

Prefatory Note

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Class I FOMC – Restricted Controlled (FR)

Report to the FOMC on Economic Conditions and Monetary Policy



Book B Monetary Policy Alternatives

September 12, 2019

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

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Monetary Policy Alternatives

The alternative policy statements presented below offer a range of options for the setting of the current stance of policy and for communications regarding the likely near-term path of monetary policy. Alternative B, like the Committee's July postmeeting statement, points to the implications of global developments for the economic outlook, along with muted inflation pressures, as reasons for a modest reduction in the level of the federal funds rate at this meeting. Under this alternative, the Committee would lower the target range for the federal funds rate by $\frac{1}{4}$ percentage point, and would note that this action supports its view that sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective remain the most likely outcomes. Even so, Alternative B acknowledges that uncertainties about the outlook remain. The Committee would continue to note that, as it "contemplates" the future path for the federal funds rates, it will "act as appropriate" to help attain its preferred outcomes.

Alternative C maintains the current target range for the federal funds rate. It expresses the view that the current stance of policy is consistent with sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective as the most likely outcomes, while acknowledging lingering uncertainties about this outlook. However, Alternative C alters significantly the policy message associated with the July FOMC meeting, dropping explicit reference to global developments and muted inflation pressures as having implications for the Committee's outlook or for the appropriate path for policy. As in Alternative B, the text of Alternative C states that the Committee will "act as appropriate" to sustain its preferred outcomes as it "contemplates" future settings of the federal funds rate.

Alternative A gives an assessment of the incoming data that is much the same as Alternative B, except that market-based measures of inflation compensation are said to "have declined" in Alternative A. In describing the economic conditions expected to prevail in the period ahead, Alternative A has the same outlook as Alternative B—albeit conditioned on a more vigorous policy response. Specifically, under Alternative A the Committee would lower the target range for the federal funds rate by $\frac{1}{2}$ percentage point, citing inflation running "persistently" below 2 percent as a principal reason.

By removing the “contemplates” language, Alternative A also signals greater openness to additional reductions in the policy rate.

With regard to the specifics of the language in Alternatives A, B, and C:

- The assessment of the incoming data:
 - The three alternatives have identical descriptions of the incoming data with respect to the labor market and economic activity. In particular, all three continue to portray the labor market as strong, while noting that the unemployment rate remains low and that average job gains in recent months have been solid. They also describe growth in economic activity as “moderate,” characterize household spending as having risen at a strong pace, and note that business fixed investment and exports “have weakened.”
 - The alternatives continue to note that “overall inflation and inflation for items other than food and energy are running below 2 percent.” With regard to inflation expectations, Alternatives B and C say, as did the July statement, that market-based measures of inflation compensation “remain low.” By contrast, Alternative A asserts that inflation compensation has “declined.” All three alternatives continue to indicate that survey-based measures of longer-term inflation expectations are “little changed.”
- The outlook for economic activity and inflation:
 - The outlook for economic activity, the labor market, and inflation is the same under all three alternatives and is unchanged from the July FOMC statement. The three alternatives only differ in the paths for the target range of the federal funds rate that are regarded as appropriate to achieve the Committee’s objectives.
- For the current policy decision and the outlook for policy:
 - Alternative B lowers the target range for the federal funds rate by $\frac{1}{4}$ percentage point. The language associated with this action is otherwise unchanged from what appeared in the July postmeeting statement. Alternative A lowers the target range by $\frac{1}{2}$ percentage point while Alternative C leaves the target range unchanged.
 - Regarding the outlook for policy, Alternatives B and C retain the language from the July postmeeting statement that, as the Committee “contemplates the

future path” for the federal funds rate, it will “monitor” incoming information. The minutes of the July meeting indicated that the “contemplates” language was added to the statement “to underscore the Committee’s intention to carefully assess incoming information before deciding on future policy adjustments.” Hence by dropping the “contemplates” language and stating that the Committee will “closely monitor” the incoming data, Alternative A signals a greater likelihood that further accommodation may become appropriate. Finally, all three alternatives continue to state that the Committee “will act as appropriate” to achieve favorable outcomes.

JULY 2019 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in June indicates that the labor market remains strong and that economic activity has been rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although growth of household spending has picked up from earlier in the year, growth of business fixed investment has been soft. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In light of the implications of global developments for the economic outlook as well as muted inflation pressures, the Committee decided to lower the target range for the federal funds rate to 2 to 2-1/4 percent. This action supports the Committee's view that sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective are the most likely outcomes, but uncertainties about this outlook remain. As the Committee contemplates the future path of the target range for the federal funds rate, it will continue to monitor the implications of incoming information for the economic outlook and will act as appropriate to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.
3. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.
4. The Committee will conclude the reduction of its aggregate securities holdings in the System Open Market Account in August, two months earlier than previously indicated.

ALTERNATIVE A FOR SEPTEMBER 2019

1. Information received since the Federal Open Market Committee met in ~~June~~ **July** indicates that the labor market remains strong and that economic activity has been rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although ~~growth of~~ household spending has ~~picked up from earlier in the year, growth of~~ **been rising at a strong pace**, business fixed investment ~~has been soft~~ **and exports have weakened**. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation ~~remain low have declined~~; survey-based measures of longer-term inflation expectations are little changed.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In light of the implications of global developments for the economic outlook as well as ~~muted~~ inflation ~~pressures~~ **running persistently below 2 percent**, the Committee decided to lower the target range for the federal funds rate to ~~2 to 2-1/4~~ **1-1/2 to 1-3/4** percent. This action supports the Committee's view that sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective are the most likely outcomes, but uncertainties about this outlook remain. ~~As The Committee contemplates the future path of the target range for the federal funds rate, it will continue to~~ **closely** monitor the implications of incoming information for the economic outlook and will act as appropriate to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.
3. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.
4. ~~The Committee will conclude the reduction of its aggregate securities holdings in the System Open Market Account in August, two months earlier than previously indicated.~~

ALTERNATIVE B FOR SEPTEMBER 2019

1. Information received since the Federal Open Market Committee met in ~~June~~ **July** indicates that the labor market remains strong and that economic activity has been rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although ~~growth of~~ household spending has ~~picked up from earlier in the year, growth of~~ **been rising at a strong pace**, business fixed investment ~~has been soft~~ **and exports have weakened**. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In light of the implications of global developments for the economic outlook as well as muted inflation pressures, the Committee decided to lower the target range for the federal funds rate to **1-3/4 to 2 to 2 1/4** percent. This action supports the Committee's view that sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective are the most likely outcomes, but uncertainties about this outlook remain. As the Committee contemplates the future path of the target range for the federal funds rate, it will continue to monitor the implications of incoming information for the economic outlook and will act as appropriate to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.
3. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.
4. ~~The Committee will conclude the reduction of its aggregate securities holdings in the System Open Market Account in August, two months earlier than previously indicated.~~

ALTERNATIVE C FOR SEPTEMBER 2019

1. Information received since the Federal Open Market Committee met in ~~June~~ **July** indicates that the labor market remains strong and that economic activity has been rising at a moderate rate. Job gains have been solid, on average, in recent months, and the unemployment rate has remained low. Although ~~growth of~~ household spending has ~~picked up from earlier in the year, growth of~~ **been rising at a strong pace**, business fixed investment ~~has been soft~~ **and exports have weakened**. On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. In ~~light of the implications of global developments for the economic outlook as well as muted inflation pressures~~ **support of these goals**, the Committee decided to ~~lower~~ **maintain** the target range for the federal funds rate ~~to~~ **at** 2 to 2-1/4 percent. This action ~~supports~~ The Committee's **continues to** view that sustained expansion of economic activity, strong labor market conditions, and inflation near the Committee's symmetric 2 percent objective ~~are as~~ **as** the most likely outcomes, but uncertainties about this outlook remain. As the Committee contemplates the future path of the target range for the federal funds rate, it will continue to monitor the implications of incoming information for the economic outlook and will act as appropriate to sustain the expansion, with a strong labor market and inflation near its symmetric 2 percent objective.
3. In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.
4. ~~The Committee will conclude the reduction of its aggregate securities holdings in the System Open Market Account in August, two months earlier than previously indicated.~~

ECONOMIC CONDITIONS AND OUTLOOK

- The staff projects that real GDP growth will slow from about 2½ percent in the first half of 2019 to about 1¾ percent in the second half, despite notable strength in consumer spending.
- Resurgent trade tensions and weakness among foreign economies have adversely affected manufacturing, business fixed investment, and exports in the United States. According to the staff's assessment, uncertainty regarding trade policy and geopolitical events are sources of downward pressure on domestic real activity.
- Compared with the July Tealbook projection, the global outlook is weaker, the exchange value of the dollar is higher, corporate earnings expectations have declined, and equity prices are lower; these developments are only partly offset by lower interest rates and higher estimates of personal income. As a result, the medium-term Tealbook outlook is somewhat weaker than in July.
- The staff has reevaluated its assessment of the level of resource utilization, both in terms of the labor market and output. This reassessment leaves the output gap about ½ percentage point lower than it would have been, all else equal. Similarly, the staff has reduced its estimate of the natural rate of unemployment by 0.2 percentage point to 4.4 percent.
- Available data indicate that the labor market continued to tighten so far this year, but at a more gradual pace than in 2018.
 - Payrolls rose 130,000 in August, less than what the staff expected but still above the pace that the staff estimates to be consistent with no change in resource utilization. For the three months ending in August, payroll gains averaged 155,000 per month, down from a monthly average of 223,000 in 2018. With GDP projected to decelerate over the medium term, the staff expects payroll gains to slow.
 - The unemployment rate held steady at 3.7 percent in August, as anticipated, and is projected to remain at that rate through the end of the year. The labor force participation rate ticked up to 63.2 percent. Since the beginning of 2016, labor force participation has been remarkably stable at around 63 percent despite the demographically driven downward trend in participation over this period.

- Average hourly earnings rose 3.2 percent over the 12 months ending in August, and are projected to continue to grow at a similar pace over the coming months. The employment cost index for July increased 2.6 percent over the 12 months ending in June. Meanwhile, new data on compensation per hour show four-quarter growth of 4.4 percent through the second quarter of 2019, although some of this increase may be due to bonuses and the exercise of stock options.
- Inflation remains subdued despite the unemployment rate having run at or below 4 percent for well over a year.
 - Headline inflation has continued to run below the Committee's symmetric 2 percent objective and core PCE inflation has also been below 2 percent. On the whole, indicators for core inflation over the intermeeting period have come in close to staff expectations. Inflation is expected to move up later this year, as the effects of idiosyncratic and temporary factors that held down inflation earlier in the year dissipate and core inflation is temporarily boosted by the effects of tariff increases.
 - Core PCE prices increased 1.6 percent over the 12 months ending in July. The staff projects this measure of inflation to rise to 1.8 percent by October and remain at this level through the end of the year. Total PCE prices rose 1.4 percent over the 12 months ending in July and are forecast to move up at a 12-month pace of 1.6 percent in December, as notably lower consumer energy prices outweigh the anticipated increase in core inflation and an expected acceleration in food prices over the second half of the year.
 - With the acceleration in compensation per hour and folding in the data on productivity growth, unit labor costs are now estimated to have risen 2.6 percent over the four quarters ending in the second quarter of 2019, somewhat faster than the 1.9 percent rate posted for the same period a year earlier.
 - Survey-based measures of longer-term inflation expectations are little changed since the July FOMC meeting. Market-based measures of inflation compensation declined and are close to their lowest levels of this year.
- Financial market developments over most of the intermeeting period were dominated by resurgent trade policy uncertainty, global growth concerns, and expectations of more-accommodative monetary policy both domestically and abroad. Treasury yields

tumbled amid falling rates overseas and increased global demand for low-risk assets, with some bounce back in recent days.¹ Equity prices declined notably early in the intermeeting period but have made up much of those losses since that time.

