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 01/11/2019.

Report to the FOMC on Economic Conditions and Monetary Policy

Book B

Monetary Policy: Strategies and Alternatives

December 12, 2013

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

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 six policy rules: the Taylor (1993) rule, the Taylor (1999) rule, the inertial Taylor (1999) rule, the outcome-based rule, the first-difference rule, and the nominal income targeting rule. 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.) As shown in the left-hand columns, four of the six rules keep the federal funds rate at the effective lower bound over the next two quarters. The Taylor (1993) rule, which puts relatively little weight on the output gap, prescribes a federal funds rate of about 1 percent for the first quarter of 2014 and almost 1½ percent the following quarter. The first-difference rule, which responds to the expected change in the output gap, prescribes increasing the federal funds rate to about ½ percent over the same time frame.[1]

The right-hand columns display the near-term prescriptions in the absence of the lower-bound constraint on the federal funds rate.[2] For the first two quarters of 2014, the inertial Taylor (1999) rule and the outcome-based rule prescribe federal funds rates near zero. In contrast, the Taylor (1999) rule, which does not include an interest-rate smoothing term and thus responds more strongly to the staff's estimates of current inflation and the current output gap, prescribes a moderately negative value for the federal funds rate in the first quarter of 2014; however, the rule then specifies moving the funds rate up toward zero in the second quarter of 2014. The nominal income targeting rule responds to the current estimate of the output gap and to the cumulative shortfall of inflation from the assumed 2 percent target since the end of 2007. Reflecting these

[1] The result that the first-difference rule prescribes an early departure from the effective lower bound depends on the fact that, for the "Policy Rules and the Staff Projection" exhibit, the staff's baseline projections for real activity and inflation are taken as given and used as inputs into the rule. In contrast, in the dynamic policy rule simulations discussed below, these projections are allowed to respond to the policy settings prescribed by the rules. In that case, prescriptions from the first-difference rule remain constrained by the effective lower bound until the third quarter of 2014.

[2] Four of these rules—the inertial Taylor (1999) rule, the outcome-based rule, the nominal income targeting rule, and the first-difference rule—place substantial weight on the lagged federal funds rate. Because the rule prescriptions are conditioned on the actual level of the nominal federal funds rate observed thus far this quarter, the unconstrained prescriptions shown in the table are indirectly affected by the presence of the effective lower bound. The appendix provides further details.

Strategies

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Policy Rules

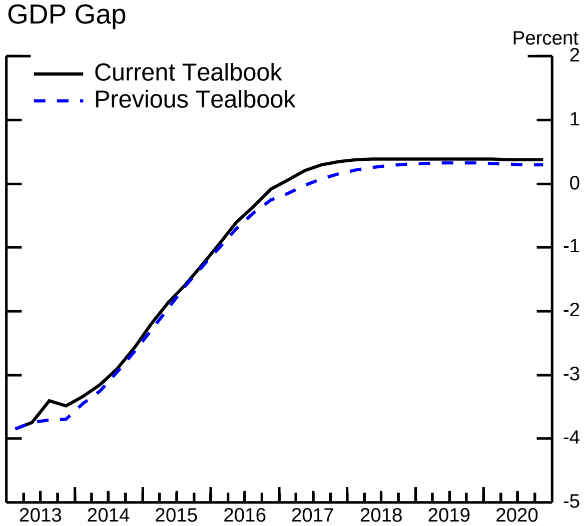
	Constrained Policy 2014Q1	Constrained Policy 2014Q2	Unconstrained Policy 2014Q1	Unconstrained Policy 2014Q2
Taylor (1993) rule	**1.07**	**1.49**	**1.07**	**1.49**
Previous Tealbook	*1.23*	*1.68*	*1.23*	*1.68*
Taylor (1999) rule	**0.13**	**0.13**	**–0.57**	**–0.06**
Previous Tealbook	*0.13*	*0.13*	*–0.47*	*–0.08*
Inertial Taylor (1999) rule	**0.13**	**0.13**	**0.02**	**0.01**
Previous Tealbook outlook	*0.13*	*0.13*	*0.04*	*0.04*
Outcome-based rule	**0.13**	**0.14**	**0.08**	**0.14**
Previous Tealbook outlook	*0.16*	*0.27*	*0.16*	*0.27*
First-difference rule	**0.29**	**0.59**	**0.29**	**0.59**
Previous Tealbook outlook	*0.41*	*0.75*	*0.41*	*0.75*
Nominal income targeting rule	**0.13**	**0.13**	**–0.77**	**–1.37**
Previous Tealbook outlook	*0.13*	*0.13*	*–0.76*	*–1.35*

Memo: Equilibrium and Actual Real Federal Funds Rates

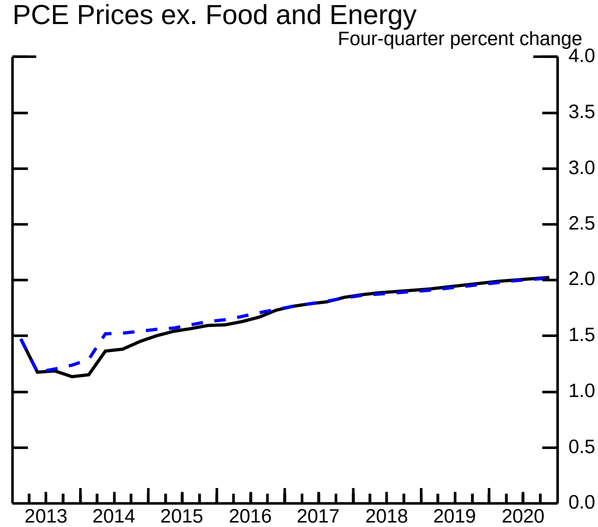
	Current Tealbook	*Previous Tealbook*
Tealbook-consistent FRB/US *r** estimate	–1.27	*–1.44*
Actual real federal funds rate	–1.06	*–1.07*

Key Elements of the Staff Projection

GDP Gap



PCE Prices ex. Food and Energy



Note: For rules that have the 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 average value for the policy rate thus far in the current quarter.

features, this rule calls for significantly more negative values of the federal funds rate than the other rules in the near term.

The unconstrained near-term prescriptions for most rules are largely unchanged from the October Tealbook, reflecting offsetting effects from revisions in the staff's near-term estimates of inflation and the output gap.[3] As shown in the lower left panel, the staff's output gap estimates for the next few years are slightly narrower than before, in response to a higher estimate of the current level of real GDP as well as a slightly stronger medium-term forecast for growth. As shown in the lower right panel, the staff's estimate for core PCE inflation is a littler lower for the next six quarters, and is mostly unchanged thereafter.

The top panel of the first exhibit also reports the Tealbook-consistent estimate of short-run r^*, which is generated using the FRB/US model after adjusting it to replicate the staff's economic forecast. The short-run r^* estimate of the equilibrium real federal funds rate corresponds to the rate that would, if maintained, return output to potential in 12 quarters. Reflecting the narrower output gap in the staff's medium-term projection, the r^* estimate for the current Tealbook has increased slightly, to about –1¼ percent. The current estimate of r^* is now about 20 basis points below the real federal funds rate.

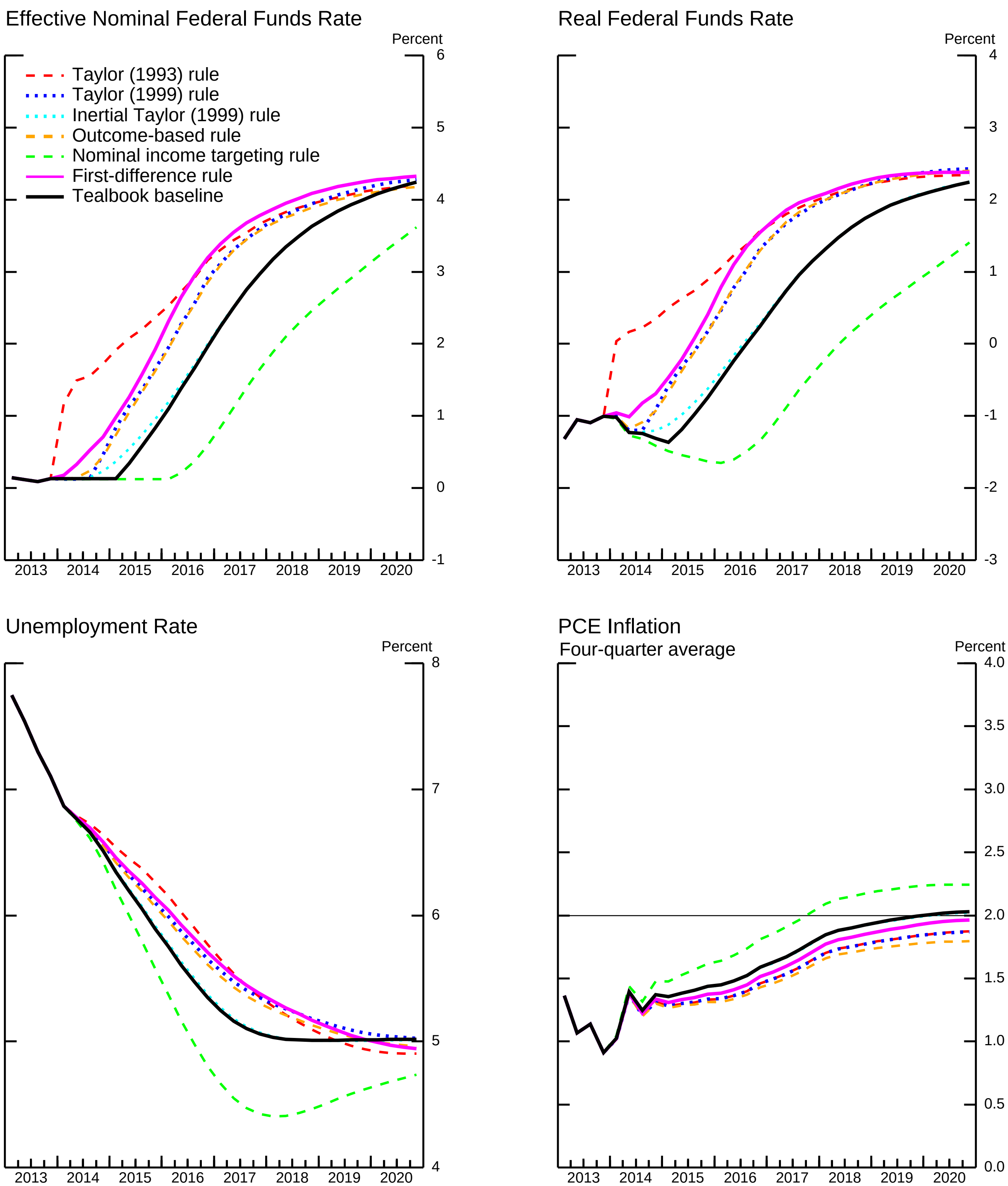
The second exhibit, "Policy Rule Simulations without Thresholds," reports dynamic simulations of the FRB/US model that incorporate endogenous responses of inflation and the output gap implied by having the federal funds rate follow the paths prescribed by the different policy rules, under the assumption that the federal funds rate is constrained by the effective lower bound and without regard to the Committee's thresholds related to inflation and the unemployment rate.[4] (Alternative policy rule simulations that incorporate the thresholds are discussed below.) Each rule is applied from the first quarter of 2014 onward, under the assumptions that financial market participants as well as price- and wage-setters believe that the FOMC will follow that rule

[3] Most significantly, the near-term prescriptions from the Taylor (1993) rule, which responds more strongly to inflation rather than the output gap, as well as the first-difference rule, which places equal weight on expected inflation and the expected change in the output gap, are about 15 basis points lower than in the October Tealbook.

[4] The policy rule simulations discussed here and below incorporate the macroeconomic effects of the FOMC's large-scale asset purchase programs. For the current program, the baseline forecast embeds the assumption that purchases of longer-term Treasury securities and agency MBS under the current program will end in the second half of 2014 and total about $1.4 trillion.

Strategies

Policy Rule Simulations without Thresholds



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.

and that agents fully understand and anticipate the implications of the rule for future real activity, inflation, and interest rates.

