Prefatory Note

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

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

Content last modified 01/08/2021.

Report to the FOMC on Economic Conditions and Monetary Policy

Book B

Monetary Policy:
Strategies and Alternatives

July 23, 2015

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 Strategies

The top panel of the first exhibit, "Policy Rules and the Staff Projection," provides near-term prescriptions for the federal funds rate from four policy rules: the Taylor (1993) rule, the Taylor (1999) rule, an inertial version of the Taylor (1999) rule, and a first-difference rule.[1] These prescriptions take as given the staff's baseline projections for real activity and inflation in the near term. Medium-term prescriptions derived from dynamic simulations of the rules are discussed below. All of the Taylor-type rules prescribe an immediate increase in the federal funds rate. The Taylor (1993) and Taylor (1999) rules call for sizable increases in the federal funds rate to values of 1 percent or higher over the near term. The inertial Taylor (1999) rule prescribes less-sizable interest-rate increases—to just over ¼ percent this quarter and just under ½ percent in the next quarter—because this rule places a considerable weight on keeping the federal funds rate close to its lagged value. The first-difference rule, which responds to expected changes in the output gap and does not depend on a measure of the longer-run real interest rate, calls for values of the federal funds rate of just under ¼ percent in the third and fourth quarters.

All four simple rules prescribe policy rates for the current and next quarters that are similar to their prescriptions in the June Tealbook. As explained in Tealbook, Book A, and as shown in the lower-left panel of the exhibit, the percent deviation of output from potential is essentially the same as in the previous Tealbook through 2017. The staff's projection for core PCE inflation rises a bit more slowly toward 2 percent, reflecting some limited pass-through from recent declines in energy prices and a more persistent slowdown in health-care services inflation.

The top panel of the first exhibit also reports the Tealbook-consistent estimate of the equilibrium real federal funds rate, r^*, generated using the FRB/US model. This measure is an estimate of the real federal funds rate that would, if maintained, return output to potential in 12 quarters. The current estimate of r^*, -0.06, is essentially the same as the current-quarter estimate derived from the staff's outlook in June. The actual real federal funds rate, at about −1.1 percent, is over 100 basis points below the current

[1] The appendix to this section provides details on each of the four rules.

Strategies

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Policy Rules[1]

	2015:Q3	2015:Q4
Taylor (1993) rule	**1.77**	**1.92**
Previous Tealbook	*1.78*	*1.95*
Taylor (1999) rule	**1.16**	**1.40**
Previous Tealbook	*1.18*	*1.44*
Inertial Taylor (1999) rule	**0.28**	**0.45**
Previous Tealbook outlook	*0.29*	*0.46*
First-difference rule	**0.13**	**0.20**
Previous Tealbook outlook	*0.16*	*0.26*

Memo: Equilibrium and Actual Real Federal Funds Rates[2]

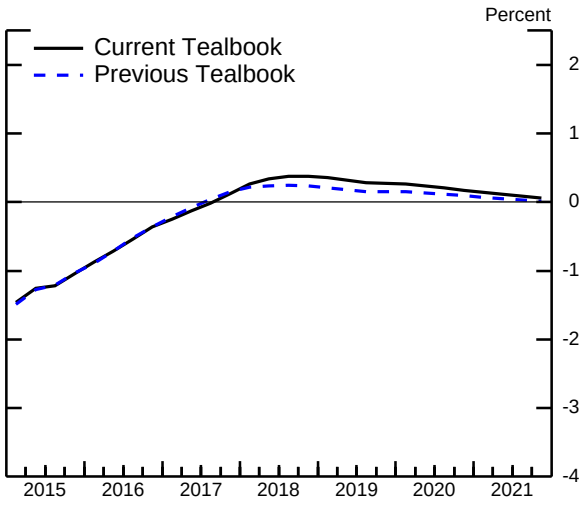
	Current Tealbook	*Current Quarter Estimate as of Previous Tealbook*	*Previous Tealbook*
Tealbook-consistent FRB/US *r** estimate	–0.06	–0.14	*–0.30*
Actual real federal funds rate	–1.11		*–1.18*

1. For rules that have a lagged policy rate as a right-hand-side variable, the lines denoted "Previous Tealbook outlook" report rule prescriptions based on the previous Tealbook's staff outlook, but jumping off from the realized value for the policy rate last quarter.

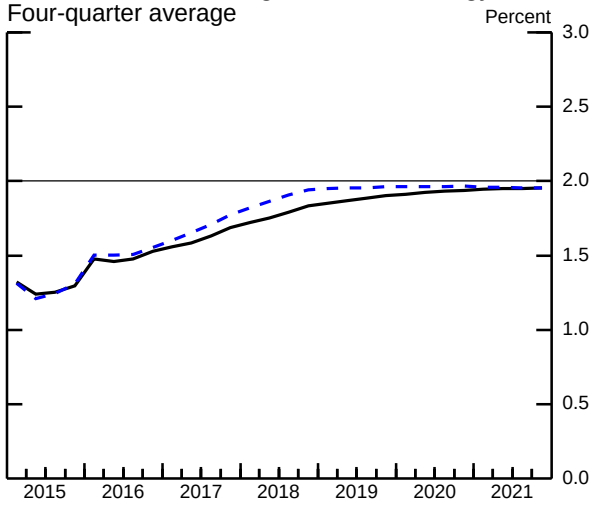
2. Estimates of *r** may change at the beginning of a quarter even when the staff outlook is unchanged because the twelve-quarter horizon covered by the calculation has rolled forward one quarter. Therefore, whenever the Tealbook is published early in the quarter, the memo includes an extra column labeled "Current Quarter Estimate as of Previous Tealbook" to facilitate comparison with the current Tealbook estimate.

Key Elements of the Staff Projection

GDP Gap



PCE Prices Excluding Food and Energy
Four-quarter average



estimate of r^*. This difference between r^* and the actual real federal funds rate is well within the range recorded thus far this year.

The second exhibit, "Policy Rule Simulations," reports dynamic simulations of the FRB/US model under each of the policy rules. These simulations reflect the endogenous responses of inflation and the output gap when the federal funds rate follows the paths implied by the different policy rules, subject to an effective lower bound of 12½ basis points for the federal funds rate. The results for each rule presented in these and subsequent simulations depend importantly on the assumptions that policymakers will adhere to the rule in the future and that the private sector fully understands the policy that will be pursued as well as its implications for real activity and inflation.

The second exhibit also displays the implications, in FRB/US, of following the baseline monetary policy assumptions in the current staff forecast.[2] As discussed in Tealbook, Book A, the staff assumes that the first increase in the federal funds rate will occur at the September FOMC meeting. After departing from its effective lower bound, the federal funds rate is assumed to rise at the pace prescribed by the inertial version of the Taylor (1999) rule. The federal funds rate increases about 20 basis points per quarter for three years, reaching 3 percent in early 2019; the pace of tightening subsequently slows, and the federal funds rate converges to its longer-run value of 3½ percent.

All of the Taylor-type policy rules in these dynamic simulations call for policy firming to begin this quarter.[3] The first-difference rule calls for firming to begin in the fourth quarter. The Taylor (1993) and Taylor (1999) rules produce paths for the real federal funds rate that lie significantly above the Tealbook baseline over the next few years, leading to somewhat higher unemployment rates but similar trajectories for inflation. Under the inertial Taylor (1999) rule, the federal funds rate initially rises a bit

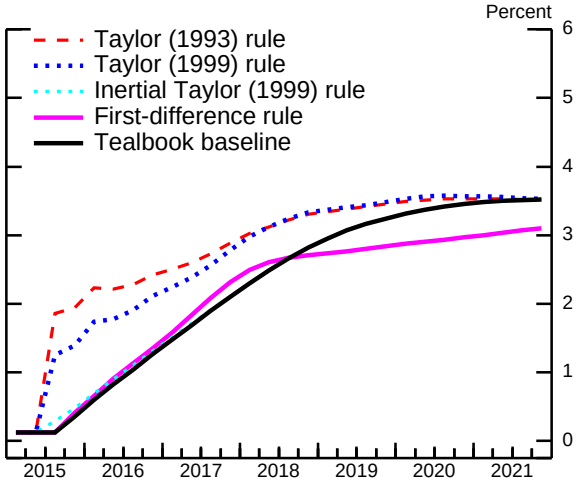
[2] The dynamic simulations discussed here and below incorporate the assumptions about underlying economic conditions that are used in the staff's baseline forecast, including the macroeconomic effects of the Committee's asset holdings from the large-scale asset purchase programs.

[3] Policy firming also begins in the third quarter under the Tealbook baseline policy. However, because it occurs late in the quarter, the quarterly average value for the federal funds rate remains within the current target range.

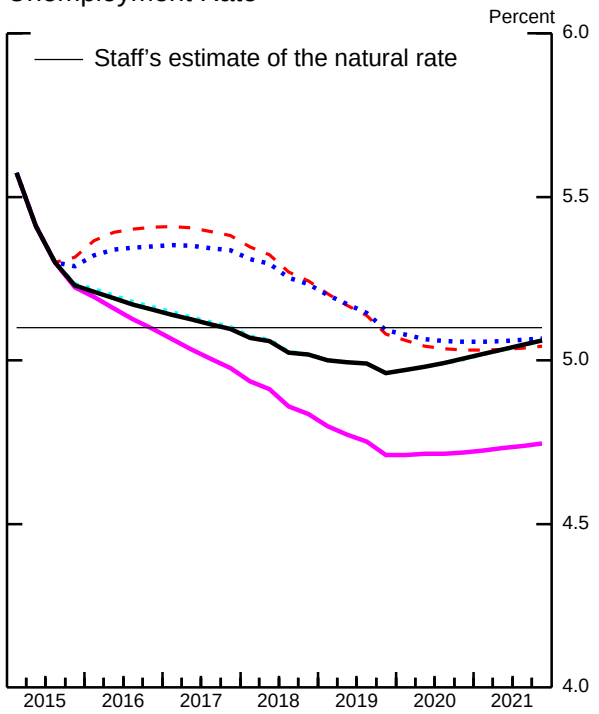
Strategies

Policy Rule Simulations

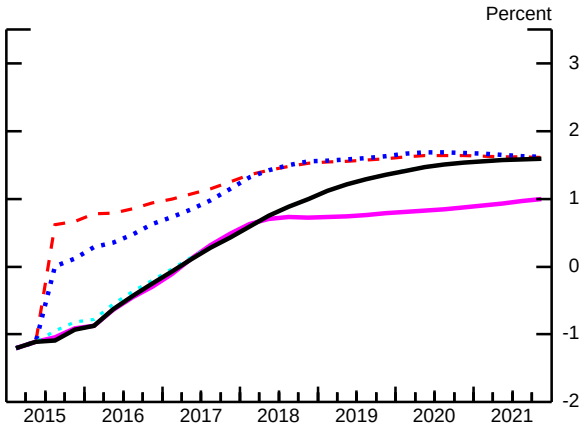
Effective Nominal Federal Funds Rate



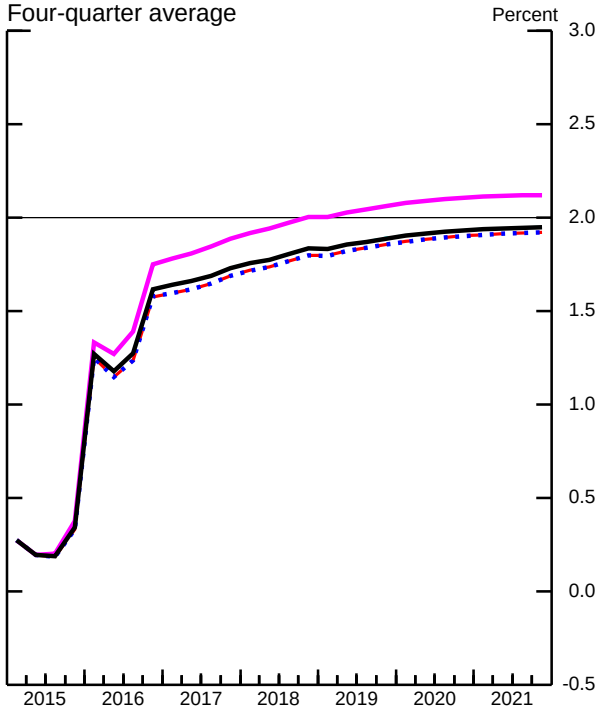
Unemployment Rate



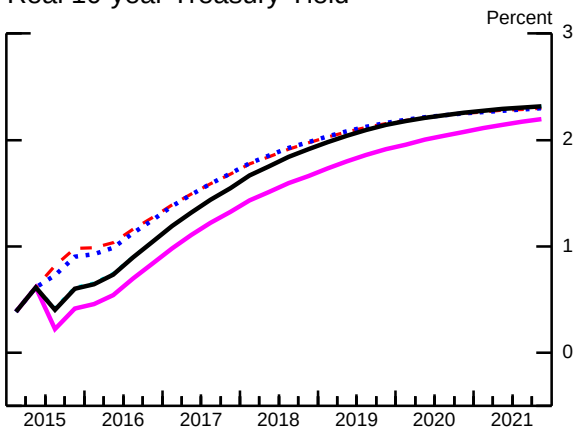
Real Federal Funds Rate



PCE Inflation
Four-quarter average



Real 10-year Treasury Yield



Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation. This choice of rule specification was made in light of the tendency for current and near-term core inflation rates to outperform headline inflation rates as predictors of the medium-term behavior of headline inflation.

above baseline but subsequently tracks the baseline path almost exactly. Macroeconomic outcomes are essentially the same as under the Tealbook baseline.[4]

The real federal funds rate path implied by the first-difference rule over the next couple of years is also similar to that in the Tealbook baseline, but it is somewhat lower than the baseline beginning in 2018. This pattern results from the slower pace of economic growth expected to occur late in the decade—after output overshoots its potential value—because the first-difference rule responds to the expected change in the output gap rather than its level. The lower path of the federal funds rate in the medium run, in conjunction with expectations of higher price and wage inflation in the future, leads to both higher levels of resource utilization and more inflation in the short run. Overall, the first-difference rule generates outcomes late in the decade for the unemployment rate and the inflation rate that, compared with the outcomes associated with other policy rules, are farther from the staff's estimates of the natural rate of unemployment and the Committee's 2 percent longer-run inflation objective.

