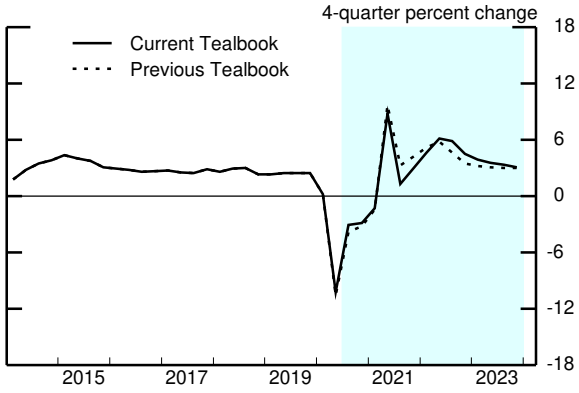
Exports and Non-oil Imports



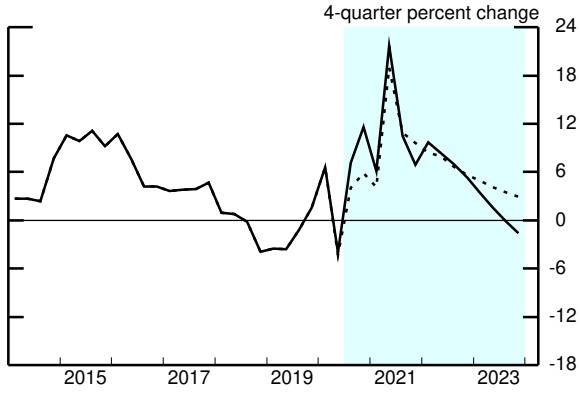
Note: Forecasts are linear interpolations of quarterly values.
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis; U.S. Census Bureau.

Components of Final Demand

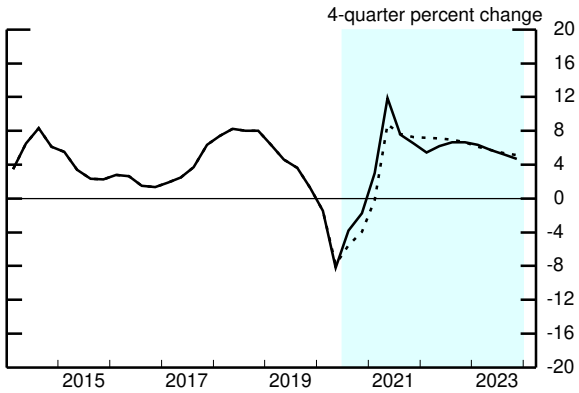
Personal Consumption Expenditures



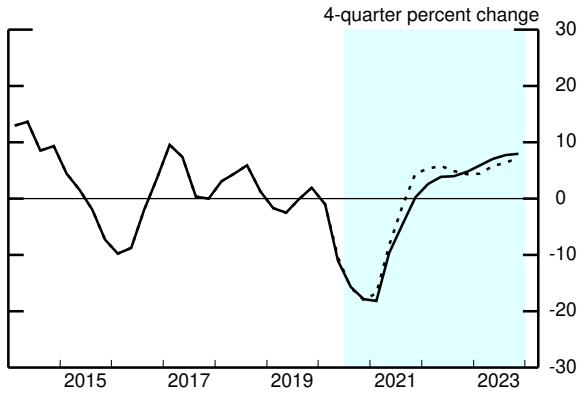
Residential Investment



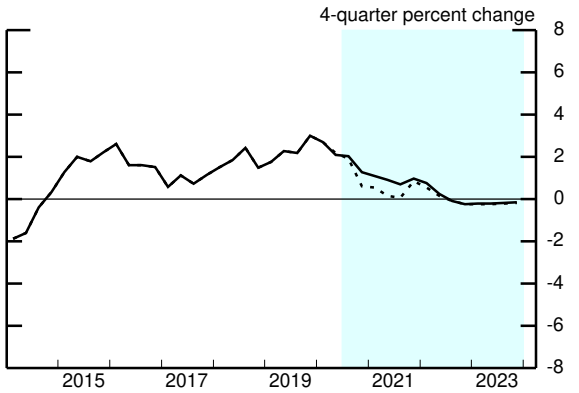
Equipment and Intangibles



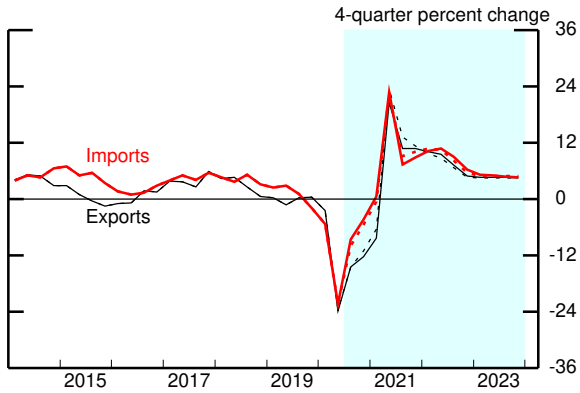
Nonresidential Structures



Government Consumption and Investment



Exports and Imports

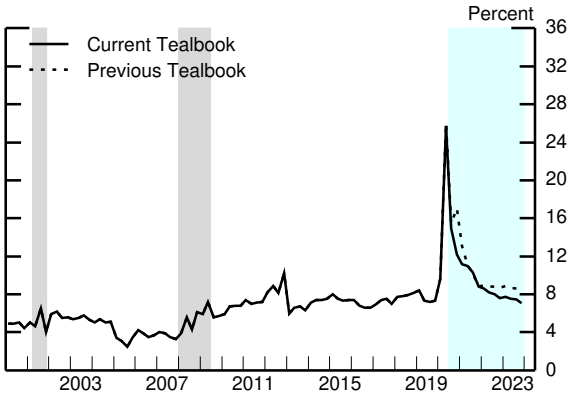


Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Domestic Econ Devel & Outlook

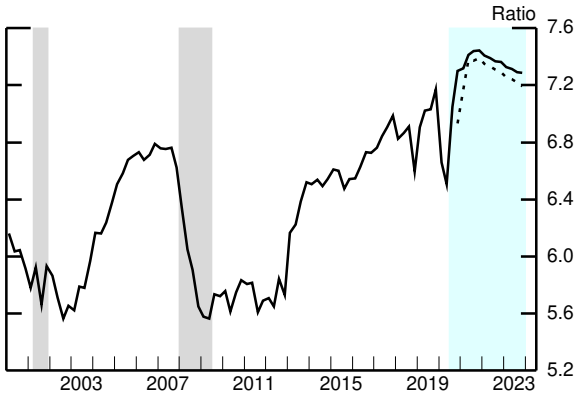
Aspects of the Medium-Term Projection

Personal Saving Rate



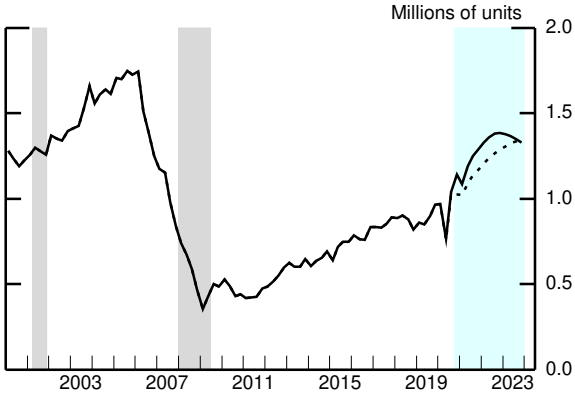
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

Wealth-to-Income Ratio



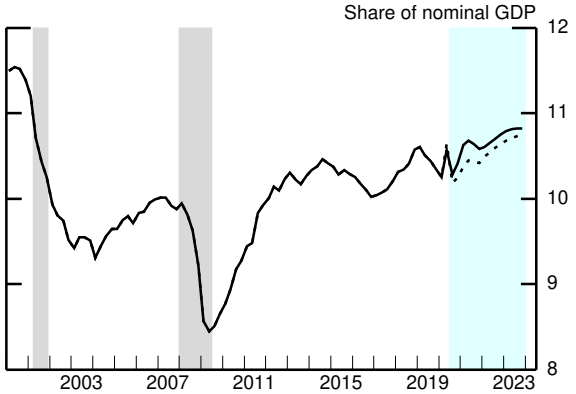
Note: Ratio of household net worth to disposable personal income.
Source: For net worth, Federal Reserve Board, Financial Accounts of the United States; for income, U.S. Dept. of Commerce, Bureau of Economic Analysis.

Single-Family Housing Starts



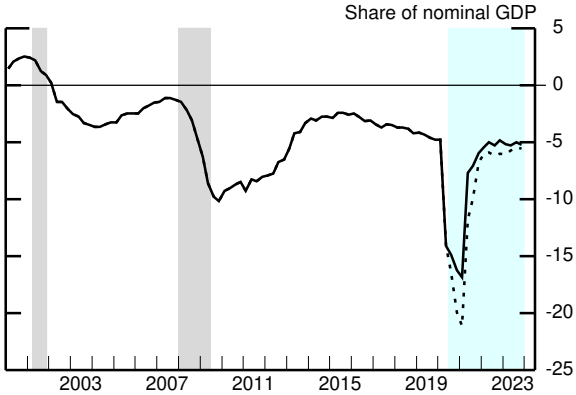
Source: U.S. Census Bureau.

Equipment and Intangibles Spending



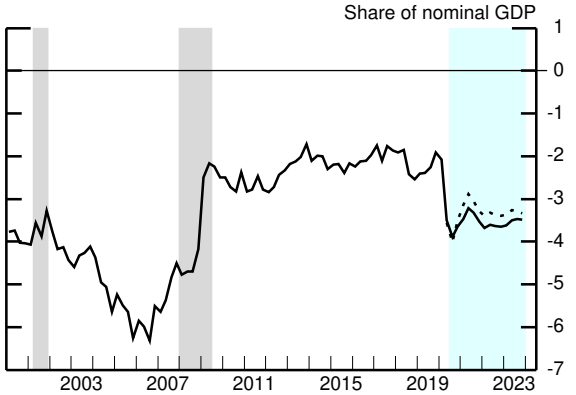
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

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.

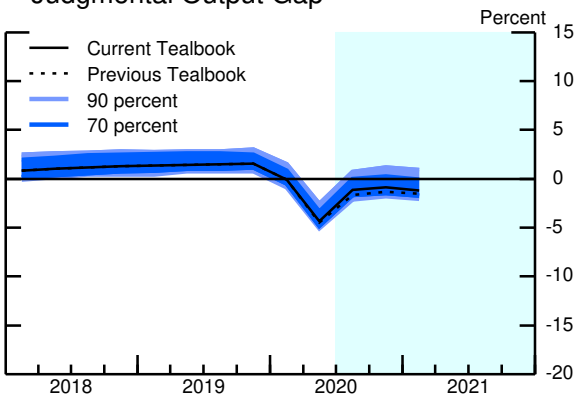
Cyclical Position of the U.S. Economy: Near-Term Perspective

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

Measure	2019	2020	2020 Q2	2020 Q3	2020 Q4
Output gap[1]	**1.5**	**-.9**	**-4.3**	**-1.1**	**-.9**
Previous Tealbook	*1.5*	*-1.3*	*-4.5*	*-1.7*	*-1.3*
Real GDP	2.3	-2.8	-31.4	31.9	3.9
Previous Tealbook	*2.3*	*-3.2*	*-31.8*	*29.7*	*4.5*
Measurement error in GDP	.2	.0	.0	.0	.0
Previous Tealbook	*.2*	*.0*	*.0*	*.0*	*.0*
Potential output	1.9	-.4	-18.3	15.5	3.0
Previous Tealbook	*1.9*	*-.4*	*-18.3*	*15.5*	*3.0*

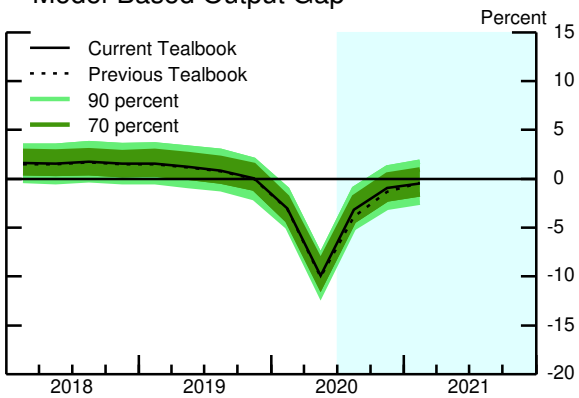
Note: The output gap is the percent difference between actual and potential output; a negative number indicates that the economy is operating below potential. The change in the output gap is equal to real GDP growth less the contribution of measurement error less the growth rate of potential output. 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



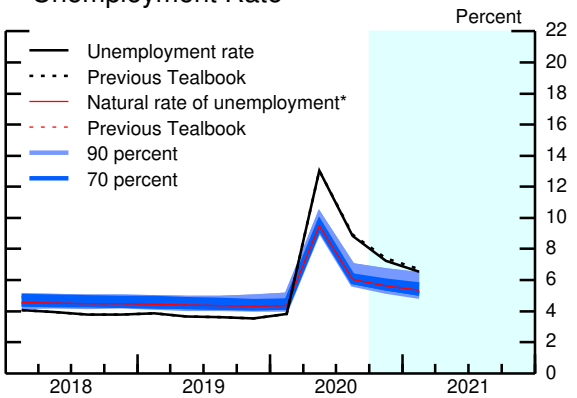
Note: Shaded regions show the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.

Model-Based Output Gap



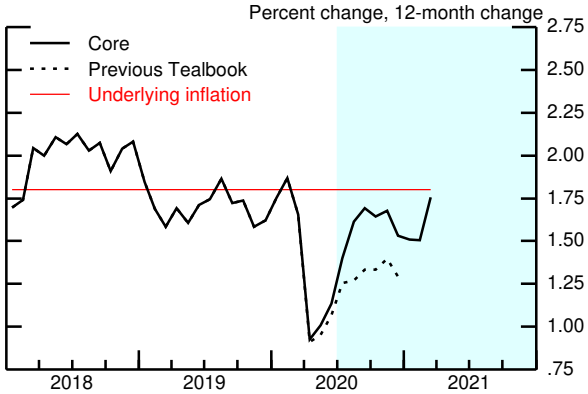
Note: Shaded regions denote model-computed uncertainty bands.
Source: Various macroeconomic data; staff assumptions.

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.

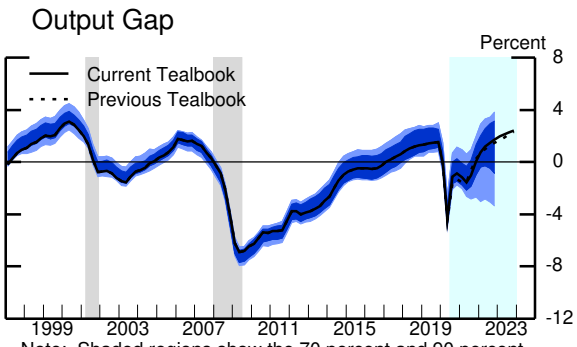
Core PCE Price Inflation



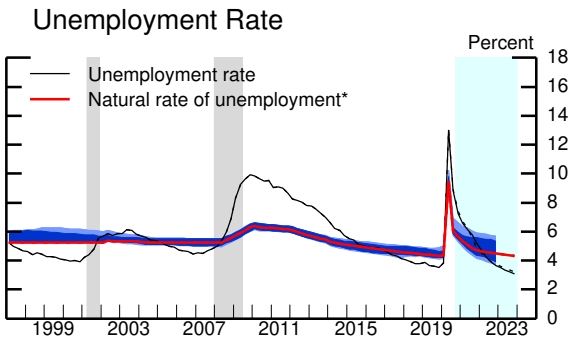
Source: U.S. Department of Commerce, Bureau of Economic Analysis; staff assumptions.

Domestic Econ Devel & Outlook

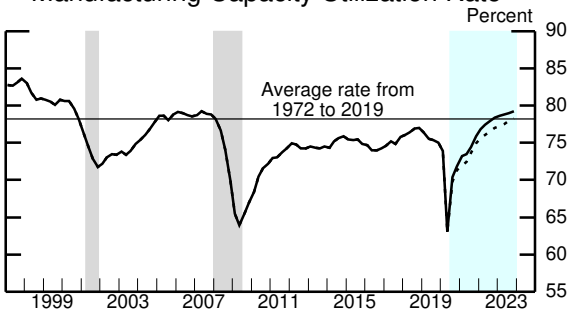
Cyclical Position of the U.S. Economy: Longer-Term Perspective



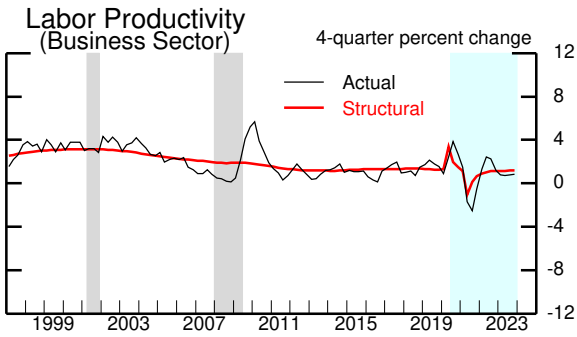
Note: Shaded regions show the 70 percent and 90 percent confidence intervals of the distribution of historical revisions to the staff's estimates of the output gap.
Source: Various macroeconomic data; staff assumptions.



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

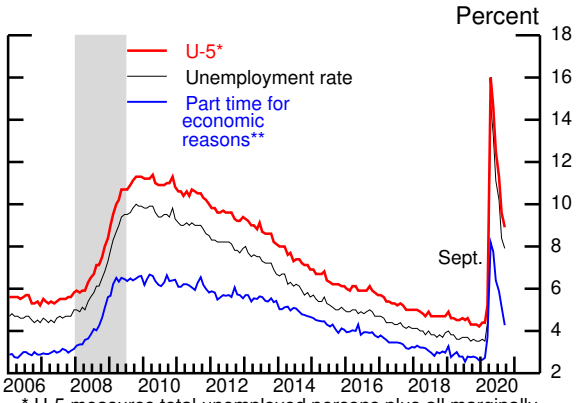
(Percent change, Q4 to Q4, except as noted)

Measure	1975-96	1997-2001	2002-08	2009-11	2012-18	2019	2020	2021	2022	2023
Potential output	3.1	3.6	2.5	1.7	1.6	1.9	-.4	2.6	1.9	2.0
Previous Tealbook	*3.1*	*3.6*	*2.5*	*1.7*	*1.6*	*1.9*	*-.4*	*2.6*	*1.9*	*2.0*
Selected contributions:[1]										
Structural labor productivity[2]	1.7	3.2	2.4	1.6	1.3	1.3	1.5	.6	1.2	1.2
Previous Tealbook	*1.7*	*3.2*	*2.4*	*1.6*	*1.3*	*1.3*	*1.5*	*.6*	*1.2*	*1.2*
Capital deepening	.7	1.5	1.0	.4	.8	.7	1.4	-.3	.4	.5
Multifactor productivity	.8	1.3	1.2	1.0	.2	.4	-.1	.7	.5	.5
Structural hours	1.5	1.2	.8	.4	.5	.5	-2.4	2.4	1.0	.9
Previous Tealbook	*1.5*	*1.2*	*.8*	*.4*	*.5*	*.5*	*-2.4*	*2.4*	*1.0*	*.9*
Labor force participation	.4	-.1	-.2	-.5	-.4	.0	-1.4	.7	.1	.0
Previous Tealbook	*.4*	*-.1*	*-.2*	*-.5*	*-.4*	*.0*	*-1.4*	*.7*	*.1*	*.0*
Memo:										
Output gap[3]	-.4	-.8	-4.2	-4.6	1.3	1.5	-.9	.0	1.7	2.4
Previous Tealbook	*-.4*	*-.8*	*-4.2*	*-4.6*	*1.3*	*1.5*	*-1.3*	*.3*	*1.5*	*2.3*

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.

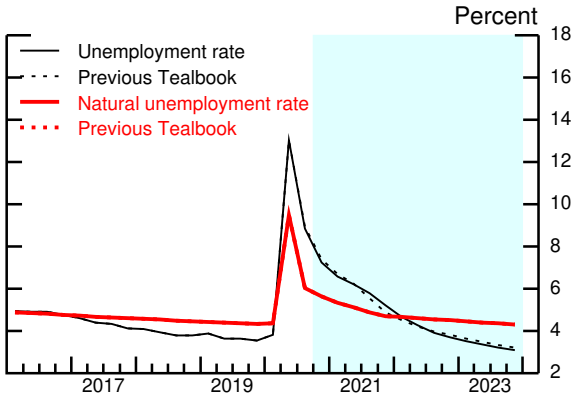
Labor Market Developments and Outlook (1)

Measures of Labor Underutilization



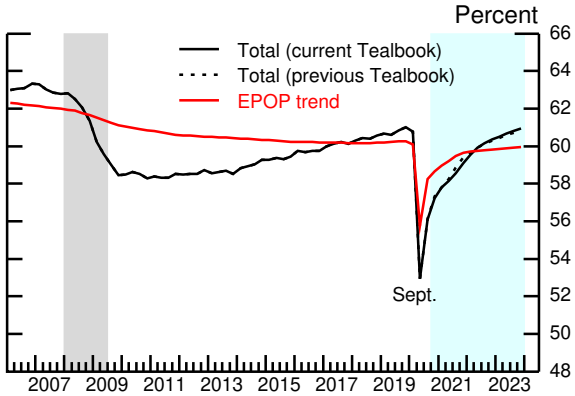
* U-5 measures total unemployed persons plus all marginally attached to the labor force as a percent of the labor force plus persons marginally attached to the labor force.
** Percent of Current Population Survey employment.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Unemployment Rate



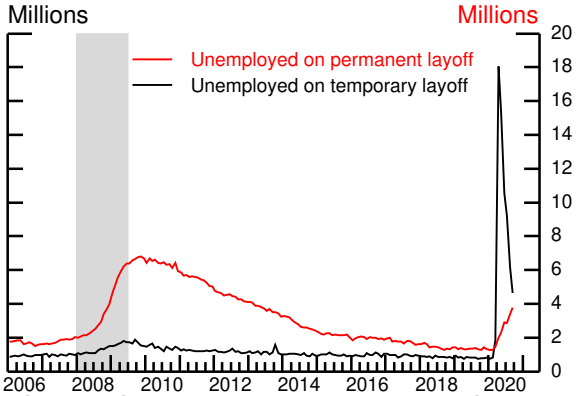
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Employment-to-Population Ratio



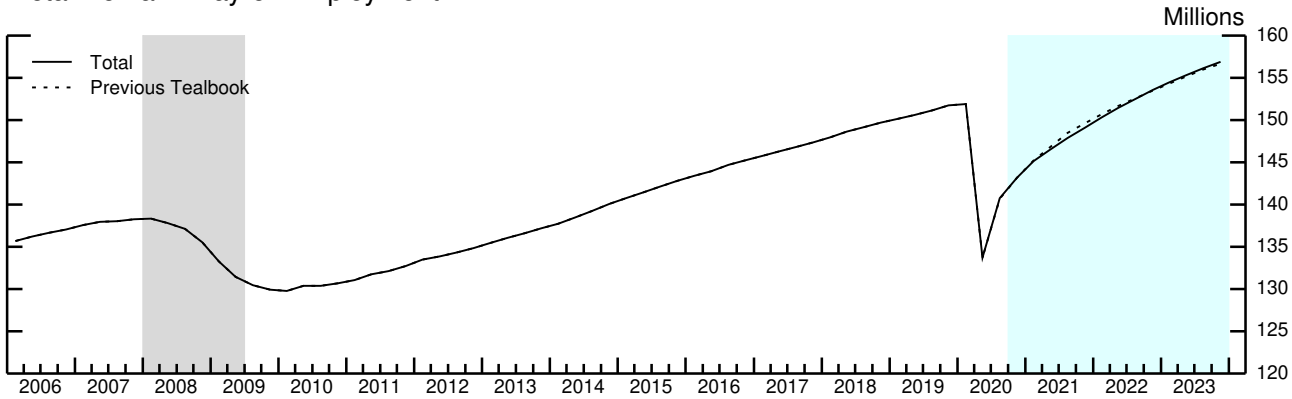
Source: U.S. Department of Labor, Bureau of Labor Statistics.

Unemployed Workers on Temporary and Permanent Layoff



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

Total Nonfarm Payroll Employment



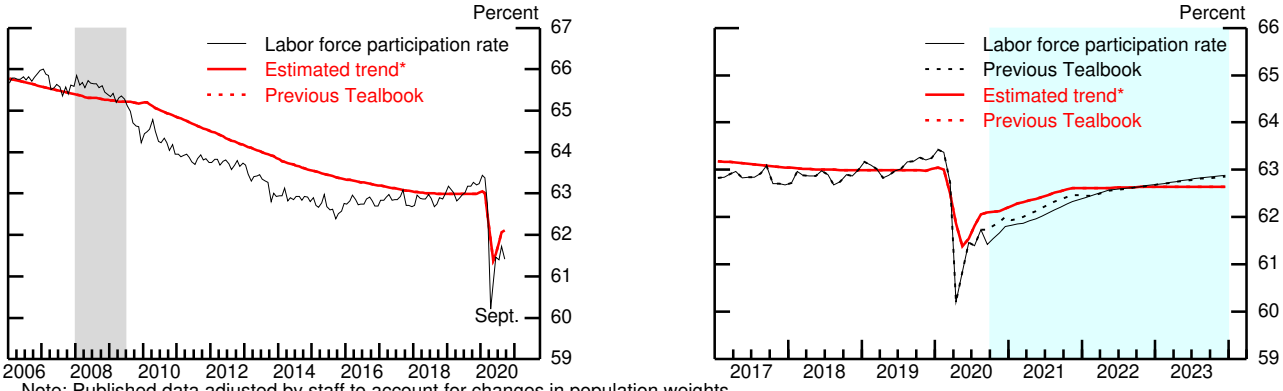
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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

Domestic Econ Devel & Outlook

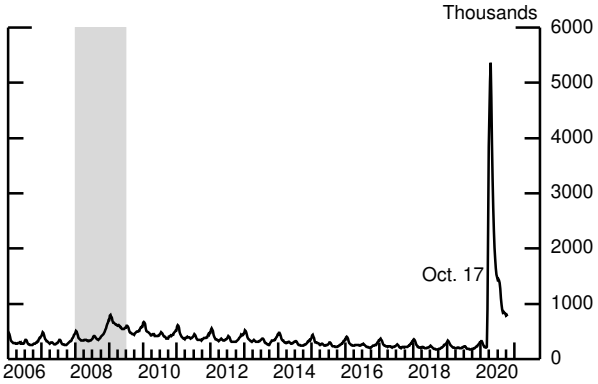
Labor Market Developments and Outlook (2)

Labor Force Participation Rate



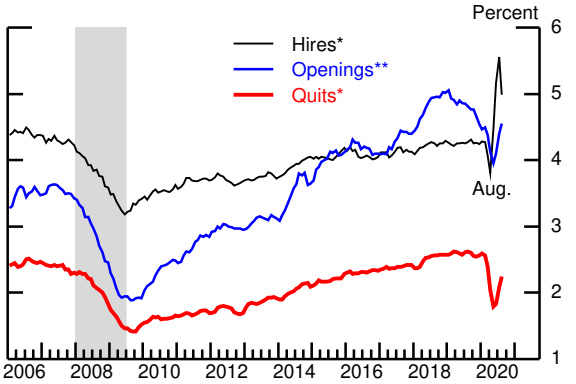
Note: Published data adjusted by staff to account for changes in population weights.
* Includes staff estimate of the effect of extended and emergency unemployment benefits.
Source: U.S. Department of Labor, Bureau of Labor Statistics; staff assumptions.

Initial Unemployment Insurance Claims



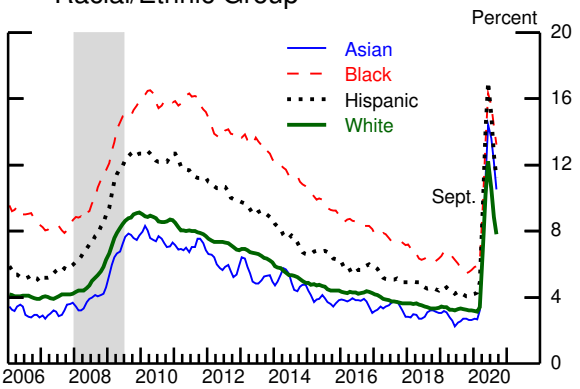
Note: 4-week moving average. Series plots values that are not seasonally adjusted.
Source: U.S. Department of Labor, Employment and Training Administration.

Hires, Quits, and Job Openings



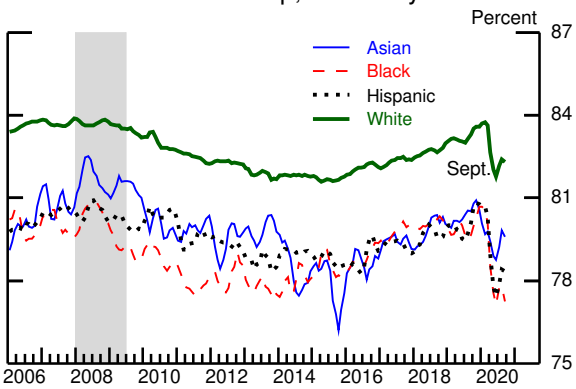
* Percent of private nonfarm payroll employment, 3-month moving average.
** Percent of private nonfarm payroll employment plus unfilled jobs, 3-month moving average.
Source: Job Openings and Labor Turnover Survey.

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.

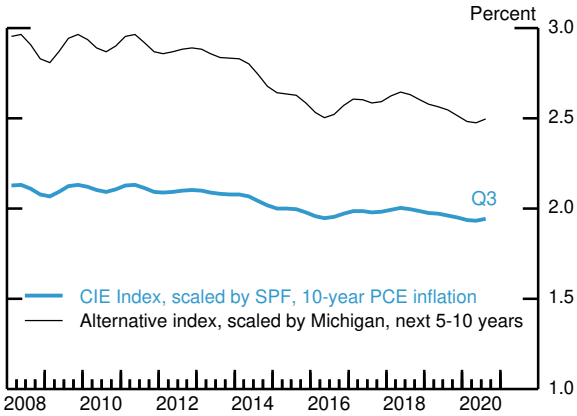
Labor Force Participation Rate by Racial/Ethnic Group, 25 to 54 years old



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.

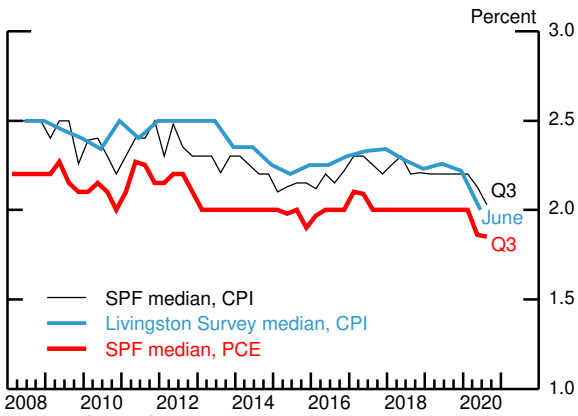
Measures of Longer-Term Inflation Expectations

Index of Common Inflation Expectations



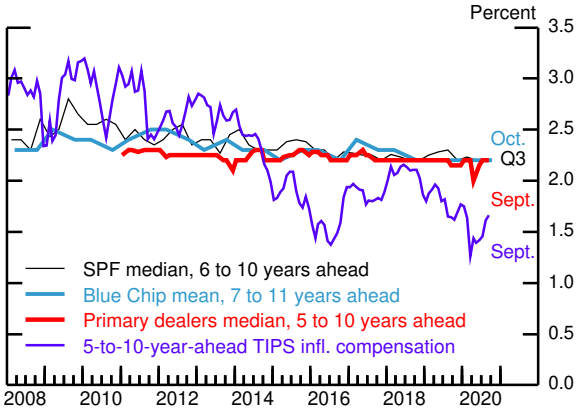
Note: Index of 21 inflation expectations indicators.
Source: Staff calculations.

Next 10 Years



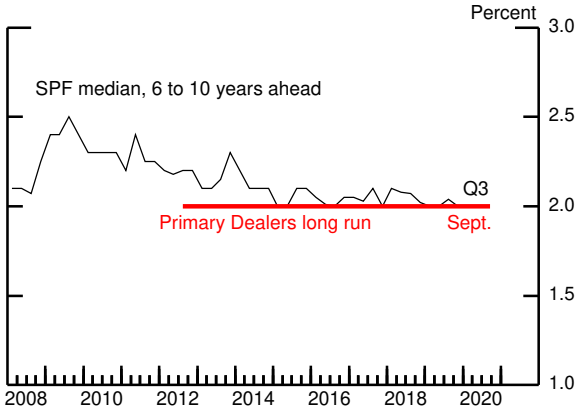
Note: SPF is Survey of Professional Forecasters.
Source: Federal Reserve Bank of Philadelphia.

CPI Forward Expectations



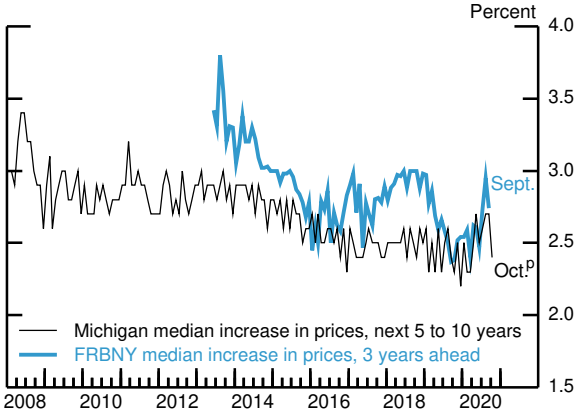
Source: Federal Reserve Bank of Philadelphia; Blue Chip Economic Indicators; Federal Reserve Bank of New York; Federal Reserve Board staff calculations.

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.
p Preliminary estimate based on data available to date.
Source: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York Survey of Consumer Expectations.

Survey of Business Inflation Expectations

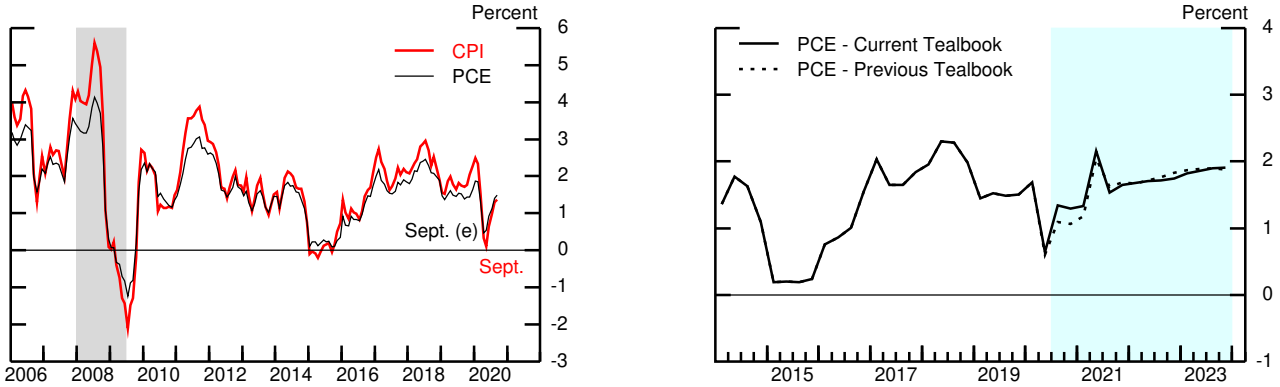
Note: Survey of businesses in the Sixth Federal Reserve District. Data begin in February 2012.
Source: Federal Reserve Bank of Atlanta.

Domestic Econ Devel & Outlook

Inflation Developments and Outlook (1)

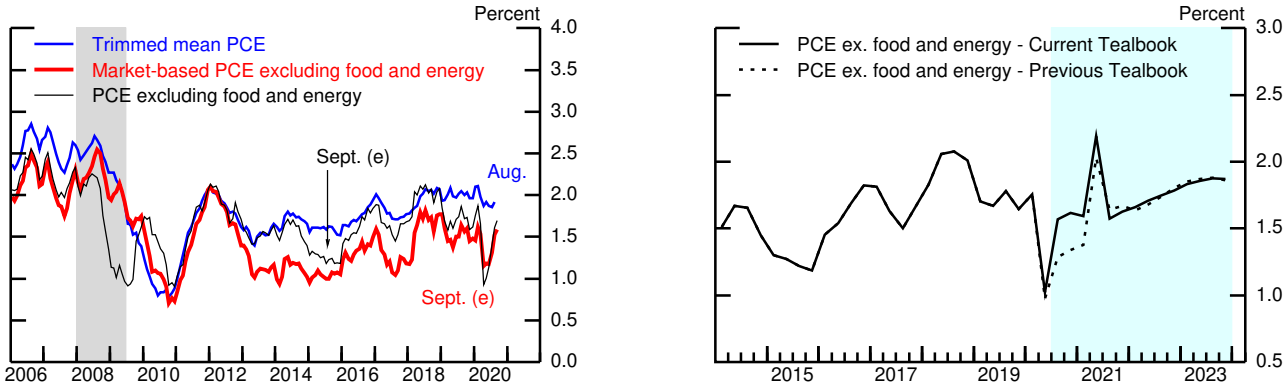
(Percent change from year-earlier period)

Headline Consumer Price Inflation



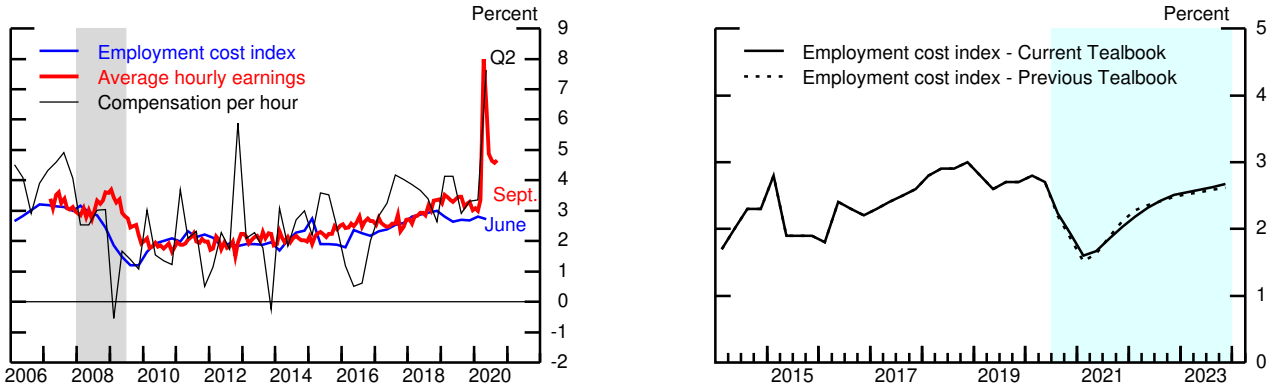
Note: PCE prices from July to September 2020 are staff estimates (e).
Source: For CPI, U.S. Department of Labor, Bureau of Labor Statistics; for PCE, U.S. Department of Commerce, Bureau of Economic Analysis.

Measures of Core PCE Price Inflation



Note: Core PCE prices from July to September 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



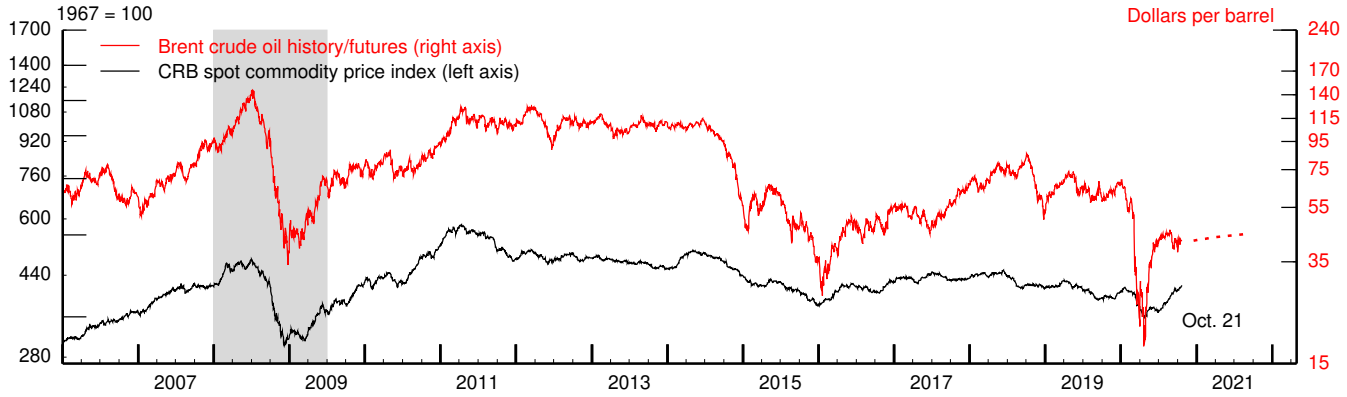
Note: Compensation per hour is for the business sector. Average hourly earnings are for the private nonfarm sector. The employment cost index is for the private sector.
Source: U.S. Department of Labor, Bureau of Labor Statistics.

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)

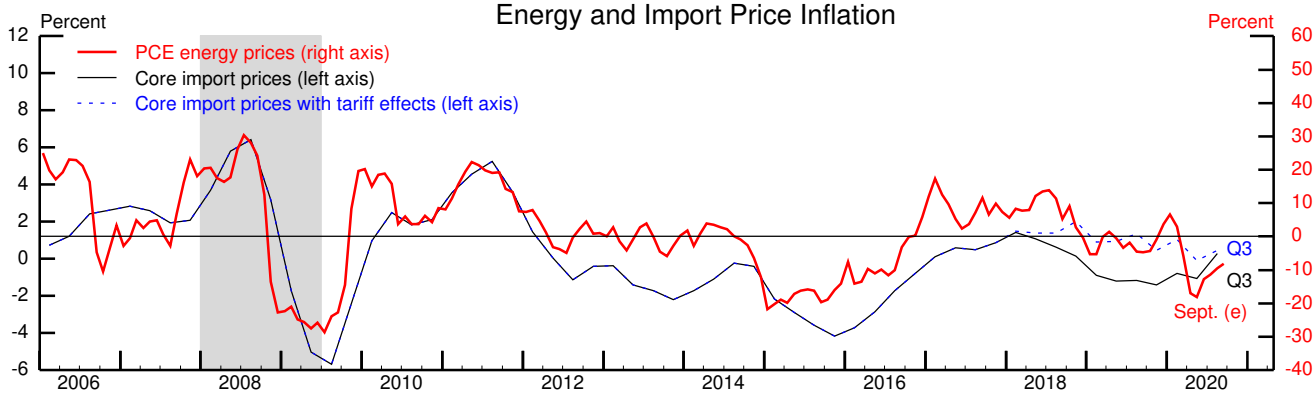
(Percent change from year-earlier period, except as noted)

Commodity and Oil Price Levels



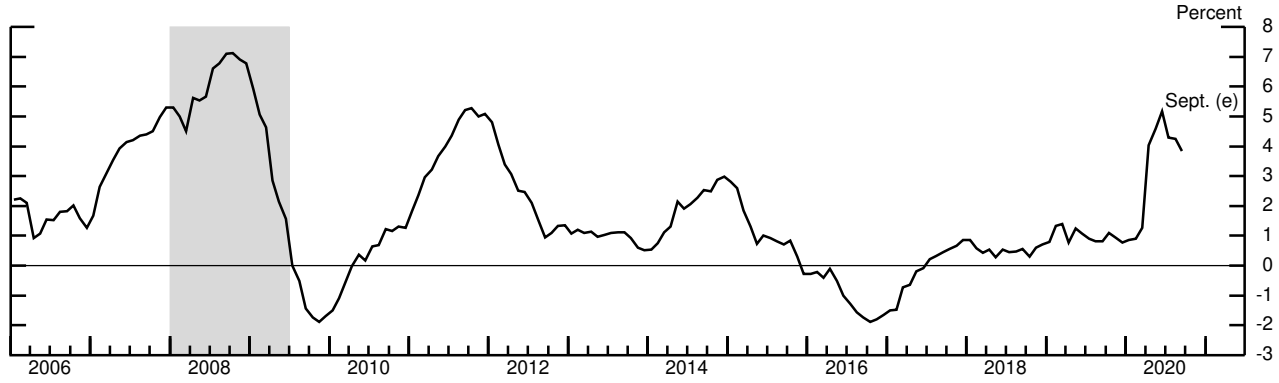
Note: Futures prices (dotted lines) are the latest observations on monthly futures contracts.
Source: For oil prices, U.S. Department of Energy, Energy Information Agency; for commodity prices, Commodity Research Bureau (CRB).