The exhibit also displays the implications of following the Tealbook baseline policy. This policy keeps the federal funds rate at the effective lower bound of 12½ basis points as long as the unemployment rate is above 6½ percent and average inflation five to eight quarters hence is projected to be less than 2½ percent. Once either of these variables crosses its threshold value, the federal funds rate follows the prescription of the inertial Taylor (1999) rule. As in the October Tealbook, the Tealbook baseline rule implies departure from the effective lower bound in the second quarter of 2015, one quarter after the unemployment rate drops below 6½ percent. The federal funds rate then steadily increases about ¼ percentage point per quarter over the next three years, reaching 3½ percent by the end of 2018. The unemployment rate reaches the staff's estimate of the long-term natural rate of unemployment of 5¼ percent by the beginning of 2017. Headline inflation rises only slowly, reaching 2 percent by early 2020.

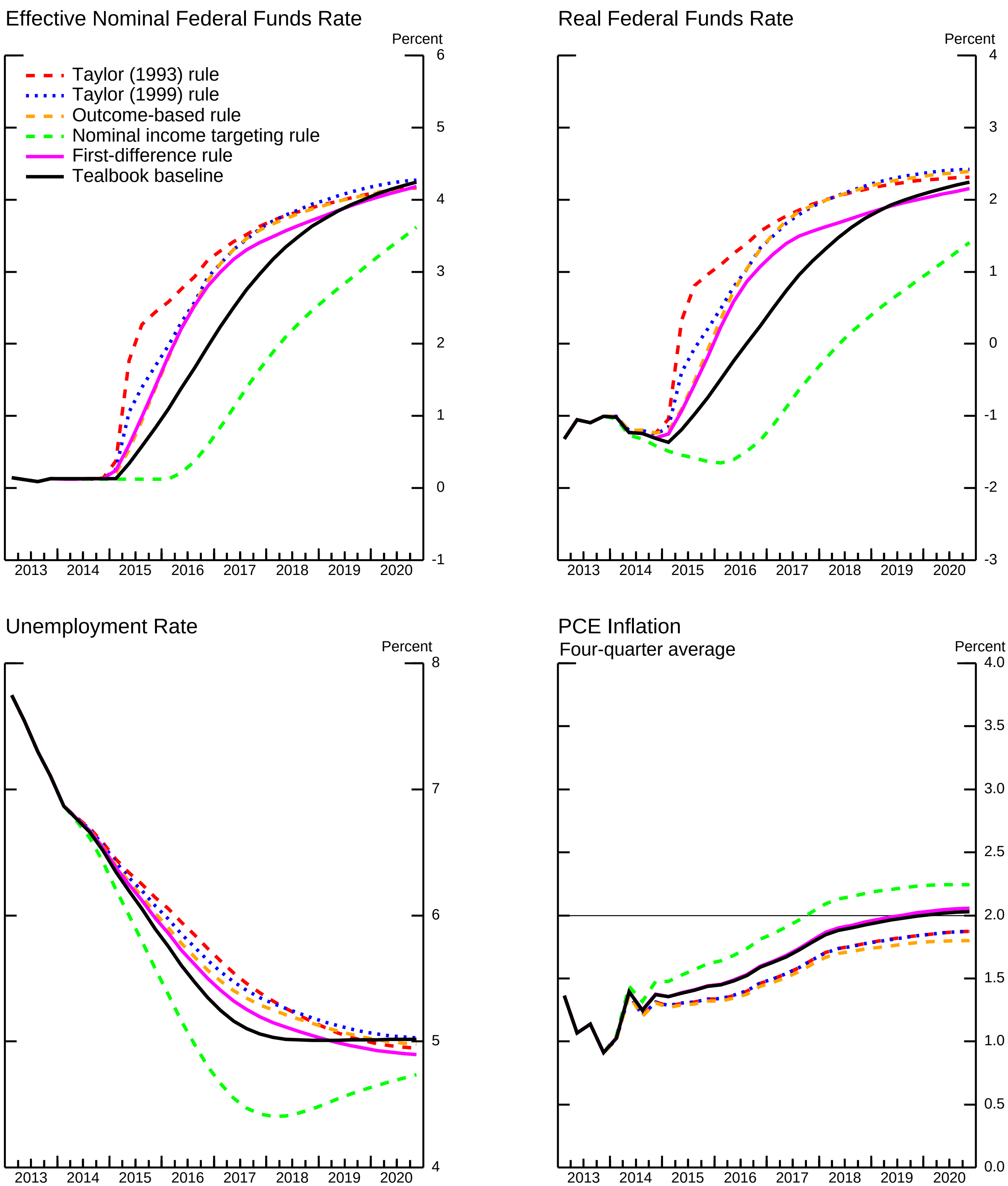
Without thresholds, most of the policy rules call for tightening to begin earlier than under the Tealbook baseline. Four of the rules put the real federal funds rate appreciably above the path implied by the baseline forecast, policy settings that result in higher unemployment and lower inflation than the baseline through most of the decade. The prescription of the inertial Taylor (1999) rule is nearly identical to the baseline. Only the nominal income targeting rule prescribes a later tightening than that in the Tealbook baseline. This rule keeps the federal funds rate at the lower bound until the third quarter of 2016 and generates a real federal funds rate persistently below baseline for the rest of the decade, thereby inducing stronger future real activity and higher future inflation.

The results presented in these and subsequent simulations depend importantly on the assumptions that policymakers will adhere to the simulated rule in the future and that private sector expectations fully incorporate the paths for the federal funds rate, real activity, and inflation implied by the rule. These assumptions play a particularly critical role in the case of the nominal income targeting rule, which is associated with outcomes in which inflation runs above the 2 percent long-run goal for some years, even after the output gap is closed.

The third exhibit, "Policy Rule Simulations with Thresholds," displays dynamic simulations in which the policy rules are subject to the thresholds that the Committee adopted in December 2012. For each of the rules, the thresholds are imposed by keeping

Strategies

Policy Rule Simulations with Thresholds



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.

the federal funds rate at the effective lower bound of 12½ basis points as long as the unemployment rate is above 6½ percent and average inflation five to eight quarters hence is projected to be less than 2½ percent. Financial market participants and price- and wage-setters are assumed to understand that the Committee will switch to the specified rule when one of the threshold conditions is satisfied and to view this switch as permanent and fully credible. In each of the simulations discussed below, crossing the unemployment threshold is the catalyst for switching to the specified rule.

As in the October Tealbook, the imposition of the thresholds leads to a departure of the federal funds rate from the effective lower bound in the second quarter of 2015 for most rules.[5] In most cases, this timing is the same as under the Tealbook baseline; compared to the case without thresholds, the augmented rules would thus postpone the departure of the federal funds rate from the effective lower bound by two quarters or more. Because the nominal income targeting rule does not prescribe raising the federal funds rate above its effective lower bound until after the unemployment rate falls below 6½ percent, imposing the thresholds on the nominal income targeting rule does not alter the date for this rule's prescribed departure from the lower bound.

The threshold strategy delays the departure of the federal funds rate from the effective lower bound by five quarters under the Taylor (1993) and by three quarters under the first-difference rules. As a result, the unemployment rate declines more rapidly, and inflation is a touch higher, when the thresholds are imposed on these rules. The threshold strategy only postpones departure from the effective lower bound by a quarter or two under the Taylor (1999), the inertial Taylor (1999), and the outcome-based rules, generating little difference in macroeconomic outcomes from the same rules without the thresholds.[6]

The fourth exhibit, "Constrained versus Unconstrained Optimal Control Policy," compares the optimal control simulations derived using this Tealbook's baseline forecast with those reported in the October Tealbook.[7] Policymakers are assumed to place equal

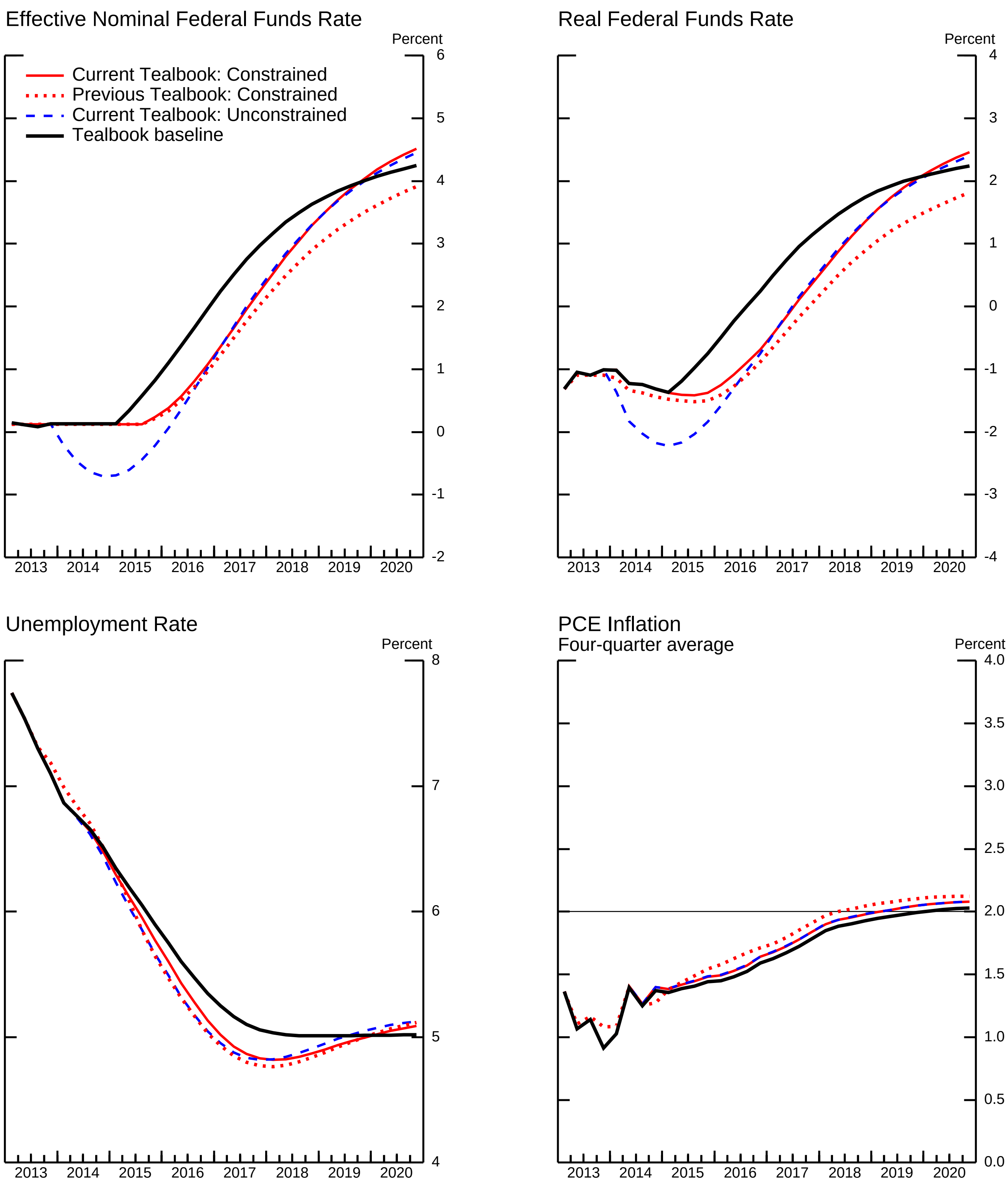
[5] Only the Taylor (1993) rule prescribes the first increase in the funds rate to occur in the first quarter of 2015, one quarter earlier than in the October Tealbook. As in the October Tealbook, the nominal income targeting rule keeps the funds rate at its effective lower bound until the third quarter of 2016.

[6] The inertial Taylor (1999) rule with thresholds corresponds to the Tealbook baseline.

[7] The optimal control policy simulations incorporate the assumptions about underlying economic conditions used in the staff's baseline forecast, as well as the assumptions about balance sheet policies described in footnote 3. The simulated policies do not incorporate thresholds.

Strategies

Constrained versus Unconstrained Optimal Control Policy



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 optimal control concept presented here corresponds to a commitment policy under which policymakers make choices today that effectively constrain policy choices in future periods.

The federal funds rate prescriptions derived from optimal control simulations in which policy is constrained by the effective lower bound are more accommodative than the staff's baseline forecast. In the simulations, the optimal federal funds rate departs from the lower bound in the first quarter of 2016, nearly a year later than in the staff's baseline forecast, and rises only to 2½ percent by early 2018. Over the medium-term, the constrained optimal control path for the funds rate is almost identical to the path shown in the October Tealbook. Beyond 2017, the optimal control prescriptions for the current Tealbook are somewhat less accommodative than those shown in the October Tealbook.