- As of the close of Tealbook B, the yield curve had inverted for Treasury maturities ranging out to about four years.
- Statistical models used to estimate the probability of a recession within four quarters have generally shown increases in probabilities over the intermeeting period. The staff model that employs the spread between the 10-year and 3-month Treasury rates as the sole recession indicator shows a 66 percent probability as of the close of Tealbook A, while the model that uses a weighted average of a selection of conditioning variables gives a 45 percent probability. Probabilities from models that use the “excess bond premium” or the term premium, in addition to the yield spread, as well as models that are based principally on macroeconomic variables, show significantly lower probabilities.²
- Foreign GDP increased at about a 2 percent annual rate in the second quarter. The staff outlook is for foreign economic growth to be about flat over the second half of the year, before recovering modestly in 2020—a projection that is somewhat weaker than in the July Tealbook. The staff regards relatively benign resolutions of key uncertain developments on the international front as the most likely outcomes, but its assessment of downside risks has increased.³
- The staff continues to judge that the risks to its outlook for U.S. GDP growth are tilted to the downside over the next year, as well as further out. Uncertainties related to trade policies, Brexit negotiations, and foreign economic developments—along with the potential for adverse reactions in financial markets to these risks—could

¹ See the box, “Drivers of Recent Movements in Treasury Yields,” which appears in Tealbook A, for a discussion of the details and likely sources of the recent outsized movement in longer-term Treasury rates.

² See the exhibit “Assessment of Key Macroeconomic Risks” and discussion in the Risks and Uncertainty section of Tealbook A, pp. 81–82. The “excess bond premium” is the compensation in excess of the expected losses from default that investors demand in order to agree to hold risky corporate bonds. See Gilchrist and Zakrajšek (2012) for details.

³ Two of the alternative scenarios that appear in the Risks and Uncertainty section of Tealbook A explore the implications of unfavorable outcomes on the international front. One of these scenarios concerns Brexit while the other deals with trade tensions.

have significant negative effects on U.S. economic activity beyond those already incorporated into the staff outlook.

Monetary Policy Expectations and Uncertainty

Expectations for the path of the federal funds rate shifted down notably, on net, over the intermeeting period and were especially responsive to news related to international trade tensions. Financial market prices as well as results from the Desk's September surveys currently suggest a high likelihood of a 25-basis-point reduction in the target range for the federal funds rate at the September FOMC meeting.

Figure 1 shows the market-implied probability distribution of the federal funds rate following the September 2019 meeting, as derived from the most recent quotes on options prices and not adjusted for risk premiums. The distribution shifted to the left and ended the period placing about 65 percent odds on a 25-basis-point decline in the target range at the September meeting. However, the distribution also attached about 25 percent probability to a 50-basis-point reduction in the target range and about 10 percent odds to no change.¹ The corresponding average probability distribution from the September Desk surveys (figure 2) shows that survey respondents assigned on average around 15 percent probability to a 50 basis point reduction in the target range, 80 percent probability to a 25 basis point reduction, and a 5 percent probability to no change.

The option-implied probability distribution of the federal funds rate for the end of 2019 (figure 3) also shifted toward lower values. It currently suggests that the federal funds rate is most likely to end the year in the 1.5 to 1.75 percent range, although it also assigns considerable odds to the 1.25 to 1.5 percent range. Likewise, the corresponding year-end probability distribution from the September Desk surveys (figure 4) has shifted lower compared with the July surveys. It too is now centered on the 1.5 to 1.75 percent range, with respondents placing, on average, about 40 percent probability to that outcome, while assigning about 20 and 30 percent probability to the 1.25 to 1.5 and 1.75 to 2 percent ranges, respectively. The differences between the market-implied and survey-implied distribution likely reflect, in part, negative risk premiums and liquidity premiums embedded in the option quotes.

Figure 5 compares various measures of the expected federal funds rate path over the next few years. On net over the intermeeting period, financial market measures of the expected federal funds rate declined notably. A straight read of forward rates derived from overnight index swaps (the blue lines) declined by 17 and 22 basis points for end-2019 and end-2020, respectively. These unadjusted forward rates now

¹ Probabilities calculated from binomial tree models, such as Bloomberg's WIRP function, show a substantially smaller likelihood of a 50-basis-point cut at the September meeting. This is a result of WIRP's methodology using futures prices, which allows for the calculation of probabilities for only two alternative policy rate decisions at the next FOMC meeting. WIRP currently sets these to be either a 25- or a 50-basis-point rate cut, thereby ignoring any other possibilities. By contrast, while the option-implied distribution assigns higher probability to a 50-basis-point reduction at the September meeting, it also assigns probability to a third outcome of no change. For further details, see the memo to the Board by Dobrislav P. Dobrev, Don H. Kim and Marcel A. Priebsch (2019) "[Comparison of Market-Implied Federal Funds Rate Distributions](#)".

suggest that investors expect the federal funds rate to fall 53 basis points by the end of the current year and an additional 41 basis points in 2020. For comparison, the latest path from a staff term structure model that adjusts for term premiums (the purple lines), declined a bit less over the intermeeting period and now suggests that investors expect the federal funds rate to be 32 basis points lower by year-end and about unchanged in 2020. The expected path from an alternative macro-finance model of the federal funds rate (in green) lies closer to the unadjusted forward rate path, suggesting a decline of about 40 basis points by year-end and an additional 35 basis points in 2020. The modal path for the federal funds rate reported by the median respondent to the September Desk surveys (the brown diamonds) points to a 50 basis point decline in the target range by year-end, and then a flat path until the end of 2021.^{2,3}

Figure 6 shows market-based measures of monetary policy uncertainty at horizons of 6 and 18 months ahead as derived from option prices. Both of these measures have remained near the top of their ranges in recent years. The 6-month measure rose to a new multi-year high during the intermeeting period, suggesting increased uncertainty among market participants about the near-term path of monetary policy. Perhaps reflective of this uncertainty, respondents to the September Desk surveys assigned a nearly 40 percent probability to moving to the zero lower bound (ZLB) between now and end-2022 (figure 7). The reported probability of returning to the ZLB has been increasing since the middle of last year, although the increase between the September and July Desk surveys can likely be attributed in part to the extension of the forecast horizon through 2022.⁴

Figure 8 shows measures of the longer-run expected federal funds rate. A straight read of forward rates implied by Treasury yields suggests that investors' current expectation for the average federal funds rate 5 to 10 years ahead (the blue line) declined sharply over the intermeeting period to a level of about 1.9 percent.⁵ Adjusting for term premiums using various staff term structure models (with the light-

² According to the survey responses, the most likely timing of declines in the target range during the remainder of this year are the September and December FOMC meetings, each with a 25 basis point reduction. This represents an additional 25 basis-point decline compared to the July surveys when the modal expectations beyond the July FOMC meeting were for a single 25 basis point reduction at the September FOMC meeting and no change thereafter. Likewise, the consensus forecasts by survey respondents in the September Blue Chip Financial Forecasts survey similarly showed that the level of the federal funds rate for the fourth quarter of 2019 (as well as the first quarter of 2020) had shifted down by 20 basis points compared to the August Blue Chip survey.

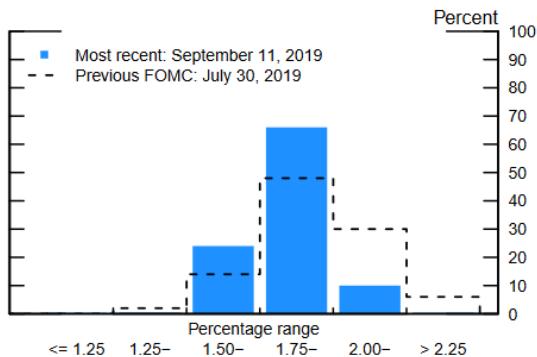
³ One anomaly in the September Desk surveys is that the median response implies a 25-basis-point increase in the target range in the first half of 2022 that subsequently reverses in the second half of 2022. At both of these forecast horizons, the median response appears particularly sensitive and would have shifted in reaction to a change in a single respondent's projection.

⁴ A market-based measure of the probability of moving to the ZLB or lower, as derived from options on Eurodollar futures contracts (not shown), has also increased notably since mid-2019.

⁵ See the box "Drivers of Recent Movements in Treasury Yields" in the Financial Markets chapter of Tealbook A for a detailed analysis of the intermeeting moves in short- and longer-dated Treasury yields.

red-shaded region showing a range of three such model estimates) indicates a somewhat smaller decline in the 5-to-10-year-ahead expectation for the federal funds rate to between 2.8 and 3.0 percent. These smaller moves are consistent with a term premium at those horizons that has moved deeper into negative territory. The model-based projections lie fairly close to the longer-run forecasts from the Blue Chip and Desk surveys (the yellow and green diamonds, respectively).

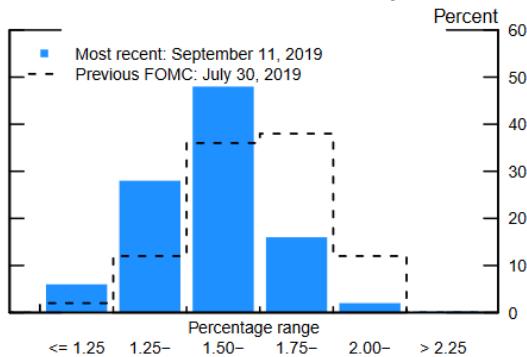
Figure 1: Market-Implied Probability Distribution of the Federal Funds Rate in October 2019



Note: Estimated from federal funds futures options, not adjusted for risk premiums. The distribution for October 2019 is used to provide a read on the distribution following the September FOMC meeting.

Source: CME Group, Board staff calculations.

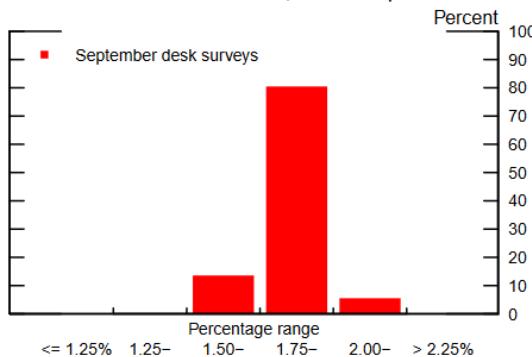
Figure 3: Market-Implied Probability Distribution of the Federal Funds Rate in January 2020



Note: Estimated from federal funds futures options, not adjusted for risk premiums. The distribution for January 2020 is used to provide a read on the distribution at the end of 2019.

Source: CME Group, Board staff calculations.