Energy and Import Price Inflation



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

Food Price Inflation



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

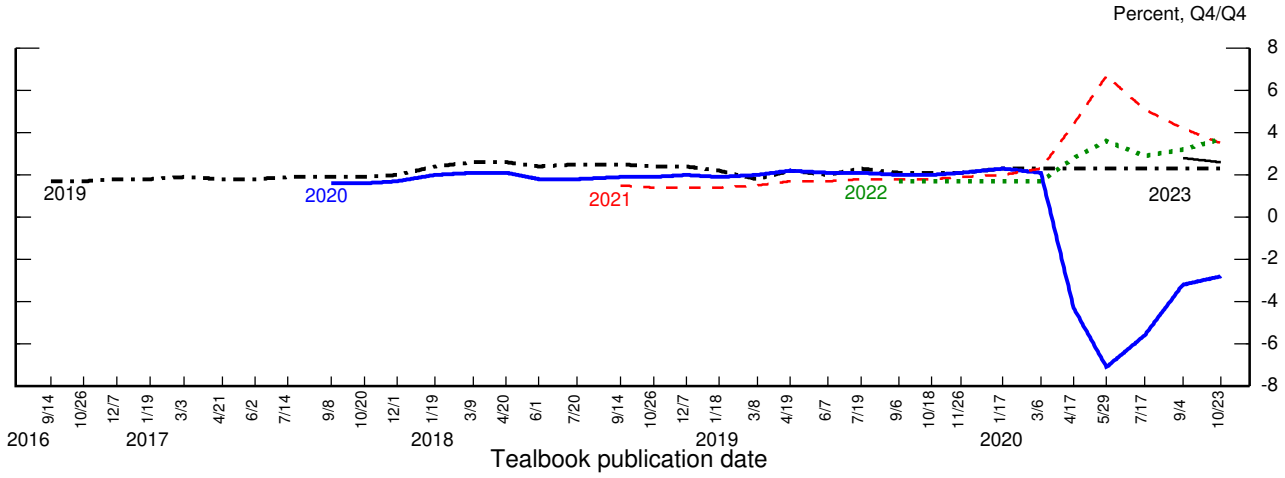
Note: The gray shaded bars indicate a period of business recession as defined by the National Bureau of Economic Research.

Federal Reserve System Nowcasts of 2020:Q3 Real GDP Growth
(Percent change at annual rate from previous quarter)

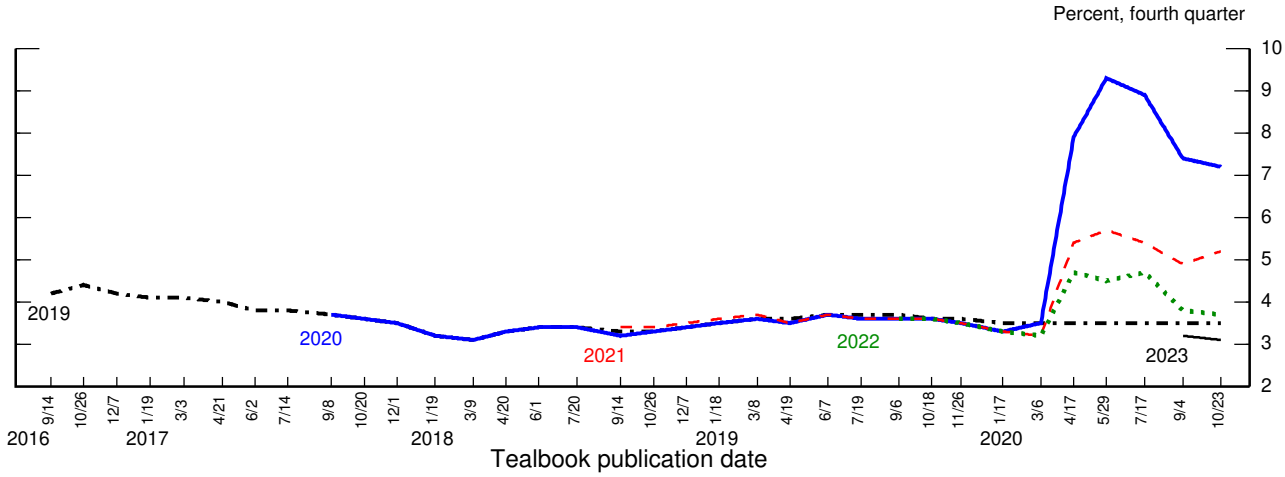
Federal Reserve entity	Type of model	Nowcast as of Oct. 21, 2020
Federal Reserve Bank		
Boston	• Mixed-frequency BVAR	21.6
New York	• Dynamic factor model	13.8
Cleveland	• Bayesian regressions with stochastic volatility • Tracking model	12.6 33.1
Atlanta	• Tracking model combined with Bayesian vector autoregressions (VARs), dynamic factor models, and factor-augmented autoregressions (known as GDPNow)	35.3
Chicago	• Dynamic factor model • Large mixed-frequency BVAR	12.9 30.9
St. Louis	• Dynamic factor model • News index model • Let-the-data-decide regressions	9.1 19.3 3.0
Kansas City	• Accounting-based tracking estimate	33.9
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)	31.7 6.8 14.6 21.9
Memo: Median of Federal Reserve System nowcasts		19.3

Evolution of the Staff Forecast

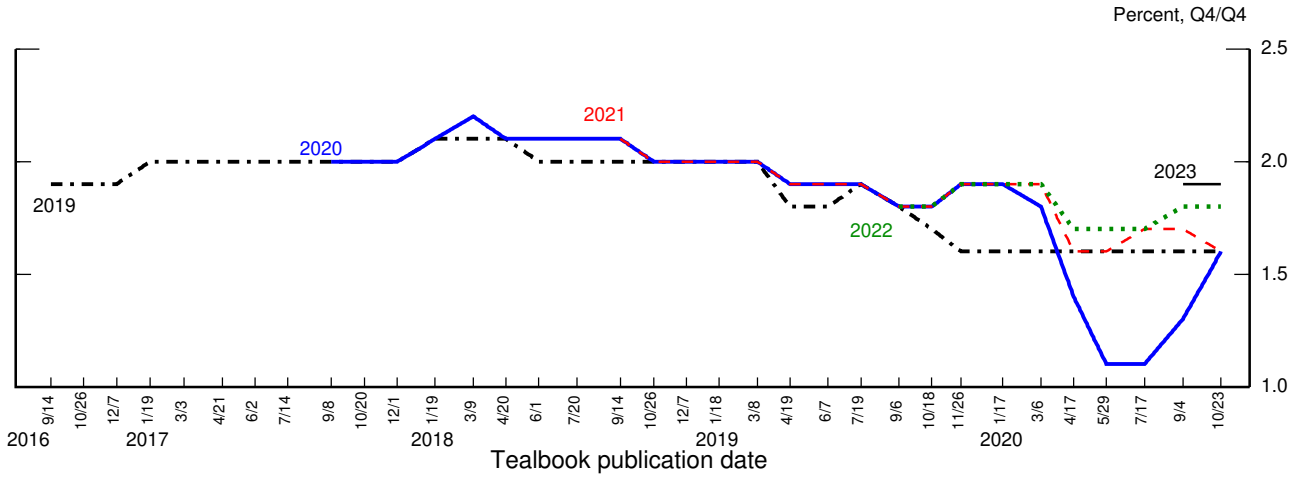
Change in Real GDP



Unemployment Rate



Change in PCE Prices excluding Food and Energy



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International Economic Developments and Outlook

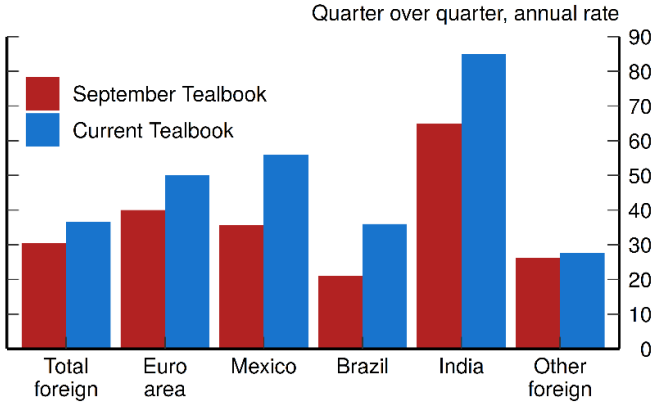
Strong incoming data abroad are being offset by a worsening virus outlook

Surprisingly strong data across the foreign economies have led us to boost our assessment of the third-quarter bounceback, but we have lowered the pace of recovery thereafter in the face of worsening coronavirus (COVID-19) developments, leaving the level of foreign gross domestic product (GDP) little changed from the September Tealbook. The sharp recent rise in COVID-19 cases in many advanced foreign economies (AFE) has also led us to reassess the risks around the baseline. We are now putting more weight on the possibility of a return to more stringent mobility restrictions with commensurately greater economic strains and financial stresses.

The global economy recovery has been somewhat stronger than expected, but foreign activity is still well below the pre-pandemic level

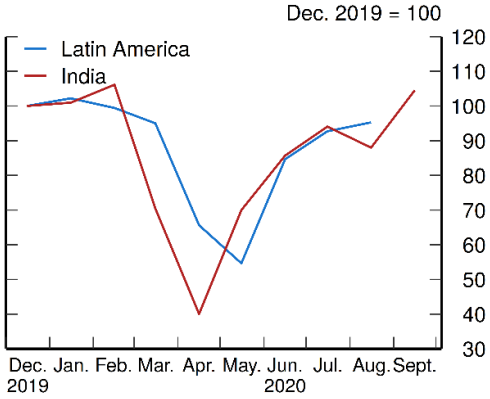
Positive data surprises pertaining to third-quarter activity were particularly notable for those emerging market economies (EME) that had experienced especially deep contractions in the second quarter, including Brazil, India, and Mexico, as well as the euro area (figure 1). Importantly, exports for these EME countries have rebounded to close to pre-pandemic levels (figure 2). In response, we have raised our estimate for third-quarter growth abroad to about 37 percent, 6 percentage points higher than in the September Tealbook. We estimate that foreign activity in the third quarter recovered more than half of its earlier decline but remains 5 percent below its pre-pandemic level. We see the greater-than-expected size of the third-quarter snapback as bringing forward some of the recovery we had predicted to come later, rather than indicating stronger growth momentum. Indeed, our forecast for the level of foreign GDP at the end of 2020 is little revised from what we projected in the spring, contrary to the staff's outlook for the United States (figure 3). (For country details, see the box "Regional Developments and Outlook." For a review of the staff's outlook compared with those of the International Monetary Fund and private forecasters, see the box "Comparing the Staff International Growth Outlook with Other Forecasts.")

Figure 1. Real GDP Growth in Third Quarter of 2020



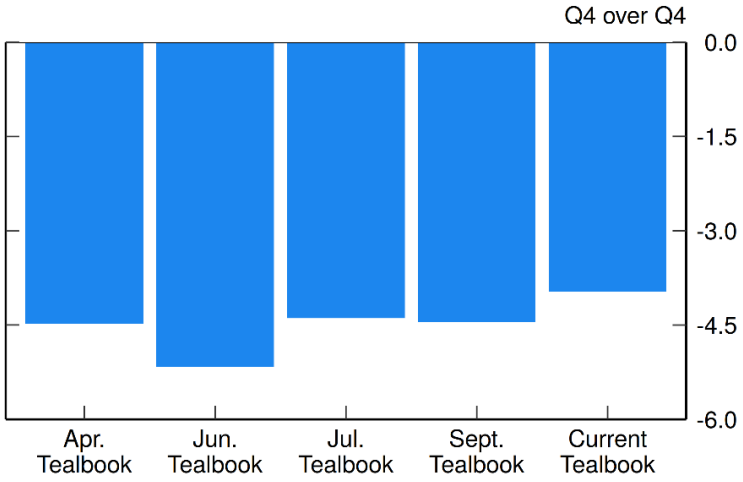
Note: GDP is gross domestic product.
Source: Haver Analytics; Federal Reserve Board staff forecasts.

Figure 2. Nominal Exports



Note: The data for Latin America extend through August 2020.
Source: Haver Analytics.

Figure 3. 2020 Foreign GDP Forecasts



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

Outbreaks of COVID-19 cases have intensified and will hamper growth, although by much less than in the spring

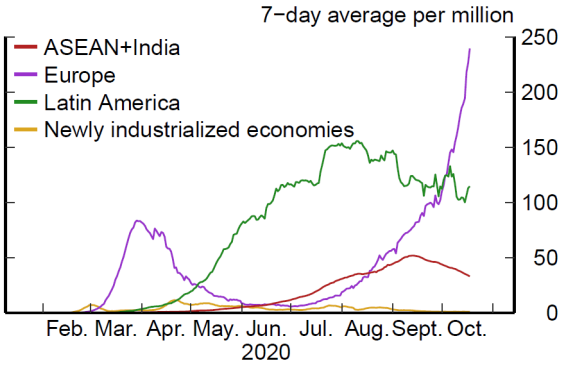
Developments regarding the virus have led us to temper our optimism about foreign growth going forward, despite the robust third-quarter recovery. Although the outbreaks in the newly industrialized Asian economies have largely subsided, the situation in Europe continues to deteriorate, and other countries, such as Canada, are seeing flare-ups in COVID-19 cases (figure 4). Only a limited part of the current rise in new cases is coming from increased testing, as the rate of positive tests has risen.

In response, governments have reintroduced measures to combat the virus. To date, most governments still seem reluctant to impose widespread lockdowns, given the severe economic costs and waning public patience for such measures. Instead, with few exceptions, governments have implemented more targeted measures such as restricting the operation of some types of businesses (bars and restaurants, for example) and limiting the size of gatherings, as well as focusing on better testing, wider usage of masks, and more guidance on social distancing.

We never thought that controlling the virus would be easy, but the size and breadth of these renewed outbreaks are more substantial than we had previously assumed. Consequentially, we now expect tighter restrictions through the first half of next year in a number of AFEs than we had in the September Tealbook (table 1). These tighter restrictions are likely to have a negative effect on economic activity in these economies. Indeed, preliminary services purchasing managers indexes for October in the euro area and the United Kingdom signaled a declining pace of growth. But given businesses and consumers are learning to better adapt to the virus, we assume the economic drag from these measures will be less than in the spring. As such, we have marked down the AFE forecast about 2½ percentage points in the current quarter and almost 1¾ percentage points in the first half of next year mostly on account of the recent pandemic developments.

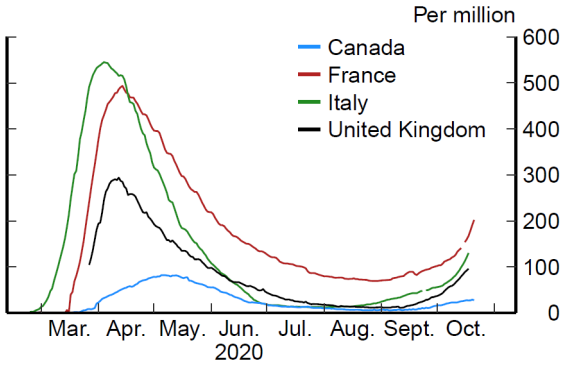
The situation is evolving rapidly, however. So far, health-care systems are not overwhelmed, but hospitalizations and death rates have steadily increased, and many governments have signaled increasing concern (figure 5). If hospital capacity reaches a tipping point, we could see significantly tighter restrictions, if not lockdowns, especially as we enter the winter flu season. The holiday spending season, especially in the AFEs, is particularly vulnerable to the adverse effects of tighter restrictions. These considerations have increased the downside risks to our outlook, discussed in more detail later in this section.

Figure 4. New COVID-19 Cases



Note: The Association of Southeast Asian Nations (ASEAN) comprises Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Europe comprises France, Italy, Germany, Spain, and the United Kingdom. Latin America comprises Argentina, Brazil, Chile, Colombia, and Mexico.
Source: Johns Hopkins University.

Figure 5. Daily Hospital Occupancy Related to COVID−19



Note: For the United Kingdom, these data begin on March 27, 2020.
Source: European Centre for Disease Prevention and Control; Government of France; Canadian provincial−level public health websites and news reports.

Table 1. Stringency of Restrictions due to Covid-19

	Euro area	United Kingdom	Canada
2020:Q1			
2020:Q2			
2020:Q3			
2020:Q4	+	+	+
2021:Q1	+	+	+
2021:Q2	+	+	
2021:H2			
2022			

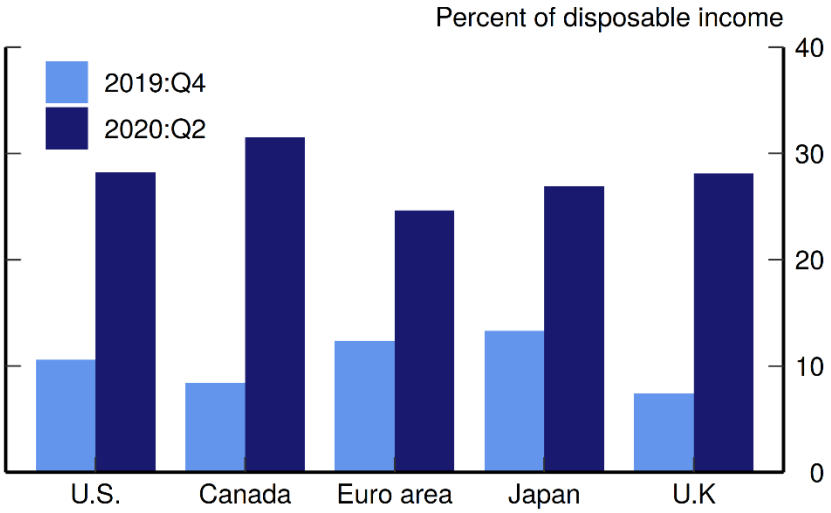
None	No restrictions
Low	Some restrictions on social interaction and on international travel
Moderate	Some nonessential activity shut down
Notable	Majority of nonessential activity shut down; limited movement
Elevated	Shelter in place

Note: + sign signifies a notch increase in the stringency of measures from the September Tealbook.
Source: Federal Reserve Board staff calculations from University of Oxford's Stringency Index through September and staff forecasts thereafter.

The drawdown of accumulated savings should provide a modest near-term boost to foreign spending

We expect that consumer spending will be helped somewhat in the near term by households' recent accumulated savings. As noted in the box "Household Savings and Prospects for Consumer Spending" in the Domestic Economic Developments and Outlook section, U.S. household savings surged during the spring, and consumer spending could be bolstered as households draw down these savings. Across some foreign economies too, household savings could provide a tailwind through higher consumer spending, especially in Canada, where the increase in the saving rate is comparable with that of the United States (figure 6). The increase in savings was much less pronounced in some AFEs, however, in part as the fiscal packages in these economies replaced less of household income and, in some economies, disposable income declined. Moreover, greater uncertainty related to the course of the virus and employment prospects in recent months may lead consumers to hold more savings as a buffer against further difficulties. Accordingly, while we have some increase in consumption from accumulated savings, in aggregate this effect is smaller than in the United States.

Figure 6. Evolution of Household Gross Saving Rate

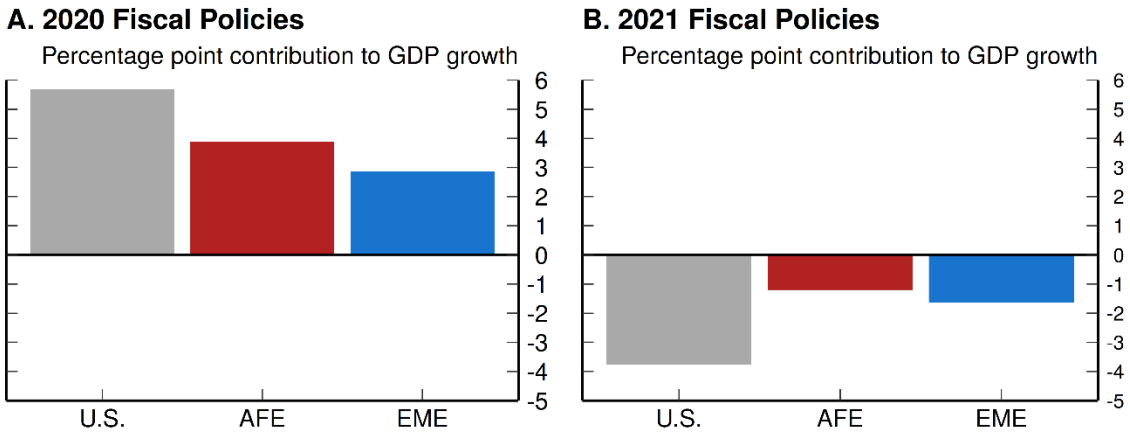


Note: Japan's gross saving rate is estimated from net saving rate and imputed fixed capital consumption.
Source: Haver Analytics.

Policy support should continue in advanced foreign economies but be more limited in emerging economies

Fiscal and monetary policy have provided a substantial boost to the foreign economy during the pandemic, but we anticipate that boost will wane somewhat. We do not expect a "fiscal cliff" effect in the foreign economies overall, but we do see fiscal policy shifting from providing considerable support this year to being a small drag for AFE growth and somewhat larger drag for EME growth in the next (figure 7). Fiscal authorities in AFEs should continue to provide fiscal stimulus, although to a lesser and more targeted degree, by extending pandemic support, particularly short-time work schemes, as in Spain and the United Kingdom recently, and by enacting some broader fiscal measures, as in Australia, Canada, and France. Additionally, we expect the European Union (EU) to begin disbursement from the EU recovery fund in the second half of 2021. In contrast, many EMEs have less fiscal space to extend support, especially those with very high debt-to-GDP ratios, such as Brazil.

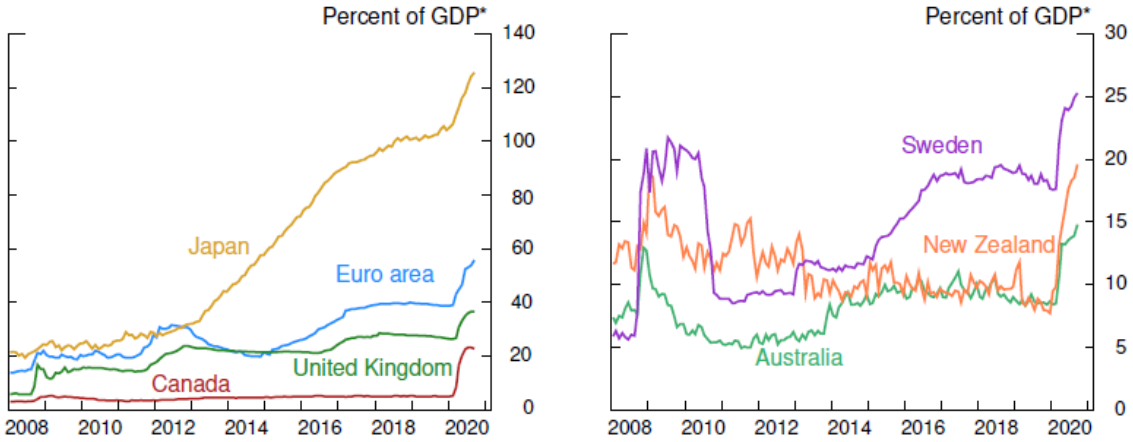
Figure 7. Effects of Fiscal Policies on GDP Growth



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

Foreign central banks are pledging to maintain an accommodative stance for some time given sizable output gaps and low inflation. In the AFEs, central banks are providing guidance concerning both policy rates and asset purchases and in some cases have suggested that they may deliver further accommodation through expanded asset purchases or other tools. In particular, after rapidly expanding balance sheets, many AFE central banks have shifted communication about asset purchases away from an emphasis on restoring market functioning toward explicit recognition of the need for monetary stimulus to support the recovery (figure 8). After reducing policy rates to record-low levels, several EME central banks have indicated that the space for additional monetary stimulus seems limited, although some, notably the Central Bank of Brazil, have also provided forward guidance that rates will stay low for long.

Figure 8. Central Bank Assets in Major Advanced Foreign Economies



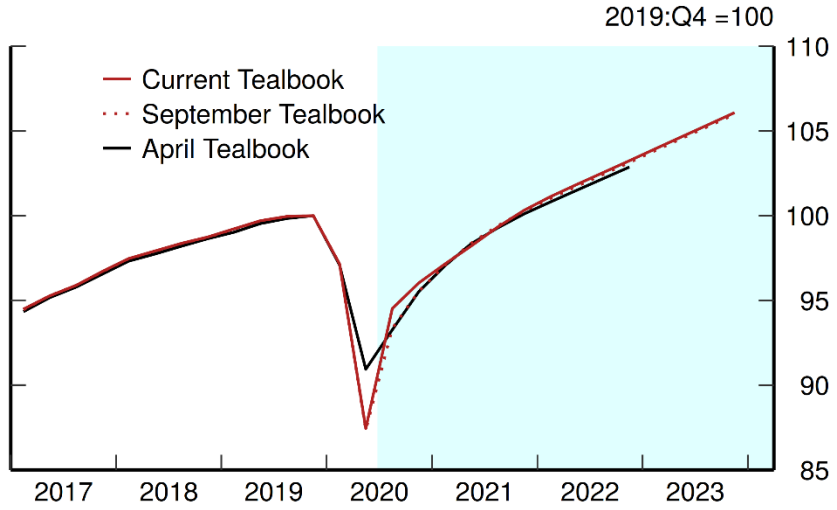
*For this year, we are scaling the size of the balance sheet by end-2019 gross domestic product (GDP).

Source: Haver Analytics; Federal Reserve Board staff calculations.

Full recovery will take time

Over the medium term, the level of economic activity should improve at a pace greater than its historical trend as pandemic restrictions ease; public health officials address the virus, including through treatments and a vaccine; and governments continue to provide policy support. Reaching the pre-pandemic level of output, however, will take time, with that level attained only by the third quarter of 2021 (figure 9). In addition to virus flare-ups, the economic recovery should face headwinds from negative business cycle dynamics and longer-term structural damage. We anticipate that labor markets will be scarred, including through a rise in long-term unemployment and disruptions in human capital accumulation. Product markets will also be negatively affected, through lower levels of multifactor productivity and capital services caused by the destruction of intangible capital and decrease in investment, respectively.

Figure 9. Foreign Aggregate GDP



Note: Data are weighted by bilateral shares in U.S. merchandise exports. GDP is gross domestic product.
Source: Federal Reserve Board staff forecasts.

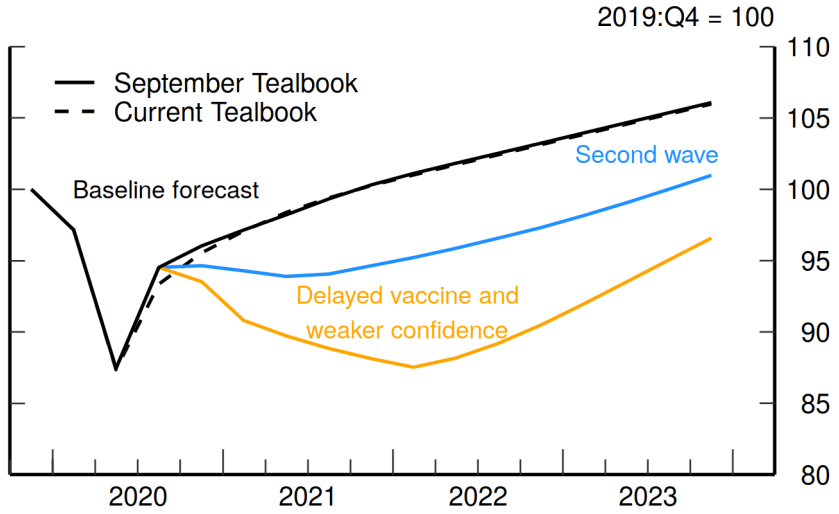
The significant risks to our baseline forecast are tilted to the downside

Given the heightened uncertainty, our baseline forecast is one of several plausible scenarios. The resurgence of the virus in Europe and other regions poses significant and increasing risk to our baseline outlook. These renewed outbreaks could foreshadow an even sharper increase of COVID-19 cases and hospitalizations around the world that governments are unable to control with targeted measures. Such a "second wave" would likely cause market conditions to deteriorate, amplifying the crisis and resulting in more protracted weakness abroad (figure 10, blue line). Given the reluctance so far of most governments to adopt widespread lockdowns and the observed greater capacity of the economy to function with the virus, we now think a second-wave scenario will be somewhat less damaging to economic activity than we thought earlier in the year.

We have also grown more worried that the generally improving risk-on sentiment that is supporting economic recovery abroad could be undermined by a confluence of negative events. In the "Delayed Vaccine and Weaker Confidence" scenario in the Risks and Uncertainty section, confidence collapses in the wake of discouraging news about the virus (possibly related to delays in vaccine developments), a spike in political uncertainty, and some downbeat economic indicators. The shift in sentiment leads to a sharp deterioration in financial market conditions—especially in vulnerable EMEs—and in consumer and business spending (figure 10, yellow line). That said, more favorable scenarios are also possible, such as the faster development of treatments and a widespread vaccine, or greater underlying momentum in the recovery than we currently assume.

Finally, the risks associated with Brexit to the global economy and financial markets conditions are in focus again. The ongoing tensions between the U.K. government and the EU as we approach the end of the transition period (on December 31) might result in a more tumultuous Brexit process and pose additional headwinds to the global economy. While we still assume that a trade deal will be reached by year-end, a no-trade deal remains a material possibility. (For details on Brexit, see the box "Current Developments in the Brexit Process.")

Figure 10. Foreign GDP: Baseline and Scenarios



Note: Data are weighted by bilateral shares in U.S. merchandise exports. GDP is gross domestic product.
Source: Federal Reserve Board staff calculations.

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Regional Developments and Outlook

ADVANCED FOREIGN ECONOMIES

- ***Euro Area.*** Recent indicators, such as retail sales and industrial production through August, suggest that economic activity rebounded strongly after the second-quarter collapse. We estimate that GDP expanded about 50 percent at an annual rate in the third quarter, 10 percentage points more than projected in September. New coronavirus (COVID-19) cases have been rising rapidly throughout the region, however, and have led authorities in some countries to reintroduce regional restrictions on mobility and nonessential activities. In France, authorities imposed a one-month night curfew in several regions, including Paris, and, in Spain, many bars and restaurants are closed. Ireland has taken more dramatic steps, reissuing a "stay at home" order through December. But, even in Ireland, essential activities are still permitted, and schools remain open, as is generally still the case elsewhere in the euro area. The renewed restrictions in the euro area are already weighing on business and consumer sentiment, as indicated by the decline in the services purchasing managers indexes (PMIs) of several euro-area countries in September and October. Accordingly, relative to the September Tealbook, we have euro-area growth sharply slowing to around 2¼ percent this quarter and next, a downward revision of around 5 percentage points in both quarters, and have shaved a further 2½ percentage points off second-quarter growth of 2021, with more pronounced revisions for France and Spain.

  That said, we expect the recovery in the euro area to continue in 2021 and 2022, supported by accommodative fiscal and monetary policies. Generous short-time work (STW) subsidies helped contain the rise in the region's unemployment rate, which printed at 8.1 percent in August, only 0.9 percentage point higher than at the start of the crisis. Even as the STW take-up has declined with the rebound of the economy, several governments have extended these programs through 2021. In late September, Spain reached an agreement to continue its subsidies through January 2021, and, in October, France reintroduced the generous conditions offered in the spring to the sectors affected by the newly announced curfews. We also expect the European Union (EU) to begin disbursement from the EU recovery fund in the second half of 2021. Consequently, we see fiscal policy exerting only a small drag on growth next year.

  Our projection assumes that the European Central Bank (ECB) will announce additional asset purchases worth €500 billion (about 4 percent of GDP) in December, €200 billion more than we had assumed in September, and extend the duration of the program through the end of 2021. Even so, we do not see the ECB meeting its objective of "below, but close to, 2 percent" inflation. Indeed, headline 12-month inflation further declined to negative 0.3 percent in September, partly reflecting the drag from a stronger euro, which has appreciated about 8.5 percent on a trade-weighted basis since mid-February. Going forward, given that longer-term inflation expectations have remained stubbornly low and some resource slack is projected to persist through the end of the forecast period, we see inflation rising to only 1.3 percent in 2023.

- ***United Kingdom.*** Monthly GDP through August indicates that economic activity rebounded sharply in the third quarter, with growth estimated to be nearly 80 percent (a.r.) after contracting almost 60 percent in the second quarter. However, more recent data, including flash PMIs for October, point to a sharp moderation in the pace of recovery, in part as U.K. authorities imposed new restrictions in order to tame a resurgence in COVID-19 infections. Thus far, the government has introduced limits on social gatherings and closed pubs and restaurants, or even imposed a temporary lockdown, in some parts of the country. Given these new restrictions, additional fiscal support measures were announced in September and October, including an extension of the wage subsidy program. All told, we project GDP growth to slow sharply to less than 6 percent this quarter and to only 1 percent next quarter. The recovery should gather more steam over the course of next year as the second wave abates and restrictions are eased. That said, risks to the outlook are tilted to the downside, in part because the negotiations with the EU have been difficult and a "no trade deal" Brexit remains possible, as discussed in the box "Current Developments in the Brexit Process."

  At its September 16 meeting, the Bank of England (BOE) noted that the uncertainty around the outlook had increased and reiterated that it would not tighten its policy stance until "significant progress is being made in eliminating spare capacity and achieving the 2 percent inflation target sustainably."[1] Accordingly, we now assume that the BOE will announce by year-end a £100 billion increase of its asset purchase program, bringing the total stock of purchases to £845 billion (close to 40 percent of GDP). We also assume that the BOE will complete its program by the middle of next year. In addition, although the BOE is reviewing the case for negative interest rates, preliminary BOE analysis raised concerns that negative rates may adversely affect banks and, ultimately, not boost lending. As such, we expect the BOE to keep its policy rate at 0.1 percent until the end of 2022.

- ***Canada.*** The economic recovery that started in May continued at a robust pace during the third quarter, but a recent rise in new COVID-19 cases and the measures to contain it are expected to exert some drag in the near term. After collapsing 18 percent between February and April, preliminary monthly GDP in August was only 5 percent below the February level. In addition, manufacturing PMI and credit card spending data suggest that the recovery continued in September. The labor market has also bounced back strongly, recouping by September two-thirds of the job losses recorded in March and April. Hence, we estimate that GDP grew 46 percent (a.r.) in the third quarter, a bit stronger than projected in September. However, amid record-high COVID-19 infection rates, authorities introduced new restrictions in some regions, including limits to the size of gatherings in Ontario and closures of some nonessential businesses (such as restaurants and bars) in Quebec. Accordingly, we revised down the near-term growth outlook a bit more than 1 percentage point, with a small payback later in 2021. We expect Canadian GDP to return to its pre-COVID level at the end of next year.

[1] Bank of England (2020), "Bank Rate Maintained at 0.1% - September 2020," press release, September 17, https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2020/september-2020.

- ***Japan.*** The economic recovery in Japan is also well under way but to a lesser extent than in many other foreign countries, with third-quarter growth estimated to be only 10 percent (a.r.). The relatively less impressive third-quarter growth estimate is partly due to a less dramatic plunge in output earlier in the year than in other countries and also to the weak tone of incoming data. Unlike in many other countries, Japanese consumers have remained particularly cautious, which is weighing on the production of durable goods and household spending. Slow improvements in households' willingness to consume during the summer, together with further increases in people's mobility in September, suggest that private consumption should gradually strengthen going forward. In addition, in contrast to other advanced foreign economies, the news on the virus front has been more positive, with the number of new COVID-19 cases remaining low following a short-lived and limited spike in cases during the summer. All told, we expect GDP to contract 4.4 percent this year, a touch lower than in the September Tealbook, and to grow 4.1 percent in 2021, partly supported by a small increase in spending due to the postponed 2020 Olympics.

EMERGING MARKET ECONOMIES

- ***China.*** After fully returning to its pre-COVID-19 level in the second quarter, Chinese GDP rose a solid 13.1 percent (a.r.) in the third quarter. Loosening of credit conditions supported a recovery in auto demand and a rebound in the property market, while fiscal stimulus has driven a surge in infrastructure investment. Strong external demand for equipment and office tech goods also boosted export growth in the third quarter. While the recovery in consumption lagged initially, retail sales and services PMIs through September point to a stronger pickup, after Chinese authorities took swift actions to contain a second wave of COVID in late July. Because of the stronger-than-expected GDP in the third quarter and momentum in the September indicators, we revised the forecast up a little for the current quarter to 10.2 percent. All told, GDP growth in 2020 is 1.2 percentage points higher than in the September Tealbook. We view some of this near-term upward revision as pulling forward the recovery we had built in. Accordingly, we revised down growth, by 0.4 percentage point in 2021 and a little bit less in 2022 and 2023, reflecting this pull forward as well as tapering stimulus and the appreciation of the renminbi. By the end of the forecast period, we expect Chinese GDP growth to slow to its potential growth rate of 5.4 percent. An escalation of trade tensions and a weakening of external demand represent key downside risks to the Chinese outlook.

- ***Asia ex. China.*** Following a sharp contraction of 25 percent (a.r.) in the second quarter, real GDP in Asia excluding China should rebound 18 percent in the third quarter—nearly 2 percentage points more than our September forecast—fueled by strong exports throughout the region and a gradual lifting of social-distancing measures in several countries, particularly India. We anticipate a mixed experience ahead for these countries, as the successful containment of the virus in the newly industrialized economies (NIEs) contrasts with recent signs of virus resurgence in several ASEAN countries.

  In the NIEs, further progress has been made on the virus front, with new cases trending down for the past two months. The first wave is now under control in Singapore, and outbreaks over the summer in Korea and Hong Kong have been successfully controlled,

with limited economic effect. We are now seeing soaring exports, on the back of strong demand for electronics and information-technology equipment from people shifting to working from home as well as a global surge in data-processing equipment. In some ASEAN countries, despite the positive momentum in the third-quarter data, the rebound is likely to fade in the near term because of the reintroduction of mobility restrictions. In India, after increasing continuously until mid-September, the number of new contaminations is declining but remains elevated.

For the region as a whole, we now see GDP growing around 10.7 percent this quarter, a touch below our September Tealbook projection, reflecting both a small offset of the third-quarter surprise, which we see as a pulling forward of the recovery, and the effects of restrictions on activities in some countries. Growth remains above potential in the first half of 2021 as private consumption strengthens further, and GDP is expected to reach its pre-virus level around mid-2021.

- ***Mexico.*** After a massive contraction in the second quarter, the Mexican economy is rallying sharply, on the back of strong external demand, especially for autos. Stronger-than-expected incoming data—including industrial production and the monthly activity indicator—led us to revise up substantially the growth forecast for the third quarter to 56 percent (a.r.), 20 percentage points more than in September. However, we expect the recovery to cool in the fourth quarter, given the projected deceleration in U.S. manufacturing production and the still-sluggish recovery in domestic consumption, reflecting in part the paucity of fiscal support. In addition, despite a recent decline, daily COVID cases are still high, and localized outbreaks continue to threaten the normalization of activity. All told, we expect the Mexican economy to contract 9.2 percent this year, less than in the September Tealbook, and then see a weak recovery ahead, with GDP not returning to pre-COVID levels until 2023.

- ***Brazil.*** The solid recovery in Brazil's activity continued in recent months, and incoming data point to a third-quarter rebound in GDP of 36 percent (a.r.), almost double what we had in the September Tealbook. Notably, retail sales surpassed their pre-pandemic level, buoyed by the government's emergency aid payments called "coronavouchers," and electricity consumption data suggest that economic activity started the fourth quarter on a strong footing. In addition, progress in virus containment has continued, with the number of new daily cases now stable for several weeks, albeit at still-elevated levels. The capacity of the government to support the economy further is diminishing, however. Public debt is set to climb above 100 percent of GDP this year, raising concerns about the prospects for additional fiscal support next year. Brazilian asset prices have underperformed in recent months, with the government's borrowing rates steadily increasing. All told, we expect the economy to contract 5.3 percent this year, considerably less than projected in the September Tealbook, and expand a meager 3 percent next year, with the government ultimately removing some stimulus because of fiscal concerns. Return to International text

Current Developments in the Brexit Process

The United Kingdom and the European Union (EU) have been negotiating the terms of their future relationship since the United Kingdom left the EU on January 31, 2020, and entered a transition period. During this time, the United Kingdom has remained part of the EU single market for goods and services, and, as such, economically nothing has changed. However, the transition period ends on December 31, and if an agreement is not reached by then, the United Kingdom will leave the EU single market and revert to the World Trade Organization's rules in trading with the EU.[1] Negotiations have not led to a major breakthrough thus far, and they are likely to continue until the last minute. Figure 1 presents a timeline of recent and upcoming Brexit events, and this discussion considers the current state of play in the negotiations, potential outcomes, and implications for U.S. firms.

Two main sticking points in negotiations pertain to conditions to ensure fair competition between U.K. and EU companies—including rules regarding state aid or subsidies to companies—and fishing rights. While the EU insists that the United Kingdom should closely follow EU rules on state aid to businesses, the U.K. government wants regulatory freedom to support U.K. businesses. Additionally, the EU demands continued access to British waters for fisheries as part of the trade deal, whereas the U.K. government wants to have full control over its own waters and to negotiate rights annually.

Figure 1. Timeline for Recent and Upcoming Brexit Events

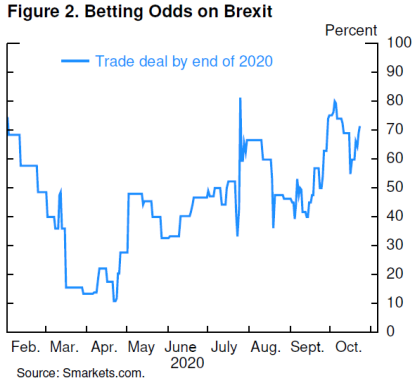
Note: The European Council (EC) is composed of heads of state or governments of the European Union (EU) member states.
Source: European Commission, European Parliament.

[1] So far, the United Kingdom has rolled over 19 of the 40 trade deals it had through its EU membership with non–EU countries. The original 40 deals constituted 11 percent of total U.K. trade, and about three-fourths of that trade has been renegotiated with the new 19 trade agreements.

Both issues stand in the way of a trade deal and an agreement on the wider U.K.–EU relationship, the broad contours of which are set out in the Political Declaration, a nonbinding document signed shortly before Brexit (on January 24, 2020). In terms of goods, should the issues discussed earlier be resolved, the two sides aim to create a free trade area with deep regulatory and customs cooperation, involving "no tariffs, fees, charges or quantitative restrictions across all sectors."[2] The United Kingdom's commitment to customs cooperation and regulatory alignment will be key in determining the EU's strictness about checks and controls at the border. Regarding financial services, the relationship is intended to be based on an "equivalence regime" where the two parties recognize each other's regulations to facilitate trading in specific markets. The EU has similar deals with the United States, Australia, Hong Kong, and Switzerland. Yet, under current EU law, the equivalence can be applied only to certain transactions and can be revoked with just 30 days' notice.

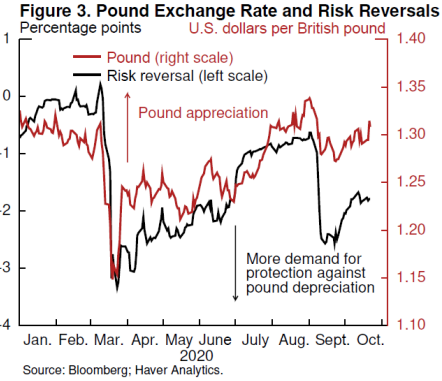
Ongoing tensions between the U.K. government and the EU have led to swings in the betting markets' implied probability of signing a U.K.–EU deal in 2020 (figure 2). The probability fell from almost 80 percent in late September to around 60 percent amid a disappointing European Council summit on October 15–16, 2020. After the summit, U.K. Prime Minister Johnson initially canceled further talks, yet the latest news indicates that U.K. and EU negotiators agreed to an intensified phase of talks, which led to an increase to 70 percent in the probability of reaching a deal. The British pound has continued to move on Brexit news and has depreciated more than 2 percent against the U.S. dollar since the beginning of September on net (figure 3). Consistent with the increased volatility of the pound, pound risk reversals declined notably in September but then recovered partially from their trough, indicating that investor demand for protection against pound depreciation has increased. We expect that a trade-only deal—rather than a broader arrangement, including harmonization of regulations—will be reached and ratified by the end of this year. The approvals by the European Council and the European Parliament alone would be enough to ratify such a trade deal. A broader arrangement, including agreements on regulations, would need to be ratified by each individual EU country.

Figure 2. Betting Odds on Brexit



Source: Smarkets.com.

Figure 3. Pound Exchange Rate and Risk Reversals



Source: Bloomberg; Haver Analytics.

[2] See European Union and United Kingdom (2019), "Political Declaration Setting out the Framework for the Future Relationship between the European Union and the United Kingdom," *Official Journal of the European Union*, vol. 62 (November 12), p. 178, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.CI.2019.384.01.0178.01.ENG&toc=OJ%3AC%3A2019%3A384I%3ATOC.