By generating a lower path for the real federal funds rate than in the staff's baseline outlook, the constrained optimal control policy promotes a stronger economic recovery.[8] In particular, the unemployment rate reaches the staff's estimate of the long-term natural rate of unemployment of 5¼ percent by the last half of 2016, two quarters earlier than in the staff's baseline forecast. Inflation runs slightly above the staff's baseline forecast, although it does not reach the 2 percent objective until the beginning of 2019.

In the absence of a lower-bound constraint, the optimal federal funds rate would reach a minimum of about negative ¾ percent in the first quarter of 2015 and turn positive only by the first quarter of 2016, with the real rate turning positive only in the third quarter of 2017. The unconstrained policy would bring down the unemployment rate a bit faster than the constrained policy but lead to a nearly identical path for inflation. This similarity in inflation outcomes arises because inflation has a low sensitivity to resource slack in the FRB/US model.

[8] Although the loss function uses headline inflation instead of core inflation, the real federal funds rate shown in the upper-right panel of the exhibit, as in the other simulations reported in this section, is calculated as the difference between the nominal federal funds rate and a four-quarter moving average of core PCE inflation. Core PCE inflation is used to compute the real interest rate for this illustrative purpose because it provides a less volatile measure of inflation expectations than does a four-quarter moving average of headline inflation.

The fifth exhibit, "A Comparison of Optimal Control Policies and the Baseline Policy Rule under Alternative Unemployment Rate Thresholds," compares results from optimal control simulations against prescriptions from the staff's baseline rule subject to alternative unemployment rate thresholds.

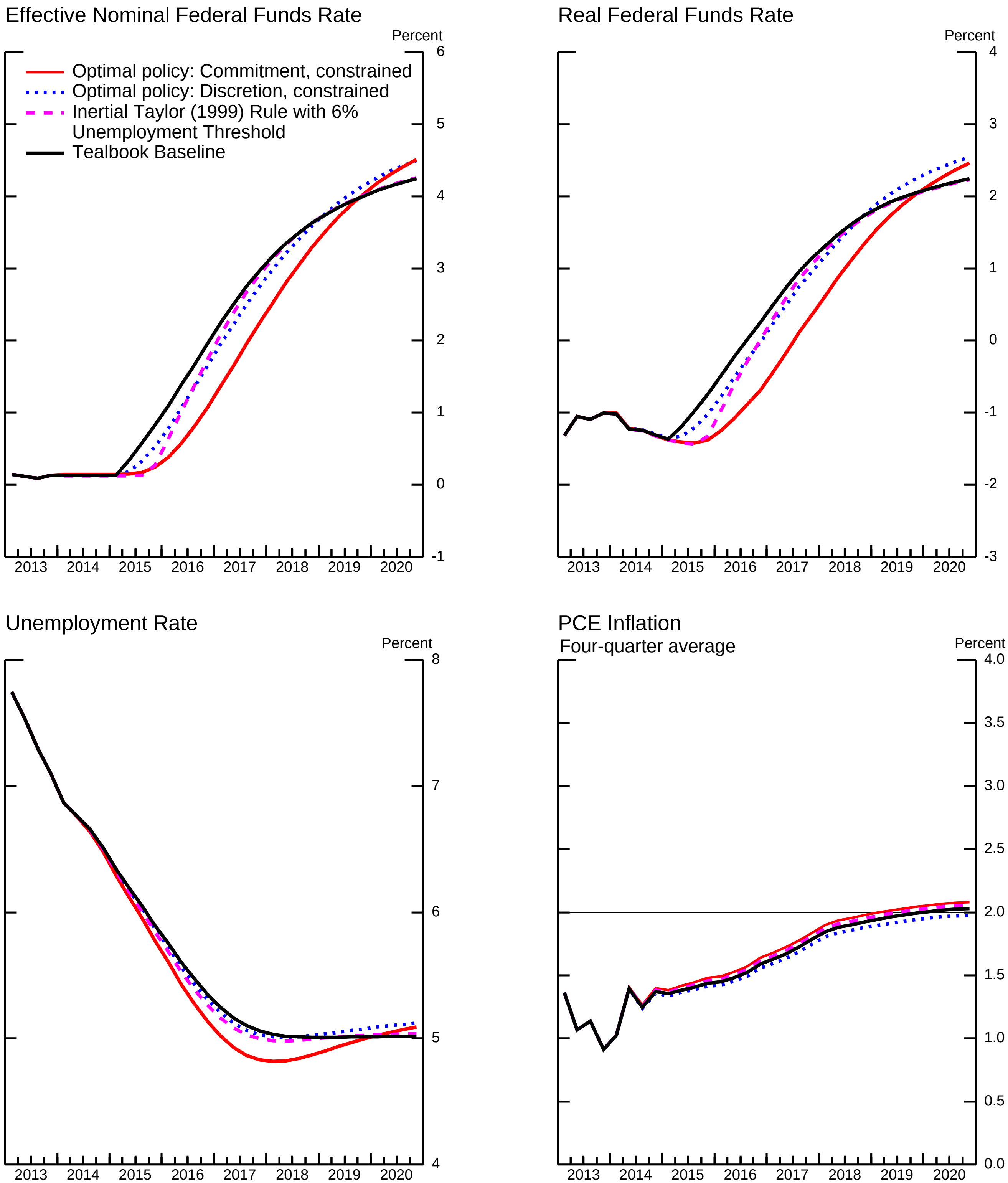
The optimal control simulations discussed above were derived from a commitment policy under which policymakers make choices today that effectively constrain policy choices in future periods. The fifth exhibit displays results that use an alternative optimality concept—discretion—under which policymakers cannot credibly commit to carrying out a plan that requires them to make future choices that would be suboptimal at that future time. The discretion concept limits policymakers' ability to influence private-sector expectations regarding the federal funds rate and other variables. Instead, the private sector knows that future Committees will always reoptimize without regard for past policymakers' promises, and this behavior leads to less stimulative policy in current circumstances. Under discretion, the Committee raises the federal funds rate two quarters sooner and keeps monetary policy somewhat less accommodative than under commitment, so the unemployment rate does not fall as much below its natural rate and inflation does not rise above the 2 percent objective. Optimal control under discretion generates a persistently lower path for the federal funds rate than the baseline until mid-2018; afterwards, however, the discretion path for the federal funds rate is a little higher than in the baseline. On net, the overall stance of the discretionary policy thus turns out to be only slightly more accommodative than in the baseline, and leads to an only marginally more speedy recovery in the unemployment rate and very similar outcomes for inflation.

The exhibit also displays results from a dynamic simulation of the inertial Taylor (1999) rule with an unemployment threshold of 6 percent and an unchanged inflation threshold.[9] In contrast, under the Tealbook baseline projection the federal funds rate follows the prescription of the inertial Taylor (1999) rule once the unemployment rate falls under 6½ percent. Lowering the unemployment threshold to 6 percent keeps the federal funds rate at its effective lower bound for three quarters longer than in the

[9] As in the dynamic simulations of simple policy rules presented above, the thresholds are imposed by keeping the federal funds rate at its effective lower bound of 12½ basis points as long as the unemployment rate is above the designated threshold—now at 6 percent—and average inflation five to eight quarters hence is projected to be less than 2½ percent. As before, crossing the unemployment threshold is the catalyst for switching to the inertial Taylor (1999) rule in the simulations considered here.

Strategies

A Comparison of Optimal Control Policies and the Baseline Policy Rule under Alternative Unemployment Rate Thresholds



baseline case; this extra accommodation leads to a somewhat more rapid improvement in the labor market than in the baseline.[10] The alternative threshold strategy for the inertial Taylor (1999) rule generates outcomes for unemployment and inflation that are very similar to those obtained from optimal control under discretion. Under the alternative unemployment threshold, the baseline rule prescribes the first increase in the funds rate to occur a little later than in the case of optimal control under discretion; subsequently, the inertial Taylor (1999) rule calls for swifter funds rate increases. As a result, both policies imply very similar paths for longer-term rates (not shown), in turn generating similar trajectories for the unemployment rate and inflation.

The final two exhibits, “Outcomes under Alternative Policies without Thresholds” and “Outcomes under Alternative Policies with Thresholds,” tabulate the simulation results for key variables under each policy rule discussed above, with and without thresholds.

[10] The inflation outcomes under either simulation are fairly similar because of the low sensitivity of inflation to resource slack in the FRB/US model.

Outcomes under Alternative Policies without Thresholds

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

Measure and scenario	2013 H1	2013 H2	2014	2015	2016	2017
Real GDP						
Extended Tealbook baseline[1]	1.8	2.6	3.1	3.5	3.4	2.7
Taylor (1993)	1.8	2.2	2.7	3.2	3.2	2.9
Taylor (1999)	1.8	2.2	3.0	3.3	3.1	2.8
Inertial Taylor (1999)	1.8	2.2	3.2	3.5	3.2	2.7
Outcome based	1.8	2.2	3.0	3.3	3.1	2.8
First difference	1.8	2.2	2.9	3.2	3.1	2.8
Nominal income targeting	1.8	2.2	3.6	4.0	3.6	2.8
Constrained optimal control	1.8	2.6	3.2	3.7	3.5	2.7
Unemployment rate[2]						
Extended Tealbook baseline[1]	7.5	7.1	6.5	5.9	5.3	5.1
Taylor (1993)	7.5	7.3	6.8	6.3	5.8	5.4
Taylor (1999)	7.5	7.3	6.7	6.1	5.7	5.4
Inertial Taylor (1999)	7.5	7.3	6.6	5.9	5.4	5.2
Outcome based	7.5	7.3	6.7	6.1	5.7	5.4
First difference	7.5	7.3	6.7	6.2	5.8	5.5
Nominal income targeting	7.5	7.3	6.5	5.6	4.8	4.5
Constrained optimal control	7.5	7.1	6.5	5.8	5.1	4.8
Total PCE prices						
Extended Tealbook baseline[1]	0.5	1.3	1.4	1.4	1.6	1.8
Taylor (1993)	0.5	1.5	1.3	1.3	1.4	1.6
Taylor (1999)	0.5	1.5	1.3	1.3	1.5	1.6
Inertial Taylor (1999)	0.5	1.6	1.4	1.5	1.6	1.8
Outcome based	0.5	1.5	1.3	1.3	1.4	1.6
First difference	0.5	1.5	1.3	1.4	1.5	1.7
Nominal income targeting	0.5	1.6	1.5	1.7	1.8	2.0
Constrained optimal control	0.5	1.3	1.4	1.5	1.6	1.8
Core PCE prices						
Extended Tealbook baseline[1]	1.0	1.3	1.4	1.6	1.7	1.8
Taylor (1993)	1.0	1.5	1.5	1.5	1.6	1.7
Taylor (1999)	1.0	1.5	1.5	1.5	1.6	1.7
Inertial Taylor (1999)	1.0	1.5	1.5	1.6	1.7	1.8
Outcome based	1.0	1.5	1.5	1.5	1.6	1.7
First difference	1.0	1.5	1.5	1.5	1.6	1.7
Nominal income targeting	1.0	1.5	1.7	1.8	2.0	2.1
Constrained optimal control	1.0	1.3	1.5	1.6	1.8	1.9
Effective nominal federal funds rate[2]						
Extended Tealbook baseline[1]	0.1	0.1	0.1	0.8	2.0	3.0
Taylor (1993)	0.1	1.1	1.7	2.3	3.0	3.5
Taylor (1999)	0.1	0.1	0.5	1.7	2.8	3.4
Inertial Taylor (1999)	0.1	0.1	0.3	1.0	2.0	2.9
Outcome based	0.1	0.1	0.5	1.7	2.8	3.4
First difference	0.1	0.1	0.8	2.1	3.1	3.8
Nominal income targeting	0.1	0.1	0.1	0.1	0.6	1.6
Constrained optimal control	0.1	0.1	0.1	0.2	1.1	2.2

1. Policy in the Tealbook baseline keeps the federal funds rate at an effective lower bound of 12.5 basis points as long as the unemployment rate is above 6.5 percent and projected one-year-ahead inflation is less than 2.5 percent. Once either threshold is crossed, the federal funds rate follows the prescription of the inertial Taylor (1999) rule.
2. Percent, average for the final quarter of the period.