The third exhibit, "Optimal Control Policy under Commitment," compares optimal control simulations for this Tealbook's baseline forecast with those reported in June. Policymakers are assumed to place equal weights on keeping headline PCE inflation close to the Committee's 2 percent goal, on keeping the unemployment rate close to the staff's estimate of the natural rate of unemployment, and on minimizing changes in the federal funds rate. The concept of optimal control that is employed here corresponds to a commitment policy under which the plans that policymakers make today are assumed to constrain future policy choices.[5]

Under the optimal control policy, the real federal funds rate tracks the baseline closely. Accordingly, the path of the real 10-year Treasury yield under the optimal control policy is also virtually the same as in the Tealbook baseline, leading to essentially the same macroeconomic outcomes.

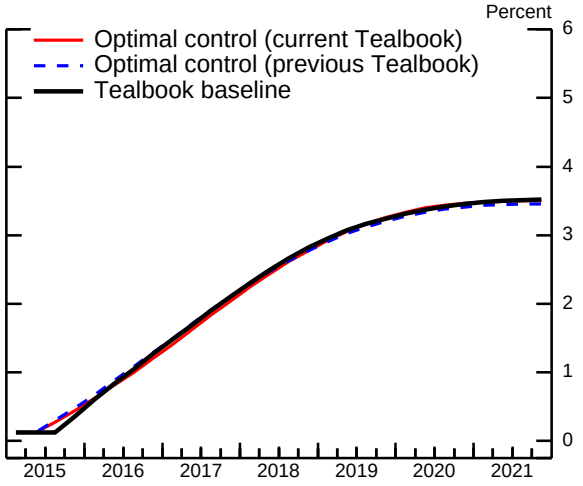
[4] The prescriptions and outcomes of the inertial Taylor (1999) rule and the Tealbook baseline policy are so close that in most of the panels of the exhibit the lines for the inertial Taylor (1999) rule are not visible.

[5] The results for optimal control policy under discretion (in which policymakers cannot credibly commit to carrying out a plan involving policy choices that would be suboptimal at the time that these choices have to be implemented) are similar.

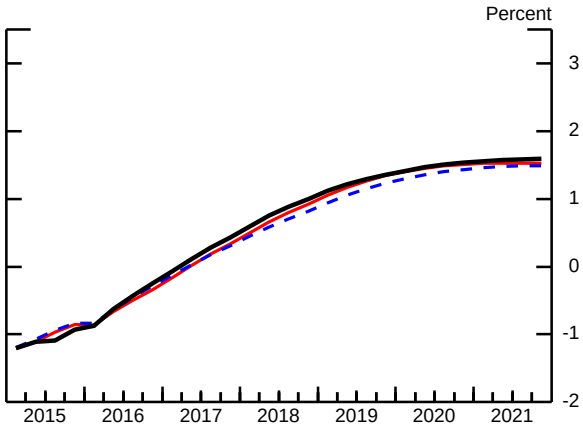
Strategies

Optimal Control Policy under Commitment

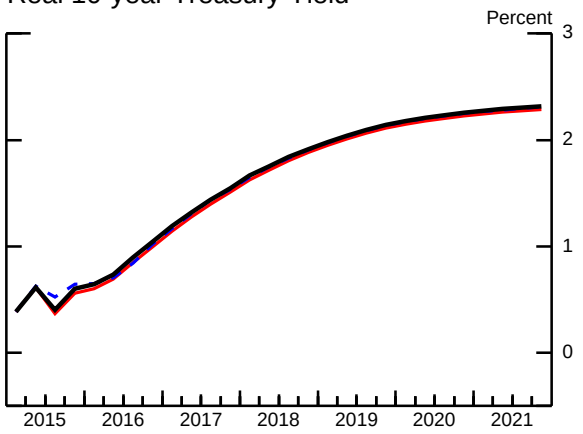
Effective Nominal Federal Funds Rate



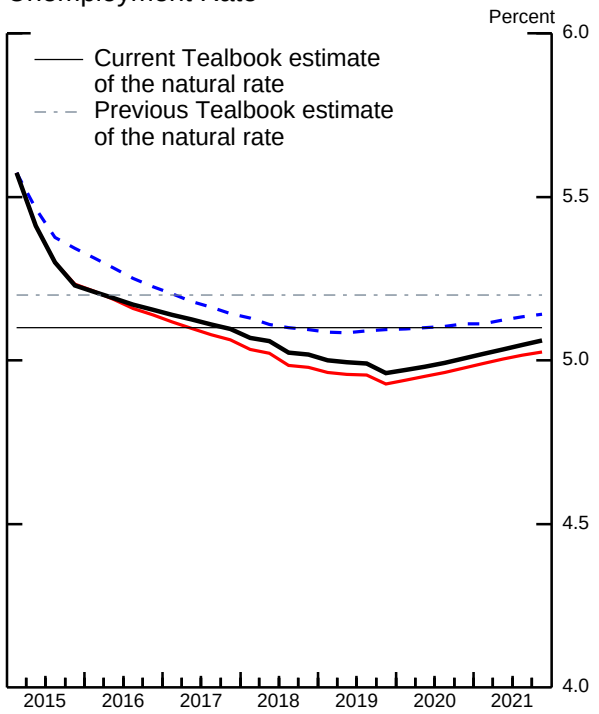
Real Federal Funds Rate



Real 10-year Treasury Yield

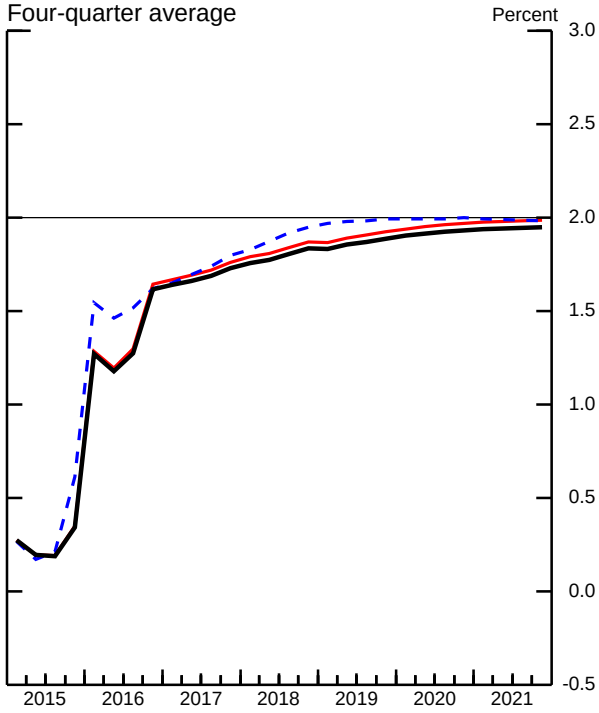


Unemployment Rate



PCE Inflation

Four-quarter average



The optimal control path for the federal funds rate is largely similar to its path in the June Tealbook, as the staff's assessments of resource slack and inflation are little changed. Accordingly, the path for longer-term real rates implied by the optimal control tracks closely the path of the previous Tealbook. Although the path of the unemployment rate under the optimal control policy is lower than in the previous Tealbook, the unemployment rate gap is about unchanged due to an offsetting reduction in the staff's estimate of the natural rate.

Optimal Control Policy under Commitment with Alternative Preferences for Labor Market Outcomes

One of the assumptions embedded in the standard optimal control simulations discussed above is that welfare losses due to unemployment are symmetric around the staff's estimate of the natural rate of unemployment. However, policymakers may regard the cost of the unemployment rate being below the natural rate as considerably smaller than the cost of being above the natural rate by the same amount. This could be so for a variety of reasons, including that high unemployment could lead to skill deterioration and thus to persistently low output, while the tight labor market in an economy operating below the natural rate may lead workers and employers to undertake greater investment in human capital and thus result in persistently higher productivity. Policymakers may, instead, choose to ignore unemployment rate deviations as a pragmatic response to uncertainty about estimates of the natural rate of unemployment on the grounds that policy responses to poorly estimated unemployment gaps could lead to policy mistakes.

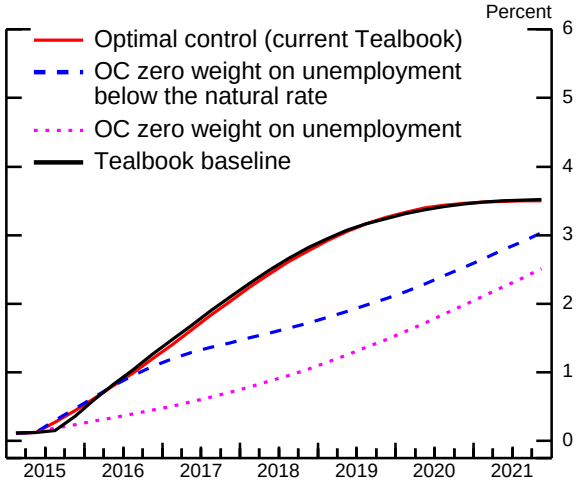
To model the first, we consider a policymaker who attaches no losses to unemployment falling below the natural rate but who retains the usual aversion to unemployment that exceeds the natural rate. To model the second, we consider a policymaker who places no weight on unemployment rate deviations, whether positive or negative, thus narrowing the arguments in the loss function to inflation deviations and policy rate changes.[6] The fourth exhibit, "Optimal Control Policy under Commitment With Alternative Preferences for Labor Market Outcomes," displays optimal control simulations under these alternative preferences.

[6] Optimal control simulations that place a low weight on penalizing deviations of unemployment from the natural rate are also consistent with preferences that are more concerned with stabilizing inflation. Calibrations that reduce the weight placed on policy rate changes produce similar results.