Given the limited time remaining, a no-trade-deal Brexit is a material possibility. Such an outcome poses an important downside risk to the U.K. outlook and, to a lesser extent, the global outlook. We think that the U.K. economy would be affected negatively through reduced trade because of the higher tariffs and supply disruptions due to delays associated with customs checks at the border. In the short run, we would expect the pound to depreciate sharply (up to 20 percent based on past disruptive events), U.K. equity prices to fall, and U.K. credit spreads to rise as investors reduce exposures to U.K. financial assets. We estimate that in the long run, a no-deal Brexit would lower U.K. gross domestic product (GDP) around 3 percent relative to our baseline of a Brexit with a free trade agreement, which already envisages a 5 percent hit to GDP.

Of note, the Withdrawal Agreement, signed by the U.K. and EU authorities upon Brexit, states that in the case of a no-trade-deal Brexit, Northern Ireland would remain part of the EU single market, resulting in an internal border with the rest of the United Kingdom. However, the U.K. authorities are in the process of ratifying an Internal Market Bill that would enable free flow of goods and services across the United Kingdom upon a no-trade-deal Brexit, which the EU argues would violate the Withdrawal Agreement and thus has become another reason for continued tensions during the negotiations.

A no-trade-deal Brexit may also lead to negative international spillovers through supply disruptions in Europe and strains in global financial markets, as the City of London would lose its "passporting" right to serve EU firms. In the short run, we can expect increased financial market volatility, especially given the current fragile state of the global economy.

As mentioned earlier, a potential loss of passporting rights by the City of London poses risks to financial firms worldwide. Overall, large U.S. financial firms appear to be prepared for a no-trade-deal Brexit and the end of the transition period. These institutions have invested in infrastructure and built out subsidiaries to perform their activities in the EU and have tested these operations. Operational risks remain, however, partly due to restrictions related to COVID-19, which have delayed some staff transfers and local hiring, and there are concerns about increased market fragmentation. On central clearing, the EU eliminated an important systemic risk by allowing the U.K. central clearing counterparties to continue to provide their services to EU firms for another 18 months. Several other outstanding issues remain, including finishing the re-papering of uncleared derivatives and addressing potential liquidity issues related to share trading and derivative trading obligations, which require firms to execute their trades in their jurisdictions. All told, we anticipate that U.S. institutions will be able to manage these issues successfully. Return to International text

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Comparing the Staff International Growth Outlook with Other Forecasts

Both outside forecasters and the Board's staff expect the foreign economy to recover in the second half of this year and into next year after a deep recession in the first half. As shown in the first row of the table, the staff sees total foreign output in 2020 contracting at a similar pace to the rate estimated by Consensus Economics but less than projected by the International Monetary Fund (IMF). The difference between the forecasts of the staff and the IMF is largely in advanced economies, including the United States. The Organisation for Economic Co-operation and Development's (OECD) forecasts are more similar to those of the staff and Consensus Economics for advanced economies. For 2021, the Board anticipates a stronger recovery abroad than projected by other forecasters, especially in China and other Asian economies.

The staff's 2020 forecast for the aggregate foreign economy, like that of Consensus Economics, is little changed, on net, since the September Tealbook, as shown in panel A on the next page. The IMF (the purple line) and the OECD (not shown) both marked up their 2020 forecasts notably relative to their previous updates in June. Both outside forecasters and the staff continue to expect a gradual recovery, with only a partial rebound in growth next year (shown in panel B).

Ranges around professional forecasts collected by Consensus Economics are sizable, but the dispersion of forecasts has narrowed in recent months. As of October, the forecasts for 2020 growth range from negative 8.7 percent to negative 6.5 percent for the euro area and run from positive 1.7 to 3.3 percent for China. For next year, the forecasts range from 3.8 to 6.2 percent for the euro area and from 5.5 to 9.5 percent for China. Return to International text

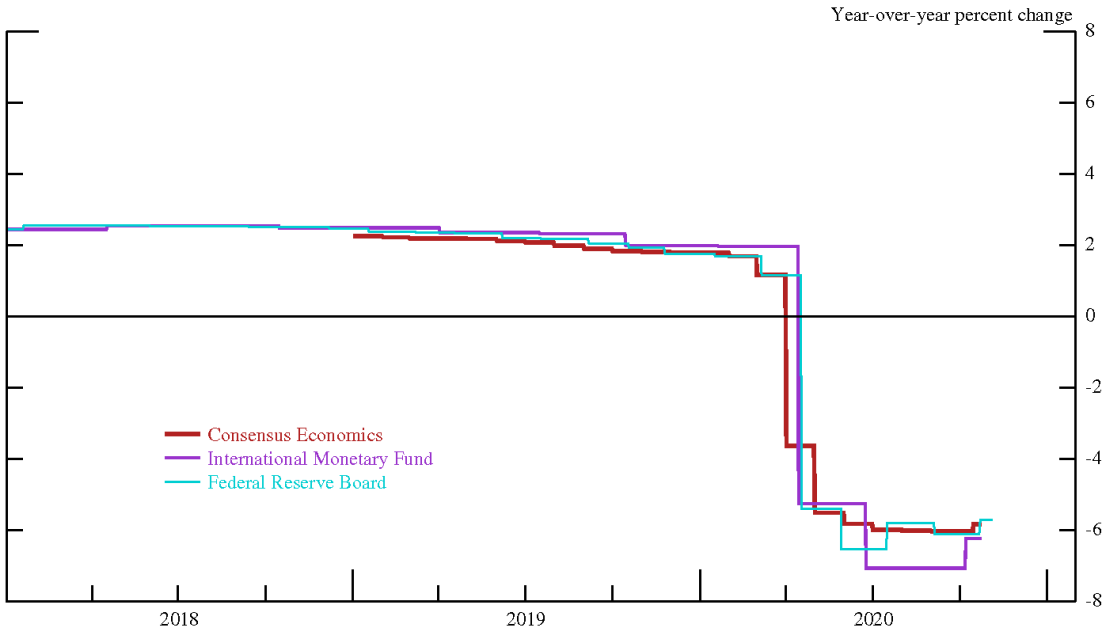
Comparison of Foreign Real GDP Forecasts

	Year-over-year percent change							
	2020				2021			
	FRB	IMF	Consensus	OECD	FRB	IMF	Consensus	OECD
1. Total foreign	-5.7	-6.2	-5.8	n.a.	5.0	4.6	4.6	n.a.
2. Advanced foreign economies	-6.5	-7.4	-6.6	-6.8	4.7	4.8	4.7	4.4
3. Canada	-5.6	-7.1	-5.8	-5.8	5.2	5.2	4.9	4.0
4. Euro area	-7.4	-8.3	-7.5	-7.9	5.0	5.2	5.3	5.1
5. Japan	-6.1	-5.3	-5.7	-5.8	3.4	2.3	2.5	1.5
6. United Kingdom	-10.4	-9.8	-10.1	-10.1	4.2	5.9	5.7	7.6
7. Emerging market economies	-5.1	-5.3	-5.3	n.a.	5.5	4.6	4.7	n.a.
8. China	1.9	1.9	2.3	1.8	10.1	8.2	7.9	8.0
9. Emerging Asia ex. China	-3.3	-4.0	-3.7	n.a.	5.5	4.3	4.5	n.a.
10. Mexico	-9.2	-9.0	-9.6	-10.2	3.8	3.5	3.7	3.0
11. Brazil	-5.3	-5.8	-5.3	-6.5	3.1	2.8	3.2	3.6
Memo								
Emerging market economies ex. China	-6.5	-6.8	-6.9	n.a.	4.5	3.8	4.0	n.a.
India	-9.9	-10.3	-9.7	-10.2	12.5	8.8	10.9	10.7
United States	-3.7	-4.3	-4.0	-3.8	3.4	3.1	3.7	4.0

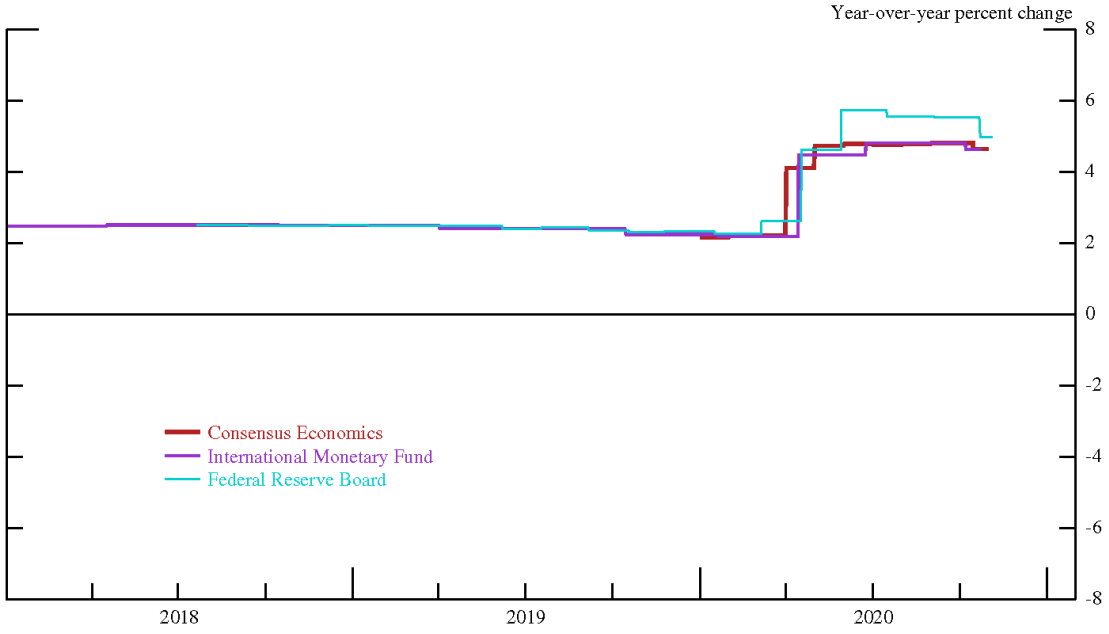
Note: Gross domestic product (GDP) aggregates are weighted by shares of U.S. nonagricultural exports. India is excluded from all year-over-year forecast aggregates, as Consensus Economics reports Indian growth on a fiscal year basis. Federal Reserve Board (FRB) forecasts are from the current Tealbook. International Monetary Fund (IMF) forecasts are from the October 2020 *World Economic Outlook*. Consensus Economics' forecasts were published on October 15 for advanced economies and Asian countries, October 21 for Russia, and October 22 for Latin American countries. Organisation for Economic Co-operation and Development (OECD) forecasts are from the September 2020 *Interim Economic Outlook* for most countries and from the May 2020 *Economic Outlook* for Sweden and Switzerland.
n.a. Not available.
Source: Federal Reserve Board Tealbook forecasts; International Monetary Fund; Consensus Economics; Organisation for Economic Co-operation and Development.

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 October 2020 *World Economic Outlook*. Consensus Economics' forecasts were published on October 15 for advanced economies and Asian countries, October 21 for Russia, and October 22 for Latin American countries. Consensus Economics began forecasting 2020 only in 2019 and 2021 only in 2020. The FRB and IMF began forecasting 2020 and 2021 earlier.
Source: Federal Reserve Board Tealbook forecasts; International Monetary Fund; Consensus Economics.

The Foreign GDP Outlook

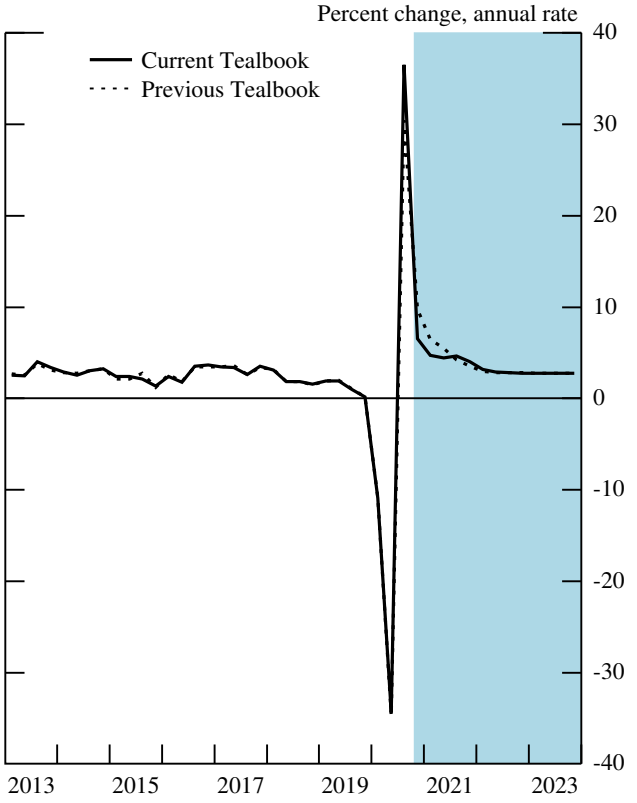
Real GDP* Percent change, annual rate**

	2019	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021	2022	2023
1. Total foreign	1.3	-10.9	-34.4	36.5	6.5	4.5	2.9	2.8
Previous Tealbook	*1.3*	*-10.8*	*-34.7*	*30.5*	*9.7*	*4.9*	*2.9*	*2.8*
2. Advanced foreign economies	1.1	-9.4	-39.1	42.6	4.3	4.4	2.5	2.2
Previous Tealbook	*1.1*	*-9.2*	*-39.6*	*39.3*	*6.9*	*4.7*	*2.3*	*2.2*
3. Canada	1.5	-8.2	-38.7	45.5	4.5	4.1	2.6	2.5
4. Euro area	1.0	-14.1	-39.5	50.1	2.5	5.0	2.7	2.2
5. Japan	-.7	-2.3	-28.1	10.2	7.7	4.1	1.2	1.1
6. United Kingdom	1.0	-9.7	-58.7	78.6	5.6	3.7	2.4	2.1
7. Emerging market economies	1.4	-12.4	-29.2	30.7	8.9	4.5	3.4	3.3
Previous Tealbook	*1.4*	*-12.5*	*-29.4*	*22.2*	*12.7*	*5.2*	*3.4*	*3.3*
8. China	5.9	-36.3	59.1	13.1	10.2	5.7	5.5	5.4
9. Emerging Asia ex. China	1.7	-8.6	-24.8	18.2	10.7	6.1	3.7	3.5
10. Mexico	-.8	-4.6	-52.7	56.0	6.0	2.9	2.2	2.2
11. Brazil	1.6	-9.5	-33.5	36.0	4.0	2.2	2.8	2.6
Memo								
Emerging market economies ex. China	.5	-6.4	-40.2	34.7	8.6	4.3	2.9	2.8

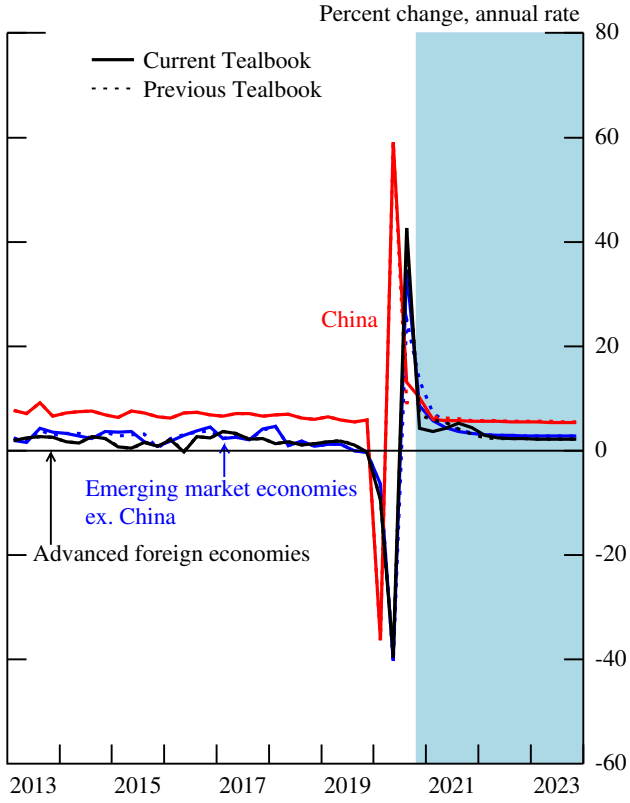
* GDP aggregates weighted by shares of U.S. merchandise exports.
** Annual data are Q4 over Q4.

Int'l Econ Devel & Outlook

Total Foreign GDP



Foreign GDP



The Foreign Inflation Outlook

Consumer Prices* Percent change, annual rate**

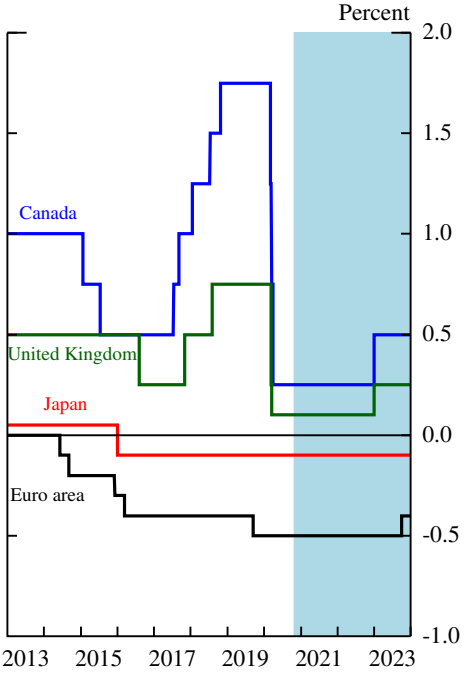
	2019	2020				2021	2022	2023
		Q1	Q2	Q3	Q4			
1. Total foreign	2.4	2.3	-2.2	2.7	1.8	2.1	2.2	2.3
Previous Tealbook	*2.4*	*2.4*	*-2.2*	*2.7*	*1.5*	*2.1*	*2.2*	*2.3*
2. Advanced foreign economies	1.2	.6	-2.0	1.0	1.1	1.1	1.3	1.4
Previous Tealbook	*1.2*	*.6*	*-2.0*	*1.3*	*1.1*	*1.1*	*1.3*	*1.4*
3. Canada	2.1	.5	-3.3	2.9	1.8	1.6	1.8	2.0
4. Euro area	1.0	.6	-1.4	-.4	.9	.9	1.1	1.3
5. Japan	.5	.3	-1.0	1.0	.7	.4	.6	.8
6. United Kingdom	1.4	1.9	-1.5	1.5	1.0	2.1	1.7	1.9
7. Emerging market economies	3.3	3.6	-2.2	3.9	2.2	2.8	2.8	2.9
Previous Tealbook	*3.3*	*3.6*	*-2.2*	*3.7*	*1.8*	*2.7*	*2.8*	*2.9*
8. China	4.2	4.2	-4.3	2.3	1.5	2.5	2.5	2.5
9. Emerging Asia ex. China	1.9	2.6	-3.6	3.5	2.0	2.4	2.6	3.0
10. Mexico	2.9	3.3	2.0	7.1	3.2	3.2	3.2	3.2
11. Brazil	3.4	4.9	-1.6	3.9	4.8	3.7	3.5	3.5
Memo								
Emerging market economies ex. China	2.6	3.1	-.8	5.1	2.8	3.0	3.1	3.2

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

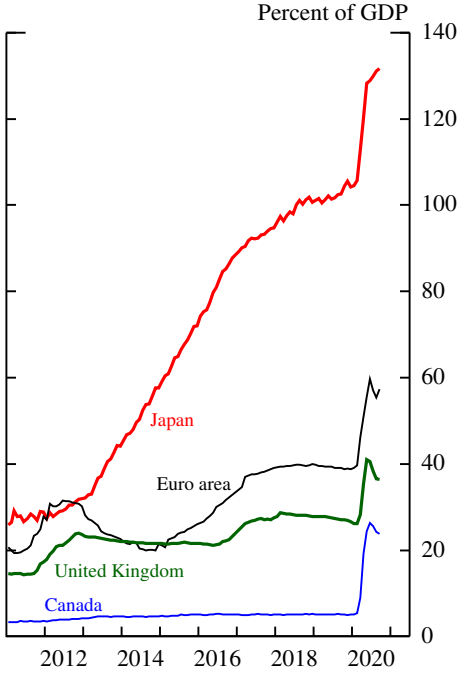
Int'l Econ Devel & Outlook

Foreign Monetary Policy

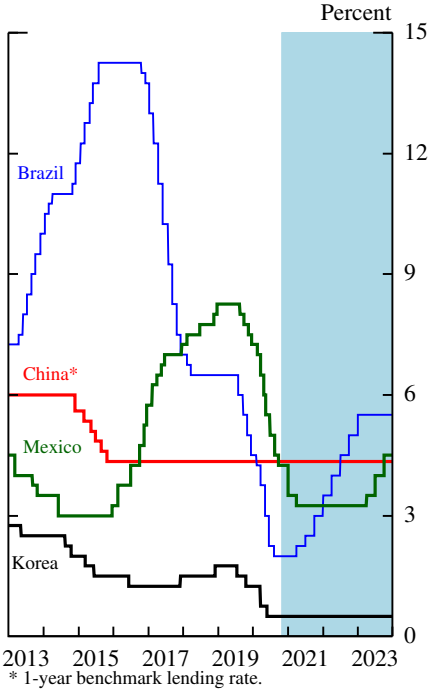
AFE Policy Rates



AFE Central Bank Balance Sheets



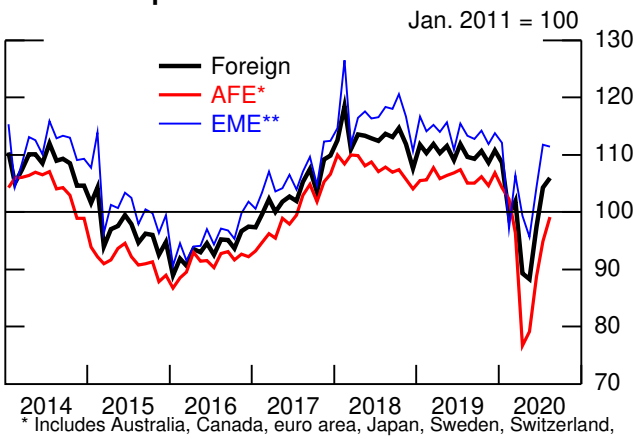
EME Policy Rates



* 1-year benchmark lending rate.

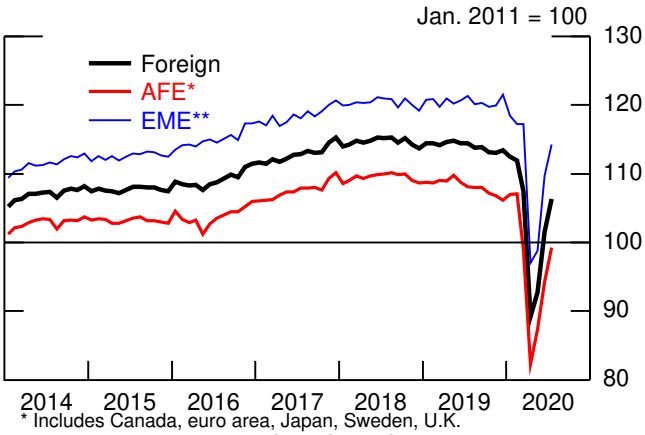
Recent Foreign Indicators

Nominal Exports



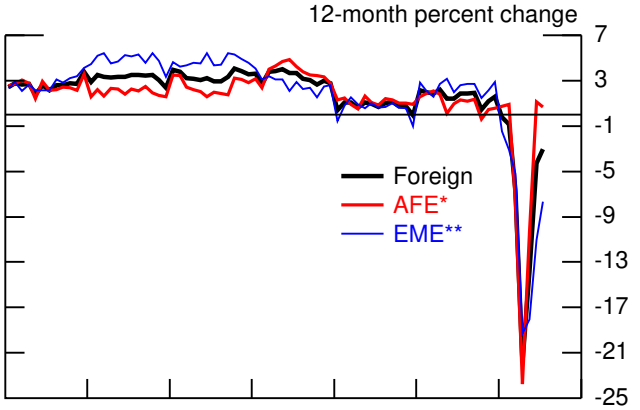
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Singapore, Taiwan, Thailand.

Industrial Production



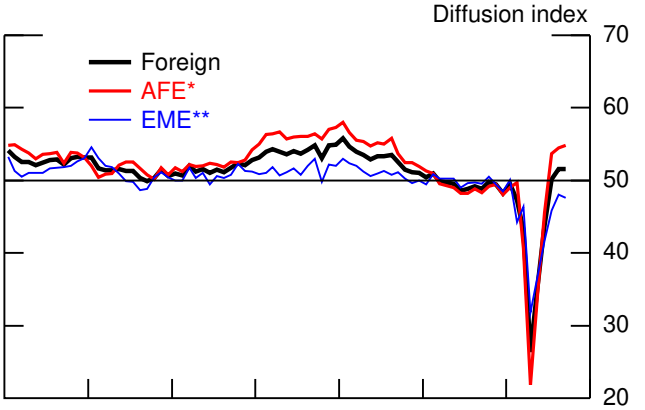
* Includes Canada, euro area, Japan, Sweden, U.K.
** Includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Korea, Mexico, Philippines, Russia, Singapore, Taiwan, Thailand.

Retail Sales



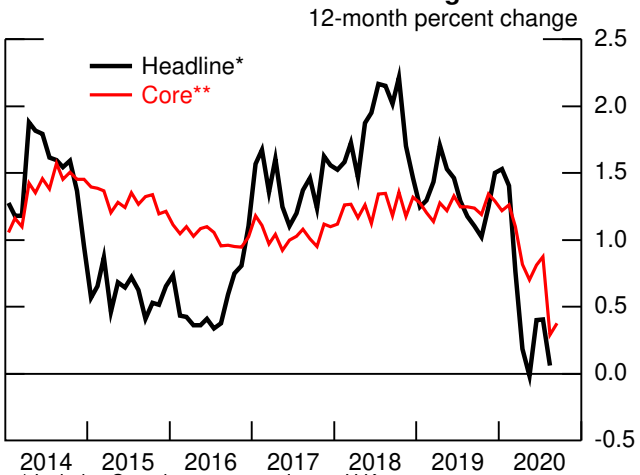
* Includes Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, Chile, China, Korea, Mexico, Singapore, Taiwan.

Manufacturing PMI



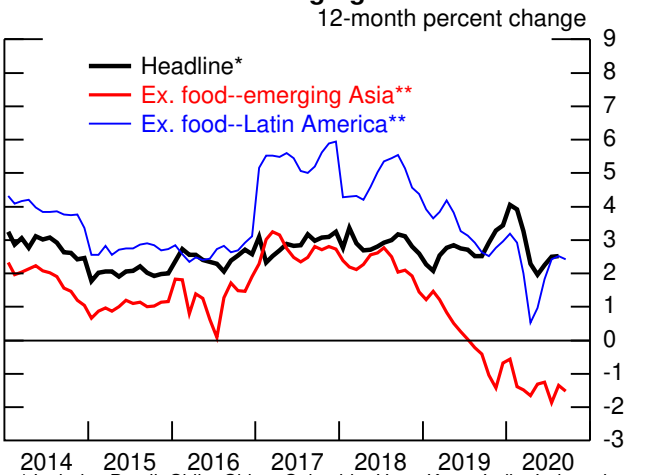
* Includes Australia, Canada, euro area, Japan, Sweden, Switzerland, U.K.
** Includes Brazil, China, India, Indonesia, Israel, Korea, Mexico, Russia, Singapore, Taiwan, Turkey.

Consumer Prices: Advanced Foreign Economies



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

Consumer Prices: Emerging Market Economies

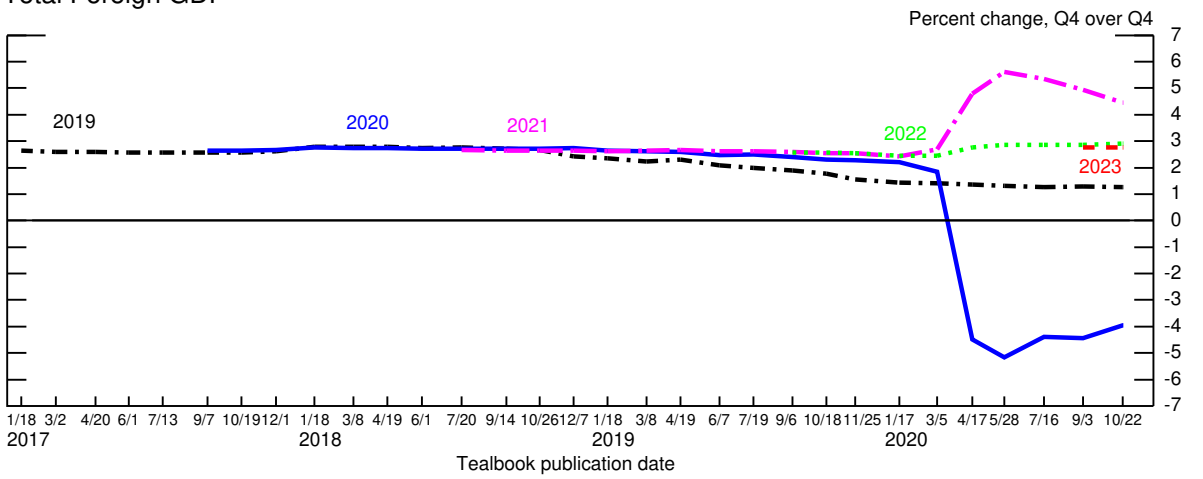


* Includes Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand.
** Excludes all food; staff calculation. Latin America excludes Argentina and Venezuela.

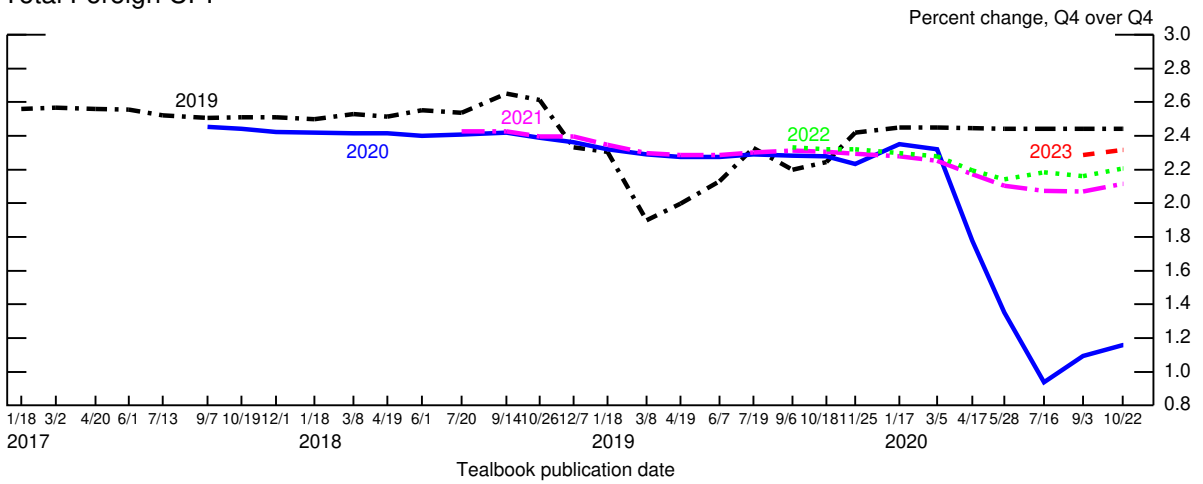
Note: Individual economies' data series may have more recent months than shown here.

Evolution of Staff's International Forecast

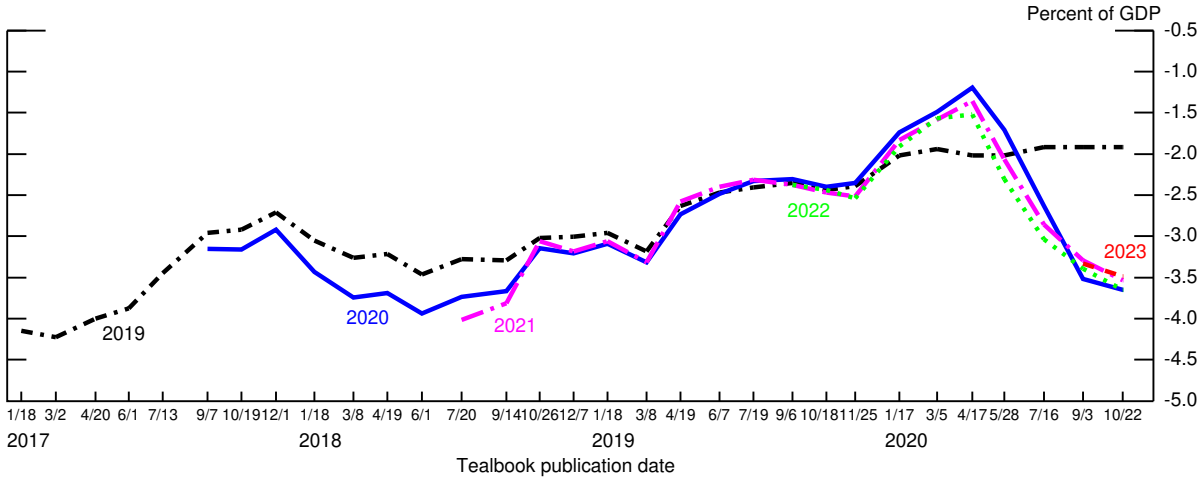
Total Foreign GDP



Total Foreign CPI



U.S. Current Account Balance



Int'l Econ Devel & Outlook

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Financial Market Developments

Financial market sentiment improved modestly over the intermeeting period, as a perceived reduction in the likelihood of a contested presidential U.S. election and, reportedly, perceptions of improved prospects of further U.S. fiscal stimulus appeared to more than offset concerns about rising daily U.S. COVID-19 case counts. On net, broad equity price indexes increased slightly amid elevated volatility, corporate bond spreads narrowed somewhat, and the Treasury yield curve steepened modestly. Investor sentiment toward foreign risky assets deteriorated somewhat, on net, particularly in Europe, on growing concerns about the economic recovery and rising COVID-19 case counts in several countries.

- On net, the 2-year nominal Treasury yield was little changed, while 10- and 30-year nominal Treasury yields increased 15 basis points and 19 basis points, respectively. TIPS-based inflation compensation at the 5-year and the 5-to-10-year horizons increased 10 basis points and 13 basis points, respectively; both measures are roughly at pre-pandemic levels.

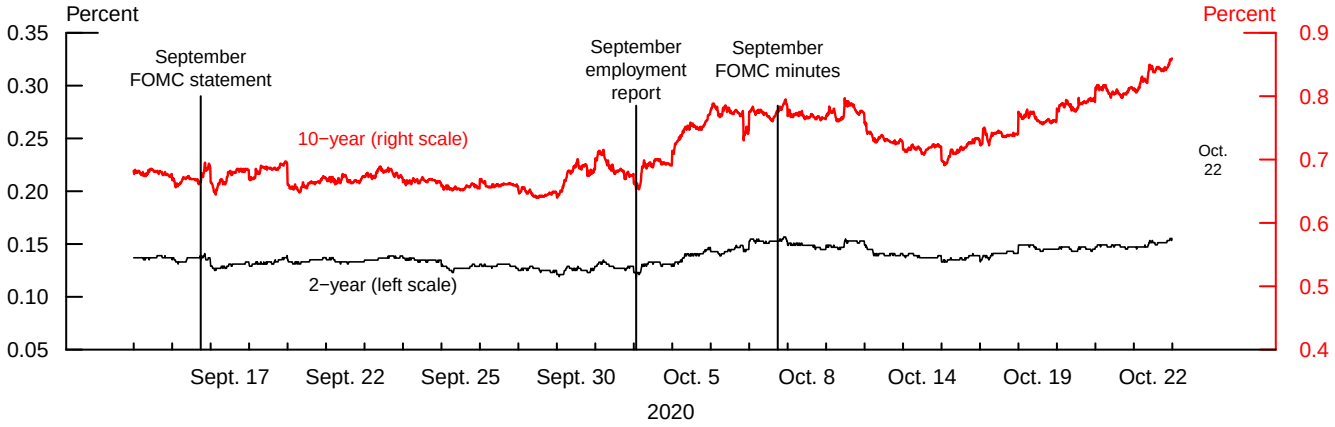
- The expected federal funds rate based on a straight read of OIS quotes remains near the effective lower bound (ELB) until the fourth quarter of 2023. Adjusted for term premiums from staff models, the policy path is expected to stay at the ELB until the first quarter of 2023, although there is considerable uncertainty around these estimates.

- Broad equity price indexes exhibited some volatility over the intermeeting period and edged up 2.3 percent, on net, with stocks of small market capitalization firms outperforming the broader market. Spreads on speculative- and investment-grade corporate bonds narrowed 20 basis points and 7 basis points, respectively, and remained near the midpoint of their historical ranges. Municipal bond spreads to comparable-maturity Treasury yields were roughly unchanged and remained elevated relative to pre-pandemic levels.

- One-month implied volatility on the S&P 500 index (the VIX) increased somewhat, on net, to 28 percent, a level near the 90th percentile of its historical distribution.

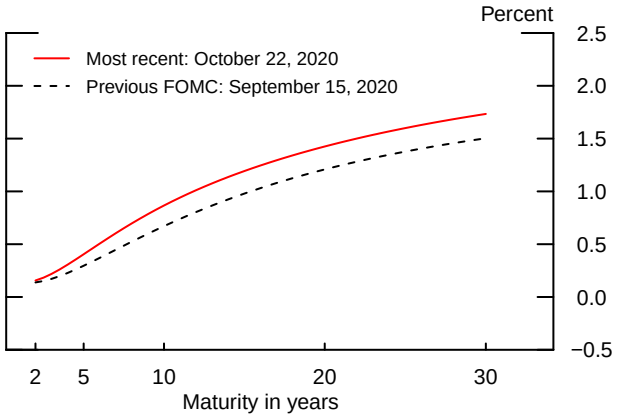
Treasury Yields and Policy Expectations

Intraday Treasury Yields



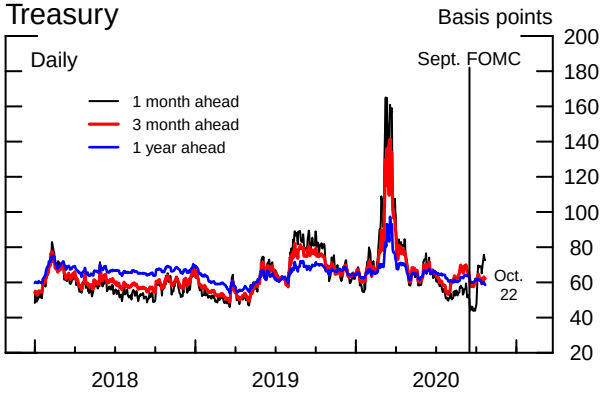
Note: Data are spaced at 5−minute intervals from 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

Treasury Yield Curve



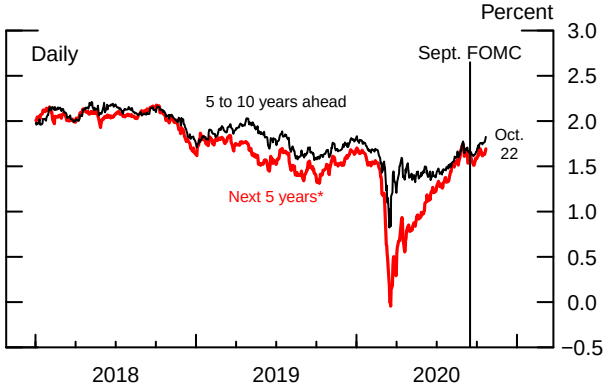
Note: Smoothed yield curve estimated from off−the−run Treasury coupon securities. Yields shown are those on notional par Treasury securities with semiannual coupons.
Source: Federal Reserve Bank of New York; Board staff calculations.

Measure of Implied Volatility of 10−Year Treasury



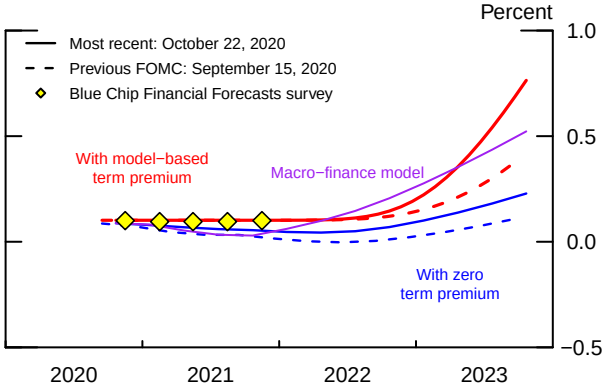
Note: Implied volatility is derived from 10−year swaptions.
Source: Barclays.

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 October 1.
Source: Bloomberg; Board staff calculations.

Financial Markets

- Liquidity conditions in most secondary markets were about unchanged and remained close to pre-pandemic levels.

- Most foreign equity indexes were lower, on net, since the September FOMC meeting. Equity-implied volatility in the euro area jumped and the German 10-year sovereign yield fell 9 basis points. The staff's foreign exchange rate indexes were little changed.

- Based on a variety of indicators and reports from market participants, year-end pressures appear likely to be relatively muted this year.

DOMESTIC DEVELOPMENTS

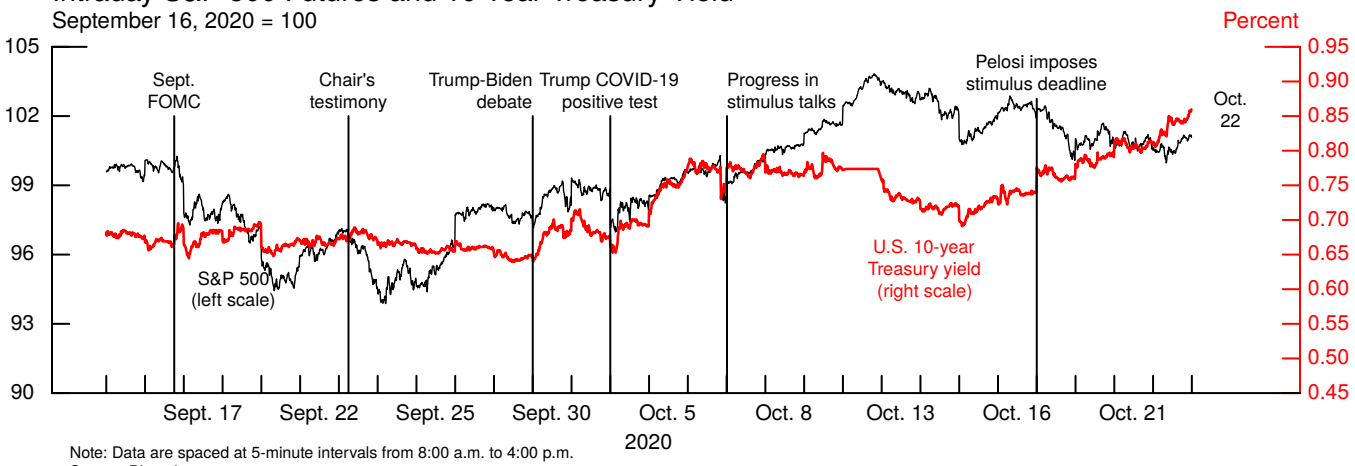
The Treasury yield curve steepened modestly since the September FOMC meeting. Yields on 2-year nominal Treasury securities were little changed at 0.15 percent, while 10- and 30-year yields rose 15 basis points and 19 basis points, to 0.83 percent and 1.69 percent, respectively. Market commentary attributed the increase in longer-term yields since late September to a perceived reduction in the likelihood of a contested presidential election and, reportedly, perceptions of improved prospects of U.S. fiscal stimulus. FOMC communications and macroeconomic data releases were reportedly viewed as broadly in line with expectations and did not elicit material yield reactions. Over the intermeeting period, the volatility of 10-year interest rates implied by options maturing in one month's time rose notably, albeit from very low levels, largely reflecting the fact that the U.S. elections now fall within the one-month maturity period of the option. (For a discussion of the factors contributing to the low volatility of Treasury yields over the summer, see the box "Why Have Treasury Yields Been So Stable?")

TIPS-based measures of inflation compensation increased modestly after edging down slightly in early September. The 5- and 5-to-10-year measures increased 10 basis points and 13 basis points, to 1.67 percent and 1.80 percent, respectively. Both measures remain close to their pre-pandemic levels, reflecting TIPS market liquidity conditions that have largely recovered from their stressed levels in the spring. However, both measures are still near the lower end of their historical ranges.

