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.

Report to the FOMC on Economic Conditions and Monetary Policy

Book B

Monetary Policy Alternatives

December 10, 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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Monetary Policy Alternatives

Although spending and activity data through October came in better than expected, recent indicators point to more of a slowing in the economy than previously anticipated. While news regarding vaccine development has been very encouraging, the number of COVID-19 cases, hospitalizations, and deaths has been rising rapidly. More broadly, the economy remains far away from the Committee's maximum employment and price stability goals, and the outlook remains highly uncertain amid the ongoing COVID-19 pandemic. Against this backdrop, in all three of the alternative policy statements presented below, the Committee reiterates its commitment to use its full range of tools to support the U.S. economy, maintains the target range for the federal funds rate at 0 to ¼ percent, repeats its forward guidance regarding the policy rate, and states that it expects to maintain an accommodative stance of monetary policy until its maximum employment and price stability goals are achieved. The alternatives differ only in their communications about ongoing asset purchases.

In recent policy statements, the Committee has indicated that over coming months, the Federal Reserve would increase its holdings of Treasury securities and agency mortgage-backed securities (MBS) at least at the current pace to sustain smooth market functioning and help foster accommodative financial conditions. With the Committee having updated its forward guidance on the federal funds rate in September, it may want to consider enhancing its guidance for asset purchases as well, as suggested by participants in recent FOMC meetings. To that end, Alternative B specifies that net asset purchases will continue at the recent monthly pace—that is, at least $80 billion of Treasury securities and $40 billion of agency MBS—"until substantial further progress has been made toward the Committee's maximum employment and price stability goals." Alternative A makes the same changes but also adds that "purchases of Treasury securities will be weighted toward those with longer maturities," thus providing a greater degree of monetary policy accommodation so as "to promote a stronger economic recovery." Alternative C maintains the language of the November FOMC statement that net asset purchases will continue "over coming months…at least at the current pace."

NOVEMBER 2020 FOMC STATEMENT

1. The Federal Reserve is committed to using its full range of tools to support the U.S. economy in this challenging time, thereby promoting its maximum employment and price stability goals.

2. The COVID-19 pandemic is causing tremendous human and economic hardship across the United States and around the world. Economic activity and employment have continued to recover but remain well below their levels at the beginning of the year. Weaker demand and earlier declines in oil prices have been holding down consumer price inflation. Overall financial conditions remain accommodative, in part reflecting policy measures to support the economy and the flow of credit to U.S. households and businesses.

3. The path of the economy will depend significantly on the course of the virus. The ongoing public health crisis will continue to weigh on economic activity, employment, and inflation in the near term, and poses considerable risks to the economic outlook over the medium term.

4. The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. With inflation running persistently below this longer-run goal, the Committee will aim to achieve inflation moderately above 2 percent for some time so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. The Committee expects to maintain an accommodative stance of monetary policy until these outcomes are achieved. The Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and expects it will be appropriate to maintain this target range 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. In addition, over coming months the Federal Reserve will increase its holdings of Treasury securities and agency mortgage-backed securities at least at the current pace to sustain smooth market functioning and help foster accommodative financial conditions, thereby supporting the flow of credit to households and businesses.

5. In assessing the appropriate stance of monetary policy, the Committee will continue to monitor the implications of incoming information for the economic outlook. The Committee would be prepared to adjust the stance of monetary policy as appropriate if risks emerge that could impede the attainment of the Committee's goals. The Committee's assessments will take into account a wide range of information, including readings on public health, labor market conditions, inflation pressures and inflation expectations, and financial and international developments.

ALTERNATIVE A FOR DECEMBER 2020

1. The Federal Reserve is committed to using its full range of tools to support the U.S. economy in this challenging time, thereby promoting its maximum employment and price stability goals.

2. The COVID-19 pandemic is causing tremendous human and economic hardship across the United States and around the world. Economic activity and employment have continued to recover but remain well below their levels at the beginning of the year. Weaker demand and earlier declines in oil prices have been holding down consumer price inflation. Overall financial conditions remain accommodative, in part reflecting policy measures to support the economy and the flow of credit to U.S. households and businesses.

3. The path of the economy will depend significantly on the course of the virus. The ongoing public health crisis will continue to weigh on economic activity, employment, and inflation in the near term, and poses considerable risks to the economic outlook over the medium term.

4. The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. With inflation running persistently below this longer-run goal, the Committee will aim to achieve inflation moderately above 2 percent for some time so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. The Committee expects to maintain an accommodative stance of monetary policy until these outcomes are achieved. The Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and expects it will be appropriate to maintain this target range 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. In addition, over coming months the Federal Reserve will **continue to** increase its holdings of Treasury securities **by at least $80 billion per month** and **of** agency mortgage-backed securities **by** at least ~~at the current pace to sustain~~ **$40 billion per month until substantial further progress has been made toward the Committee's maximum employment and price stability goals. To promote a stronger economic recovery, purchases of Treasury securities will be weighted toward those with longer maturities. These asset purchases help foster** smooth market functioning and ~~help foster~~ accommodative financial conditions, thereby supporting the flow of credit to households and businesses.

5. In assessing the appropriate stance of monetary policy, the Committee will continue to monitor the implications of incoming information for the economic outlook. The Committee would be prepared to adjust the stance of monetary policy as appropriate if risks emerge that could impede the attainment of the Committee's goals. The Committee's assessments will take into account a wide range of information, including readings on public health, labor market conditions, inflation pressures and inflation expectations, and financial and international developments.

ALTERNATIVE B FOR DECEMBER 2020

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ALTERNATIVE C FOR DECEMBER 2020

1. The Federal Reserve is committed to using its full range of tools to support the U.S. economy in this challenging time, thereby promoting its maximum employment and price stability goals.
2. The COVID-19 pandemic is causing tremendous human and economic hardship across the United States and around the world. Economic activity and employment have continued to recover but remain well below their levels at the beginning of the year. Weaker demand and earlier declines in oil prices have been holding down consumer price inflation. Overall financial conditions remain accommodative, in part reflecting policy measures to support the economy and the flow of credit to U.S. households and businesses.
3. The path of the economy will depend significantly on the course of the virus. The ongoing public health crisis will continue to weigh on economic activity, employment, and inflation in the near term, and poses considerable risks to the economic outlook over the medium term.
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5. In assessing the appropriate stance of monetary policy, the Committee will continue to monitor the implications of incoming information for the economic outlook. The Committee would be prepared to adjust the stance of monetary policy as appropriate if risks emerge that could impede the attainment of the Committee's goals. The Committee's assessments will take into account a wide range of information, including readings on public health, labor market conditions, inflation pressures and inflation expectations, and financial and international developments.

Economic Conditions and Outlook

- Most of the data released during the intermeeting period continued to come in better than expected, but some key indicators released late in the period suggested that the economy started to slow notably in November.
    - Consumer spending through October continued to rebound toward pre-pandemic levels, but signs of weakening in high-frequency indicators began to emerge in November.
    - The rebound in both residential construction and new home sales, supported by low interest rates, the housing sector's ability to adjust business practices in response to social distancing, and the release of pent-up demand accumulated during the spring shutdown, has been surprisingly robust.
    - Although equipment and intangibles investment appears to be expanding robustly, investment in nonresidential structures has continued to decline. Overall business fixed investment is projected to regain its pre-pandemic level in the second half of next year.
    - On balance, the staff projects that real GDP will rise at an annual rate of 5 percent in the fourth quarter, but it also now expects spending growth to stall temporarily in the first quarter of next year, reflecting increased social distancing and the continued unwinding of earlier fiscal stimulus. Over the medium term, as effective vaccines become widely available, the effects of social distancing gradually fade, and financial conditions continue to be supported by accommodative monetary policy, GDP growth is expected to move up to 4.3 percent next year and then to slow to 2.3 percent by 2023.
- The pace of improvement in the labor market moderated in November.
    - Currently published data indicate that total nonfarm payrolls rose by 245,000 in November, significantly less than expected.
    - The reported unemployment rate has continued to decline, falling from 7.9 percent in September to 6.7 percent in November.
    - Despite the decline in total unemployment, long-term unemployment continued to rise through November, as workers laid off in the spring have now been jobless for 27 weeks or more. Many such workers exhausted

their 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 benefits early next year as these supplemental programs phase out.

- The labor force participation rate edged down to 61.5 percent in November. The staff expects the shift to virtual learning at schools to continue to weigh on participation in coming months.

- PCE price inflation continued to slow in October from the robust pace seen in the three months through August.
    - Price increases for durable goods have waned since the summer, and price increases for services have remained subdued. The staff projects core PCE price inflation to be 1.4 percent this year on a 12-month basis, about 0.1 percentage point lower than in the October Tealbook. As the low readings recorded earlier this year, which were due to COVID-19 effects, drop out of the 12-month calculation, the staff forecasts 12-month core inflation to move above 2 percent in the spring before dropping back again.
    - Total PCE prices are projected to rise just 1.1 percent this year, a bit below core inflation, as energy prices are expected to remain well below year-ago levels.
    - Over the medium term, with economic slack and pandemic effects diminishing, the staff expects core inflation to move up to 1.8 percent in 2021, reaching 1.9 percent by 2023, and total PCE prices to rise roughly in line with core prices.
    - Survey measures of longer-term inflation expectations have remained fairly stable, on balance, this year.
- Financial market sentiment improved over the intermeeting period as news that multiple highly effective COVID-19 vaccines will soon become widely available in the United States and reduced political uncertainty following the U.S. election far outweighed concerns regarding the dramatic increase in COVID-19 cases and the potential effects on economic activity in the months ahead.
    - Since the October Tealbook, stock prices are notably higher.

- Yields on 2-year nominal Treasury securities were little changed since the November FOMC meeting, while yields on 10- and 30-year Treasury securities rose.
- Inflation compensation measures rose notably and are near the pre-pandemic levels.
- A range of indicators point to continued smooth functioning in markets for Treasury securities, and liquidity conditions in secondary market trading for other securities improved a bit and moved closer to pre-pandemic levels.
- Financing conditions in capital markets remained accommodative over the intermeeting period, while bank lending conditions continued to be relatively tight.

- The staff judges that the path of the COVID-19 pandemic and its consequences for the economy are highly uncertain, with risks to the forecast still skewed to the downside.
  - Sharply rising cases of COVID-19 infections in the United States and abroad suggest that, while positive news on vaccine development has diminished adverse tail risks over the medium term, near-term downside risks to economic activity have nonetheless risen in recent weeks.