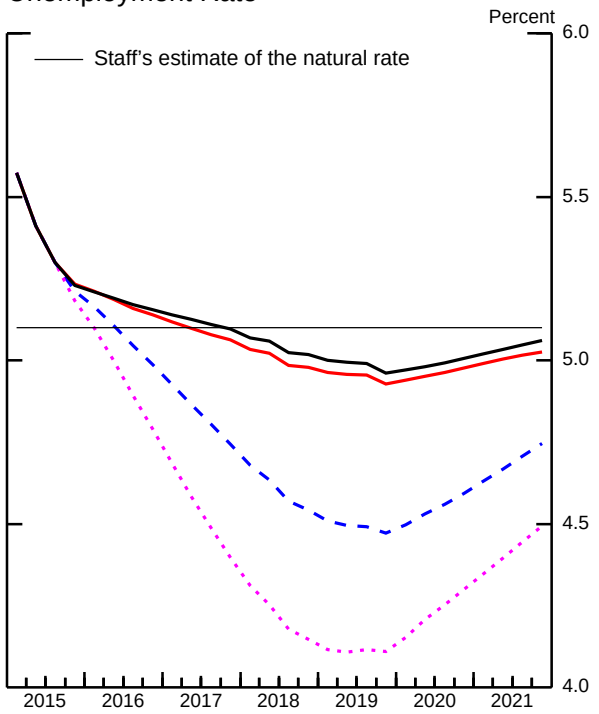
Strategies

Optimal Control Policy under Commitment
With Alternative Preferences for Labor Market Outcomes

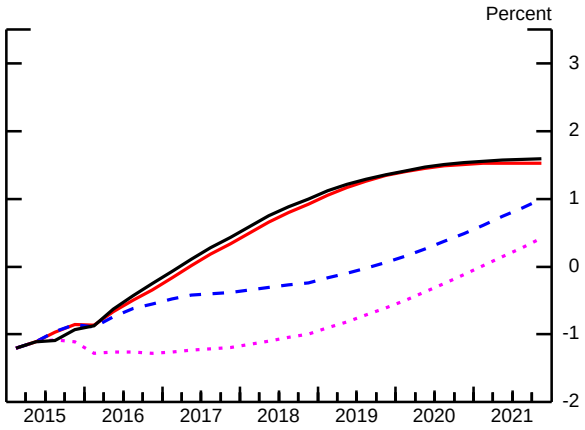
Effective Nominal Federal Funds Rate



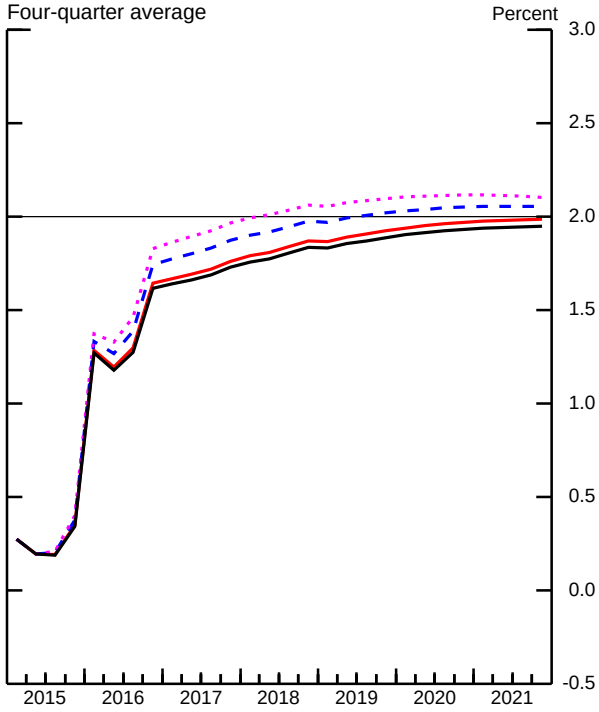
Unemployment Rate



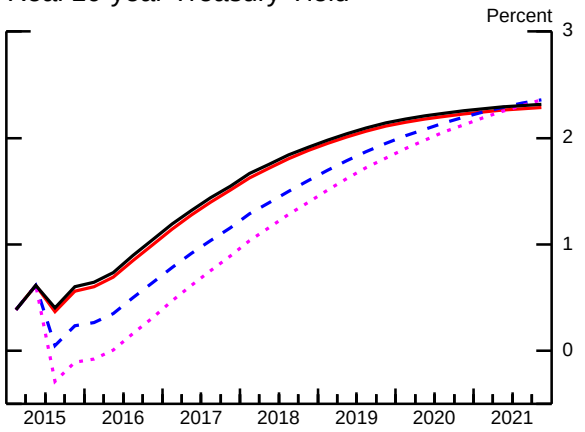
Real Federal Funds Rate



PCE Inflation
Four-quarter average



Real 10-year Treasury Yield



Note: The lines labeled "Optimal control (current Tealbook)" correspond to the current Tealbook baseline optimal control policy under commitment, which embeds the assumption that policymakers' loss function places equal weights on squared deviations of inflation, the unemployment gap, and federal funds rate changes. The lines labeled "OC zero weight on unemployment below the natural rate" correspond to a loss function that places no weight on the unemployment gap when unemployment falls below the staff's estimate of the natural rate. The lines labeled "OC zero weight on unemployment" correspond to a loss function that places no weight on the unemployment gap.

Given that, under the baseline outlook, inflation is running substantially below target for the next few years, the first alternative optimal control simulation—the one which ascribes no costs to undershooting the natural rate of unemployment—advocates a substantially more accommodative policy path compared with the standard case of optimal control with equal and symmetric weights. The federal funds rate departs from the effective lower bound in the same quarter as in the standard optimal control simulation, but its ensuing rise is more gradual, with the federal funds rate increasing, on average, 10 basis points per quarter over the next three years, compared to 20 basis points per quarter in the optimal control simulation with standard preferences. The unemployment rate undershoots the staff's estimate of the natural rate significantly more than in the standard case, and inflation returns to the Committee's 2 percent objective faster and subsequently remains slightly above target for some time. That a scenario of this nature would result in the unemployment rate undershooting the natural rate is an outcome that might be expected; the substantial magnitude of the undershooting is a manifestation of the estimated low sensitivity of inflation to resource slack in the FRB/US model.

Given the staff outlook, with an unemployment rate that is expected to undershoot the natural rate for some time, the second alternative optimal control simulation—the one that ascribes no cost to deviations of unemployment above or below the natural rate of unemployment—results in a qualitatively similar but more accommodative version of the asymmetric case on the horizon shown. The differences in these alternatives' policy paths stem from the greater willingness of the policymaker who places no weight on labor market outcomes to tolerate overshooting of the natural rate of unemployment in the period beyond the horizon shown. This policymaker is thus more amenable to easing policy aggressively early on and tightening aggressively later.[7]

There are some important caveats attached to these findings. Notably, the results are sensitive to a number of maintained modelling assumptions, including that inflation

[7] The dominating feature of the simulations is the willingness of the policymaker who is indifferent to the labor market to overshoot the natural rate more substantially and for a longer duration. Note that the binding portion of the overshoot occurs beyond the horizon shown. This leads the indifferent policymaker to choose a more accommodative path that boosts inflation early on. This result is robust to reducing the relative weight assigned to changes in the federal funds rate. With a lower weight on changes in the federal funds rate, both alternative optimal control simulations tolerate a slightly more rapid pace of increase in the federal funds rate on some portion of the horizon but produce very similar paths for the real 10-year Treasury yield relative to their counterpart with similar preference over the labor market but stronger preference for small changes in the federal funds rate.

expectations would remain well anchored as policymakers pushed the unemployment rate well below the natural rate for an extended period. Even if inflation expectations were to remain anchored, it is uncertain whether the estimated low sensitivity of inflation to resource slack in the FRB/US model holds for a path of the unemployment rate far from the staff's baseline projection.

The final exhibit, "Outcomes under Alternative Policies," tabulates the simulation results for key variables under the policy rules described above.

Outcomes under Alternative Policies

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

Measure and policy	2015		2016	2017	2018	2019
	H1	H2				
Real GDP						
Extended Tealbook baseline[1]	1.1	2.0	2.3	2.1	2.0	1.7
Taylor (1993)	1.1	1.7	2.0	2.1	2.1	1.9
Taylor (1999)	1.1	1.8	2.0	2.0	2.0	1.8
Inertial Taylor (1999)	1.1	2.0	2.3	2.1	2.0	1.7
First-difference	1.1	2.0	2.5	2.3	2.1	1.8
Optimal control	1.1	2.0	2.4	2.2	2.0	1.7
Unemployment rate[2]						
Extended Tealbook baseline[1]	5.4	5.2	5.2	5.1	5.0	5.0
Taylor (1993)	5.4	5.3	5.4	5.4	5.2	5.1
Taylor (1999)	5.4	5.3	5.3	5.3	5.2	5.1
Inertial Taylor (1999)	5.4	5.2	5.2	5.1	5.0	5.0
First-difference	5.4	5.2	5.1	5.0	4.8	4.7
Optimal control	5.4	5.2	5.1	5.1	5.0	4.9
Total PCE prices						
Extended Tealbook baseline[1]	0.0	0.7	1.6	1.7	1.8	1.9
Taylor (1993)	0.0	0.7	1.6	1.7	1.8	1.9
Taylor (1999)	0.0	0.7	1.6	1.7	1.8	1.9
Inertial Taylor (1999)	0.0	0.7	1.6	1.7	1.8	1.9
First-difference	0.0	0.8	1.8	1.9	2.0	2.1
Optimal control	0.0	0.7	1.6	1.8	1.9	1.9
Core PCE prices						
Extended Tealbook baseline[1]	1.2	1.4	1.5	1.7	1.8	1.9
Taylor (1993)	1.2	1.3	1.5	1.6	1.8	1.9
Taylor (1999)	1.2	1.3	1.5	1.6	1.8	1.9
Inertial Taylor (1999)	1.2	1.4	1.5	1.7	1.8	1.9
First-difference	1.2	1.4	1.7	1.8	2.0	2.1
Optimal control	1.2	1.4	1.6	1.7	1.9	1.9
Effective nominal federal funds rate[2]						
Extended Tealbook baseline[1]	0.1	0.4	1.3	2.1	2.8	3.2
Taylor (1993)	0.1	1.9	2.4	2.9	3.3	3.5
Taylor (1999)	0.1	1.4	2.1	2.8	3.3	3.5
Inertial Taylor (1999)	0.1	0.5	1.3	2.1	2.8	3.2
First-difference	0.1	0.4	1.4	2.3	2.7	2.8
Optimal control	0.1	0.4	1.2	2.0	2.8	3.3

1. In the Tealbook baseline, the federal funds rate first departs from an effective lower bound of 12½ basis points in September of 2015. Thereafter, the federal funds rate follows the prescriptions of the inertial Taylor (1999) rule.
2. Percent, average for the final quarter of the period.

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Appendix

POLICY RULES USED IN "MONETARY POLICY STRATEGIES"

The table below gives the expressions for the selected policy rules used in "Monetary Policy Strategies." In the table, R_t denotes the effective nominal federal funds rate for quarter t, while the right-hand-side variables include the staff's projection of trailing four-quarter core PCE inflation for the current quarter and three quarters ahead (π_t and $\pi_{t+3|t}$), the output gap estimate for the current period (gap_t), and the forecast of the three-quarter-ahead annual change in the output gap ($\Delta^4 gap_{t+3|t}$). The value of policymakers' longer-run inflation objective, denoted π^{LR}, is 2 percent.

Taylor (1993) rule	$R_t = r^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 0.5gap_t$
Taylor (1999) rule	$R_t = r^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + gap_t$
Inertial Taylor (1999) rule	$R_t = 0.85R_{t-1} + 0.15(r^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + gap_t)$
First-difference rule	$R_t = R_{t-1} + 0.5(\pi_{t+3\|t} - \pi^{LR}) + 0.5\Delta^4 gap_{t+3\|t}$

The first two of the selected rules were studied by Taylor (1993, 1999), while the inertial version of the Taylor (1999) rule has been featured prominently in analysis by Board staff.[1] The intercepts of these rules are chosen so that they are consistent with a 2 percent longer-run inflation objective and a longer-run real interest rate, denoted r^{LR}, of 1½ percent, a value used in the FRB/US model. The prescriptions of the first-difference rule do not depend on the level of the output gap or the longer-run real interest rate; see Orphanides (2003).

Near-term prescriptions from the four policy rules are calculated using Tealbook projections for inflation and the output gap. For the rules that include the lagged policy rate as a right-hand-side variable—the inertial Taylor (1999) rule and the first-difference rule—the lines labelled "Previous Tealbook outlook" report prescriptions derived from the previous Tealbook projections for inflation and the output gap, while using the same lagged funds rate value as in the prescriptions computed for the current Tealbook. When the Tealbook is published early in a quarter, this lagged funds rate value is set equal to the actual value of the lagged funds rate in the previous quarter, and prescriptions are shown for the current quarter. When the Tealbook is published late in a quarter, the prescriptions are shown for the next quarter, and the lagged policy rate, for each of these rules, including those that use the "Previous Tealbook outlook," is set equal to the average value for the policy rate thus far in the quarter. For the subsequent quarter, these rules use the lagged values from their simulated, unconstrained prescriptions.

[1] See, for example, Erceg and others (2012).