The expected path of the federal funds rate based on a straight read of OIS quotes was little changed, on net, and remains below 0.25 percent until the fourth quarter of

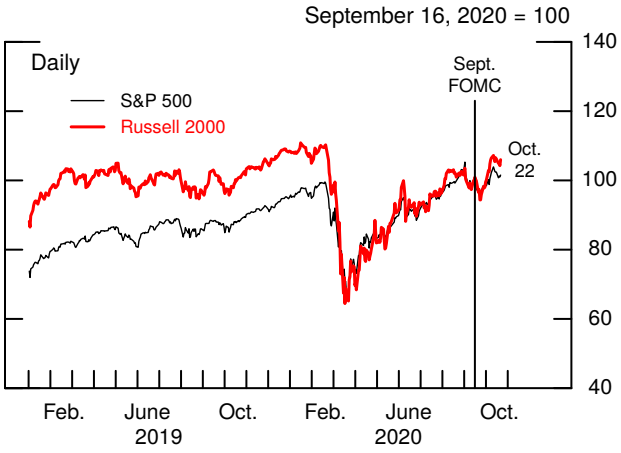
Corporate Markets

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



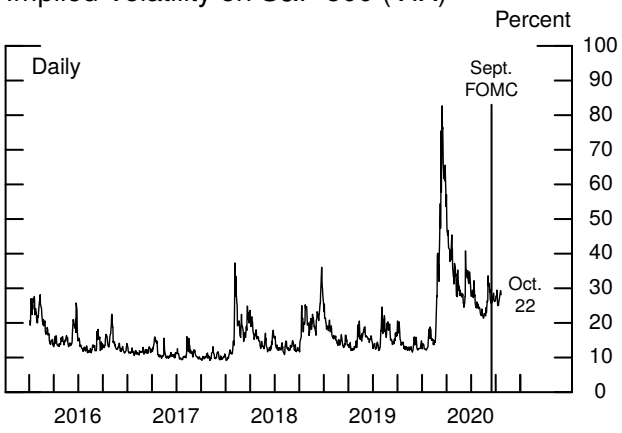
Note: Data are spaced at 5-minute intervals from 8:00 a.m. to 4:00 p.m.
Source: Bloomberg.

Stock Price Indexes



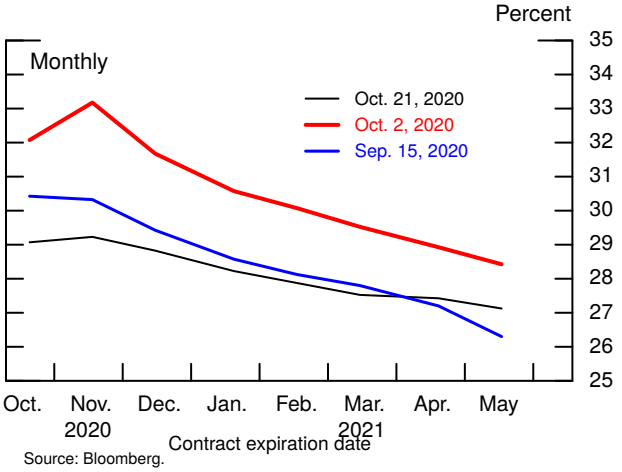
Source: Bloomberg.

Implied Volatility on S&P 500 (VIX)



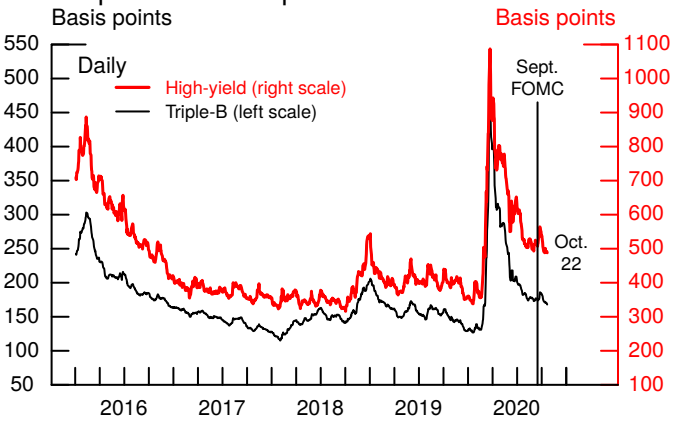
Source: Chicago Board Options Exchange.

VIX Futures Curves around U.S. Elections



Source: Bloomberg.

Corporate Bond Spreads



Note: Series are option-adjusted spreads. The ICE Triple-B index has a weighted-average maturity of 11.5 years, and the ICE high-yield index has a weighted-average maturity of 6.4 years.
Source: Intercontinental Exchange (ICE) Indices.

Financial Markets

2023. The staff's model-based measures that adjust for term premiums put the expected policy rate path near the ELB until the first quarter of 2023. That said, the staff estimates are surrounded by considerable uncertainty. In the October Blue Chip Economic Indicators survey, roughly two-thirds of respondents expect the first increase in the federal funds rate to occur in 2024 or later and one-fourth of respondents expect it to occur in 2023.

Amid elevated volatility, broad stock price indexes increased slightly, on balance, since the September FOMC meeting. Early in the intermeeting period, stock prices declined as much as 5 percent, as concerns about the valuation of technology stocks and the rise in the pace of new COVID-19 cases weighed on investor sentiment. Subsequently, reduced risk for a contested U.S. presidential election and perceived progress on negotiations for additional U.S. fiscal stimulus reportedly led stock prices to more than retrace these earlier declines, with stocks of small market capitalization firms outperforming the broader market and increasing 6 percent. The VIX increased some, reflecting in part uncertainty regarding the outcome of the November U.S. elections.

Spreads of investment- and speculative-grade corporate bond yields to comparable-maturity Treasury yields narrowed somewhat, and spreads on corporate bonds rated triple-C and below declined markedly. Corporate bond spreads across the credit rating spectrum are now near their historical median levels. The Secondary Market Corporate Credit Facility continued to purchase relatively small amounts of corporate bonds, while no issuer has yet sold debt to the Primary Market Corporate Credit Facility.

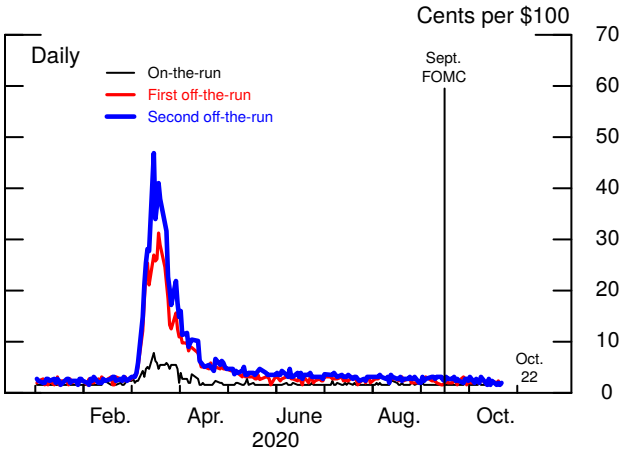
In the municipal bond market, secondary-market spreads over comparable-maturity Treasury yields were mostly unchanged for both triple-A-rated and triple-B-rated bonds. These spreads—even after retracing roughly 80 percent of their sharp increases in late March—remained well above those observed since the financial crisis.

Liquidity Conditions in Domestic Markets

Liquidity conditions remained close to pre-pandemic levels in the Treasury market and were generally little changed over the intermeeting period. Bid-ask spreads remained near-pre-pandemic levels, with the exception of spreads for 30-year bonds, which remained somewhat wider. Market depth in the on-the-run market continued to rise and is now at or close to pre-pandemic levels for most tenors, although depth remains below pre-pandemic levels for the 30-year tenor. Agency MBS market functioning

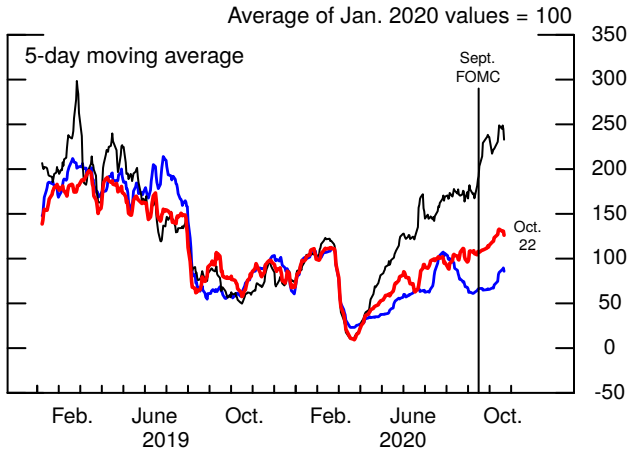
Liquidity Conditions in Domestic Markets

10-Year Indicative Bid-Ask Spreads for Treasury Securities



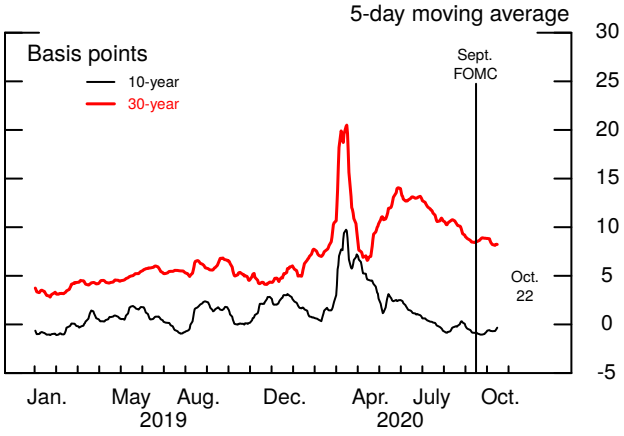
Source: Federal Reserve Bank of New York

Treasury Market Depth



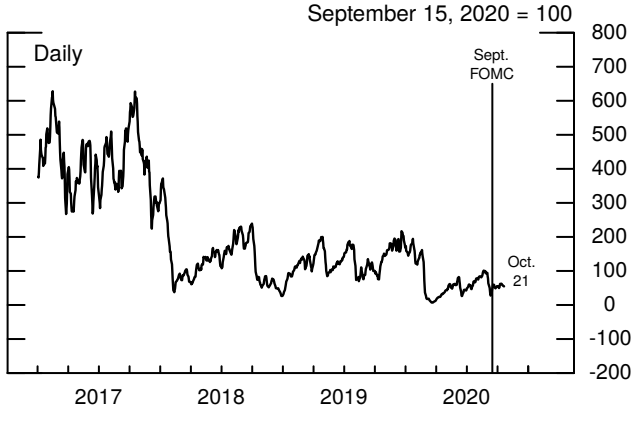
Note: Market depth is defined as the average top 3 bid and ask quote sizes for on-the-run Treasury securities. The tick size of the 2-year is one-fourth of the tick size of the 10-year security.
Source: Repo Inter Dealer Broker community.

On-the-Run Treasury Liquidity Premium



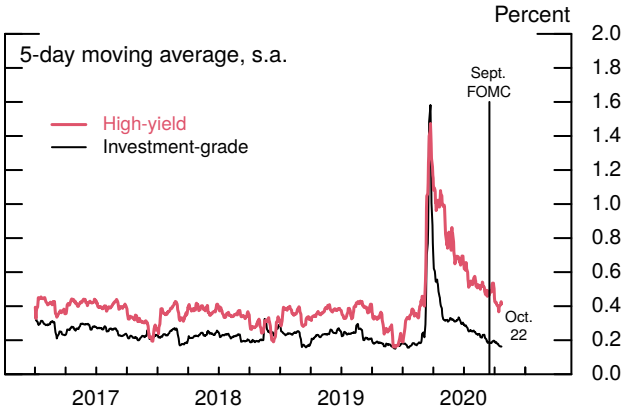
Note: Premium is calculated as spread between regular yields and predicted yields using off-the-run Svensson coefficients.
Source: Federal Reserve Bank of New York; Board staff calculations.

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



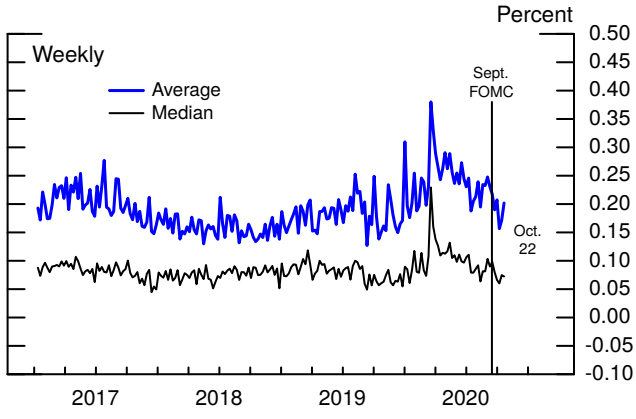
Note: Figure is based on the E-mini S&P 500. Average depth: (Avg. bid size + avg. ask size) / 2.
Source: Tick History.

Bid-Ask Spreads for Corporate Bonds



Source: FINRA; Board staff calculations.

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.

Financial Markets

remained largely in line with pre-pandemic conditions, although liquidity in some portions of the market—notably, for those securities excluded from Federal Reserve open market purchases—remained below pre-pandemic levels.

Based on measures of market depth and the price impact of trades, liquidity conditions in equity markets improved slightly but are still somewhat strained compared with conditions prevailing before the pandemic. Liquidity conditions in the corporate bond market appeared to remain stable: Bid-ask spreads on investment-grade corporate bonds are close to their pre-pandemic levels, while those on speculative-grade bonds are still somewhat above those levels but have retraced notably from their peaks in March. Liquidity conditions in the municipal bond market also remained largely stable over the intermeeting period.

FOREIGN DEVELOPMENTS

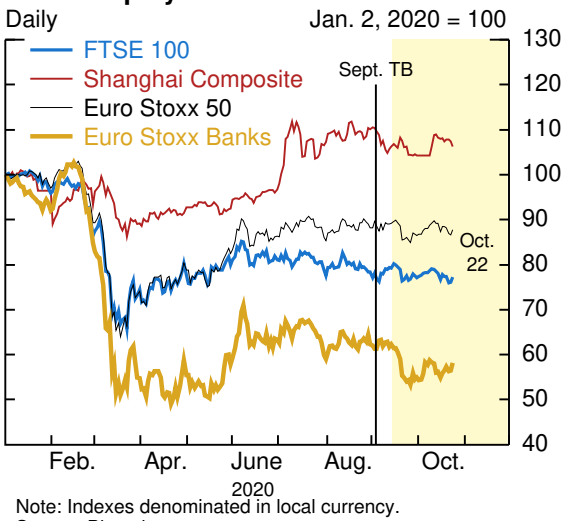
Investor sentiment abroad deteriorated somewhat over the intermeeting period amid rising COVID-19 case counts and indicators pointing to a slowing recovery in several foreign economies. The shifting outlook for additional U.S. fiscal stimulus also caused some asset price volatility abroad over the period. On net, risky foreign asset prices declined somewhat and the dollar remained little changed.

The deterioration in sentiment abroad was concentrated in Europe. In the euro area, major equity prices declined 3 to 5 percent as new restrictions aimed at containing the spread of COVID-19 were imposed. Concerns about credit losses associated with these restrictions weighed heavily on financial-sector equity prices, which declined about 8 percent. Option-implied volatilities rose notably in response to new COVID-19-related restrictions, with the VDAX and the VSTOXX indexes each increasing about 7 percentage points over the intermeeting period. Lockdown concerns also weighed on core euro-area sovereign yields, with the German 10-year sovereign yield declining 9 basis points. Equity price indexes also declined in other advanced foreign economies (AFE), with equity prices falling 1.3 percent in Japan and 5.2 percent in the United Kingdom, where the ongoing Brexit negotiations added to the deterioration in sentiment. Other AFE asset prices remained fairly stable, with exchange rates and long-term sovereign yields outside of the euro area little changed on net.

Asset price movements in emerging Asia had a more positive tone as the spread of COVID-19 remained contained and growth prospects continued to improve,

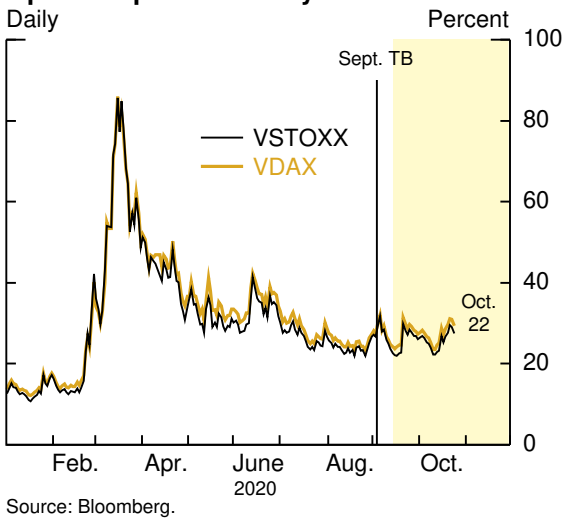
Foreign Developments

Global Equity Indexes



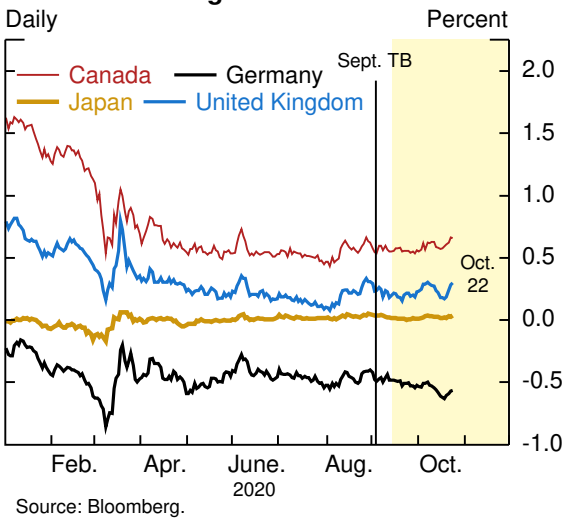
Note: Indexes denominated in local currency.
Source: Bloomberg.

Option-Implied Volatility Indexes



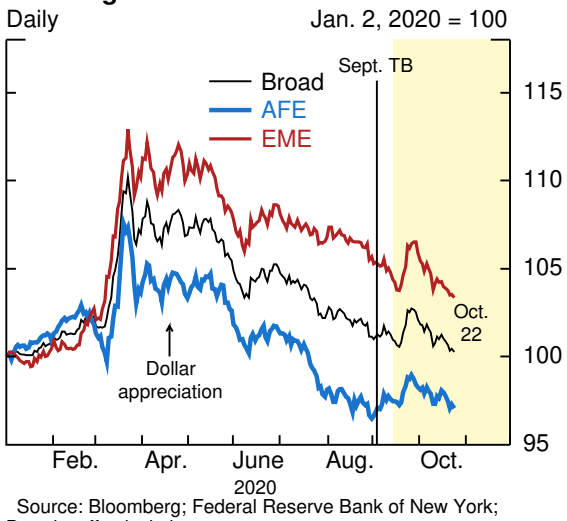
Source: Bloomberg.

10-Year Sovereign Yields



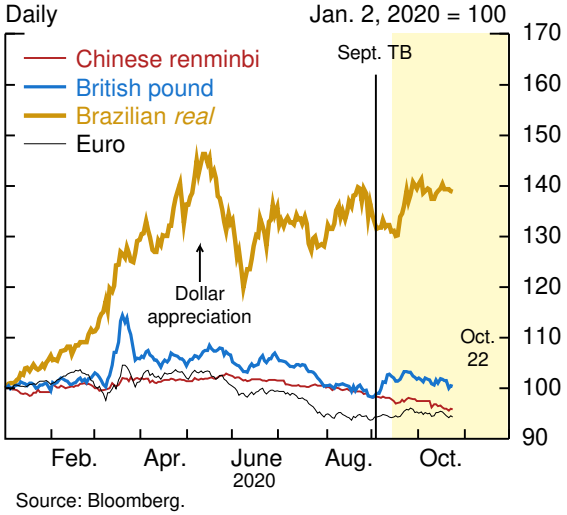
Source: Bloomberg.

Exchange Rate Indexes



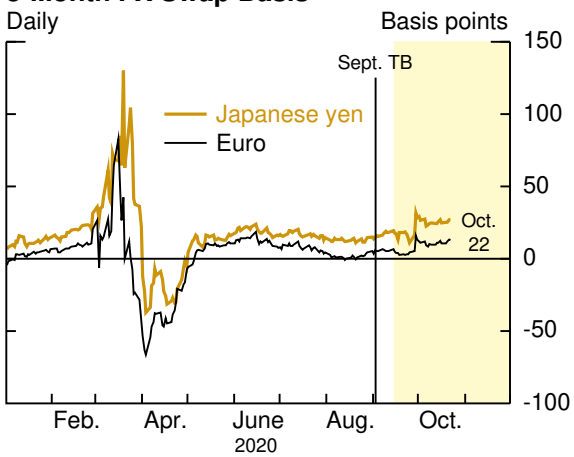
Source: Bloomberg; Federal Reserve Bank of New York; Board staff calculations.

Selected Exchange Rates



Source: Bloomberg.

3-Month FX Swap Basis



Note: Foreign exchange (FX) swap basis is the implied dollar borrowing rate less the dollar borrowing rate in the cash market.
Source: Bloomberg; Board staff calculations.

particularly in China. The Chinese renminbi appreciated 1.4 percent against the dollar and the Shanghai stock index outperformed most other foreign equity indexes, rising slightly over the period. Capital flows into dedicated emerging market bond and equity mutual funds were generally positive, and China-dedicated funds in particular continued to receive strong inflows. In Latin America, the Brazilian *real* and other currencies depreciated against the dollar on concerns about fiscal and political prospects in these countries. Altogether, the emerging market currency index was little changed over the period.

Foreign central bank communications garnered some market attention, though there were few surprises and little market reaction. Market participants were attentive to the ECB minutes and communications about the ECB framework review, particularly President Lagarde's remarks noting that the review will examine the costs and benefits of makeup strategies. Reports that the Bank of England is reviewing the option of negative interest rates temporarily weighed on the British pound. The Reserve Bank of Australia maintained its accommodative tone and signaled the likelihood of additional monetary stimulus.

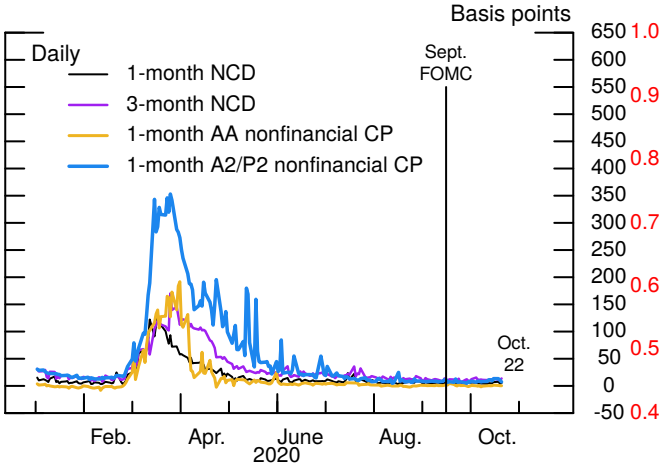
As three-month FX swap contracts crossed over year-end in late September, FX swap spreads increased discretely by 15 basis points and 11 basis points for the yen and the euro, respectively—only about half of the move observed at similar crossovers in recent years. This subdued year-end pressure is likely the result of efforts to ease conditions in dollar funding markets abroad, including the earlier-in-the-year expansion of the central bank swap lines, the FIMA Repo Facility, and regulatory changes that reduce G-SIB balance sheet constraints.

SHORT-TERM FUNDING MARKETS AND FEDERAL RESERVE OPERATIONS

Over the intermeeting period, conditions in short-term funding markets remained stable. Spreads on commercial paper (CP) and negotiable certificates of deposit across tenors were little changed and have remained at pre-pandemic levels. The outstanding level of nonfinancial CP continued to move down, reportedly driven by issuers' relatively low appetite for CP funding amid availability of longer-term financing on attractive terms. September quarter-end effects were muted, and outstanding assets of the Commercial Paper Funding Facility dropped to zero over the intermeeting period.

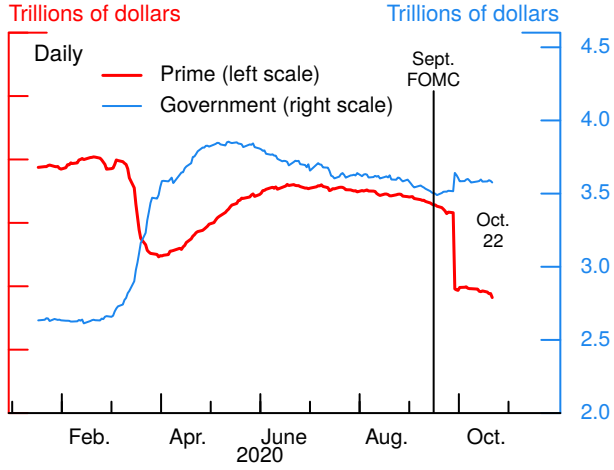
Short-Term Funding Markets and Federal Reserve Operations

Short-Term Funding Market Spreads



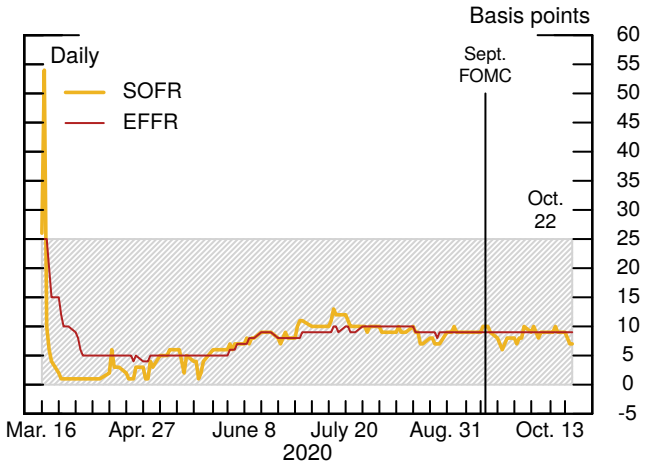
Note: CP is commercial paper; NCD is negotiable certificate of deposit. All spreads are to OIS (overnight index swaps) of the same tenor.
Source: Depository Trust & Clearing Corporation.

MMF Assets under Management



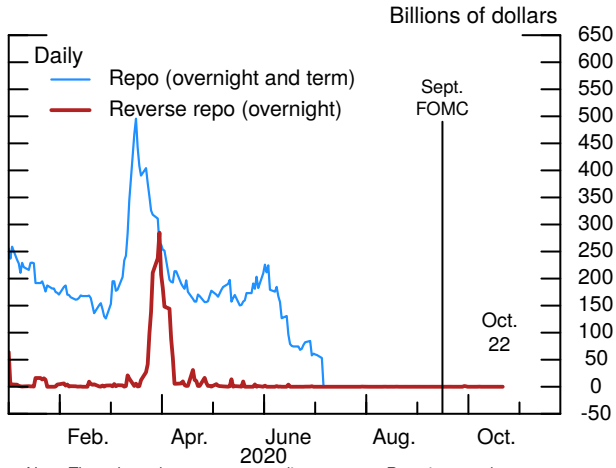
Note: MMF is money market fund.
Source: iMoneyNet.

Overnight Funding Rates



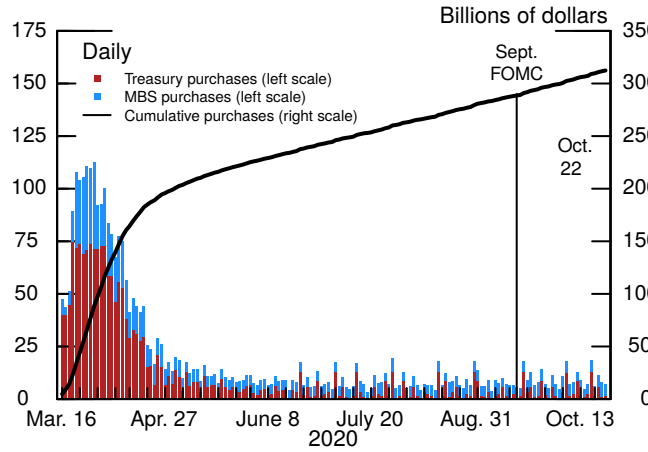
Note: Shaded area is the target range for the federal funds rate. EFFR is effective federal funds rate. SOFR is Secured Overnight Financing Rate.
Source: Federal Reserve Bank of New York; Federal Reserve Board.

Fed Repo and Reverse Repo Operations



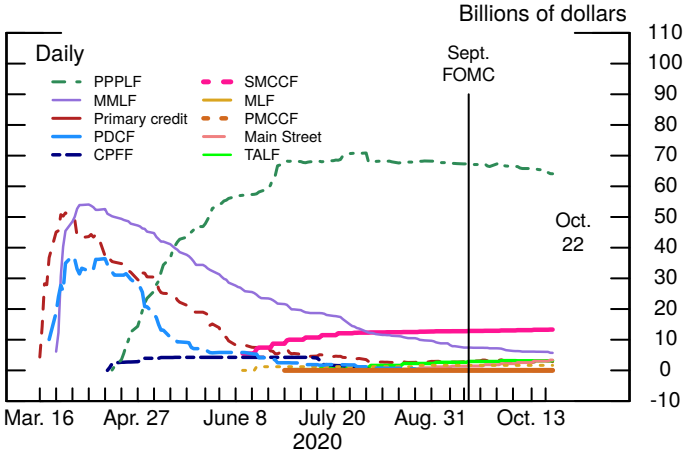
Note: The values shown are outstanding amounts. Repo is repurchase agreement.
Source: Federal Reserve Bank of New York.

Outright Security Purchases



Note: Cumulative purchases are from March 16. MBS is mortgage-backed securities. MBS purchases include reinvestments.
Source: Federal Reserve Bank of New York.

Usage of Liquidity and Credit Facilities



Note: The values shown are outstanding amounts. PPPLF is Paycheck Protection Program Liquidity Facility; MMLF is Money Market Mutual Fund Liquidity Facility; PDCF is the Primary Dealer Credit Facility; CPFF is Commercial Paper Funding Facility; SMCCF is Secondary Market Corporate Credit Facility; MLF is Municipal Liquidity Facility; PMCCF is Primary Market Corporate Credit Facility.
Source: Federal Reserve Board.

Financial Markets

Conditions in money market funds (MMFs) were also generally calm over the intermeeting period, despite an 19 percent drop (about $140 billion) in prime MMF assets under management (AUM), largely due to the conversion of a $124 billion Vanguard prime fund to a government fund. Vanguard stated that the conversion was intended to provide investors with safer investment choices at reduced fees. Earlier this year, two other MMF firm sponsors closed prime MMFs, but no additional closures or conversions of prime funds have been announced.[1] Net yields of MMFs also remained stable at near historical lows. Amid stable market conditions, there was no new activity at the Money Market Mutual Fund Liquidity Facility, which has not attracted any take-up since April.

The effective federal funds rate was 9 basis points every day over the intermeeting period, unchanged from the average over the previous intermeeting period. The Secured Overnight Financing Rate averaged 8 basis points, 1 basis point lower than over the previous intermeeting period, likely due to a modest net decrease in Treasury bill issuance. Regarding year-end pressures, market participants expect temporary upward pressure on overnight rates around year-end to be more muted than some historical year-ends based on pricing of forward trades.

The amount of Federal Reserve repo outstanding remained at zero over the intermeeting period, as dealers can obtain more attractive rates in the private market. The monthly pace of Desk purchases of Treasury securities remained at $80 billion. Purchases of agency residential MBS are currently at a pace of $111 billion per month, including $71 billion in reinvestments and $40 billion in additional purchases.

Over the intermeeting period, the Federal Reserve's balance sheet expanded slightly, as the increase of approximately $150 billion in securities held outright was partially offset by continued declines in central bank liquidity swaps outstanding. Aggregate amounts outstanding in liquidity and credit facilities were little changed.

[1] The corresponding increase in government MMF AUM resulting from the Vanguard conversion was a modest share of aggregate government fund AUM.

Why Have Treasury Yields Been So Stable?

Over the summer, medium- and longer-term Treasury yields were unusually stable, fluctuating in only narrow ranges (figure 1). One might have expected Treasury yields to exhibit greater movements as the near-term outlook for the economy improved and several data releases were notably stronger than expected. For example, in June, the change in nonfarm payrolls was 4.8 million, much higher than the Bloomberg median expectation of 3.2 million, and the unemployment rate came in at 11.1 percent, substantially below the Bloomberg median expectation of 12.5 percent. This discussion argues that the large gap between current economic conditions and the FOMC's monetary policy goals together with monetary policy currently being at the effective lower bound, as well as the Committee's actions and communications, have likely been important factors contributing to the low volatility of yields. That said, other factors have likely played a role as well. In particular, the signal embedded in recent data releases for the economic outlook has arguably been weaker than normal, damping the sensitivity of yields to economic data surprises.

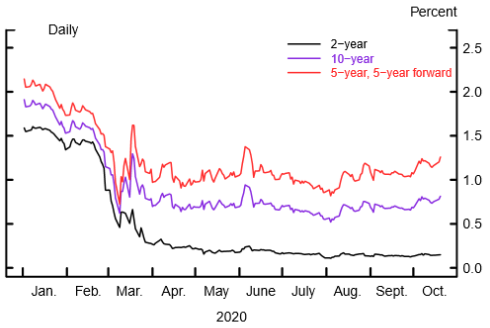
The gap between current conditions and the FOMC's monetary policy goals pins the policy rate at the effective lower bound.[1] In other words, current economic conditions likely warrant an expected policy path that, absent the lower-bound constraint, would be substantially negative over the next few years. As a result, the observable lower-bound-constrained expected policy path over the next few years is relatively unresponsive to changes in the near-term economic outlook. FOMC communications may have also reinforced the view that current economic conditions are far from those associated with liftoff.[2] The OIS-implied policy path over the next few years, unadjusted for term premiums, remained flat and stable near the effective lower bound over the summer (figure 2). This stability of the policy path has likely passed through to medium-term Treasury yields as well.

That said, it is notable that forward rates well beyond the expected liftoff horizon, including the five-year, five-year-forward rate in figure 1, have also fluctuated relatively little in response to the stronger-than-expected data

[1] The FOMC has communicated that it is unlikely to lower the federal funds rate below zero, which is reflected in recent Desk surveys, where respondents assign low odds to negative federal funds rate outcomes.

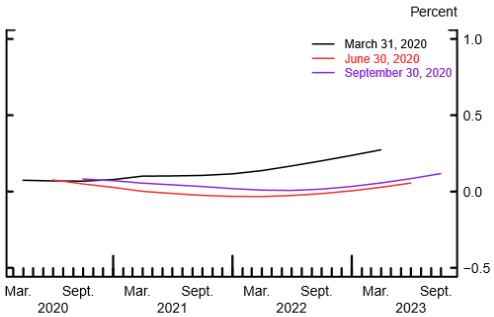
[2] In its March, April, June, and July postmeeting statements, the FOMC communicated that it expected to maintain the target range of 0 to ¼ percent "until it is confident that the economy has weathered recent events and is on track to achieve its maximum employment and price stability goals." In September, this forward guidance became more explicit about the economic outcomes associated with liftoff, with the language being modified to "until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time." According to the Desk surveys, as of September, the median respondent expects an unemployment rate of 4 percent and PCE inflation of 2.3 percent at the time of the first increase in the target range.

Figure 1: Nominal Treasury Yields



Source: Board staff calculations.

Figure 2: Implied Federal Funds Rate



Note: The path is estimated using overnight index swap quotes with a spline approach and a term premium of 0 basis points.
Source: Bloomberg; Board staff calculations.

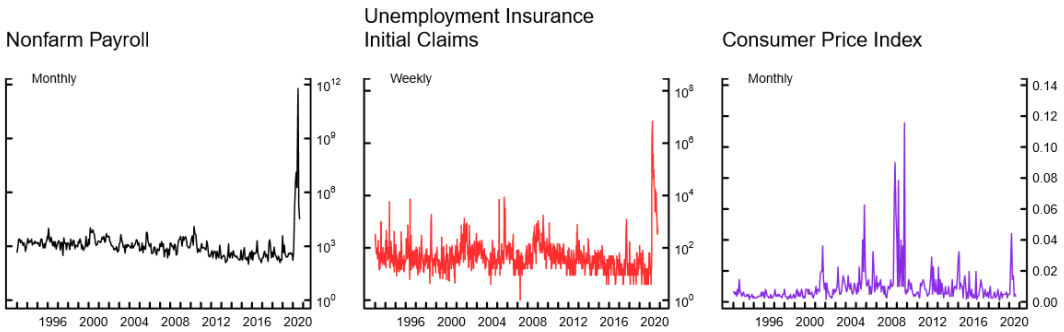
releases during the summer. One might have expected these forward rates to exhibit sensitivity to data surprises, in part through responses in the term premium components of long-horizon forward rates.[3] But the net effect of, for example, the June through September employment report releases on the five-year, five-year-forward rate, as measured by the cumulative change in narrow windows around each release, was only about 5 basis points. The reaction of equity prices, which are also not constrained by the effective lower bound, was similarly muted.

One factor that has likely helped keep longer-horizon forward rates low and stable is the Federal Reserve's ongoing and expected future asset purchases. For example, investors may be interpreting the FOMC's communication of its commitment to use its full range of tools to support the economy as limiting the scope for significant upward movements in longer-term yields and forward rates.

Another factor contributing to the limited fluctuations of both medium- and longer-term yields may have been a weaker signal in recent data releases. The surprise in a data release is typically measured as the deviation from the average or median of survey respondents' modal expectations. However, the global pandemic has brought considerable uncertainty about the outlook, particularly for the labor market, which means that survey respondents have likely had little conviction about their modal forecasts. For this reason, market participants may have taken a much weaker signal about the economic outlook from these large data surprises. A reduced sensitivity of market participants' economic outlook to news would help explain why long-term forward rates and equity prices have seemed fairly unresponsive to news.

[3] Most of the notable data surprises during the summer were stronger than expected. The historically low levels of longer-term forward rates may have reduced the sensitivity to weaker-than-expected data a bit, but it is not clear that the proximity of forward rates to the lower bound should affect the sensitivity to stronger-than-expected data.

Figure 3: Survey Dispersion of Economic Indicators



Note: Survey dispersion is calculated as the cross-sectional variance of survey respondents' reported expectations. The left panel measures the net change in total nonfarm employment since the previous month; the y-axis is plotted on a logarithmic scale. The middle panel measures the new unemployment insurance initial claims since the previous week; the y-axis is plotted on a logarithmic scale. The right panel measures the monthly percentage change in the consumer price index.
Source: Action Economics survey.

Consistent with forecasters having less conviction about their modal forecasts, survey responses from Action Economics reveal much greater dispersion among forecasters in recent months.[4] Using dispersion as a proxy for forecast uncertainty, the largest data surprises have also been the releases for which forecast uncertainty was the highest. For the labor market, large surprises for nonfarm payrolls and unemployment insurance initial claims were accompanied by record-high dispersion among forecasters (the left and middle panels in figure 3). In contrast, CPI data releases resulted in smaller surprises and showed only a modest uptick in dispersion among forecasters (the right panel in figure 3).
Return to Financial Markets text

[4] Although dispersion is not strictly the same as uncertainty, dispersion and GARCH-based measures of uncertainty are generally positively correlated. For example, for nonfarm payrolls and unemployment insurance initial claims, the correlation is of the order of 0.5 to 0.8.

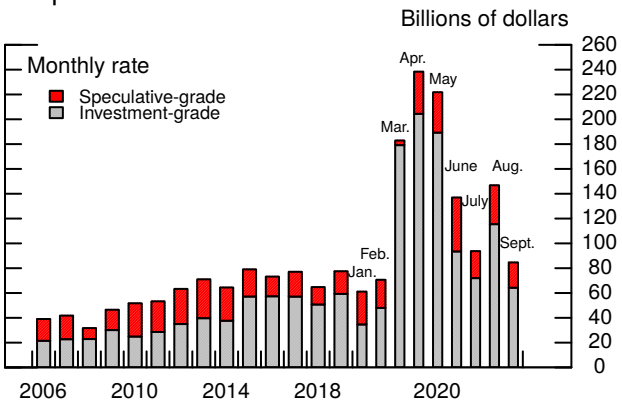
Financing Conditions for Businesses and Households

While market-based financing conditions for large nonfinancial corporations, municipalities, and real estate borrowers remained generally accommodative over the intermeeting period, bank lending standards tightened somewhat from already tight levels. Nonetheless, bank lending conditions may be stabilizing for businesses and households. For example, the net share of banks in the Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS) reporting tightening in the third quarter was notably below the respective net share in the second quarter. Demand has weakened further for C&I and CRE loans and only recovered somewhat from depressed levels for consumer loans.

- Gross issuance of equity and corporate bonds remained solid over the intermeeting period, and gross institutional leveraged loan issuance continued to pick up from its earlier sluggish pace. The volume of corporate bond and leveraged loan rating downgrades remained low.
- C&I loans outstanding on banks' books continued to decline through September, albeit at a slower pace than in the middle of the year. In the October SLOOS, banks reported further tightening of lending standards on C&I loans, although fewer banks reported having done so than in the previous two surveys. Demand for C&I loans reportedly weakened for businesses of all sizes.
- Small business lending remained depressed, reflecting tight lending standards, uncertainty about earnings prospects, and the firms' reluctance to borrow at prevailing terms. Small business loan performance deteriorated further.
- CRE loan growth on banks' books decelerated during the third quarter, but CMBS issuance picked up. CMBS loan delinquencies remained notable in the hotel and retail sectors.
- Residential mortgage financing conditions were generally accommodative, as suggested by high volumes of home-purchase and refinancing mortgage lending. Even so, mortgage financing conditions remained tight for borrowers with lower credit scores and for nonstandard loans.
- Credit card balances declined and auto loan balances were little changed, respectively, in the third quarter, as increases for borrowers with relatively strong credit scores were offset by declines for subprime borrowers.
- Banks are providing forbearance for all loan categories.

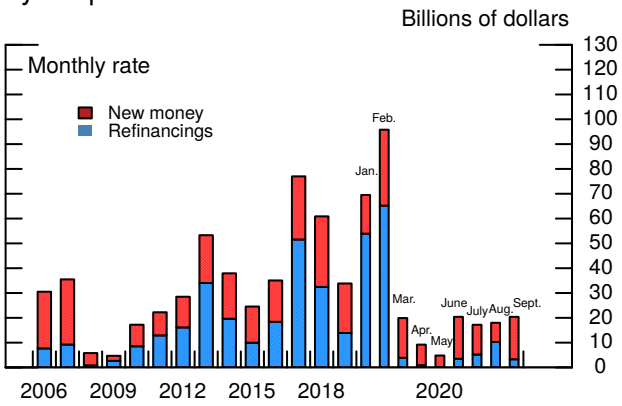
Business Finance

Gross Issuance of Nonfinancial Corporate Bonds



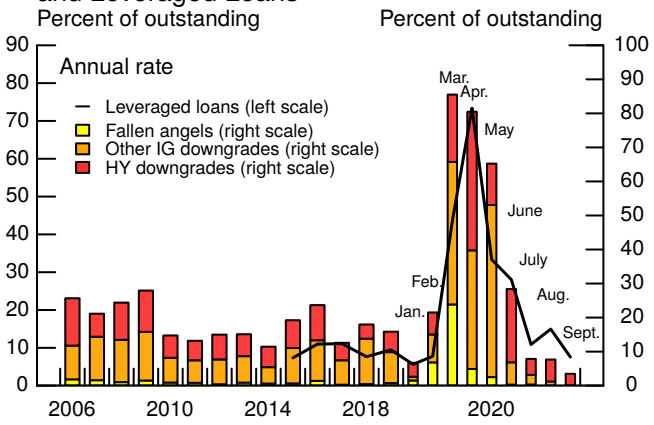
Note: Bonds are categorized by Moody's, Standard & Poor's, and Fitch.
Source: Mergent Fixed Income Securities Database.

Institutional Leveraged Loan Issuance, by Purpose



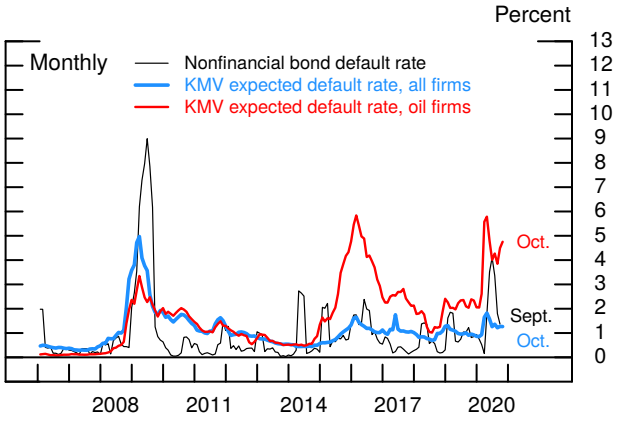
Source: Thomson Reuters LPC LoanConnector.

