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

March 12, 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, and they incorporate the staff's lower estimate of the longer-run equilibrium real federal funds rate.[2] (Medium-term prescriptions derived from dynamic simulations of the rules are discussed below.) As in January, all of the simple rules prescribe an increase in the federal funds rate by the third quarter. The Taylor (1993) and the Taylor (1999) rules call for sizable increases in the federal funds rate to values of 1½ percent or higher over the near term. The inertial Taylor (1999) rule and the first-difference rule prescribe less-sizable interest-rate increases—to near ½ percent and just over ¼ percent in the third quarter of 2015, respectively—because both rules place a considerable weight on keeping the federal funds rate close to its lagged value.

In general, the current prescriptions from the simple rules using the current staff forecast imply slightly lower policy rates than those using the previous Tealbook forecast. This difference reflects the downward revisions in the staff's projection for the output gap and core PCE inflation. As explained in Tealbook, Book A, and as shown in the lower panel of the exhibit, the staff now projects that the trajectory of the output gap will run, on average, about ½ percentage point lower than in the previous Tealbook through 2017, with the output gap closing in the third quarter of 2016, two quarters later than in the January Tealbook. The staff's projection for core PCE inflation is a bit lower in 2015 but mostly unchanged thereafter. 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. Reflecting the staff's updated assessment of slack in the economy, the current estimate of r^*, at –0.82 percent,

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

[2] As detailed in the box, "Changes to Interest Rates in the Longer Run," in Tealbook, Book A, the staff has revised its estimate of the longer-run value of the real federal funds rate down from 1¾ to 1½ percent. To facilitate comparisons, new values of the intercepts of rules, where applicable, have been used to construct both the "Current Tealbook" and "Previous Tealbook outlook" numbers tabulated in the exhibit.

Strategies

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Policy Rules

	2015Q2	2015Q3
Taylor (1993) rule	**1.85**	**1.95**
Previous Tealbook	*2.02*	*2.20*
Taylor (1999) rule	**1.49**	**1.67**
Previous Tealbook	*1.69*	*2.00*
Inertial Taylor (1999) rule	**0.33**	**0.53**
Previous Tealbook outlook	*0.36*	*0.61*
First-difference rule	**0.22**	**0.29**
Previous Tealbook outlook	*0.38*	*0.66*

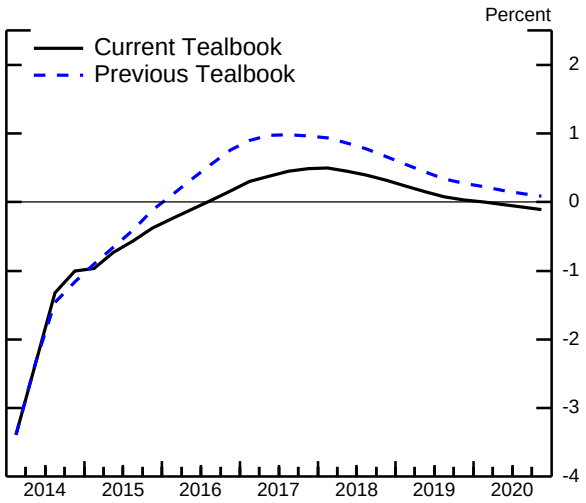
Memo: Equilibrium and Actual Real Federal Funds Rates

	Current Tealbook	*Previous Tealbook*
Tealbook-consistent FRB/US *r** estimate	-0.82	*-0.56*
Actual real federal funds rate	-1.27	*-1.28*

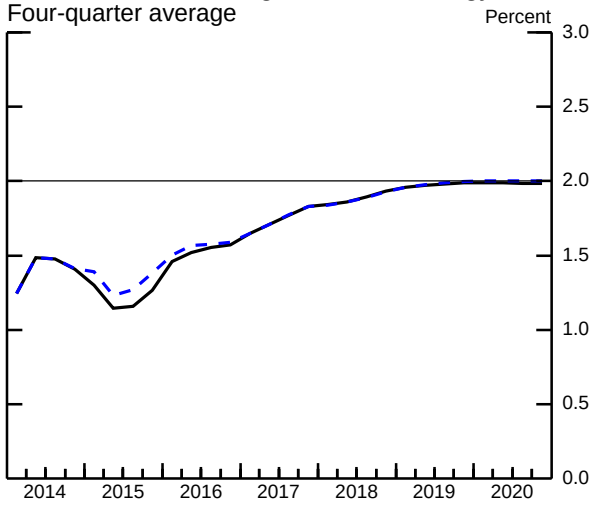
Note: The lines denoted "Previous Tealbook outlook" report rule prescriptions based on the previous Tealbook's staff outlook using the current rule specifications, which have intercept terms that have been adjusted, where applicable, to reflect the staff's downward revision to the longer-run real federal funds rate. Rules that have the lagged policy rate as a right-hand-side variable jump off from the average value of the policy rate thus far in the current quarter.

Key Elements of the Staff Projection

GDP Gap



PCE Prices Excluding Food and Energy
Four-quarter average



is 26 basis points lower than the corresponding value derived from the staff's outlook in January. The actual real federal funds rate, at about -1¼ percent, is almost 50 basis points below the current estimate of *r**.

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, under the assumption that the federal funds rate is subject to an effective lower bound of 12½ basis points. 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 exhibit also displays the implications of following the baseline monetary policy assumptions adopted in the current staff forecast.[3] As in January, the staff has assumed in its current forecast that the first increase in the federal funds rate will occur at the June FOMC meeting. After departing from its effective lower bound, the federal funds rate is assumed to rise at a pace prescribed by the inertial Taylor (1999) rule. The prescribed path for the federal funds rate initially increases a little more than ¼ percentage point per quarter and reaches 3 percent in the first half of 2018; the pace of tightening subsequently slows, and the federal funds rate begins to level off near its longer-run value of 3½ percent.

All of the policy rules in these dynamic simulations call for tightening to begin immediately.[4] The Taylor (1993) and the 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 real federal funds rate initially rises

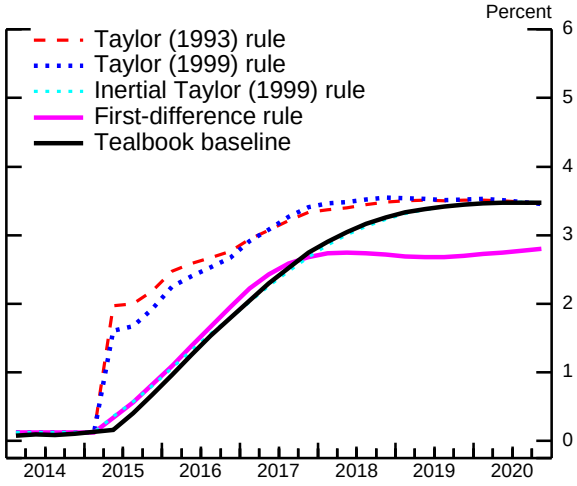
[3] The dynamic simulations discussed here and below incorporate the assumptions about underlying economic conditions used in the staff's baseline forecast, including the macroeconomic effects of the Committee's asset holdings from the large-scale asset purchase programs, and the staff's downward revision to the longer-run real federal funds rate.

[4] Unlike the Tealbook baseline, the simulations employing the four policy rules make no attempt to account for the Committee's forward guidance regarding the start of policy firming. However, as shown in the December Tealbook, policy rule simulations that take account of this guidance by imposing an unemployment rate threshold only delay the departure from the effective lower bound by at most one quarter, with negligible implications for unemployment and inflation.