ESTIMATES OF THE EQUILIBRIUM AND ACTUAL REAL FEDERAL FUNDS RATES

An estimate of the equilibrium real federal funds rate appears as a memo item in the first exhibit, "Policy Rules and the Staff Projection." The concept of the short-run equilibrium real rate underlying the estimate corresponds to the level of the real federal funds rate that is consistent with output reaching potential in 12 quarters using an output projection from FRB/US, the staff's large-scale econometric model of the U.S. economy. This estimate depends on a very broad array of economic factors, some of which take the form of projected values of the model's exogenous variables. The memo item in the exhibit reports the "Tealbook-consistent" estimate of r^*, which is generated after the paths of exogenous variables in the FRB/US model are adjusted so that they match those in the extended Tealbook forecast. Model simulations then determine the value of the real federal funds rate that closes the output gap conditional on the exogenous variables in the extended baseline forecast.

The estimated actual real federal funds rate reported in the exhibit is constructed as the difference between the federal funds rate and the trailing four-quarter change in the core PCE price index. The federal funds rate is specified as the midpoint of the target range for the federal funds rate on the Tealbook, Book B, publication date.

FRB/US MODEL SIMULATIONS

The exhibits of "Monetary Policy Strategies" that report results from simulations of alternative policies are derived from dynamic simulations of the FRB/US model. Each simulated policy rule is assumed to be in force over the whole period covered by the simulation; this period extends several decades beyond the time horizon shown in the exhibits. The simulations are conducted under perfect foresight and are predicated on the staff's extended Tealbook projection, which includes the macroeconomic effects of the Committee's large-scale asset purchase programs. When the Tealbook is published early in a quarter, all of the simulations begin in that quarter. However, when the Tealbook is published late in a quarter, all of the simulations begin in the subsequent quarter.

COMPUTATION OF THE OPTIMAL CONTROL POLICY UNDER COMMITMENT

The optimal control simulations posit that policymakers minimize a discounted sum of weighted squared deviations of four-quarter headline PCE inflation (π_t^{pce}) from the Committee's 2 percent objective, of squared deviations of the unemployment rate from the staff's estimate of the natural rate (this difference is also known as the unemployment rate gap, $ugap_t$), and of squared changes in the federal funds rate. The resulting loss function, shown below, embeds the assumptions that policymakers discount the future using a quarterly discount factor $\beta = 0.9963$ and place equal weights on squared deviations of inflation, the unemployment gap, and federal funds rate changes (that is, $\lambda_\pi = \lambda_{ugap} = \lambda_R$).

$$L_t = \sum_{\tau=0}^{T} \beta^{\tau} \left\{ \lambda_{\pi} \left(\pi_{t+\tau}^{pce} - \pi^{LR} \right)^2 + \lambda_{ugap} (ugap_{t+\tau})^2 + \lambda_R (R_{t+\tau} - R_{t+\tau-1})^2 \right\}$$

The optimal control policy is the path for the federal funds rate that minimizes the above loss function in the FRB/US model, subject to the effective lower bound constraint on nominal interest rates, under the assumption of perfect foresight, and conditional on the staff's extended Tealbook projection. Policy tools other than the federal funds rate are taken as given and subsumed within the Tealbook baseline. The path chosen by policymakers today is assumed to be credible, meaning that decision makers in the model see this path as being a binding commitment on the future Committees; the optimal control policy takes as given the lagged value of the federal funds rate but is otherwise unconstrained by policy decisions made prior to the simulation period. The discounted losses are calculated over a period that ends sufficiently far into the future that extending that period farther would not affect the policy prescriptions shown in the exhibits.

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Monetary Policy Alternatives

Available data show continuing improvement in labor market conditions this year and indicate that the first-quarter weakness in economic growth was largely transitory. However, both core and headline inflation continue to run below the Committee's 2 percent objective. As presented in the "Financial Developments" section of Tealbook, Book A, participants in the Desk's Primary Dealer Survey continue to place very little weight on policy firming commencing in July; they place about 40 percent average probability on the first rate increase happening in September and about 35 percent average probability on an increase happening in the fourth quarter. Financial-market measures suggest broadly similar probabilities.[1] Market-implied expectations about the path for the federal funds rate for late-2015 and late-2016 continue to lie within the central tendency of the "dot plot" from the June Summary of Economic Projections, while the expected value for late-2017 again lies well below the central tendency.

Against this backdrop, the draft alternative statements presented below offer a range of policy choices as well as a range of assessments about recent economic developments and the Committee's progress toward its objectives. If the Committee chooses not to raise the target range at this meeting, a key issue will be how to convey the Committee's sense of the likelihood of various future economic outcomes and policy actions. The draft statement associated with Alternative B is intended to convey the message that the economy has been evolving in such a way that the Committee might decide to raise the target range in September if it sees continued progress toward its objectives. In Alternative A, the draft statement is intended to signal that the Committee believes the conditions for policy firming will not be met by September, particularly because of the risk that inflation could run substantially below 2 percent for a protracted period. By contrast, under Alternative C the Committee would announce that it was raising the target range for the federal funds rate at this meeting.

The draft statement associated with Alternative B characterizes job gains in recent months as "solid" and acknowledges cumulative improvement in the labor market "since early this year," indicating that the Committee is focusing not just on the recent pace of

[1] The probability of departure from the effective lower bound in a given month is calculated from federal funds futures prices assuming that the effective federal funds rate is expected to average 37.5 basis points immediately after the target range increase.

improvement in the labor market but also on the cumulative improvement since it established the criteria for policy firming at its March meeting. Alternative B also observes that inflation continued to run below 2 percent, partly reflecting earlier declines in energy prices, but does not refer to energy price developments over the intermeeting period because they have not materially affected the 12-month inflation rate or the outlook for inflation over the medium term. Under Alternative B, the Committee would note that the housing sector has shown "additional improvement" and characterize household spending, business fixed investment, and net exports as it did in its June statement. The draft statement would leave the economic outlook unchanged and also announce that the Committee wants to see "some" further improvement in the labor market before policy firming, signaling that progress has been made toward the labor market criterion that the FOMC first stated in March. The unchanged description of the inflation outlook suggests that the Committee's degree of confidence that inflation will move back to its 2 percent inflation objective over the medium term is also roughly unchanged.

In the draft statement for Alternative A, the Committee would provide an assessment of inflation and the labor market, relative to the Committee's goals, that would indicate that a target range increase in September was not likely. Though the Committee would acknowledge "solid" job gains, it would also state that it is concerned that "inflation could run substantially below the 2 percent objective for a protracted period." Moreover, under Alternative A, the Committee would judge that "economic and financial developments abroad" have tilted the risks to the outlook for the labor market "to the downside." In light of these risks to the economic outlook, the draft statement in Alternative A would provide a more stringent condition for policy normalization, saying that the Committee will not raise its target range until it projects that "inflation will reach 2 percent within one to two years," and the Committee would indicate that it "is prepared to use all of its tools as necessary to return inflation to 2 percent within one to two years" if inflation "does not begin to rise soon."

In the draft statement associated with Alternative C the Committee would announce that its criteria for policy firming—laid out in March—have been met and that it has decided to increase the target range for the federal funds rate by 25 basis points. Under Alternative C, the Committee's statement would refer to "appreciable improvement in labor market conditions since early this year" while acknowledging that inflation continues to run below the Committee's 2 percent objective. The Committee would announce its expectation that the labor market will be "reaching" levels consistent

with the Committee's dual mandate, and state that it is "reasonably confident that inflation will rise to 2 percent over the medium term as the labor market improves further." Nonetheless, the Committee would note that "the stance of monetary policy remains highly accommodative," but would delete the reference to policy accommodation provided through the balance sheet.

Under Alternatives A and B, the Committee would retain the "balanced approach" language that it has provided for quite some time to characterize how it plans to conduct policy after tightening begins. Under Alternative C, the Committee would state that, in determining future adjustments to the target range, it will assess *either* "realized and expected deviations from its objectives of maximum employment and 2 percent inflation," *or* "realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation." Alternative C also offers the option of stating that the Committee "will take a balanced approach to pursuing those objectives." Furthermore, the draft statement associated with Alternative C says that the path of the federal funds rate will "depend on the incoming data." All three alternatives retain language indicating that, even once employment and inflation are close to mandate-consistent levels, economic conditions may, for some time, warrant keeping the federal funds rate below levels the Committee judges as normal in the longer run.

The next seven pages contain the June postmeeting statement and the draft statements associated with the three alternatives; they are followed by cases for each alternative. After that is a discussion about a draft implementation note for Alternative C that would be released concurrently with the Committee's statement, followed by the draft directives for Alternatives A and B as well as the proposed text of the implementation note.

JUNE 2015 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in April suggests that economic activity has been expanding moderately after having changed little during the first quarter. The pace of job gains picked up while the unemployment rate remained steady. On balance, a range of labor market indicators suggests that underutilization of labor resources diminished somewhat. Growth in household spending has been moderate and the housing sector has shown some improvement; however, business fixed investment and net exports stayed soft. Inflation continued to run below the Committee's longer-run objective, partly reflecting earlier declines in energy prices and decreasing prices of non-energy imports; energy prices appear to have stabilized. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations have remained stable.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic activity will expand at a moderate pace, with labor market indicators continuing to move toward levels the Committee judges consistent with its dual mandate. The Committee continues to see the risks to the outlook for economic activity and the labor market as nearly balanced. Inflation is anticipated to remain near its recent low level in the near term, but the Committee expects inflation to rise gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of earlier declines in energy and import prices dissipate. The Committee continues to monitor inflation developments closely.
3. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that the current 0 to ¼ percent target range for the federal funds rate remains appropriate. In determining how long to maintain this target range, the Committee will assess progress—both realized and expected—toward its objectives of maximum employment and 2 percent inflation. 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. The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term.
4. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.
5. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent. The Committee currently anticipates that, even after employment and inflation are near mandate-consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.

ALTERNATIVE A FOR JULY 2015

1. Information received since the Federal Open Market Committee met in ~~April~~ **June** suggests that economic activity has been expanding moderately ~~after having changed little during the first quarter~~. The pace of job gains ~~picked up while~~ **was solid and** the unemployment rate ~~remained steady~~ **declined**. On balance, a range of labor market indicators suggests that underutilization of labor resources diminished somewhat. Growth in household spending has been moderate and the housing sector has shown some improvement; however, business fixed investment and net exports stayed soft. Inflation continued to run below the Committee's longer-run objective, partly reflecting earlier declines in energy prices and decreasing prices of non-energy imports~~; energy prices appear to have stabilized~~. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic activity will expand at a moderate pace, with labor market indicators continuing to move toward levels the Committee judges consistent with its dual mandate. Inflation is anticipated to remain near its recent low level in the near term, but the Committee expects inflation to rise gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of earlier declines in energy and import prices dissipate. ~~The Committee continues to monitor inflation developments closely.~~ **However, in light of economic and financial developments abroad,** the Committee ~~continues to~~ see**s** the risks to the outlook for economic activity and the labor market as ~~nearly balanced~~ **tilted to the downside**. **Moreover, the Committee is concerned that inflation could run substantially below the 2 percent objective for a protracted period.**

3. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that the current 0 to ¼ percent target range for the federal funds rate remains appropriate. In determining how long to maintain this target range, the Committee will assess progress—both realized and expected—toward its objectives of maximum employment and 2 percent inflation. 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. The Committee ~~anticipates~~ **judges** that it will be appropriate to raise the target range for the federal funds rate when it has seen further improvement in the labor market and ~~is reasonably confident~~ **projects** that inflation will ~~move back to its~~ **reach** 2 percent ~~objective over the medium term~~ **within one to two years**.

4. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions. **If inflation does not begin to rise soon, the Committee is prepared to use all of its tools as necessary to return inflation to 2 percent within one to two years.**

5. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent. The Committee currently anticipates that, even after employment and inflation are near mandate-consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.

ALTERNATIVE B FOR JULY 2015

1. Information received since the Federal Open Market Committee met in ~~April~~ **June** ~~suggests~~ **indicates** that economic activity has been expanding moderately ~~after having changed little during the first quarter~~ **in recent months**. Growth in household spending has been moderate and the housing sector has shown ~~some~~ **additional** improvement; however, business fixed investment and net exports stayed soft. The ~~pace of~~ **labor market continued to improve, with solid** job gains ~~picked up while the~~ **and declining** unemployment ~~rate remained steady~~. On balance, a range of labor market indicators suggests that underutilization of labor resources **has** diminished ~~somewhat~~ **since early this year**. Inflation continued to run below the Committee's longer-run objective, partly reflecting earlier declines in energy prices and decreasing prices of non-energy imports~~; energy prices appear to have stabilized~~. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic activity will expand at a moderate pace, with labor market indicators continuing to move toward levels the Committee judges consistent with its dual mandate. The Committee continues to see the risks to the outlook for economic activity and the labor market as nearly balanced. Inflation is anticipated to remain near its recent low level in the near term, but the Committee expects inflation to rise gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of earlier declines in energy and import prices dissipate. The Committee continues to monitor inflation developments closely.

3. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that the current 0 to ¼ percent target range for the federal funds rate remains appropriate. In determining how long to maintain this target range, the Committee will assess progress—both realized and expected—toward its objectives of maximum employment and 2 percent inflation. 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. The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen **some** further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term.

4. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.

5. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent. The Committee currently anticipates that, even after employment and inflation are near mandate-consistent levels, economic conditions

may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.

ALTERNATIVE C FOR JULY 2015

1. Information received since the Federal Open Market Committee met in ~~April~~ **June** ~~suggests~~ **indicates** that economic activity has been expanding moderately ~~after having changed little during the first quarter~~ **in recent months**. Growth in household spending has been moderate and the housing sector has ~~shown some improvement~~ **continued to strengthen**; however, business fixed investment and net exports stayed soft. The ~~pace of~~ **labor market continued to improve, with solid** job gains ~~picked up while the~~ **and declining** unemployment ~~rate remained steady~~. On balance, a range of labor market indicators ~~suggests that underutilization of labor resources diminished somewhat~~ **shows an appreciable improvement in labor market conditions since early this year**. Inflation continued to run below the Committee's longer-run objective, partly reflecting earlier declines in energy prices and decreasing prices of non-energy imports~~; energy prices appear to have stabilized~~. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate **adjustments in the stance of monetary** policy ~~accommodation~~, economic activity will expand at a moderate pace, with labor market indicators ~~continuing to move toward~~ **reaching** levels the Committee judges consistent with its dual mandate. The Committee continues to see the risks to the outlook for economic activity and the labor market as nearly balanced. **Although** inflation is anticipated to remain near its recent low level in the near term, ~~but~~ the Committee ~~expects~~ **is reasonably confident that** inflation ~~to~~ **will** rise ~~gradually toward~~ **to** 2 percent over the medium term as the labor market improves further and the transitory effects of earlier declines in energy and import prices dissipate. ~~The Committee continues to monitor inflation developments closely.~~

3. ~~To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that the current 0 to ¼ percent target range for the federal funds rate remains appropriate.~~ **In light of the considerable progress that has been achieved toward the attainment of the Committee's objective of maximum employment, and the Committee's expectation that inflation will rise, over the medium term, to its 2 percent objective, the Committee decided to raise the target range for the federal funds to ¼ to ½ percent. Even after this adjustment, the stance of policy remains highly accommodative and will continue to support a strong economy.**

4. In determining ~~how long to maintain this~~ **future adjustments of the** target range, the Committee will assess ~~progress—both~~ realized and expected~~—toward~~ **[deviations from | economic conditions relative to]** its objectives of maximum employment and 2 percent inflation **[, and will take a balanced approach to pursuing those objectives]**. 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. ~~The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen further improvement in the labor market and is~~

~~reasonably confident that inflation will move back to its 2 percent objective over the medium term.~~ The Committee currently anticipates that, even after employment and inflation are near mandate-consistent levels, economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run. **However, the actual path of the target for the federal funds rate will depend on the incoming data.**

5. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. ~~This policy, by keeping the Committee's holdings of longer-term securities at sizable levels, should help maintain accommodative financial conditions.~~

6. ~~When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent.~~

For Alternative C, the "Directive" section of this Tealbook, Book B includes a document titled "Actions to Implement Monetary Policy." That document includes the directive as well as a list of Federal Reserve actions to implement the Committee's monetary policy decision; it would be an addendum to the Committee's postmeeting statement at the time of liftoff and after subsequent meetings.

THE CASE FOR ALTERNATIVE B

Growth in household spending continues to be moderate, and the housing sector has shown additional improvement. In the labor market, recent solid job gains and the decline in the unemployment rate contributed to improvement in overall labor market conditions, but looking across a broad range of indicators, policymakers may believe that there is room for further improvement. Participants may be encouraged by the cumulative improvement in the labor market since early this year and by the observation that inflation expectations appear to be well-anchored. Even so, they may judge that the 12-month inflation rate is likely to run below 2 percent for some time as it will continue to be affected by the large energy price declines witnessed late last year, and they may worry that the recent decline in the price of oil may further delay the projected return of inflation to 2 percent. Policymakers may thus want to wait for incoming data to confirm or deny their outlook that the economic expansion will support further improvement in the labor market and that inflation will return to 2 percent over the medium term. If so, participants may deem it appropriate to issue a statement like that in Alternative B, which would acknowledge that "underutilization of labor resources has diminished since early this year," and also indicate that it will be appropriate to raise the target range after the Committee has seen only "some" further improvement in the labor market and is reasonably confident that inflation will return to 2 percent over the medium term.

With the unemployment rate having declined from 5.7 percent in January to 5.3 percent in June, some policymakers may judge that the economy is at or close to maximum employment and that a solid economic expansion is under way, making them feel confident that inflation will move back to 2 percent over the medium term. These policymakers may thus feel that the Committee's criteria for policy firming have been met. But with inflation continuing to run below the Committee's objective, these policymakers may see the benefits of waiting for further information—including two employment reports prior to the September meeting—outweighing the risks of needing to raise interest rates more rapidly later.

Other participants may be concerned that inflation is not likely to return to 2 percent over the medium term, perhaps because they judge that there is still appreciable slack in labor markets—they may cite still-high involuntary part-time employment and surprisingly low labor force participation, for example—and anticipate only a slow reduction in that slack. They may think it likely that the Committee will need to provide further policy accommodation to reach its objectives in the next few years. These

participants may nonetheless judge that, with the economy expanding moderately and the unemployment rate having declined to levels near the longer-run normal values reported in the Committee's Summary of Economic Projections, they would want to await further information before announcing additional stimulus. Moreover, they may take some reassurance from the observation that survey measures of longer-term inflation expectations appear well anchored. Policymakers may thus choose to forego additional accommodation for now, but be alert to possible indications that the economy is not expanding at a satisfactory rate or that inflation expectations are moving down.

A statement like that included in Alternative B would probably elicit little market reaction, but it is difficult to be sure. Financial-market and survey measures suggest market participants do not expect a change in the target range in July, see a good chance of an increase in September, but put similar or only slightly smaller odds on an increase in the fourth quarter. That said, two-thirds of respondents to the Desk surveys reported that they see September as the most likely meeting for the initial increase. It is difficult to assess how market participants will interpret the insertion of the word "some" in the third paragraph of the draft statement associated with Alternative B. Most respondents expect no changes to forward guidance at this meeting. Market participants could see the insertion of the word "some" as indicating that the Committee views the economy progressing in line with its outlook, which would lead to little change in the probability of a rate increase in September and a more muted market reaction. Alternatively, if market participants view the insertion of "some" as a signal that the Committee is more likely than not to raise the target range in September, then interest rates will likely increase some, equity prices could fall, and the foreign exchange value of the dollar would likely rise.

THE CASE FOR ALTERNATIVE C

Policymakers may view continued solid job gains, the decline of the unemployment rate to 5.3 percent, the pickup in consumer spending, and improvements in the housing sector as confirmation that the slowdown in economic growth observed in the first quarter was mostly transitory and that a solid economic expansion is under way. These policymakers might judge that there has been appreciable improvement in labor market conditions since early this year. They might also point to the net increase in consumer energy prices in recent months as reasons that they are reasonably certain that inflation will, over the medium term, return to the Committee's 2 percent longer-run objective. That is, these policymakers might view the two criteria for policy firming—

first included in the Committee's March statement—as having been met. In addition, policymakers may note that, for the past several meetings, most of the simple policy rules and the optimal control simulations in the "Monetary Policy Strategies" section of Tealbook, Book B, have called for policy tightening to begin. Therefore, they may support issuing a statement along the lines of Alternative C, which announces a 25 basis-point increase in the target range for the federal funds rate to ¼ to ½ percent.[2]

Policymakers may believe that the slower-than-anticipated recovery in output and employment over the past several years reflects, to a large extent, a step-down in trend productivity growth from its pre-crisis value. Even with modest output growth, participants may judge that the recent strength in the labor market is likely to persist, contributing to a fairly prompt increase in inflation to 2 percent or even higher. They might view the alternative simulation "Weak Labor Productivity, Strong Labor Market" in the "Risks and Uncertainty" section of Tealbook, Book A as better reflecting their views about the economic outlook than does the staff's baseline projection. These policymakers may be particularly concerned that inflation could persistently exceed 2 percent if inflation expectations rise as the unemployment rate undershoots its longer-run normal level.

Policymakers also may be concerned that the path for the federal funds rate currently expected by market participants is too shallow. In light of the high level of excess reserves held by the banking system, and amid some signs that banks have been easing their credit standards, participants may have become concerned about an unexpected sharp increase in lending that could boost aggregate demand and cause inflation to rise above the Committee's 2 percent objective for a prolonged period. Policymakers may be concerned that a rapid, and unexpected, tightening of monetary policy in response to accelerating inflation could result in material losses at financial institutions and disorderly conditions in financial markets. Additionally, some policymakers might see delaying the initial increase in the target range as also increasing the risk of a steep rise in the federal funds rate at a later date. Although these risks may not feature prominently in policymakers' baseline forecasts, they might judge that the adverse consequences are sufficiently severe to justify policy firming at this time.

[2] Alternatively, the Committee might view the language in the draft statement for Alternative C as premature in present circumstances but might nonetheless discuss whether this language, especially paragraphs 2, 3, and 4, would be appropriate when the time arrives to raise the target range for the federal funds rate above its effective lower bound.

According to the Desk's Survey of Primary Dealers and the Desk's Survey of Market Participants, respondents see little likelihood that the Committee will decide to change the target range for the federal funds rate at this meeting. The implied probability of a policy tightening in July derived from prices of financial derivatives is similarly low. If the Committee issued a statement similar to Alternative C, medium- and longer-term real interest rates would most likely rise and investors may also revise up their expectations about the pace of policy firming. Equity prices and inflation compensation would likely decline, and the dollar would appreciate.

THE CASE FOR ALTERNATIVE A

Policymakers may see substantial risk that inflation will run persistently below the Committee's stated goal, as both core and headline inflation have continued to run well below 2 percent. They might also view the recent decline in crude oil prices as a harbinger for headline inflation well below 2 percent later this year. Though potentially encouraged by recent job gains, these policymakers might point to the decline in the labor force participation rate in June as evidence that, in the current environment, measures of the unemployment rate mask the amount of slack in the labor market. They might also cite relatively subdued wage gains as an indication that significant labor market slack remains. With inflation expectations seemingly well-anchored, policymakers may see little cost to the unemployment rate falling below its longer-run normal level. Moreover, they may be worried that inflation expectations could fall in response to an already prolonged period of low inflation or that soft spending data indicate the economic expansion is not currently robust enough to support further improvement in the labor market. These policymakers may want to offer more-stringent criteria for policy firming than those in Alternative B; accordingly, they may support Alternative A, which states that it will be appropriate to raise the target range for the federal funds rate when the Committee "projects that inflation will reach 2 percent within one or two years" and emphasizes that the Committee "is prepared to use all of its tools as necessary" to achieve this goal if inflation "does not begin to rise soon."

For some policymakers, recent events in China and Greece may have tilted to the downside the balance of risks to the outlook for the labor market and inflation. They might be concerned that a deterioration of financial conditions and consumer confidence in China will generate an appreciable slowdown in growth of economic activity in that country which could spill over to other emerging markets and cause the dollar to appreciate further. Additionally, if Greece exits the euro area, these policymakers may

fear that spillovers could cause a recession in the region. They might see the alternative simulations "China-Driven EME Slump with Stronger Dollar" and "Greek Exit with Strong Spillovers" in the "Risks and Uncertainty" section of Tealbook, Book A as encompassing some of the risks that they have in mind. If either scenario plays out, policymakers may judge that the Federal Reserve will need to provide greater policy accommodation in order to offset the effects on the domestic economy from weak global demand and downward pressure on inflation from an appreciation of the dollar. They may also view the recent decline in metals prices as a signal that global demand has already weakened. Participants might therefore favor language in the second paragraph of Alternative A that indicates that "in light of economic and financial developments abroad, the Committee sees the risks to the outlook for economic activity and the labor market as tilted to the downside." They also may favor the new language that appears at the end of paragraph 4 of Alternative A—language that says the Committee is prepared to provide additional accommodation if inflation does not begin to rise soon.