THE CASE FOR ALTERNATIVE B

The Committee may view the information received during the intermeeting period as indicating that while the economic recovery has continued, it is likely to slow significantly in the near term due to the recent resurgence of the pandemic. However, in looking beyond the winter, policymakers may see recent information on vaccine development and the prospects for an additional fiscal stimulus package as encouraging and as likely to boost the pace of economic recovery next year. Nonetheless, they may view a full recovery as still far away and therefore judge that, in order to promote ongoing improvement in the labor market and inflation averaging 2 percent over time, the current level of the federal funds rate, as well as the current guidance about the future path of the funds rate, continues to be appropriate.

Having updated its forward guidance for the federal funds rate in September, the Committee might want to consider enhancing its guidance for asset purchases in order to help keep the public's expectations about future asset purchases aligned with Committee intentions and help ensure that financial conditions remain appropriately accommodative. To that end, policymakers may wish to issue a statement like Alternative B, which provides additional information about the Committee's outlook regarding its asset purchases by stating that "the Federal Reserve will continue to increase its holdings of Treasury securities by at least $80 billion per month and of agency mortgage-backed securities by at least $40 billion per month until substantial further progress has been made toward the Committee's maximum employment and price stability goals."

Policymakers may judge that the use of "over coming months" to specify the time horizon over which the Federal Reserve will increase (at the current pace) its securities holdings does not adequately reflect the Committee's policy intentions, particularly with regard to the Committee's implicit "reaction function." The outcome-based guidance in Alternative B would enhance the extent to which the public's expectations regarding the path of securities holdings would adjust as the economic outlook evolves. For example, if an unanticipated material improvement in the economic outlook were to occur, the period over which purchases would be expected to continue at the current pace would likely shorten. In addition, the guidance may help prevent medium- and longer-term interest rates from rising unduly rapidly as the recovery progresses. At the same time, in stating "until substantial further progress has been made," the guidance preserves some flexibility that would allow the Committee to make changes as the data warrant.

Policymakers may also see this form of guidance as further conveying the Committee's strong commitment to achieve both maximum employment and inflation at a rate of 2 percent over the longer run. Consequently, they may regard this guidance on asset purchases as likely to be perceived by the public as consistent with, and reinforcing, the existing forward guidance about the likely path of the federal funds rate, and hence as further promoting the achievement of the Committee's goals.

Market prices, along with responses of primary dealers and market participants to the Desk's latest surveys, indicate that investors do not expect any changes to the target range for the federal funds rate or the guidance about the likely path of the policy rate at this meeting. The Desk's surveys also suggest that the median survey respondent expects monthly net purchases of U.S. Treasury securities and agency MBS of $80 and $40 billion, respectively, through the second half of 2021, equivalent to the current purchase amounts. A statement like Alternative B could be perceived as largely in line with market expectations and, as such, elicit only limited reaction.

THE CASE FOR ALTERNATIVE A

In light of the unprecedented depth of the economic downturn, the recent resurgence of COVID-19, and continued high uncertainty about the implications of the pandemic for the economic outlook, policymakers may wish to enhance their guidance about asset purchases along the lines outlined in Alternative B and also provide more accommodation than that implied by Alternative B. To that end, Alternative A specifies that "purchases of Treasury securities will be weighted toward those with longer maturities" so as "to promote a stronger economic recovery." Policymakers may judge that lengthening the maturity of Treasury securities purchases would increase the amount of policy accommodation for a given amount of total purchases.[1] This step would also retain policymakers' flexibility to adjust the pace of purchases at a later time.

Policymakers may be concerned that, without additional policy accommodation at this time, inflation will remain below the Committee's 2 percent objective over the medium term. They may also be concerned that longer-term inflation expectations are anchored below levels consistent with the Committee's goals, and that raising these expectations will require more forceful action to deliver inflation above 2 percent for some time.

Policymakers may also consider the timing and size of any additional fiscal policy stimulus to address the economic effects of the pandemic as highly uncertain. They may believe that if fiscal actions take time to be decided upon and implemented, or imply less support to the economy than expected, then providing more accommodation at this time may be useful to help support continued economic recovery. Consequently, they may consider additional policy accommodation, like that in Alternative A, as well suited to address such risk management concerns.

Policymakers may be further concerned that the pandemic has worsened dramatically in recent weeks, with the level of COVID-19 hospitalizations far exceeding the level of previous peaks reached in the spring and the summer. Moreover, they may perceive a great deal of uncertainty about the ability of drug companies to produce, and of the health-care system to distribute, vaccines on a vast scale. Relatedly, they may

[1] For example, as shown in the October memo to the Committee, "Considerations for Asset Purchases," if purchases in the 0-3 year maturity range had been reallocated across other nominal coupon sectors in recent months, the estimated 10-year equivalent amount of monthly purchases would have increased about $30 billion, from approximately $50 billion per month to almost $80 billion.

point to the alternative scenario "Second Round of Severe Restrictions" presented in the Risks and Uncertainty section of this Tealbook—in which economic activity is significantly and persistently below the baseline projection—as pointing toward the desirability of the extra policy accommodation that Alternative A offers. Policymakers may judge that risk management considerations suggest that the Committee should attach considerable weight to such adverse scenarios in its assessment of the appropriate stance of policy, particularly in light of the constraints associated with the effective lower bound.

Even though market participants reportedly see some probability that the Committee could lengthen the maturity of purchases, a statement such as Alternative A could be seen as implying a more accommodative stance of policy than had been anticipated. While the market reactions to a statement like Alternative A are uncertain, it would likely exert downward pressure on Treasury yields and boost equity prices, with the impact on the dollar perhaps more ambiguous.

THE CASE FOR ALTERNATIVE C

Policymakers may judge that with the actions taken by the Federal Reserve to support the economy since the onset of the pandemic—including setting the federal funds rate at the effective lower bound, providing forward guidance about the future path of the federal funds rate, conducting substantial asset purchases, and implementing a range of credit and liquidity programs—there is no need to adjust the stance of policy at this time, including the Committee's guidance on the federal funds rate path or asset purchases.

With recent progress in vaccine development, on the one hand, and the dramatic rise in COVID-19 cases, hospitalizations, and deaths, on the other, policymakers may continue to see uncertainty about the course of the COVID-19 pandemic and its implications for the economy as highly elevated. Policymakers may also consider the timing and size of additional fiscal policy stimulus to address the economic effects of the pandemic as very uncertain. They may therefore see some benefit in the Committee taking more time to adapt and refine its monetary policy actions and communications, as more information becomes available concerning the distribution of the vaccines, the potential additional fiscal stimulus, and as contours of the economic recovery come into better focus. Until then, the Committee may want to maintain its previous forward guidance and policy stance, and retain the option to modify its policy communications and stance at a later time, should it become necessary to do so.

With financial conditions already highly accommodative, some policymakers may see a risk that signaling a stronger intention to keep adding accommodation through asset purchases could lead to a buildup of financial imbalances that could subsequently unwind in a disorderly way and harm the economy.

Most of the respondents to the Desk's December surveys of primary dealers and market participants expect a change to the guidance about asset purchases to occur at the December meeting. Against this backdrop, if maintaining the previous forward guidance and policy stance is perceived as a signal that the Committee is less willing to provide policy accommodation than was expected, then interest rates would likely rise, and equity prices and inflation compensation would likely decline.

Implementation Note

Draft implementation notes corresponding to each of the Alternatives appear on the following pages. Struck-out text indicates language deleted from, and bold red underlined text indicates language added to, the previously issued note. Blue underlined text indicates text that links to websites.

Alternatives

Implementation Note for December 2020, Alternative A

*Release Date: ~~November 5~~ **December 16**, 2020*

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 ~~November 5~~ **December 16**, 2020:

- The Board of Governors of the Federal Reserve System voted unanimously to maintain the interest rate paid on required and excess reserve balances at 0.10 percent, effective ~~November 6~~ **December 17**, 2020.
- 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 ~~November 6~~ **December 17**, 2020, 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 0 to 1/4 percent.
  - Increase the System Open Market Account holdings of Treasury securities **by $80 billion per month** and **of** agency mortgage-backed securities (MBS) ~~at the current pace~~ **by $40 billion per month**. **Beginning with the January 2021 monthly purchase schedule, weight Treasury purchases toward longer-dated securities.**
  - Increase holdings of Treasury securities and agency MBS by additional amounts**, adjust the maturity composition of Treasury purchases,** and purchase agency commercial mortgage-backed securities (CMBS) as needed to sustain smooth functioning of markets for these securities.
  - Conduct term and overnight repurchase agreement operations to support effective policy implementation and the smooth functioning of short-term U.S. dollar funding markets.
  - Conduct overnight reverse repurchase agreement operations at an offering rate of 0.00 percent and with a per-counterparty limit of $30 billion per day; the per-counterparty limit can be temporarily increased at the discretion of the Chair.
  - Roll over at auction all principal payments from the Federal Reserve's holdings of Treasury securities and reinvest all principal payments from the Federal Reserve's holdings of agency debt and agency MBS in agency MBS.
  - Allow modest deviations from stated amounts for purchases and reinvestments, if needed for operational reasons.
  - Engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency MBS transactions."

- In a related action, the Board of Governors of the Federal Reserve System voted unanimously to approve the establishment of the primary credit rate at the existing level of 0.25 percent.

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.

Alternatives

Implementation Note for December 2020, Alternative B

*Release Date: ~~November 5~~ **December 16**, 2020*

Decisions Regarding Monetary Policy Implementation

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  - Increase holdings of Treasury securities and agency MBS by additional amounts and purchase agency commercial mortgage-backed securities (CMBS) as needed to sustain smooth functioning of markets for these securities.
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Alternatives

Implementation Note for December 2020, Alternative C

*Release Date: ~~November 5~~ **December 16**, 2020*

Decisions Regarding Monetary Policy Implementation

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Monetary Policy Expectations and Uncertainty

Market-based measures of federal funds rate expectations have edged higher since the November FOMC meeting. The expected path of the federal funds rate, as implied by OIS quotes and unadjusted for term premiums (the blue line in figure 1), remains below 0.25 percent until the third quarter of 2023. The expected path implied by a staff macro-finance model that adjusts for term premiums (the green line) remains below 0.25 percent through the end of 2022.