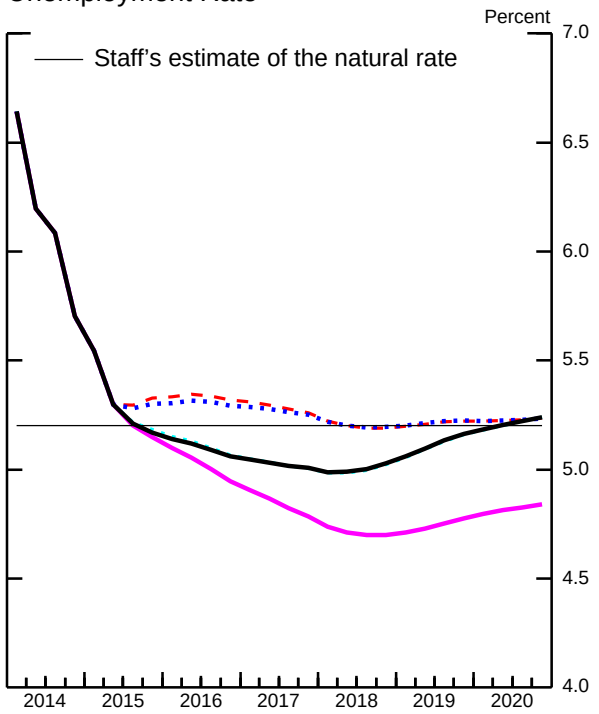
Strategies

Policy Rule Simulations

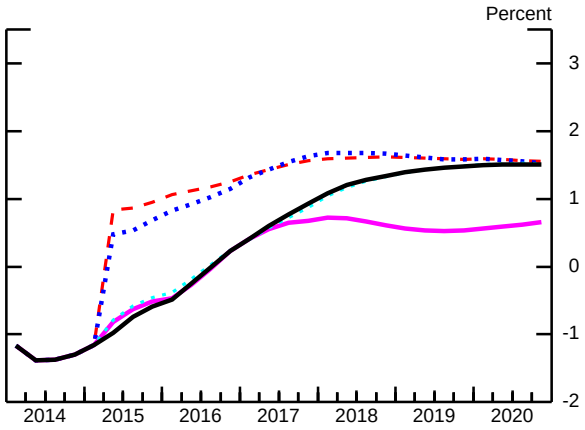
Effective Nominal Federal Funds Rate



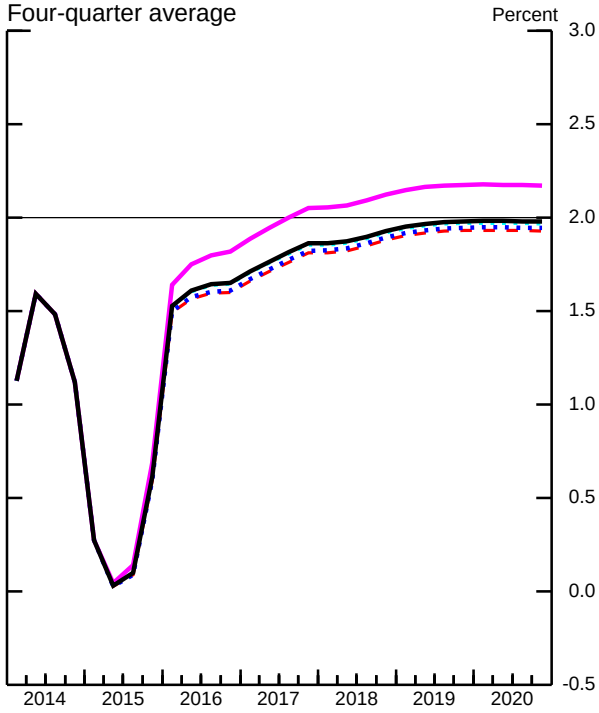
Unemployment Rate



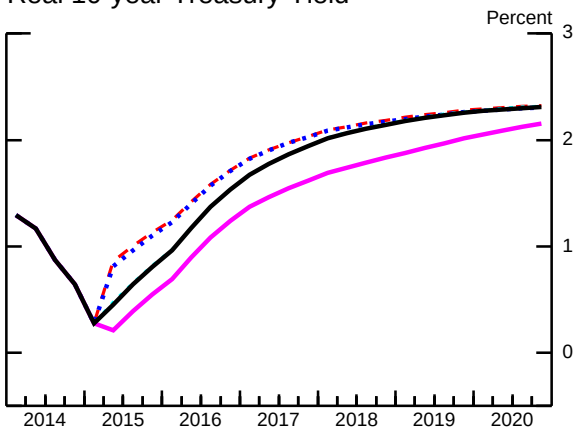
Real Federal Funds Rate



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 its baseline path because the federal funds rate departs from its effective lower bound immediately, almost one quarter earlier than in the Tealbook baseline. However, the difference is too small to have a material effect on the real longer-term interest rates that influence economic activity in the FRB/US model, so macroeconomic outcomes are essentially the same in this case as those under the Tealbook baseline.

The first-difference rule calls for a slightly higher real federal funds rate over the coming year than in the Tealbook baseline. However, because the first-difference rule responds to the expected change in the output gap rather than its level, declines in the output gap later in the decade—expected to occur after the initial overshooting of output relative to its potential level—generate a federal funds rate path that is below baseline after the middle of 2017. This lower path, combined with expectations of higher price and wage inflation in the future, leads to higher levels of resource utilization and more inflation in the short run. Overall, this rule generates outcomes late in the decade that are farther than the other policy rules from both the staff's estimate 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 January. 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 decisions that policymakers make today are assumed to constrain future policy choices.[5]

Compared with the January Tealbook, optimal control policy entails a lower path of the federal funds rate, reflecting the weaker aggregate demand embedded in the current forecast.[6] Despite the more accommodative policy, the unemployment rate undershoots the staff's estimate of the natural rate by less than in January, consistent with the staff's assessment of a slightly higher trajectory for the unemployment rate. The optimal control

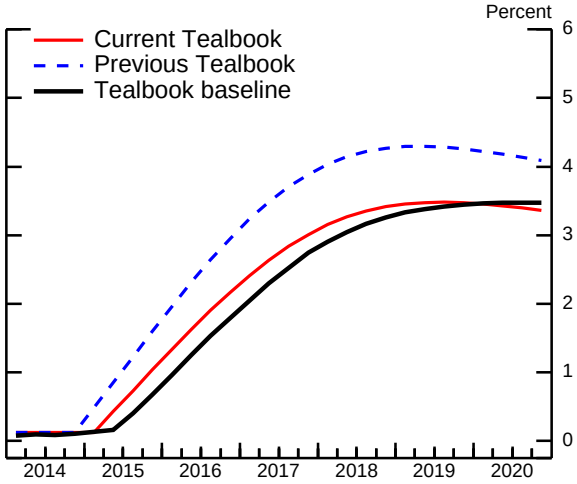
[5] The results for optimal control policy under discretion (in which policymakers cannot credibly commit to carrying out a plan involving policy choices that would be suboptimal at the time that these choices have to be implemented) are similar.

[6] As noted above, the current Tealbook baseline reflects the staff's reduction in its estimate of the longer-run real federal funds rate, and this change also contributes to the lower optimal control path for the federal funds rate.

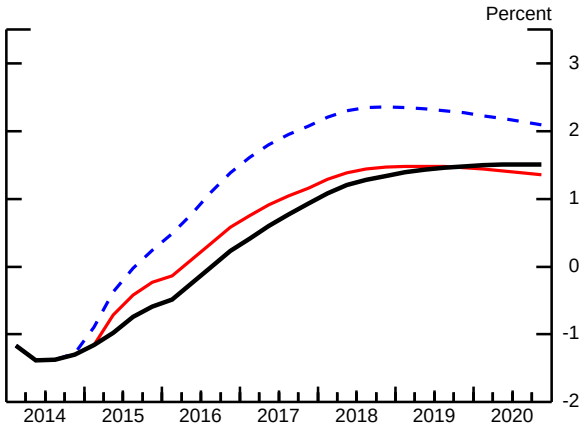
Strategies

Optimal Control Policy under Commitment

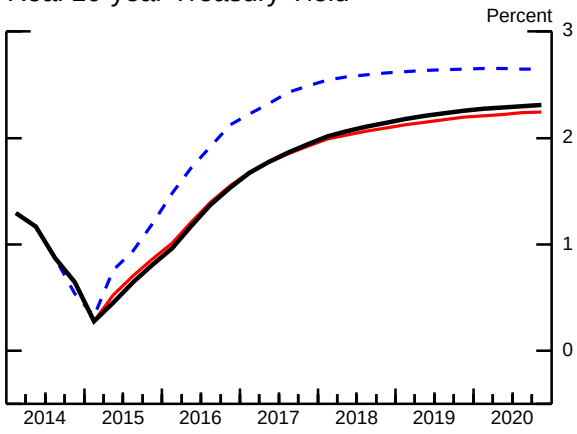
Effective Nominal Federal Funds Rate



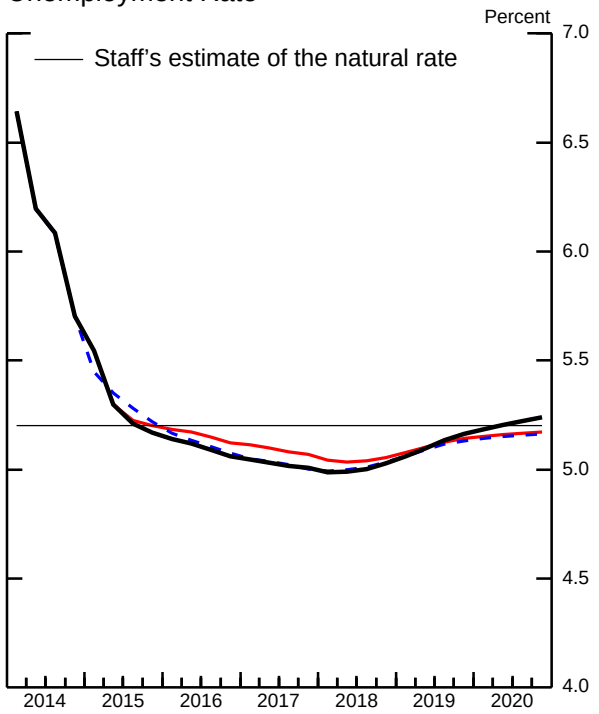
Real Federal Funds Rate



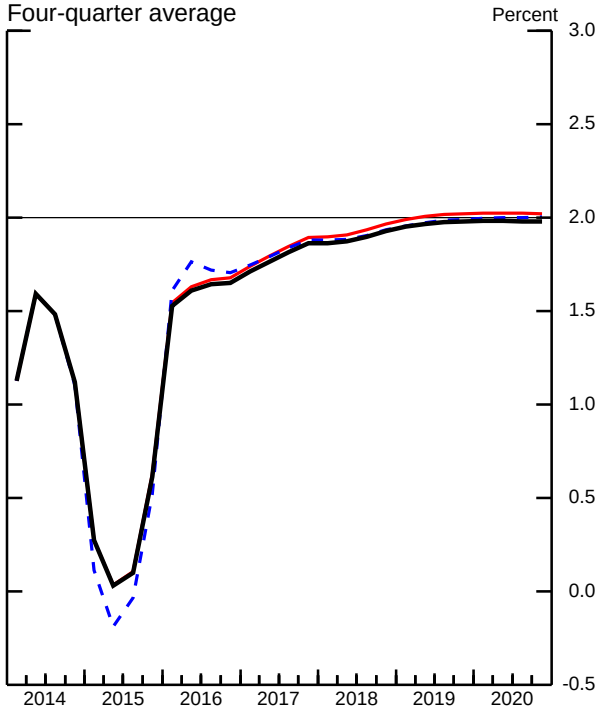
Real 10-year Treasury Yield



Unemployment Rate



PCE Inflation
Four-quarter average



path for headline inflation is nearly identical to the baseline path, with differences relative to the trajectory shown in the January Tealbook mostly reflecting revisions to the staff's baseline projection associated with upward revisions to energy prices in the near term.