Downgrades of Nonfinancial Corporate Bonds and Leveraged Loans



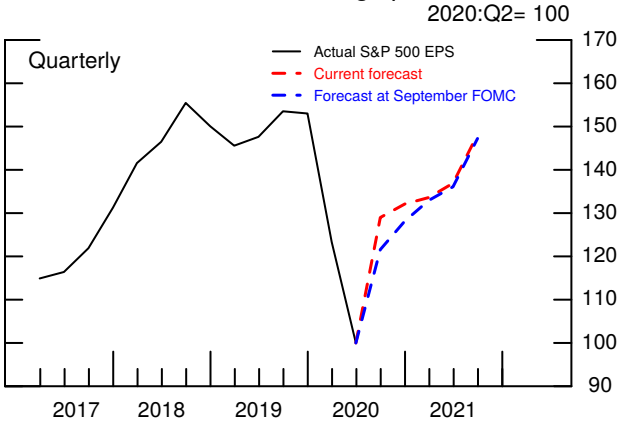
Note: Computed as a percent of nonfinancial bonds outstanding and reported at an annual rate. Fallen angels are bonds downgraded from investment grade (IG) to speculative grade (HY). Leveraged loan downgrades represent changes between ratings buckets.
Source: For corporate bonds, Federal Reserve Board 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



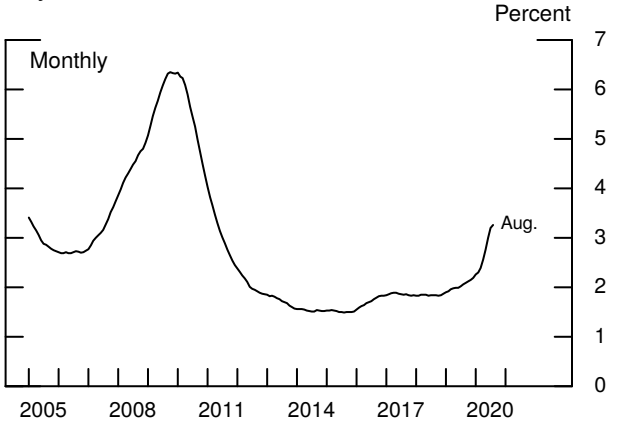
Note: For realized default rate, 3-month trailing defaults divided by beginning-of-period outstanding, at an annual rate. For expected default rate, firm-level estimates of default weighted by firm liabilities as a percent of total liabilities, excluding defaulted firms.
Source: For realized default rate, Moody's Investors Service; for expected default rate, calculated using firm-level data from Moody's KMV.

Bias-Adjusted Wall Street Analyst Forecasts of S&P 500 Earnings per Share



Note: Bias-adjustments control for the "earnings guidance game" (Richardson, Teoh, and Wysocki, 2004). Observations are quarterly and adjusted for seasonality. EPS is earnings per share.
Source: Thomson Reuters Financial.

PayNet Small Business Default Index



Source: Paynet.

Financing Conditions

BUSINESS FINANCING CONDITIONS

Nonfinancial Business

Financing conditions in capital markets continued to be broadly accommodative over the intermeeting period, supported by low interest rates and high equity valuations. Amid historically low corporate bond yields, gross issuance of both investment- and speculative-grade corporate bonds remained solid in September, at levels below the robust issuance volumes of August but similar to averages seen in recent years. Most of this issuance was reportedly intended to refinance existing debt, suggesting that terms of bond financing remain favorable.

Gross institutional leveraged loan issuance continued to pick up in September but remained below its average pace in 2019. Issuances were primarily for new-money purposes, which supported non-acquisition-related activity such as dividend recapitalizations. CLO issuance was strong in September, providing robust investor demand for newly issued leveraged loans in the coming months, and the first-ever TALF-eligible CLO was issued in late October.[1]

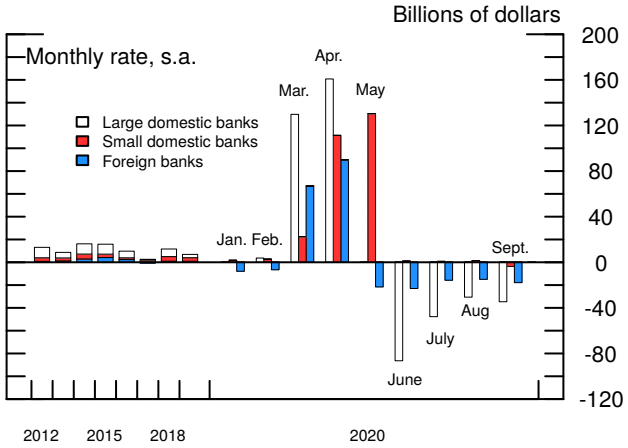
The credit quality of nonfinancial corporations continued to show signs of stabilization. The volume of downgrades to corporate bonds and leveraged loans fell to pre-pandemic levels through September. Corporate bond and leveraged loan defaults were low in August and September relative to the elevated volume of defaults in July. Market indicators of future corporate bond and leveraged loan default expectations, such as the KMV expected year-ahead default rate, remained somewhat elevated at above pre-pandemic levels, especially for lower-rated leveraged loan issuers.

C&I loans on banks' balance sheets continued to decline through September, reflecting a mix of weak origination activity and the repayment of credit-line draws from earlier in the year. The decline in C&I lending slowed over the third quarter, and that trend will likely continue given that undrawn commitments are now back around their pre-pandemic levels, with the majority of the drawdowns in March appearing to have been repaid. In the October SLOOS, banks reported that standards for C&I loans continued to tighten during the third quarter, although fewer banks reported tightening than in previous quarters. In addition, demand for C&I loans reportedly weakened in the

[1] Federal Reserve staff do not anticipate much more TALF-eligible CLO issuance, because the TALF requirements are significantly more stringent than market standards. In the 2008–09 financial crisis, the original TALF program did not accept CLOs as collateral.

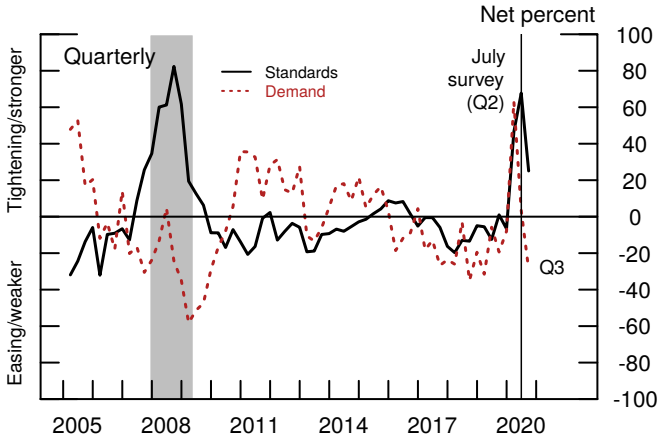
Bank Lending Conditions

Change in C&I Loans



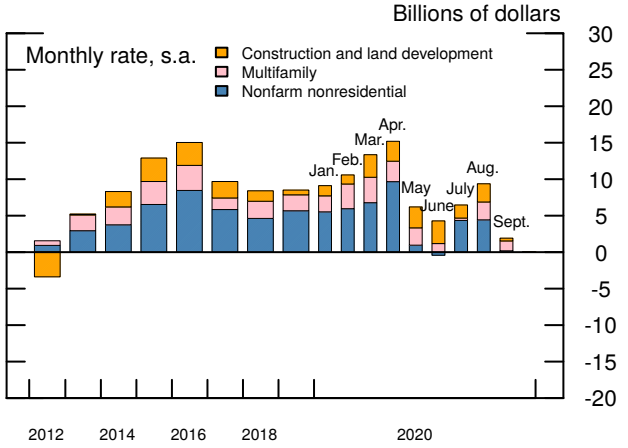
Note: Yearly rates show changes in loans on banks' books at the end of each year; monthly rates show changes in the average level of outstanding loans each month.
Source: Federal Reserve Board (FRB), Form FR 2644, Weekly Report of Selected Assets and Liabilities of Domestically Chartered Commercial Banks and U.S. Branches and Agencies of Foreign Banks; FRB staff calculations.

C&I Loans: Changes in Standards and Demand



Note: The shaded bar indicates a period 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.

Commercial Real Estate Loans



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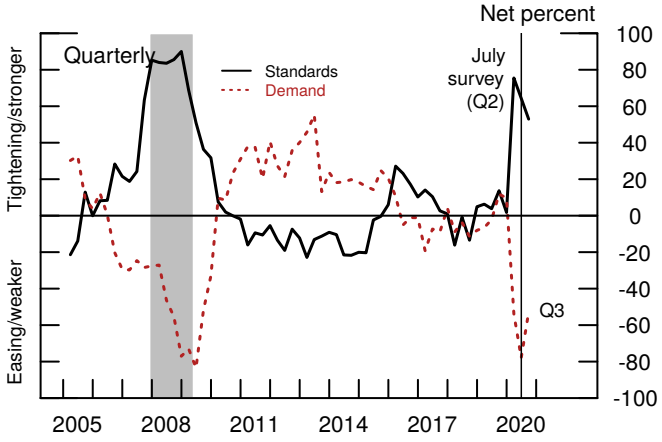
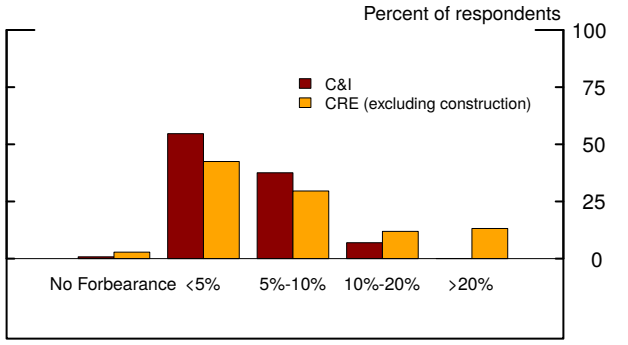
Commercial Real Estate Loans: Changes in Standards and Demand



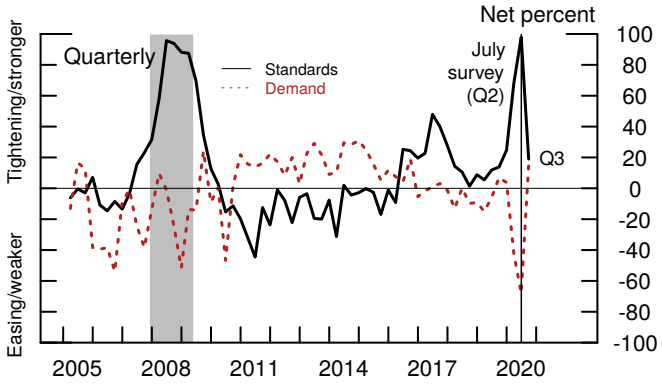
Note: The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.
Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Fraction of Business Loans Made by Domestic Banks Currently in Forbearance



Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices.

Consumer Loans: Changes in Standards and Demand



Note: The shaded bar indicates a period 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.

Financing Conditions

third quarter after having surged in the earlier stages of the pandemic, initially as a result of credit-line drawdowns and then later because of Paycheck Protection Program (PPP) loans. (For foreign central banks' actions to support bank lending, see the box "Funding-for-Lending Programs of the Bank of England and the European Central Bank.")

Despite tight standards for new loans, the majority of banks in the October SLOOS reported forbearance rates of up to 5 percent for existing C&I loan balances, where forbearance mostly took the form of payment deferrals and covenant relief. Forbearance seems unlikely to boost future delinquencies, since borrowers' payment histories have reportedly been an important criterion in granting forbearance, and forbearance rates have fallen without any apparent deterioration in loan performance.

Amid notable equity market gains, equity raised through initial public offerings (IPOs) was very strong in September. Many of the recent IPOs are in the biotechnology and information technology industries, which have benefited from robust investor sentiment during the pandemic.

With 13 percent of S&P 500 firms having already reported, third-quarter earnings are coming in even stronger than the sharp recovery forecast by Wall Street analysts. That said, third-quarter earnings per share are still expected to be about 15 percent below year-ago levels. Earnings are expected to reach 2019 levels by the end of 2021 for the S&P 500 overall, although earnings of hard-hit industries, like airlines, hotels, and leisure, are forecast to remain far below pre-pandemic levels.

Small Businesses

Financing conditions for small businesses remain tight as a result of the pandemic. According to the PayNet Small Business Lending Index, small business loan originations dropped off sharply in August, after a temporary boost from PPP distributions over the summer, and are currently 10 percent lower than the level in January. At the same time, liquidity needs of small businesses are high and likely to increase as businesses continue to operate at reduced capacity. In the most recent Census Small Business Pulse Survey, more than half of small businesses report having no more than two months of cash on hand. Also, 20 percent of small businesses believe they will need additional financial assistance in the next six months. However, while the need for assistance and liquidity appears high, results from the National Federation of Independent Business survey and the Wells Fargo/Gallup survey suggest that many business owners

may be reluctant to take on debt at prevailing terms, given the uncertainty surrounding their earnings prospects.

Small business loan performance has generally deteriorated further. Although some improvement was observed in 30-day delinquencies between May and August, these short-term delinquencies could resume their climb in the next few months as increasing numbers of small businesses exhaust their PPP funding. Moreover, both PayNet's measure of long-term delinquencies and the annualized default index rose in August and now stand 48 percent and 42 percent higher than in February, respectively.

Commercial Real Estate

The securitization market for CRE borrowing remained accommodative over the intermeeting period. Spreads on agency CMBS were narrow and issuance was very strong in September. Spreads on triple-A non-agency CMBS, which were already within their pre-pandemic range in August, moved down further in September and early October, while non-agency issuance remained relatively subdued in September.

In contrast to the strong CMBS issuance, the growth of CRE loans on banks' books decelerated in the third quarter.[2] In particular, loans for income-producing properties at large banks—for which CMBS funding is a substitute—accounted for much of the slowdown in CRE loan growth. Consistent with the deceleration in CRE loan growth, banks reported that standards for CRE loans tightened further, and demand for such loans weakened again in the October SLOOS.

The majority of banks in the October SLOOS reported forbearance rates above 5 percent for CRE loans secured by income-producing properties, with average forbearance rates for this category of CRE loans the highest among all categories of loans surveyed. In turn, forbearance likely contributed to the lower observed delinquency rates for bank CRE loans compared with CMBS, which have more restrictions on available credit risk mitigation approaches.[3] Moreover, properties from sectors disproportionately hit by the pandemic crisis, such as hotel and retail, account for a larger share of CMBS

[2] The current continued growth of bank CRE loan volumes is not atypical of past recessions. For example, during the Global Financial Crisis, CRE loan balances held by banks also did not decline immediately, despite stress in the sector. Bank CRE balances peaked in December 2008 and started trending down in 2009.

[3] While CRE loans in forbearance are not reported as delinquent, CMBS loans receiving some forms of forbearance continue to be reported as delinquent. Similarly, RRE loans in forbearance and missing payments are also recorded as delinquent by the servicer.

collateral than bank loans, and CMBS loan delinquencies from these sectors have been particularly high while remaining low for the multifamily, office, and industrial sectors.

State and Local Government Financing Conditions

Financing conditions in the municipal bond market remained generally accommodative over the intermeeting period. Supported by low yields, new capital, refinancing, and taxable issuance remained strong. Issuance of high-yield and unrated municipal bonds, however, have continued to be somewhat below pre-pandemic levels. Indicators of the credit quality of municipal debt weakened a bit in September, with the volume of credit rating downgrades exceeding upgrades by a modest amount, and state CDS spreads roughly unchanged.

HOUSEHOLD FINANCING CONDITIONS

Residential Real Estate

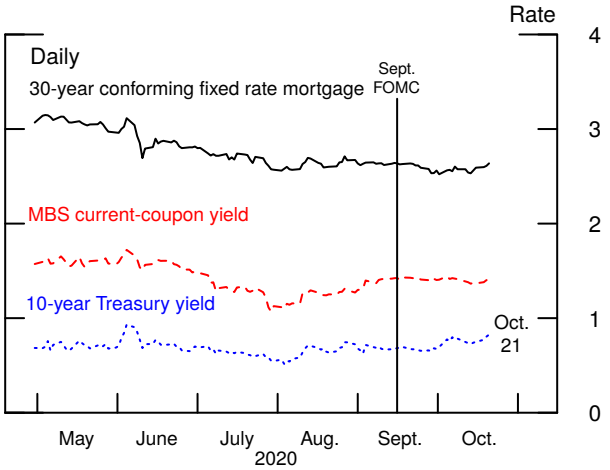
Financing conditions in the residential mortgage market were little changed over the intermeeting period. Mortgage rates remained near historic lows, supporting high volumes of both home-purchase and refinancing originations. Mortgage credit continued to flow to higher-score borrowers who meet standard-conforming loan criteria, while it remained tight for borrowers with lower credit scores and for nonstandard mortgage products such as jumbo loans.

Consistent with the decline in RRE loans on banks' balance sheets, in the October SLOOS, respondents, on net, reported tightening standards on jumbo mortgages and HELOCs while easing standards for GSE-eligible mortgages. Meanwhile, demand strengthened for most categories of RRE loans.

Mortgage forbearance rates, as reported by the Mortgage Bankers Association, continued their downward trend but, on average, remained above 5 percent of RRE loan balances. Forbearance rates dropped almost one percentage point in October, as the initial six-month period of forbearance for federally backed loans provided under the CARES Act began to expire, and some affected borrowers did not request a six-month extension. While rates of forbearance and missed payments remain substantially higher among the riskier loans populating Ginnie Mae pools, the rates of new transitions into delinquency for these loans remained low in September.

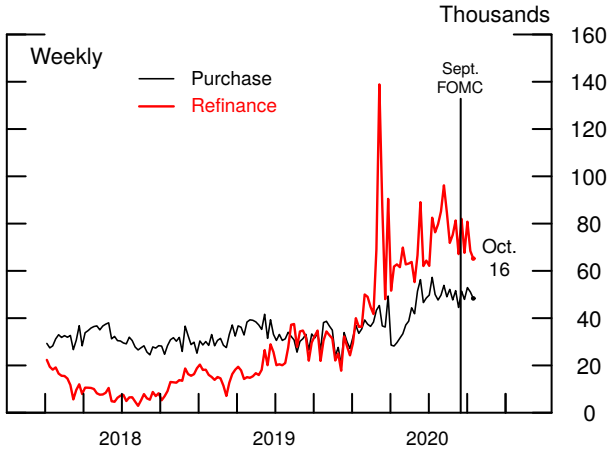
Household Finance

Mortgage Rate and MBS Yield



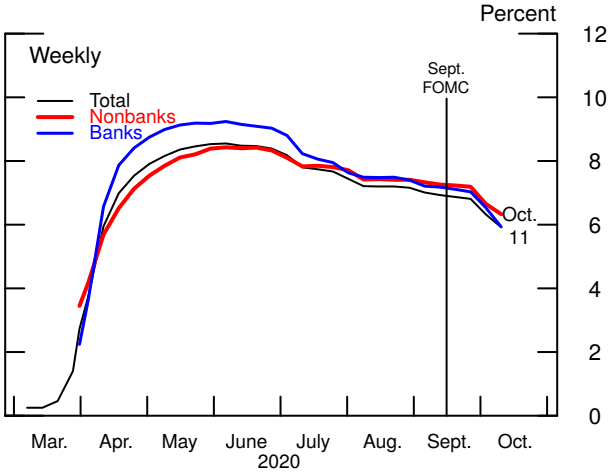
Note: The mortgage-backed securities (MBS) yield is from Fannie Mae through May 31, 2019, and from uniform mortgage-backed securities thereafter.
Source: For mortgage rates, Optimal Blue; for MBS yield, J.P. Morgan.

Number of Rate Locks



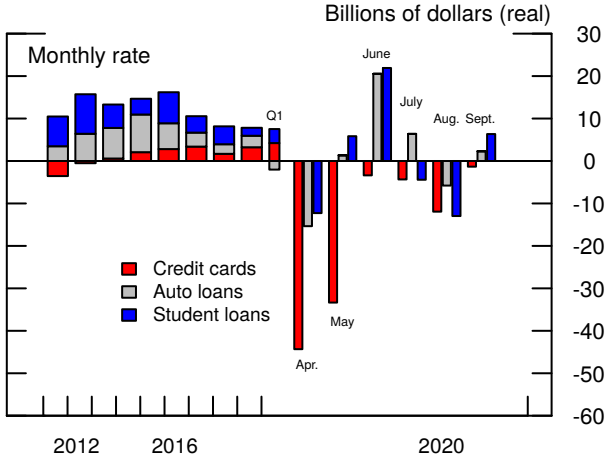
Note: Seasonally adjusted by Board staff.
Source: Optimal Blue.

Percent of Mortgages in Forbearance



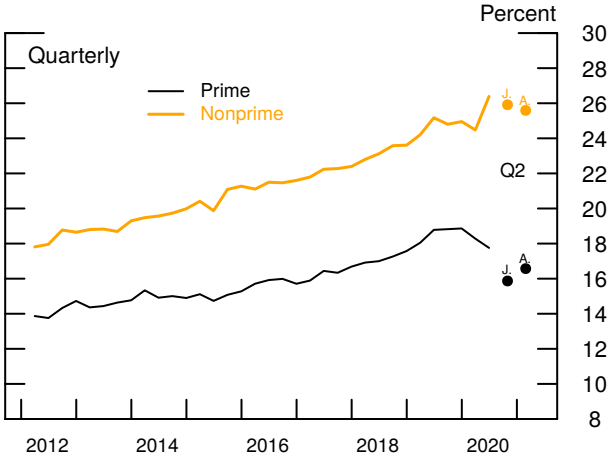
Source: Mortgage Bankers Association.

Consumer Credit Flows



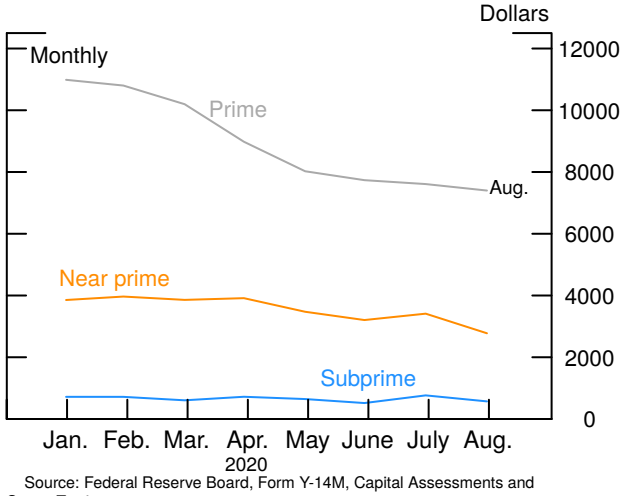
Note: The data are seasonally adjusted by Federal Reserve Board staff.
Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

Offered Interest Rates for Purchases, by Credit Scores



Note: Mail-volume weighted. Dots indicate any monthly data since most recent quarter. J. and A. are July and August, respectively. Prime is a VantageScore 2.0 credit score of 700 and above. Nonprime is a VantageScore 2.0 credit score below 700.
Source: Mintel.

Average Credit Limit for New Credit Cards



Source: Federal Reserve Board, Form Y-14M, Capital Assessments and Stress Testing.

Financing Conditions

Consumer Credit

Financing conditions in consumer credit markets remained accommodative for borrowers with relatively strong credit scores but tight for subprime borrowers.

Credit card balances continued to decline through the third quarter, with gains in balances for account holders with prime credit scores offset by declines on those for nonprime accounts. Interest rates on existing accounts were little changed at below pre-crisis levels, while offered interest rates for new accounts to nonprime borrowers remained elevated. Credit limits on new accounts continued to fall in August, with the decline for near-prime borrowers most pronounced. Moreover, credit limits for subprime borrowers remained very tight. In the October SLOOS, respondents, on net, reported tighter standards and somewhat stronger demand for all consumer loan types, following a sharp contraction in demand in the second quarter.

Auto loan balances increased solidly for prime and near-prime borrowers but declined for subprime borrowers through September. Auto loan interest rates increased in recent months but remain below pre-pandemic levels and continued to be cited as a favorable factor in auto-purchase decisions. Moreover, ABS market conditions remained stable over the intermeeting period.

Financing and Financial Conditions Indexes

Indexes of broad financial conditions that mostly reflect market-based financing have continued to ease, in contrast to the SLOOS-based index of bank lending standards that showed further tightening over the intermeeting period. A staff index that provides a measure of financing conditions for nonfinancial corporations indicates that conditions have eased modestly and have recently been about as accommodative as before the onset of the COVID-19 outbreak in the United States. The average reading of publicly available financial conditions indexes, which are largely based on a range of market prices, is consistent with the staff index. However, the Bank Lending Standards Index of reported changes based on the October SLOOS points to continued tightening in the third quarter, although to a lesser extent than in the first and second quarters. The index points to a pace of tightening in the third quarter that is similar to the one observed during the early stages of the recovery from the Global Financial Crisis.

Funding-for-Lending Programs of the Bank of England and the European Central Bank

Faced with a large and precipitous decline in economic activity, the Bank of England (BOE) and the European Central Bank (ECB) have undertaken significant easing measures. In addition to monetary policy accommodation, these central banks introduced new voluntary funding-for-lending programs (FFLPs) to help ensure that bank loans remained available to firms and households on reasonable terms at lower interest rates.[1] These programs—the BOE's Term Funding Scheme with additional incentives for small and medium-sized enterprises (TFSME) and the ECB's modified targeted longer-term refinancing operations III (TLTRO III)—provide banks medium-term funding at particularly favorable interest rates upon meeting a lending target.

Both programs have similar objectives and some broad features in common.[2] Both set a lending target based on pre-COVID-19 loan stocks and offer cost incentives to do so.[3] They offer a favorable cost of borrowing—below market rates on customer deposits or medium-term funding—if a bank meets the lending target, and a less favorable cost of borrowing that depends on the extent to which a bank misses the target. Both programs tolerate a fair amount of bank deleveraging.

Lending targets and incentive structures differ in some key aspects. The BOE TFSME aims to support broad lending, while the ECB TLTRO III targets corporate and consumer lending. The ECB program incorporates stronger cost incentives—in terms of the level of, and the spread between, the most and least favorable program borrowing costs. It has a particularly favorable rate for banks that meet the target and no penalty rate for banks that miss the target. In addition, the program provides temporary cost incentives that are likely to encourage immediate participation. The BOE program takes a different approach. For banks that miss the target by a large margin, the program charges an interest rate that is higher than the interest rate on its other credit operations. The BOE program also has a novel quantity incentive: It offers banks extra funding if they increase lending and even more funding if they increase lending to small and medium-sized enterprises (SMEs). Specifically, every £1 of net lending to SMEs raises a bank's borrowing allowance by £5.

Take-up in both programs has been substantial. Drawdowns in the BOE program, which began in mid-April, reached £45 billion as of mid-October (3.2 percent of 2019 U.K. GDP), which is about 29 percent of the program's initial size.[4] In turn, the total borrowing from

[1] Both central banks introduced FFLPs in the wake of the Global Financial Crisis to address strains in bank term funding that impeded the transmission of policy rates to lending rates and weighed on bank lending. Studies of these previous programs suggest that they induced banks to replace market funding with cheaper central bank funding and passed the savings to borrowers, improved lending conditions, and might have boosted bank lending.

[2] Both programs rely on the existing central bank collateral frameworks, have full recourse on participating banks, and do not have direct fiscal backstops. Neither program mitigates credit risk of participating banks.

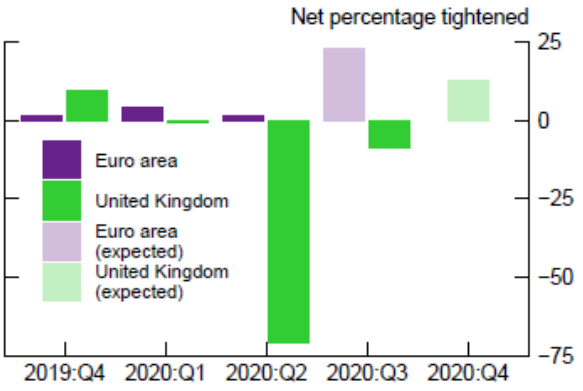
[3] The BOE program bases incentives on eligible net lending growth from December 31, 2019, to December 31, 2020, and the ECB program from April 1, 2019, to March 31, 2021. The ECB program has two lending targets for legacy reasons. Like the BOE program, the ECB program has a "main" target of zero percent growth in the near term. For banks that miss this target, there is a "fallback" target of modest positive growth over a longer period that includes a significant stretch of robust, pre-pandemic lending.

[4] Because of the quantity incentive, the TFSME will grow in size if banks expand lending.

ECB program operations, which began in June, approached €1.5 trillion as of mid-October (12.4 percent of 2019 euro-area GDP), which could be well over half of the program's undisclosed fixed size.[5] The total borrowing net of refinancings of pre-pandemic operations, at 6 percent of GDP, is comparable with the BOE program drawdowns. The higher ECB program usage is likely attributable to relatively more attractive cost incentives.

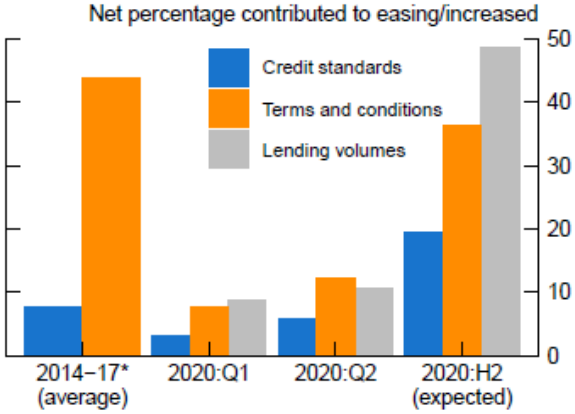
Both programs show tentative signs of supporting lending and lending conditions. That said, the program effects are hard to disentangle from other factors, such as demand for bank loans, government loan guarantee programs, and bank regulatory and supervisory relief. In the United Kingdom, following the introduction of the TFSME and the other measures, lending to SMEs surged 22 percent (£37 billion) from March through August. The vast majority of participating banks have increased TFSME-targeted lending, mainly lending to SMEs. Moreover, the October U.K. bank lending survey suggests that banks substantially improved the availability of loans to firms in Q2 and Q3 (figure 1, green bars), with government support measures likely contributing significantly to the easing. In the remainder of the year, banks expected to tighten lending conditions (figure 1, light green bar). In the euro area, growth in TLTRO III–targeted lending through August has not shown a pickup. The latest euro-area bank lending survey indicates that banks expect overall credit standards to tighten in Q3 (figure 1, light purple bars), chiefly because of the anticipated expiration of government loan guarantee programs and concerns about firm, industry, and economy outlooks. But survey respondents also expect the ECB program to mitigate the tightening and to support lending to firms in 2020:H2 (figure 2). Return to Financing Conditions text

Figure 1. Credit Standards of Loans to Firms



Note: The European Central Bank (ECB) survey asks about "credit standards," while the Bank of England (BOE) survey asks about "credit availability." For the ECB survey, Q4 data are not available.
Source: BOE; ECB; Federal Reserve Board staff calculations.

Figure 2. Effect of TLTRO on Availability of Loans to Firms



*Question on lending volume effect not included in the 2014–17 surveys.
Source: European Central Bank; Federal Reserve Board staff calculations.

[5] In contrast to their lack of interest in the previous TLTRO programs, banks from the core euro area have borrowed large amounts at the TLTRO III operations, possibly because of the new program's strong cost incentives.

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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]

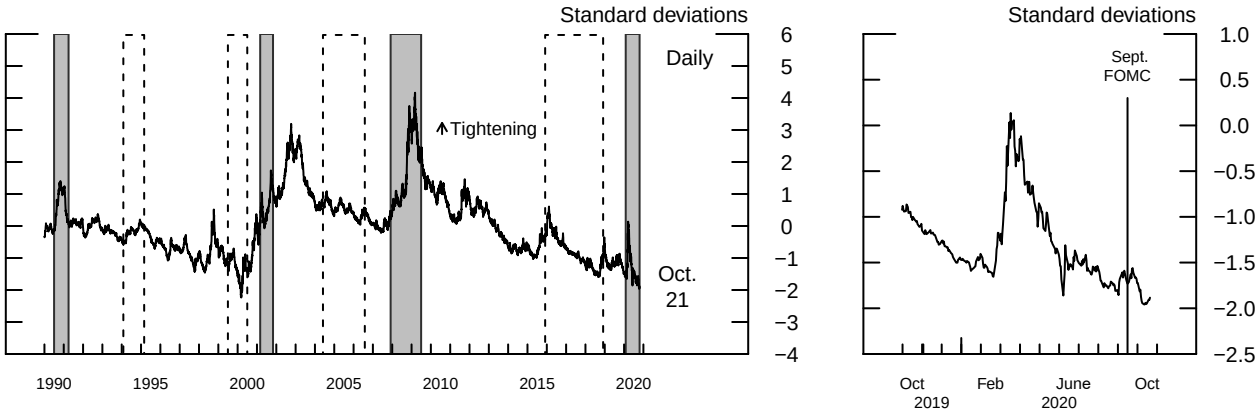
The other FCIs are constructed by aggregating a large set of financial variables into a summary series using various statistical methods. While these indexes provide a useful summary of broad financial market developments, the movements in these indexes may reflect both changes in financing conditions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

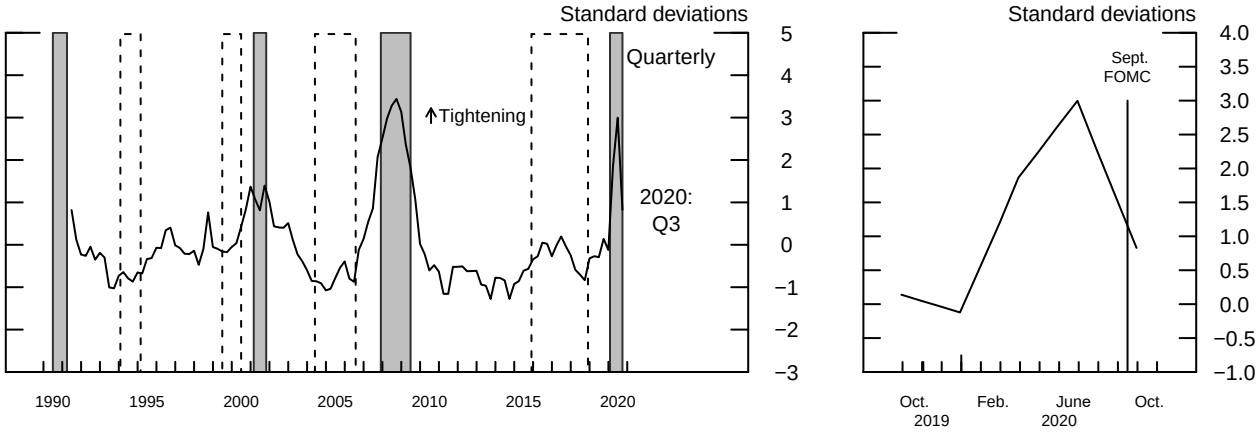
Selected Financial Conditions Indexes

Staff FCI for Nonfinancial Corporations



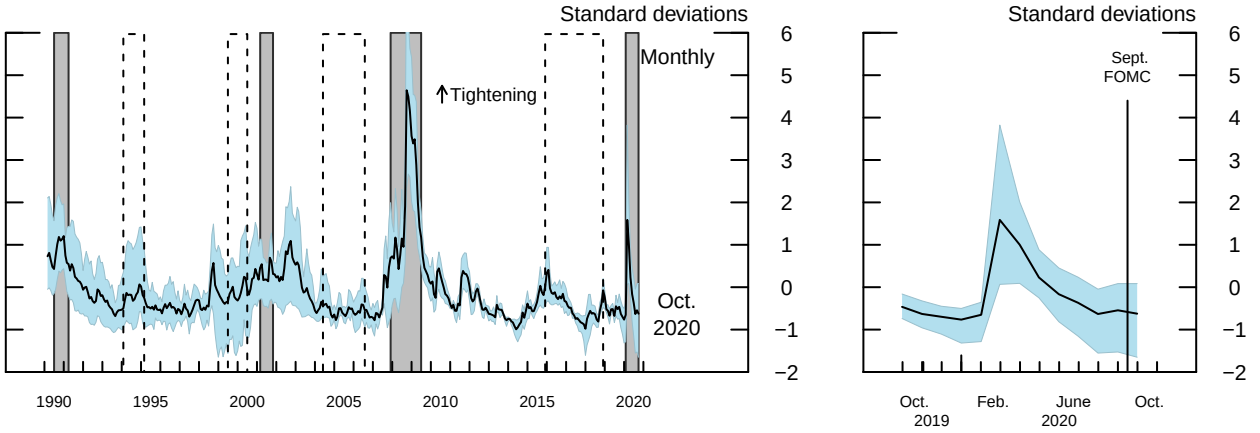
Note: The financial conditions index (FCI) is the deviation from the long−run relation between the systematic components of the cumulative log returns of 2 portfolios of firms with credit ratings above and just below investment grade. The systematic components are derived from the 5−factor Fama−French 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

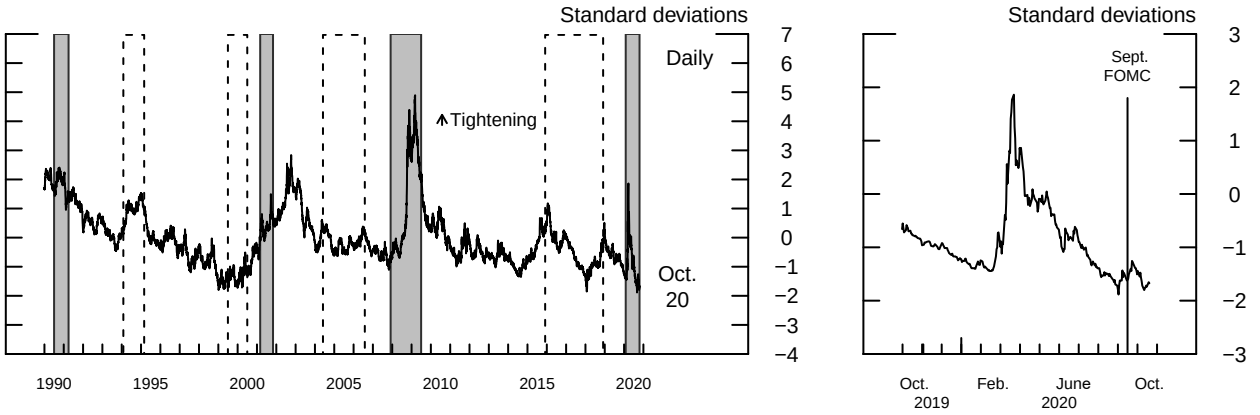


Note: Mean FCI represents the mean of FCIs developed by Goldman Sachs and the Federal Reserve Banks of Chicago, St. Louis, and Kansas City. The blue shaded region represents the range of these 4 standardized FCIs.
Source: Bloomberg; Federal Reserve Banks of Chicago, St. Louis, and Kansas City.

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.

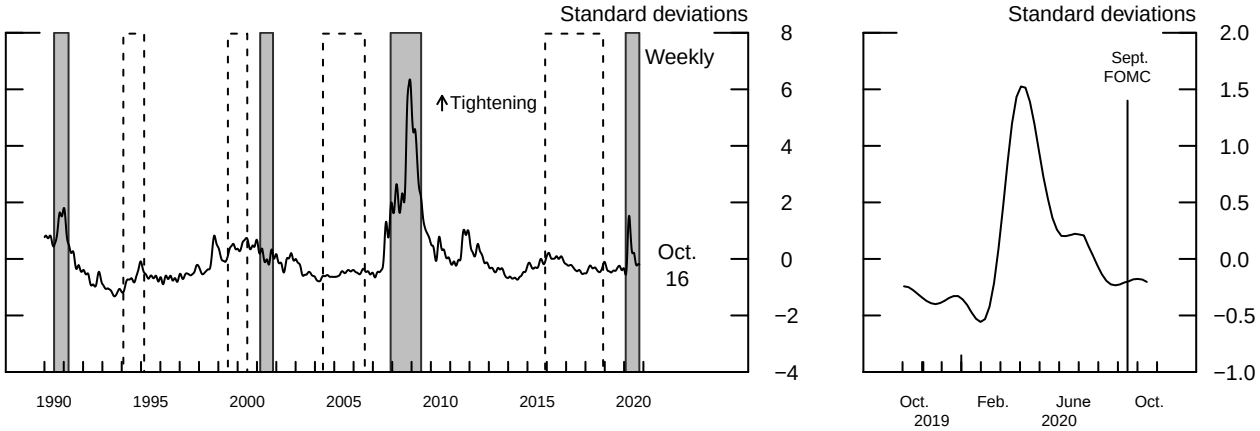
Selected Financial Conditions Indexes (continued)

Goldman Sachs FCI



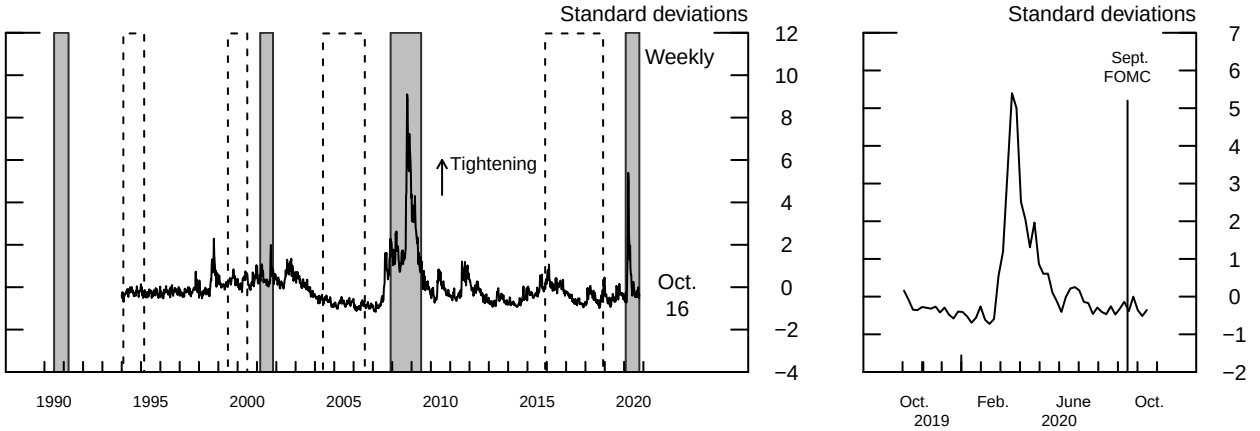
Note: The index is a weighted average of 5 financial variables: the federal funds rate, the 10−year Treasury yield, the triple−B yield spreads to Treasury, the S&P price−to−earnings ratio, and the broad value of the U.S. dollar. Weights are pinned down by the contribution of each financial variable on 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

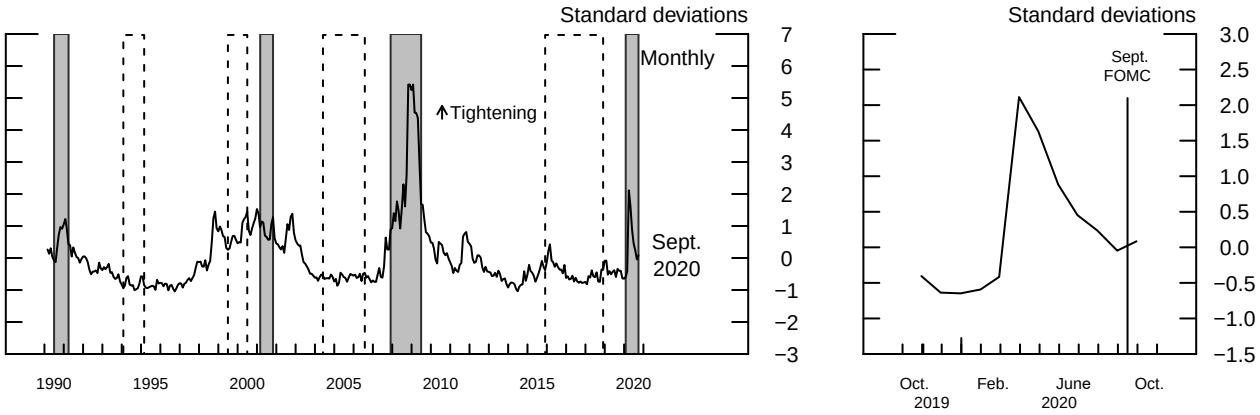


Note: The index is the principal component of 18 variables, including short− and long−term Treasury yields, corporate yields, money market and corporate bond spreads, bond and stock market volatility indicators, breakeven inflation rate, and the S&P 500 index.
Source: Federal Reserve Bank of St. Louis.

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.

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Risks and Uncertainty

Assessment of Risks

Overall, we continue to view uncertainty about economic outcomes over the medium term as high and the risks as tilted to the downside. The future course of the COVID-19 pandemic and its consequences for the economy continue to pose the most salient risks to the outlook. The latest data suggest that the risk of a resurgence of the disease has increased since the September Tealbook. New cases and hospitalizations have moved up both at home and in Europe. Increases in new U.S. cases are particularly marked in the Midwest and Mountain states, where cold weather has already set in, raising the prospect that the disease will spread more easily as winter approaches. Over the summer months, the experience in the United States and abroad had sparked hopes that spikes in new cases could be contained without implementing economically costly mitigation measures such as those used in the spring. Although the reimposition of restrictions has thus far been localized, these developments raise concerns that stricter social-distancing rules with possibly negative economic effects may prove necessary.