The median respondent to the Desk's December surveys continues to view the most likely path of the federal funds rate as remaining in its current range until the first half of 2024 (the black crosses in figure 1 show the path through the end of 2023).[1] Figure 1 also shows that the averages of respondents' mean federal funds rate expectations (the gold diamonds) increase gradually, consistent with uncertainty about the federal funds rate that is tilted to the upside at the effective lower bound. This tilt is evident in the average probability distribution for the federal funds rate at year-end 2023 implied by the Desk's surveys (figure 2). In particular, while the modal expected outcome is in the current target range, respondents attached material probability to an increase in the target range by year-end 2023 and a negligible probability to decreases below zero. This distribution of probabilities is little changed relative to the November surveys. Regarding the economic conditions at the time of the first increase in the target range for the federal funds rate, the median respondent expected the unemployment rate to be 4.0 percent and the 12-month PCE inflation rate to be 2.3 percent; these median expectations were unchanged from the November surveys.

Figure 3 shows measures of the longer-run expected federal funds rate. A straight read of forward rates implied by the prices of Treasury securities (the blue line) suggests that investors' current expectation for the average federal funds rate 5 to 10 years ahead is about 1.5 percent. This measure has increased a further 24 basis points since the November meeting and is much closer now to the average Blue Chip survey response (the yellow diamonds) than it was in June. The measure nonetheless remains only about 0.5 percentage point above its lowest level since the beginning of the series in 1971. Adjusting for term premiums using various staff term structure models (with the light-red-shaded region showing the range of three such model estimates) suggests that 5-to-10-year-ahead expectations remain significantly above the unadjusted forward rates, at between about 2.1 percent and 2.3 percent.

[1] The Desk surveys asked respondents to provide their views about the most likely path of the federal funds rate through the end of 2023. However, if a respondent did not indicate a rate increase by year-end 2023, they were asked a separate question about the earliest half-year period during which their modal expectation for the federal funds rate is above the current target range. This additional information can be used to infer the most likely path of the federal funds rate beyond 2023.

These estimates would suggest long-run expectations of the short-term real rate are only slightly positive, assuming that longer-term expected inflation is 2 percent.

The December Desk surveys also asked respondents to report their estimate of the most likely level for the 10-year Treasury yield at the end of calendar quarters up to the fourth quarter of 2021, and then half years up to the end of the first half of 2023. Figure 4 shows the medians and interquartile ranges of the individual responses. The median survey respondent expected the 10-year Treasury yield to be 1.3 percent at the end of 2021 and to climb gradually, to a little under 2 percent, by the end of 2023.

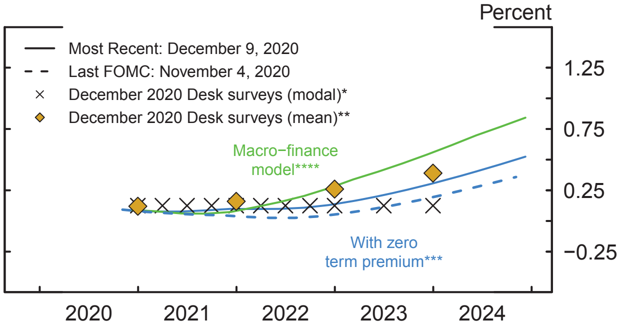
Respondents were asked to report their expectations of the most likely quantities of the Desk's purchases of U.S. Treasury securities and agency mortgage-backed securities (MBS), net of reinvestments, for December 2020, and for the years 2021 through 2023. Figures 5 and 6 show the medians and interquartile ranges of the individual responses. The median survey respondent expected monthly net U.S. Treasury and agency MBS purchases of $80 and $40 billion, respectively, through the second half of 2021, equivalent to the current monthly net purchase amounts, and unchanged from the November surveys. Respondents also generally continued to expect net purchases of both U.S. Treasury securities and agency MBS to slow over the remainder of the forecast period. Overall, the median respondent expected total net purchases of U.S. Treasury securities and agency MBS between the beginning of 2021 and the end of 2023 to be about $1,630 billion and $660 billion, respectively. Compared with the November surveys, the total net amount of Treasury purchases is little changed and of agency MBS is modestly lower.[2]

The December Desk surveys also asked respondents to report their probability distributions for the total purchases, net of reinvestments, of U.S. Treasury securities and agency MBS from the beginning of 2021 until the end of 2023. The average probability distribution of purchases of U.S. Treasuries, shown in figure 7, suggests that investors place the highest, roughly equal odds on total purchases being either between $1 trillion and $1.5 trillion or between $1.5 trillion and $2 trillion. Finally, as shown in figure 8, the average probability distribution of purchases of agency MBS suggests that investors place the highest odds of total purchases in the $500-$750 billion range. However, figures 7 and 8 both display a notable level of uncertainty about the total amount of U.S. Treasury and agency MBS purchases.

[2] The median respondent to the December surveys expected no net purchases of U.S. Treasury securities after the first half of 2023 and no net purchases of agency MBS after 2022.

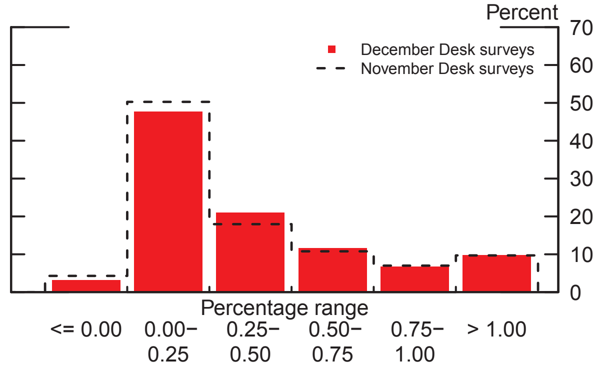
Alternatives

Figure 1: Federal Funds Rate Projections



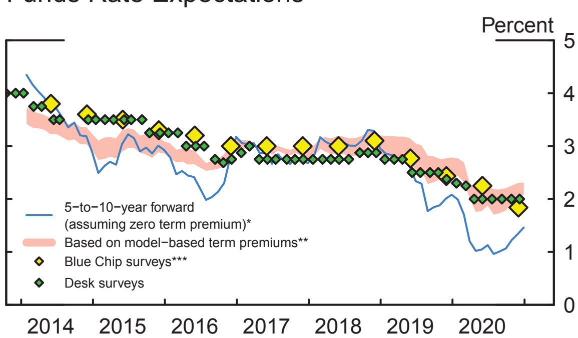
* Median of respondents' modal paths for the federal funds rate.
** Estimated from respondents' unconditional year−end probability distributions.
*** Estimated using overnight index swap quotes with a spline approach and a term premium of 0 basis points.
**** Macro−finance model path is estimated by averaging over regressions of survey−OIS gaps on the covariances between real and nominal variables based on Diercks and Carl (2019).
Source: Bloomberg; Board staff calculations; FRBNY.

Figure 2: Desk Surveys Probability Distribution of the Federal Funds Rate, Year−End 2023



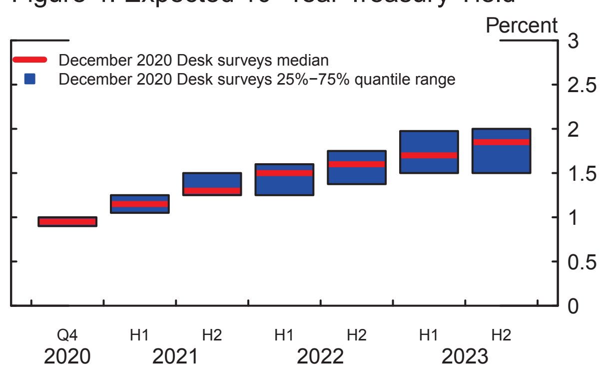
Note: Probabilities are the averages of the probabilities assigned by respondents to the Survey of Market Participants and Survey of Primary Dealers to different ranges of the federal funds rate at the end of 2023.
Source: FRBNY.

Figure 3: Measures of Longer−Run Federal Funds Rate Expectations



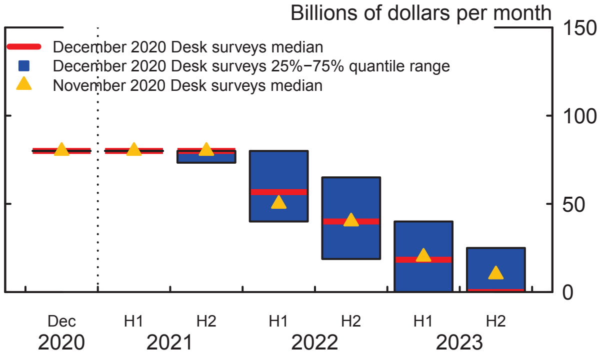
* Monthly average 5−to−10−year forward rate derived from prices of Treasury securities.
** Monthly averages 5−to−10−year forward rate adjusted for three alternative term premium estimates using Kim and Wright (2005), D'Amico, Kim, and Wei (2018), and Aronovich and Meldrum (2020).
*** Most recent longer−run survey value is from the December 2020 Blue Chip survey.
Note: Forward rates and term structure model estimates for December 2020 are based on values through December 1.
Source: Blue Chip; FRBNY; Board staff calculations.

Figure 4: Expected 10−Year Treasury Yield



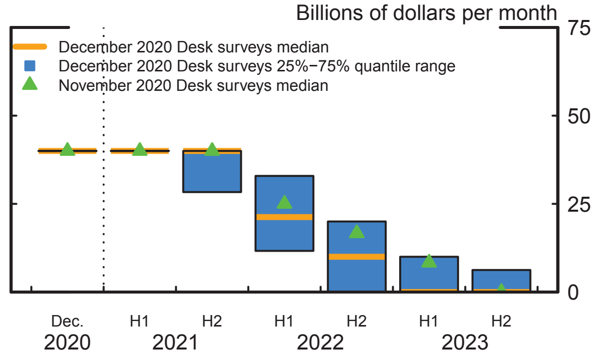
Note: Values refer to end−of−period expectations.
Source: FRBNY.

Figure 5: Expected Purchases of Treasury Securities Net of Reinvestments



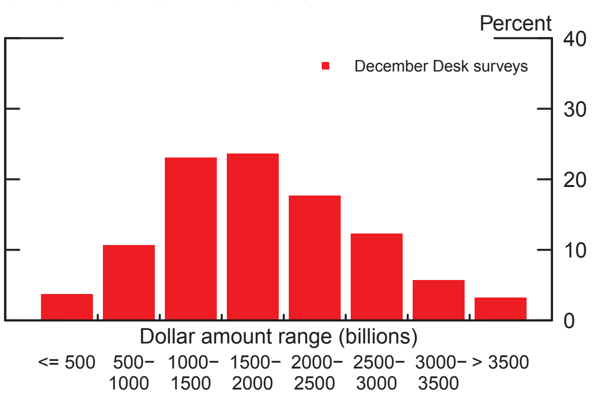
Note: Values for H1−2021, H2−2021, H1−2022, H2−2022, H1−2023 and H2−2023 are monthly averages calculated from respondents' expectations for total purchases in those periods.
Source: FRBNY.