Under the optimal control policy, the federal funds rate departs from the effective lower bound almost one quarter earlier than in the Tealbook baseline and then increases at about the same pace as in the baseline through 2017; on average, the federal funds rate path prescribed by optimal control is about ½ percentage point higher than the baseline path over the next few years. Compared with the Tealbook baseline, the tighter stance of the optimal control policy—evident from the somewhat higher path of real longer-term rates—generates less undershooting of unemployment below the staff's estimate of the natural rate, while inflation converges to the Committee's objective at about the same pace.

OPTIMAL CONTROL WITH A NONLINEAR WAGE PHILLIPS CURVE

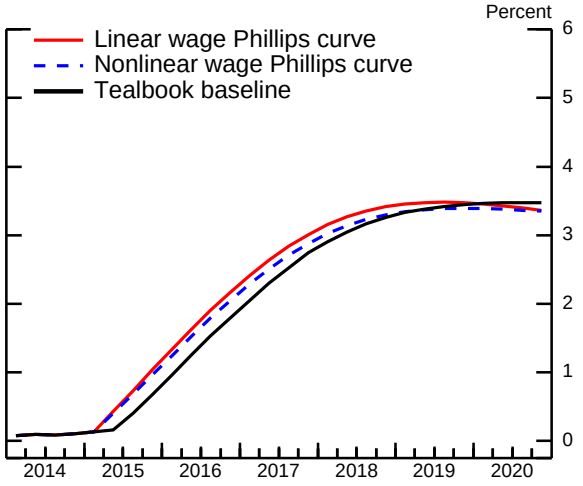
The optimal control simulations discussed above assume that the response of inflation to labor market slack or tightness is modest in magnitude and linear in the degree of resource utilization. An Alternative View box in the January Tealbook, Book A, considered implications of a nonlinear wage Phillips curve for the staff's inflation projection. The special exhibit, "Optimal Control with a Nonlinear Wage Phillips Curve," examines the policy implications of a related specification in which wage inflation is more sensitive to the unemployment rate gap when the labor market is tight than when there is economic slack. As in the January box, a nonlinear wage Phillips curve could be motivated, for instance, by the presence of downward nominal wage rigidities, which could make wages and prices relatively unresponsive to slack during and after economic downturns. Once the labor market reaches full employment, the sensitivity of wages and prices to slack could surge back. Consistent with such an asymmetric response, FRB/US estimates of the immediate response of wage inflation to the unemployment rate gap are about twice as large using a 1985-2007 sample rather than the 1985-2012 sample currently in use.

To capture such a nonlinearity, we replace the standard, linear wage Phillips curve in the FRB/US model with one in which the sensitivity of wage inflation to labor market slack is the same as in the FRB/US model when the unemployment rate is above the staff's estimate of its natural rate but is four times as responsive when the unemployment rate is below the natural rate. While the calibration is meant to be illustrative, it is within

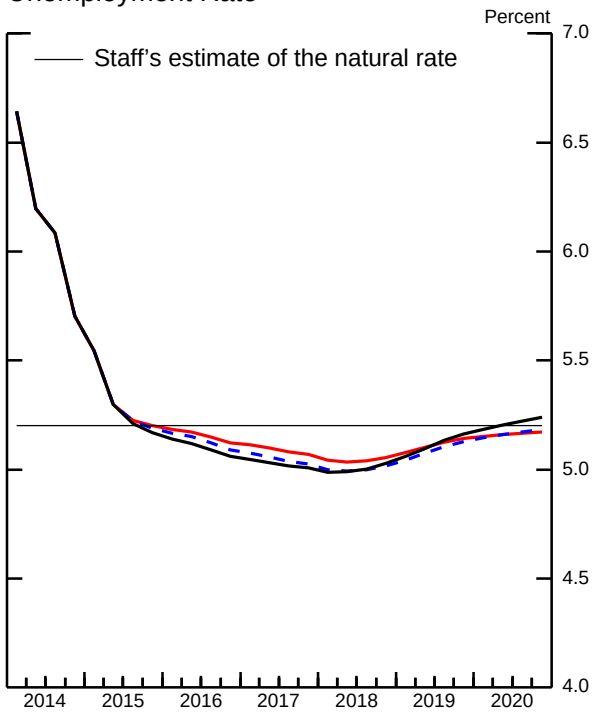
Strategies

Optimal Control with a Nonlinear Wage Phillips Curve

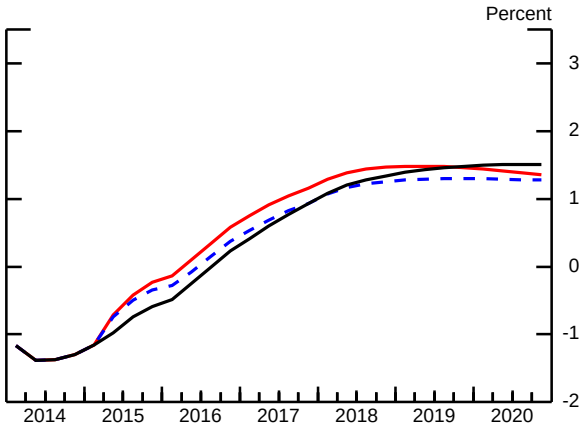
Effective Nominal Federal Funds Rate



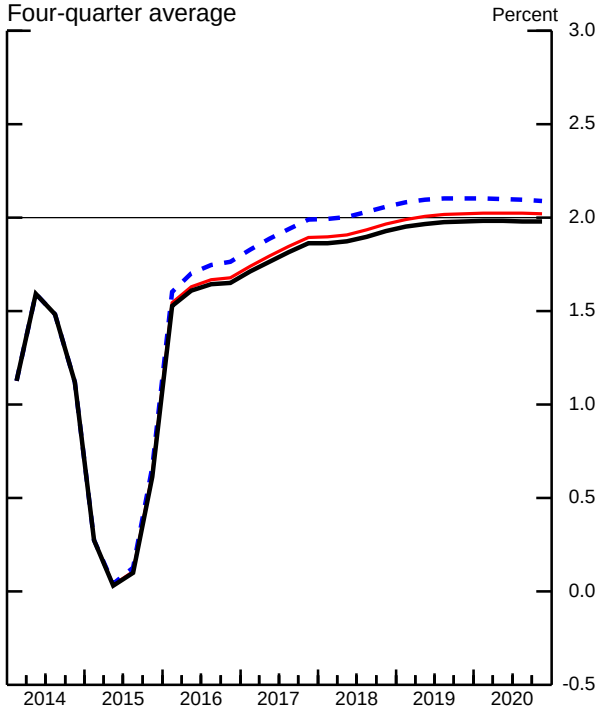
Unemployment Rate



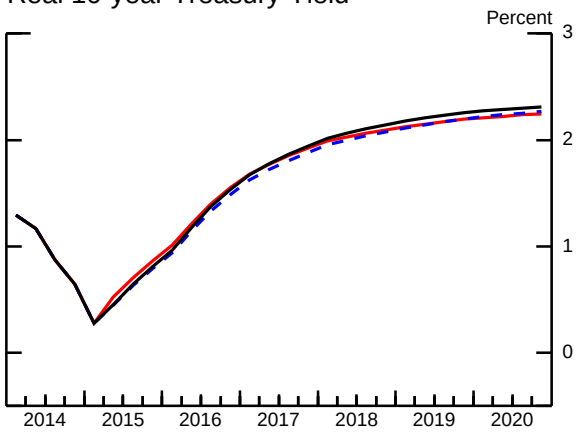
Real Federal Funds Rate



PCE Inflation
Four-quarter average



Real 10-year Treasury Yield



Note: The nonlinear wage Phillips curve assumes that wage inflation is four times as responsive to the unemployment rate gap when the unemployment rate is below the staff's estimate of the natural rate than when it is above.

the range of conventional estimates.[7] In the simulation, it is assumed that both the private sector and policymakers know that the wage Phillips curve is nonlinear and fully understand its implications for inflation and real activity.[8] In addition, as in the previous exhibit, policymakers are assumed to commit to the prescribed policy and this prescription is regarded as credible by the public.