In this round, we have reduced the severity of the "Second Waves" scenario, continuing a sequence of similar revisions in recent Tealbooks. These revisions reflect our view that governments and the public, both in the United States and abroad, have become more adept at preventing the spread of the virus and keeping the economic costs of mitigation measures lower compared with earlier this year. Because we have reduced the severity of the scenario while the risk of a resurgence in the disease has increased, we view this scenario as more likely than we did in September, although we continue to view it as less likely than the baseline.

Another COVID-related risk is the possibility that early vaccines may not be very effective at preventing the disease. The annual flu vaccine is only about 50 percent effective, and a similar efficacy may hold for the COVID vaccine. In this case, the risk of contracting a serious case of COVID could remain high enough that economic activity may not be able to return to normal even after a vaccine is widely available. Expectations about the vaccine are just one of several areas where the threat of disappointment looms large. For example, the public could face disappointment about the degree of stimulus from fiscal and monetary policies, or the projected deceleration in economic activity could disappoint those expecting a more rapid recovery. Such disappointment could spark a drop in household, business, and financial market

confidence globally. We explore the implications of such an outcome in the "Delayed Vaccine and Weaker Confidence" scenario.

In our baseline forecast, the drop in the unemployment rate in the 2021–23 period is about twice as rapid as the pace of decline in any of the three most recent recoveries, raising the prospect that the recovery could be slower than we have assumed in the baseline. We explore this possibility in the "Slower Recovery" scenario. Another scenario explores the implications of disruptions to supply factors related to COVID that might exert greater-than-expected inflationary pressures.

There are also reasons for optimism: The data in recent months have surprised us to the upside, and in the "Faster Recovery" scenario we assume the good news continues. In addition, the on-again, off-again negotiations over an additional fiscal stimulus package highlight the upside risk that, contrary to our baseline assumption, the Congress may enact a substantial additional tranche of stimulus. We explore this possibility in the "Additional Fiscal Support" scenario.

ALTERNATIVE SCENARIOS

This section describes several alternative scenarios simulated using the FRB/US and SIGMA models as well as a recently developed staff model—US-FLM—that features financial and labor market frictions.[1] In all scenarios, the federal funds rate follows the policy rule used for the baseline projection.[2]

Second Waves (FRB/US, SIGMA)

The baseline projection assumes that social-distancing measures—especially voluntary ones—will ease somewhat further by early next year in both the United States and foreign economies. However, the number of new infections has been resurging in many parts of the United States, especially the cooler regions, in Canada, and in several European countries that

[1] US-FLM is a DSGE model that builds on the model developed by Gertler, Sala, and Trigari. See Mark Gertler, Luca Sala, and Antonella Trigari (2008), "An Estimated Monetary DSGE Model with Unemployment and Staggered Nominal Wage Bargaining," *Journal of Money, Credit, and Banking*, vol. 40 (December), pp. 1713–64. In addition to the labor market frictions in that paper, the US-FLM also features financial market frictions, household decisionmaking regarding hours worked and labor force participation, and an expanded range of data employed during estimation, including the unemployment rate and credit spreads.

[2] Unless otherwise stated, all scenarios assume that federal fiscal policy and the Federal Reserve's balance sheet policies are the same as in the baseline.

appeared to have the virus under control in the summer. Moreover, a rise in indoor social activities during the fall and winter may increase the risk of a further surge in infections in the Northern Hemisphere. An increasing number of deaths per day and rising hospitalization rates could put health-care systems under renewed stress, raising the prospect that economically costly mitigation measures may become unavoidable. Financial-sector vulnerabilities could be revealed, with further weakening of the economy particularly damaging as firms' and households' access to financing becomes increasingly impaired.[3] In addition, limited policy space for additional fiscal support in many countries may cause those economies to weaken sharply. The supply side of the economy could suffer more than in the baseline because of greater permanent job loss, a spike in firm exits, and reduced investment.[4]

In this scenario, we illustrate the effects of a resurgent pandemic. Specifically, a rebound in new cases in many U.S. states leads to a widespread and persistent increase in social-distancing measures starting in the fourth quarter of 2020. Similarly, renewed outbreaks in many foreign economies necessitate a revival of strict social-distancing measures abroad. Because we believe governments and private agents have learned how to better deal with these disruptions, the social-distancing measures are less damaging to both the United States and foreign economies than earlier this year. Abroad, GDP stops growing in 2021 and remains more than 5 percent below the baseline throughout 2021 and 2022. Flight-to-safety flows to the United States lead to a 5 percent appreciation of the dollar in early 2021.

In the United States, the broad reinstatement of social distancing along with the deterioration in financial conditions cause both consumption and investment to weaken, and the slump in foreign demand, together with the appreciation of the dollar, leads to lower exports. Disruptions associated with renewed social distancing drive up the unemployment rate, which hits 8.7 percent in the middle of 2021 and remains at an elevated level for the rest of the year.

[3] Our view of the risks to the economic outlook is informed by the analysis supporting the publication of the Board's *Financial Stability Report*. There, we noted that asset valuations may be vulnerable to sudden price declines should investor sentiment sour or the economic recovery prove ephemeral. Moreover, business incomes have fallen and borrowing has risen, which leaves firms more vulnerable to future shocks. In addition, the COVID-19 shock has highlighted how vulnerabilities related to leverage and funding risk at nonbank financial institutions could amplify shocks in the financial system in times of stress.

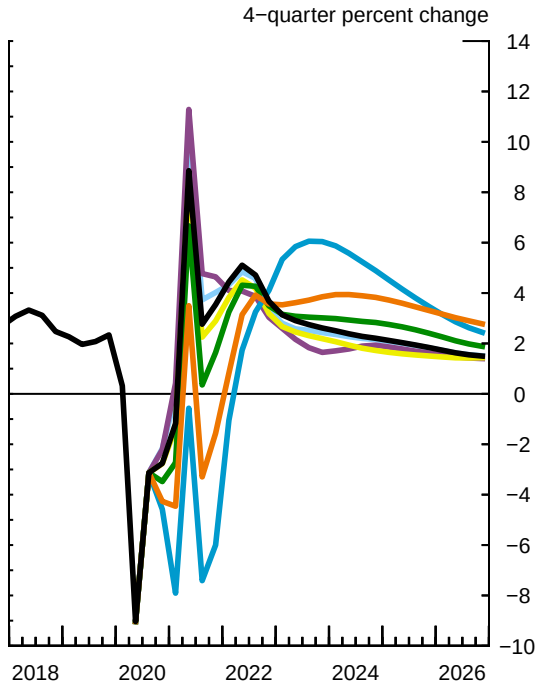
[4] This scenario assumes that, over much of the next two years, the natural rate of unemployment averages 0.5 percentage point above the baseline, consistent with the staff's estimate of the extent to which mandatory social distancing and associated impairments in labor market functioning temporarily raise the natural rate of unemployment as of 2020:Q4. In addition, the labor force participation rate averages 0.6 percentage point below the baseline over this period. Both the natural rate of unemployment and the participation rate converge to the baseline thereafter.

Risks & Uncertainty

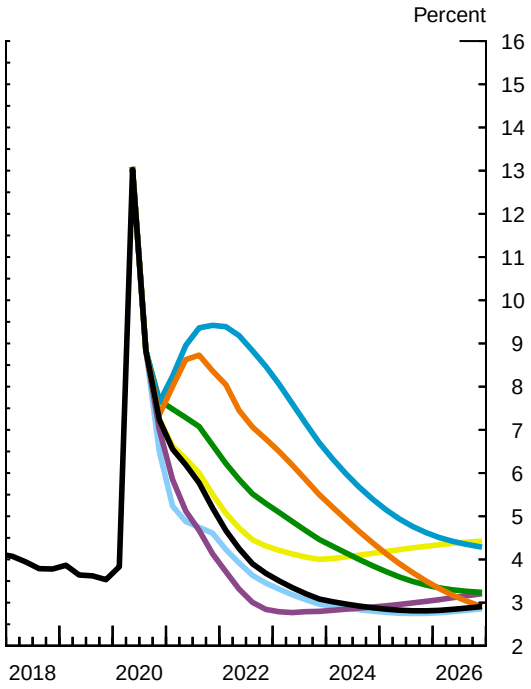
Alternative Scenarios

Tealbook baseline and extension
Second waves
Delayed vaccine and weaker confidence
Slower recovery
Inflationary pressures
Additional fiscal support
Faster recovery

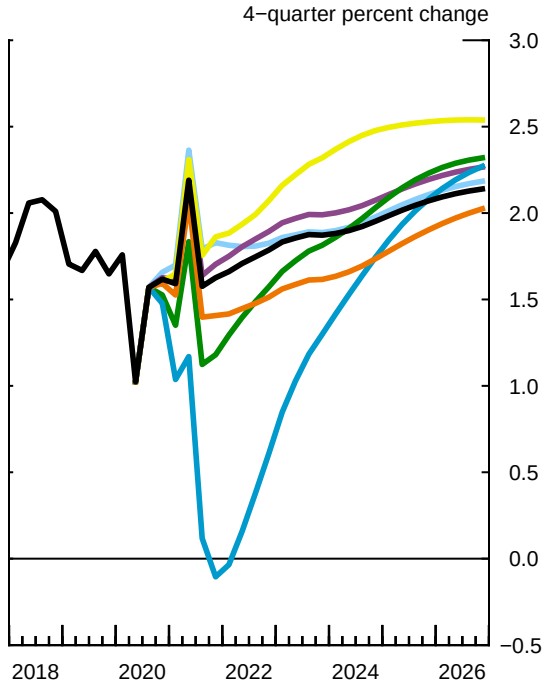
Real GDP



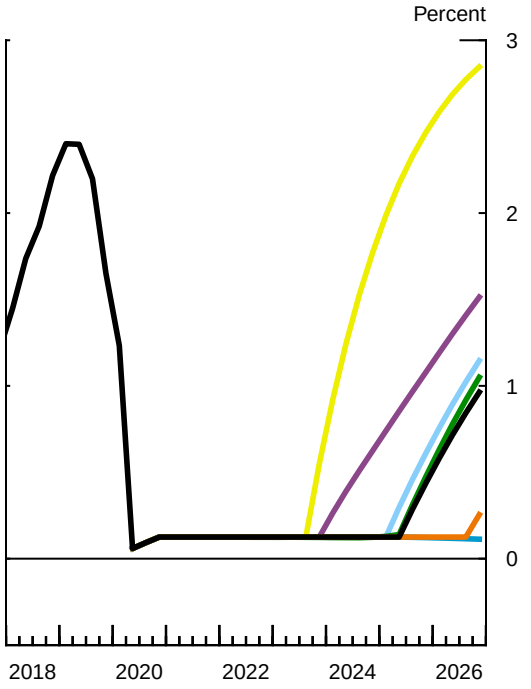
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



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		2021	2022	2023	2024	2025-26
	H1	H2					
Real GDP							
Tealbook baseline and extension	-19.2	17.1	3.5	3.7	2.6	2.2	1.7
Second waves	-19.2	13.5	-1.6	3.6	3.9	3.8	3.0
Delayed vaccine and weaker confidence	-19.2	12.7	-6.0	4.1	6.0	4.9	3.0
Slower recovery	-19.2	15.4	1.6	3.5	3.0	2.8	2.1
Inflationary pressures	-19.2	17.1	2.9	3.2	2.2	1.7	1.5
Additional fiscal support	-19.2	18.4	4.6	3.0	1.6	1.9	1.5
Faster recovery	-19.2	18.5	4.0	3.3	2.4	2.2	1.7
Unemployment rate[1]							
Tealbook baseline and extension	13.0	7.2	5.2	3.7	3.1	2.9	2.9
Second waves	13.0	7.3	8.4	6.8	5.5	4.4	2.9
Delayed vaccine and weaker confidence	13.0	7.6	9.4	8.5	6.7	5.4	4.3
Slower recovery	13.0	7.7	6.6	5.3	4.5	3.9	3.2
Inflationary pressures	13.0	7.2	5.5	4.3	4.0	4.1	4.4
Additional fiscal support	13.0	7.0	4.1	2.8	2.8	2.9	3.2
Faster recovery	13.0	6.5	4.6	3.5	3.0	2.8	2.9
Total PCE prices							
Tealbook baseline and extension	-.2	2.8	1.6	1.7	1.9	2.0	2.1
Second waves	-.2	2.4	1.1	1.5	1.7	1.8	2.1
Delayed vaccine and weaker confidence	-.2	1.9	-1.0	.6	1.6	2.0	2.3
Slower recovery	-.2	2.7	1.2	1.6	1.8	2.0	2.3
Inflationary pressures	-.2	2.7	1.9	2.0	2.3	2.5	2.5
Additional fiscal support	-.2	2.8	1.7	1.9	2.0	2.1	2.2
Faster recovery	-.2	2.9	1.9	1.8	1.9	2.0	2.2
Core PCE prices							
Tealbook baseline and extension	.4	2.8	1.6	1.8	1.9	2.0	2.1
Second waves	.4	2.8	1.4	1.5	1.6	1.7	2.0
Delayed vaccine and weaker confidence	.4	2.5	-.1	.6	1.3	1.7	2.2
Slower recovery	.4	2.6	1.2	1.6	1.8	2.0	2.3
Inflationary pressures	.4	2.8	1.9	2.1	2.3	2.5	2.5
Additional fiscal support	.4	2.8	1.7	1.9	2.0	2.1	2.2
Faster recovery	.4	2.9	1.8	1.8	1.9	2.0	2.1
Federal funds rate[1]							
Tealbook baseline and extension	.1	.1	.1	.1	.1	.1	1.0
Second waves	.1	.1	.1	.1	.1	.1	.3
Delayed vaccine and weaker confidence	.1	.1	.1	.1	.1	.1	.1
Slower recovery	.1	.1	.1	.1	.1	.1	1.0
Inflationary pressures	.1	.1	.1	.1	.5	1.8	2.8
Additional fiscal support	.1	.1	.1	.1	.1	.6	1.5
Faster recovery	.1	.1	.1	.1	.1	.1	1.1

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

By the end of 2021, the level of U.S. GDP is 6.4 percent below the baseline. The decline in aggregate demand causes core inflation to move down to 1.4 percent in 2021.

Compared with the baseline, the disruption to economic activity is more protracted, in part because of persistent damage to the functioning of labor and financial markets. Indeed, at the end of 2023, when the natural rate has returned to its long-run value, the unemployment rate is 5.5 percent, 1.2 percentage points above the natural rate. The persistent weakness of aggregate demand depresses inflation, which averages around 25 basis points below the baseline through 2025. The stubbornly low inflation causes the federal funds rate to remain at the ELB until the end of 2026.

Delayed Vaccine and Weaker Confidence (SIGMA)

Confidence among consumers and financial market participants in many countries has been supported by the belief that one or more effective vaccines may soon be approved for widespread use, by fiscal and monetary stimulus, and by the encouraging signals sent by the recovery itself. Disappointing news on these factors could lead to a sharp drop in investor confidence and in consumers' confidence and willingness to go out and spend, to rising economic uncertainty, and to severe doubts about the capacity of fiscal and monetary policies to support the global recovery.

In this scenario, we assume that these disappointments materialize, exerting a significant drag on worldwide economic activity. Increased perception of risk leads to an increase in corporate borrowing spreads by early 2021 of 350 basis points and 500 basis points in the advanced economies—including the United States—and in the emerging market economies, respectively, and a collapse in global equity prices. Concerns about flight-to-safety flows, especially from financially vulnerable countries, lead to an appreciation of the dollar of 10 percent in early 2021. All told, foreign GDP declines 6 percent next year, a pace that is about 10 percentage points below the baseline.

Weaker foreign demand, the stronger dollar, and the adverse financial conditions are a drag on U.S. economic activity. As with the foreign economies, U.S. GDP declines 6 percent next year, a pace that is about 10 percentage points below the baseline. The U.S. unemployment rate averages 9 percent in 2021 and 2022. Lower resource utilization and falling import prices result in a small decline in core PCE prices in 2021. In response to the large output contraction and deflation, the federal funds rate remains at the effective lower bound beyond the end of 2026.

Slower Recovery (US-FLM)

In the baseline forecast, the staff assumes that the unemployment rate falls 4 percentage points between 2020:Q4 and 2023:Q4. This decline in the unemployment rate would be unusually rapid: During expansions over the past 70 years, the unemployment rate has fallen, on average, 0.85 percentage point per year, equivalent to 2.5 percentage points over a 3-year period.[5]

The recent fall in the unemployment rate, which has been historically unprecedented, largely reflects businesses recalling workers who had been temporarily laid off. To the extent that this process has largely run its course, the improvement in the unemployment rate could slow to a pace that is closer to the one that has characterized other recent recoveries. In this connection, it is noteworthy that the ratio of long-term unemployed workers to the labor force in September had already reached levels seen during the 1990–91 and 2001 recessions and is likely to increase further.

Against this backdrop, we assume that the recessionary dynamics unleashed by the COVID shock—such as heightened pessimism and risk aversion—are more intense and persistent than we had previously assumed. On balance, the pace of the decline in the rate of unemployment is closer to that of previous recessions than to the baseline.

GDP growth in 2020 is 0.75 percentage point lower than in the baseline forecast, and the unemployment rate is 7.7 percent in the fourth quarter, 0.4 percentage point above the baseline. Growth in 2021 and 2022 is considerably weaker than in the baseline, and GDP returns to its pre-pandemic level only in 2022. The unemployment rate moves back toward its long-run natural rate only very gradually and does not reach it until the beginning of 2024. Inflation falls to near 1 percent in 2021.[6] Thereafter, the combination of accommodative monetary policy and weaker potential output causes inflation to rebound quickly, reaching 2 percent by the end of 2024 and almost 2¼ percent by the end of 2025. The federal funds rate lifts off in 2025:Q3, as in the baseline, but it rises more quickly thereafter, in line with the higher path for inflation.

[5] See Robert Hall and Marianna Kudlyak (2020), "Why Has the US Economy Recovered So Consistently from Every Recession in the Past 70 Years?" Working Paper Series 20-20 (San Francisco: Federal Reserve Bank of San Francisco, May), https://www.frbsf.org/economic-research/publications/working-papers/2020/20.

[6] The sharp decline in inflation in this scenario reflects a relatively high sensitivity of inflation to aggregate demand in the US-FLM model compared with FRB/US and a number of DSGE models estimated on recent samples.

Inflationary Pressures (FRB/US)

The COVID crisis has unleashed an unprecedented mixture of supply and demand forces. In the early stages of the crisis, inflation moved down in large part because demand for many goods and services directly affected by social distancing, such as apparel, accommodation, and airfares, fell sharply. More recently, inflation has rebounded noticeably (and by more than we expected), as prices for durable goods have jumped. Although we view the pace of recent price gains as transitorily high, it is possible they will persist. Indeed, the COVID economy could put upward pressure on inflation through a number of channels. For example, disruptions to supply chains could lead to shortages of some key inputs while the measures firms have taken to protect workers and customers from the virus add to costs, putting additional upward pressure on prices. The crisis may also be leading to greater tightness in labor markets than we have assumed. Labor force participation may be lower than we have assumed in the baseline because, for example, fear of the disease is persuading some to avoid working outside the home or because the closure of schools is leading some parents to withdraw from the labor force to care for children. While these factors are already reflected to some extent in our baseline projection, they may have a larger effect than we have assumed.

In this scenario, supply–demand imbalances exert greater pressure on inflation than in the baseline; in addition, longer-run inflation expectations become more sensitive to realized price inflation.[7] These assumptions interact to produce a marked increase in price inflation. Inflation moves up to 1.9 percent next year, compared with 1.6 percent in the baseline, and reaches 2.5 percent by the end of 2024. In response to the higher path of inflation, the federal funds rate lifts off at the end of 2023 and increases steeply thereafter. With monetary policy tighter than in the baseline, GDP rises more slowly, and the unemployment rate is 0.6 percentage point higher than in the baseline by the end of 2022.

Additional Fiscal Support (FRB/US)

While the baseline assumes no additional fiscal support beyond that provided in previous legislation, talks are ongoing regarding additional fiscal stimulus, presenting an upside risk to the baseline forecast. In this scenario, we consider the effect of a $2 trillion fiscal package that

[7] In the calibration of this scenario, we assume that both the slope of the wage Phillips curve and the sensitivity of long-run inflation expectations to realized inflation are four times larger than in the current version of the FRB/US model. The magnitude of these increases reflects a comparison between estimates of the recent past and those from a sample that covers the late 1980s to the late 1990s. Nevertheless, the magnitudes of the coefficients used in this scenario are well below those characterizing inflation dynamics in the 1970s.

begins later this quarter. We delay the timing of the effects on aggregate demand of this package because, as discussed in the box "Household Savings and Prospects for Consumer Spending," consumers appear to have built up a sufficient level of savings—even in the absence of additional fiscal support—to maintain their spending levels for several months.

The additional fiscal assistance greatly accelerates the recovery in our simulation. The four-quarter change in GDP is 2.4 percentage points higher than baseline by the middle of next year as the stimulus flows through the economy. The unemployment rate is 1.1 percentage points lower than baseline by the end of next year and reaches 2.8 percent by the end of 2022. In turn, inflation is 10 basis points above baseline over the 2022–25 period. Under our policy rule, the higher inflation pulls the first increase in the federal funds rate forward to early 2024.

Faster Recovery (FRB/US)

Following the collapse in activity in the spring, the economy's rebound has been unprecedented: The unemployment rate has declined rapidly, private employment has jumped, and we estimate that third-quarter GDP rose more than 30 percent at an annual rate. While the pace of the rebound has slowed more recently, incoming data on retail sales, housing starts, and shipments of capital goods have continued to surprise to the upside. In addition, as discussed in the box "Household Savings and Prospects for Consumer Spending," household balance sheets are strong.

Against this background, gains in consumer spending may be even stronger than we have assumed, especially if consumers and businesses continue to find ways to adapt to the new requirements the pandemic imposes. For example, to a greater extent, individuals may find ways to participate in the economy while avoiding high-risk behavior, in-person service providers may work out ways to operate their businesses more safely, and a greater share of the workforce may be able to adapt to a remote work environment. As a result, confidence could rise that a broad spectrum of economic activities is safe—with confidence perhaps further boosted by the widespread availability of instant testing—and that the virus is under control.

In this scenario, as these positive developments unfold, social-distancing effects on spending and employment wind down faster and are eliminated almost completely by early next year. Stock markets surge as confidence rises. The economy therefore recovers more rapidly. The unemployment rate averages 6.5 percent this quarter, 0.7 percentage point 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 its natural rate, falling to 5.2 percent by the first quarter of 2021. With stronger demand running ahead of supply, core inflation reaches 1.8 percent in 2021, 0.2 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 second quarter of 2025, one quarter earlier than in the baseline.

Model-Based Assessment of Risk

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.[8] The model shows that the expected distribution of staff forecast errors is unusually wide for the coming year and is adversely skewed. A key factor driving this model prediction is the evolution of the macroeconomic activity uncertainty index, which in turn reflects the extreme movements in spending, production, and employment in the recent past. As economic activity has recovered, the distribution has narrowed from its peak in the spring but remains wider than at any time during the Great Recession, consistent with our judgmental assessment that uncertainty is very high.

Alternative Model Forecasts

Given the unusual circumstances of the pandemic, the FRB/US and EDO 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 6.8 percent in 2021 and 4.2 percent, on average, in 2022 and 2023, 1.6 percentage points faster, on average, than in the Tealbook baseline outlook over the medium term.[9] 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.

With GDP growth in the FRB/US model's projection for 2021 and 2022 stronger than its potential pace of about 2.0 percent, the output gap turns positive in the second half of 2021 and

[8] This analysis uses a framework similar in spirit to quantile regressions using past forecast errors as the dependent variable. The variables that serve as inputs into the model are shown in the exhibit "Macroeconomic Indexes Underlying the Conditional Distributions of Staff Forecast Errors 1 Year Ahead."

[9] 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 FRB/US forecast procedure also does not make any explicit assumptions about some adverse effects from social distancing beyond 2020. Finally, the federal funds rate is governed by the same policy rule as in the baseline.

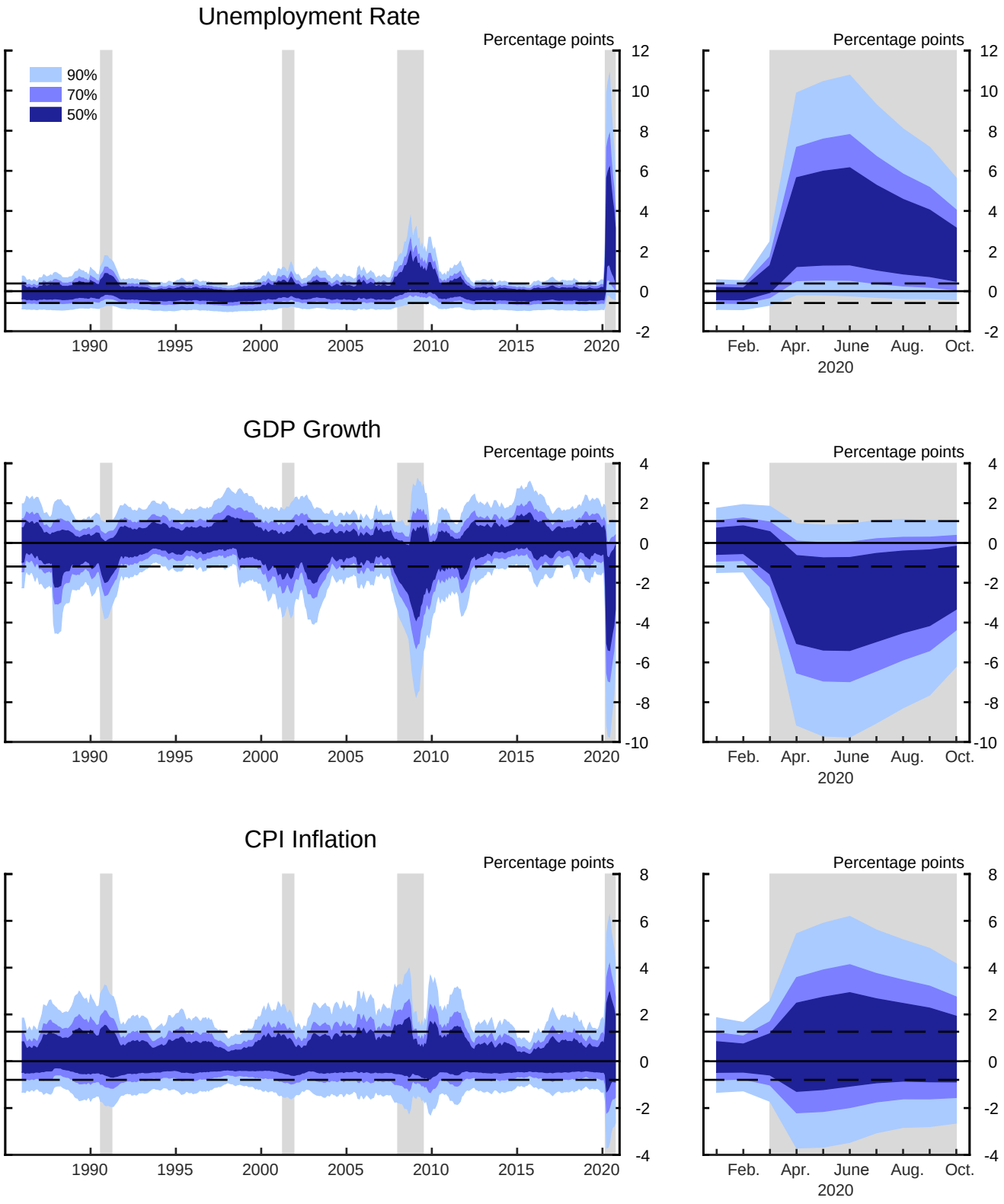
rises over the projection period until it reaches 6.2 percent at the end of 2023, an unprecedentedly high level. The unemployment rate moves down and reaches 2.9 percent by the end of 2023, slightly below the staff projection of 3.1 percent. Core PCE inflation gradually moves up from 1.6 percent in 2020 to 1.9 percent in 2023, held below 2 percent by persistently low wages and long-term inflation expectations in the model forecast.

The EDO model projects GDP growth of 4.4 percent in 2021 and 3.3 percent, on average, in 2022 and 2023, well above the model's estimate of an average growth rate of potential output of 2.4 percent over those years. Core PCE inflation increases gradually over the projection period from 1.6 percent at the end of 2020 and achieves its longer-run level of 2 percent in 2023. The model predicts unemployment will decline to 4.8 percent by the end of 2023 as economic activity recovers. The federal funds rate rises to 3.9 percent by the end of the medium term.[10]

[10] In the EDO model forecast, the federal funds rate is governed by the model's estimated rule. The high value for the federal funds rate that results has two sources. First, the EDO model assumes that, in the absence of shocks, the federal funds rate would converge to a value around 4 percent. Second, the natural rate of unemployment in EDO is 5.2 percent, and a 4.8 percent unemployment rate is associated with a positive output gap, raising the federal funds rate value.

Risks & Uncertainty

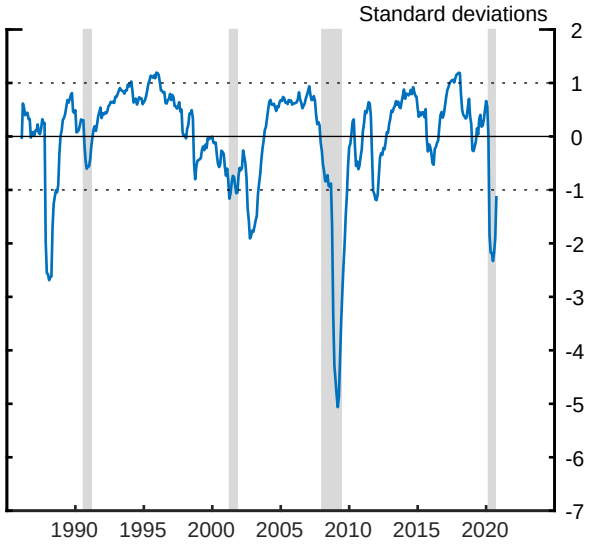
Conditional Distributions of Staff Forecast Errors 1 Year Ahead



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.

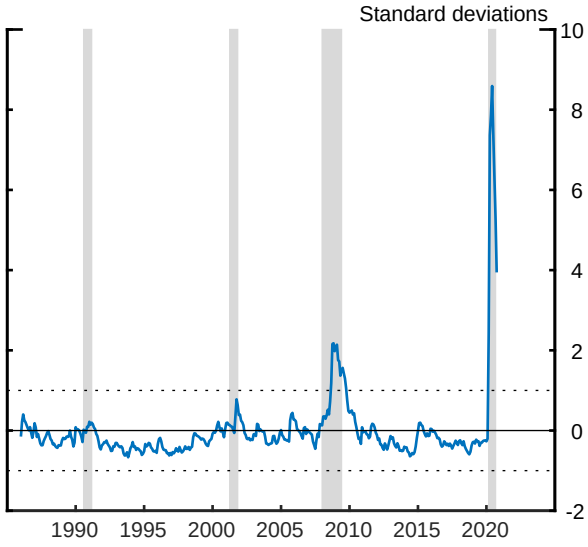
Macroeconomic Indexes Underlying the Conditional Distributions of Staff Forecast Errors 1 Year Ahead

Financial Market Conditions



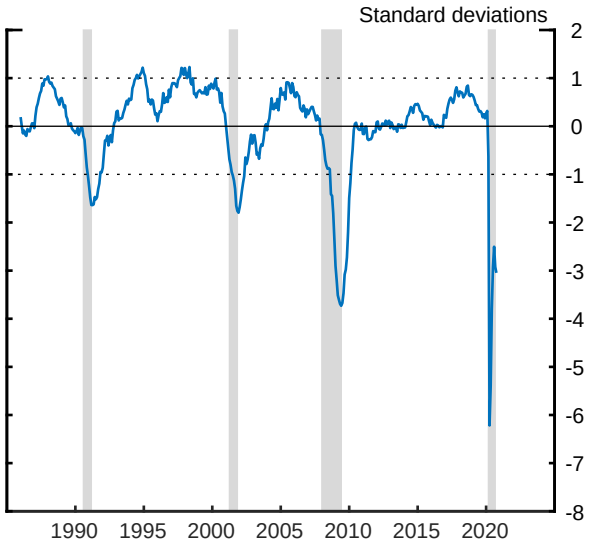
Source: Staff estimates.

Macroeconomic Uncertainty



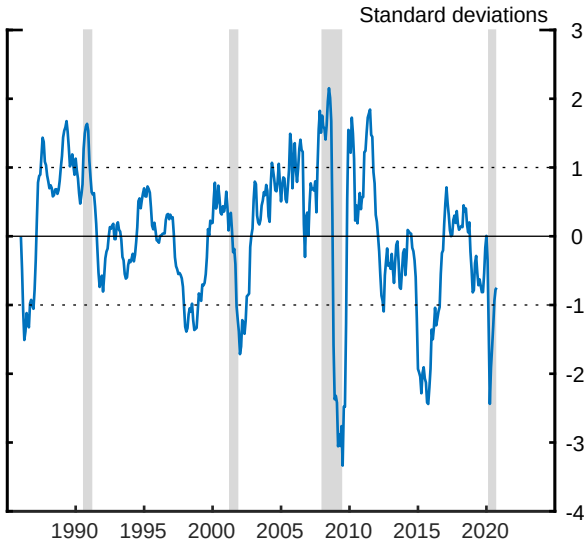
Source: Staff estimates.

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.

Risks & Uncertainty

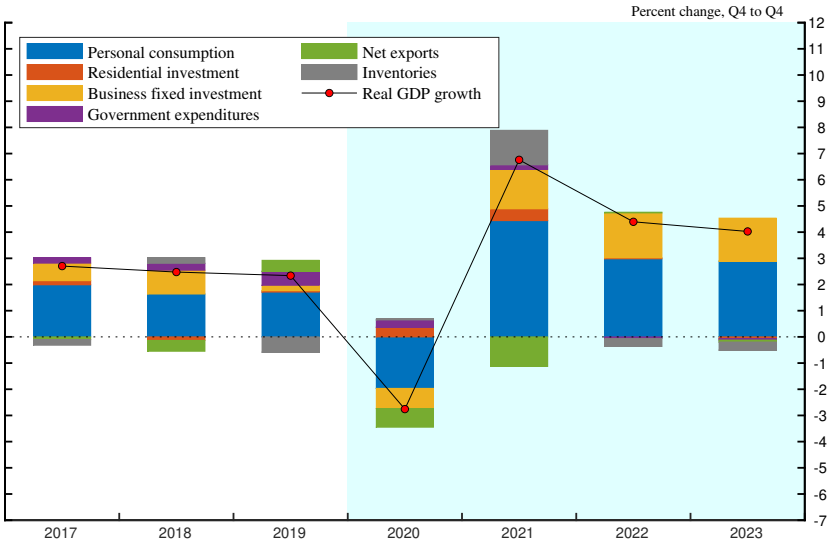
Alternative Model Forecasts

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

Measure and projection	2020		2021		2022		2023	
	Previous Tealbook	Current Tealbook	*Previous Tealbook*	Current Tealbook	*Previous Tealbook*	Current Tealbook	*Previous Tealbook*	Current Tealbook
Real GDP								
Staff	*-3.2*	-2.8	*4.2*	3.5	*3.2*	3.7	*2.8*	2.6
FRB/US[1]	*-3.2*	-2.8	*5.5*	6.8	*4.5*	4.4	*4.1*	4.0
EDO[1]	*-3.2*	-2.8	*4.9*	4.4	*3.6*	3.4	*3.2*	3.2
Unemployment rate[2]								
Staff	*7.4*	7.2	*4.9*	5.2	*3.8*	3.7	*3.2*	3.1
FRB/US[1]	*7.4*	7.2	*6.6*	5.8	*5.1*	4.3	*3.6*	2.9
EDO[1]	*7.9*	7.7	*5.3*	5.4	*4.7*	4.9	*4.6*	4.8
Total PCE prices								
Staff	*1.1*	1.3	*1.7*	1.6	*1.8*	1.7	*1.9*	1.9
FRB/US[1]	*1.1*	1.3	*1.6*	1.7	*1.7*	1.8	*1.7*	1.9
EDO[1]	*1.0*	1.3	*1.5*	1.7	*1.7*	1.9	*1.9*	2.0
Core PCE prices								
Staff	*1.3*	1.6	*1.7*	1.6	*1.8*	1.8	*1.9*	1.9
FRB/US[1]	*1.3*	1.6	*1.7*	1.8	*1.7*	1.9	*1.7*	1.9
EDO[1]	*1.3*	1.6	*1.5*	1.7	*1.7*	1.9	*1.9*	2.0
Federal funds rate[2]								
Staff	*.1*	.1	*.1*	.1	*.1*	.1	*.1*	.1
FRB/US[1]	*.1*	.1	*.1*	.1	*.1*	.1	*.1*	.1
EDO[1]	*.1*	.1	*2.4*	2.4	*3.3*	3.4	*3.8*	3.9

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 September Tealbook.
2. Percent, average for Q4.

Decomposition of FRB/US Real GDP Growth Forecast



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

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 September Tealbook, the near-term prescriptions of simple policy rules are little changed or have been revised up because of the somewhat higher projection for inflation and resource utilization in the near term. Over the medium term, the economic outlook is similar to that projected in the September Tealbook. As a result, the simple policy rules and optimal control strategies herein imply policy rate paths that are similar to those under the September Tealbook baseline.

Near-Term Prescriptions of Selected Simple Policy Rules

The top-left panel of the first exhibit shows the near-term prescriptions for the federal funds rate from the inertial version of the Taylor (1999) rule, the Taylor (1993) rule, and the asymmetric discounted average inflation targeting (ADAIT) rule under two different initializations of the discounted average inflation gap.[1] Under the ADAIT rules, the policy rate responds to past deviations of core PCE inflation from the 2 percent objective, dating back to either 2020 or 2012, with the effects of these deviations fading over time.[2] The ADAIT rules featured here are intended to illustrate an approach to policy that seeks, at least in part, to "make up" for past inflation deviations from the 2 percent objective. Consistent with elements of the FOMC's revised Statement on Longer-Run Goals and Monetary Policy Strategy, such approaches—particularly when combined with a shortfalls-only response to employment gaps—can help generate inflation that rises modestly above 2 percent following periods in which inflation has been persistently below 2 percent. However, many other policy rules, or variations on existing rules, could deliver similar outcomes. For example, rules that impose macroeconomic thresholds for departure from the effective lower bound (ELB) or that

[1] The simple policy 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 to this Tealbook section provides technical details on these simple policy rules.

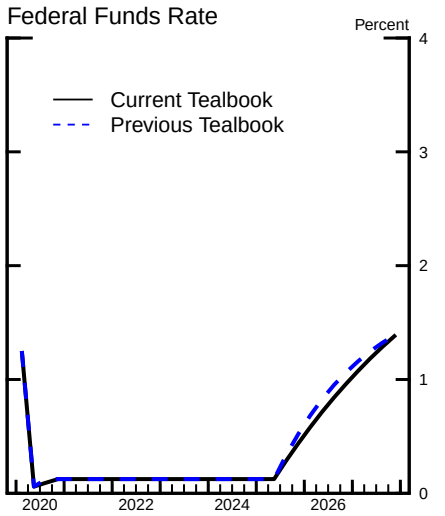
[2] The first variant of the ADAIT rule (ADAIT–2020) is specified to coincide with the release, on August 27 of this year, of the FOMC's revised Statement on Longer-Run Goals and Monetary Policy Strategy (consensus statement). To initialize its measure of the inflation gap, this variant includes inflation deviations in the four quarters up to and including that date. Correspondingly, the second variant of the rule (ADAIT–2012) is specified so that it coincides with the release of the original consensus statement in January 2012.

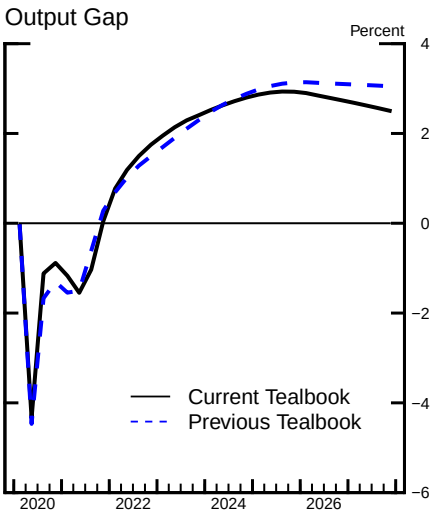
Policy Rules and the Staff Projection

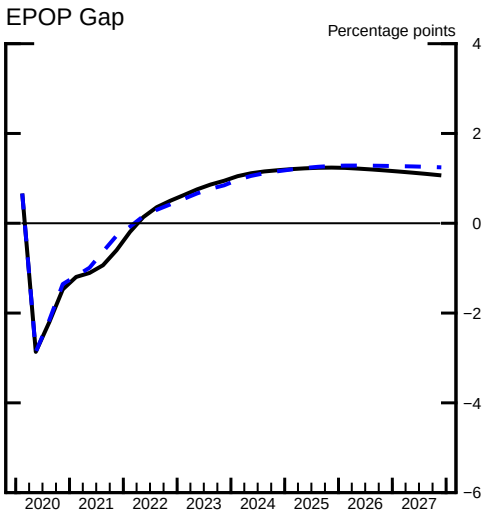
Near−Term Prescriptions of Selected Simple Policy Rules[1]

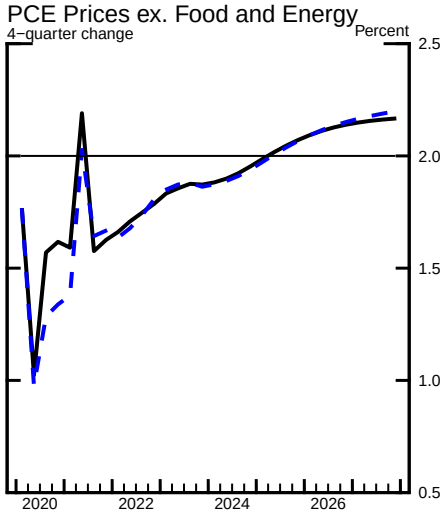
(Percent)

	2020:Q4	2021:Q1
Taylor (1993) rule	**1.46**	**1.28**
Previous Tealbook projection	*.84*	*.78*
Inertial Taylor (1999) rule	**.23**	**.30**
Previous Tealbook projection	*.11*	*.09*
ADAIT−2020 rule	**.01**	**−.02**
Previous Tealbook projection	*−.06*	*−.14*
ADAIT−2012 rule	**−.22**	**−.43**
Previous Tealbook projection	*−.25*	*−.49*
Addendum:		
Tealbook baseline	**.13**	**.13**









A Medium−Term Notion of the Equilibrium Real Federal Funds Rate Under the Tealbook Baseline (Percent)[2]

	Current Value	*Current−Quarter Estimate Based on Previous Tealbook (adjusted)*	*Previous Tealbook (adjusted)*
FRB/US *r**	.01	*−.10*	*−.20*
Average projected real federal funds rate	−1.62	*−1.57*	*−1.52*

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 projection.The "Average projected real federal funds rate" is calculated under the Tealbook baseline projection over the same 12−quarter period as FRB/US *r**.

have intercepts, inflation targets, or inertial coefficients that vary over time may also achieve the same end. Hence, the ADAIT rules featured here are not intended to encapsulate the Committee's monetary policy strategy but rather are meant to serve as benchmarks for comparison.

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 for the output gap, the employment-to-population ratio (EPOP) gap, and core inflation. These projections are shown in the middle panels.[3] The top-right panel provides the staff's baseline path for the federal funds rate, which remains at the ELB until 2025.

- The Taylor (1993) rule calls for the policy rate to be above 1 percent in the near term. These policy rate prescriptions are somewhat higher than their counterparts in the September Tealbook due to the staff's upward revisions to the near-term projections for inflation and resource utilization.

- The prescriptions of the inertial Taylor (1999) rule have also increased relative to their counterparts in the September Tealbook, again reflecting the changes to the near-term Tealbook baseline projection. However, because of the interest rate smoothing term in the inertial Taylor (1999) rule, these prescriptions remain close to the ELB.

- The ADAIT rule with the inflation gap initialized in 2020 (ADAIT–2020) prescribes levels for the federal funds rate that are near zero. When the inflation gap is initialized in 2012 (ADAIT–2012), the ADAIT rule prescribes levels for the federal funds rate that are somewhat lower than its 2020 counterpart, reflecting the wider discounted average inflation (DAI) gap. Because of the higher projected levels of inflation in the near term relative to those in the September Tealbook, the policy rate prescriptions of both versions of the ADAIT rule have moved up. However, these increases are small because of the interest rate smoothing term in the rule.