Figure 6: Expected Purchases of Agency MBS Net of Reinvestments



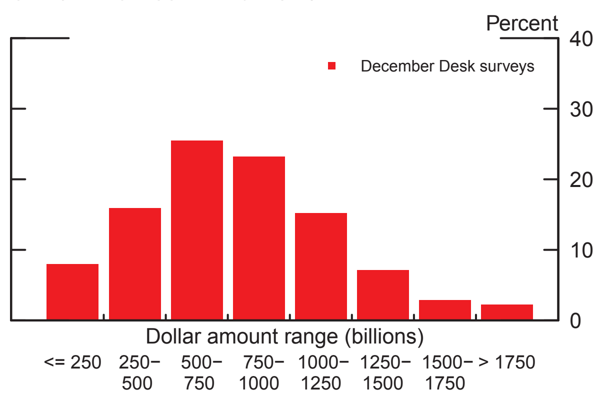
Note: Values for H1−2021, H2−2021, H1−2022, H2−2022, H1−2023 and H2−2023 are monthly averages calculated from respondents' expectations for total purchases in those periods.
Source: FRBNY.

Figure 7: Probability Distribution of Total U.S. Treasury Purchases, Beginning of 2021 to Year−End 2023



Note: Probabilities are the averages of the probabilities assigned by respondents to the Survey of Market Participants and Survey of Primary Dealers to different ranges of total purchases between the beginning of 2021 and the end of 2023.
Source: FRBNY.

Figure 8: Probability Distribution of Total Agency MBS Purchases, Beginning of 2021 to Year−End 2023



Note: Probabilities are the averages of the probabilities assigned by respondents to the Survey of Market Participants and Survey of Primary Dealers to different ranges of total purchases between the beginning of 2021 and the end of 2023.
Source: FRBNY.

Considerations Regarding Variability of the Treasury Stock's Term Premium Effect

The Balance Sheet and Income Projections (BSP) section in this Tealbook presents estimates of the "Total Term Premium Effect" (TTPE) of the securities—both current and projected—held in the SOMA portfolio. That analysis is based on a staff term structure model originating from research by Li and Wei (2013).[1] In the model, the term premium embedded in the nominal 10-year Treasury yield is affected by the amount of longer-term debt held—and, therefore, the amount of duration risk borne—by the public (the "duration risk channel"). The effect of changes in the (duration-adjusted) stock of Treasury securities on term premiums is assumed to be constant over time and symmetric for increases and decreases in the Treasury stock, at a rate of approximately 10 basis points per $200 billion of 10-year-equivalent securities. This discussion outlines some of the factors that may, at times, attenuate or amplify these baseline estimates of the term premium effect and introduce asymmetry between the extent of upward and downward responses of term premiums.

One reason why the term premium effect may currently be smaller than that implied by the staff model is that longer-term nominal yields are lower than in the pre–Global Financial Crisis (GFC) sample used to estimate the model. Under certain assumptions, including the absence of arbitrage opportunities, longer-term yields are subject to an effective lower bound (ELB).[2] If these assumptions hold, the size of the term premium effect likely shrinks as yields get closer to the ELB, resulting in an attenuated and asymmetric response of term premiums to changes in the stock of publicly held Treasury securities.

One way to quantify these ELB-related effects is through the use of a shadow rate term structure model that describes the relationship between observed yields and unconstrained "shadow yields."[3] If the response of shadow yields to economic shocks—such as changes in the stock of Treasury securities—is constant, we can use variation in the sensitivity of observed yields to shadow

[1] Canlin Li and Min Wei (2013), "Term Structure Modeling with Supply Factors and the Federal Reserve's Large-Scale Asset Purchase Programs," *International Journal of Central Banking*, vol. 9 (March), pp. 3–39.

[2] For a more detailed analysis, see Marcel Priebsch (2020), "Does Central Bank Policy Imply a Lower Bound on Longer-Term Yields?" memorandum, Board of Governors of the Federal Reserve System, Division of Monetary Affairs, March 31. As concluded there, when there is an ELB on the policy rate, longer-term Treasury yields are likely to be constrained by at least a "soft" lower bound (possibly at a slightly different level than the ELB relevant for the policy rate).

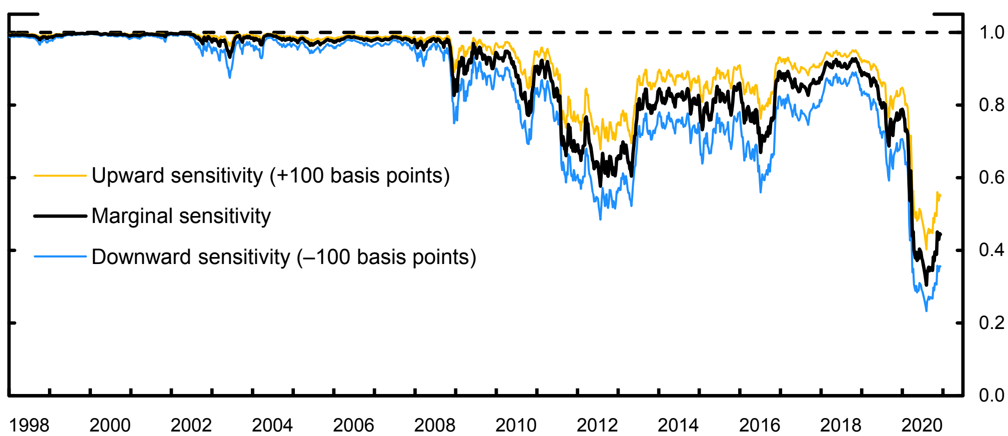
[3] While shadow yields are unconstrained and may fall below the ELB, model-implied observed yields obey the ELB. Away from the ELB—that is, when the probability of reaching the ELB over the lifetime of the bond is negligible—shadow yields approximate observed yields. In this analysis, the ELB on longer-term interest rates is the same as the ELB on the corresponding short-term interest rate as an implication of the no-arbitrage assumption.

yields to quantify how much less responsive observed yields are to these shocks near the ELB.

Figure 1 plots three measures of the sensitivity of the observed 10-year yield to the unconstrained 10-year shadow yield, using a shadow rate model based on staff research.[4] A level of unity (the dashed horizontal line) indicates a one-for-one relationship, as would be expected sufficiently far away from the ELB. The marginal sensitivity (the black line)—the rate of change in the 10-year yield for a small change in the 10-year shadow yield—illustrates the magnitude of the attenuation effect as yields approach the ELB. Because this attenuation weakens as yields rise and becomes more pronounced as yields fall, the sensitivity with respect to a large change in the shadow yield is larger on the upside than on the downside. This asymmetry is illustrated by the downward sensitivity (the blue line) and the upward sensitivity (the yellow line), each with respect to a hypothetical 100 basis point change in the shadow yield.

As seen in figure 1, before 2008, these sensitivities were relatively constant at a level close to unity, consistent with a one-for-one relationship between shadow and observed yields away from the ELB. Between 2008 and early 2020, the marginal sensitivity fluctuated somewhat with the level of the 10-year yield and overall averaged around 0.8, implying that the marginal pass-through from shadow yields to observed yields was attenuated by around 20 percent relative

Figure 1: Model-Implied Sensitivities of the 10-Year Treasury Yield to Changes in the 10-Year Shadow Yield



Note: Weekly observations from Jan. 7, 1998, to Dec. 9, 2020. Upward and downward sensitivities are computed with respect to 100 basis point changes in the shadow yield.

Source: Staff computation based on a shadow rate model from Kim and Priebsch (2020).

[4] See Don H. Kim and Marcel A. Priebsch (2020), "Are Shadow Rate Models of the Treasury Yield Curve Structurally Stable?" Finance and Economics Discussion Series 2020-061 (Washington: Board of Governors of the Federal Reserve System, June), https://doi.org/10.17016/FEDS.2020.061. The model assumes that nominal Treasury yields are subject to an ELB, which is estimated to be about 7 basis points.

to pre-GFC levels. Since March 2020, the 10-year yield has fallen to historic lows, and the relationship between observed yields and shadow yields has become more strongly attenuated, with marginal sensitivities falling below 0.5.

We can use the shadow rate model to obtain an estimate for how the TTPE in the BSP section of this Tealbook could be adjusted to account for ELB-related attenuation: The shadow rate model suggests that a TTPE on the shadow 10-year yield of 277 basis points—the estimated magnitude in the current quarter obtained using the model that does not account for ELB effects—translates to an effect on the observed 10-year yield of about 200 basis points. This adjusted, attenuated estimate would vary with the level of yields, even if the expected stock of Treasury securities remained unchanged.[5]

The hypothesis that the relationship between the stock of Treasury securities and observed longer-term yields has become weaker, on average, in recent years is supported empirically by the observation that term premiums have remained low despite a substantial increase in the stock of Treasury securities held by the public. In particular, the model underlying the staff's TTPE estimate implies a net increase in the 10-year term premium of several percentage points since the GFC, largely because the ratio of privately held Treasury securities (expressed in 10-year equivalents to adjust for changes in average duration over time) to GDP has more than doubled over the same period, from below 0.15 to roughly 0.4. However, term premium estimates from other models as well as those implied by surveys have not risen substantially on net. By itself, attenuation due to ELB proximity is unlikely to explain why a higher Treasury stock has not resulted in higher term premiums. One possible explanation is that offsetting factors—such as increased institutional demand for safe assets—may have contributed to term premiums remaining low.