Because inflation is initially below the Committee's 2 percent target, the higher sensitivity of wage inflation to labor market slack in the simulation with a nonlinear wage Phillips curve makes the tradeoff between pushing inflation up toward target and reducing the unemployment rate below the natural rate more meaningful. Accordingly, policy is more accommodative than in the standard optimal control simulation: Real long-term rates rise a bit more gradually and the unemployment rate undershoots the natural rate more in the simulation with the nonlinear wage Phillips curve. Given the tighter labor market and wage inflation's greater sensitivity to real activity in this specification, inflation rises faster and then slightly overshoots the Committee's 2 percent objective. Overall, the trajectory for inflation is about 0.1 percentage point higher than in the standard optimal control simulation.

The result that monetary policy is more accommodative and leads to a more pronounced undershooting of unemployment reflects the fact that inflation starts from well below the Committee's objective. If inflation were closer to the longer-run target, policy would instead be tighter under optimal control with the nonlinear wage Phillips curve than under standard optimal control, as concerns about unemployment falling below its natural rate would weigh more heavily in policymakers' objective function.

Two assumptions noted above point to caveats worth emphasizing. First, these simulations assume that policymakers fully understand the wage and price dynamics of the economy. However, our understanding of these dynamics is imperfect, limiting the

[7] The calibration implies that, all else equal, a one percentage point positive unemployment gap, leads to an immediate reduction in annualized nominal wage inflation of 0.015 percentage point, while a one percentage point negative unemployment gap leads to an immediate increase in annualized nominal wage inflation of 0.060 percentage point. The latter response is within two standard deviations of the FRB/US model estimate informed by the 1985-2007 subsample. Using a different specification, Kumar and Orrenius (2014) also report a significantly larger response of wage inflation to a fall in the unemployment rate when the unemployment rate is low. Finally, the qualitative results of the simulation hold under even larger asymmetries.

[8] In particular, if the unemployment rate fluctuates over time around the natural rate, monetary policy would need to keep the unemployment rate above the natural rate on average over time to prevent an upward acceleration of inflation.

ability of policymakers to achieve inflation outcomes near their longer-run objective in the presence of this nonlinearity. Second, as with the earlier optimal control simulations, this simulation embeds the critical assumption that policy is perfectly credible and that inflation expectations remain well anchored. If the private sector doubted policymakers' commitment to their goals and plans, the increase in inflation could be larger and more persistent than shown in the simulations.

The final two exhibits, "Outcomes under Alternative Policies" and "Outcomes under Alternative Policies, Quarterly," tabulate the simulation results for key variables under the above-described policies.

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]	2.2	2.3	2.3	2.0	1.6	1.5
Taylor (1993)	2.2	1.9	2.0	2.1	1.8	1.7
Taylor (1999)	2.2	1.9	2.0	2.0	1.8	1.7
Inertial Taylor (1999)	2.2	2.3	2.3	2.1	1.6	1.5
First-difference	2.2	2.5	2.5	2.3	1.9	1.7
Optimal control	2.2	2.2	2.2	2.1	1.7	1.6
Unemployment rate[2]						
Extended Tealbook baseline[1]	5.3	5.2	5.1	5.0	5.0	5.2
Taylor (1993)	5.3	5.3	5.3	5.3	5.2	5.2
Taylor (1999)	5.3	5.3	5.3	5.3	5.2	5.2
Inertial Taylor (1999)	5.3	5.2	5.1	5.0	5.0	5.2
First-difference	5.3	5.1	4.9	4.8	4.7	4.8
Optimal control	5.3	5.2	5.1	5.1	5.1	5.1
Total PCE prices						
Extended Tealbook baseline[1]	-0.3	1.6	1.7	1.9	1.9	2.0
Taylor (1993)	-0.3	1.5	1.6	1.8	1.9	1.9
Taylor (1999)	-0.3	1.5	1.6	1.8	1.9	1.9
Inertial Taylor (1999)	-0.3	1.6	1.6	1.9	1.9	2.0
First-difference	-0.3	1.7	1.8	2.1	2.1	2.2
Optimal control	-0.3	1.6	1.7	1.9	2.0	2.0
Core PCE prices						
Extended Tealbook baseline[1]	1.1	1.5	1.6	1.8	1.9	2.0
Taylor (1993)	1.1	1.4	1.5	1.8	1.9	1.9
Taylor (1999)	1.1	1.4	1.5	1.8	1.9	2.0
Inertial Taylor (1999)	1.1	1.5	1.6	1.8	1.9	2.0
First-difference	1.1	1.6	1.7	2.0	2.1	2.2
Optimal control	1.1	1.5	1.6	1.9	2.0	2.0
Effective nominal federal funds rate[2]						
Extended Tealbook baseline[1]	0.2	0.7	1.8	2.7	3.3	3.4
Taylor (1993)	2.0	2.2	2.8	3.3	3.5	3.5
Taylor (1999)	1.6	1.9	2.7	3.4	3.5	3.5
Inertial Taylor (1999)	0.4	0.8	1.8	2.7	3.2	3.4
First-difference	0.3	0.8	2.0	2.7	2.7	2.7
Optimal control	0.4	1.0	2.2	3.0	3.4	3.5

1. In the Tealbook baseline, the federal funds rate first departs from an effective lower bound of 12½ basis points in the second quarter 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.

Outcomes under Alternative Policies, Quarterly

(Four-quarter percentage change, except as noted)

Measure and policy	2015				2016			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP								
Extended Tealbook baseline[1]	3.5	3.0	2.5	2.7	2.8	2.7	2.7	2.6
Taylor (1993)	3.5	3.0	2.3	2.4	2.4	2.3	2.4	2.3
Taylor (1999)	3.5	3.0	2.3	2.5	2.5	2.3	2.4	2.3
Inertial Taylor (1999)	3.5	3.0	2.5	2.7	2.8	2.7	2.7	2.6
First-difference	3.5	3.0	2.5	2.7	2.8	2.8	2.8	2.7
Optimal control	3.7	3.2	2.6	2.7	2.6	2.6	2.6	2.6
Unemployment rate[2]								
Extended Tealbook baseline[1]	5.5	5.4	5.3	5.2	5.1	5.1	5.0	5.0
Taylor (1993)	5.5	5.4	5.4	5.4	5.3	5.3	5.3	5.2
Taylor (1999)	5.5	5.4	5.4	5.3	5.3	5.3	5.3	5.2
Inertial Taylor (1999)	5.5	5.4	5.3	5.2	5.1	5.1	5.0	5.0
First-difference	5.5	5.4	5.3	5.2	5.1	5.1	5.0	5.0
Optimal control	5.4	5.3	5.3	5.2	5.1	5.1	5.1	5.0
Total PCE prices								
Extended Tealbook baseline[1]	0.3	0.1	0.2	0.7	1.6	1.7	1.7	1.7
Taylor (1993)	0.3	0.1	0.2	0.7	1.6	1.7	1.7	1.7
Taylor (1999)	0.3	0.1	0.2	0.7	1.6	1.7	1.7	1.7
Inertial Taylor (1999)	0.3	0.1	0.2	0.8	1.7	1.7	1.8	1.8
First-difference	0.3	0.1	0.2	0.8	1.8	1.9	1.9	1.9
Optimal control	0.1	-0.1	0.0	0.6	1.8	1.9	1.9	1.9
Core PCE prices								
Extended Tealbook baseline[1]	1.3	1.2	1.2	1.4	1.6	1.6	1.6	1.6
Taylor (1993)	1.3	1.2	1.2	1.3	1.5	1.6	1.6	1.6
Taylor (1999)	1.3	1.2	1.2	1.3	1.5	1.6	1.6	1.6
Inertial Taylor (1999)	1.3	1.2	1.2	1.4	1.6	1.6	1.7	1.7
First-difference	1.3	1.2	1.3	1.5	1.7	1.8	1.8	1.8
Optimal control	1.4	1.3	1.3	1.5	1.6	1.7	1.7	1.8
Effective nominal federal funds rate[2]								
Extended Tealbook baseline[1]	0.1	0.2	0.5	0.9	1.2	1.6	1.9	2.2
Taylor (1993)	0.1	2.2	2.3	2.6	2.9	3.0	3.1	3.2
Taylor (1999)	0.1	1.7	1.9	2.3	2.7	2.9	3.0	3.2
Inertial Taylor (1999)	0.1	0.4	0.6	0.9	1.3	1.6	1.9	2.2
First-difference	0.1	0.5	0.9	1.3	1.6	2.0	2.4	2.7
Optimal control	0.4	0.8	1.1	1.4	1.8	2.1	2.4	2.8

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

2. Percent, average for the quarter.

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 Taylor (1999) rule has been featured prominently in recent 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.[2] 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 denoted "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

[1] See Erceg and others (2012).

[2] For the March 2015 Tealbook, the staff revised the longer-run value of the real interest rate from 1¾ percent to 1½ percent.

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.

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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. For the optimal control simulations, the dotted line labeled "Previous Tealbook" is derived from the

previous Tealbook projection. 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.

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Monetary Policy Alternatives

This Tealbook presents three alternative draft FOMC statements—labeled A, B, and C—for the Committee's consideration. In addition to providing different possibilities for characterizing incoming information and the outlook, these alternatives offer a variety of options for forward guidance regarding the federal funds rate.

The Committee's March meeting is taking place against a backdrop in which continued improvement in the labor market is juxtaposed with a significant shortfall in inflation from the Committee's 2 percent objective. While many participants may be confident that conditions consistent with maximum employment may be reached fairly soon, they may be less confident about the trajectory for inflation.