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

A Medium-Term Notion of the Equilibrium Real Federal Funds Rate under the Tealbook Baseline

The bottom panel of the first exhibit reports estimates of a medium-term concept of the equilibrium real federal funds rate (r^*) generated under the current and previous Tealbook baselines. 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, according to the FRB/US model. This measure is a summary of the projected underlying strength of the real economy but does not take into account considerations such as achieving the inflation objective or avoiding sharp changes in the federal funds rate.

At almost exactly zero, the current value of the Tealbook-consistent FRB/US r^* is close to the value of its current-quarter counterpart under the September Tealbook baseline, reflecting the similar economic outlooks.[4] This estimated equilibrium real rate is more than 1½ percentage points above the average projected real federal funds rate in the Tealbook baseline, in which output returns to its potential level by the fourth quarter of 2021.[5]

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 Taylor (1993) rule, and the two variants of the ADAIT rule. 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 for 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.

[4] Beginning with this Tealbook, we assume that personal income tax rates in the model adjust at a slower rate than was assumed in the previous Tealbook in response to deviations in the level of government debt from the baseline. To facilitate comparisons, the values of r^* reported in the exhibit that refer to the previous Tealbook baseline have been adjusted for this change to the model.

[5] In this Tealbook, we do not report an r^* value consistent with the median responses in the September 2020 Summary of Economic Projections (SEP). Creating a SEP-consistent baseline involves interpolating between year-end projections. Such a procedure may not capture the unprecedented speeds of both the economic decline and the economic recovery that have been observed this year.

- As described in the Domestic Economic Developments and Outlook section of this Tealbook, and as shown by the solid black line in the top-left panel, in the baseline projection the federal funds rate departs from the ELB in 2025. Thereafter, the policy rate rises to about 1¼ percent by the end of 2027.

- Both the Taylor (1993) rule and the inertial Taylor (1999) rule call for the policy rate to depart from the ELB within the next couple of years. Under the Taylor (1993) rule, the policy rate path runs higher than that prescribed by the inertial Taylor (1999) rule until the end of the period shown, at which point both rules prescribe a policy rate just above 2 percent. Neither of these rules returns inflation to the 2 percent objective over the period shown because these rules prescribe increases in the federal funds rate in response to output exceeding its potential level starting in 2022.

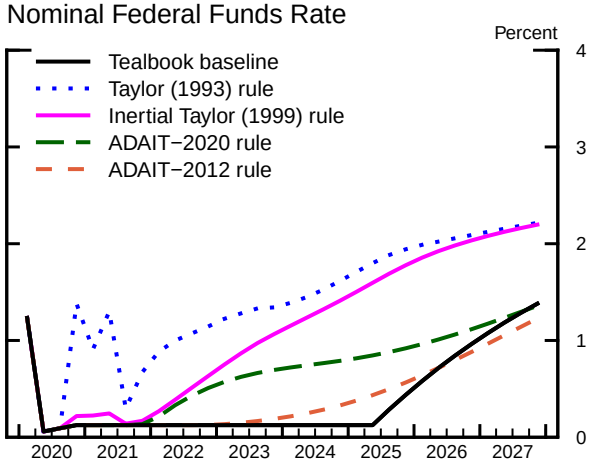
- The exhibit shows two variants of the ADAIT rule: one using the discounted average inflation gap initialized in 2012 and another in which that gap is initialized in 2020.

    - As shown by the green dashed line, the ADAIT–2020 rule calls for the federal funds rate to depart from the ELB in 2022. Thereafter, the prescribed level for the federal funds rate rises only slowly, approaching 1½ percent toward the end of the period shown. Because this rule responds only to shortfalls from the EPOP trend, as opposed to deviations in either direction, the policy rate remains low even after the EPOP gap closes in 2022. Under this rule, the path for the real 10-year Treasury yield is slightly higher than in the Tealbook baseline, resulting in slightly higher unemployment and lower inflation outcomes.

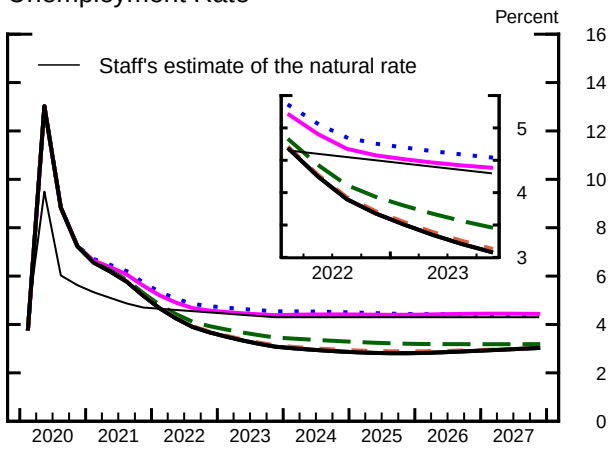
    - The ADAIT–2012 rule (the orange dashed line) calls for departure from the ELB in 2024, a year earlier than the Tealbook baseline. Thereafter, the policy rate rises slowly, and by the beginning of 2026 it runs slightly below the path for the policy rate in the Tealbook baseline. The resulting path of the real 10-year Treasury yield is similar to the Tealbook baseline path, and the associated macroeconomic outcomes are almost indistinguishable.

Simple Policy Rule Simulations

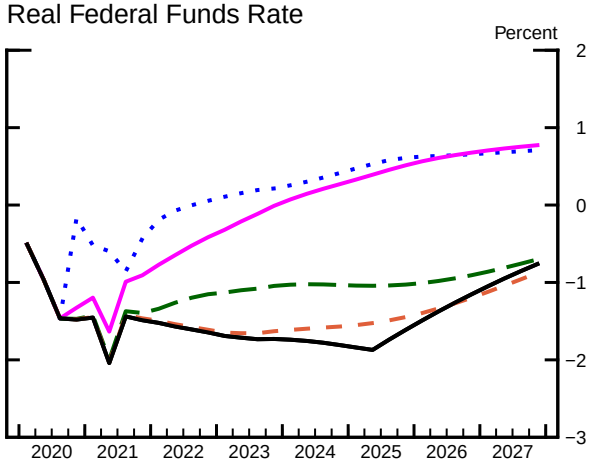
Nominal Federal Funds Rate



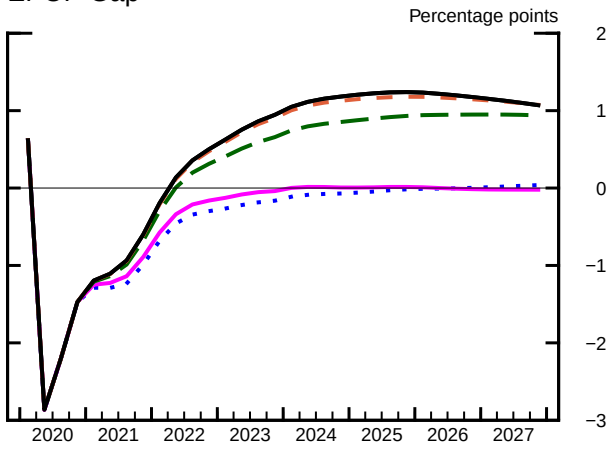
Unemployment Rate



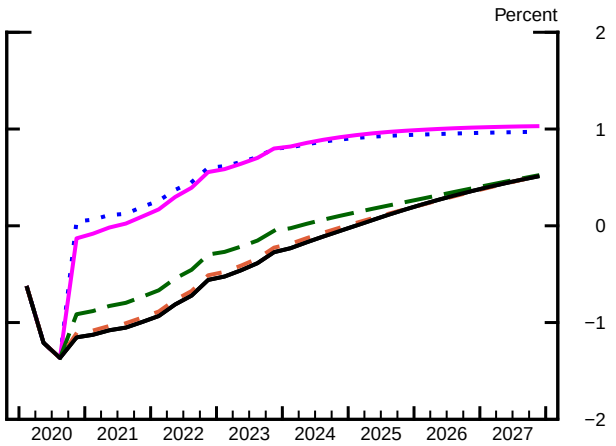
Real Federal Funds Rate



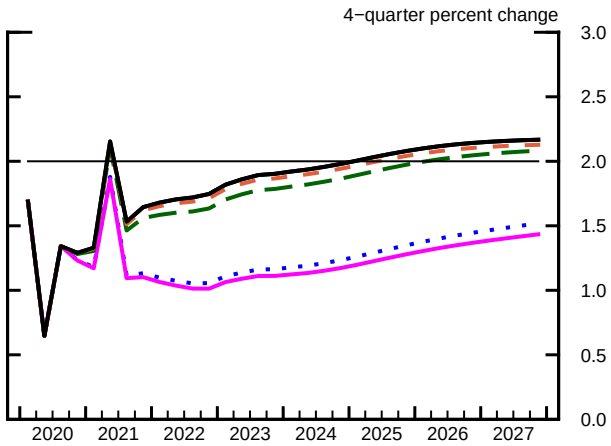
EPOP Gap



Real 10−Year Treasury Yield



PCE Inflation



Note: The simulations in this exhibit are based on policy rules that respond to core PCE inflation.

- Under both versions of the ADAIT rule, inflation rises slightly above 2 percent toward the end of the period shown. This overshoot is modestly more pronounced under the ADAIT–2012 rule than the ADAIT–2020 rule because the former variant carries forward a more negative inflation gap.

- The simple policy rules featured in this section prescribe raising the federal funds rate earlier than in the Tealbook baseline projection because the staff assumed in the baseline projection that the federal funds rate could depart the ELB only after inflation rises above 2 percent.

OPTIMAL CONTROL SIMULATIONS UNDER DISCRETION

In the third exhibit, we display optimal control simulations conditional on the Tealbook baseline under different assumptions about policymakers' preferences, as captured by a loss function expressed in terms of macroeconomic outcomes. The concept of optimal control that we employ here is one in which we assume that current policymakers set the policy rate that is optimal from their perspective, without regard to past policy commitments and with knowledge that future policymakers will also not be bound to follow any particular policy rate path. We refer to simulations, like these, that do not embed the assumption of commitment, as being run under discretion.[6]

We assume that policymakers choose the level of the federal funds rate to minimize the present value of the weighted sum of a squared inflation gap measure, the squared EPOP gap, and squared changes in the federal funds rate.[7] We consider two inflation gap measures: the difference between headline inflation (measured on a four-quarter basis) and 2 percent, and the DAI gap initialized in 2020—a metric that carries forward past inflation misses.[8] These two inflation gap measures are comparable to those used in the Taylor-type rules and the ADAIT–2020 rule, respectively.[9] We also consider

[6] The Monetary Policy Strategies section from the September 2020 Tealbook compares commitment and discretion simulations applied to a baseline that is not very different from the current Tealbook baseline. For a more detailed discussion of commitment-versus-discretion considerations in the context of monetary policy strategies, see Duarte and others (2020).

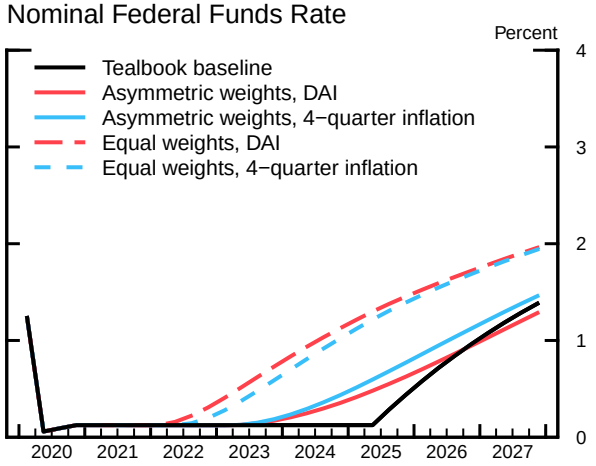
[7] The appendix to this section contains further details on the methodology.

[8] Using the discounted average inflation gap initialized in 2012 results in policy rate paths and macroeconomic outcomes that are similar to those that use the version initialized in 2020.

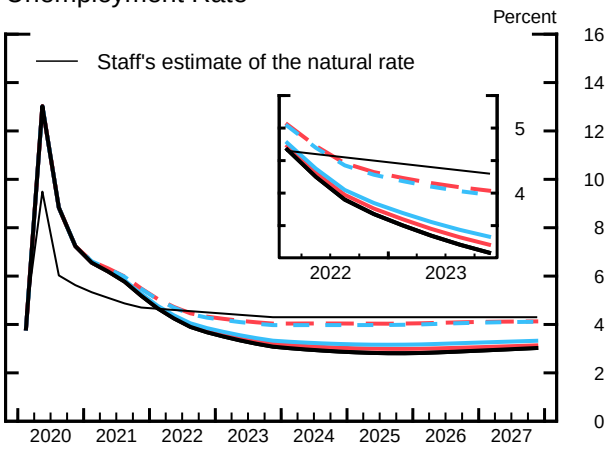
[9] For the purposes of the optimal control simulations, the discounted average inflation gap is defined in terms of PCE inflation. For the simple policy rules, core PCE inflation is used.

Optimal Control Simulations under Discretion

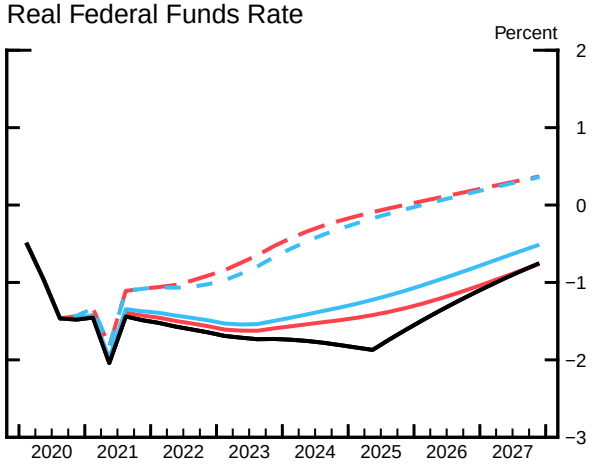
Nominal Federal Funds Rate



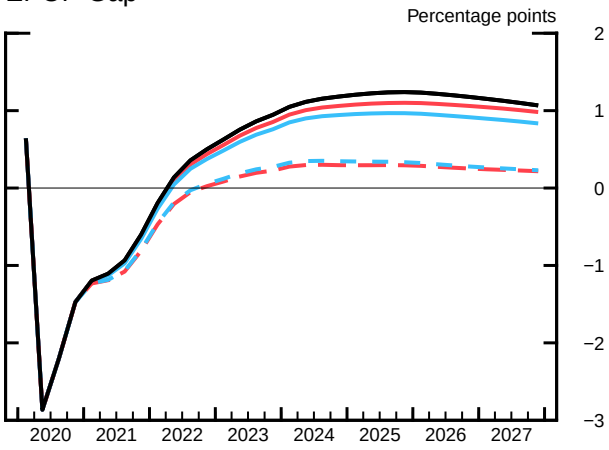
Unemployment Rate



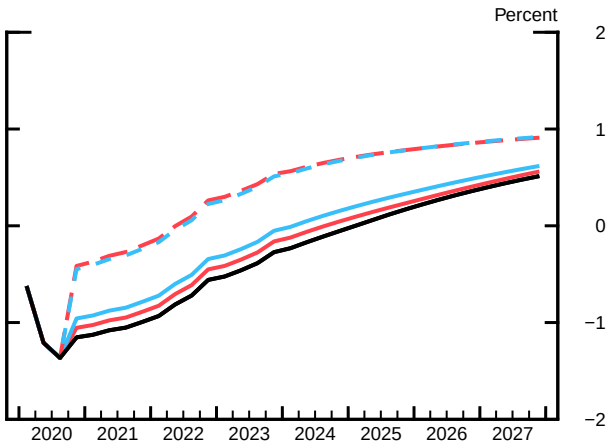
Real Federal Funds Rate



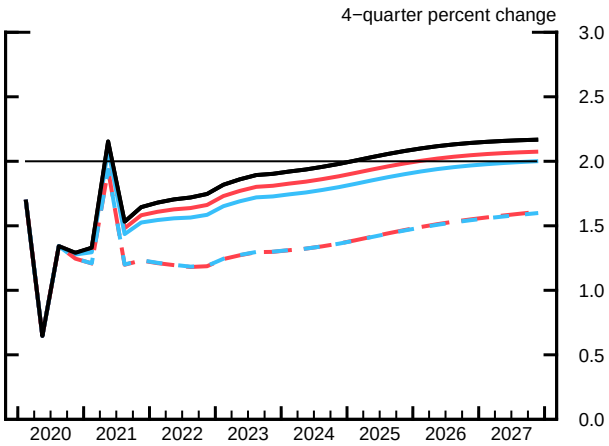
EPOP Gap



Real 10−Year Treasury Yield



PCE Inflation



two specifications of the weight on the EPOP gap in the loss function: asymmetric weights and equal weights.

Asymmetric Weights

- Under asymmetric weights, policymakers assign no cost to positive EPOP gaps but penalize negative EPOP gaps using the same unit weight that they assign to the other two components of the loss function. These asymmetric weights implement a shortfalls-based strategy regarding the labor market: Under these preferences, policymakers' desire to close the inflation gap measure over time is not balanced against a desire to prevent employment from running above its estimated trend level.

- With asymmetric preferences, under both the four-quarter inflation gap measure (the blue solid line) and the DAI gap measure (the red solid line), the federal funds rate departs from the ELB in 2024, just over a year earlier than in the Tealbook baseline. Thereafter, the paths for the federal funds rate under both specifications rise slowly, with prescriptions under the loss function based on the DAI gap being somewhat more accommodative. In these simulations, having inflation overshoot 2 percent is hard to achieve without a loss function that includes past inflation deviations. When the loss function includes the DAI gap, which carries forward past inflation misses, inflation remains modestly above 2 percent for a few years beyond the period shown before converging back to 2 percent. However, when the loss function includes the inflation gap based only on deviations of four-quarter inflation, inflation does not rise above 2 percent during the period shown or in any significant way thereafter.[10]

Equal Weights

- The simulations labeled "Equal weights" present cases in which policymakers are assumed to place equal weights on the three components of the loss functions, regardless of the state of the economy. These equal-weights

[10] When simulations are run under commitment with asymmetric weights, policymakers choose to overshoot the 2 percent inflation objective regardless of the inflation gap measure. Under these policies, policymakers commit to overshooting the 2 percent inflation objective in the future in order to support employment and inflation in the near term. By contrast, with equal weights in the loss function, inflation runs below 2 percent in the optimal control simulations under commitment.

strategies seek to counter both the high level of resource slack in the near term and the persistently tight labor market in the medium term in the Tealbook baseline. In this way, the equal-weights loss function provides a symmetric response to the measure of labor market slack, under which policymakers seek to eliminate both positive and negative deviations from the staff's estimate of maximum employment rather than responding only to shortfalls.

- Under both inflation gap measures, the policy rate departs from the ELB more than two years earlier than in the Tealbook baseline. Because policymakers attempt, under equal weights, to eliminate all labor market deviations rather than only shortfalls, the federal funds rate prescriptions are markedly less accommodative than those under asymmetric preferences. Notably, inflation does not return to 2 percent until well after the period shown and never meaningfully overshoots the longer-run goal.

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 Discretion."

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	2027
Nominal federal funds rate[1]								
Taylor (1993)	1.4	.7	1.1	1.3	1.6	1.9	2.1	2.2
Inertial Taylor (1999)	.2	.2	.6	1.1	1.4	1.8	2.0	2.2
ADAIT-2020	.1	.1	.5	.7	.8	.9	1.1	1.4
ADAIT-2012	.1	.1	.1	.2	.3	.6	.9	1.2
Extended Tealbook baseline	.1	.1	.1	.1	.1	.4	1.0	1.4
Real GDP								
Taylor (1993)	-2.8	2.4	2.8	2.1	1.9	1.8	1.5	1.6
Inertial Taylor (1999)	-2.8	2.7	2.9	2.0	1.8	1.7	1.4	1.5
ADAIT-2020	-2.8	3.3	3.4	2.4	2.2	1.9	1.6	1.6
ADAIT-2012	-2.8	3.5	3.6	2.6	2.2	1.8	1.6	1.5
Extended Tealbook baseline	-2.8	3.5	3.7	2.6	2.2	1.8	1.5	1.5
Unemployment rate[1]								
Taylor (1993)	7.2	5.7	4.8	4.5	4.5	4.4	4.4	4.4
Inertial Taylor (1999)	7.2	5.6	4.6	4.4	4.4	4.4	4.4	4.4
ADAIT-2020	7.2	5.3	3.9	3.5	3.3	3.2	3.2	3.2
ADAIT-2012	7.2	5.2	3.7	3.1	3.0	2.9	2.9	3.0
Extended Tealbook baseline	7.2	5.2	3.7	3.1	2.9	2.8	2.9	3.0
Total PCE prices								
Taylor (1993)	1.2	1.1	1.1	1.2	1.2	1.3	1.4	1.5
Inertial Taylor (1999)	1.2	1.1	1.0	1.1	1.2	1.3	1.4	1.4
ADAIT-2020	1.3	1.6	1.6	1.8	1.9	2.0	2.0	2.1
ADAIT-2012	1.3	1.6	1.7	1.9	1.9	2.0	2.1	2.1
Extended Tealbook baseline	1.3	1.6	1.7	1.9	2.0	2.1	2.1	2.2
Core PCE prices								
Taylor (1993)	1.6	1.1	1.1	1.1	1.2	1.3	1.4	1.5
Inertial Taylor (1999)	1.6	1.1	1.1	1.1	1.1	1.3	1.4	1.4
ADAIT-2020	1.6	1.5	1.7	1.8	1.8	2.0	2.0	2.1
ADAIT-2012	1.6	1.6	1.8	1.8	1.9	2.0	2.1	2.1
Extended Tealbook baseline	1.6	1.6	1.8	1.9	2.0	2.1	2.1	2.2

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				2022	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Nominal federal funds rate[1]								
Taylor (1993)	.1	1.4	.9	1.3	.3	.7	.9	1.0
Inertial Taylor (1999)	.1	.2	.2	.2	.1	.2	.3	.4
ADAIT-2020	.1	.1	.1	.1	.1	.1	.2	.3
ADAIT-2012	.1	.1	.1	.1	.1	.1	.1	.1
Extended Tealbook baseline	.1	.1	.1	.1	.1	.1	.1	.1
Real GDP								
Taylor (1993)	-3.1	-2.8	-1.5	8.2	1.9	2.4	3.4	4.1
Inertial Taylor (1999)	-3.1	-2.8	-1.4	8.4	2.1	2.7	3.6	4.2
ADAIT-2020	-3.1	-2.8	-1.2	8.7	2.6	3.3	4.2	4.9
ADAIT-2012	-3.1	-2.8	-1.2	8.8	2.7	3.5	4.4	5.1
Extended Tealbook baseline	-3.1	-2.8	-1.2	8.9	2.8	3.5	4.4	5.1
Unemployment rate[1]								
Taylor (1993)	8.8	7.2	6.7	6.5	6.2	5.7	5.3	5.1
Inertial Taylor (1999)	8.8	7.2	6.6	6.4	6.1	5.6	5.2	4.9
ADAIT-2020	8.8	7.2	6.6	6.2	5.8	5.3	4.8	4.4
ADAIT-2012	8.8	7.2	6.6	6.2	5.8	5.2	4.7	4.3
Extended Tealbook baseline	8.8	7.2	6.6	6.2	5.8	5.2	4.7	4.3
Total PCE prices								
Taylor (1993)	1.3	1.2	1.2	1.9	1.1	1.1	1.1	1.1
Inertial Taylor (1999)	1.3	1.2	1.2	1.9	1.1	1.1	1.1	1.0
ADAIT-2020	1.3	1.3	1.3	2.1	1.5	1.6	1.6	1.6
ADAIT-2012	1.3	1.3	1.3	2.1	1.5	1.6	1.7	1.7
Extended Tealbook baseline	1.3	1.3	1.3	2.2	1.5	1.6	1.7	1.7
Core PCE prices								
Taylor (1993)	1.6	1.6	1.4	1.9	1.2	1.1	1.1	1.1
Inertial Taylor (1999)	1.6	1.6	1.4	1.9	1.1	1.1	1.0	1.0
ADAIT-2020	1.6	1.6	1.6	2.1	1.5	1.5	1.6	1.6
ADAIT-2012	1.6	1.6	1.6	2.2	1.6	1.6	1.6	1.7
Extended Tealbook baseline	1.6	1.6	1.6	2.2	1.6	1.6	1.7	1.7

1. Percent, average for the quarter.

Outcomes of Optimal Control Simulations under Discretion

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

Outcome and strategy	2020	2021	2022	2023	2024	2025	2026	2027
Nominal federal funds rate[1]								
Asymmetric weights (DAI)	.1	.1	.1	.2	.4	.6	.9	1.3
Asymmetric weights (4-quarter inflation)	.1	.1	.1	.2	.4	.8	1.1	1.5
Equal weights (DAI)	.1	.1	.3	.7	1.1	1.5	1.7	2.0
Equal weights (4-quarter inflation)	.1	.1	.2	.6	1.0	1.4	1.7	1.9
Extended Tealbook baseline	.1	.1	.1	.1	.1	.4	1.0	1.4
Real GDP								
Asymmetric weights (DAI)	-2.8	3.5	3.6	2.6	2.2	1.8	1.5	1.5
Asymmetric weights (4-quarter inflation)	-2.8	3.4	3.5	2.5	2.1	1.8	1.5	1.5
Equal weights (DAI)	-2.8	2.9	3.1	2.1	1.9	1.7	1.4	1.5
Equal weights (4-quarter inflation)	-2.8	2.9	3.1	2.2	1.9	1.7	1.4	1.5
Extended Tealbook baseline	-2.8	3.5	3.7	2.6	2.2	1.8	1.5	1.5
Unemployment rate[1]								
Asymmetric weights (DAI)	7.2	5.2	3.8	3.2	3.0	3.0	3.1	3.1
Asymmetric weights (4-quarter inflation)	7.2	5.3	3.8	3.3	3.2	3.2	3.2	3.3
Equal weights (DAI)	7.2	5.5	4.3	4.0	4.0	4.0	4.1	4.1
Equal weights (4-quarter inflation)	7.2	5.5	4.3	4.0	4.0	4.0	4.1	4.1
Extended Tealbook baseline	7.2	5.2	3.7	3.1	2.9	2.8	2.9	3.0
Total PCE prices								
Asymmetric weights (DAI)	1.3	1.6	1.7	1.8	1.9	2.0	2.0	2.1
Asymmetric weights (4-quarter inflation)	1.3	1.5	1.6	1.7	1.8	1.9	2.0	2.0
Equal weights (DAI)	1.2	1.2	1.2	1.3	1.4	1.5	1.5	1.6
Equal weights (4-quarter inflation)	1.2	1.2	1.2	1.3	1.4	1.5	1.5	1.6
Extended Tealbook baseline	1.3	1.6	1.7	1.9	2.0	2.1	2.1	2.2
Core PCE prices								
Asymmetric weights (DAI)	1.6	1.6	1.7	1.8	1.9	2.0	2.0	2.1
Asymmetric weights (4-quarter inflation)	1.6	1.5	1.6	1.7	1.8	1.9	2.0	2.0
Equal weights (DAI)	1.6	1.2	1.2	1.3	1.3	1.5	1.5	1.6
Equal weights (4-quarter inflation)	1.6	1.2	1.2	1.3	1.3	1.5	1.5	1.6
Extended Tealbook baseline	1.6	1.6	1.8	1.9	2.0	2.1	2.1	2.2

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

Outcomes of Optimal Control Simulations under Discretion, Quarterly

(4-quarter percent change, except as noted)

Outcome and strategy	2020		2021				2022	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Nominal federal funds rate[1]								
Asymmetric weights (DAI)	.1	.1	.1	.1	.1	.1	.1	.1
Asymmetric weights (4-quarter inflation)	.1	.1	.1	.1	.1	.1	.1	.1
Equal weights (DAI)	.1	.1	.1	.1	.1	.1	.1	.2
Equal weights (4-quarter inflation)	.1	.1	.1	.1	.1	.1	.1	.1
Extended Tealbook baseline	.1	.1	.1	.1	.1	.1	.1	.1
Real GDP								
Asymmetric weights (DAI)	-3.1	-2.8	-1.2	8.8	2.7	3.5	4.4	5.0
Asymmetric weights (4-quarter inflation)	-3.1	-2.8	-1.2	8.8	2.6	3.4	4.3	4.9
Equal weights (DAI)	-3.1	-2.8	-1.3	8.5	2.3	2.9	3.8	4.5
Equal weights (4-quarter inflation)	-3.1	-2.8	-1.3	8.5	2.3	2.9	3.8	4.5
Extended Tealbook baseline	-3.1	-2.8	-1.2	8.9	2.8	3.5	4.4	5.1
Unemployment rate[1]								
Asymmetric weights (DAI)	8.8	7.2	6.6	6.2	5.8	5.2	4.7	4.3
Asymmetric weights (4-quarter inflation)	8.8	7.2	6.6	6.2	5.8	5.3	4.8	4.4
Equal weights (DAI)	8.8	7.2	6.6	6.3	6.0	5.5	5.1	4.7
Equal weights (4-quarter inflation)	8.8	7.2	6.6	6.3	6.0	5.5	5.0	4.7
Extended Tealbook baseline	8.8	7.2	6.6	6.2	5.8	5.2	4.7	4.3
Total PCE prices								
Asymmetric weights (DAI)	1.3	1.3	1.3	2.1	1.5	1.6	1.6	1.6
Asymmetric weights (4-quarter inflation)	1.3	1.3	1.3	2.1	1.4	1.5	1.5	1.6
Equal weights (DAI)	1.3	1.2	1.2	1.9	1.2	1.2	1.2	1.2
Equal weights (4-quarter inflation)	1.3	1.2	1.2	1.9	1.2	1.2	1.2	1.2
Extended Tealbook baseline	1.3	1.3	1.3	2.2	1.5	1.6	1.7	1.7
Core PCE prices								
Asymmetric weights (DAI)	1.6	1.6	1.6	2.2	1.5	1.6	1.6	1.6
Asymmetric weights (4-quarter inflation)	1.6	1.6	1.6	2.1	1.5	1.5	1.5	1.6
Equal weights (DAI)	1.6	1.6	1.5	2.0	1.2	1.2	1.2	1.2
Equal weights (4-quarter inflation)	1.6	1.6	1.5	2.0	1.2	1.2	1.2	1.2
Extended Tealbook baseline	1.6	1.6	1.6	2.2	1.6	1.6	1.7	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.

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. 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.

A Discounted Average Inflation Gap

The Monetary Policy Strategies section makes use of a discounted average inflation (DAI) gap in both the simple rules and optimal control exhibits. This inflation gap measure seeks to capture current and past inflation deviations from 2 percent in a manner that allows those deviations to become bygones gradually over time. Specifically, the discounted average inflation gap in period t (labeled $\bar{\pi}gap_t$) is defined by a recursive formula,

$$\bar{\pi}gap_t = \left(\frac{1}{D}\right)\left(\frac{1}{1+3\gamma}\right)(\pi_t - 2) + \gamma\,\bar{\pi}gap_{t-1},$$

where π_t is the quarterly inflation rate expressed at an annual rate and γ is a parameter controlling the speed at which past inflation deviations from 2 percent are gradually discounted. The fraction $1/(1+3\gamma)$ is a technical adjustment to account for annualized inflation rates. The fraction $1/D$ converts the recursive object into a weighted average by dividing the gap by the annualized duration of the process. $D = 1/(4(1-\gamma))$ is also a function of γ, the speed at which past inflation deviations are discounted. In our benchmark implementation, we set γ=0.95, implying an annualized duration of five years, which places the majority of the weight on inflation misses over roughly a business cycle frequency.

For the simple rules in this section, core PCE price inflation is used to create the discounted average inflation gap. In the optimal control simulations, headline PCE price inflation is used.

POLICY RULES USED IN THE MONETARY POLICY STRATEGIES SECTION

The table "Simple Rules" that follows gives expressions for three simple policy rules reported in the exhibits of the Monetary Policy Strategies section.[1] R_t denotes the nominal federal funds rate prescribed by a strategy for quarter t. The right-hand-side variables of the first two rules include the staff's projection of trailing four-quarter core PCE price inflation for the current quarter (π_t^4) and the output gap estimate for the current period ($ygap_t$). The value of policymakers' longer-run inflation objective, denoted π^{LR}, is 2 percent. The additional right-hand-side variables of the asymmetric discounted average inflation targeting (ADAIT) rule include the DAI gap, described in this appendix and denoted $\bar{\pi}gap_t$. The ADAIT rule also responds to shortfalls of employment from its trend level, as determined by the gap between the level of the employment-to-population (EPOP) ratio and the staff's estimate of its trend (henceforth, the EPOP gap), with the response being limited to shortfalls via the minimum operator that replaces positive values of the EPOP gap with zero.

Simple Rules

Taylor (1993) rule	$R_t = r^{LR} + \pi_t^4 + 0.5(\pi_t^4 - \pi^{LR}) + 0.5ygap_t$
Inertial Taylor (1999) rule	$R_t = 0.85R_{t-1} + 0.15(r^{LR} + \pi_t^4 + 0.5(\pi_t^4 - \pi^{LR}) + ygap_t)$
ADAIT rule	$R_t = 0.85R_{t-1} + 0.15(r^{LR} + 2 + 1.5\,D\,\bar{\pi}gap_t + 1.5\min(EPOPgap_t, 0))$

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. The inertial Taylor (1999) rule has been featured prominently in analysis by Board staff. The intercepts of the three 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.

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 and measures of resource slack. 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

[1] In the staff's construction of the baseline projection, not shown in this table, the federal funds rate departs from the ELB in the quarter after the unemployment rate is below 4.1 percent and the four-quarter inflation rate is above 2.0 percent. Thereafter, the federal funds rate follows an inertial version of the Taylor (1999) rule, but with no response to the output gap when the gap is positive. The intercept in this rule is adjusted as a function of a measure of the long-term inflation trend.

variable use the midpoint of the current target 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 the Tealbook baseline. 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 the Tealbook 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.[2] 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 reported in the panel is the corresponding average of the real federal funds rate under the Tealbook baseline projection, calculated over the same 12-quarter period as the Tealbook-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 Discretion" 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 large-scale asset purchase programs. 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.

The simple rule 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. By contrast, the optimal control simulations embed the

[2] 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).

assumption that policymakers will re-optimize every period, described as discretion strategies. Under discretion, there may be policy rate paths that would result in more desirable macroeconomic outcomes than the path chosen. However, these outcomes are not feasible, as they require future policymakers to take actions that may not be optimal from the perspective of those future policymakers. As under the commitment case, financial market participants, price setters, and wage setters fully understand the macroeconomic implications of the policymakers' strategy.

COMPUTATION OF OPTIMAL CONTROL POLICIES UNDER DISCRETION

To demonstrate the differences generated by the use of different inflation gap measures, the current Tealbook reports results from two specific gap measures: the four-quarter inflation gap and the DAI gap. The four-quarter inflation gap, measured as the difference between four-quarter headline PCE price inflation, π_t^{PCE}, and the Committee's 2 percent objective, has historically been used in optimal control simulations in this section. The DAI gap is described earlier in this appendix.

In the following equations, the resulting loss functions embed the assumption that policymakers discount the future using a quarterly discount factor, $\beta = 0.9963$:

Four-quarter inflation gap specification

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

DAI gap specification

$$\boldsymbol{L_t} = \sum_{\boldsymbol{\tau=0}}^{T} \boldsymbol{\beta^{\tau}} \left\{ \lambda_{\pi} \left(\bar{\pi} gap_{t+\tau} \right)^{\mathbf{2}} + \lambda_{e,t+\tau} (EPOPgap_{t+\tau})^{\mathbf{2}} + \lambda_R (R_{t+\boldsymbol{\tau}} - R_{t+\boldsymbol{\tau-1}})^{\mathbf{2}} \right\}.$$

The exhibit "Optimal Control Simulations under Discretion" considers weighting structures on the inflation gap, the EPOP gap, and the policy rate change components of the loss function. The table "Loss Functions" shows the weights used in each of the equal-weights and asymmetric-weights specifications.

Loss Functions

	λ_{π}	$\lambda_{e,t+\tau}$		λ_R
		$EPOPgap_{t+\tau} < 0$	$EPOPgap_{t+\tau} \geq 0$	
Equal weights	1	1	1	1
Asymmetric weights	1	1	0	1

The first weighting structure, labeled "Equal weights," assigns equal weights to all three components at all times. The second weighting structure, labeled "Asymmetric weights," uses the same weights as the equal-weights structure whenever the EPOP gap is below the staff's estimate of its trend. However, this second weighting structure assigns no penalty to the EPOP gap moving above the staff's estimate of its trend. The optimal control policy and associated outcomes depend on the relative (rather than the absolute) values of the weights.

For each of these choices 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 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.

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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	09/04/20	10/22/20	09/04/20	10/22/20	09/04/20	10/22/20	09/04/20	10/22/20	09/04/20	10/22/20
Quarterly										
2020:Q1	-3.4	-3.4	-5.0	-5.0	1.3	1.3	1.6	1.6	3.8	3.8
Q2	-33.3	-32.8	-31.8	-31.4	-1.8	-1.6	-1.0	-.8	13.0	13.0
Q3	32.8	36.0	29.7	31.9	3.4	4.2	3.2	4.1	8.9	8.8
Q4	5.9	5.6	4.5	3.9	1.4	1.3	1.6	1.5	7.4	7.2
2021:Q1	3.5	3.0	1.6	1.4	1.8	1.4	1.8	1.5	6.7	6.6
Q2	4.7	3.0	2.8	1.0	1.6	1.6	1.6	1.6	6.2	6.2
Q3	8.2	6.7	6.3	4.8	1.7	1.7	1.6	1.6	5.5	5.8
Q4	8.2	9.1	6.3	7.1	1.7	1.8	1.7	1.7	4.9	5.2
2022:Q1	5.4	6.7	3.6	4.9	1.7	1.6	1.7	1.7	4.5	4.7
Q2	5.3	5.6	3.3	3.6	1.8	1.7	1.8	1.8	4.2	4.3
Q3	5.0	5.1	3.0	3.2	1.9	1.8	1.8	1.8	4.0	3.9
Q4	4.7	4.9	2.8	2.9	1.9	1.9	1.9	1.9	3.8	3.7
Two-quarter[2]										
2020:Q2	-19.7	-19.4	-19.5	-19.2	-.3	-.2	.3	.4	9.5	9.5
Q4	18.6	19.8	16.4	17.1	2.4	2.8	2.4	2.8	-5.6	-5.8
2021:Q2	4.1	3.0	2.2	1.2	1.7	1.5	1.7	1.6	-1.2	-1.0
Q4	8.2	7.9	6.3	5.9	1.7	1.7	1.6	1.7	-1.3	-1.0
2022:Q2	5.3	6.2	3.4	4.3	1.7	1.7	1.7	1.7	-.7	-.9
Q4	4.8	5.0	2.9	3.1	1.9	1.8	1.9	1.8	-.4	-.6
Four-quarter[3]										
2019:Q4	4.0	4.0	2.3	2.3	1.5	1.5	1.6	1.6	-.3	-.3
2020:Q4	-2.5	-1.7	-3.2	-2.8	1.1	1.3	1.3	1.6	3.9	3.7
2021:Q4	6.1	5.4	4.2	3.5	1.7	1.6	1.7	1.6	-2.5	-2.0
2022:Q4	5.1	5.6	3.2	3.7	1.8	1.7	1.8	1.8	-1.1	-1.5
2023:Q4	4.7	4.6	2.8	2.6	1.9	1.9	1.9	1.9	-.6	-.6
Annual										
2019	4.0	4.0	2.2	2.2	1.5	1.5	1.7	1.7	3.7	3.7
2020	-3.0	-2.6	-3.9	-3.7	1.1	1.2	1.3	1.5	8.3	8.2
2021	5.4	5.1	3.8	3.4	1.6	1.7	1.7	1.7	5.8	5.9
2022	6.1	6.4	4.2	4.5	1.7	1.7	1.7	1.7	4.1	4.1
2023	4.8	4.8	2.8	2.8	1.9	1.9	1.9	1.9	3.4	3.3

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	2020			2021				2022							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2020[1]	2021[1]	2022[1]	2023[1]
Real GDP	-31.4	31.9	3.9	1.4	1.0	4.8	7.1	4.9	3.6	3.2	2.9	-2.8	3.5	3.7	2.6
Previous Tealbook	*-31.8*	*29.7*	*4.5*	*1.6*	*2.8*	*6.3*	*6.3*	*3.6*	*3.3*	*3.0*	*2.8*	*-3.2*	*4.2*	*3.2*	*2.8*
Final sales	-28.1	25.2	3.2	.6	.8	4.2	6.8	4.2	4.0	3.3	3.2	-2.7	3.1	3.7	2.5
Previous Tealbook	*-28.5*	*22.6*	*3.7*	*2.0*	*2.4*	*6.1*	*5.9*	*3.4*	*3.4*	*2.8*	*2.6*	*-3.3*	*4.1*	*3.1*	*2.7*
Priv. dom. final purch.	-32.4	36.0	4.0	.3	.1	5.1	8.9	5.8	4.9	4.3	4.2	-2.6	3.5	4.8	3.2
Previous Tealbook	*-32.9*	*32.0*	*4.4*	*1.6*	*2.3*	*8.0*	*7.8*	*4.5*	*4.1*	*3.8*	*3.5*	*-3.4*	*4.9*	*4.0*	*3.4*
Personal cons. expend.	-33.2	39.5	2.6	-.9	-1.2	4.9	9.6	5.5	4.5	4.0	3.9	-2.8	3.0	4.5	3.1
Previous Tealbook	*-34.1*	*37.4*	*4.1*	*.0*	*1.2*	*8.0*	*7.9*	*3.9*	*3.6*	*3.3*	*3.0*	*-3.2*	*4.2*	*3.4*	*3.0*
Durables	-1.7	77.7	.8	-7.7	-1.6	-.1	3.6	8.3	7.5	4.9	4.7	11.4	-1.6	6.3	4.3
Nondurables	-15.0	30.5	-.2	-3.1	-2.9	3.8	7.7	5.0	4.7	3.5	3.5	4.3	1.3	4.2	2.8
Services	-41.8	36.7	3.9	1.0	-.7	6.2	11.2	5.2	4.0	4.0	3.9	-7.1	4.3	4.3	3.0
Residential investment	-35.6	62.5	24.6	-2.7	11.4	10.3	9.1	7.9	6.0	4.8	2.7	11.6	6.9	5.3	-1.6
Previous Tealbook	*-36.3*	*45.9*	*13.7*	*11.4*	*8.5*	*10.1*	*8.4*	*6.8*	*6.3*	*5.1*	*4.4*	*5.9*	*9.6*	*5.6*	*3.0*
Nonres. priv. fixed invest.	-27.2	12.8	4.7	8.1	3.1	4.5	5.5	6.5	6.4	6.0	6.3	-5.3	5.3	6.3	5.3
Previous Tealbook	*-25.7*	*4.2*	*3.2*	*6.8*	*5.8*	*7.3*	*6.9*	*7.2*	*5.9*	*6.1*	*5.6*	*-7.1*	*6.7*	*6.2*	*5.6*
Equipment & intangibles	-25.2	22.4	10.2	11.5	4.2	4.6	6.0	7.0	7.1	6.4	6.2	-1.7	6.5	6.7	4.7
Previous Tealbook	*-23.7*	*11.6*	*8.2*	*8.1*	*7.3*	*6.9*	*6.9*	*7.6*	*7.0*	*6.3*	*5.8*	*-3.9*	*7.3*	*6.7*	*5.1*
Nonres. structures	-33.6	-16.7	-14.7	-5.1	-1.5	4.0	3.7	4.1	3.4	4.5	6.9	-17.9	.2	4.7	7.9
Previous Tealbook	*-32.1*	*-19.0*	*-14.4*	*1.6*	*.0*	*9.1*	*7.0*	*5.5*	*1.8*	*5.3*	*4.6*	*-17.9*	*4.4*	*4.3*	*7.3*
Net exports[2]	-775	-1015	-1024	-1011	-991	-1017	-1072	-1117	-1126	-1149	-1175	-901	-1023	-1142	-1206
Previous Tealbook[2]	*-770*	*-972*	*-956*	*-929*	*-920*	*-971*	*-1025*	*-1053*	*-1057*	*-1084*	*-1107*	*-872*	*-961*	*-1075*	*-1138*
Exports	-64.4	60.3	14.1	8.1	7.0	13.7	14.6	5.3	4.8	4.6	4.6	-12.4	10.8	4.8	4.5
Imports	-54.1	92.6	10.8	3.9	2.2	12.9	17.2	9.0	4.3	5.7	6.1	-4.5	8.9	6.2	4.6
Gov't. cons. & invest.	2.5	1.9	-.6	.6	1.7	1.1	.4	-.2	-.3	-.3	-.2	1.3	.9	-.2	-.2
Previous Tealbook	*2.9*	*1.1*	*-2.7*	*1.0*	*1.2*	*.8*	*.4*	*-.3*	*-.3*	*-.3*	*-.2*	*.6*	*.8*	*-.3*	*-.2*
Federal	16.4	11.0	3.2	1.7	1.5	.4	-.6	-2.0	-2.1	-2.2	-1.8	7.9	.7	-2.0	-2.0
Defense	3.8	2.1	2.1	.8	.8	.8	.1	.6	.6	.6	1.1	1.9	.6	.7	1.0
Nondefense	37.6	24.3	4.6	2.8	2.4	-.1	-1.5	-5.3	-5.5	-5.9	-5.7	16.9	.9	-5.6	-6.2
State & local	-5.4	-3.7	-3.0	-.1	1.9	1.5	1.1	1.0	1.0	1.0	1.0	-2.8	1.1	1.0	1.0
Change in priv. inventories[2]	-287	-33	4	43	56	84	103	143	122	115	103	-99	71	121	108
Previous Tealbook[2]	*-289*	*-13*	*29*	*5*	*26*	*37*	*62*	*74*	*65*	*76*	*86*	*-89*	*33*	*75*	*91*