There may also be times, however, when the term premium effect is temporarily larger than implied by the staff model. During episodes such as the 2013 taper tantrum or the onset of the COVID-19 pandemic in March 2020, Treasury yields were arguably highly sensitive to investor expectations about the stock of Treasury securities, possibly because investors were particularly averse to holding or absorbing additional interest rate risk at those times. Consequently, in

[5] The shadow rate model–based illustration of attenuation and asymmetry effects is subject to model uncertainty and will differ somewhat quantitatively depending on how the model is specified and estimated. The broad qualitative conclusions—including the order of magnitude of the recent attenuation factor—appear to be relatively robust across modifications to the baseline Kim and Priebsch (2020) specification (such as using different estimation sample periods) and consistent with findings based on other methodologies, including the staff's memo to the Committee, titled "Considerations for Asset Purchases," from October 16, 2020, and Thomas King (2019), "Expectation and Duration at the Effective Lower Bound," *Journal of Financial Economics*, vol. 134, (December), pp. 736–60.

such times, increases in projected SOMA holdings may be particularly effective in reducing the risk of a sudden rise in yields.

To summarize, there is evidence suggesting that changes in the stock of Treasury securities held by the public may have a weaker effect on term premiums than the staff's baseline estimates would imply and that this effect is asymmetric near the ELB. However, episodes such as the taper tantrum suggest that Treasury yields may still react strongly to reduced expectations about the Federal Reserve's asset holdings, especially at times when investors are averse to holding additional duration risk.[6] As an important caveat, in line with the staff's existing analytical framework of the effects of SOMA holdings on yields, the discussion and analysis here are limited to the duration risk channel and do not capture the effects of other potential channels through which the Federal Reserve's asset holdings may affect longer-term yields.[7]

Return to BSP

[6] Because ELB-related attenuation weakens as yields move higher, such a scenario remains a relevant concern even when yields are near the ELB.

[7] While alternative channels would be equally subject to factors such as ELB-related attenuation, the empirical relevance of different channels (and their interactions) might conceivably change near the ELB.

Alternatives

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Balance Sheet and Income Projections

The staff has prepared projections of the Federal Reserve's balance sheet and associated income, taking as given the economic and financial projections in Tealbook A. Overall, the projections are about unchanged from the October Tealbook and continue to assume asset purchases at the current pace through 2021.[1] The size of the balance sheet is projected to peak in early 2022, and remain near its peak through mid-2027 as principal payments received on securities in the SOMA portfolio are assumed to be reinvested until the policy rate reaches 1.25 percent. As always, projections for the size and composition of the balance sheet are highly uncertain because they depend on the future course of the economy and policy actions.

Total Assets. Total assets were $7.2 trillion at the end of November 2020 and are projected to increase to a peak of $8.9 trillion in January 2022 (see the top-left panel in the exhibit titled "Total Assets and Selected Balance Sheet Items").[2] Subsequently, total assets are projected to remain near their peak, edging down slightly as balances in credit and liquidity facilities decline while securities holdings remain roughly constant. Once the policy rate reaches 1.25 percent in mid-2027, the decline in assets accelerates as principal payments received on Treasury coupon securities and agency MBS are assumed to roll off the balance sheet until reserve balances fall to the minimum level consistent with ample supply.[3]

Total assets as a share of nominal GDP at the end of November 2020 stood at 34 percent; that ratio is projected to reach a peak of 39 percent at the end of 2021, an all-time high (see the bottom-left panel of the exhibit). Thereafter, the ratio of total assets to nominal GDP declines before leveling off at 22 percent in 2029.

[1] In Appendix II of the December 2020 *Intermeeting Report on the Federal Reserve Balance Sheet and Open Market Operations*, the staff presents several illustrative paths for additional asset purchases, including their potential implications for the balance sheet, as well as a comparison of these paths with prior asset purchase programs.

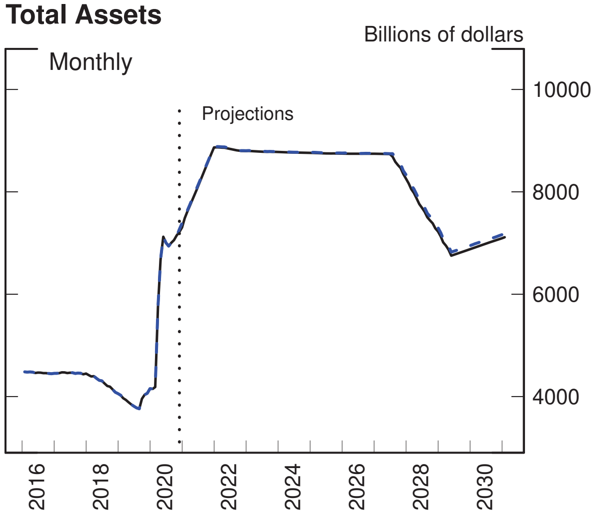
[2] For context, this projection would result in a more than doubling of the size of the Federal Reserve's balance sheet in two years; it stood at $4.2 trillion at the beginning of 2020.

[3] In this section, "agency MBS" refers to agency residential MBS, unless otherwise noted. Agency CMBS purchases have been small to date, and the staff assumes that holdings of these securities will remain at their end-November level of $9.8 billion before rolling off the balance sheet completely in 2030.

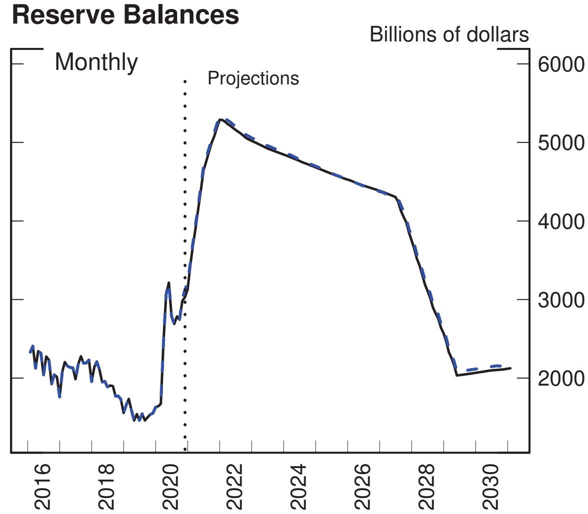
Total Assets and Selected Balance Sheet Items

December Tealbook Baseline — October Tealbook Baseline

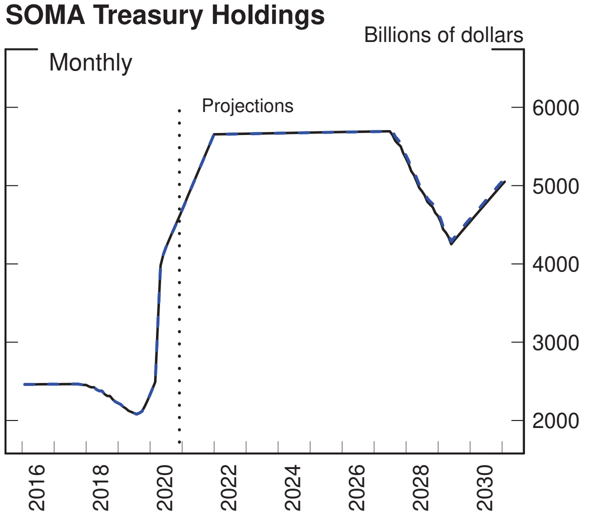
Total Assets



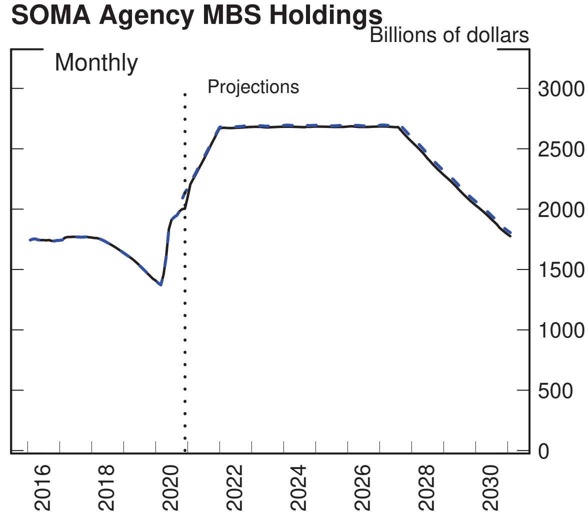
Reserve Balances



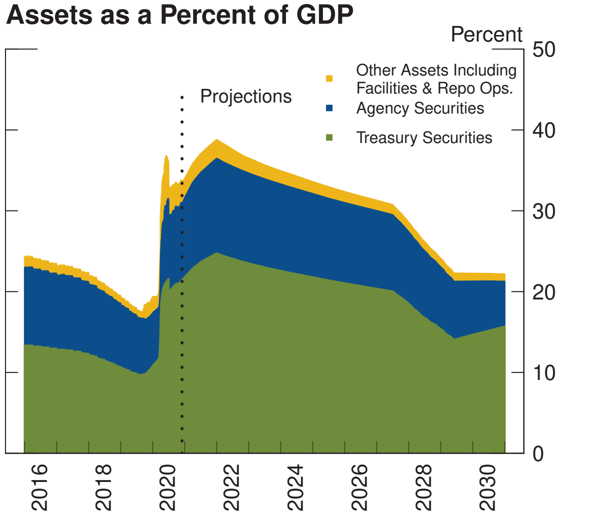
SOMA Treasury Holdings



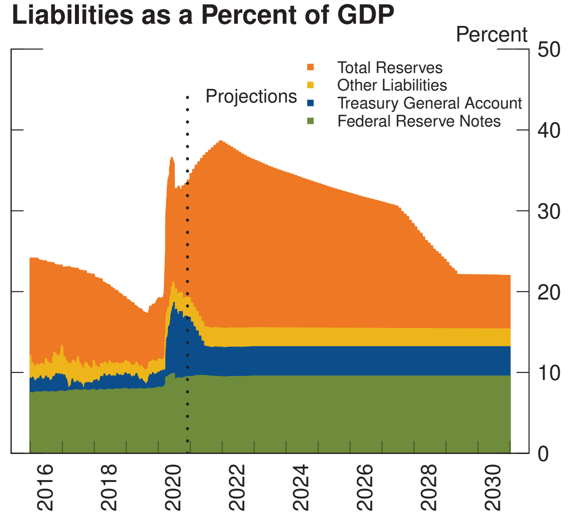
SOMA Agency MBS Holdings



Assets as a Percent of GDP



Liabilities as a Percent of GDP



SOMA Portfolio. At the end of November 2020, $6.6 trillion of securities were held outright in the SOMA portfolio, consisting of $4.6 trillion of Treasury securities and $2.0 trillion of agency securities (see the exhibit titled "Federal Reserve Balance Sheet"). Current projections incorporate monthly increases in holdings of Treasury securities and agency MBS of $80 billion and $40 billion, respectively, through December 2021, and no increases thereafter.[4] In comparison, the median respondent to the Desk's December 2020 surveys of primary dealers and market participants forecasted net monthly increases of $80 billion of Treasury securities and $40 billion of agency MBS through December 2021 with continued increases at a diminishing pace through mid-2023.[5]

The staff continues to assume that maturing Treasury securities will be reinvested at auction and that principal payments received on agency MBS will be reinvested into agency MBS until the federal funds rate reaches 1.25 percent, which is projected to occur in 2027:Q3. Subsequently, Treasury coupon securities and agency MBS are assumed to roll off the balance sheet as they mature or prepay.[6] The roll-off period is assumed to conclude when the ratio of reserve balances to nominal GDP falls to 7 percent, which is projected to occur in 2029:Q2.[7] Thereafter, reserve management purchases of Treasury securities are assumed to expand the SOMA portfolio in line with projected increases in the demand for reserves and other Federal Reserve liabilities. In addition, all maturing Treasury securities are assumed to be reinvested at auction, while principal payments received on agency MBS are reinvested into Treasury securities.[8]

[4] The staff assumes that the maturity distribution of Treasury security purchases will be broadly the same as that of the purchases that have occurred since March 15, 2020, which have been distributed across the maturity curve and have excluded bills.