No respondent to the Desk's Survey of Primary Dealers or the Desk's Survey of Market Participants noted an expectation that the Committee would announce further policy accommodation in July or thereafter. If the Committee issued a statement along the lines of the draft associated with Alternative A, investors would push out their expectations about the most probable date of the first increase in the target range for the federal funds rate; they might also revise down their expectations of how quickly the Committee will raise the target range thereafter. Longer-term real yields would likely decline, and equity prices and inflation compensation could rise. However, if investors saw a statement like Alternative A as reflecting a downbeat assessment for global economic conditions, equity prices and inflation compensation might fall.

DIRECTIVE AND IMPLEMENTATION NOTE

The June directive appears after this introductory discussion. That same directive would be issued in July if the Committee adopts Alternative A or B, which maintain the current target range for the federal funds rate.

The directive for Alternative C, which raises the target range, is included in an implementation note that would be released with the FOMC's policy statement to communicate actions the Federal Reserve was taking to implement the Committee's decision.[3] The draft implementation note shown for Alternative C is intended as a model that could be used at the time of the first increase in the target range, whether the increase occurs in July or later, and after subsequent FOMC meetings. (Struck-out text indicates language deleted from the current directive; bold, red, underlined text indicates language added to the current directive.)

The current draft of the implementation note reflects a few revisions relative to the text proposed in June. The changes are:

1) The first sentence in the current directive (the sentence that describes the FOMC's dual mandate) was struck because this information is conveyed in the Committee's policy statement.
2) For clarity, an effective date was added to the directive; as discussed below, the staff recommends that changes in the target range take effect the day after a policy decision is announced so that such decisions may be supported by corresponding changes to all of the overnight administered rates.
3) Language was added to the directive to make clear that "overnight" RRPs can have a maturity of more than one day when necessary to span a weekend or holiday.
4) The description in the directive of the practical limit on the Desk's RRP operations was revised slightly to say that the Desk can conduct ON RRPs in amounts "limited only by the value of Treasury securities held outright in the SOMA that are available for such operations." The Desk's operational statement

[3] The implementation note was described in a memo sent to the Committee on June 10, 2015, called "Proposal for Communicating Details Regarding the Implementation of Monetary Policy at Liftoff and After" by Deborah Leonard and Gretchen Weinbach.

will indicate that the value of Treasury securities in the SOMA available for RRP operations is about $2 trillion and explain how staff derived that operational limit.

During the policy normalization process, the FOMC's decisions to change the target range will be implemented primarily by making corresponding changes to the Federal Reserve's overnight administered rates—the interest rates paid on required and excess reserves, the ON RRP rate, and the primary credit rate. In order to provide maximum clarity to the markets and the public and to increase the likelihood that the effective federal funds rate will fall within the new target range as soon as the new range becomes effective, the staff recommends that changes to the target range for the federal funds rate and changes to the administered rates all be effective on the day after the Committee's decision.[4] With this timing, the Desk would be able to support the Committee's decision to change the target range for the federal funds rate, beginning on the date that decision becomes effective, by conducting ON RRP operations at the new rate specified by the FOMC.[5]

This approach is consistent with the staff's recommendation that intermeeting changes in the administered rates—if any prove necessary to foster federal funds trading within the FOMC's target range—be announced at 4:30 p.m., when markets are closed, and take effect the next day.

Note that the sentence in the current directive that begins "The Committee seeks conditions in reserve markets… " has been struck from the directive, as was the case in the illustrative example shown in the June memo.

As indicated by what is now the first sentence of the draft directive shown in the implementation note, staff recommends the Desk be instructed to undertake open market

[4] While changes to the Reserve Banks' primary credit rates would generally be effective on the day after a Committee decision to change the target range for the federal funds rate, the timing could be affected by when Reserve Bank boards of directors submit discount rate recommendations. The staff proposes that, on the day of the FOMC's policy action, the Board approve Reserve Bank boards' recommendations for changes in the discount rate that accord with the FOMC's decision to change the target range, effective on the following day. Discount rate recommendations that are submitted during the 24 hours following the release of the FOMC's postmeeting statement could be approved to take effect on the day following the FOMC meeting. As in the past, requests for discount rate changes from one or more Reserve Bank boards of directors might sometimes be received and approved more than a day after the FOMC's policy action.

[5] The Desk plans to conduct an ON RRP operation each day, typically at 12:45 p.m. That is the latest time that is operationally feasible, given that transactions will settle through the tri-party repo system.

operations as necessary to keep the federal funds rate in its target range, specifically including overnight and term reverse repurchase agreements according to parameters approved by the Committee. The baseline expectation is that reverse repos as specified in the directive will be the only open market operations needed to support interest on excess reserves to keep the federal funds rate in the FOMC's target range. Nonetheless, a directive that authorizes the Desk to conduct other types of open market operations if necessary may communicate to the public that the Committee has given the Desk latitude to respond quickly to unexpected circumstances in order to maintain the federal funds rate in the FOMC's target range.[6] Any use of such authority would be limited and aimed at alleviating transitory factors; in the event of more persistent issues, it would be appropriate for the FOMC to consider whether it wants to revise the directive. The Desk would consult with the Chair and inform the FOMC of any plans to conduct open market operations other than the reverse repos specified in the directive.

Finally, regarding balance sheet policies, the draft directive associated with each of the alternative statements continues to instruct the Desk to maintain the current policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities into new issues.

[6] For example, in the event that the federal funds rate were trading above the target range for idiosyncratic technical reasons, a repo operation might signal to the market that the Federal Reserve stands ready to move the rate back into the target range. Or in response to a major payment system disruption, it might prove useful for the Desk to conduct repo operations to address potential liquidity shortages in money markets. Although the latter scenario may be covered by paragraph 5B of the Domestic Authorization, broad authority in the directive may provide additional assurance to market participants. Additionally, it might be valuable for the Desk to have some operational flexibility to adjust its mode of executing reverse repo operations, for example retaining the ability to conduct a fixed-quantity RRP operation, in response to unexpected technical issues.

June 2015 Directive

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to undertake open market operations as necessary to maintain such conditions. The Committee directs the Desk to maintain its policy of rolling over maturing Treasury securities into new issues and its policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. 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. The System Open Market Account manager and the secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

Directive for July 2015 Alternatives A and B

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to undertake open market operations as necessary to maintain such conditions. The Committee directs the Desk to maintain its policy of rolling over maturing Treasury securities into new issues and its policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. 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. The System Open Market Account manager and the secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

Implementation Note for July 2015 Alternative C

Release Date: July 29, 2015

Actions to Implement Monetary Policy

The Federal Reserve has taken the following actions to implement the monetary policy stance adopted and announced by the Federal Open Market Committee on July 29, 2015:

- The Board of Governors of the Federal Reserve System voted [unanimously] to raise the interest rate paid on required and excess reserve balances to [0.50] percent, effective July 30, 2015.

- 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:

  "~~Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent.~~ **Effective July 30, 2015,** the Committee directs the Desk to undertake open market operations as necessary to maintain ~~such conditions~~ **the federal funds rate in a target range of [¼ to ½] percent, including: (1) 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 [0.25] percent and 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 (2) term reverse repurchase operations as authorized in the resolution on term RRP operations approved by the Committee at its March 17-18, 2015, meeting.**

  "The Committee directs the Desk to ~~maintain its policy of~~ **continue** rolling over maturing Treasury securities into new issues and ~~its policy of~~ **to continue** reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. 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." ~~The System Open Market Account manager and the secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.~~

  More information regarding open market operations may be found on the Federal Reserve Bank of New York's website.

  When this document is released to the public, the blue text will be a link to the relevant page on the FRBNY website.

- The Board of Governors of the Federal Reserve System voted [unanimously] to approve a [¼] percentage point increase in the primary credit rate to [1.00] percent, effective July 30, 2015. In taking this action, the Board approved requests 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.

Projections

BALANCE SHEET, INCOME, AND MONETARY BASE

The staff has developed a projection of the Federal Reserve's balance sheet and income statement that is broadly consistent with the monetary policy assumptions incorporated in the staff's forecast presented in Tealbook, Book A. As in the June Tealbook scenario, we assume that policy firming will occur at the September FOMC meeting and that reinvestments of maturing Treasury securities and the reinvestment of principal received on agency securities will continue through the first quarter of 2016. Reinvestments cease in the second quarter, and thereafter the SOMA portfolio shrinks through redemptions of maturing Treasury and agency debt securities as well as paydowns of principal from agency MBS. Regarding the Federal Reserve's use of its policy normalization tools, we assume that the level of overnight reverse repurchase agreements (ON RRPs) runs at $100 billion through the end of 2018 and then falls to zero by the end of 2019, and that term deposits and term RRPs are not used during the normalization period.[1,2] The bullets below highlight some key features of the projections for the Federal Reserve's balance sheet and income statement under these assumptions.

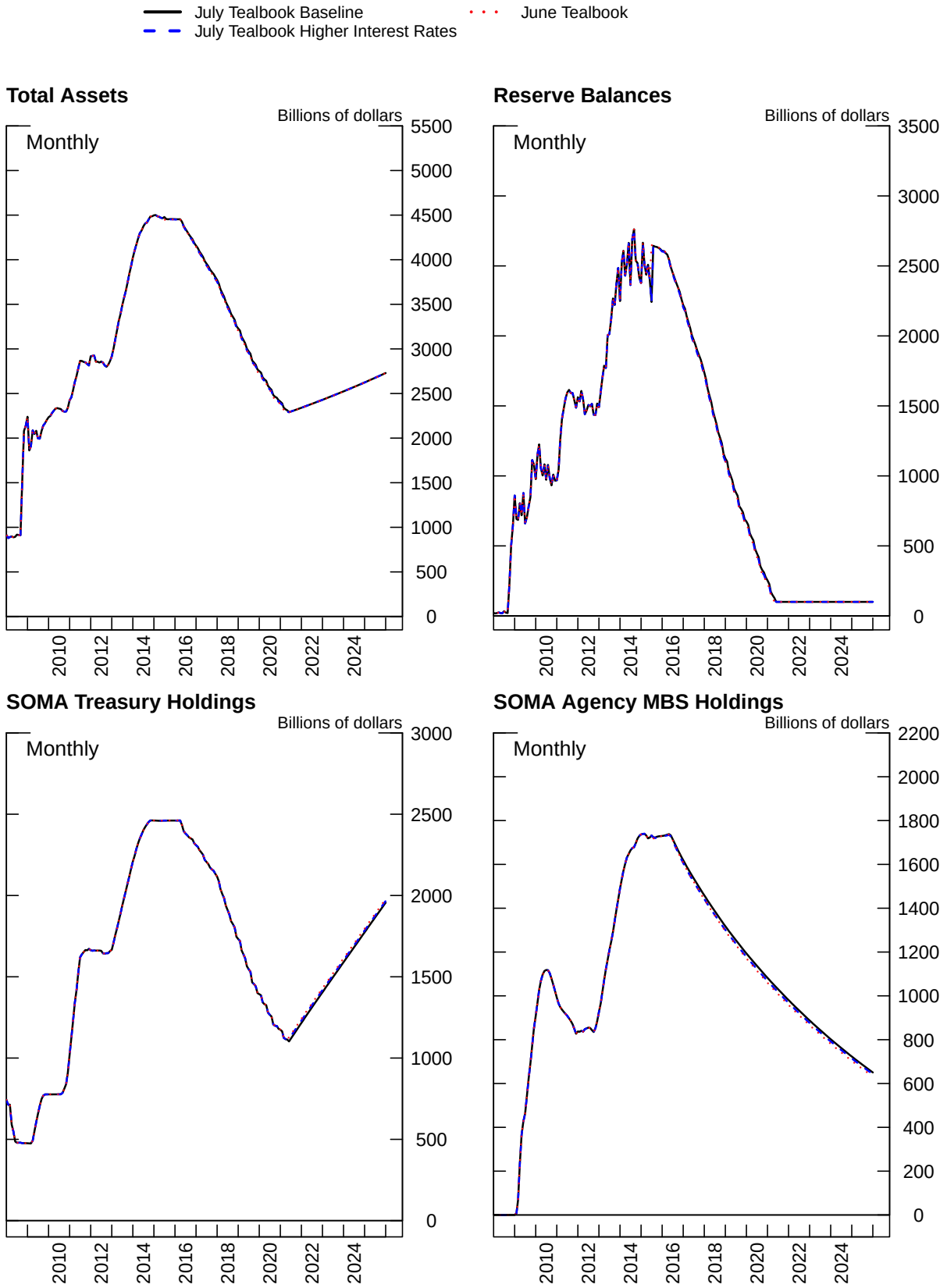
- ***Balance sheet.*** As shown in the exhibit "Total Assets and Selected Balance Sheet Items" and in the table that follows, the size of the portfolio is normalized in the second quarter of 2021, the same quarter as in the June Tealbook.[3] Once reserve balances reach their new steady-state level, total assets stand at $2.3 trillion, with about $2.1 trillion in total SOMA securities holdings. Total assets and securities holdings increase thereafter, keeping pace with growth in currency in circulation and Federal Reserve Bank capital.