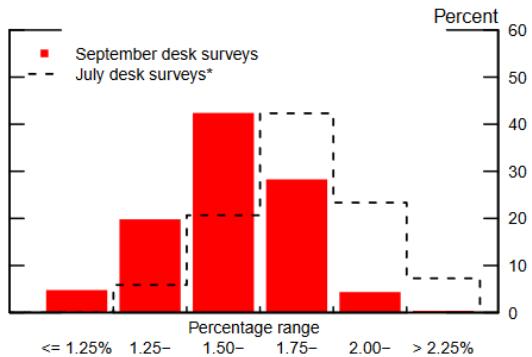
Figure 2: Desk Surveys Average Probability Distribution of the Federal Funds Rate, Post-September FOMC



Note: Probabilities are the averages of the probabilities assigned by respondents to different ranges of the federal funds rate at the end of 2019.

Source: FRBNY

Figure 4: Desk Surveys Average Probability Distribution of the Federal Funds Rate, Year-End 2019

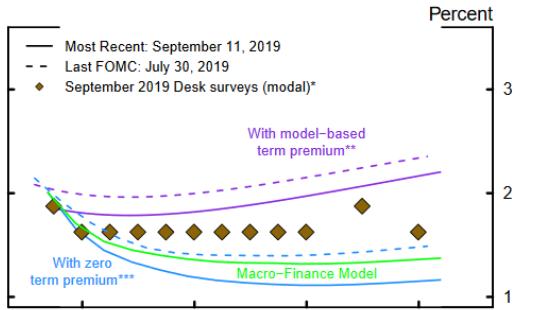


Note: Probabilities are the averages of the probabilities assigned by respondents to different ranges of the federal funds rate following the September FOMC meeting.

* The July desk surveys asked for the probability of the target rate or range falling in the range of 1.50 percent or less. For comparison with the more granular September surveys, this probability is here solely attributed to the 1.25-1.50 percent range.

Source: FRBNY

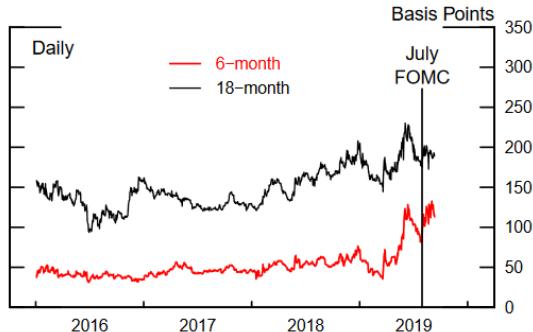
Figure 5: Federal Funds Rate Projections



* Median of respondents' modal paths for the federal funds rate.
 ** Adjusting for premiums using a term structure model maintained by Board staff.
 *** Estimated using overnight index swap quotes with a spline approach and a term premium of zero basis points.

Source: Bloomberg; Federal Reserve Board staff estimates, FRBNY.

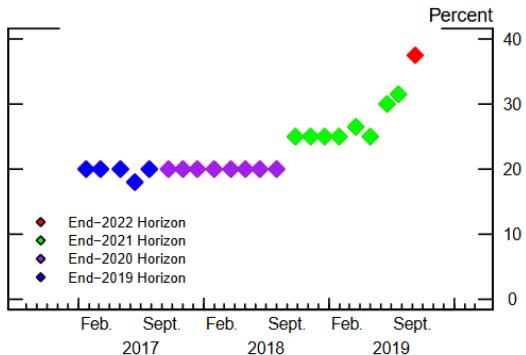
Figure 6: Measures of Monetary Policy Uncertainty



Note: Computed as the width of the 90-percent confidence interval of the market-implied federal funds rate distribution at each horizon. The distribution is estimated from Eurodollar futures options, accounting for the difference in the volatilities of LIBOR and the federal funds rate.

Source: CME; Federal Reserve Board staff estimates.

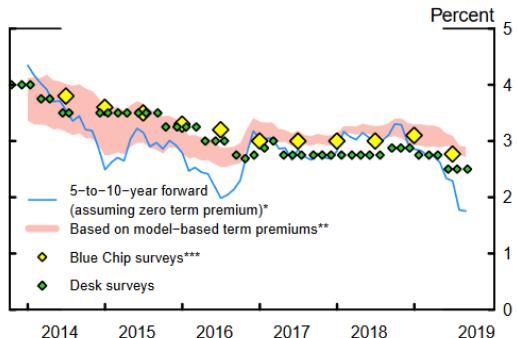
Figure 7: Probability of Returning to the Zero Lower Bound*



* The Desk surveys ask for the probability of moving to the zero lower bound at some point between the date of the survey and the end of the indicated horizon.

Source: FRBNY.

Figure 8: Measures of Longer-Run Federal Funds Rate Expectations



* Monthly average 5-to-10-year forward rate derived from prices of Treasury securities.

** Monthly average 5-to-10-year forward rate adjusted for three alternative model-based term premium estimates using Kim and Wright (2005), D'Amico, Kim, and Wei (2018), and Kim and Priebsch (2019).

*** Most recent long-run survey value is from the June 2019 Blue Chip survey.

Note: Forward rates and term structure model estimates for September 2019 are based on values through September 11.

Source: Blue Chip; FRBNY; Federal Reserve Board staff estimates.

THE CASE FOR ALTERNATIVE B

Over the course of the year, trade policy tensions have mounted and global growth has weakened, materially affecting the U.S. economy. These factors and uncertainties surrounding them continue to pose risks to the economic outlook. The period since the Committee met at the end of July has featured “more of the same,” with some further deterioration in the global outlook, increased trade policy uncertainty and some tightening in financial market conditions.

Economic activity expanded at a solid pace during the first half of this year, but at present the expansion owes mainly to strong household spending, with business fixed investment and exports increasingly showing the effects of weaker foreign growth and trade uncertainties. Financial markets reacted strongly to news over the intermeeting period about trade and other global developments. With bond yields falling significantly over the last few months not just in the United States, but globally, policymakers may be alert to downside risks.

Policymakers might note the toll that trade and international factors have already taken on the U.S. economy, with decelerating business fixed investment and exports over the past year, on balance, culminating in outright declines in the second quarter, and with growth in manufacturing output having turned negative.⁴ At the same time, with inflation pressures still muted, and continuing indications of low longer-term inflation expectations, policymakers may be concerned that inflation is taking too long to return to the Committee’s symmetric 2 percent objective on a sustained basis. In these circumstances, policymakers may determine that a second, modest easing in the stance of monetary policy this year is appropriate.

Under Alternative B, policymakers would communicate much the same message regarding the rationale for their policy action as they did in the July statement. Indeed, the text of Alternative B differs very little from the July postmeeting statement. In particular, they would continue to state that, “in light of the implications of global developments for the economic outlook as well as muted inflation pressures,” the Committee would lower the target range for the federal funds rate to 1½ to 2 percent.

⁴ For a discussion of the connection between global trade tensions, manufacturing output and business fixed investment in a global context see the box “Weakness in the Global Manufacturing Sector” in the International Economic Developments and Outlook section of Tealbook A, pp. 40-41.

Policymakers may judge that there is little discernible upward pressure on price inflation, with nominal wage growth remaining moderate, despite the fact that labor market conditions remain strong—including the very low unemployment rate and solid job gains in recent months. Alternatively, they may regard the effects of resource utilization on price inflation as too modest to be of concern.

Even though data for the last few months on consumer prices excluding food and energy have been firmer than readings from earlier in the year, inflation has continued to run below the Committee's 2 percent objective. In addition, indicators of longer-term inflation expectations remain low, with market-based measures of inflation compensation having declined over the intermeeting period. To the extent that policymakers fear that a continued shortfall of inflation could result in a deterioration in inflation expectations, they may choose a somewhat more accommodative monetary policy stance, along the lines of Alternative B, to forestall that outcome.

Policymakers may also concur with the staff view that the risks to the outlook for economic activity and inflation are weighted to the downside mostly because of trade policy uncertainty and concerns about global growth. They might observe that several staff models suggest that the probability of recession within a year show higher probabilities than earlier in the year. On that basis, policymakers may judge that the risks to the outlook warrant the provision of additional accommodation in the near term on risk-management grounds. They might also note the asymmetry associated with those risks: Should the risks abate, and economic activity and inflation turn out to be stronger than expected, the Committee would have the means to manage that situation with changes in the policy rate, whereas the converse is less likely to be true in light of the proximity of the policy rate to its effective lower bound.

Should policymakers choose policy communications along the lines of Alternative B, financial market responses would likely be relatively modest. Market prices and responses to the Desk's latest surveys of primary dealers and market participants currently indicate that a reduction in the target range by 25 basis points at the September meeting is widely viewed as the most likely outcome. The nearly unchanged language associated with the rate cut would probably be viewed as in line with market participants' perceptions of the outlook for policy.

THE CASE FOR ALTERNATIVE C

If policymakers do not yet see much evidence that global developments are significantly degrading the economic outlook, they may prefer to maintain the current target range. Indeed, they might take some encouragement from recent indicators that suggest that the domestic economy as a whole has been resilient to economic disturbances affecting the trade-intensive manufacturing sector. Thus, they may also elect to omit the reference to “implications of global developments for the economic outlook” that appeared in the July postmeeting statement, as in Alternative C.

Policymakers may observe that, while overall output growth in the second quarter moderated, private domestic final purchases—usually regarded as a more reliable measure of underlying trends in aggregate spending—was stronger than staff had anticipated. They may expect that, with household spending picking up markedly from earlier in the year, growth will be near potential over the remainder of 2019. They may also take note of recent economic indicators, including still-healthy readings on consumer sentiment in August, strong light motor vehicle sales in August, and the solid gains in payroll employment and income in the last few months. These factors may lead policymakers to conclude that the solid economic outlook they project is consistent with maintaining current levels of monetary accommodation.

Policymakers may observe that the softness in inflation readings in the first half of the year appears to have been temporary, as they had expected. They may also note that compensation per hour for the first half of the year came in notably higher than expected and that the last several months’ observations for average hourly earnings have also been a bit stronger than consensus. Policymakers may therefore be increasingly confident that the usual channels connecting high levels of resource utilization to stronger wage growth and higher price inflation are beginning to manifest themselves. Policymakers may also perceive an increased likelihood that current and expected tariff-induced increases in prices will provide some lift to inflation, at least in the short run. In addition, they may judge that recent declines in market-based measures of inflation compensation were driven by safe haven flows of investment and therefore not indicative of lower expected inflation. They might therefore be confident that, under the current stance of monetary policy, inflation will rise to the Committee’s 2 percent objective over the medium term.

Policymakers may view current financial conditions as highly accommodative. They might note the magnitude of the easing in financial conditions so far this year, as exemplified by the approximately 1 percentage point decline in the 10-year Treasury rate since the start of the year, and argue that the effects of much of that easing have yet to show through to expenditures. They might further note that the volatility in financial markets in recent weeks has had little impact on financing conditions for corporations. They may view monetary policy and associated discussions as important determinants of financial conditions, irrespective of macroeconomic fundamentals, and be concerned about perceptions of a feedback loop between market expectations of monetary policy and policy itself. They might also note that, while some of the recession probability models reported by the staff and others show an increased likelihood of a recession in the next year, that inference may be fragile, as alternative models, which either include the excess bond premium or correct for unusually low term premiums, do not show particularly high recession probabilities.