[5] For Treasuries, the median respondent to the Desk's December 2020 surveys implied net monthly increases of $48 billion on average in 2022 and $18 billion on average in the first half of 2023. For agency MBS, the median respondent to the Desk's December 2020 surveys implied net monthly increases of $16 billion on average in 2022 and no purchases thereafter.

[6] The staff assumes that maturing Treasury bills will continue to be reinvested during this period.

[7] A reserves to nominal GDP ratio of 7 percent is the ratio that was assumed to be consistent with an ample supply of reserves in the January 2020 Tealbook (see the box "Money Market Developments and Monetary Policy Implementation" in the February 2020 *Monetary Policy Report*). Because of the considerable uncertainty regarding future policy actions and their effects on the size of the balance sheet as well as the period over which the balance sheet will remain elevated, both the date at which reserves will reach 7 percent of nominal GDP and the corresponding level of reserves implied by that ratio are highly uncertain.

[8] The staff assumes that reinvestments of maturing Treasury securities will continue to be directed toward newly issued securities at Treasury auctions in proportion to the maturity distribution of the Treasury debt issued at the time of reinvestment, with maturing coupon securities only reinvested into new coupon securities and maturing bills only reinvested into new bills.

Balance Sheet & Income

Federal Reserve Balance Sheet

Month-end Values - December Tealbook Baseline
(Billions of dollars)

	Historical*			Projected				
	Sep 2017	Feb 2020	Nov 2020	Dec 2020	Dec 2021	Dec 2022	Dec 2025	Dec 2030
Total assets	4,460	4,158	7,214	7,303	8,868	8,797	8,749	7,093
Selected assets								
Securities held outright	4,240	3,863	6,613	6,788	8,326	8,345	8,370	6,806
U.S. Treasury securities	2,465	2,489	4,607	4,687	5,655	5,662	5,685	5,012
Agency securities	1,775	1,374	2,006	2,101	2,671	2,682	2,686	1,794
Loans and other credit extensions	2	0	94	88	78	17	0	0
Facilities	2	0	92	86	78	17	0	0
Discount window	0	0	2	2	0	0	0	0
Central bank liquidity swaps	4	0	8	8	0	0	0	0
Repurchase agreements	0	126	1	0	0	0	0	0
Total liabilities	4,419	4,119	7,175	7,264	8,828	8,756	8,701	7,033
Selected liabilities								
Federal Reserve notes	1,532	1,753	2,018	2,032	2,157	2,290	2,568	3,040
Reverse repurchase agreements	557	229	192	196	208	219	246	291
Deposits	2,323	2,131	4,840	5,027	6,452	6,236	5,875	3,687
Reserve balances held by depository institutions	2,073	1,691	3,030	3,128	5,289	5,018	4,526	2,119
U.S. Treasury, General Account	159	357	1,623	1,583	836	881	989	1,170
Other deposits	91	83	187	317	327	337	360	398
Total capital**	41	39	39	39	40	41	48	60

Source: Federal Reserve H.4.1 daily data and staff calculations
Note: Components may not sum to totals due to rounding.
*September 2017 corresponds to the last month-end before the initiation of the normalization program; February 2020 corresponds to the last month-end before the initiation of Federal Reserve actions following the onset of the COVID-19 pandemic.
**Total capital includes capital paid-in and capital surplus accounts.

Facilities and Operations. As was the case in the October Tealbook, the staff assumes that the outstanding amounts under the discount window, central bank liquidity swaps, Primary Dealer Credit Facility (PDCF), and Money Market Mutual Fund Liquidity Facility (MMLF) will continue to decline gradually and reach zero by early 2021 (see the exhibit titled "Outstanding Balances in Facilities and Operations"). For the Term Asset-Backed Securities Loan Facility (TALF), Paycheck Protection Program Liquidity Facility (PPPLF), Secondary Market Corporate Credit Facility (SMCCF), Municipal Liquidity Facility (MLF), and Main Street Lending Program (MSLP), the staff assumes that credit outstanding will remain constant at its November 2020 level for some time before gradually declining as these assets mature and roll off the balance sheet over several years. Finally, the outstanding amounts of repurchase agreements and credit extensions under the Commercial Paper Funding Facility (CPFF) and Primary Market Corporate Credit Facility (PMCCF) are assumed to remain at zero over the forecast horizon.[9,10]

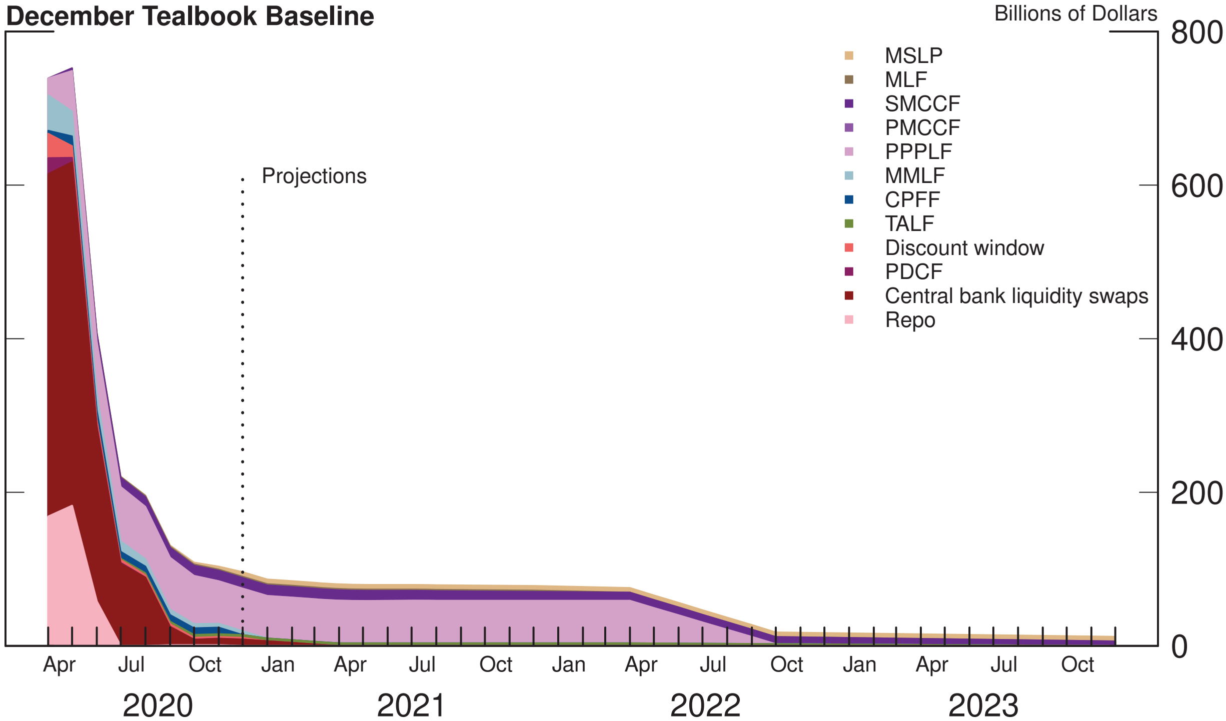
Reserve Balances. At the end of November 2020, the level of reserve balances stood at $3.0 trillion. The staff projects reserve balances to reach a peak of $5.3 trillion at the end of 2021, reflecting assumed increases in securities holdings through next year and projected reductions in the balance maintained in the Treasury General Account (TGA) (see the upper-right panel in the exhibit titled "Total Assets and Selected Balance Sheet Items").[11] After 2021, reserve balances are projected to fall at a moderate pace, in line

[9] The median respondent to the Desk's December 2020 surveys of primary dealers and market participants forecasted that outstanding balances across all facilities and operations will total $159 billion on December 30, 2020. For comparison, the staff's projection of that amount is $105 billion.

[10] On November 19, 2020, Treasury Secretary Mnuchin issued a letter stating that the authority for facilities utilizing CARES Act funding to originate new loans or purchase new assets will expire as scheduled. As a result, all facilities that are supported by CARES Act funding—the PMCCF, SMCCF, MLF, MSLP, and TALF—will expire on December 31, and the Federal Reserve will return unused CARES Act funds to the Treasury. The return of the unused funds does not affect the amount of credit that has already been extended under these facilities, the staff's projections of future usage of these facilities, or the current or future level of reserve balances. Overall, given the way the facilities were initially funded, there will be a small effect on the TGA and the total size of the balance sheet. See the December 2020 *Intermeeting Report on the Federal Reserve Balance Sheet and Open Market Operations* for further discussion.

[11] As in recent Tealbooks, in light of Treasury's ongoing precautionary approach to cash management, the staff continues to project an elevated TGA balance in the near term. Specifically, from a projected TGA balance of $1.6 trillion at the end of December, the staff assumes a gradual decline over the first half of 2021 to $800 billion, and then a flat balance over the third quarter. Thereafter, the TGA balance grows in line with nominal GDP, as in previous projections. Uncertainty about the near-term outlook for the TGA balance remains high, reflecting a number of factors, including the timing of outlays, the size and timing of any additional fiscal stimulus, and the termination next summer of the debt limit suspension.