[1] Use of RRPs or term deposits would result in a shift in the composition of Federal Reserve liabilities—a decline in reserve balances and an equal increase in RRPs or term deposits—but would not produce an overall change in the size of the balance sheet.

[2] We also assume that RRPs associated with foreign official and international accounts remain around $166 billion throughout the projection period.

[3] The size of the balance sheet is considered normalized when reserve balances reach an assumed $100 billion steady-state level. At this time, the size of the securities portfolio is primarily determined by the level of currency in circulation plus Federal Reserve capital, the balances held in the Treasury general account, and the projected steady-state level of reserve balances.

Total Assets and Selected Balance Sheet Items



Projections

Federal Reserve Balance Sheet
End-of-Year Projections -- July Tealbook
(Billions of dollars)

	Jun 30, 2015	2015	2017	2019	2021	2023	2025
Total assets	4,479	4,454	3,773	2,752	2,340	2,524	2,730
Selected assets							
Loans and other credit extensions*	2	0	0	0	0	0	0
Securities held outright	4,229	4,224	3,579	2,589	2,199	2,394	2,609
U.S. Treasury securities	2,461	2,461	2,116	1,393	1,216	1,590	1,956
Agency debt securities	36	33	4	2	2	2	2
Agency mortgage-backed securities	1,732	1,730	1,459	1,194	981	802	650
Unamortized premiums	198	191	151	117	93	81	71
Unamortized discounts	-18	-17	-13	-10	-8	-7	-6
Total other assets	47	49	49	49	49	49	49
Total liabilities	4,421	4,395	3,702	2,661	2,226	2,379	2,547
Selected liabilities							
Federal Reserve notes in circulation	1,324	1,363	1,537	1,661	1,800	1,954	2,121
Reverse repurchase agreements	558	266	266	166	166	166	166
Deposits with Federal Reserve Banks	2,530	2,761	1,894	830	255	255	255
Reserve balances held by depository institutions	2,242	2,606	1,739	674	100	100	100
U.S. Treasury, General Account	254	150	150	150	150	150	150
Other deposits	34	5	5	5	5	5	5
Interest on Federal Reserve Notes due to U.S. Treasury	3	0	0	0	0	0	0
Total capital	58	60	71	90	114	145	183

Source: Federal Reserve H.4.1 statistical releases and staff calculations.
Note: Components may not sum to totals due to rounding.
*Loans and other credit extensions includes primary, secondary, and seasonal credit; central bank liquidity swaps; and net portfolio holdings of Maiden Lane LLC.

- ***Federal Reserve remittances.*** The next exhibit, "Income Projections," shows the implications of the balance sheet projection and interest rate assumptions for Federal Reserve income.[4] Remittances to the Treasury are projected to be about $90 billion this year, down a bit from their $100 billion peak in 2014, and then to decline further over the next few years. Annual remittances reach their trough of roughly $35 billion in 2019; no deferred asset is recorded.[5] The Federal Reserve's cumulative remittances from 2009 through 2025 are about $1 trillion, approximately $270 billion above the staff estimate of the amount that would have been observed had there been no asset purchase programs, and roughly $5 billion less than in the June Tealbook projection.[6]

- ***Unrealized gains or losses.*** The unrealized gain or loss position of the SOMA portfolio is influenced importantly by the level of interest rates. The staff estimates that the portfolio was in an unrealized gain position of about $110 billion as of the end of June.[7] Reflecting the assumed rise in longer-term interest rates over the next several years, the position is projected to shift to an unrealized loss by the middle of 2016 and record a peak unrealized loss of about $200 billion in 2019, nearly unchanged from the June Tealbook. At the end of that year, roughly $95 billion of the unrealized losses can be attributed to the portfolio of Treasury securities and $110 billion to the portfolio of agency MBS. The unrealized loss position then narrows through 2025, as securities acquired under the large-scale asset purchase programs mature or pay down and new securities are added to the portfolio at par.

Projections

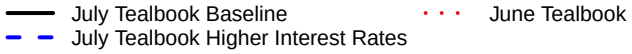
[4] We assume the interest rate paid on reserve balances remains at 25 basis points as long as the federal funds rate remains at its effective lower bound. In addition, we assume that, once firming of the policy rate begins, the spread between the interest rate paid on reserve balances and the ON RRP rate is 25 basis points. Moreover, we assume that the effective federal funds rate will average about 15 basis points below the rate paid on reserve balances and about 10 basis points above the ON RRP rate.

[5] In the event that a Federal Reserve Bank's earnings fall short of the amount necessary to cover its operating costs, pay dividends, and equate surplus to capital paid-in, a deferred asset for interest on Federal Reserve notes would be recorded.

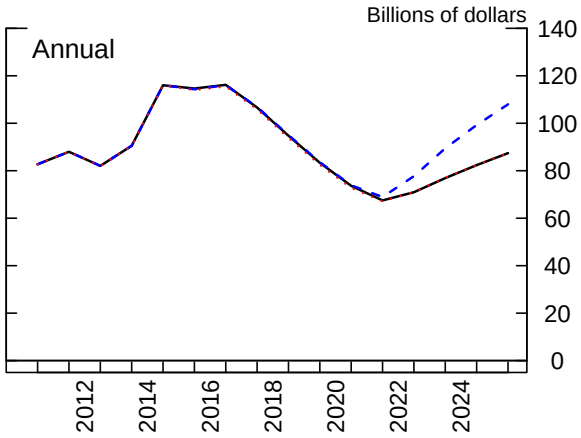
[6] The staff estimate of remittances had there been no asset purchase programs is a linear interpolation from 2006 to 2025 of actual 2006 income and projected 2025 income.

[7] The Federal Reserve reports the level and the change in the quarter-end net unrealized gain/loss position of the SOMA portfolio to the public in the "Federal Reserve Banks Combined Quarterly Financial Reports," available on the Board's website at http://www.federalreserve.gov/monetarypolicy/bst_fedfinancials.htm#quarterly.

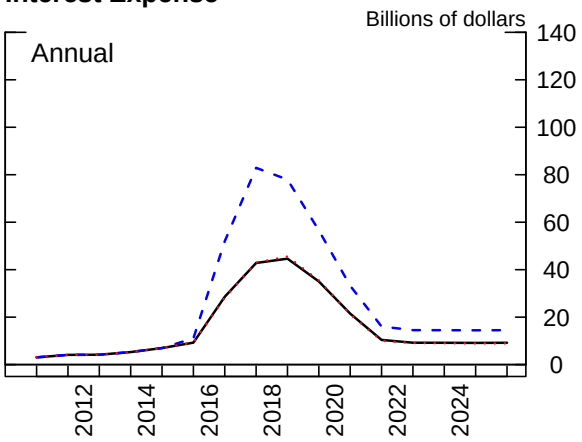
Income Projections



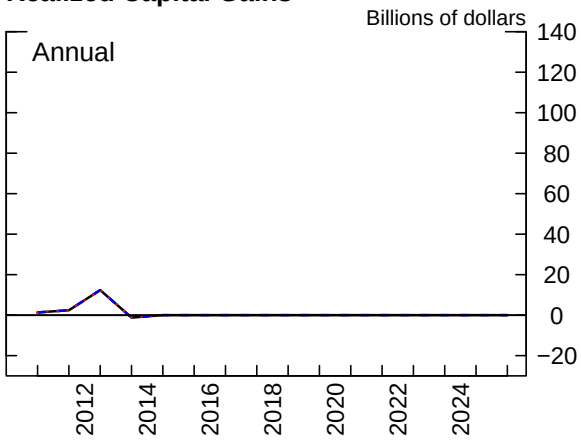
Interest Income



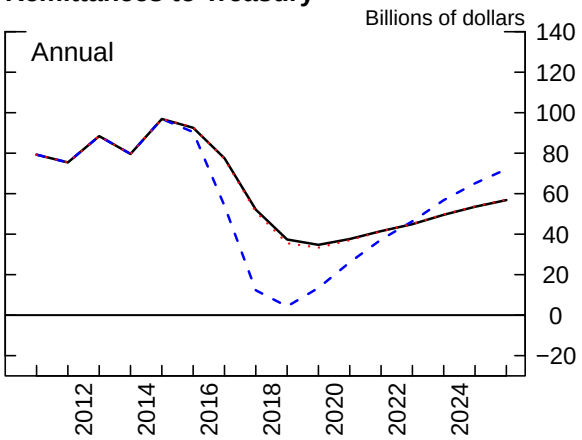
Interest Expense



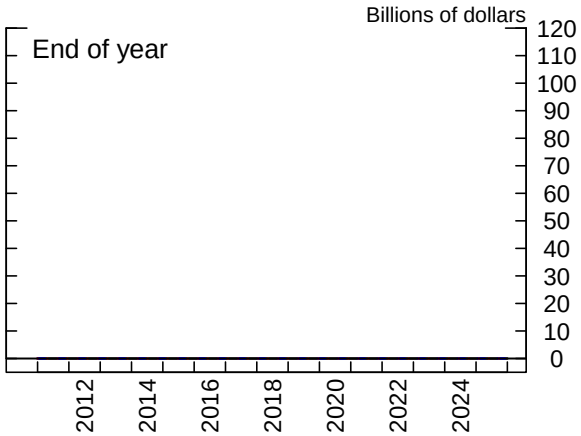
Realized Capital Gains



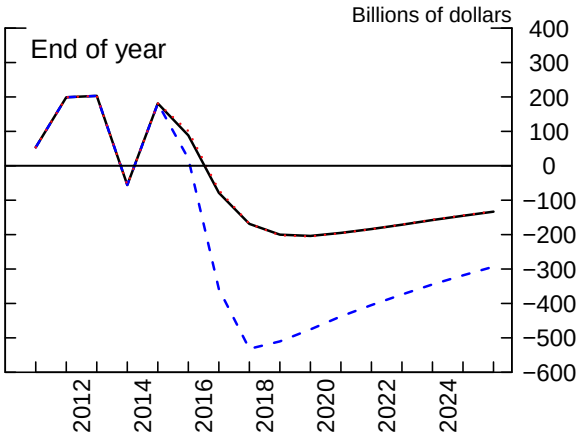
Remittances to Treasury



Deferred Asset



Memo: Unrealized Gains/Losses



Projections

- ***Interest rate sensitivity.*** To illustrate the sensitivity of the projections to the path of interest rates, we compare the July Tealbook baseline projections to a scenario in which, after policy firming begins in the third quarter of 2015, all interest rates gradually rise a total of 200 basis points above the staff forecast and remain at that level over the projection period.[8,9] Relative to the baseline projection, the size of the balance sheet is not materially affected, and SOMA net income follows the same general contour, but with a significant difference in magnitude. As shown in the dashed blue line in the exhibit, "Income Projections," cumulative annual interest expense is larger than under the baseline by roughly $130 billion during the normalization period, years 2016 through 2020. As a result, net income is less than in the baseline and annual remittances to the Treasury reach a trough of near zero in 2018. In the later years of the projection period, net income is projected to rise above that of the baseline scenario as Treasury securities are purchased at higher yields. Under the higher interest rate path, cumulative remittances from 2009 to 2025 are approximately $900 billion, about $100 billion less than in the July Tealbook baseline. Finally, under the higher rate path, the unrealized loss position peaks at approximately $530 billion in 2017.

- ***Term premium effects.*** As shown in the table "Projections for the 10-Year Treasury Term Premium Effect," the effect of the Federal Reserve's elevated stock of longer-term securities on the term premium embedded in the 10-year Treasury yield in the third quarter of 2015 is estimated to be negative 108 basis points, nearly unchanged from the June Tealbook. Over the next couple of years, the term premium effect diminishes at a pace of about 5 basis points per quarter, reflecting the projected shrinking of the portfolio. A key input into our term premium effect model is the duration of the SOMA Treasury portfolio; refer to the "History and Projections for the Characteristics of SOMA Treasury Holdings" box for more information on this measure.