Policymakers may regard persistently low interest rates and easy financial conditions more generally as exacerbating vulnerabilities to financial stability. For example, they may see valuation pressures in leveraged loan and commercial real estate markets as worryingly high or regard the recent outsized decline in longer-term interest rates around the world as indicative of a bond market bubble. Putting all these considerations together, they might judge that financial stability considerations strengthen the case for leaving the target range unchanged.

The policy action in Alternative C would be inconsistent with the widely-held market expectation of a reduction in the target range for the federal funds rate at the upcoming meeting. Consequently, Alternative C would likely result in a significant repricing in financial markets. Market expectations for the path of short-term interest rates would probably shift up. Equity prices and inflation compensation would likely fall. Although policymakers may view some revisions to market expectations as warranted, the apparent inconsistency of Alternative C with recent Federal Reserve communications could cause confusion among investors about the Committee's intentions.

THE CASE FOR ALTERNATIVE A

Policymakers may view risks to the economic outlook as significantly weighted to the downside, or worry about the ongoing weakness in inflation and inflation expectations. If so, they may deem it appropriate to provide a greater degree of monetary policy accommodation at this meeting than would be the case under Alternative B in order to sustain the economic expansion and achieve a durable return of inflation to the Committee's symmetric 2 percent objective. From a risk-management perspective, they may judge that a larger cut in the target range for the federal funds rate could help cushion the effects on the economy of possible adverse shocks. With Alternative A, policymakers would communicate that, in light of "the implications of global developments for the economic outlook as well as inflation running persistently below 2 percent," the Committee would reduce the target range by 50 basis points. Alternative A would also drop the "contemplate" language from the July statement and would say that the Committee intends to "closely monitor" incoming information, thereby indicating preparedness to make further adjustments to policy.

With inflation continuing to run persistently below the Committee's symmetric 2 percent objective, several survey-based measures of inflation expectations near the lower end of their historical ranges, and market-based measures of inflation compensation having declined further during the intermeeting period, policymakers may be concerned that inflation expectations have already moved below levels consistent with the Committee's 2 percent objective. They may therefore see significant risks that inflation could fail to return to 2 percent on a sustained basis. They may concur with the staff's reassessment that resource utilization is not as tight as conventionally thought and thus that the risk of an outbreak of inflation is low. They might also note the weak reading for private-sector job gains in the August payroll report and further argue that the preliminary benchmark revision to payrolls will reduce estimated payroll gains from April 2018 to March 2019 which, all else equal, suggests less price pressures in the pipeline than otherwise.⁵ They may judge that the string of underpredictions of the labor force participation rate by forecasters over the past few years indicates that the labor market has more room to run without inducing an undue increase in inflation. Policymakers might also argue that with longer-term inflation expectations as low as they

⁵ The Domestic Economic Developments and Outlook section of Tealbook A discusses the likely implications of these revisions, which are preliminary; the final revisions are not expected until February.

appear to be, it could be helpful if inflation were to move modestly above 2 percent for a time, as that could help re-center inflation expectations on the 2 percent objective.

Policymakers may judge that, in the absence of a countervailing policy response, current and prospective global developments and trade policy uncertainty and their financial market repercussions, will weigh heavily on the economic outlook. They may also judge that, with many policy authorities apparently not well positioned to provide support for worldwide demand, the global economy is in a fragile state. They may view the heightened sensitivity of asset prices to news as evidence of this fragility and judge that the ambiguities underlying the current situation are not likely to be resolved favorably any time soon. They might also point to recession-probability models that show a marked increase over recent months in the estimated likelihood of a recession in the next year. More generally, policymakers might regard the continued decline in bond yields, domestic and foreign, as a signal of a downward trend in the equilibrium real interest rate. In the same vein, they might judge that in light of the proximity of the policy rate to its effective lower bound, policymakers should act vigorously when confronted with such risks.

Current indications are that a statement such as Alternative A would likely be seen by market participants as implying a more accommodative path for the policy rate than had been anticipated, which together with the language of “inflation running persistently below 2 percent,” would likely induce market expectations for future settings of the federal funds rate to fall. If market participants interpreted Alternative A as a move to a more accommodative policy reaction function, then equity prices and inflation compensation would likely rise. The effect on the dollar would be ambiguous, with lower real rates and higher future inflation pointing to depreciation, but stronger economic activity suggesting the opposite. However in the event that market participants interpreted Alternative A as a bleaker reading of the outlook for activity and inflation than they had been expecting, equity prices would likely fall together with the exchange value of the dollar, and possibly inflation compensation.

IMPLEMENTATION NOTE

Draft implementation notes corresponding to each of the three Alternatives appear on the following pages. As usual, struck-out text indicates language deleted from the July directive and implementation note, bold red underlined text indicates added language, and blue underlined text indicates text that links to websites.

Implementation Note for September 2019 Alternative A

Release Date: September 18, 2019

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its statement on July 31, 2019 **September 18, 2019**:

- The Board of Governors of the Federal Reserve System voted [unanimously] to lower the interest rate paid on required and excess reserve balances to ~~2.10~~ **1.60** percent, effective ~~August 1, 2019~~ **September 19, 2019**.
- As part of its policy decision, the Federal Open Market Committee voted to authorize and direct the Open Market Desk at the Federal Reserve Bank of New York, until instructed otherwise, to execute transactions in the System Open Market Account in accordance with the following domestic policy directive:

“Effective ~~August 1, 2019~~ **September 19, 2019**, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of ~~2 to 2 1/4~~ **1-1/2 to 1-3/4** percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of ~~2.00~~ **1.50** percent, in amounts limited only by the value of Treasury securities held outright in the System Open Market Account that are available for such operations and by a per-counterparty limit of \$30 billion per day.

~~Effective August 1, 2019~~, The Committee directs the Desk to **continue** **rolling** over at auction all principal payments from the Federal Reserve’s holdings of Treasury securities and to **continue** **reinvesting** all principal payments from the Federal Reserve’s holdings of agency debt and agency mortgage-backed securities received during each calendar month. Principal payments from agency debt and agency mortgage-backed securities up to \$20 billion per month will **continue to** be reinvested in Treasury securities to roughly match the maturity composition of Treasury securities outstanding; principal payments in excess of \$20 billion per month will continue to be reinvested in agency mortgage-backed securities. Small deviations from these amounts for operational reasons are acceptable.

The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve’s agency mortgage-backed securities transactions.”

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve a 1/4 1/2 percentage point decrease in the primary credit rate to 2.75 2.25 percent, effective August 1, 2019 September 19, 2019. In taking this action, the Board approved requests to establish that rate submitted by the Boards of Directors of the Federal Reserve Banks of [...].

This information will be updated as appropriate to reflect decisions of the Federal Open Market Committee or the Board of Governors regarding details of the Federal Reserve's operational tools and approach used to implement monetary policy.

More information regarding open market operations and reinvestments may be found on the Federal Reserve Bank of New York's [website](#).

Implementation Note for September 2019 Alternative B

Release Date: September 18, 2019

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its statement on July 31, 2019 **September 18, 2019**:

- The Board of Governors of the Federal Reserve System voted [unanimously] to lower the interest rate paid on required and excess reserve balances to ~~2.10~~ **1.85** percent, effective ~~August 1, 2019~~ **September 19, 2019**.
- As part of its policy decision, the Federal Open Market Committee voted to authorize and direct the Open Market Desk at the Federal Reserve Bank of New York, until instructed otherwise, to execute transactions in the System Open Market Account in accordance with the following domestic policy directive:

~~Effective August 1, 2019~~ **September 19, 2019**, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of ~~1-3/4 to 2 to 2-1/4~~ percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of ~~2.00~~ **1.75** percent, in amounts limited only by the value of Treasury securities held outright in the System Open Market Account that are available for such operations and by a per-counterparty limit of \$30 billion per day.

~~Effective August 1, 2019~~, The Committee directs the Desk to continue rolling over at auction all principal payments from the Federal Reserve's holdings of Treasury securities and to continue reinvesting all principal payments from the Federal Reserve's holdings of agency debt and agency mortgage-backed securities received during each calendar month. Principal payments from agency debt and agency mortgage-backed securities up to \$20 billion per month will continue to be reinvested in Treasury securities to roughly match the maturity composition of Treasury securities outstanding; principal payments in excess of \$20 billion per month will continue to be reinvested in agency mortgage-backed securities. Small deviations from these amounts for operational reasons are acceptable.

The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions.”

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve a 1/4 percentage point decrease in the primary credit rate to ~~2.75~~ 2.50 percent, effective ~~August 1, 2019~~ September 19, 2019. In taking this action, the Board approved requests to establish that rate submitted by the Boards of Directors of the Federal Reserve Banks of [...].

This information will be updated as appropriate to reflect decisions of the Federal Open Market Committee or the Board of Governors regarding details of the Federal Reserve's operational tools and approach used to implement monetary policy.

More information regarding open market operations and reinvestments may be found on the Federal Reserve Bank of New York's [website](#).

Implementation Note for September 2019 Alternative C

Release Date: September 18, 2019

Decisions Regarding Monetary Policy Implementation

The Federal Reserve has made the following decisions to implement the monetary policy stance announced by the Federal Open Market Committee in its [statement](#) on July 31, 2019 **September 18, 2019**:

- The Board of Governors of the Federal Reserve System voted [unanimously] to lower **maintain** the interest rate paid on required and excess reserve balances to **at** 2.10 percent, effective August 1, 2019 **September 19, 2019**.
- As part of its policy decision, the Federal Open Market Committee voted to authorize and direct the Open Market Desk at the Federal Reserve Bank of New York, until instructed otherwise, to execute transactions in the System Open Market Account in accordance with the following domestic policy directive:

“Effective August 1, 2019 **September 19, 2019**, the Federal Open Market Committee directs the Desk to undertake open market operations as necessary to maintain the federal funds rate in a target range of 2 to 2-1/4 percent, including overnight reverse repurchase operations (and reverse repurchase operations with maturities of more than one day when necessary to accommodate weekend, holiday, or similar trading conventions) at an offering rate of 2.00 percent, in amounts limited only by the value of Treasury securities held outright in the System Open Market Account that are available for such operations and by a per-counterparty limit of \$30 billion per day.

Effective August 1, 2019, The Committee directs the Desk to **continue rolling** over at auction all principal payments from the Federal Reserve’s holdings of Treasury securities and to **continue reinvesting** all principal payments from the Federal Reserve’s holdings of agency debt and agency mortgage-backed securities received during each calendar month. Principal payments from agency debt and agency mortgage-backed securities up to \$20 billion per month will **continue to** be reinvested in Treasury securities to roughly match the maturity composition of Treasury securities outstanding; principal payments in excess of \$20 billion per month will continue to be reinvested in agency mortgage-backed securities. Small deviations from these amounts for operational reasons are acceptable.

The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve’s agency mortgage-backed securities transactions.”

- In a related action, the Board of Governors of the Federal Reserve System voted [unanimously] to approve a 1/4 percentage point decrease in **the establishment of** the primary credit rate to **at the existing level of** 2.75 percent, effective August 1, 2019. In taking this action, the Board approved requests to establish that rate submitted by the Boards of Directors of the Federal Reserve Banks of Philadelphia, Chicago, St. Louis, Dallas, and San Francisco.