Outstanding Balances in Facilities and Operations



Note: The following facilities are abbreviated above: Primary Dealer Credit Facility (PDCF), Term Asset–Backed Securities Loan Facility (TALF), Commercial Paper Funding Facility (CPFF), Money Market Mutual Fund Liquidity Facility (MMLF), Paycheck Protection Program Liquidity Facility (PPPLF), Primary Market Corporate Credit Facility (PMCCF), Secondary Market Corporate Credit Facility (SMCCF), Municipal Liquidity Facility (MLF), Main Street Lending Program (MSLP).

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with the growth in non-reserve liabilities and the declines in facilities balances.[12] The pace of decline in reserves steps up in 2027:Q3 as Treasury coupon securities and agency MBS begin to roll off the balance sheet. This more rapid pace of runoff continues until 2029:Q2, when reserves reach their assumed share of 7 percent of nominal GDP, which corresponds to a level of just over $2 trillion. Thereafter, reserves are projected to grow in line with nominal GDP.

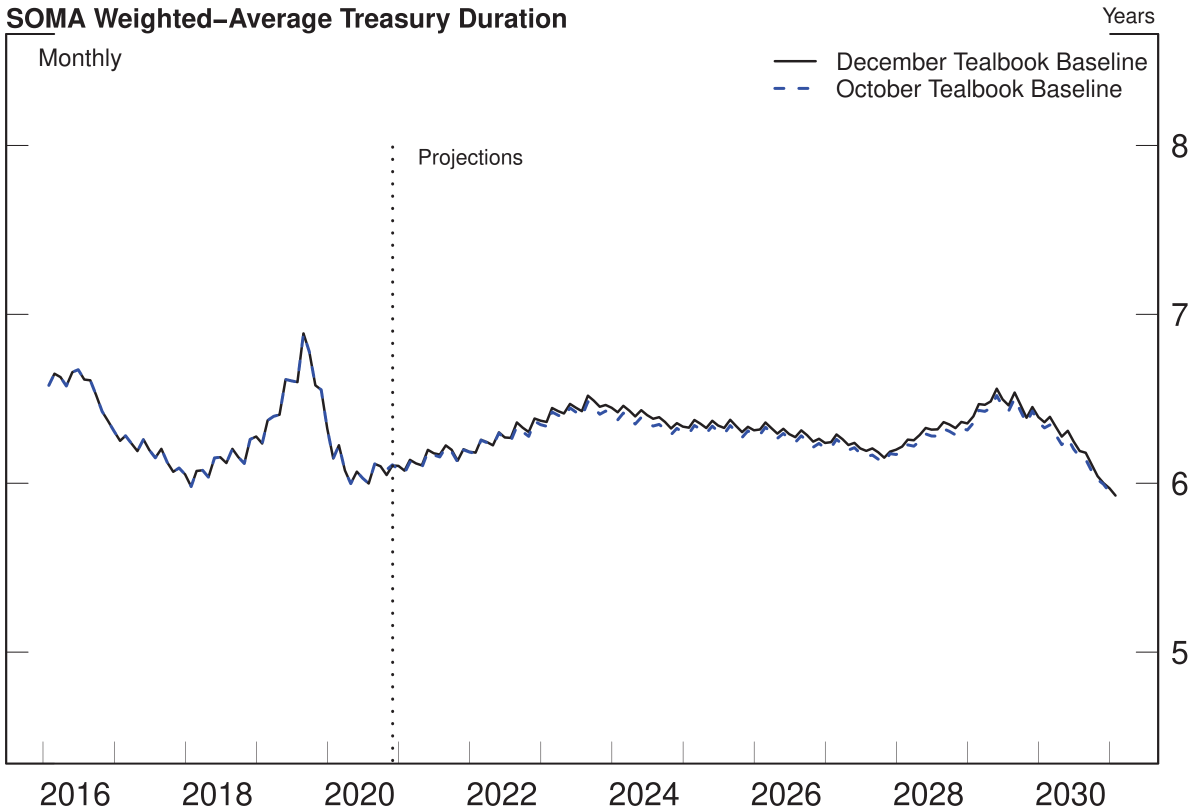
Duration. As shown in the exhibit titled “Projections for the Characteristics of SOMA Treasury Securities Holdings,” relative to the October Tealbook, the path for the weighted-average duration of the SOMA Treasury portfolio is largely unchanged. The weighted-average duration is projected to initially increase to 6.5 years in 2023 and then to decrease slightly during the remainder of the reinvestment period. During the portfolio roll-off phase, which starts in mid-2027, the weighted-average duration increases as a sizable share of securities with shorter maturities rolls off. Duration reaches a peak of 6.6 years in 2029. Subsequently, the weighted-average duration declines at a rapid pace as only Treasury bills are initially purchased to accommodate trend growth in liabilities. The share of bills is projected to increase to 15 percent of the SOMA Treasury portfolio by 2030, up from 7 percent at the end of November 2020.[13]

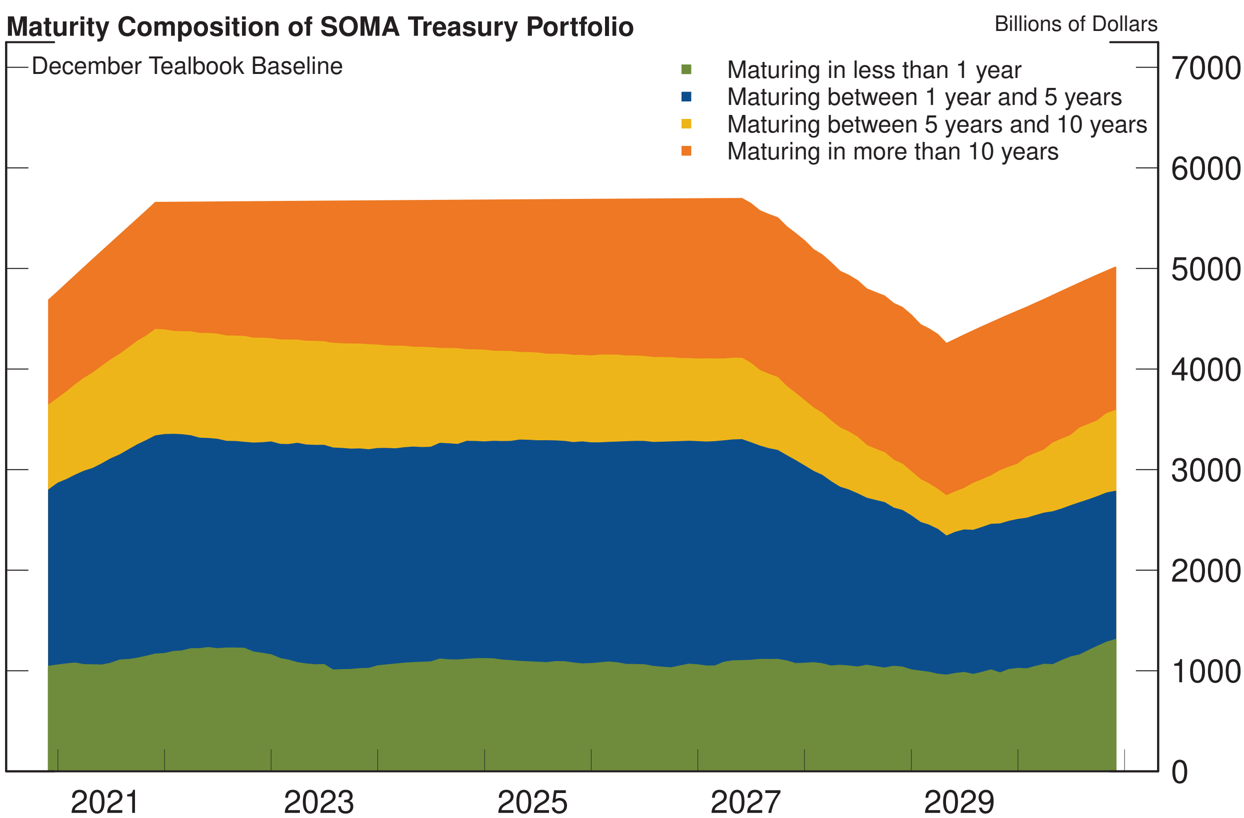
Total Term Premium Effect. As shown in the table “Projections for the 10-Year Treasury Total Term Premium Effect (TTPE) of the SOMA Portfolio,” the securities held in the SOMA portfolio, together with expectations for future SOMA holdings consistent with the staff projections, are estimated to be pushing the term premium embedded in the 10-year Treasury yield down by 277 basis points in the current quarter. Over the projection horizon, the magnitude of the downward pressure exerted on the term premium embedded in the 10-year Treasury yield is projected to diminish gradually, at an

[12] The staff assumes that the foreign repo pool and overnight reverse repo operations grow in line with nominal GDP from the start of the projection period. Currency grows in line with the staff’s near-term forecasts through December 2021 and with nominal GDP thereafter.

[13] The staff continues to assume that purchases aimed at accommodating trend growth in Federal Reserve liabilities will be directed entirely toward Treasury bills until bills constitute approximately one-third of the Federal Reserve’s portfolio of Treasury securities, close to the pre-2008 composition. Once that composition is reached in 2036:Q4, further purchases aimed at accommodating growth in Federal Reserve liabilities are assumed to reflect the projected maturity distribution of Treasury securities outstanding at that time.

Projections for the Characteristics of SOMA Treasury Securities Holdings





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Projections for the 10-Year Treasury
Total Term Premium Effect (TTPE) of the SOMA Portfolio
(Basis points)

Date	December Tealbook	October Tealbook
2020: Q4	-277	-279
2021: Q1	-276	-278
Q2	-275	-276
Q3	-272	-274
Q4	-270	-271
2022: Q4	-257	-258
2023: Q4	-242	-243
2024: Q4	-226	-227
2025: Q4	-211	-212
2026: Q4	-195	-196
2027: Q4	-179	-181
2028: Q4	-167	-169
2029: Q4	-159	-160
2030: Q4	-151	-153

Note: Values shown are quarterly averages.

average pace of 13 basis points per year. At the end of the projection horizon in 2030, the TTPE is estimated to be negative 151 basis points.[14]

As always, it is important to keep in mind that the TTPE is defined as the effect on the term premium path of only the current and projected Treasury securities and agency MBS held in the SOMA portfolio.[15] Other factors, notably the current and projected size and composition of Treasury debt outstanding, have important effects on the level of the term premium path. While the effects of factors other than SOMA holdings are not captured in the TTPE values reported here, other staff analyses provide estimates of the effects of increases in the projected size and maturity of Treasury securities outstanding on term premiums.[16] Additionally, while the model used to calculate the TTPE values presented here assumes that the relationship between changes in SOMA holdings and the term premium is constant over time, staff analysis suggests that the strength of this relationship may be attenuated near the effective lower bound. See the box "Considerations Regarding Variability of the Treasury Stock's Term Premium Effect" for a discussion.