The key judgment to be made at this meeting is whether the Committee can replace the "patient" language that is now associated with a two-meeting delay before liftoff with more flexible, data-dependent forward guidance that would put decisionmaking about the first increase in the target federal funds rate in play at the June meeting or later. Under Alternative B, the Committee would modify its forward guidance in a manner that signals that an increase in the target range is possible as early as June provided that the Committee has seen further improvement in the labor market and is reasonably confident that inflation will move back to 2 percent over the medium term. Under Alternative A, the statement would indicate that policymakers want to see clear evidence that inflation is turning up before they would increase the federal funds rate. In contrast, under Alternative C, policymakers would communicate that an increase in the target range for the federal funds rate will likely be appropriate at the June meeting.

With regard to forward guidance, Alternative B replaces the Committee's previous assessment that "it can be patient in beginning to normalize the stance of monetary policy." The new guidance states that, consistent with the Committee's previous postmeeting statement, an increase in the federal funds rate "remains unlikely at the April FOMC meeting" and notes the Committee's anticipation that the first increase in the federal funds rate will be appropriate when the Committee "has seen further improvement in the labor market" and is "reasonably confident" that inflation will move back to 2 percent "over the medium term." Alternative B further adds that this "change in the forward guidance does not indicate that the Committee has decided on the timing of the initial increase in the target range." The Committee would presumably drop the

reference to the April decision from future statements, but may want to retain some indication that the timing of the initial increase has not been decided.

The draft statement for Alternative A extends the notion of being patient by adding the condition that the federal funds rate will remain at its current level "until inflation is clearly moving up toward 2 percent." In addition, the Committee would assert the intention to "use its tools as necessary to return inflation to 2 percent in two to three years." In contrast, the statement under Alternative C indicates that the Committee judges that economic conditions "will likely warrant an increase in the target range for the federal funds rate in a couple of meetings." Under this alternative, the Committee would also retain the qualification that "slower" progress toward the Committee's dual objectives would likely cause the initial increase in the target range to occur later than currently expected; the converse stipulation that faster progress would result in an earlier tightening would be dropped in light of the indication that a tightening will soon occur under that alternative.

Under Alternatives A and B, the Committee would retain the language stating that, in determining "how long to maintain" the current target range, it will assess progress toward its dual objectives. Under Alternative C, however, the Committee would state that it will assess progress toward its objectives to determine "future adjustments of the target range," meaning both the initial and subsequent adjustments.

With respect to the Committee's characterization of its approach to removing policy accommodation, under Alternatives A and B the Committee would reaffirm its intention to take a "balanced approach." Under Alternative C, the "balanced approach" phrase would be dropped in favor of language emphasizing the data dependence of the Committee's policy decisions. The new language would state that "in response to unanticipated economic and financial developments, the Committee will adjust the target federal funds rate to best promote the attainment of its objectives of maximum employment and 2 percent inflation." The text of all three alternatives would reiterate that economic conditions may, for some time, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.

With regard to balance sheet policy, under all three alternatives, the Committee would maintain its existing reinvestment policy.

Concerning the characterization of current economic conditions, Alternative B would incorporate three key changes relative to the January statement: It would use "moderate" instead of "solid" to describe the expansion in economic activity; note that export growth had weakened; and acknowledge that measures of inflation compensation have reversed part of their previous decline but remain low. Relative to Alternative B, the corresponding language under Alternatives C and A reflect brighter and more downbeat tones, respectively, than that for Alternative B in their characterizations of economic activity, labor market conditions, household spending, business fixed investment, export growth, and market-based measures of inflation compensation. Data to be received between the publication of this Tealbook and the second day of the March FOMC meeting could lead to revisions in the first paragraph of each of the draft statements.

Regarding the Committee's outlook for inflation, with energy price declines now expected to stay in the rear-view mirror, all of the alternative statements would describe near-term inflation as anticipated to "remain near its recent low level" (instead of decline further). In contrast with Alternative B, under Alternative C the Committee would say it expects inflation to rise gradually "to" (not toward) 2 percent over the medium term, while Alternative A would say the rise toward 2 percent is expected to be "very" gradual. Finally, Alternative A would add that the Committee is concerned that inflation could run substantially below 2 percent for a protracted period.

Subsequent pages present: the January FOMC statement; the draft statements for March under Alternatives A, B, and C; supporting arguments for the three alternatives; and a draft directive.

JANUARY 2015 FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in December suggests that economic activity has been expanding at a solid pace. Labor market conditions have improved further, with strong job gains and a lower unemployment rate. On balance, a range of labor market indicators suggests that underutilization of labor resources continues to diminish. Household spending is rising moderately; recent declines in energy prices have boosted household purchasing power. Business fixed investment is advancing, while the recovery in the housing sector remains slow. Inflation has declined further below the Committee's longer-run objective, largely reflecting declines in energy prices. Market-based measures of inflation compensation have declined substantially in recent months; 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 decline further 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 lower energy prices and other factors 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. Based on its current assessment, the Committee judges that it can be patient in beginning to normalize the stance of monetary policy. However, if incoming information indicates faster progress toward the Committee's employment and inflation objectives than the Committee now expects, then increases in the target range for the federal funds rate are likely to occur sooner than currently anticipated. Conversely, if progress proves slower than expected, then increases in the target range are likely to occur later than currently anticipated.

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.

FOMC STATEMENT—MARCH 2015 ALTERNATIVE A

1. Information received since the Federal Open Market Committee met in ~~December~~ **January** ~~suggests~~ **indicates** that **growth in** economic activity has ~~been expanding at a solid pace~~ **moderated**. Labor market conditions have improved further, with strong job gains and a lower unemployment rate. On balance, a range of labor market indicators suggests that underutilization of labor resources continues to diminish**, but wage increases remain subdued**. Household spending is rising moderately; ~~recent~~ **earlier** declines in energy prices have boosted household purchasing power. Business fixed investment is advancing **modestly, export growth has weakened**, ~~while~~ **and** the recovery in the housing sector remains slow. Inflation has declined further below the Committee's longer-run objective, ~~largely~~ **partly** reflecting **earlier** declines in energy prices. Market-based measures of inflation compensation ~~have declined substantially in recent months~~ **remain well below levels observed last summer**; 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 ~~decline further~~ **remain near its recent low level** in the near term**.** ~~, but~~ The Committee expects inflation to rise **very** gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of ~~lower~~ **earlier** energy ~~prices~~ **price declines** and other factors dissipate. **However,** the Committee **is concerned that inflation could run substantially below the 2 percent objective for a protracted period and** 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. Based on its current assessment, the Committee judges that it can be patient in beginning to normalize the stance of monetary policy **until inflation is clearly moving up toward 2 percent**. ~~However, if incoming information indicates faster progress toward the Committee's employment and inflation objectives than the Committee now expects, then increases in the target range for the federal funds rate are likely to occur sooner than currently anticipated. Conversely, if progress proves slower than expected, then increases in the target range are likely to occur later than currently anticipated.~~ **The Committee is prepared to use its tools as necessary to return inflation to 2 percent in two to three 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.

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.

FOMC STATEMENT—MARCH 2015 ALTERNATIVE B

1. Information received since the Federal Open Market Committee met in ~~December~~ **January** suggests that economic activity ~~has been~~ **is** expanding at a ~~solid~~ **moderate** pace. Labor market conditions have improved further, with strong job gains and a lower unemployment rate. ~~On balance,~~ A range of labor market indicators suggests that underutilization of labor resources continues to diminish. Household spending is rising moderately; ~~recent~~ **earlier** declines in energy prices have boosted household purchasing power. Business fixed investment is advancing, while the recovery in the housing sector remains slow **and export growth has weakened**. Inflation has declined further below the Committee's longer-run objective, largely reflecting **earlier** declines in energy prices. Market-based measures of inflation compensation ~~have declined substantially in recent months~~ **have reversed part of their previous decline but 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 ~~decline further~~ **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 ~~lower~~ **earlier** energy ~~prices~~ **price declines** and other factors 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. ~~Based on its current assessment~~ **Consistent with its previous statement**, the Committee judges that ~~it can be patient in beginning to normalize the stance of monetary policy~~ **an increase in the target range for the federal funds rate remains unlikely at the April FOMC meeting. 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. This change in the forward guidance does not indicate that the Committee has decided on the timing of the initial increase in the target range.** ~~However, if incoming information indicates faster progress toward the Committee's employment and inflation objectives than the Committee now expects, then increases in the target range for the federal funds rate are likely to occur sooner than currently anticipated. Conversely, if progress proves~~

~~slower than expected, then increases in the target range are likely to occur later than currently anticipated.~~

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.