Strategies

Outcomes under Alternative Policies with Thresholds[1]

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

Measure and scenario	2013 H1	2013 H2	2014	2015	2016	2017
Real GDP						
Extended Tealbook baseline[1]	1.8	2.6	3.1	3.5	3.4	2.7
Taylor (1993)	1.8	2.6	2.9	3.1	3.2	2.9
Taylor (1999)	1.8	2.6	2.9	3.2	3.2	2.8
Outcome based	1.8	2.6	3.0	3.3	3.2	2.7
First difference	1.8	2.6	3.0	3.4	3.2	2.8
Nominal income targeting	1.8	2.6	3.4	4.0	3.8	2.9
Constrained optimal control	1.8	2.6	3.2	3.7	3.5	2.7
Unemployment rate[2]						
Extended Tealbook baseline[1]	7.5	7.1	6.5	5.9	5.3	5.1
Taylor (1993)	7.5	7.1	6.6	6.1	5.7	5.4
Taylor (1999)	7.5	7.1	6.6	6.1	5.6	5.3
Outcome based	7.5	7.1	6.5	6.0	5.6	5.3
First difference	7.5	7.1	6.5	6.0	5.5	5.2
Nominal income targeting	7.5	7.1	6.4	5.6	4.8	4.4
Constrained optimal control	7.5	7.1	6.5	5.8	5.1	4.8
Total PCE prices						
Extended Tealbook baseline[1]	0.5	1.3	1.4	1.4	1.6	1.8
Taylor (1993)	0.5	1.3	1.3	1.3	1.5	1.6
Taylor (1999)	0.5	1.3	1.3	1.3	1.5	1.6
Outcome based	0.5	1.3	1.3	1.3	1.4	1.6
First difference	0.5	1.3	1.4	1.4	1.6	1.8
Nominal income targeting	0.5	1.3	1.5	1.6	1.8	2.0
Constrained optimal control	0.5	1.3	1.4	1.5	1.6	1.8
Core PCE prices						
Extended Tealbook baseline[1]	1.0	1.3	1.4	1.6	1.7	1.8
Taylor (1993)	1.0	1.3	1.4	1.5	1.6	1.7
Taylor (1999)	1.0	1.3	1.4	1.5	1.6	1.7
Outcome based	1.0	1.3	1.4	1.5	1.6	1.7
First difference	1.0	1.3	1.4	1.6	1.7	1.9
Nominal income targeting	1.0	1.3	1.6	1.8	2.0	2.1
Constrained optimal control	1.0	1.3	1.5	1.6	1.8	1.9
Effective nominal federal funds rate[2]						
Extended Tealbook baseline[1]	0.1	0.1	0.1	0.8	2.0	3.0
Taylor (1993)	0.1	0.1	0.1	2.4	3.2	3.6
Taylor (1999)	0.1	0.1	0.1	1.7	2.9	3.6
Outcome based	0.1	0.1	0.1	1.4	2.9	3.6
First difference	0.1	0.1	0.1	1.4	2.8	3.4
Nominal income targeting	0.1	0.1	0.1	0.1	0.6	1.6
Constrained optimal control	0.1	0.1	0.1	0.2	1.1	2.2

1. With the exception of constrained optimal control, monetary policy is specified to keep the federal funds rate at an effective lower bound of 12.5 basis points as long as the unemployment rate is above 6.5 percent and projected one-year-ahead inflation is less than 2.5 percent. Once either of these thresholds is crossed, the federal funds rate follows the prescriptions of the specified rule. Policy in the Tealbook baseline also uses these threshold conditions and switches to the inertial Taylor (1999) rule once either of these thresholds is crossed.
2. Percent, average for the final quarter of the period.

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 as well as its one-quarter-ahead forecast (gap_t and $gap_{t+1|t}$), and the forecast of the three-quarter-ahead annual change in the output gap ($\Delta^4 gap_{t+3|t}$). The value of policymakers' long-run inflation objective, denoted π^*, is 2 percent. The nominal income targeting rule responds to the nominal income gap, which is defined as the difference between nominal income yn_t (100 times the log of the level of nominal GDP) and a target value yn_t^* (100 times the log of target nominal GDP). Target nominal GDP in 2007:Q4 is set equal to the staff's estimate of potential real GDP in that quarter multiplied by the GDP deflator in that quarter; subsequently, target nominal GDP grows 2 percentage points per year faster than the staff's estimate of potential GDP.

Taylor (1993) rule	$R_t = 2 + \pi_t + 0.5(\pi_t - \pi^*) + 0.5gap_t$
Taylor (1999) rule	$R_t = 2 + \pi_t + 0.5(\pi_t - \pi^*) + gap_t$
Inertial Taylor (1999) rule	$R_t = 0.85R_{t-1} + 0.15(2 + \pi_t + 0.5(\pi_t - \pi^*) + gap_t)$
Outcome-based rule	$R_t = 1.2R_{t-1} - 0.39R_{t-2} + 0.19[0.54 + 1.73\pi_t + 3.66gap_t - 2.72gap_{t-1}]$
First-difference rule	$R_t = R_{t-1} + 0.5\left(\pi_{t+3\mid t} - \pi^*\right) + 0.5\Delta^4 gap_{t+3\mid t}$
Nominal income targeting rule	$R_t = 0.75R_{t-1} + 0.25(2 + \pi_t + yn_t - yn_t^*)$

The first two of the selected rules were studied by Taylor (1993, 1999), while the inertial Taylor (1999) rule has featured prominently in recent analysis by Board staff.[1] The outcome-based rule uses policy reactions estimated using real-time data over the sample 1988:Q1–2006:Q4. The intercept of the outcome-based rule was chosen so that it is consistent with a 2 percent long-run inflation objective and a long-run real interest rate of 2 percent, a value used in the FRB/US model.[2] The intercepts of the Taylor (1993, 1999) rules and the long-run

[1] See Erceg and others (2012).

[2] For the January 2013 Tealbook, the staff revised the long-run value of the real interest rate from 2¼ percent to 2 percent. The FRB/US model as well as the intercepts of the different policy rules have been adjusted to reflect this change.

intercept of the inertial Taylor (1999) rule are set at 2 percent for the same reason. The 2 percent real rate estimate also enters the long-run intercept of the nominal income targeting rule. The prescriptions of the first-difference rule do not depend on the level of the output gap or the long-run real interest rate; see Orphanides (2003).

Near-term prescriptions from the different 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, the first-difference rule, the estimated outcome-based rule, and the nominal income targeting 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 the 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 the 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.

References

Erceg, Christopher, Jon Faust, Michael Kiley, Jean-Philippe Laforte, David López-Salido, Stephen Meyer, Edward Nelson, David Reifschneider, and Robert Tetlow (2012). "An Overview of Simple Policy Rules and Their Use in Policymaking in Normal Times and Under Current Conditions." Memo sent to the Committee on July 18, 2012.

Erceg, Christopher, Michael Kiley, and David López-Salido (2011). "Alternative Monetary Policy Frameworks." Memo sent to the Committee on October 6, 2011.

McCallum, Bennett T., and Edward Nelson (1999). "Nominal Income Targeting in an Open-Economy Optimizing Model," *Journal of Monetary Economics*, Vol. 43 (June), pp. 553–578.

Orphanides, Athanasios (2003). "Historical Monetary Policy Analysis and the Taylor Rule," *Journal of Monetary Economics*, Vol. 50 (July), pp. 983–1022.

Taylor, John B. (1993). "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, Vol. 39 (December), pp. 195–214.

Taylor, John B. (1999). "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules*. University of Chicago Press, pp. 319–341.

Estimates of the Equilibrium and Actual Real Rates

An estimate of the equilibrium real 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 twelve 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 optimal control simulations, when applied to the previous Tealbook projection.

(This page is intentionally blank.)

Monetary Policy Alternatives

This Tealbook presents three policy alternatives—labeled A, B, and C—for the Committee's consideration. Alternative B reduces monthly purchases of both MBS and Treasury securities by modest amounts, signals that further reductions are likely, and enhances the forward guidance for the federal funds rate by incorporating a qualitative description of the Committee's likely policy approach after the 6½ percent unemployment threshold is reached. Alternative C announces larger reductions in monthly purchases, also signals that further reductions are likely, and maintains October's forward guidance. This alternative includes an option to convert the current "flow-based" asset purchase program to a "fixed-size" program that would end in June. Alternative A makes the stance of policy more accommodative than the other alternatives by augmenting the forward guidance along several dimensions while maintaining the pace of asset purchases and indicating that the Committee is not likely to reduce the pace of its purchases in the near term.

In summarizing recent economic developments, Alternatives B and C state that economic activity is expanding at a "moderate" pace and that labor market conditions have shown "further improvement," while Alternative A characterizes the expansion as "modest" and cites "some" further improvement in labor market conditions. All of the alternatives say that fiscal policy is restraining economic growth, but Alternatives B and C add that the extent of restraint "may be" and "appears to be" diminishing, respectively. Alternative B says that inflation has been running "below" the Committee's longer-run objective; Alternative C uses "somewhat below" and Alternative A says "well below." All three alternatives note that longer-term inflation expectations have remained stable.

In characterizing the economic outlook, Alternatives A and B say the Committee expects that economic growth will pick up from its recent pace and the unemployment rate "will gradually decline" toward its mandate-consistent level; Alternative C uses "will continue to decline" and cites growing underlying strength in the broader economy. With respect to risks to the outlook, Alternative A says the Committee continues to see "modest downside risks," Alternative B offers a choice of describing the risks as "having diminished" or as "roughly balanced," and Alternative C uses "roughly balanced." All of the alternatives state that the Committee recognizes the risks associated with inflation running persistently below 2 percent. Alternatives B and C indicate that the Committee anticipates that inflation will move back toward its objective over the medium term; Alternative B adds that the Committee "will monitor inflation developments carefully." Alternative A signals less confidence that inflation will return to 2 percent by saying that the Committee "will monitor inflation developments carefully for evidence that inflation is moving back toward its objective."

With respect to balance sheet policies, Alternatives B and C indicate that cumulative progress toward maximum employment and the improvement in the outlook for labor market conditions justify a downward adjustment in the pace of asset purchases, with Alternative B making a modest reduction (to $35 billion per month for agency MBS and to $40 billion per month for Treasury securities) and Alternative C making a more substantial reduction (to $30 billion per month for agency MBS and $30 billion per month for Treasury securities). Both of these alternatives specify that "the Committee will likely reduce the pace of asset purchases" at future meetings, but note that asset purchases are state contingent and are not on a preset course. Alternative C also provides the Committee with another option for reducing the pace of asset purchases under which the Committee states the total amount of purchases in 2014 and gives a June 2014 end date for the purchase program. Alternative A instead indicates that a cut in the pace of purchases is not imminent, saying that progress toward the Committee's objectives is "not yet sufficient to warrant" such an adjustment.

Regarding forward guidance for the federal funds rate, all of the alternatives maintain the 0 to ¼ percent target range for the funds rate and the 2½ percent "ceiling" threshold for projected inflation. Alternatives B and C also maintain the 6½ percent threshold for the unemployment rate, while Alternative A provides the option of lowering this threshold to either 6 or 5½ percent. Alternative C retains the other elements of the forward guidance used in the October statement, saying that in determining how long to maintain a highly accommodative policy stance the Committee "will also consider other information" and that it will take a balanced approach when it begins to remove policy accommodation. Alternative B adds language strengthening the forward guidance, saying that the Committee expects to keep the target federal funds rate low "well past the time" that the unemployment threshold is crossed. Alternative A augments the forward guidance even more: In addition to stating that the Committee will consider a "broad range of indicators" in determining how long to keep the target rate low, Alternative A says the Committee "expects to be patient" and anticipates keeping the federal funds rate "below its longer-run normal value for a considerable time." The following table summarizes key elements of the three alternative statements, followed by complete drafts of the statements and arguments for each alternative.