This information will be updated as appropriate to reflect decisions of the Federal Open Market Committee or the Board of Governors regarding details of the Federal Reserve's operational tools and approach used to implement monetary policy.

More information regarding open market operations and reinvestments may be found on the Federal Reserve Bank of New York's [website](#).

Balance Sheet and Income Projections

The staff has prepared projections of the Federal Reserve's balance sheet and the associated income statement that are consistent with the projections in Tealbook A.¹

The September baseline projection includes paths for interest rates that are generally lower than in the July Tealbook. Through the end of 2021, the 10-year Treasury yield is, on average, about 45 basis points lower, while the path for the 30-year fixed mortgage rate was revised down roughly 40 basis points. These revisions imply higher agency MBS prepayment activity than projected in July, which in turn leads to more reinvestments into agency MBS in 2019 and 2020, as prepayments are expected to exceed reinvestment caps through the end of this year.

Reserve balances. Reserves are projected to decline over the fourth quarter, driven largely by forecasted increases in the Treasury General Account (TGA). In light of the resolution of the debt ceiling and Treasury's plans to rebuild the TGA, we expect the TGA to be roughly \$400 billion by year end, about \$120 billion higher than projected in the July Tealbook. Once the TGA is replenished to meet Treasury's stated target balance, reserves should decrease gradually reflecting growth in nonreserve liabilities.² We are now projecting that the level of reserves at the end of 2019 will be about \$160 billion lower than in the July Tealbook, and that it will remain generally near \$1.2 trillion through the first quarter of 2020.³ We continue to assume that once reserves reach \$1 trillion—which is currently projected to be at the beginning of the third quarter of 2021—they will begin growing in line with nominal GDP.⁴

¹ In this Tealbook, for convenience, we provide a comparison of our projections to those from the July Tealbook's alternative scenario labeled "Earlier End to Runoff," in which it was assumed that the reduction in total securities holdings would have concluded by August 1, as was subsequently decided by the FOMC at its July 30-31 meeting.

² We assume that liability items other than currency, reserves, and the TGA, such as the foreign repo pool and DFMU balances, grow in line with nominal GDP from the start of the projection period.

³ To account for the effects of Treasury debt management on the projected path of reserves, we incorporated the staff's near-term forecast for the TGA balances for the next two quarters. This assumption replaces that from the July Tealbook in which the TGA balance at the start of the projection period was set to the most recent three-month historical average, excluding those months within debt-limit episodes.

⁴ As discussed in the March FOMC memo "Transitioning to an Ample Reserves Regime with Lower Reserves," the actual level of reserves prevailing when the decline in reserves ceases is uncertain and will need to be determined in light of information regarding banks' reserve demand.

Evolution of the SOMA portfolio. Reinvestments into Treasury securities are expected to average roughly \$140 billion in the fourth quarter of 2019. Of this, \$80 billion will come from rollovers of maturing Treasury securities and roughly \$60 billion will come from redemptions of agency securities that are reinvested into Treasury securities (see the table in the exhibit titled “SOMA Reinvestments”). Reinvestments of principal payments from agency securities into MBS are estimated to be \$25 billion in 2019, and \$8 billion in 2020. For the last four months of 2019, reinvestments of agency securities into MBS are expected to be \$14 billion higher than in the July Tealbook as a result of the lower projected path for the mortgage rate. Through 2021, cumulative reinvestment into Treasury securities of principal payments from holdings of agency securities is expected to be about \$495 billion.

By the time the balance sheet runoff concluded at the end of July, the size of the SOMA portfolio was roughly \$3.6 trillion, consisting of about \$2.1 trillion of Treasury securities and \$1.5 trillion of agency securities (see the exhibit titled “Total Assets and Selected Balance Sheet Items”). The balance sheet is currently about 17 percent of nominal GDP, compared to about 5 percent over the decade prior to the crisis and a peak value of about 25 percent in the fourth quarter of 2014.⁵

The share of agency MBS in the SOMA portfolio, which currently stands at 42 percent, is expected to decline to about 16 percent by the end of 2025, slightly lower than the July projection (see the exhibit titled “Federal Reserve Balance Sheet Month-end Projections – September Tealbook”).

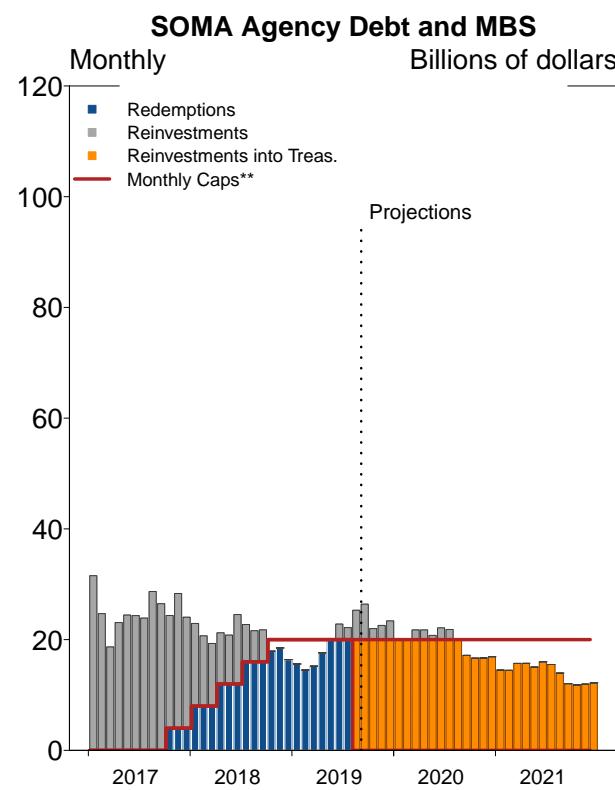
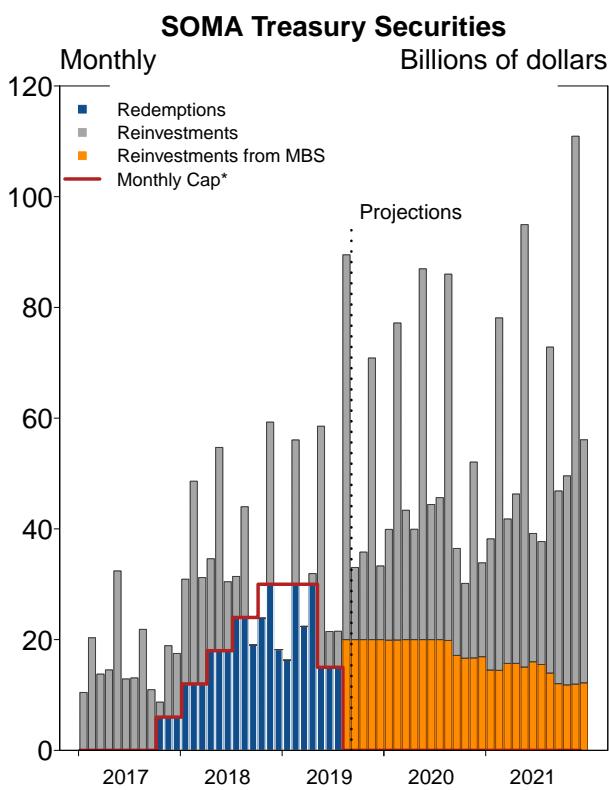
SOMA portfolio characteristics. The weighted-average duration of the SOMA Treasury portfolio is currently nearly seven years (see the top panel of the exhibit titled “Projections for the Characteristics of SOMA Treasury Securities Holdings”). Duration is projected to stay roughly constant until the decline in reserve balances ends and the SOMA portfolio begins to expand again.⁶ As in the July Tealbook, we assume that once the decline in reserve balances ends, rollovers of maturing Treasury securities will

⁵ Liabilities plus Federal Reserve Bank capital equals total assets, which include the SOMA securities portfolio and also items such as unamortized premiums and discounts, and other assets.

⁶ We assume that rollovers of maturing Treasury securities will be allocated across newly issued securities at Treasury auctions on a pro-rata basis in proportion with the amounts being issued. Consistent with the Desk’s interim plan for reinvesting principal payments from agency debt and MBS into Treasury securities once the balance sheet runoff ceases, we also assume that these purchases will be spread across the Treasury maturity spectrum, in line with the amounts outstanding in each residual maturity sector.

SOMA Reinvestments

Date	Rollovers of Treasury Securities:		Reinvestments from Agency Securities:			
	Period	Since Oct 2017	Period	Since Aug 2019	Period	Since Oct 2017
2019:Q3	89.0	391.2	40.0	40.0	13.9	169.1
2019:Q4	79.9	471.2	60.0	100.0	7.9	177.0
2019	246.9	471.2	100.0	100.0	24.7	177.0
2020	388.9	860.1	227.0	327.0	8.2	185.2
2021***	543.6	1403.7	168.8	495.8	0.0	185.2



* Starting in August 2019, all principal payments from maturing Treasury securities are reinvested into Treasury securities.

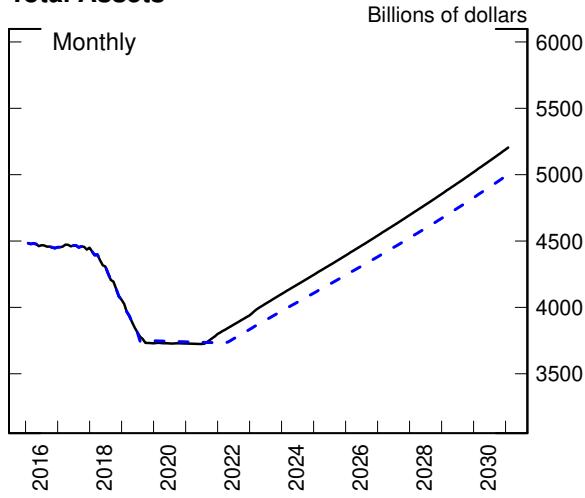
** Starting in August 2019, principal payments from holdings of agency securities below \$20 billion per month are reinvested into Treasury securities, while those above are reinvested into agency MBS.

*** Reserves are projected to reach \$1 trillion in July 2021. After this date, all principal payments received from all security holdings are reinvested into Treasury securities.