FOMC STATEMENT—MARCH 2015 ALTERNATIVE C

1. Information received since the Federal Open Market Committee met in ~~December~~ **January** ~~suggests~~ **indicates** that economic activity has been expanding at a solid pace **on average in recent quarters**. Labor market conditions have improved further, with strong job gains and a lower unemployment rate. ~~On balance,~~ A **wide** range of labor market indicators suggests that ~~underutilization of labor resources continues to diminish~~ **the labor market is approaching conditions consistent with maximum employment**. Household spending is rising ~~moderately~~ **solidly**; ~~recent~~ **earlier** declines in energy prices have boosted household purchasing power. Business fixed investment is advancing, while the recovery in the housing sector remains slow. Inflation has declined further below the Committee's longer-run objective, largely reflecting **earlier** declines in energy prices. Market-based measures of inflation compensation have ~~declined substantially in recent months~~ **increased**; 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 ~~decline further~~ **remain near its recent low level** in the near term, but the Committee expects inflation to rise gradually ~~toward~~ **to** 2 percent over the medium term as the labor market improves further and the transitory effects of ~~lower~~ **earlier** energy ~~prices~~ **price declines** and other factors 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~~ **future adjustments of the** target range **for the federal funds rate**, 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. Based on its current assessment, the Committee judges that ~~it can be patient in beginning to normalize the stance of monetary policy~~ **economic conditions will likely warrant an increase in the target range for the federal funds rate in a couple of meetings**. However, if incoming information indicates ~~faster~~ **slower** progress toward the Committee's employment and inflation objectives than the Committee now expects, then ~~increases in the target range for the federal funds rate are likely to occur sooner than currently anticipated. Conversely, if progress proves slower than expected, then increases in the target range are~~ **the initial increase is** likely to occur later than currently anticipated.

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.~~ **Based on its economic outlook,** 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. **In response to unanticipated economic and financial developments, the Committee will adjust the target federal funds rate to best promote the attainment of its objectives of maximum employment and 2 percent inflation.**

Alternatives

THE CASE FOR ALTERNATIVE B

The Committee may view the information received during the intermeeting period as consistent with an assessment that the current target range of the federal funds rate remains appropriate for at least another meeting. However, policymakers may want to drop "patient" from the postmeeting statement because they may judge that an increase in the target range may be warranted at the June meeting. The Committee may therefore choose to maintain the current target range for the federal funds rate while updating its forward guidance, as in Alternative B.

In light of the latest readings on the labor market, showing strong job gains and a further decline in the unemployment rate over the intermeeting period, members may consider it appropriate to again indicate in the Committee's postmeeting statement that the underutilization of labor resources "continues to diminish." Policymakers might also continue to judge that resource slack remains. They may point to the persistent absence of price and wage pressures despite large declines in the unemployment rate. More broadly, policymakers may judge that a range of other labor-market indicators continues to indicate that resource utilization is lower than suggested by the unemployment rate alone; they might for example point to the below-trend labor force participation rate, the still-elevated share of those who are working part time but would prefer a full-time job, and the still-high share of unemployed workers who have been out of work for six months or more.

Some policymakers might be inclined to signal that the target range for the federal funds rate is likely to be raised sooner than what would be suggested by the language of Alternative B. In light of the further improvement in labor market conditions in January and February, they may judge that levels of resource slack are low and are poised to be eliminated altogether in the near future. They may be concerned that prolonging a policy of near-zero short-term interest rates, and maintaining below-normal policy rates for some time once the economy returns to full employment, would risk pushing the unemployment rate well below levels consistent with maximum sustainable employment and fuel an undesirably large rise in inflation over the medium run. Nonetheless, they may remain cautious in their judgment about the momentum in economic activity in light of the recent downward revision to real GDP growth in the fourth quarter as well as weaker incoming data on spending and international trade in the current quarter. Furthermore, they might note that inflation remains well below the Committee's objective, and judge that inflation expectations remain well anchored and that there are as

yet no signs of increasing wage and price pressures. They might also note that the higher foreign exchange value of the dollar implies less accommodative financial conditions, all else equal. Moreover, participants might see the experience of other countries exiting from periods of long-standing high levels of policy accommodation—most notably Sweden and Japan, countries for which the departure from the effective lower bound proved premature and subsequently was reversed—as suggesting that it may be better to err on the side of commencing policy firming later, rather than earlier.[1] They may therefore conclude that the costs of waiting another couple of meetings before increasing the target range for the federal funds rate are likely outweighed by the risks of removing accommodation too early.

Some policymakers may be concerned that the extended period of near-zero interest rates is increasing incentives for risk-taking in the financial sector, with potential for undermining financial stability in the future. However, they may note that signs of excessive risk-taking are not widespread, and use of short-term financing instruments and indicators of leverage have remained at moderate levels to date. Moreover, a premature tightening of policy might itself pose risks to financial stability—namely by undermining the economic recovery, increasing loan losses, and thereby impairing the balance sheets of financial institutions. Policymakers may accordingly conclude that the statement language provided under Alternative B—by signaling that the first increase in the federal funds rate may, but need not, take place as early as June—gives the Committee ample flexibility to take financial stability concerns into account while supporting its employment and inflation objectives.

Conversely, some participants may be concerned that the updated forward guidance in Alternative B—in particular the signal that the process of policy normalization may begin as early as June—might be premature. They may be concerned that persistently low market-based measures of inflation compensation might be an indication that the credibility of the Committee's commitment to its 2 percent inflation objective is in question. However, as survey-based measures of longer-term inflation expectations have so far remained stable and as market-based measures of inflation compensation have, over the intermeeting period, reversed some of their earlier declines, these participants may now be less concerned that changes in market-based measures of

[1] For an account of the relevant foreign experience, see the memo, "Foreign Experience with Liftoff from the Effective Lower Bound," by Andrea De Michelis, Michiel De Pooter, and Paul Wood, sent to the Committee on January 16, 2015.

inflation compensation in recent quarters reflect a fundamental shift in inflation expectations rather than movements in risk or liquidity premiums.[2] Alternatively, they may see risks that weakness in economic activity abroad might have significant repercussions for the U.S. economy—especially if that weakness intensified, along the lines of the "Greek Exit with Severe Spillovers" scenario in the "Risks and Uncertainty" section of Tealbook, Book A. However, weighing these risks against the assessment that there has so far been only a modest spillover of weakness abroad to U.S. growth, these policymakers may recognize that under Alternative B, the Committee would retain the latitude to adjust the stance of monetary policy as necessary in response to softer-than-expected data. Consequently, before signaling the potential provision of greater policy accommodation, policymakers may prefer to wait for further information about inflation expectations and the economic situation abroad and its implications for the U.S. outlook, and thus choose statement language as proposed in Alternative B.

On average, respondents to both the Desk's Survey of Primary Dealers and to the Desk's Survey of Market Participants place odds of about 30 percent on the first increase in the target range for the federal funds rate occurring in June, but consider an increase in September almost as likely. In addition, the majority of respondents to both surveys expects a modification in forward guidance at this meeting that removes the "patient" language. Accordingly, overall, the new language in Alternative B is not likely to surprise many market participants.

THE CASE FOR ALTERNATIVE C

Some policymakers may be more confident that the expansion has gained sufficient momentum such that economic slack—if any should still remain—will likely be absorbed fairly quickly, and they may see inflation as likely to move back toward 2 percent in short order. In support of this view, policymakers might highlight the strong expansion in payroll employment as well as the decline in the unemployment rate over the past year. In particular, these policymakers might note that the unemployment rate, at 5.5 percent in February, has reached the upper end of the central tendency of participants' longer-run projections for the unemployment rate given in the December SEP, raising the

[2] Five-to-ten-year-ahead inflation forecasts from the Michigan survey in February, as well as forecasts from the first-quarter SPF for CPI inflation five and ten years ahead, and PCE inflation five years ahead ticked down by just about one tenth—well with their historical ranges—and the ten-year-ahead SPF forecast for PCE prices remained unchanged. Short-term forecasts from those surveys varied mostly in line with observed changes in gasoline prices.

possibility that the unemployment gap may already have closed. Policymakers might also point to the fact that oil prices recently appear to have leveled off, and that oil futures prices suggest that energy prices will no longer be reducing headline inflation relative to core inflation.

These policymakers might also see increased momentum in U.S. economic activity in the period ahead, and point for example to the elevated consumer confidence and the solid growth in real consumption expenditures shown in the revised data for the fourth quarter. Accordingly, these policymakers may regard it as appropriate to indicate that a first increase in the target range for the federal funds rate at the June meeting is more likely than suggested by Alternative B; consequently, they may prefer Alternative C.

Policymakers may also be concerned that the path for the federal funds rate currently expected by market participants could imply an overly accommodative policy. They may judge that the current low levels of inflation largely reflect transitory effects of earlier declines in energy prices and thus may expect headline inflation to rise toward 2 percent before long. Participants may point to increases in market-based measures of inflation compensation that came in the wake of the recent upturn in energy prices, and they may regard earlier declines in these measures observed since summer as predominantly reflecting changes in risk or liquidity premiums rather than a decline in longer-run inflation expectations. Thus, they may view the balance of the evidence, including information from survey measures, as suggesting that longer-run expected inflation has not declined. In contrast, they may already see a significant risk that the unemployment rate could substantially undershoot its natural rate, a development that might generate higher actual wage and price inflation in the future, and in turn boost expected inflation above 2 percent as the labor market tightens. These policymakers might cite the scenario "Faster Growth with Higher Inflation" in the "Risks and Uncertainty" section of Tealbook, Book A, as encapsulating some of the risks they have in mind. They also might emphasize that all of the simple monetary policy rule prescriptions and the optimal control simulations presented in the "Monetary Policy Strategies" section of Tealbook, Book B, call for an immediate policy tightening. Based on these judgments, some participants may want to signal that an initial increase in rates by June is quite likely.