Table 1: Overview of Policy Alternatives for December FOMC Statement

Selected Elements	October Statement	December Alternatives A	December Alternatives B	December Alternatives C
Economic Conditions, Outlook, and Risks				
Economic Conditions	activity continued to expand at moderate pace	is expanding at modest pace	is expanding at moderate pace	
	labor market conditions have shown some further improvement	unchanged	shown further improvement	
	unemployment rate remains elevated	unchanged	has declined but remains elevated	still elevated, has continued to decrease
	fiscal policy is restraining growth	unchanged	…although extent may be diminishing	…but extent appears to be diminishing
	inflation has been running below objective	continues to run well below	unchanged	has been running somewhat below
Outlook	growth will pick up, unemployment rate will gradually decline	unchanged		growing underlying strength; growth will pick up, unemployment rate will continue to decline
Risks	downside risks have diminished, on net	modest downside risks; will monitor inflation	[unchanged | risks roughly balanced]; will monitor inflation	risks roughly balanced
Balance Sheet Policies				
Agency MBS	$40 billion/month	unchanged	$35 billion/month	$30 billion/month
Treasuries	$45 billion/month	unchanged	$40 billion/month	$30 billion/month
Rationale for Purchases	await more evidence of sustained progress	progress not yet sufficient	in light of cumulative progress and improvement in outlook	
Purchase Guidance	assess incoming information at coming meetings; purchases not on preset course; contingent on outlook, efficacy and costs	assess incoming information; purchases not on preset course…	if incoming information broadly supports expectations, will likely reduce pace at future meetings; however, purchases are not on preset course…	
Option	n.a.	n.a.	n.a.	convert to fixed-size program: add $360 billion through June (see C.3′ and C.4′)
Federal Funds Rate				
Target	0 to ¼ percent	unchanged		
Rate Guidance	at least as long as thresholds (6½ percent; 2½ percent) are not crossed and inflation expectations remain well anchored	…unemployment rate is above [6 | 5½] percent…	unchanged	
	will also consider other information	if inflation well contained when unemployment threshold reached, will consider broad range of indicators; expects to be patient	likely will be appropriate to maintain low target well past time that unemployment threshold is crossed	unchanged
	when remove accommodation, will take balanced approach	when eventually remove accommodation, will take balanced approach; keeping target low for considerable time will be appropriate	unchanged	

Alternatives

October FOMC Statement

1. Information received since the Federal Open Market Committee met in September generally suggests that economic activity has continued to expand at a moderate pace. Indicators of labor market conditions have shown some further improvement, but the unemployment rate remains elevated. Available data suggest that household spending and business fixed investment advanced, while the recovery in the housing sector slowed somewhat in recent months. Fiscal policy is restraining economic growth. Apart from fluctuations due to changes in energy prices, inflation has been running below the Committee's longer-run objective, but 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 growth will pick up from its recent pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee sees the downside risks to the outlook for the economy and the labor market as having diminished, on net, since last fall. The Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance, but it anticipates that inflation will move back toward its objective over the medium term.
3. Taking into account the extent of federal fiscal retrenchment over the past year, the Committee sees the improvement in economic activity and labor market conditions since it began its asset purchase program as consistent with growing underlying strength in the broader economy. However, the Committee decided to await more evidence that progress will be sustained before adjusting the pace of its purchases. Accordingly, the Committee decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month. 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. Taken together, these actions should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative, which in turn should promote a stronger economic recovery and help to ensure that inflation, over time, is at the rate most consistent with the Committee's dual mandate.
4. The Committee will closely monitor incoming information on economic and financial developments in coming months and will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. In judging when to moderate the pace of asset purchases, the Committee will, at its coming meetings, assess whether incoming information continues to support the Committee's expectation of ongoing improvement in labor market conditions and inflation moving back toward its longer-run objective. Asset purchases are not on a preset course, and the Committee's decisions about their pace will remain contingent on the Committee's economic outlook as well as its assessment of the likely efficacy and costs of such purchases.

5. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens. In particular, the Committee decided to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6½ percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. 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.

FOMC Statement—December 2013 Alternative A

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** generally suggests that economic activity ~~has continued to expand~~ **is expanding** at a ~~moderate~~ **modest** pace. Indicators of labor market conditions have shown some further improvement, but the unemployment rate remains elevated. ~~Available data suggest that~~ Household spending and business fixed investment advanced, ~~while~~ **but** the recovery in the housing sector slowed ~~somewhat~~ in recent months **and** fiscal policy is restraining economic growth. ~~Apart from fluctuations due to changes in energy prices,~~ Inflation ~~has been running~~ **continues to run well** below the Committee's longer-run objective~~, but~~ **even though** 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 growth will pick up from its recent pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee ~~sees the~~ **continues to see modest** downside risks to the outlook for the economy and the labor market ~~as having diminished, on net, since last fall~~. The Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance, ~~but it anticipates that inflation will move~~ **and it will monitor inflation developments carefully for evidence that inflation is moving** back toward its objective over the medium term.

3. Taking into account the extent of federal fiscal retrenchment ~~over the past year~~ **since the inception of its current asset purchase program**, the Committee sees the improvement in economic activity and labor market conditions ~~since it began its asset purchase program~~ **over that period** as consistent with growing underlying strength in the broader economy. However, the Committee ~~decided to await more evidence that progress will be sustained before adjusting~~ **judges that progress toward its objectives for the labor market and inflation is not yet sufficient to warrant reducing** the pace of its purchases. Accordingly, the Committee decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month. 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. Taken together, these actions should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative, which in turn should promote a stronger economic recovery and help to ensure that inflation, over time, is at the rate most consistent with the Committee's dual mandate.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months and will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. In judging when to moderate the pace of asset purchases, the Committee

will~~, at its coming meetings,~~ assess whether incoming information ~~continues to~~ support**s** the Committee's expectation of ongoing improvement in labor market conditions and inflation moving back toward its longer-run objective. Asset purchases are not on a preset course, and the Committee's decisions about their pace will remain contingent on the Committee's economic outlook as well as its assessment of the likely efficacy and costs of such purchases.

5. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens. ~~In particular~~ **Indeed, to provide additional monetary accommodation**, the Committee ~~decided~~ **now intends** to keep ~~the~~ **its** target range for the federal funds rate at 0 to ¼ percent ~~and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate~~ at least as long as the unemployment rate remains above ~~6½~~ **[6 | 5½]** percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. ~~In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments.~~ **If inflation remains well contained when the unemployment threshold is reached, as the Committee expects, the Committee will consider a broad range of indicators of economic and financial conditions in determining how much longer to maintain the 0 to ¼ percent target range for the federal funds rate. Indicators relevant to a comprehensive assessment of labor market conditions include the level and growth of payroll employment, labor force participation, and measures of hiring and separation. The Committee expects to be patient in considering any increase in its target for the federal funds rate so long as inflation remains well behaved.**

6. When the Committee **eventually** 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. **Consistent with its current economic outlook, the Committee anticipates that keeping the target for the federal funds rate below its longer-run normal value for a considerable time will be appropriate to help achieve and maintain maximum employment and price stability.**

FOMC STATEMENT—DECEMBER 2013 ALTERNATIVE B

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** ~~generally suggests~~ **indicates** that economic activity ~~has continued to~~ **is** expand**ing** at a moderate pace. ~~Indicators of~~ Labor market conditions have shown ~~some~~ further improvement; ~~but~~ the unemployment rate **has declined but** remains elevated. ~~Available data suggest that~~ Household spending and business fixed investment advanced, while the recovery in the housing sector slowed somewhat in recent months. Fiscal policy is restraining economic growth**, although the extent of restraint may be diminishing**. ~~Apart from fluctuations due to changes in energy prices,~~ Inflation has been running below the Committee's longer-run objective, but 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 growth will pick up from its recent pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee sees the **[** downside risks to the outlook for the economy and the labor market as having diminished, on net, since ~~last fall~~ **the inception of the asset purchase program | risks to the outlook for the economy and the labor market as roughly balanced]**. The Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance~~, but it~~**. The Committee** anticipates that inflation will move back toward its objective over the medium term**, but it will monitor inflation developments carefully**.

3. Taking into account the extent of federal fiscal retrenchment ~~over the past year~~ **since the inception of its current asset purchase program**, the Committee sees the improvement in economic activity and labor market conditions ~~since it began its asset purchase program~~ **over that period** as consistent with growing underlying strength in the broader economy. ~~However, the Committee decided to await more evidence that progress will be sustained before adjusting the pace of its purchases. Accordingly, the Committee decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month.~~ **In light of the cumulative progress toward maximum employment and the improvement in the outlook for labor market conditions, the Committee decided to modestly reduce the pace of its asset purchases. Beginning in January, the Committee will add to its holdings of agency mortgage-backed securities at a pace of $35 billion per month rather than $40 billion per month, and will add to its holdings of longer-term Treasury securities at a pace of $40 billion per month rather than $45 billion per month.** 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. ~~Taken together, these actions~~ **The Committee's sizable and still-increasing holdings of longer-term securities** should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative, which in turn should promote a stronger

economic recovery and help to ensure that inflation, over time, is at the rate most consistent with the Committee's dual mandate.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months and will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. ~~In judging when to moderate the pace of asset purchases, the Committee will, at its coming meetings, assess whether~~ **If** incoming information ~~continues to~~ **broadly** support**s** the Committee's expectation of ongoing improvement in labor market conditions and inflation moving back toward its longer-run objective**, the Committee will likely reduce the pace of asset purchases in further measured steps at future meetings**. **However,** asset purchases are not on a preset course, and the Committee's decisions about their pace will remain contingent on the Committee's economic outlook as well as its assessment of the likely efficacy and costs of such purchases.

5. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens. ~~In particular,~~ The Committee ~~decided to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that this~~ **previously has stated its expectation that the current** exceptionally low range for the federal funds rate **of 0 to ¼ percent** will be appropriate at least as long as the unemployment rate remains above 6½ percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. **The Committee also has stated that,** in determining how long to maintain a highly accommodative stance of monetary policy, ~~the Committee~~ **it** will ~~also~~ consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. **Based on its assessment of current economic conditions and the outlook, the Committee now anticipates that it likely will be appropriate to maintain the current target range for the federal funds rate well past the time that the unemployment rate declines below 6½ percent, especially if projected inflation continues to run below the Committee's 2 percent longer-run goal.** 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.

FOMC STATEMENT—DECEMBER 2013 ALTERNATIVE C

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** ~~generally suggests~~ **indicates** that economic activity ~~has continued to~~ **is** expand**ing** at a moderate pace. ~~Indicators of~~ Labor market conditions have shown ~~some~~ further improvement; ~~but~~ the unemployment rate ~~remains~~**, although still** elevated**, has continued to decrease**. ~~Available data suggest that~~ Household spending and business fixed investment advanced, while the recovery in the housing sector slowed somewhat in recent months. Fiscal policy is restraining economic growth**, but the extent of restraint appears to be diminishing**. ~~Apart from fluctuations due to changes in energy prices,~~ Inflation has been running **somewhat** below the Committee's longer-run objective, but longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. **Taking into account the extent of federal fiscal retrenchment, the Committee sees the cumulative improvement in economic activity and labor market conditions since it began its current asset purchase program as indicating growing underlying strength in the broader economy.** The Committee expects that, with appropriate policy accommodation, economic growth will pick up from its recent pace and the unemployment rate will ~~gradually~~ **continue to** decline toward levels the Committee judges consistent with its dual mandate. The Committee sees the ~~downside~~ risks to the outlook for the economy and the labor market as ~~having diminished, on net, since last fall~~ **roughly balanced**. The Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance, but it anticipates that inflation will move back toward ~~its objective~~ **2 percent** over the medium term.

3. ~~Taking into account the extent of federal fiscal retrenchment over the past year, the Committee sees the improvement in economic activity and labor market conditions since it began its asset purchase program as consistent with growing underlying strength in the broader economy. However, the Committee decided to await more evidence that progress will be sustained before adjusting the pace of its purchases. Accordingly, the Committee decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month.~~ **In light of the cumulative progress toward maximum employment and the improvement in the outlook for the labor market, the Committee decided to reduce the pace of its asset purchases. Beginning in January, the Committee will add to its holdings of agency mortgage-backed securities at a pace of [$30] billion per month rather than $40 billion per month, and will add to its holdings of longer-term Treasury securities at a pace of [$30] billion per month rather than $45 billion per month.** 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. ~~Taken together, these actions~~ **The Committee's sizable and still-increasing holdings of longer-term securities** should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader

financial conditions more accommodative, which in turn should promote a stronger economic recovery and help to ensure that inflation, over time, is at the rate most consistent with the Committee's dual mandate.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months and will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. ~~In judging when to moderate the pace of asset purchases, the Committee will, at its coming meetings, assess whether~~ **If** incoming information ~~continues to~~ **broadly** support**s** the Committee's expectation of ongoing improvement in labor market conditions and inflation moving back toward its longer-run objective**, the Committee will likely reduce the pace of asset purchases in measured steps at future meetings**. **However,** asset purchases are not on a preset course, and the Committee's decisions about their pace will remain contingent on the Committee's economic outlook as well as its assessment of the likely efficacy and costs of such purchases.
5. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens. In particular, the Committee decided to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6½ percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. 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.