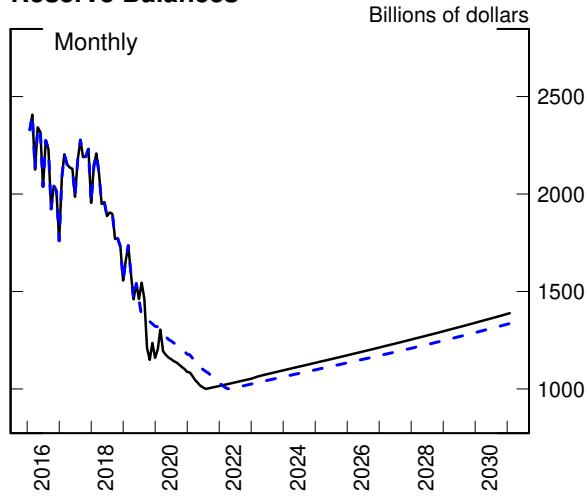
Total Assets and Selected Balance Sheet Items

— September Tealbook baseline - - - July Tealbook – Earlier End to Runoff

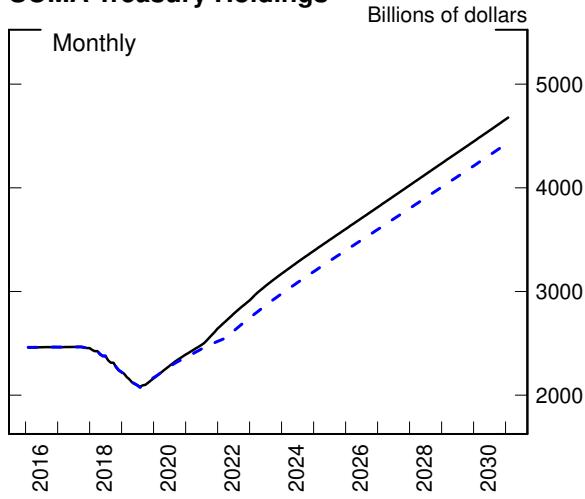
Total Assets



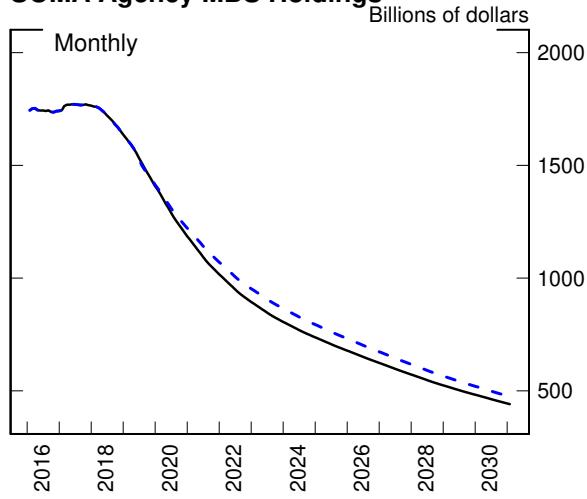
Reserve Balances



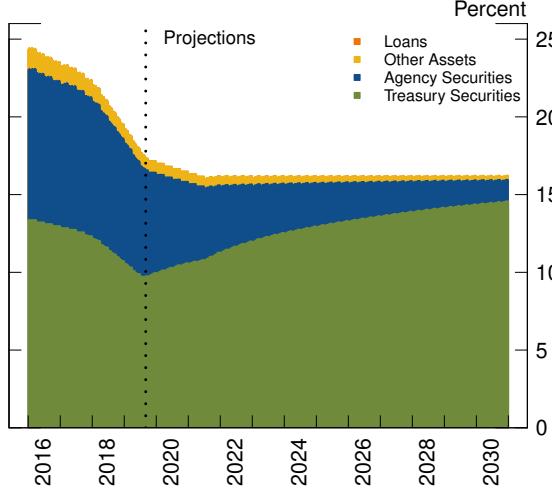
SOMA Treasury Holdings



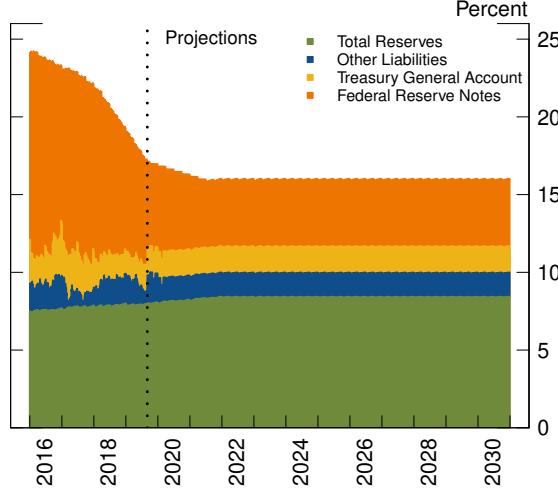
SOMA Agency MBS Holdings



Assets as a Percent of GDP



Liabilities as a Percent of GDP



Federal Reserve Balance Sheet
Month-end Projections – September Tealbook
(Billions of dollars)

	Historical*			Projections				
	Aug 2014	Sep 2017	Aug 2019	Dec 2019	Dec 2020	Dec 2022	Dec 2025	Dec 2030
Total assets	4,416	4,460	3,761	3,729	3,728	3,939	4,390	5,189
Selected assets								
Loans and other credit extensions**	2	6	1	0	0	0	0	0
Securities held outright	4,157	4,240	3,587	3,571	3,579	3,810	4,282	5,106
U.S. Treasury securities	2,437	2,465	2,095	2,161	2,391	2,913	3,601	4,659
Agency debt securities	42	7	2	2	2	2	2	2
Agency mortgage-backed securities	1,678	1,768	1,490	1,408	1,186	894	678	444
Unamortized premiums	209	162	128	123	113	91	68	41
Unamortized discounts	-19	-14	-13	-12	-11	-8	-6	-4
Total other assets	66	66	58	46	46	46	46	46
Total liabilities	4,360	4,419	3,722	3,690	3,688	3,896	4,340	5,126
Selected liabilities								
Federal Reserve notes in circulation	1,249	1,533	1,714	1,752	1,860	2,048	2,282	2,695
Reverse repurchase agreements	277	432	297	299	311	334	372	440
Deposits with Federal Reserve Banks	2,825	2,447	1,704	1,634	1,512	1,509	1,681	1,986
Reserve balances held by depository institutions	2,762	2,190	1,461	1,160	1,087	1,052	1,172	1,385
U.S. Treasury, General Account	49	176	177	409	356	383	427	504
Other deposits	15	82	66	66	69	74	82	97
Earnings remittances due to the U.S. Treasury	3	2	2	0	0	0	0	0
Total Federal Reserve Bank capital***	56	41	39	39	40	44	50	63

Source: Federal Reserve H.4.1 daily data and staff calculations.

Note: Components may not sum to totals due to rounding.

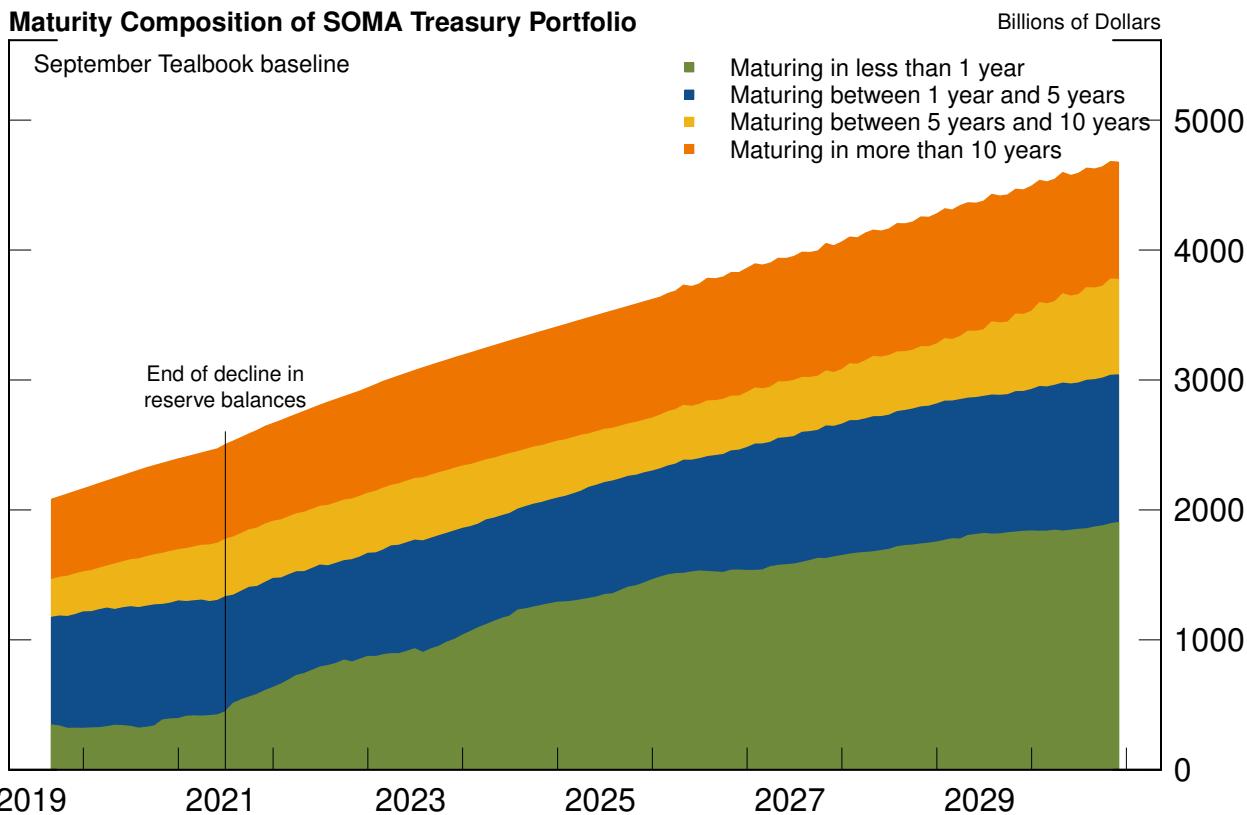
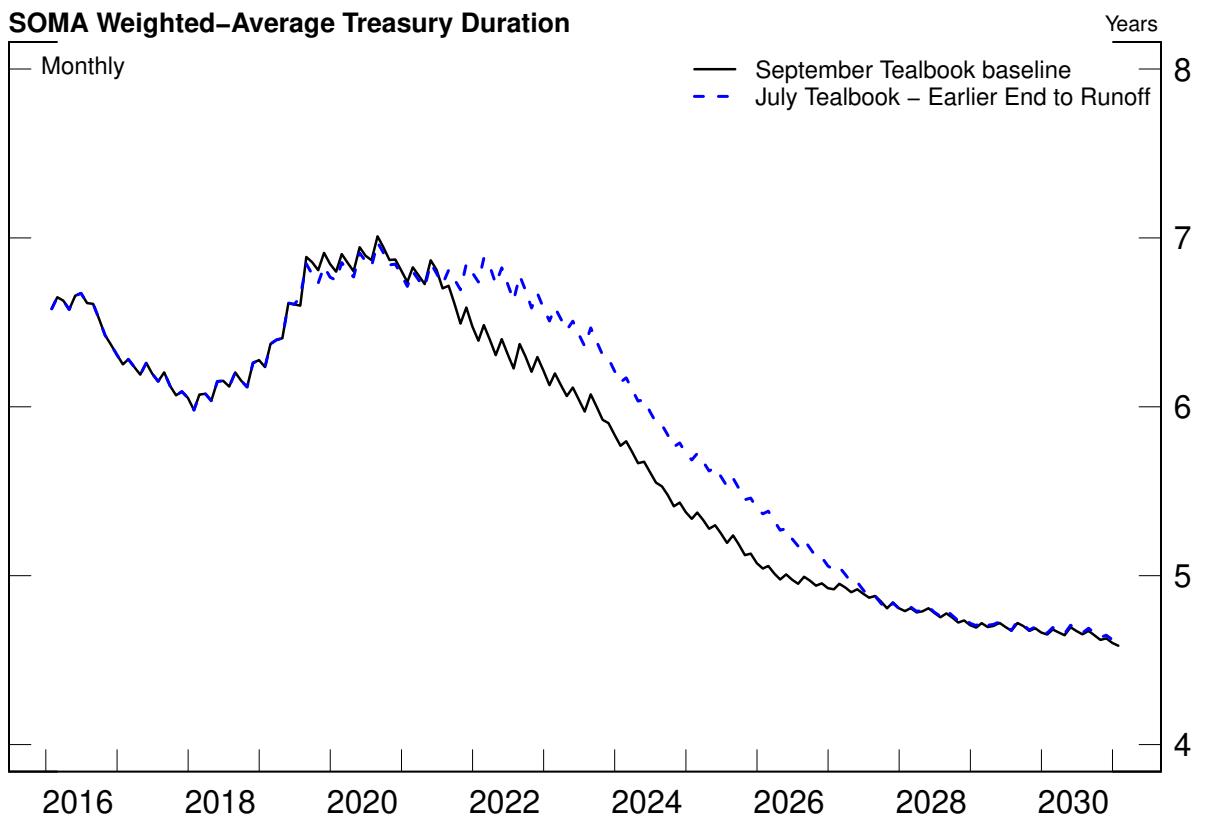
*August 2014 corresponds to the peak month-end value of reserve balances; September 2017 corresponds to the last month-end before the initiation of the normalization program; August 2019 is the most recent historical value