A decision to issue a statement along the lines of Alternative C would likely surprise market participants to some extent. Although respondents to the Survey of

Primary Dealers and the Survey of Market Participants place, on average, the highest odds on the first target-range increase to occur in June, at 30 percent, these odds are not very high, and respondents consider it, on average, twice as likely that the first increase will occur only after the June meeting. In addition, the views expressed in the surveys are disperse, and quite a few respondents view dates later than June as the most likely. Many market participants might thus be surprised by the high likelihood placed by Alternative C on an increase in the target range for the federal rate at the June meeting. If so, in response to a statement like that in Alternative C, medium- and longer-term real interest rates would likely rise, inflation compensation would likely fall, equity prices would probably decline, and the dollar appreciate. However, to the extent that investors interpreted the statement as reflecting a more positive outlook for economic activity and inflation, and accepted that outlook as correct, equity prices and inflation compensation would not fall as much or could even rise.

THE CASE FOR ALTERNATIVE A

In light of the information received over the intermeeting period on inflation, economic developments abroad, and the restraining effects of the appreciation of the dollar, some policymakers may be concerned that the durability of the current expansion is at risk, or that inflation is likely to remain well below 2 percent for the foreseeable future. Accordingly, these policymakers may regard it as appropriate that the Committee more clearly specify these concerns as a reason to be patient in beginning to normalize the stance of monetary policy, as in the statement under Alternative A. While acknowledging that job gains in January and February were "solid," and that the unemployment rate fell further, these policymakers might judge that subdued nominal wage growth and other indicators of labor market utilization suggest that appreciable slack remains in the labor market.

Some policymakers may note that, over the last few years, inflation has persistently fallen short of the Committee's 2 percent objective without much sign of moving back up again; they may be concerned that "inflation could run substantially below the 2 percent objective for a protracted period." They may take little comfort from the stability of survey-based measures of longer-term inflation expectations, pointing, for example, to the behavior of survey expectations in Japan that failed to reflect a decade-long experience of very low, even negative, inflation rates. These participants may judge that market-based measures of inflation compensation provide a more useful gauge of longer-term inflation expectations. While these market-based measures have increased,

on balance, over the intermeeting period, policymakers might point to their still-low levels and interpret these as suggesting that inflation expectations may have begun to drift down—possibly along the lines of the scenario "Lower Long-Term Inflation Expectations" that is considered in the "Risks and Uncertainty" section of Tealbook, Book A—or that the potential costs of low inflation outcomes have increased. In addition, they might be concerned about the possible implications for prices and personal incomes of low growth in labor compensation. Containing such risks might be a particular concern for policymakers because the effective lower bound on policy rates and the Federal Reserve's already-large balance sheet could limit the Committee's flexibility in responding to downside outcomes. In response, some participants may want to signal the Committee's readiness to use its tools as necessary to move inflation back up again.

Some policymakers may read the incoming data since the January meeting as suggesting that real GDP growth is likely to be no more than moderate in coming quarters. While they might judge that the recent decline in energy prices has raised household purchasing power, they might see this effect as likely to be transitory, and they might note the relatively weak retail sales data for January and February. They could also point to weakness in business investment and residential construction, in the face of a highly accommodative stance of monetary policy, as signs that the underlying trend in private domestic demand remains unsatisfactory. These participants may also be concerned that the prospects for continued moderate growth over coming quarters have been damaged by weakness in key European economies and the strong appreciation of the dollar. They may regard the weakness in energy prices over recent months as an indicator that global growth is on a lower path than before, with adverse implications for U.S. net exports. Based on these judgments, some participants may want to lay out more stringent conditions than in Alternative B (or the current statement), for beginning to normalize the stance of monetary policy.

An announcement like that in Alternative A would likely surprise market participants. The third paragraph of the alternative not only retains the Committee's existing "patient" language, but also adds the requirement that inflation should clearly move up toward 2 percent before beginning to normalize the stance of monetary policy, and hints at the possible provision of additional policy accommodation. In response to such a statement, investors would likely push further into the future their expectation of the date of the first increase in the target range for the federal funds rate. Medium- and longer-term real interest rates would likely decline, inflation compensation and equity

prices might rise, and the dollar could depreciate. However, insofar as investors interpreted the statement as reflecting a more downbeat assessment of the outlook for economic growth and inflation, equity prices would not rise as much or could even decline, and inflation compensation could fall.

DIRECTIVE

The directive that was issued after the January meeting appears on the next page. It is followed by a draft of the March directive for Alternatives A, B, and C. This draft directive is the same for all three alternative statements; it is also identical to the January directive.

Regarding balance sheet policies, the draft directive 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.

January 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 March 2015 Alternatives A, B, and C

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.

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. In particular, the projection is based on the assumptions that the first increase in the target range for the federal funds rate will occur in the second quarter of 2015, and that rollovers of maturing Treasury securities and the reinvestment of principal received on agency securities will cease in the fourth quarter of 2015. From that point forward, the SOMA portfolio shrinks through redemptions of maturing Treasury securities 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.

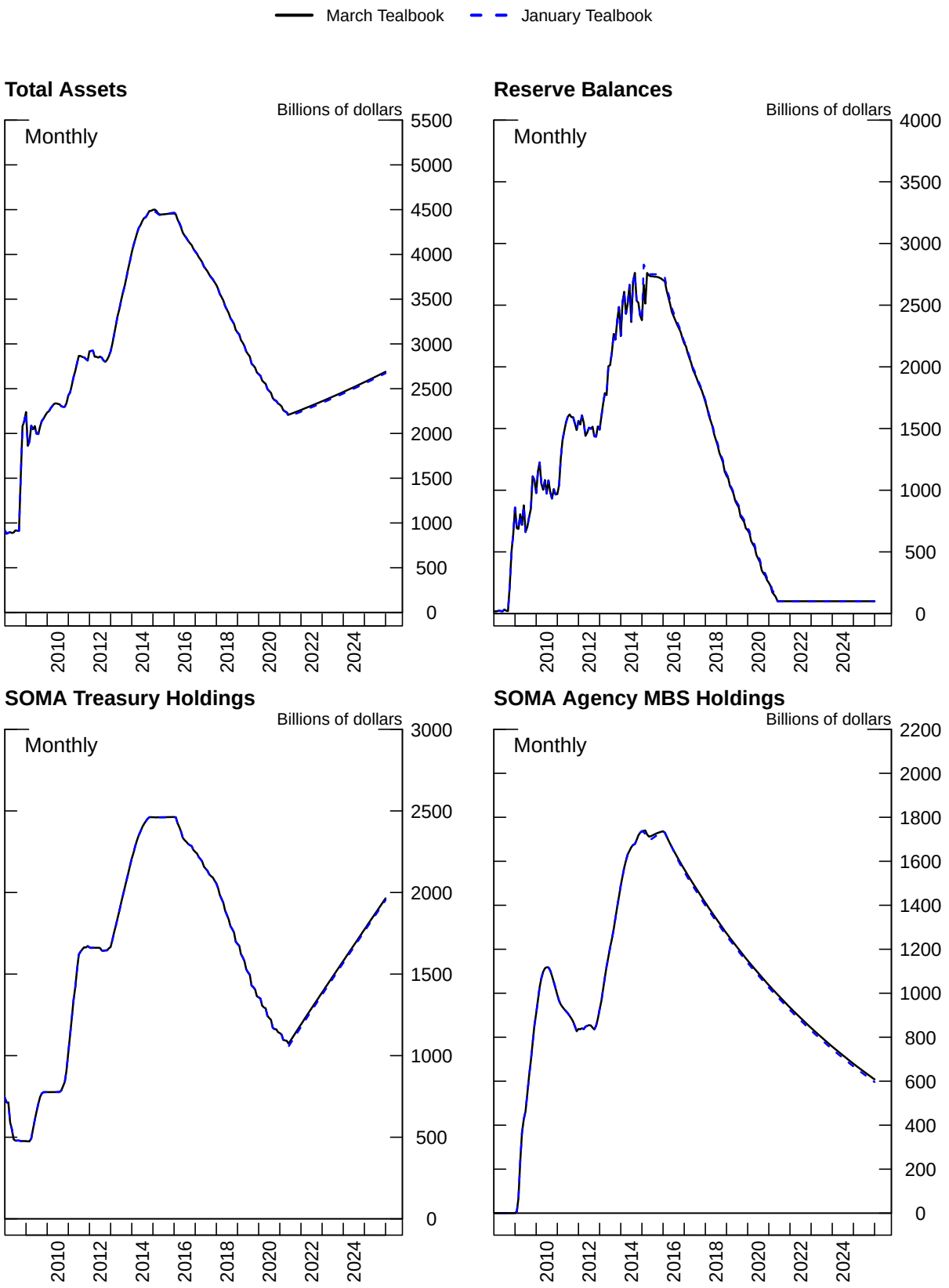
- ***Balance sheet.*** As shown in the exhibit "Total Assets and Selected Balance Sheet Items" and in the table that follows, the size of the portfolio is normalized in the second quarter of 2021, at which point total assets stand at $2.2 trillion, with about $2 trillion in total SOMA securities holdings.[3] 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 results 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 does not produce an overall change in the size of the balance sheet.

[2] RRPs associated with foreign official and international accounts remain around $135 billion throughout the projection period.