If the Committee judges it appropriate to convert the remainder of its flow-based asset purchase program to a fixed-size program in order to provide certainty about its intentions for bringing the program to a close, it could replace paragraphs 3 and 4 with the following:

3′. **In light of the cumulative progress toward maximum employment and the substantial improvement in the outlook for the labor market over the past year, the Committee today is announcing a plan to end its current asset purchase program. From January through June of 2014, the Committee will add [$180] billion to its holdings of agency mortgage-backed securities at a pace of [$30] billion per month, and also will add [$180] billion to its holdings of longer-term Treasury securities at a pace of [$30] billion per month, bringing the total increase in the Committee's holdings of longer-term securities during 2013 and**

2014 to approximately [$1.4] trillion. 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. **Even after the conclusion of the purchase program, the Committee's sizable holdings of longer-term securities** should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative, which in turn should promote a stronger economic recovery and help to ensure that inflation, over time, is at the rate most consistent with the Committee's dual mandate.

4′. The Committee will closely monitor incoming information on economic and financial developments. **If that information is not broadly consistent with the Committee's expectation of continued improvement in labor market conditions and inflation moving back toward its longer-run objective, the Committee is prepared to use its policy tools, including additional asset purchases, as appropriate to promote its longer-run goals.**

THE CASE FOR ALTERNATIVE B

Policymakers might view the economy's recent performance as broadly consistent with the modal outlook that underlay their discussions of the contingent plan for asset purchases outlined in the post-meeting press conference in June and in subsequent public communications. In particular, policymakers may judge that the moderate expansion in economic activity, taken together with the solid gains in payroll employment and the decline in the unemployment rate observed over the intermeeting period, help to confirm that there has been considerable cumulative progress toward maximum employment and appreciable improvement in the outlook for labor market conditions since the inception of the Committee's current asset purchase program. They might point to recent data, including the November retail sales report, suggesting that consumer spending is accelerating in the near term and thus see a high likelihood of the improvement in the labor market being sustained as the fiscal headwinds recede and a stronger stock market and ongoing recovery in housing prices support stronger economic growth. They therefore may prefer to announce, as in Alternative B, a modest reduction in the pace of asset purchases in December and to state that further reductions are likely at future meetings if improvements in the economy and labor market continue about as expected. However, policymakers also may be concerned that a reduction in the pace of purchases could be viewed by market participants as a signal that the Committee has generally become less inclined to provide accommodation and worry that the announcement of such a reduction could lead to a shift in expectations for the federal funds rate such as the one that occurred last summer. In order to forestall an undesirable increase in long-term interest rates, and to help foster a return of inflation to its longer-run objective, they may therefore want to clarify and strengthen the forward guidance for the federal funds rate.

Some policymakers may be concerned that the new forward guidance language in paragraph B.5 could limit the Committee's flexibility in the future, risking an undesirably large increase in inflation over the medium run or even a rise in longer-term inflation expectations. They may also worry that maintaining very low rates for as long as suggested by the forward guidance could lead to excessive risk-taking in the financial sector (see the accompanying box, "Financial Stability Considerations"). For similar reasons, they may prefer a larger reduction in the pace of asset purchases. However, increases in medium- and longer-term interest rates since the middle of the year appear to have reduced risk-taking at least to some extent by spurring market participants to pare

Alternatives

Alternatives

FINANCIAL STABILITY CONSIDERATIONS

Many FOMC participants indicated in response to the recent survey on the costs and efficacy of asset purchases that they are at least moderately concerned that additional asset purchases, and low interest rates more broadly, could increase the risk of financial instability. This box provides an overview of the possible financial stability implications of the Committee's current monetary policy stance. The degree of monetary policy accommodation, and the specific monetary policy instruments used to deliver that accommodation, including LSAPs and forward guidance regarding the federal funds target, all could have implications for financial stability.

Keeping interest rates (at all maturities) low has countervailing effects on financial stability. On the one hand, by supporting the recovery, allowing borrowers to refinance at lower interest rates, and contributing to higher asset prices, low interest rates lead to improved loan performance and stronger balance sheets for households, businesses, and financial institutions. On the other hand, low interest rates can create incentives for investors and financial institutions to reach for yield by taking on greater duration and credit risk, or to increase their use of leverage. In addition, low rates may contribute to a rise in some asset prices to excessive levels, raising the risk of a potentially disorderly reversal. Importantly, these risks can be slow-moving and difficult to measure in real time, but may build over time and emerge as a real threat later on. The recent QS Financial Stability Assessment concluded that while aggregate leverage is low and most asset valuations remain broadly in line with historical norms, there is some evidence of reach-for-yield behavior, including the elevated pace of high-yield bond issuance and eased underwriting standards in the leveraged finance market. The report concludes that the evidence of renewed pressure on credit terms and standards does not yet have systemic implications given the moderate use of leverage by investors in these markets, but that use of leverage and exposures to credit and duration risk might increase over time or a larger share of that risk might move into the shadow banking sector if interest rates remained persistently low.

LSAPs, specifically, could have additional implications for financial stability. By putting downward pressure on term premiums, LSAPs may encourage both financial and nonfinancial firms to lengthen the maturity of their liabilities, which reduces the vulnerability of the financial system to funding shortfalls. Indeed, even though long-term interest rates have risen over the last few months, financial and nonfinancial firms continue to take advantage of the relatively low level of such rates by lengthening their average debt maturity, albeit at a slower pace than earlier in the year. LSAPs might also lead some market participants to take on even more duration or credit risk in order to achieve a specific nominal return. For example, the institutional investors that in many cases have a fixed nominal return target, such as pension funds and insurance companies, have been an important source of the demand for high-yield bonds and CLOs.

The Committee's forward guidance regarding the federal funds rate target and its asset purchases can also influence financial stability in several ways. Most directly, by leading market participants to expect lower short-term interest rates in the future, forward guidance can lower current longer-term rates, resulting in the positive and negative consequences for financial stability discussed above. In addition, by increasing the conviction of market participants about the likely future level of interest rates, guidance can reduce interest rate volatility to unusually low levels for a long period of time, which in turn can induce investors to enter into carry trades whose profitability depends on a continuation of the low level of interest rates and volatility. The historic decline in interest rates and volatility earlier in the year, the May–June bond market selloff, and the recent renewed interest in carry trades as discussed in the QS report all bear witness to both the power and the fragility of forward-guidance-induced market confidence. Finally, the impetus to risk taking from expectations of a prolonged period of low interest rates may currently be held in check by the tentative economic outlook. If this restraint wanes as the economy strengthens and interest rates remain low, a broader and potentially excessive increase in risk taking could take root.

In conclusion, if the Committee, like the staff, judges that the limited signs of excessive risk taking do not currently pose a risk to financial stability and so to the outlook for employment and inflation, it may conclude that those signs should not be a major factor in setting the degree of policy accommodation at present, especially given the risk that inappropriate policy tightening could undermine the recovery and so lead to a weaker financial system and a longer period of very low rates. Moreover, Committee participants may judge that if a response is needed, a supervisory one, such as the recently issued supervisory guidance on leveraged lending, may currently be more appropriate than a monetary policy response. At the same time, if the Committee thought that low interest rates, or low volatility, could in the future lead to more widespread risk-taking accompanied by increased use of leverage that could ultimately result in substantially increased risks to the Committee's objectives, then it may prefer to express its forward guidance in a manner that would clearly preserve its option to tighten policy if necessary to mitigate those risks.

back some of their leveraged positions. Moreover, with the unemployment rate still elevated, inflation below 2 percent, and expected inflation well anchored, policymakers may judge that strengthening the forward guidance for the federal funds rate at this time is unlikely to lead to an undesirable increase in inflation. They may also judge that the language in paragraph B.5 indicating that the Committee will consider financial conditions and inflation pressures in determining how long to maintain a highly accommodative stance of monetary policy provides the Committee with sufficient flexibility in setting policy.

In contrast, other policymakers may note that inflation has been particularly low in recent months, and believe that it could well become necessary to provide even greater monetary policy stimulus, in part by maintaining the current pace of asset purchases, in order to ensure that inflation moves up toward 2 percent in coming years. However, they may judge that the recent decline in inflation reflects transitory factors to some extent, and that stable long-run inflation expectations and diminishing slack in labor and product markets should help move inflation back toward the Committee's longer-run objective even as the pace of asset purchases is reduced.

Finally, some participants may judge that the reduction in the pace of purchases together with the signal that further reductions are likely could push mortgage rates up further, undermining the recovery in the housing market. However, mortgage rates remain near historically-low levels and participants may view the changes in forward guidance in Alternative B as likely to mitigate any increase in rates. Moreover, though Alternative B indicates that the pace of purchases is likely to be scaled back over time, it also states that purchases are not on a preset course and so the path of purchases could be adjusted if needed in response to changes in the economic outlook.

It is difficult to gauge the market reaction to a statement like Alternative B. According to the Desk's latest survey, most dealers expect a largely unchanged statement at the December meeting. In particular, although the average probability that the first cut in the pace of asset purchases will occur in December was roughly twice as high in the December survey as in October, the majority of survey respondents do not expect the first reduction in asset purchases to occur at this meeting nor do they expect a change in forward guidance language. But, a majority of dealers do expect that the first cut in the pace of purchases will be combined with stronger forward guidance for the funds rate—possibly including a reduction in the threshold for the unemployment rate or new guidance about policy after the threshold is crossed. Accordingly, market participants may not be too surprised by the pairing of a cut in the pace of asset purchases with additional forward guidance and may not view the overall stance of policy as having changed much. In that case, the effects of the announcement on financial market prices would be small. There is a risk, however, that the earlier-than-expected cut in the pace of purchases and the language in B.4 signaling that further cuts are likely may have a larger impact on investors' perceptions than the qualitative changes in forward guidance for the federal funds rate, boosting both the level and volatility of longer-term interest rates. The extent and duration of higher and more volatile longer-term rates would depend importantly on other communications, including the Chairman's press conference.

THE CASE FOR ALTERNATIVE C

Policymakers may view the recent data as confirming that the economy has growing underlying strength and also see inflation moving back toward the Committee's longer-run goal and therefore prefer to make an even larger cut in asset purchases and to leave the forward guidance for the federal funds rate unchanged as in Alternative C. Policymakers may view the expansion of payroll employment observed in recent months, along with the decline in the unemployment rate since September 2012, as establishing that the economy and the labor market have sufficient momentum to make good progress toward the Committee's objective of maximum employment. In addition, participants might cite the moderate expansion of the economy in the face of significant restraint from fiscal policy as evidence that the recovery has become self-sustaining, particularly if fiscal restraint wanes in the coming year as they expect. Moreover, they may judge that, despite the net increase in mortgage rates since the spring, housing demand will continue to be supported by still-favorable home affordability. Policymakers may see the decline in PCE inflation in recent months as largely due to a temporary slowdown in medical price inflation and expect that with stable longer-term inflation expectations, inflation will move back up toward 2 percent.

Some policymakers may view the decline in the unemployment rate observed over the past year and the solid growth in real gross domestic income as providing more-accurate indications of the underlying strength of the economy than that provided by real GDP; consequently, they may see the economy as evolving along the lines of the "Faster Recovery" alternative simulation shown in Tealbook Book A. Other policymakers may judge that potential output is lower than the staff estimates, perhaps because they have concluded that the slow growth over the past six years has largely been a reflection of slower productivity growth combined with an increasing natural rate of unemployment and a downward trend in the labor force participation rate. For either reason, policymakers may see little reason to strengthen the forward guidance for the federal funds rate as in Alternative B and judge that a more rapid reduction in the pace of purchases would be appropriate.