**Loans and other credit extensions includes discount window credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.

***Total capital includes capital paid-in and capital surplus accounts.

Projections for the Characteristics of SOMA Treasury Securities Holdings

Balance Sheet & Income



continue to be directed to newly issued securities at Treasury auctions in proportion to the maturity distribution of Treasury debt issued at the time of rollover. Additionally, we continue to assume that secondary-market purchases of Treasury securities aimed at reinvesting principal payments received from agency securities holdings and at accommodating growth in Federal Reserve liabilities will be directed entirely towards Treasury bills until bills comprise approximately one-third of the Treasury portfolio, close to the pre-crisis composition.⁷

The process of rebuilding the Treasury bill portion of the SOMA portfolio is expected to take just under 5 years from the time the portfolio starts expanding again, leading to a gradual reduction in the weighted-average duration of the Treasury portfolio to less than 5 years. Thereafter, further secondary-market purchases of Treasury securities are assumed to be spread across the maturity spectrum of outstanding Treasury debt (see the bottom panel of the exhibit). Relative to the July Tealbook, the decline in the weighted-average duration is expected to occur sooner, reflecting an earlier start of the purchases of Treasury securities that are assumed to be entirely directed towards bills.

Federal Reserve remittances. Remittances to the Treasury are projected to decline to \$53 billion this year from \$65 billion in 2018 (see the exhibit titled “Income Projections”). This reduction mainly reflects reduced interest income resulting from the reduction in SOMA securities holdings, with total interest expense projected to be \$42 billion this year, little changed from 2018.⁸ Remittances are expected to be \$53 billion next year, and then to rise, reflecting an increase in net interest income associated with a growing balance sheet. The projected path for remittances is higher than in the July Tealbook, reflecting both lower interest expense resulting from the downward revision to the federal funds rate path and higher interest income.⁹

⁷ As the Committee has not yet reached a decision on the long-run composition of the SOMA portfolio, we retain this purchase assumption in our projections.

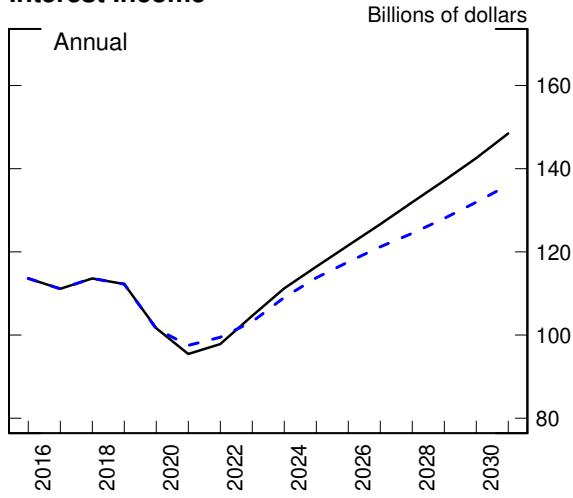
⁸ The effects on total interest expense of the increase in the IOER over 2018 and of the decrease in reserves this year approximately offset each other. Meanwhile, we continue to assume that the FOMC will set a 25 basis point-wide target range for the federal funds rate throughout the projection period. Consistent with the FOMC’s May 2019 Implementation Note, we assume that the IOER will be set 15 basis points below the top of the target range, and the offering rate on overnight RRP will be set at the bottom of the range.

⁹ The higher path of interest income is primarily due to a technical revision to the accounting methodology for Treasury coupon income from maturing securities.

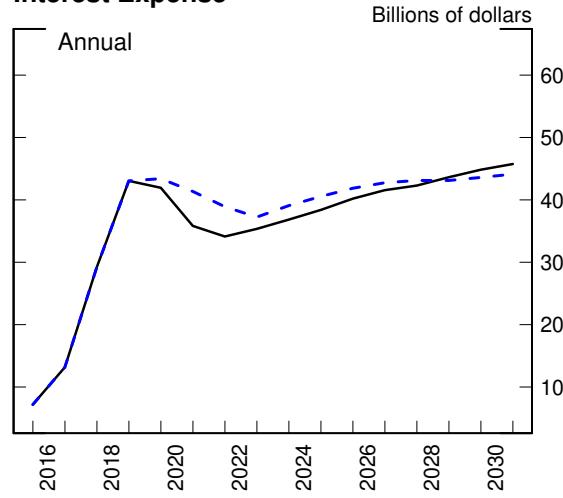
Income Projections

— September Tealbook baseline - - - July Tealbook – Earlier End to Runoff

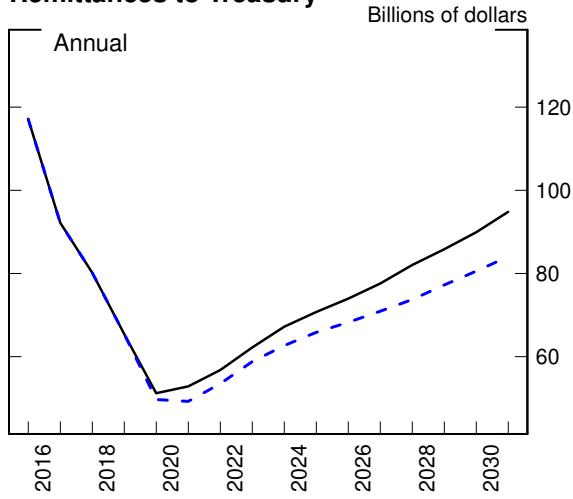
Interest Income



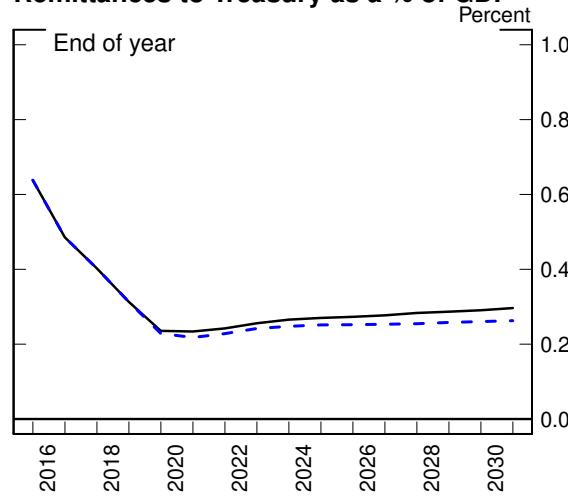
Interest Expense



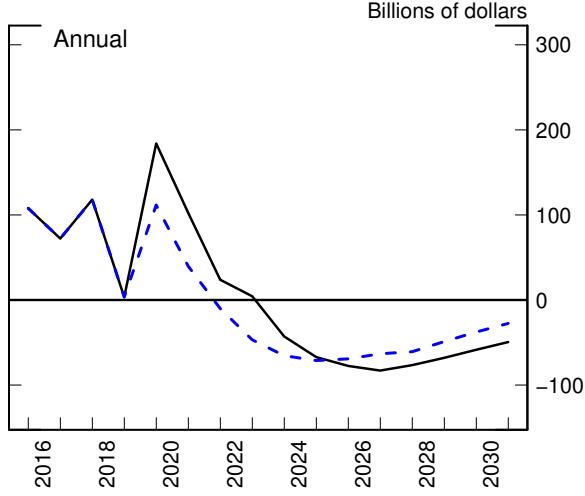
Remittances to Treasury



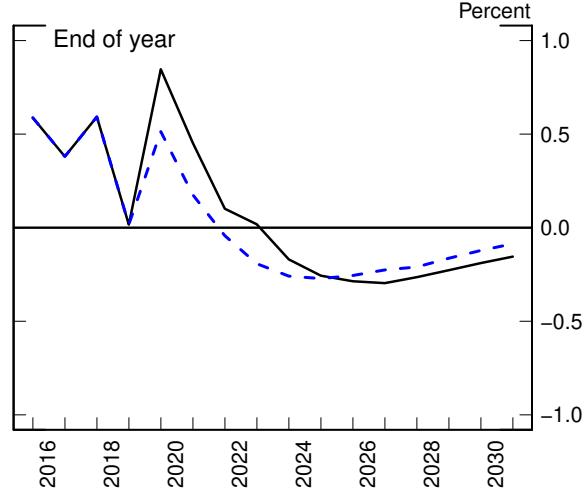
Remittances to Treasury as a % of GDP



Unrealized Gains/Losses



Unrealized Gains/Losses as a % of GDP



Unrealized gains or losses. The SOMA portfolio was in a net unrealized gain position of about \$233 billion at the end of August.¹⁰ With longer-term interest rates projected to rise, the unrealized gain position is expected to decline over the next couple of years before turning into an unrealized loss position by early-2023. The position bottoms out at an unrealized loss of around \$85 billion in 2026:Q2. Compared with the July Tealbook, the path for the unrealized position of the SOMA portfolio is moderately higher over the next several years reflecting the lower path for longer-term interest rates.

Total term premium effect. As shown in the table “Projections for the 10-Year Treasury Total Term Premium Effect (TTPE),” the securities held in the SOMA portfolio are estimated to be reducing the term premium embedded in the 10-year Treasury yield by about 130 basis points in the current quarter, little changed from the July projections.¹¹

Over the projection horizon, the magnitude of the downward pressure exerted on the term premium in longer-term Treasury yields is estimated to diminish gradually. The gradual decline reflects both the projected continued decrease in the size of the SOMA portfolio relative to nominal GDP through the third quarter of 2021 and the decrease in the duration of the Federal Reserve’s securities holdings for the remainder of the projection horizon. Over the next decade, the average projected pace of decline in the TTPE is about 3 basis points per year. At the end of 2030, the total term premium effect of the SOMA portfolio on the 10-year Treasury yield is estimated to be less than 100 basis points.