[3] The size of the balance sheet is considered normalized when reserve balances revert to 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 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 -- March Tealbook
(Billions of dollars)

	Feb 28, 2015	2015	2017	2019	2021	2023	2025
Total assets	4,488	4,458	3,658	2,664	2,262	2,463	2,689
Selected assets							
Loans and other credit extensions*	2	0	0	0	0	0	0
Securities held outright	4,237	4,232	3,471	2,508	2,128	2,340	2,575
U.S. Treasury securities	2,460	2,463	2,056	1,357	1,191	1,580	1,964
Agency debt securities	37	33	4	2	2	2	2
Agency mortgage-backed securities	1,740	1,737	1,412	1,149	935	757	608
Unamortized premiums	204	191	148	115	91	79	69
Unamortized discounts	-18	-17	-13	-11	-8	-7	-6
Total other assets	42	44	44	44	44	44	44
Total liabilities	4,430	4,398	3,586	2,573	2,147	2,318	2,505
Selected liabilities							
Federal Reserve notes in circulation	1,307	1,375	1,550	1,678	1,827	1,997	2,185
Reverse repurchase agreements	340	235	235	135	135	135	135
Deposits with Federal Reserve Banks	2,776	2,783	1,796	756	180	180	180
Reserve balances held by depository institutions	2,513	2,703	1,716	675	100	100	100
U.S. Treasury, General Account	35	75	75	75	75	75	75
Other deposits	228	5	5	5	5	5	5
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0
Total capital	58	60	72	91	115	145	184

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 three years. Annual remittances reach their trough at about $25 billion in 2018; no deferred asset is recorded.[5] The Federal Reserve's cumulative remittances from 2009 through 2025 are about $1 trillion, approximately $200 billion above the staff estimate of the amount that would have been observed had there been no asset purchase programs.[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 $210 billion as of the end of February.[7] Reflecting the assumed rise in long-term interest rates over the next several years, the position is projected to shift to an unrealized loss by the end of this year, with projected year-end unrealized losses peaking at $260 billion in 2017. At this date, roughly $120 billion of the unrealized losses can be attributed to the portfolio of U.S. Treasury securities and $140 billion to the portfolio of 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 then-current market rates.

- ***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

Projections

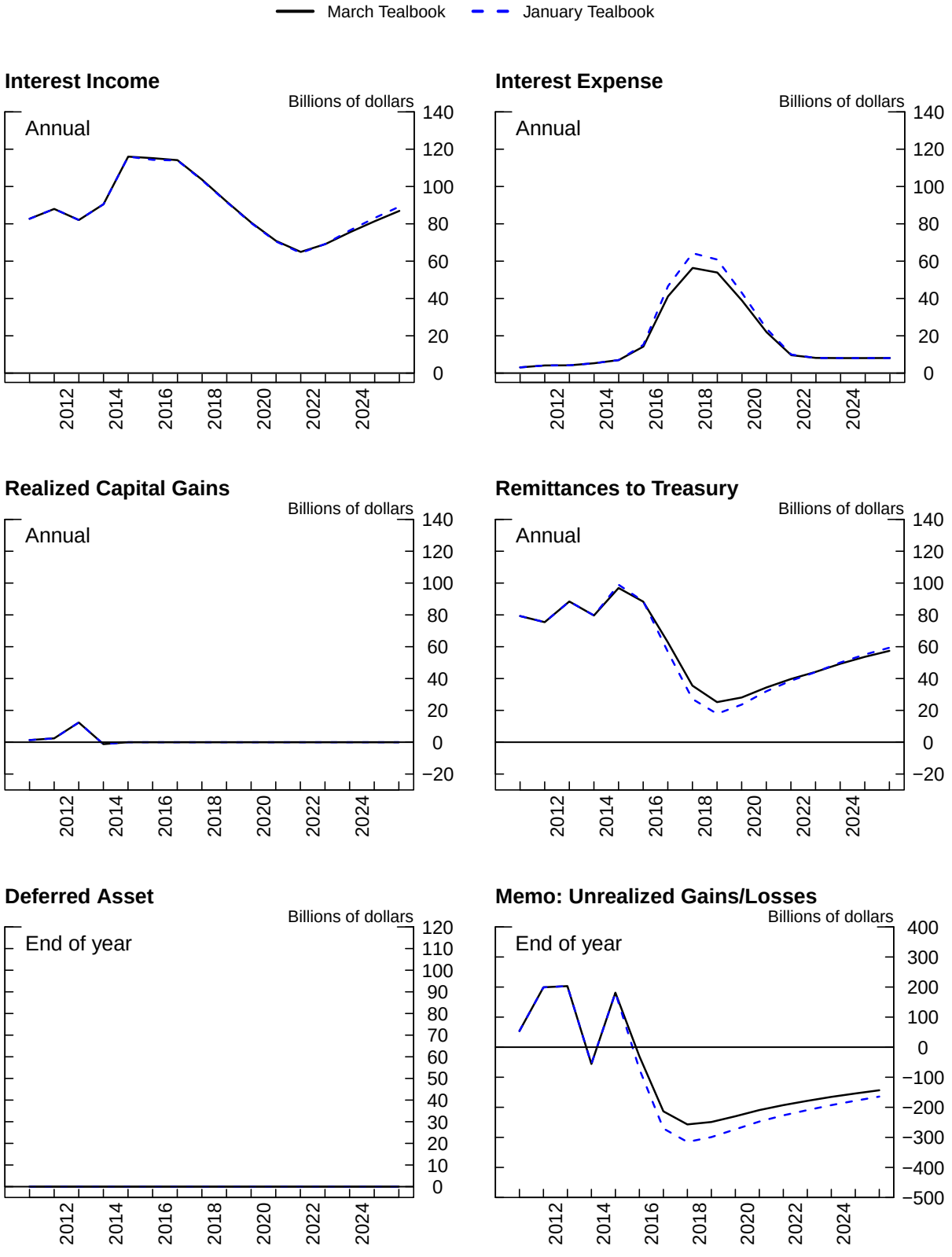
[4] We assume the interest rate paid on reserve balances remains 25 basis points as long as the federal funds rate remains at its effective lower bound. In addition, we assume that, once firming of the policy rate begins, the spread between the interest rate paid on reserve balances and the ON RRP rate 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 would be recorded.

[6] The staff estimate is obtained by 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



Projections

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

Date	March Tealbook	January Tealbook
	Quarterly Averages	
2015:Q1	-113	-112
Q2	-108	-107
Q3	-103	-102
Q4	-98	-97
2016:Q1	-94	-92
Q2	-89	-88
Q3	-85	-83
Q4	-81	-79
2017:Q4	-66	-64
2018:Q4	-54	-53
2019:Q4	-45	-44
2020:Q4	-38	-36
2021:Q4	-32	-31
2022:Q4	-28	-26
2023:Q4	-23	-21
2024:Q4	-18	-17
2025:Q4	-13	-12

Treasury yield in the first quarter of 2015 is estimated to be negative 113 basis points. Over the next couple of years, the term premium effect diminishes at a pace of about 5 basis points per quarter, reflecting the projected normalization of the portfolio.

- ***Monetary base.*** As shown in the final table, "Projections for the Monetary Base," once the normalization process begins in the second 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.[8]

[8] 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 phased out). The projected growth rate of the monetary base, however, is generally unaffected. If the FOMC employs additional reserve-draining tools during normalization, however, 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	March Tealbook	January Tealbook
Quarterly		
2015:Q1	1.7	36.3
Q2	13.3	4.2
Q3	0.2	0.7
Q4	0.4	1.1
2016:Q1	-4.3	-3.7
Q2	-13.9	-13.1
Q3	-11.0	-10.8
Q4	-9.1	-9.0
Annual		
2017	-10.3	-9.7
2018	-15.6	-14.5
2019	-14.4	-13.2
2020	-14.9	-13.4
2021	-5.5	-5.6
2022	4.2	3.8
2023	4.3	3.9
2024	4.3	3.9
2025	4.3	3.9

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

MONEY

M2 is expected to increase modestly faster than nominal GDP, on average, in the first half of 2015. Thereafter, M2 is projected to contract slightly through early 2016 and then to grow slowly over the remainder of the forecast horizon as the projected increase in the target range for the federal funds rate and the associated rise in the opportunity cost of holding money restrains money demand.[9] The increase in the opportunity cost is expected to slow M2 growth to a pace below that of nominal GDP in 2016 and, to a lesser extent, in 2017. In previous forecasts, staff had assumed that M2 growth will be additionally restrained by businesses and households reallocating a portion of the M2 balances accumulated during and after the financial crisis to other investments. However, in light of the continued strong growth in M2, staff is no longer assuming such a reallocation.

[9] The three-month Treasury bill rate is assumed to begin rising in 2015:Q1—one quarter earlier than the time at which the staff projects the target range for the federal funds rate to be raised above its effective lower bound. Subsequently, the Treasury bill rate is assumed to continue rising through the end of the forecast period, implying an increasing opportunity cost of holding M2 balances.

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

Quarterly		
2015:	Q1	8.0
	Q2	2.9
	Q3	-3.6
	Q4	-2.8
2016:	Q1	-1.4
	Q2	0.0
	Q3	0.6
	Q4	0.9
2017:	Q1	1.5
	Q2	1.9
	Q3	2.1
	Q4	2.2
Annual		
	2015	1.1
	2016	0.0
	2017	2.0

Note: This forecast is consistent with nominal GDP and interest rates in the Tealbook forecast. Actual data through March 2, 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
LIBOR	London interbank offered rate
MBS	mortgage-backed securities
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