Or policymakers may be concerned that the stronger forward guidance language in Alternatives A and B involve a greater commitment to maintain near-zero interest rates, which could lead to excessive risk-taking in financial markets, undermine financial stability, and ultimately put the achievement of the dual mandate at risk. As evidence of such risks, they may point to the rapid expansion of speculative-grade corporate borrowing over the past few years and note that a continuation of such trends could lead to elevated losses and consequent financial market stresses in the future along the lines discussed in the "Corporate Credit Boom and Bust" alternative simulation shown in Tealbook Book A. For these reasons, they may prefer Alternative C, which leaves the forward guidance unchanged. Some policymakers may also prefer the larger reduction in the pace of purchases in Alternative C relative to Alternative B because of these concerns, or because they see other costs of additional purchases as outweighing the benefits.

Alternative C offers a choice between a continuation of the "flow-based" approach to asset purchases in which future reductions in the pace of purchases are conditioned on progress toward the Committee's goals, as in paragraphs C.3 and C.4 of the statement, or switching to a "fixed-size" approach in which the Committee states its anticipated total size and end date for the program as in paragraphs C.3' and C.4'. Some policymakers may prefer retaining the "flow-based" language because it gives the Committee more flexibility to adjust the pace of asset purchases if unforeseen circumstances arise. Alternatively, other policymakers may prefer the "fixed-size" language in C.3' and C. 4' because in their view the communication challenges associated with the "flow-based" approach contributed to the heightened interest-rate uncertainty and volatility last summer. In particular, a "fixed-size" approach might be easier to communicate and would provide market participants with greater up-front clarity about the total size of the purchase program and when the program will end.

Based on the Survey of Primary Dealers, a decision to adopt a statement like Alternative C would surprise market participants, as most dealers expect the first cut in the pace of asset purchases to be both modest and to be accompanied by additional forward guidance for the federal funds rate. A sizable reduction in the pace of purchases without strengthening the funds-rate guidance would likely be read by investors as a signal that the Committee has a less-accommodative reaction function than previously thought. In response to such a signal, longer-term interest rates would likely rise, equity prices and inflation compensation fall, and the dollar appreciate. If the Committee used the language in C.3' and C.4' in which it switches to a "fixed-size" program for asset purchases, market participants would find this statement even more surprising and might view the Committee's reaction function as even less accommodative, pushing up long-term rates further.

THE CASE FOR ALTERNATIVE A

Policymakers may be concerned that monetary policy is insufficiently accommodative, given that inflation has declined further below the Committee's longer-run objective in recent months and has remained below its objective for more than a year. They also may see the incoming data as again disappointing expectations that the economic recovery will strengthen. In particular, policymakers may point to the modest increase in final sales in the third-quarter real GDP report coupled with recent data suggesting that the recovery in the housing market may have stalled. They may note that longer-term interest rates have risen over the intermeeting period and are noticeably higher than in the spring, and judge that the increase is undermining the recovery in the housing market. Policymakers may be encouraged by the recent gains in private payroll employment but remain skeptical that these gains are sustainable without a broader pickup in economic activity. Moreover, they may judge that the decline in the unemployment rate in recent months overstates the improvement in the labor market perhaps because labor force participation has declined further, on balance, and the levels of long-duration unemployment and of individuals working part time for economic reasons remain very high. They also may believe that more accommodative policy is necessary to counteract the long period of considerable slack in the labor market, which is damaging the productive capacity of the economy and further depressing aggregate demand through a lower level of permanent income. All told, policymakers may judge, in line with the assessment expressed in Alternative A, that there has not been sufficient progress towards the Committee's objectives for the labor market and inflation to warrant reducing the pace of purchases. Indeed, policymakers may judge that additional accommodation is both necessary and overdue.

Some participants may judge not only that the modal outlook is unsatisfactory but also that downside risks to the outlook, though modest, remain large enough to be a concern. In particular, another Congressional impasse on the federal debt limit could elevate policy uncertainty and undermine confidence, further restraining household spending and business investment in 2014. At the same time, with underlying inflation continuing to run well below 2 percent, some policymakers may see little risk that inflation or inflation expectations will move up; indeed, they might be concerned with the possibility that persistently low inflation could eventually lead to declines in longer-run inflation expectations, resulting in mutually-reinforcing downward dynamics for inflation and economic activity along the lines of the "Low Inflation" alternative simulation shown in Tealbook Book A. If so, they may see the configuration of risks, as well as the modal outlook, as pointing to the need for greater policy stimulus at this meeting.

Policymakers may see a statement like Alternative A as desirable in part because it does not cut the pace of asset purchases and it explicitly lowers the unemployment threshold. Therefore, it should put additional downward pressure on longer-term rates, helping to ensure that the recovery gains traction and inflation moves up towards the Committee's longer-run goal. In addition, some participants may view an explicit reduction in the unemployment rate threshold as appropriate because they believe, after taking into account a variety of labor market indicators, that the decline in the unemployment rate is overstating the improvement in the labor market. They might also see it as useful to provide further guidance about the level of future interest rates over the medium term by adding the new language shown in the final paragraph of Alternative A regarding the expected path of the federal funds rate after liftoff. As suggested by the Summary of Economic Projections released after the September FOMC meeting, policymakers may judge that it will be appropriate to keep the federal funds rate well below its longer-run normal level for the next several years, perhaps reflecting lingering headwinds from the financial crisis or a desire to commit to keeping the federal funds rate low in the medium term in order to spur more rapid economic growth in the near term.

Most market participants do not expect the first reduction in asset purchases to occur at this meeting, but they do see it as likely to come fairly soon. Thus, the elements of the statement language in Alternative A that suggest a somewhat later initial reduction in the pace of purchases might lead market participants to mark up their expected size of the purchase program. In addition, the changes to forward guidance would likely surprise market participants, especially because these changes would not be accompanied by a cut in the pace of asset purchases. Overall, in response to an announcement like that in Alternative A, longer-term interest rates would likely decline, inflation compensation and equity prices might rise, and the dollar might depreciate. If, however, investors took a statement like Alternative A as indicating that the FOMC has become more pessimistic about the economic outlook than had been thought, equity prices might not rise or could even decline.

DIRECTIVE

The directive that was issued after the October meeting appears on the next page, followed by drafts for a December directive that correspond to each of the three policy alternatives. The directive for Alternative A is unchanged; the directives for Alternatives B and C include changes to make them consistent with the corresponding postmeeting statement.

The directive for Alternative A instructs the Desk to continue purchasing additional agency mortgage-backed securities at a pace of about $40 billion per month and to continue purchasing longer-term Treasury securities at a pace of about $45 billion per month. The draft directive for Alternative B instructs the Desk to purchase agency mortgage-backed securities at a pace of about $35 billion per month, and to purchase longer-term Treasury securities at a pace of about $40 billion per month, beginning in January. The draft directive for Alternative C instructs the Desk to purchase agency mortgage-backed securities at a pace of about $30 billion per month, and to purchase longer-term Treasury securities at a pace of about $30 billion per month, beginning in January. All three of the draft directives direct 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.

October 2013 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 Desk is directed to continue purchasing longer-term Treasury securities at a pace of about $45 billion per month and to continue purchasing agency mortgage-backed securities at a pace of about $40 billion per month. 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 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 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 December 2013 Alternative A

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 Desk is directed to continue purchasing longer-term Treasury securities at a pace of about $45 billion per month and to continue purchasing agency mortgage-backed securities at a pace of about $40 billion per month. 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 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 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 December 2013 Alternative 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. **Beginning in January,** the Desk is directed to ~~continue purchasing~~ **purchase** longer-term Treasury securities at a pace of about ~~$45~~ **$40** billion per month and to ~~continue purchasing~~ **purchase** agency mortgage-backed securities at a pace of about ~~$40~~ **$35** billion per month. 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 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 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.

Alternatives

Directive for December 2013 Alternative 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. **Beginning in January,** the Desk is directed to ~~continue purchasing~~ **purchase** longer-term Treasury securities at a pace of about ~~$45~~ **$30** billion per month and to ~~continue purchasing~~ **purchase** agency mortgage-backed securities at a pace of about ~~$40~~ **$30** billion per month. 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 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 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 prepared three scenarios for the Federal Reserve's balance sheet that correspond in broad terms to Alternatives A, B, and C. All three alternatives include additional asset purchases, though the pace and cumulative amount of purchases differ across the alternatives. Under Alternative B we assume that the pace of purchases is reduced multiple times, beginning in January, and the program is completed in September 2014. Under Alternative C, the initial reduction in purchases is larger than in Alternative B, and the program is brought to a close by mid-2014. In contrast, under Alternative A the pace of asset purchases is assumed to remain unchanged in the first half of 2014 and then gradually be reduced to zero by year-end.

Projections under each scenario are based on the staff's assumptions about the trajectory of various components of the balance sheet and the balance sheet normalization strategy.[1] The projections associated with each of the alternatives assume that when the time comes to normalize the balance sheet, the SOMA portfolio shrinks only through redemptions of Treasury securities and paydowns of principal from agency MBS; consistent with the strategy outlined in the press conference statement following the June FOMC meeting, no sales of agency MBS are incorporated.

For the balance sheet scenario that corresponds to Alternative B, monthly purchases of longer-term Treasury securities and of agency MBS are reduced by $5 billion each in January. Thereafter, the purchases gradually wind down to zero by the end of the third quarter of 2014. Under these assumptions, purchases total a bit under $1.4 trillion over 2013 and 2014, compared with a bit over $1.4 trillion in the December staff forecast and $1.3 trillion in Alternative B in the October Tealbook.[2]

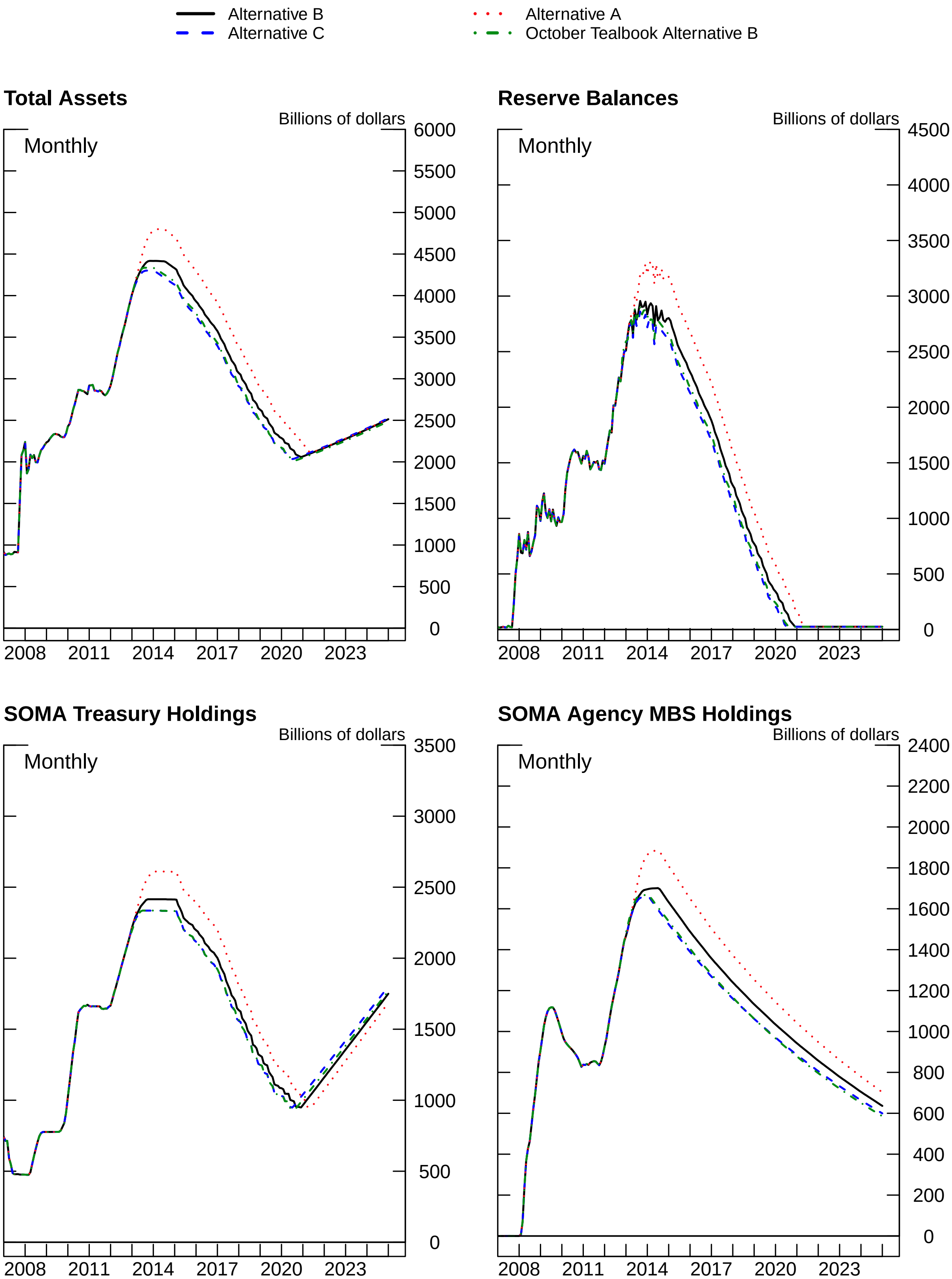
As shown in the exhibit "Total Assets and Selected Balance Sheet Items," SOMA securities holdings under the purchase program assumed for Alternative B peak at about

[1] Details of these assumptions, as well as projections for each major component of the balance sheet, can be found in the Appendix that follows this section.