In the staff’s TTPE model, it is implicitly assumed that any change in the weighted-average duration of the Federal Reserve’s Treasury securities holdings results in a corresponding change (in the opposite direction) in the weighted-average duration of Treasury securities held by the private sector. The box titled “Measuring the Combined Effects of the Federal Reserve’s Asset Purchase Programs and Treasury’s Debt Management” discusses the implications of alternative assumptions and provides historical estimates of the TTPE.

¹⁰ See the Tealbook B box titled “What Does It Mean for the SOMA Portfolio to Be in an ‘Unrealized Loss’ Position?” (June 2018) for an explanation of the accounting concepts underlying unrealized and realized gain and loss positions, as well as their implications for the Federal Reserve’s ability to meet its obligations.

¹¹ The overall 10-year Treasury term premium is assumed to gradually approach its long-run value of 88 basis points.

**Projections for the 10-Year Treasury
Total Term Premium Effect (TTPE)
(Basis Points)**

Date	September Tealbook	July Tealbook	- Earlier End to Runoff
Quarterly Averages			
2019:Q3	-131	-134	
Q4	-130	-133	
2020:Q4	-125	-128	
2021:Q4	-121	-123	
2022:Q4	-117	-118	
2023:Q4	-112	-113	
2024:Q4	-109	-108	
2025:Q4	-107	-105	
2026:Q4	-105	-102	
2027:Q4	-103	-100	
2028:Q4	-101	-98	
2029:Q4	-99	-97	
2030:Q4	-97	-95	

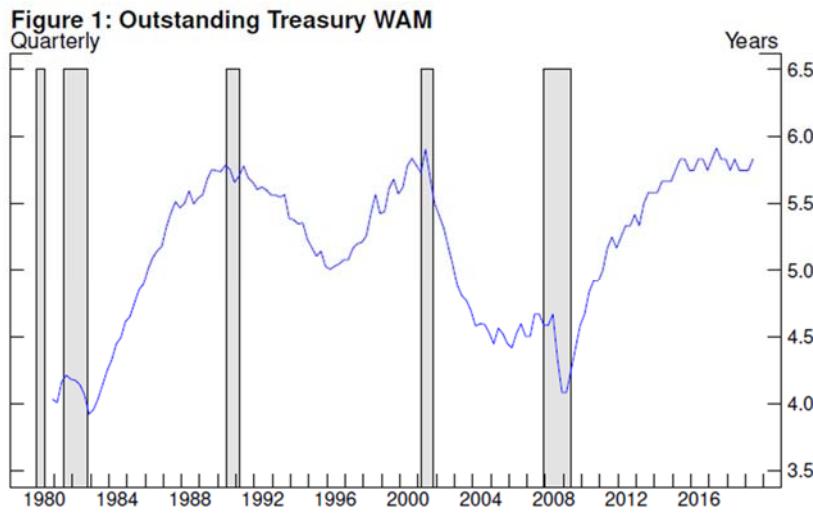
Measuring the Combined Effects of the Federal Reserve's Asset Purchase Programs and Treasury's Debt Management

The Total Term Premium Effect (TTPE) measures the estimated effect on the 10-year Treasury term premium of reducing by private investors' Treasury and MBS portfolios by the amount of securities held in the SOMA.¹ Previous staff work has interpreted changes in the TTPE as a measure of accommodation added or withdrawn through balance sheet policies. This interpretation rests on the assumption that the Treasury does not respond to changes in SOMA securities holdings by adjusting either the amount or the weighted average maturity (WAM) of total debt outstanding. In practice, however, as shown in Figure 1, the Treasury has allowed the maturity composition of outstanding debt to change over time, and it is possible that following the crisis the Treasury's debt management decisions were affected by the FOMC's balance sheet policies.² This box explores how assessments of the degree of accommodation provided through balance sheet policies would be altered by endogenous responses of the Treasury.

During the initial phase of the Great Recession, the Treasury met increased financing needs with short-term issuance, which decreased the WAM of the portfolio to a multi-decade low in 2008. Treasury debt management practices subsequently reversed, and the WAM increased to above pre-crisis levels. This reversal coincided with the period in which the Federal Reserve conducted the asset purchase programs. By altering the maturing composition of outstanding debt held by private investors, Treasury debt management practices, similarly to asset purchase programs, affect term premiums embedded in longer-term Treasury yields.

¹ The methodology underlying the calculation of the TTPE is explained in the Balance Sheet and Income Projections section of the March 2019 Tealbook B.

² Alternatively, the Treasury's maturity extension may have reflected longstanding Treasury practices consistent with past behavior in which there were substantial increases in Treasury borrowing. For example, in the 1980s, as the debt-to-GDP ratio rose by about 20 percentage points, the Treasury increased the WAM of outstanding debt by about 2 years.



Note: Shaded areas indicate recessions.

The solid lines in Figure 2 show the TTPEs following major announcements of the asset purchase programs.³ The staff's TTPE projections provide an indication of how the Federal Reserve's total securities holdings affect private-sector holdings and thus term premiums, keeping all other factors constant, including Treasury's debt management practices. However, Greenwood, Hanson, Rudolph, and Summers (2014) found that, as a result of the changes in the maturity distribution of Treasury debt issuance, private-sector holdings of longer-term securities were increased by an amount that offset about one-third of the reduction in term premiums resulting from the Federal Reserve's asset purchases of 2009-2014.⁴

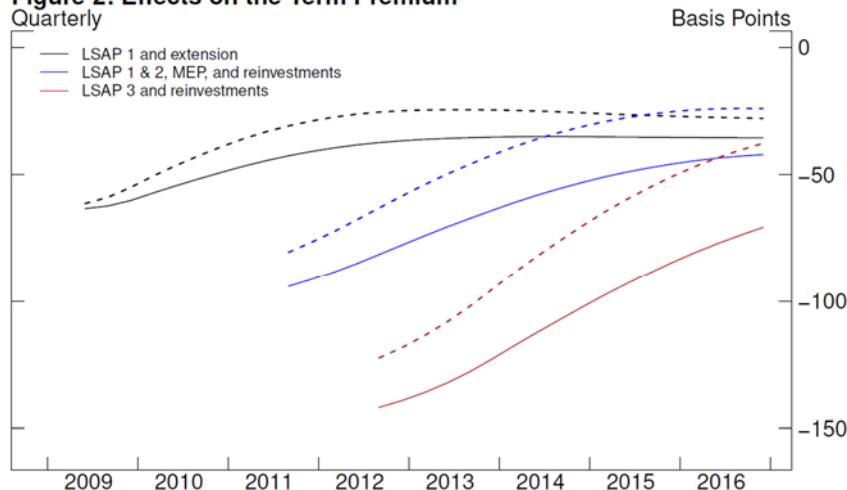
The dashed lines in Figure 2 show the combined effects on the term premium of the Federal Reserve's balance sheet policy announcements and the Treasury's decisions regarding the maturity of debt issuance. In line with the estimates by Greenwood et al. (2014), the projections that include the combined effects are associated with term premium effects that are, on average, one-third smaller than those of monetary policy alone.⁵

³ In constructing projections for the asset purchase programs, we used the methodology from Jane Ihrig, Elizabeth Klee, Canlin Li, Min Wei, and Joe Kachovec (2018), "Expectations About the Federal Reserve's Balance Sheet and the Term Structure of Interest Rates," *International Journal of Central Banking* 14, no. 2: 341-391.

⁴ See Robin Greenwood, Samuel G. Hanson, Joshua S. Rudolph, and Lawrence H. Summers (2014), "Government Debt Management at the Zero Lower Bound," Working Paper no.5, Hutchins Center on Fiscal and Monetary Policy at Brookings.

⁵ The projections of the combined effects are subject to a great deal of uncertainty, as both the magnitude and the speed of Treasury's offset of the asset purchase programs' effects on the term premium are highly uncertain.

**Figure 2: Effects on the Term Premium
Quarterly**



Note: Solid lines represent TTPEs (effect of monetary policy); Dashed lines show the combined effects of monetary policy and Treasury debt management.

As shown by the solid black line in Figure 2, the announcement of LSAP 1 and its subsequent extension are estimated to have initially reduced 10-year Treasury yields by about 60 basis points, abstracting from any change in the Treasury's debt management practices. In comparison with the solid black line, the dashed black line indicates that the estimated combined effects are, on average, about 10 basis points less negative over the whole projection.

As shown by the solid blue line, the cumulative effects of LSAPs 1 and 2, the MEP, and continued reinvestments are estimated to have further expanded the term premium effect to about negative 90 basis points. The dashed blue line shows that the cumulative effects of the Treasury's decision to lengthen the maturity of its debt widens the difference in magnitudes between the TTPE projection and the projection with the combined effect. The dashed red line, which captures the combined effects of LSAP 3, continued reinvestments, and Treasury's debt management, shows a similar pattern relative to the solid red line representing the baseline TTPE projection.

In a future recession during which the federal funds rate may be constrained by the ELB and the Committee decides to undertake asset purchases, Treasury may again increase the maturity of its debt issuance. In such circumstances, the Committee may need to take the Treasury's actions into account when determining the size and composition of a future asset purchase program. By reducing term premiums, asset purchases by the Federal Reserve may make it relatively more attractive for the Treasury to issue longer-term securities and lower debt-service costs, which would partially offset the effects of the Federal Reserve's actions. However, the Treasury Borrowing Advisory Committee has suggested that, in a future ELB episode, the Treasury might also want to give consideration to actions that would, instead, shorten the WAM of its outstanding debt, as such moves might help support economic activity.

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Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BEA	Bureau of Economic Analysis, Department of Commerce
BHC	bank holding company
CDS	credit default swaps
CFTC	Commodity Futures Trading Commission
C&I	commercial and industrial
CLO	collateralized loan obligation
CMBS	commercial mortgage-backed securities
CPI	consumer price index
CRE	commercial real estate
DEDO	section in Tealbook A: “Domestic Economic Developments and Outlook”
Desk	Open Market Desk
DFMU	Designated Financial Market Utilities
ECB	European Central Bank
EFFR	effective federal funds rate
ELB	effective lower bound
EME	emerging market economy
EU	European Union
FAST Act	Fixing America’s Surface Transportation Act
FDIC	Federal Deposit Insurance Corporation
FOMC	Federal Open Market Committee; also, the Committee
GCF	general collateral finance
GDI	gross domestic income
GDP	gross domestic product
GSIBs	globally systemically important banking organizations
HQLA	high-quality liquid assets
IOER	interest on excess reserves

ISM	Institute for Supply Management
LIBOR	London interbank offered rate
LSAPs	large-scale asset purchases
MBS	mortgage-backed securities
MEP	Maturity Extension Program
MMFs	money market funds
NBER	National Bureau of Economic Research
NI	nominal income
NIPA	national income and product accounts
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures
QS	Quantitative Surveillance
repo	repurchase agreement
RMBS	residential mortgage-backed securities
RRP	reverse repurchase agreement
SCOOS	Senior Credit Officer Opinion Survey on Dealer Financing Terms
SEP	Summary of Economic Projections
SFA	Supplemental Financing Account
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
SOMA	System Open Market Account
TBA	to be announced (for example, TBA market)
TCJA	Tax Cuts and Jobs Act of 2017
TGA	U.S. Treasury's General Account
TIPS	Treasury inflation-protected securities
TTPE	Total Term Premium Effect
WAM	Weighted Average Maturity
ZLB	zero lower bound