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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Real GDP	2.9	2.2	2.1	2.7	2.5	2.3	-2.8	3.5	3.7	2.6
Previous Tealbook	*2.9*	*2.2*	*2.1*	*2.7*	*2.5*	*2.3*	*-3.2*	*4.2*	*3.2*	*2.8*
Final sales	3.2	2.1	2.3	2.8	2.2	2.8	-2.7	3.1	3.7	2.5
Previous Tealbook	*3.2*	*2.1*	*2.3*	*2.8*	*2.2*	*2.8*	*-3.3*	*4.1*	*3.1*	*2.7*
Priv. dom. final purch.	4.5	2.8	2.6	3.2	2.7	2.3	-2.6	3.5	4.8	3.2
Previous Tealbook	*4.5*	*2.8*	*2.6*	*3.2*	*2.7*	*2.3*	*-3.4*	*4.9*	*4.0*	*3.4*
Personal cons. expend.	3.8	3.1	2.7	2.9	2.4	2.5	-2.8	3.0	4.5	3.1
Previous Tealbook	*3.8*	*3.1*	*2.7*	*2.9*	*2.4*	*2.5*	*-3.2*	*4.2*	*3.4*	*3.0*
Durables	9.2	6.0	7.0	8.1	4.2	5.7	11.4	-1.6	6.3	4.3
Nondurables	3.2	2.8	2.0	3.7	2.3	2.7	4.3	1.3	4.2	2.8
Services	3.2	2.7	2.3	1.8	2.1	1.9	-7.1	4.3	4.3	3.0
Residential investment	7.7	9.2	4.2	4.7	-3.9	1.6	11.6	6.9	5.3	-1.6
Previous Tealbook	*7.7*	*9.2*	*4.2*	*4.7*	*-3.9*	*1.6*	*5.9*	*9.6*	*5.6*	*3.0*
Nonres. priv. fixed invest.	6.9	-.1	1.8	4.8	6.5	1.4	-5.3	5.3	6.3	5.3
Previous Tealbook	*6.9*	*-.1*	*1.8*	*4.8*	*6.5*	*1.4*	*-7.1*	*6.7*	*6.2*	*5.6*
Equipment & intangibles	6.1	2.2	1.3	6.3	8.0	1.3	-1.7	6.5	6.7	4.7
Previous Tealbook	6.1	2.2	1.3	6.3	8.0	1.3	-3.9	7.3	6.7	5.1
Nonres. structures	9.3	-7.3	3.5	.0	1.2	1.9	-17.9	.2	4.7	7.9
Previous Tealbook	*9.3*	*-7.3*	*3.5*	*.0*	*1.2*	*1.9*	*-17.9*	*4.4*	*4.3*	*7.3*
Net exports[1]	-577	-720	-764	-817	-878	-918	-901	-1023	-1142	-1206
Previous Tealbook[1]	*-577*	*-720*	*-764*	*-817*	*-878*	*-918*	*-872*	*-961*	*-1075*	*-1138*
Exports	2.9	-1.5	1.5	5.8	.5	.4	-12.4	10.8	4.8	4.5
Imports	6.5	3.3	2.8	5.6	3.0	-1.9	-4.5	8.9	6.2	4.6
Gov't. cons. & invest.	.3	2.2	1.5	1.1	1.5	3.0	1.3	.9	-.2	-.2
Previous Tealbook	*.3*	*2.2*	*1.5*	*1.1*	*1.5*	*3.0*	*.6*	*.8*	*-.3*	*-.2*
Federal	-1.1	1.3	.1	1.2	3.0	4.8	7.9	.7	-2.0	-2.0
Defense	-3.4	-.4	-.7	2.2	4.2	5.6	1.9	.6	.7	1.0
Nondefense	2.7	3.8	1.2	-.1	1.1	3.7	16.9	.9	-5.6	-6.2
State & local	1.2	2.8	2.4	1.1	.6	1.9	-2.8	1.1	1.0	1.0
Change in priv. inventories[1]	86	138	25	16	53	49	-99	71	121	108
Previous Tealbook[1]	*86*	*138*	*25*	*16*	*53*	*49*	*-89*	*33*	*75*	*91*

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	2020			2021				2022							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2020[1]	2021[1]	2022[1]	2023[1]
Real GDP	-31.4	31.9	3.9	1.4	1.0	4.8	7.1	4.9	3.6	3.2	2.9	-2.8	3.5	3.7	2.6
Previous Tealbook	*-31.8*	*29.7*	*4.5*	*1.6*	*2.8*	*6.3*	*6.3*	*3.6*	*3.3*	*3.0*	*2.8*	*-3.2*	*4.2*	*3.2*	*2.8*
Final sales	-27.9	26.7	3.2	.6	.8	4.2	6.8	4.2	4.0	3.3	3.2	-2.7	3.1	3.7	2.5
Previous Tealbook	*-27.5*	*24.1*	*3.7*	*2.0*	*2.4*	*6.1*	*5.9*	*3.4*	*3.4*	*2.8*	*2.6*	*-3.3*	*4.1*	*3.1*	*2.7*
Priv. dom. final purch.	-27.7	29.8	3.4	.3	.1	4.3	7.5	4.9	4.1	3.7	3.6	-2.2	3.0	4.1	2.7
Previous Tealbook	*-28.3*	*26.7*	*3.8*	*1.3*	*1.9*	*6.7*	*6.6*	*3.9*	*3.5*	*3.3*	*3.0*	*-2.9*	*4.1*	*3.4*	*2.9*
Personal cons. expend.	-24.0	25.5	1.8	-.6	-.8	3.3	6.3	3.7	3.0	2.7	2.6	-1.9	2.0	3.0	2.1
Previous Tealbook	*-25.0*	*24.1*	*2.8*	*.0*	*.8*	*5.3*	*5.3*	*2.6*	*2.4*	*2.2*	*2.0*	*-2.2*	*2.9*	*2.3*	*2.0*
Durables	.0	5.0	.1	-.7	-.1	.0	.3	.6	.5	.4	.3	.8	-.1	.5	.3
Nondurables	-2.1	4.5	.0	-.4	-.4	.5	1.1	.7	.7	.5	.5	.6	.2	.6	.4
Services	-22.0	16.0	1.8	.5	-.3	2.8	5.0	2.4	1.8	1.8	1.8	-3.3	2.0	2.0	1.4
Residential investment	-1.6	2.2	1.0	-.1	.5	.5	.4	.4	.3	.2	.1	.4	.3	.3	-.1
Previous Tealbook	*-1.5*	*1.7*	*.5*	*.5*	*.4*	*.4*	*.4*	*.3*	*.3*	*.2*	*.2*	*.2*	*.4*	*.3*	*.1*
Nonres. priv. fixed invest.	-3.7	2.1	.6	1.0	.4	.6	.7	.8	.8	.8	.8	-.7	.7	.8	.7
Previous Tealbook	*-3.2*	*.9*	*.4*	*.8*	*.7*	*.9*	*.9*	*.9*	*.8*	*.8*	*.7*	*-.9*	*.9*	*.8*	*.7*
Equipment & intangibles	-2.6	2.5	1.0	1.1	.4	.5	.6	.7	.7	.7	.6	-.2	.7	.7	.5
Previous Tealbook	*-2.2*	*1.5*	*.8*	*.8*	*.7*	*.7*	*.7*	*.8*	*.7*	*.7*	*.6*	*-.4*	*.7*	*.7*	*.5*
Nonres. structures	-1.1	-.4	-.4	-.1	.0	.1	.1	.1	.1	.1	.2	-.5	.0	.1	.2
Previous Tealbook	*-1.0*	*-.5*	*-.4*	*.0*	*.0*	*.2*	*.2*	*.1*	*.0*	*.1*	*.1*	*-.5*	*.1*	*.1*	*.2*
Net exports	.6	-4.0	-.1	.3	.4	-.3	-.8	-.7	-.1	-.3	-.4	-.8	-.1	-.4	-.2
Previous Tealbook	*.7*	*-3.4*	*.4*	*.5*	*.2*	*-.8*	*-.8*	*-.4*	*.0*	*-.4*	*-.3*	*-.5*	*-.2*	*-.3*	*-.2*
Exports	-9.5	4.9	1.3	.8	.7	1.4	1.5	.6	.5	.5	.5	-1.4	1.1	.5	.5
Imports	10.1	-8.9	-1.4	-.5	-.3	-1.7	-2.3	-1.3	-.6	-.8	-.9	.6	-1.2	-.9	-.7
Gov't. cons. & invest.	.8	1.0	-.1	.1	.3	.2	.1	.0	.0	.0	.0	.2	.2	.0	.0
Previous Tealbook	*1.4*	*.7*	*-.5*	*.2*	*.2*	*.2*	*.1*	*.0*	*.0*	*-.1*	*.0*	*.1*	*.2*	*.0*	*.0*
Federal	1.2	1.1	.2	.1	.1	.0	.0	-.1	-.1	-.2	-.1	.5	.1	-.1	-.1
Defense	.2	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0
Nondefense	1.0	.8	.1	.1	.1	.0	.0	-.2	-.2	-.2	-.2	.4	.0	-.2	-.2
State & local	-.4	-.1	-.3	.0	.2	.2	.1	.1	.1	.1	.1	-.3	.1	.1	.1
Change in priv. inventories	-3.5	5.2	.7	.7	.3	.5	.3	.7	-.4	-.1	-.2	.0	.5	.0	.1
Previous Tealbook	*-4.2*	*5.6*	*.8*	*-.5*	*.4*	*.2*	*.5*	*.2*	*-.2*	*.2*	*.2*	*.1*	*.2*	*.1*	*.1*

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	2020			2021				2022							
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2020[1]	2021[1]	2022[1]	2023[1]
GDP chain-wt. price index	-1.8	2.9	1.5	1.6	1.9	1.9	1.8	1.7	1.9	1.9	1.9	1.0	1.8	1.9	2.0
Previous Tealbook	*-2.0*	*2.4*	*1.3*	*1.9*	*1.9*	*1.8*	*1.7*	*1.7*	*1.9*	*1.9*	*1.9*	*.8*	*1.8*	*1.9*	*1.9*
PCE chain-wt. price index	-1.6	4.2	1.3	1.4	1.6	1.7	1.8	1.6	1.7	1.8	1.9	1.3	1.6	1.7	1.9
Previous Tealbook	*-1.8*	*3.4*	*1.4*	*1.8*	*1.6*	*1.7*	*1.7*	*1.7*	*1.8*	*1.9*	*1.9*	*1.1*	*1.7*	*1.8*	*1.9*
Energy	-44.9	24.9	.4	.8	2.9	2.8	2.2	1.5	1.7	1.6	1.7	-11.2	2.2	1.6	1.8
Previous Tealbook	*-45.0*	*25.5*	*1.6*	*4.2*	*3.7*	*2.9*	*2.1*	*1.7*	*2.0*	*1.9*	*1.8*	*-10.8*	*3.2*	*1.8*	*1.9*
Food	15.4	-1.9	-.6	.7	1.6	2.1	2.1	.6	1.3	1.7	2.0	3.8	1.6	1.4	2.3
Previous Tealbook	*15.4*	*-2.3*	*-.2*	*.5*	*.7*	*1.9*	*2.0*	*2.0*	*2.1*	*2.1*	*2.0*	*3.8*	*1.3*	*2.0*	*2.0*
Ex. food & energy	-.8	4.1	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.6	1.6	1.8	1.9
Previous Tealbook	*-1.0*	*3.2*	*1.6*	*1.8*	*1.6*	*1.6*	*1.7*	*1.7*	*1.8*	*1.8*	*1.9*	*1.3*	*1.7*	*1.8*	*1.9*
Ex. food & energy, market based	.1	2.8	1.8	1.6	1.5	1.5	1.6	1.5	1.6	1.7	1.8	1.6	1.5	1.6	1.7
Previous Tealbook	*.1*	*2.4*	*1.8*	*1.7*	*1.5*	*1.5*	*1.5*	*1.5*	*1.6*	*1.7*	*1.8*	*1.5*	*1.5*	*1.7*	*1.7*
CPI	-3.5	5.2	2.1	1.8	1.8	2.0	2.1	1.9	2.0	2.0	2.1	1.2	1.9	2.0	2.2
Previous Tealbook	*-3.5*	*4.8*	*2.2*	*2.0*	*1.9*	*2.0*	*2.0*	*2.0*	*2.1*	*2.1*	*2.1*	*1.1*	*2.0*	*2.1*	*2.1*
Ex. food & energy	-1.6	4.4	2.3	1.9	1.7	1.9	2.0	2.0	2.0	2.0	2.1	1.8	1.9	2.0	2.1
Previous Tealbook	*-1.6*	*4.1*	*2.5*	*1.9*	*1.8*	*1.8*	*1.9*	*2.0*	*2.0*	*2.1*	*2.1*	*1.7*	*1.9*	*2.0*	*2.1*
ECI, hourly compensation[2]	1.7	1.3	1.4	1.9	2.0	2.1	2.1	2.5	2.5	2.5	2.5	1.9	2.0	2.5	2.7
Previous Tealbook[2]	*1.7*	*1.2*	*1.3*	*1.8*	*2.2*	*2.2*	*2.2*	*2.5*	*2.5*	*2.5*	*2.5*	*1.9*	*2.1*	*2.5*	*2.6*
Business sector															
Output per hour	9.6	4.9	-3.3	-4.7	-3.5	1.6	5.0	2.4	1.0	.7	.6	2.7	-.5	1.2	.9
Previous Tealbook	*8.9*	*3.7*	*-3.0*	*-5.2*	*-2.2*	*2.8*	*4.0*	*1.1*	*1.0*	*.9*	*.8*	*2.3*	*-.2*	*.9*	*1.0*
Compensation per hour	19.6	-5.0	.0	-3.5	-3.0	-1.5	2.0	3.8	3.8	3.8	3.8	5.5	-1.5	3.8	3.8
Previous Tealbook	*19.6*	*-11.0*	*-.8*	*-.8*	*-.6*	*1.4*	*2.6*	*3.6*	*3.6*	*3.6*	*3.6*	*3.6*	*.6*	*3.6*	*3.7*
Unit labor costs	9.1	-9.5	3.4	1.2	.5	-3.0	-2.8	1.4	2.7	3.0	3.1	2.7	-1.0	2.6	2.9
Previous Tealbook	*9.8*	*-14.2*	*2.3*	*4.7*	*1.6*	*-1.4*	*-1.3*	*2.5*	*2.6*	*2.7*	*2.8*	*1.3*	*.9*	*2.7*	*2.7*
Core goods imports chain-wt. price index[3]	-2.1	4.7	4.5	3.1	1.8	1.0	.8	1.0	.9	.9	.9	2.0	1.7	.9	.9
Previous Tealbook[3]	*-2.0*	*1.2*	*4.3*	*2.0*	*1.6*	*1.0*	*1.0*	*1.1*	*1.0*	*.9*	*1.0*	*1.0*	*1.4*	*1.0*	*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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
GDP chain-wt. price index	1.5	.8	1.5	2.0	2.3	1.6	1.0	1.8	1.9	2.0
Previous Tealbook	*1.5*	*.8*	*1.5*	*2.0*	*2.3*	*1.6*	*.8*	*1.8*	*1.9*	*1.9*
PCE chain-wt. price index	1.1	.2	1.6	1.8	2.0	1.5	1.3	1.6	1.7	1.9
Previous Tealbook	*1.1*	*.2*	*1.6*	*1.8*	*2.0*	*1.5*	*1.1*	*1.7*	*1.8*	*1.9*
Energy	-7.1	-16.4	1.9	8.0	3.8	-.6	-11.2	2.2	1.6	1.8
Previous Tealbook	*-7.1*	*-16.4*	*1.9*	*8.0*	*3.8*	*-.6*	*-10.8*	*3.2*	*1.8*	*1.9*
Food	2.8	.3	-1.8	.7	.5	.9	3.8	1.6	1.4	2.3
Previous Tealbook	*2.8*	*.3*	*-1.8*	*.7*	*.5*	*.9*	*3.8*	*1.3*	*2.0*	*2.0*
Ex. food & energy	1.5	1.2	1.8	1.7	2.0	1.6	1.6	1.6	1.8	1.9
Previous Tealbook	*1.5*	*1.2*	*1.8*	*1.7*	*2.0*	*1.6*	*1.3*	*1.7*	*1.8*	*1.9*
Ex. food & energy, market based	1.1	1.1	1.4	1.2	1.7	1.5	1.6	1.5	1.6	1.7
Previous Tealbook	*1.1*	*1.1*	*1.4*	*1.2*	*1.7*	*1.5*	*1.5*	*1.5*	*1.7*	*1.7*
CPI	1.2	.4	1.8	2.1	2.2	2.0	1.2	1.9	2.0	2.2
Previous Tealbook	*1.2*	*.4*	*1.8*	*2.1*	*2.2*	*2.0*	*1.1*	*2.0*	*2.1*	*2.1*
Ex. food & energy	1.7	2.0	2.2	1.8	2.2	2.3	1.8	1.9	2.0	2.1
Previous Tealbook	*1.7*	*2.0*	*2.2*	*1.8*	*2.2*	*2.3*	*1.7*	*1.9*	*2.0*	*2.1*
ECI, hourly compensation[1]	2.3	1.9	2.2	2.6	3.0	2.7	1.9	2.0	2.5	2.7
Previous Tealbook[1]	*2.3*	*1.9*	*2.2*	*2.6*	*3.0*	*2.7*	*1.9*	*2.1*	*2.5*	*2.6*
Business sector										
Output per hour	.3	1.0	1.3	1.0	1.3	1.8	2.7	-.5	1.2	.9
Previous Tealbook	*.3*	*1.0*	*1.3*	*1.0*	*1.3*	*1.8*	*2.3*	*-.2*	*.9*	*1.0*
Compensation per hour	3.0	2.4	2.0	4.0	2.6	3.3	5.5	-1.5	3.8	3.8
Previous Tealbook	*3.0*	*2.4*	*2.0*	*4.0*	*2.6*	*3.3*	*3.6*	*.6*	*3.6*	*3.7*
Unit labor costs	2.7	1.4	.7	3.0	1.3	1.4	2.7	-1.0	2.6	2.9
Previous Tealbook	*2.7*	*1.4*	*.7*	*3.0*	*1.3*	*1.4*	*1.3*	*.9*	*2.7*	*2.7*
Core goods imports chain-wt. price index[2]	-.4	-4.2	-.8	.9	.1	-1.4	2.0	1.7	.9	.9
Previous Tealbook[2]	*-.4*	*-4.2*	*-.8*	*.9*	*.1*	*-1.4*	*1.0*	*1.4*	*1.0*	*1.0*

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

Other Macroeconomic Indicators

Item	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2020[1]	2021[1]	2022[1]	2023[1]
Employment and production															
Nonfarm payroll employment[2]	-4,427	1,304	747	569	438	446	414	399	369	348	331	-670	467	362	271
Unemployment rate[3]	13.0	8.8	7.2	6.6	6.2	5.8	5.2	4.7	4.3	3.9	3.7	7.2	5.2	3.7	3.1
Previous Tealbook[3]	*13.0*	*8.9*	*7.4*	*6.7*	*6.2*	*5.5*	*4.9*	*4.5*	*4.2*	*4.0*	*3.8*	*7.4*	*4.9*	*3.8*	*3.2*
Natural rate of unemployment[3]	9.5	6.0	5.6	5.3	5.1	4.9	4.7	4.7	4.6	4.6	4.5	5.6	4.7	4.5	4.3
Previous Tealbook[3]	*9.5*	*6.0*	*5.6*	*5.3*	*5.1*	*4.9*	*4.7*	*4.7*	*4.6*	*4.6*	*4.5*	*5.6*	*4.7*	*4.5*	*4.3*
Employment-to-Population Ratio[3]	52.9	56.1	57.2	57.8	58.1	58.6	59.1	59.5	59.9	60.2	60.4	57.2	59.1	60.4	60.9
Employment-to-Population Trend[3]	55.8	58.3	58.6	59.0	59.2	59.5	59.7	59.7	59.7	59.8	59.8	58.6	59.7	59.8	59.9
Output gap[4]	-4.3	-1.1	-.9	-1.2	-1.5	-1.0	.0	.8	1.2	1.5	1.7	-.9	.0	1.7	2.4
Previous Tealbook[4]	*-4.5*	*-1.7*	*-1.3*	*-1.5*	*-1.5*	*-.6*	*.3*	*.7*	*1.0*	*1.3*	*1.5*	*-1.3*	*.3*	*1.5*	*2.3*
Industrial production[5]	-42.9	39.8	6.2	6.4	.7	4.4	6.2	4.9	2.4	2.3	2.0	-5.7	4.4	2.9	1.3
Previous Tealbook[5]	*-43.2*	*34.6*	*7.4*	*2.6*	*2.6*	*6.2*	*6.0*	*3.8*	*2.3*	*2.4*	*2.1*	*-6.4*	*4.3*	*2.6*	*1.8*
Manufacturing industr. prod.[5]	-46.9	53.7	8.2	7.5	.7	4.8	7.6	5.3	2.7	2.6	2.3	-4.4	5.1	3.2	1.4
Previous Tealbook[5]	*-47.1*	*48.8*	*9.2*	*2.9*	*2.6*	*6.8*	*7.1*	*4.0*	*2.6*	*2.8*	*2.5*	*-5.0*	*4.8*	*3.0*	*2.1*
Capacity utilization rate - mfg.[3]	63.1	70.3	71.8	73.2	73.4	74.4	75.9	76.9	77.4	77.9	78.4	71.8	75.9	78.4	79.2
Previous Tealbook[3]	*63.1*	*69.7*	*71.4*	*71.9*	*72.4*	*73.7*	*74.9*	*75.6*	*76.1*	*76.6*	*77.0*	*71.4*	*74.9*	*77.0*	*78.3*
Housing starts[6]	1.1	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.4	1.6	1.7	1.7
Light motor vehicle sales[6]	11.3	15.4	16.3	16.8	17.3	17.3	17.0	17.0	16.8	16.8	16.8	14.5	17.1	16.8	16.8
Income and saving															
Nominal GDP[5]	-32.8	36.0	5.6	3.0	3.0	6.7	9.1	6.7	5.6	5.1	4.9	-1.7	5.4	5.6	4.6
Real disposable pers. income[5]	46.6	-20.0	-9.8	-5.5	-2.2	1.6	2.3	4.3	2.6	3.0	1.7	2.1	-1.0	2.9	2.4
Previous Tealbook[5]	*47.1*	*-20.1*	*11.7*	*-16.9*	*-7.8*	*3.2*	*1.5*	*4.4*	*2.7*	*2.9*	*2.4*	*7.7*	*-5.3*	*3.1*	*2.8*
Personal saving rate[3]	25.7	14.9	12.2	11.1	10.9	10.3	8.8	8.6	8.2	8.0	7.6	12.2	8.8	7.6	7.0
Previous Tealbook[3]	*26.0*	*15.5*	*17.0*	*13.1*	*11.1*	*10.1*	*8.8*	*9.0*	*8.8*	*8.8*	*8.7*	*17.0*	*8.8*	*8.7*	*8.6*
Corporate profits[7]	-35.2	63.9	.0	.0	-15.0	25.6	31.7	14.4	8.0	-.2	-.1	-10.6	8.9	5.4	2.4
Profit share of GNP[3]	9.3	9.7	9.6	9.5	9.1	9.4	9.9	10.1	10.1	10.0	9.9	9.6	9.9	9.9	9.7
Gross national saving rate[3]	16.7	17.3	17.8	18.5	18.8	18.7	18.3	18.3	18.4	18.4	18.4	17.8	18.3	18.4	18.7
Net national saving rate[3]	-1.5	1.2	1.6	2.2	2.8	2.6	2.3	2.6	2.8	2.8	2.8	1.6	2.3	2.8	3.1

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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Employment and production										
Nonfarm payroll employment[1]	250	227	195	176	193	178	-670	467	362	271
Unemployment rate[2]	5.7	5.0	4.8	4.1	3.8	3.5	7.2	5.2	3.7	3.1
Previous Tealbook[2]	*5.7*	*5.0*	*4.8*	*4.1*	*3.8*	*3.5*	*7.4*	*4.9*	*3.8*	*3.2*
Natural rate of unemployment[2]	5.1	4.9	4.8	4.6	4.5	4.3	5.6	4.7	4.5	4.3
Previous Tealbook[2]	*5.1*	*4.9*	*4.8*	*4.6*	*4.5*	*4.3*	*5.6*	*4.7*	*4.5*	*4.3*
Employment-to-Population Ratio[2]	59.3	59.4	59.7	60.1	60.6	61.0	57.2	59.1	60.4	60.9
Employment-to-Population Trend[2]	60.3	60.2	60.2	60.2	60.2	60.3	58.6	59.7	59.8	59.9
Output gap[3]	-1.0	-.5	-.3	.6	1.3	1.5	-.9	.0	1.7	2.4
Previous Tealbook[3]	*-1.0*	*-.5*	*-.3*	*.6*	*1.3*	*1.5*	*-1.3*	*.3*	*1.5*	*2.3*
Industrial production	3.4	-3.4	-.3	3.6	4.0	-.7	-5.7	4.4	2.9	1.3
Previous Tealbook	*3.4*	*-3.4*	*-.3*	*3.6*	*4.0*	*-.7*	*-6.4*	*4.3*	*2.6*	*1.8*
Manufacturing industr. prod.	1.4	-1.7	.3	2.5	2.2	-1.2	-4.4	5.1	3.2	1.4
Previous Tealbook	*1.4*	*-1.7*	*.3*	*2.5*	*2.2*	*-1.2*	*-5.0*	*4.8*	*3.0*	*2.1*
Capacity utilization rate - mfg.[2]	75.8	74.9	74.2	75.8	77.0	75.0	71.8	75.9	78.4	79.2
Previous Tealbook[2]	*75.8*	*74.9*	*74.2*	*75.8*	*77.0*	*75.0*	*71.4*	*74.9*	*77.0*	*78.3*
Housing starts[4]	1.0	1.1	1.2	1.2	1.2	1.3	1.4	1.6	1.7	1.7
Light motor vehicle sales[4]	16.5	17.4	17.5	17.1	17.2	17.0	14.5	17.1	16.8	16.8
Income and saving										
Nominal GDP	4.5	3.0	3.6	4.8	4.9	4.0	-1.7	5.4	5.6	4.6
Real disposable pers. income	5.3	3.1	1.8	3.4	3.7	1.6	2.1	-1.0	2.9	2.4
Previous Tealbook	*5.3*	*3.1*	*1.8*	*3.4*	*3.7*	*1.6*	*7.7*	*-5.3*	*3.1*	*2.8*
Personal saving rate[2]	7.5	7.4	6.6	7.0	8.1	7.3	12.2	8.8	7.6	7.0
Previous Tealbook[2]	*7.5*	*7.4*	*6.6*	*7.0*	*8.1*	*7.3*	*17.0*	*8.8*	*8.7*	*8.6*
Corporate profits[5]	6.7	-10.9	5.4	5.1	5.9	1.3	-10.6	8.9	5.4	2.4
Profit share of GNP[2]	12.1	10.5	10.6	10.6	10.8	10.5	9.6	9.9	9.9	9.7
Gross national saving rate[2]	20.3	19.4	18.4	18.8	18.7	18.4	17.8	18.3	18.4	18.7
Net national saving rate[2]	5.4	4.4	3.2	3.8	3.6	3.1	1.6	2.3	2.8	3.1

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	2018	2019	2020	2021	2022	2023	2020 Q2	2020 Q3	2020 Q4	2021 Q1
Unified federal budget[1]					Nominal dollars, billions					
Receipts	3,330	3,462	3,420	3,488	3,702	3,847	657	1,160	797	753
Outlays	4,109	4,447	6,552	5,028	4,916	5,057	2,657	1,548	1,421	1,260
Surplus/deficit	-779	-984	-3,132	-1,540	-1,215	-1,209	-2,001	-388	-624	-507
					Percent of GDP					
Surplus/deficit	-3.8	-4.6	-14.9	-7.1	-5.3	-5.0	-37.9	-7.4	-12.0	-9.7
Previous Tealbook	*-3.8*	*-4.6*	*-16.5*	*-10.0*	*-6.2*	*-5.5*	*-37.9*	*-13.4*	*-20.3*	*-11.9*
Primary surplus/deficit	-2.2	-2.9	-13.3	-5.8	-4.1	-3.8	-36.4	-6.2	-10.2	-8.3
Net interest	1.6	1.8	1.6	1.4	1.2	1.2	1.5	1.2	1.7	1.4
Cyclically adjusted surplus/deficit	-4.2	-5.3	-14.1	-6.3	-5.5	-6.0	-35.0	-5.6	-11.7	-8.7
Federal debt held by public	77.3	79.2	100.2	100.2	99.0	99.6	97.3	100.2	100.3	102.2
Government in the NIPA[2]					Real percent change, annual rate					
Purchases	1.5	3.0	1.3	.9	-.2	-.2	2.5	1.9	-.6	.6
Consumption	1.5	2.1	1.1	1.0	-.5	-.7	3.5	2.1	-.9	.6
Investment	1.6	6.8	1.9	.8	1.0	2.0	-.9	1.0	1.0	.8
State and local construction	-3.0	7.5	4.3	-2.0	-1.6	-.2	.7	.0	.2	-2.0
Real disposable personal income	3.7	1.6	2.1	-1.0	2.9	2.4	46.6	-20.0	-9.8	-5.6
Contribution from transfers[3]	.4	.7	3.4	-1.8	.4	.5	59.1	-31.1	-12.4	-3.7
Contribution from taxes[3]	.3	-.8	.5	-.5	-1.2	-.9	5.1	-2.2	.2	.0
Government employment					Average net change in monthly payrolls, thousands					
Federal	1	3	3	1	1	1	-1	82	-81	1
State and local	8	12	-86	39	38	36	-469	80	40	25
Fiscal indicators[2]					Percentage point contribution to change in real GDP, annual rate					
Fiscal effect (FE)[4]	.4	.9	5.4	-3.4	-.2	-.1	17.7	3.8	-.8	-5.3
Discretionary policy actions (FI)	.6	.8	3.8	-2.7	-.2	.0	13.4	1.2	-.1	-4.1
Previous Tealbook	*.6*	*.8*	*4.7*	*-3.6*	*-.4*	*.1*	*13.7*	*.9*	*3.8*	*-5.1*
Federal purchases	.2	.3	.5	.1	-.1	-.1	1.4	1.0	.2	.1
State and local purchases	.1	.2	-.3	.1	.1	.1	-.1	-.1	-.3	.0
Taxes and transfers	.3	.3	3.5	-2.9	-.2	.0	12.9	.9	.0	-4.2
Cyclical	-.1	-.1	1.0	-.4	-.4	-.2	2.9	1.4	-.6	-1.3
Other	-.1	.2	.6	-.2	.4	.2	1.4	1.2	-.2	.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	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3	2022 Q4
	Projected											
***Real GDP*[1]**												
Total foreign	-10.9	-34.4	36.5	6.5	4.7	4.4	4.6	4.1	3.2	2.9	2.8	2.8
Previous Tealbook	*-10.8*	*-34.7*	*30.5*	*9.7*	*6.5*	*5.5*	*4.2*	*3.5*	*3.0*	*2.9*	*2.8*	*2.8*
Advanced foreign economies	-9.4	-39.1	42.6	4.3	3.7	4.3	5.2	4.4	3.0	2.4	2.3	2.3
Canada	-8.2	-38.7	45.5	4.5	4.5	4.9	3.9	3.2	2.7	2.6	2.5	2.5
Japan	-2.3	-28.1	10.2	7.7	7.0	2.8	4.2	2.5	1.4	1.1	1.1	1.1
United Kingdom	-9.7	-58.7	78.6	5.6	1.0	2.4	5.3	6.2	3.2	2.2	2.1	2.1
Euro area	-14.1	-39.5	50.1	2.5	2.0	4.3	7.4	6.3	3.7	2.5	2.3	2.3
Germany	-7.8	-33.5	34.0	3.8	2.6	2.9	6.0	5.2	3.4	2.4	2.3	2.3
Emerging market economies	-12.4	-29.2	30.7	8.9	5.8	4.6	4.1	3.7	3.4	3.4	3.3	3.3
Asia	-19.3	-2.6	16.4	10.5	7.5	6.0	5.4	4.9	4.5	4.3	4.2	4.2
Korea	-5.0	-12.0	5.0	7.4	6.5	5.5	4.0	3.0	2.3	2.3	2.3	2.3
China	-36.3	59.1	13.1	10.2	6.0	5.7	5.7	5.6	5.6	5.6	5.5	5.5
Latin America	-5.0	-50.4	50.6	7.0	3.8	3.2	2.6	2.4	2.3	2.3	2.4	2.4
Mexico	-4.6	-52.7	56.0	6.0	4.0	3.0	2.5	2.2	2.2	2.2	2.2	2.2
Brazil	-9.5	-33.5	36.0	4.0	.0	3.0	3.0	3.0	2.8	2.8	2.8	2.8
Addendum												
Emerging market economies ex. China	-6.4	-40.2	34.7	8.6	5.7	4.4	3.7	3.3	3.0	2.9	2.9	2.9
***Consumer prices*[2]**												
Total foreign	2.3	-2.2	2.7	1.8	2.0	2.2	2.1	2.2	2.2	2.2	2.2	2.2
Previous Tealbook	*2.4*	*-2.2*	*2.7*	*1.5*	*2.0*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.2*	*2.2*
Advanced foreign economies	.6	-2.0	1.0	1.1	.9	1.1	1.1	1.2	1.2	1.2	1.3	1.3
Canada	.5	-3.3	2.9	1.8	1.4	1.5	1.6	1.8	1.8	1.8	1.9	1.9
Japan	.3	-1.0	1.0	.7	.2	.3	.4	.5	.5	.6	.6	.7
United Kingdom	1.9	-1.5	1.5	1.0	1.6	3.8	1.5	1.4	1.7	1.8	1.8	1.8
Euro area	.6	-1.4	-.4	.9	.8	.9	1.0	1.1	1.1	1.1	1.1	1.1
Germany	1.5	-1.0	-2.8	1.0	1.0	1.2	1.3	1.4	1.5	1.5	1.5	1.5
Emerging market economies	3.6	-2.2	3.9	2.2	2.7	2.8	2.9	2.9	2.8	2.8	2.9	2.9
Asia	3.6	-4.0	2.8	1.7	2.3	2.5	2.6	2.6	2.6	2.6	2.6	2.6
Korea	1.6	-3.2	2.5	2.4	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
China	4.2	-4.3	2.3	1.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Latin America	3.8	1.9	6.8	3.6	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5
Mexico	3.3	2.0	7.1	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Brazil	4.9	-1.6	3.9	4.8	3.7	3.7	3.7	3.7	3.6	3.5	3.5	3.5
Addendum												
Emerging market economies ex. China	3.1	-.8	5.1	2.8	2.8	3.1	3.1	3.1	3.0	3.0	3.1	3.1

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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
							----------Projected----------			
Real GDP[1]										
Total foreign	2.9	2.1	2.9	3.2	2.1	1.3	-4.0	4.5	2.9	2.8
Previous Tealbook	*3.0*	*2.1*	*2.8*	*3.3*	*2.1*	*1.3*	*-4.5*	*4.9*	*2.9*	*2.8*
Advanced foreign economies	2.0	.9	1.8	2.9	1.4	1.1	-4.8	4.4	2.5	2.2
Canada	2.8	-.4	1.7	3.2	1.8	1.5	-3.8	4.1	2.6	2.5
Japan	-.4	1.0	1.2	2.6	-.3	-.7	-4.4	4.1	1.2	1.1
United Kingdom	2.6	2.4	1.6	1.6	1.2	1.0	-8.4	3.7	2.4	2.1
Euro area	1.5	2.0	2.0	3.1	1.2	1.0	-5.4	5.0	2.7	2.2
Germany	2.3	1.1	1.9	3.6	.3	.4	-3.9	4.2	2.6	2.2
Emerging market economies	3.8	3.2	3.9	3.6	2.8	1.4	-3.1	4.5	3.4	3.3
Asia	5.2	4.7	5.3	5.4	4.4	3.1	.3	6.0	4.3	4.1
Korea	2.6	3.5	2.6	2.9	3.2	2.4	-1.5	4.7	2.3	2.3
China	7.3	6.9	6.9	6.9	6.5	5.9	6.0	5.7	5.5	5.4
Latin America	2.7	1.8	2.4	1.9	1.1	-.4	-6.6	3.0	2.3	2.3
Mexico	3.4	2.7	3.1	1.8	1.2	-.8	-7.0	2.9	2.2	2.2
Brazil	-.2	-5.5	-1.8	2.4	.8	1.6	-3.9	2.2	2.8	2.6
Addendum										
Emerging market economies ex. China	3.0	2.4	3.3	2.8	2.1	.5	-4.9	4.3	2.9	2.8
Consumer prices[2]										
Total foreign	2.0	1.4	1.9	2.5	2.4	2.4	1.2	2.1	2.2	2.3
Previous Tealbook	*2.0*	*1.4*	*1.9*	*2.5*	*2.4*	*2.4*	*1.1*	*2.1*	*2.2*	*2.3*
Advanced foreign economies	1.2	.5	.9	1.5	1.8	1.2	.2	1.1	1.3	1.4
Canada	2.0	1.3	1.4	1.8	2.1	2.1	.5	1.6	1.8	2.0
Japan	2.5	.1	.3	.6	.8	.5	.2	.4	.6	.8
United Kingdom	.9	.1	1.2	3.0	2.3	1.4	.7	2.1	1.7	1.9
Euro area	.2	.3	.7	1.4	1.9	1.0	-.1	.9	1.1	1.3
Germany	.4	.5	1.0	1.6	2.1	1.2	-.3	1.2	1.5	1.5
Emerging market economies	2.6	2.0	2.6	3.2	2.9	3.3	1.8	2.8	2.8	2.9
Asia	1.8	1.5	2.1	2.0	2.0	3.3	1.0	2.5	2.6	2.7
Korea	1.0	.9	1.4	1.4	1.7	.3	.8	2.1	2.1	2.1
China	1.5	1.4	2.1	1.7	2.1	4.2	.9	2.5	2.5	2.5
Latin America	4.7	3.2	4.0	6.3	5.0	3.3	4.0	3.6	3.5	3.4
Mexico	4.2	2.3	3.2	6.6	4.8	2.9	3.9	3.2	3.2	3.2
Brazil	6.5	10.4	7.1	2.8	4.1	3.4	3.0	3.7	3.5	3.5
Addendum										
Emerging market economies ex. China	3.5	2.3	3.0	4.2	3.4	2.6	2.5	3.0	3.1	3.2

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

	2020				2021				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Billions of dollars, s.a.a.r.											
U.S. current account balance	**-446.1**	**-682.2**	**-818.9**	**-779.6**	**-748.2**	**-697.1**	**-730.5**	**-795.9**	**-843.5**	**-837.4**	**-852.5**	**-867.9**
Previous Tealbook	*-446.5*	*-694.8*	*-837.5*	*-745.6*	*-670.2*	*-624.7*	*-674.2*	*-741.5*	*-773.9*	*-765.4*	*-788.8*	*-803.0*
Current account as percent of GDP	-2.1	-3.5	-3.9	-3.6	-3.5	-3.2	-3.3	-3.5	-3.7	-3.6	-3.6	-3.6
Previous Tealbook	*-2.1*	*-3.6*	*-4.0*	*-3.5*	*-3.1*	*-2.9*	*-3.1*	*-3.3*	*-3.4*	*-3.3*	*-3.4*	*-3.4*
Net goods & services	-505.9	-659.6	-791.2	-748.3	-742.9	-721.2	-742.3	-791.8	-834.9	-837.0	-857.2	-883.9
Investment income, net	220.0	125.4	123.0	121.2	149.4	172.1	162.5	148.5	146.1	147.6	155.5	168.7
Direct, net	306.1	268.3	237.0	227.3	249.4	265.6	252.8	238.1	236.2	240.0	251.6	270.1
Portfolio, net	-86.0	-142.9	-114.0	-106.0	-99.9	-93.5	-90.3	-89.6	-90.1	-92.4	-96.1	-101.5
Other income and transfers, net	-160.2	-148.0	-150.7	-152.6	-154.7	-148.0	-150.7	-152.6	-154.7	-148.0	-150.7	-152.6

Annual Data

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	Billions of dollars									
U.S. current account balance	**-367.8**	**-407.4**	**-394.9**	**-365.3**	**-449.7**	**-480.2**	**-681.7**	**-742.9**	**-850.3**	**-860.5**
Previous Tealbook	*-367.8*	*-407.4*	*-394.9*	*-365.3*	*-449.7*	*-480.2*	*-681.1*	*-677.6*	*-782.8*	*-806.2*
Current account as percent of GDP	-2.1	-2.2	-2.1	-1.9	-2.2	-2.2	-3.3	-3.4	-3.6	-3.5
Previous Tealbook	*-2.1*	*-2.2*	*-2.1*	*-1.9*	*-2.2*	*-2.2*	*-3.3*	*-3.1*	*-3.4*	*-3.3*
Net goods & services	-484.1	-491.3	-481.2	-513.8	-579.9	-576.9	-676.2	-749.6	-853.3	-909.0
Investment income, net	209.7	195.5	208.0	268.3	261.6	248.4	147.4	158.2	154.5	200.0
Direct, net	284.2	277.3	289.7	350.3	342.5	329.3	259.7	251.5	249.5	315.6
Portfolio, net	-74.5	-81.8	-81.7	-82.0	-80.8	-80.9	-112.2	-93.3	-95.0	-115.6
Other income and transfers, net	-93.4	-111.6	-121.7	-119.8	-131.4	-151.8	-152.9	-151.5	-151.5	-151.5

Abbreviations

ABS	asset-backed securities
ADAIT	asymmetric discounted average inflation targeting
AFE	advanced foreign economy
a.r.	annual rate
ASEAN	Association of Southeast Asian Nations
AUM	assets under management
BLS	Bureau of Labor Statistics
BOE	Bank of England
CARES Act	Coronavirus Aid, Relief, and Economic Security Act
CDS	credit default swap
C&I	commercial and industrial
CLO	collateralized loan obligation
CMBS	commercial mortgage-backed securities
COVID-19	coronavirus disease 2019
CP	commercial paper
CPI	consumer price index
CRE	commercial real estate
DAI	discounted average inflation
DSGE	dynamic stochastic general equilibrium
EB	extended benefit
ECB	European Central Bank
ECI	employment cost index
E&I	equipment and intellectual property products
ELB	effective lower bound
EME	emerging market economy

EPOP ratio	employment-to-population ratio
EU	European Union
FIMA	Federal Insurance and Mitigation Administration
FOMC	Federal Open Market Committee; also, the Committee
FRB/US	A large-scale macroeconometric model of the U.S. economy
FX	foreign exchange
GARCH	generalized autoregressive conditional heteroscedasticity
GDP	gross domestic
GSE	government-sponsored enterprise
G-SIB	global systemically important bank
IMF	International Monetary Fund
IPO	initial public offering
IT	information technology
LFPR	labor force participation rate
MBS	mortgage-backed securities
MMF	money market fund
OECD	Organisation for Economic Co-operation and Development
OIS	overnight index swap
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PMI	purchasing managers index
PPI	producer price index
PPP	Paycheck Protection Program
RRE	residential real estate
SEP	Summary of Economic Projections
SHED	Survey of Household Economics and Decisionmaking
SIGMA	A calibrated multicountry DSGE model

SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SME	small and medium-sized enterprise
SOMA	System Open Market Account
S&P	Standard & Poor's
STW	short-time work
TALF	Term Asset-Backed Securities Loan Facility
TFSME	Term Funding Scheme with additional incentives for small and medium-sized enterprises
TIPS	Treasury Inflation-Protected Securities
TLTRO III	targeted longer-term refinancing operations III
TSA	Transportation Security Administration
US-FLM	a DSGE model that features financial and labor market frictions
VAR	vector autoregression
VIX	one-month-ahead option-implied volatility on the S&P 500 index
WTO	World Trade Organization

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