[8] Interest rates include the federal funds rate; the 5, 10, and 30 year Treasury yields; the 30 year conventional fixed-rate residential mortgage rate, and the agency MBS current coupon.

[9] These interest rate shocks are phased in over eight quarters. Rates are assumed to stay at this higher level throughout the projection period. While we allow for agency MBS prepayments to change as a result of this shock, no other general feedback to the macroeconomy is incorporated. A more comprehensive assessment of the interest rate risk inherent in the Federal Reserve's current portfolio that includes this feedback is presented in Cashin, Ferris, Kim, and Klee (2015), "The Federal Reserve's Balance Sheet and Income: Projections using the 2015 Dodd-Frank Adverse Stress Test Scenario," FEDS Note, forthcoming.

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

Date	July Tealbook Baseline	July Tealbook Higher Interest Rates	June TealBook
	Quarterly Averages		
2015:Q3	-108	-109	-107
Q4	-103	-104	-102
2016:Q1	-99	-100	-98
Q2	-94	-95	-93
Q3	-90	-91	-88
Q4	-85	-87	-84
2017:Q4	-70	-71	-69
2018:Q4	-58	-59	-57
2019:Q4	-49	-50	-48
2020:Q4	-41	-42	-40
2021:Q4	-35	-36	-35
2022:Q4	-30	-31	-30
2023:Q4	-25	-25	-24
2024:Q4	-19	-20	-19
2025:Q4	-14	-14	-14

History and Projections for the Characteristics of SOMA Treasury Holdings

This box reviews the history and projected future behavior of two important characteristics of the SOMA's holdings of Treasury securities—the weighted average duration of the portfolio and the portfolio's value in terms of 10-year equivalents.[1] Before the financial crisis, the weighted-average duration of the SOMA Treasury portfolio hovered around 2.7 years. As shown by the light blue line in the top panel, following the onset of the crisis in August 2007, the duration of Treasury holdings jumped as shorter-dated securities were sold or allowed to mature without replacement. As a result of the maturity extension program and the flow-based asset purchase program, which increased holdings of longer-dated Treasury securities in the portfolio, duration continued to increase during late 2011 and 2012.[2] Duration peaked in early 2013, and as of June 1, 2015, SOMA Treasury duration stood around 7 years.

Going forward, under the current balance sheet assumptions, the weighted-average duration of SOMA Treasury holdings is expected to continue to decline a bit over the next two years before rising, as the end to reinvestments results in shorter-dated Treasury securities rolling off the portfolio.[3,4] However, after the balance sheet normalizes in size in 2021, Treasury duration is projected to decline as the Desk resumes purchasing securities to expand the size of the portfolio.[5] If purchases are spread across the maturity distribution following the Federal Reserve's historical practice in purchasing Treasury securities of different maturities, shown by the light blue dashed line, duration declines slowly.[6] However, if purchases are directed instead solely to Treasury bills initially (the "bill replenishment strategy") to actively bring the portfolio's Treasury holdings back to its historical proportion of one-third bills, as shown by the dark blue dashed line, weighted-average duration drops noticeably over the course of one year from May 2021 to June 2022.[7]

[1] Duration is the weighted average of the times until bonds' fixed cash flows are received. The 10-year equivalents of the SOMA Treasury portfolio is the dollar amount of 10-year Treasury securities that the Federal Reserve would hold in order to produce the same duration as its actual holdings.

[2] The weighted average duration of the securities purchased under the first and second asset purchase programs was roughly in line with the duration of the SOMA portfolio at that time, and so SOMA duration did not materially increase as a result of those programs.

[3] As of June 2015, 50 percent of the Treasury securities held in the SOMA will mature in less than 5 years, 24 percent will mature in 5 and 10 years, 5 percent will mature in 10 and 20 years, and 21 percent will mature in more than 20 years.

[4] If SOMA coupon securities mature and the Committee wishes to reinvest these proceeds at Treasury auctions, in general, the Desk rolls over the maturing securities held in the SOMA into newly issued securities in proportion to the issue amounts of the new securities, and the Federal Reserve receives the interest rate determined competitively in the public auction of the newly issued securities.

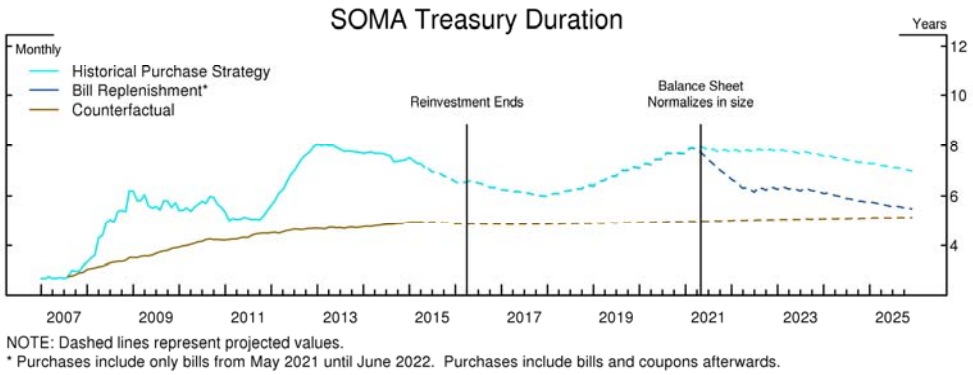
[5] These purchases would be in the secondary market.

[6] Specifically, pre-crisis, purchases in both the secondary and primary markets were aimed at maintaining a liquid portfolio, while avoiding significantly distorting prices or liquidity of specific Treasury securities. Consequently, SOMA holdings comprised an array of Treasury securities with varying remaining maturities.

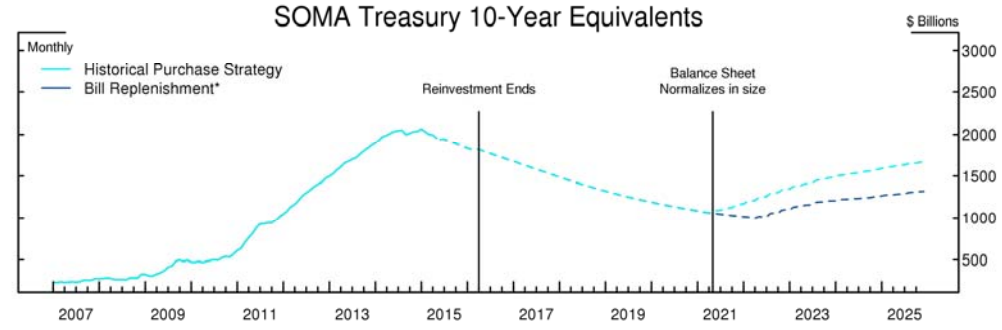
[7] This bill replenishment strategy is used in the staff baseline presented in Tealbook, Book B.

Either investment strategy will result in SOMA Treasury holdings having a much higher weighted-average duration in 2025 than prior to the crisis. This increase in duration relative to before the crisis reflects, in large part, the fact that the Treasury has and is expected to continue to extend the weighted average maturity of its debt over time. This point can be seen by the light brown line which illustrates how the weighted-average duration of the SOMA Treasury portfolio would have evolved in a scenario where the portfolio grew primarily with currency growth, and the Federal Reserve followed its normal reinvestment and secondary market purchase policy.

The effect of the Federal Reserve's balance sheet decisions on long-term rates has often been analyzed in terms of the so-called "10-year equivalent" value of the portfolio. Similar to the duration of the portfolio, as shown in the bottom panel, SOMA Treasury 10-year equivalents increased substantially after the onset of the financial crisis and subsequent recession. Going forward, after reinvestment ceases, the 10-year equivalent value of SOMA Treasury holdings is projected to fall reflecting the decrease in the size of the SOMA Treasury portfolio.[8] When purchases of Treasury coupon securities resume after the balance sheet normalizes in size, the 10-year equivalent value of the Treasury portfolio is projected to increase. Under the historical purchase strategy, the inflection point in the 10-year equivalents occurs sooner and is larger than under the bill-replenishment strategy, because the securities purchased under this strategy will have longer duration than those purchased under bill-replenishment strategy.



NOTE: Dashed lines represent projected values.
* Purchases include only bills from May 2021 until June 2022. Purchases include bills and coupons afterwards.



NOTE: Dashed lines represent projected values.
* Purchases include only bills from May 2021 until June 2022. Purchases include bills and coupons afterwards.

[8] Ten-year equivalents declines between 2017 and 2021 while duration increases because the rise in duration is more than offset by the shrinking of the SOMA Treasury portfolio.

- ***Monetary base.*** As shown in the final table, "Projections for the Monetary Base," once policy firming begins in the third quarter of 2015, the monetary base first grows less rapidly and then shrinks through the second quarter of 2021, primarily because redemptions of securities generate corresponding reductions in reserve balances. Starting around mid-2021, after reserve balances are assumed to have stabilized at $100 billion, the monetary base begins to expand in line with the increase in currency in circulation.[10]

[10] The projection for the monetary base depends critically on the FOMC's choice of tools during normalization. In this projection, a steady $100 billion take-up in an ON RRP facility is assumed and, therefore, the level of the monetary base is lower than it would otherwise be until 2019 (when the facility is assumed to be phased out). The projected growth rate of the monetary base, however, is generally unaffected. If the FOMC employs additional reserve-draining tools during normalization or ON RRP take-up is larger than assumed, the projected level of reserve balances and the monetary base could decline quite markedly.

Projections for the Monetary Base
(Percent change, annual rate; not seasonally adjusted)

Date	July Tealbook Baseline	July Tealbook Higher Interest Rates	June Tealbook
Quarterly			
2015:Q3	26.2	26.1	14.4
Q4	6.3	6.1	0.2
2016:Q1	-0.2	-0.3	-0.2
Q2	-4.9	-5.2	-5.3
Q3	-9.7	-10.2	-10.5
Q4	-8.9	-9.2	-9.6
Annual			
2017	-9.7	-9.8	-10.2
2018	-14.6	-14.7	-15.4
2019	-13.3	-13.3	-14.1
2020	-13.1	-13.2	-14.0
2021	-5.1	-4.5	-4.4
2022	3.3	3.3	3.5
2023	3.4	3.4	3.6
2024	3.4	3.4	3.6
2025	3.4	3.4	3.7

Note: For years, Q4 to Q4; for quarters, calculated from corresponding average levels.

MONEY

M2 is expected to grow sluggishly in the third quarter of 2015 and then contract through the third quarter of 2016 as the assumed increase in the target range for the federal funds rate and the associated rise in the opportunity cost of holding money restrains money demand. Over the remainder of the projection period, the increase in opportunity cost is expected to hold M2 growth below that of nominal GDP in 2017 and in 2018.

M2 Monetary Aggregate Projections
(Percent change, annual rate; seasonally adjusted)*

Quarterly		
2015:	Q2	5.0
	Q3	2.2
	Q4	-2.4
2016:	Q1	-1.2
	Q2	-0.6
	Q3	-0.1
	Q4	0.6
2017:	Q1	1.3
	Q2	1.6
	Q3	1.7
	Q4	1.8
2018:	Q1	2.1
	Q2	2.5
	Q3	2.8
	Q4	3.0
Annual		
	2015	3.1
	2016	-0.3
	2017	1.6
	2018	2.7

Note: This forecast is consistent with nominal GDP and interest rates in the Tealbook forecast. Actual data through July 13, 2015; projections thereafter.

* Quarterly growth rates are computed from quarter averages. Annual growth rates are calculated using the change from fourth quarter of previous year to fourth quarter of year indicated.

Abbreviations

ABS	asset-backed securities
BEA	Bureau of Economic Analysis, Department of Commerce
BHC	bank holding company
CDS	credit default swaps
C&I	commercial and industrial
CLO	collateralized loan obligation
CMBS	commercial mortgage-backed securities
CPI	consumer price index
CRE	commercial real estate
Desk	Open Market Desk
ECB	European Central Bank
EME	emerging market economy
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
ISM	Institute for Supply Management
LIBOR	London interbank offered rate
MBS	mortgage-backed securities
MMFs	money market funds
NIPA	national income and product accounts
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
PCE	personal consumption expenditures

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)
TGA	U.S. Treasury's General Account
TIPS	Treasury inflation-protected securities
TPE	Term premium effects