Unrealized Gains or Losses. The SOMA portfolio was in a net unrealized gain position of $366 billion at the end of November 2020. With longer-term interest rates projected to rise, the unrealized gain position is expected to decline over the next several years (see the top panels of the exhibit titled "Market Value and Income Projections").

[14] As a comparison, if we assume the current and expected future path of SOMA securities holdings based on the median response to the Desk's December 2020 surveys of primary dealers and market participants, the TTPE path would be more negative than the December Tealbook baseline through 2030. More specifically, in the current quarter, the TTPE would be about 20 basis points more negative than in the baseline, and the difference would diminish over the projection horizon to only 5 basis points more negative by 2030.

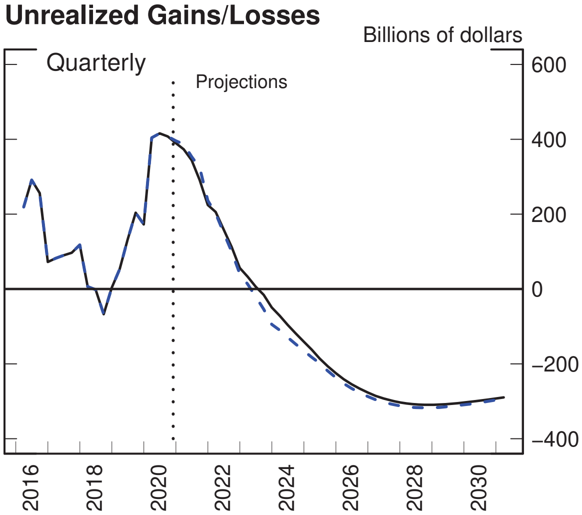
[15] While the effects on the term premium path from the current and expected future path of the Federal Reserve's facilities and agency CMBS holdings are not incorporated into the TTPE model, the financial projections presented in Tealbook A incorporate the effects of these policy actions on credit spreads.

[16] In particular, the analysis in the October 16, 2020 memo to the FOMC titled "Considerations for Asset Purchases" suggests that, relative to the path of the term premium projected prior to the pandemic, the upward revisions in the projected size and maturity of Treasury securities outstanding will increase the level of the term premium path by nearly 150 basis points over the next few years. For earlier analysis of the effects of Treasury's debt management on term premiums, see the September 2019 Tealbook B box titled "Measuring the Combined Effects of the Federal Reserve's Asset Purchase Programs and Treasury's Debt Management" and the July 2020 memo titled "Treasury Issuance Following Covid-19: Implications for Interest Rates."

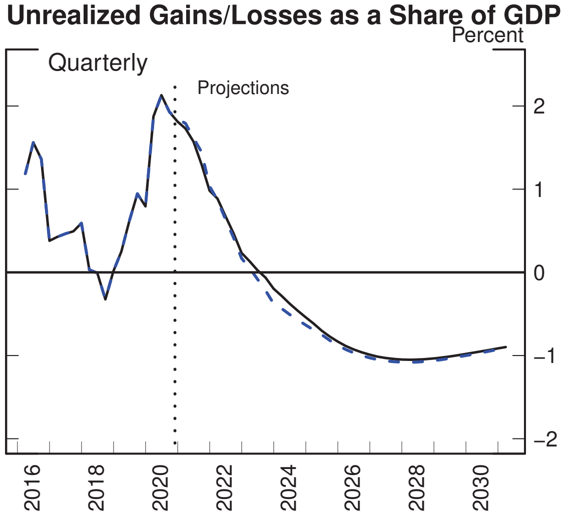
Market Value and Income Projections

December Tealbook Baseline — October Tealbook Baseline

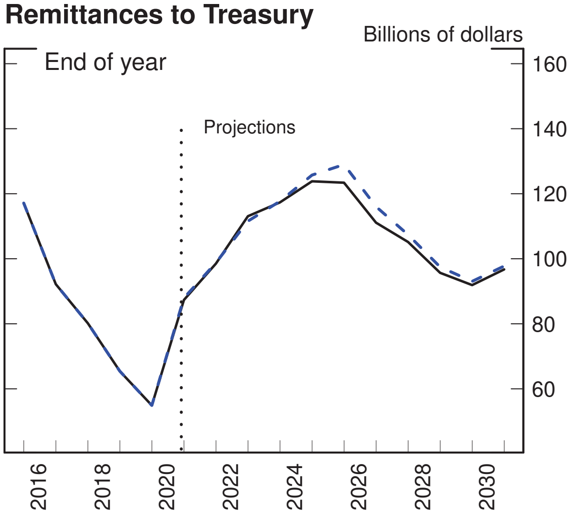
Unrealized Gains/Losses



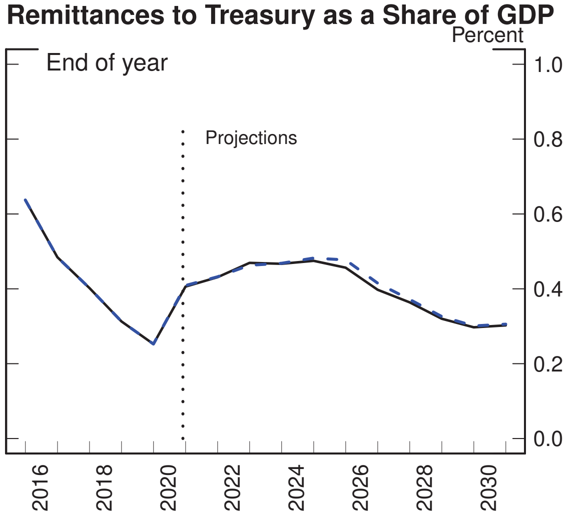
Unrealized Gains/Losses as a Share of GDP



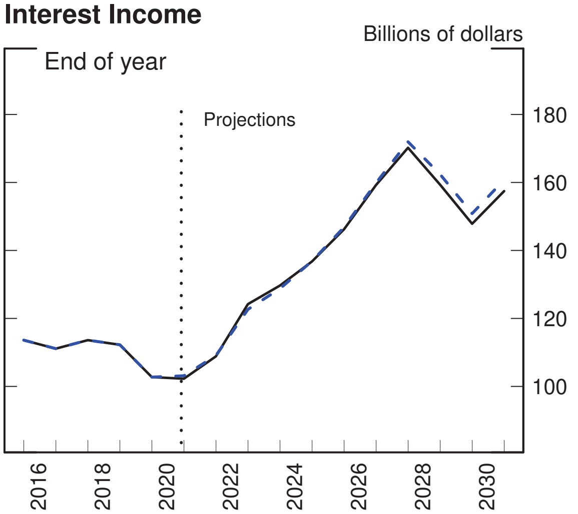
Remittances to Treasury



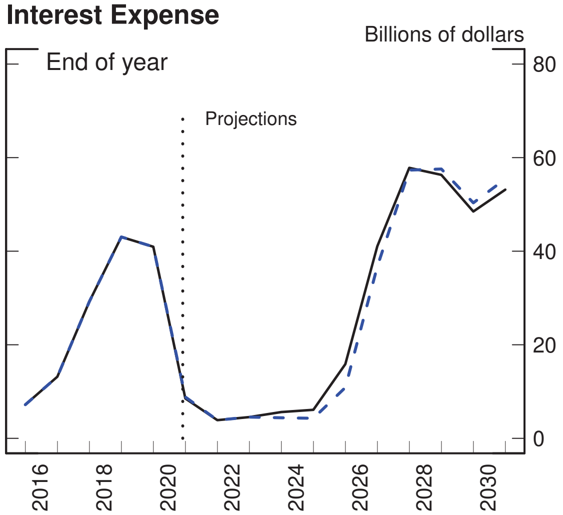
Remittances to Treasury as a Share of GDP



Interest Income



Interest Expense



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The unrealized gain becomes an unrealized loss position in mid-2023, and the unrealized loss position bottoms out at around $315 billion in 2028.[17]

Remittances. Remittances to the Treasury are projected to increase to $89 billion this year from $55 billion in 2019 (see the middle panels of the exhibit titled "Market Value and Income Projections"). This increase reflects additional interest income resulting from the expansion in SOMA securities holdings, as well as a drop in interest expense as the interest rate on excess reserves (IOER) decreased (see the bottom panels of the exhibit). Remittances are expected to peak at $124 billion in 2024. Subsequently, remittances are projected to decline through 2030 as the policy rate increases from the effective lower bound, and the corresponding IOER path results in greater interest expense.

[17] See the June 2018 Tealbook B box titled "What Does It Mean for the SOMA Portfolio to Be in an 'Unrealized Loss' Position?" 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.

Abbreviations

ABS	asset-backed securities
AFE	advanced foreign economy
BEA	Bureau of Economic Analysis, Department of Commerce
BHC	bank holding company
CARES Act	Coronavirus Aid, Relief, and Economic Security Act
CDS	credit default swaps
CFTC	Commodity Futures Trading Commission
C&I	commercial and industrial
CLO	collateralized loan obligation
CMBS	commercial mortgage-backed securities
CPFF	Commercial Paper Funding Facility
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
GFC	Global Financial Crisis

G-SIBs	global systemically important banking organizations
HQLA	high-quality liquid assets
IOER	interest on excess reserves
ISM	Institute for Supply Management
LFPR	labor force participation rate
LIBOR	London interbank offered rate
LSAPs	large-scale asset purchases
MBS	mortgage-backed securities
MEP	Maturity Extension Program
MLF	Municipal Liquidity Facility
MMFs	money market funds
MMLF	Money Market Mutual Fund Liquidity Facility
MSELF	Main Street Expanded Loan Facility
MSNLF	Main Street New Loan Facility
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
PDCF	Primary Dealer Credit Facility
PMCCF	Primary Market Corporate Credit Facility
PPP	Paycheck Protection Program
PPPLF	Paycheck Protection Program Liquidity Facility
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
SMCCF	Secondary Market Corporate Credit Facility
SOMA	System Open Market Account
TALF	Term Asset-backed Securities Loan Facility
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
WAD	Weighted Average Duration
WAM	Weighted Average Maturity
ZLB	zero lower bound

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