[2] The balance sheet scenario for Alternative B assumes that the first reduction in the pace of purchases comes in January, while this first reduction is a bit later in the staff forecast reported in Tealbook Book A. Both scenarios assume purchases drop to zero in the third quarter of 2014.

Projections

Total Assets and Selected Balance Sheet Items



$4.2 trillion in the first quarter of 2015, with $2.4 trillion in Treasury securities holdings and $1.7 trillion in agency securities holdings. We assume that the first increase in the target federal funds rate is in the fourth quarter of 2015, two quarters later than in the staff forecast and Alternative B of the October Tealbook. The date for the first increase in the federal funds rate represents the staff's translation of the Committee's indication in Alternative B that it will maintain the current target range for the federal funds rate well past the time that the unemployment rate declines below 6½ percent, and is intended to be representative of all of the elements of forward guidance in that alternative. Two quarters before the first increase in the target federal funds rate, all securities reinvestments and rollovers are assumed to cease, and the SOMA portfolio begins to contract.[3] The size of the portfolio is normalized by late 2021, one quarter later than in the October Tealbook. The balance sheet then begins to expand, with increases in SOMA holdings essentially matching the growth of currency in circulation and Federal Reserve Bank capital.[4] Total assets are $2.5 trillion at the end of 2025, with about $640 billion in agency MBS holdings remaining in the SOMA portfolio.

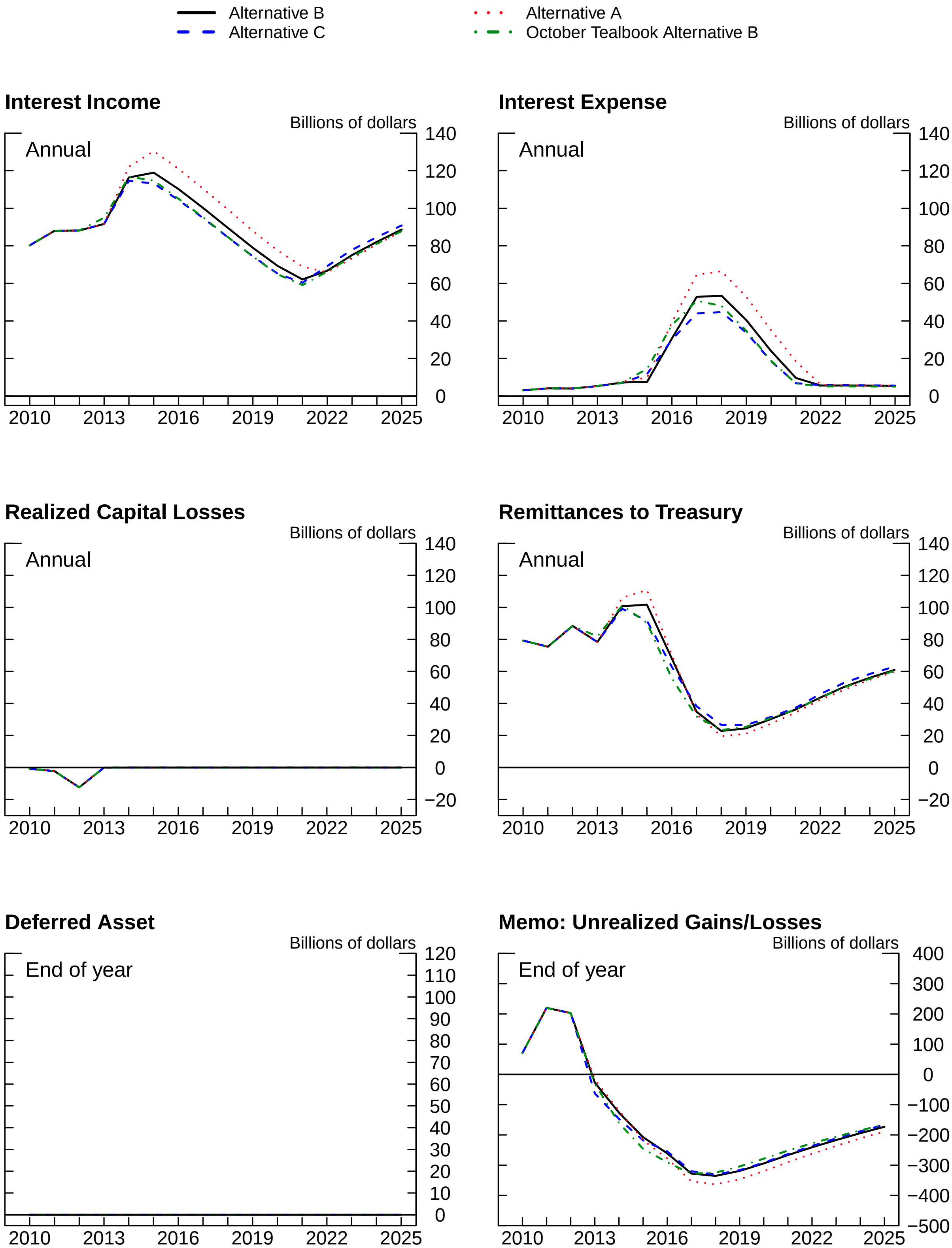
The second exhibit, "Income Projections," shows the implications of balance sheet developments for Federal Reserve income. Under Alternative B, interest income rises while purchases are ongoing, then stabilizes until reinvestments cease, and subsequently declines for a number of years as the SOMA portfolio contracts through redemptions and paydowns of principal. Although interest expense is quite small in the near term, once the federal funds rate rises, interest expense climbs while reserve balances are still quite elevated. As a result, Federal Reserve remittances to the Treasury remain robust in the near term but then decline for several years, although they are projected to remain positive over the entire projection period. Annual remittances peak at

Projections

[3] Temporary reserve draining tools (reverse repurchase agreements and term deposits) are not modeled in any of the scenarios presented. Use of these tools would result in a shift in the composition of Federal Reserve liabilities—a decline in reserve balances and a corresponding increase in reverse repurchase agreements or term deposits—but would not produce an overall change in the size of the balance sheet.

[4] The size of the balance sheet is assumed to be normalized when the securities portfolio reverts to its longer-run trend level, which is determined largely by currency in circulation plus Federal Reserve capital and a projected steady-state level of reserve balances. The projected timing of the normalization of the size of the balance sheet depends importantly on the level of reserve balances that is assumed to be necessary to conduct monetary policy; currently, we assume that level of reserve balances to be $25 billion, about where these balances stood prior to the crisis. However, ongoing regulatory and structural changes could lead to a higher demand for reserve balances in the new steady state. A higher steady-state level for reserve balances would, all else equal, imply an earlier normalization of the size of the balance sheet.

Income Projections



Projections

about $100 billion in 2015 and trough at about $25 billion later in the decade, and no deferred asset is recorded. Cumulative remittances from 2009 through 2025 are about $1 trillion, well above the level that would have been observed without the asset purchase programs.

The unrealized gain/loss position of the SOMA portfolio is importantly influenced by the level of interest rates. For example, the portfolio was in a $200 billion unrealized net gain position at the beginning of this year and is projected to be in a slight unrealized net loss position at year-end, reflecting the nearly 100 basis-point rise in the 10-year Treasury yield over the course of the year.[5] In Alternative B, the unrealized loss position is projected to peak at about $340 billion at year-end 2018, primarily reflecting the projected rise in interest rates. The unrealized loss position narrows through the remainder of the forecast period as these securities mature and roll off the portfolio.

Under Alternative C, in January, the monthly pace of purchases of longer-term Treasury securities is reduced by $15 billion, and the pace of agency MBS is reduced by $10 billion. The pace of purchases is assumed to wind down to zero by June 2014.[6] Under this balance sheet scenario, purchases total about $1.3 trillion over 2013 and 2014, and the federal funds rate is assumed to lift off in mid-2015, earlier than in Alternative B.[7] Reinvestment of principal from maturing or prepaying securities ends and redemptions begin in late 2014, causing the portfolio to begin to contract. SOMA securities holdings in this scenario peak at about $4.0 trillion in December 2014, and the size of the balance sheet is normalized by July 2021, about one quarter earlier than in Alternative B. Federal Reserve remittances to the Treasury are projected to remain positive throughout the projection period, and no deferred asset is recorded. Cumulative remittances from 2009 to 2025 are roughly the same as under Alternative B.

[5] 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 with a lag in the "Federal Reserve Banks Combined Quarterly Financial Report," available on the Board's website at http://www.federalreserve.gov/monetarypolicy/bst_fedfinancials.htm#quarterly. The November unrealized gain position is an estimate based on Board staff projections.

[6] The assumption that purchases will end by June 2014 is consistent with a view that the recovery is proceeding more strongly than in the staff forecast or with a concern about the possible efficacy, costs, or risks associated with asset purchases.

[7] Alternative C's total purchases are slightly less than those in the staff forecast, but the liftoff date of the federal funds rate is the same across the two scenarios. The small difference in policy assumptions could reflect the fact that policymakers supporting Alternative C have a more optimistic view of the economic outlook and so anticipate providing slightly less accommodation through asset purchases than in the staff forecast.

In the scenario for Alternative A, the current pace of purchases of longer-term Treasury securities and agency MBS is maintained in the near term and then is reduced gradually, with purchases ending by the end of 2014.[8] Under these assumptions, purchases total about $1.8 trillion over 2013 and 2014. In this scenario, SOMA securities holdings increase to a peak of about $4.5 trillion in March 2015. The first increase in the target federal funds rate is assumed to occur in the last quarter of 2015, after the unemployment rate drops below 6 percent. All reinvestments are assumed to cease in the second quarter of 2015, and then the SOMA portfolio begins to contract. The size of the portfolio is normalized about two quarters later than in the scenario corresponding to Alternative B, reflecting the larger amount of asset purchases. Federal Reserve remittances to the Treasury are projected to remain positive over the entire projection period, and no deferred asset is recorded. Cumulative remittances from 2009 through 2025 are roughly the same as under Alternative B.

The differences across the scenarios regarding the projected peak amount of reserve balances and the level of reserve balances at liftoff are directly related to the magnitude of assumed asset purchases and the timing of the liftoff of the federal funds rate, although the level of reserve balances is also contingent on the evolution of other balance sheet items. Reserve balances peak at about $3.3 trillion, $3.0 trillion, and $2.9 trillion under Alternatives A, B, and C, respectively. When the federal funds rate lifts off from its lower bound, reserve balances round to $3.2 trillion, $2.8 trillion, and $2.7 trillion under Alternatives A, B, and C, respectively.

As shown in the final exhibit, "Alternative Projections for the Monetary Base," in the scenario corresponding to Alternative B, the monetary base increases through the beginning of 2015 because the purchase program is accompanied by an increase in reserve balances. Once exit begins, the monetary base shrinks, on net, into late 2021, primarily because redemptions of securities cause corresponding reductions in reserve balances. Starting around early 2022, after reserve balances are assumed to have stabilized at $25 billion, the monetary base begins to expand in line with the growth of currency in circulation. Under Alternative C, the monetary base increases through the beginning of 2015 and then contracts, on net, until the size of the portfolio is normalized. The projected increases in the monetary base under Alternative C are less than the

[8] This later conclusion to the purchases would be consistent with progress toward the Committee's objectives for the labor market and inflation occurring more gradually than in the staff forecast.

increases under Alternative B because the size of the purchase program is smaller and it ends sooner. Under Alternative A, the monetary base increases, on net, through early 2015, as the level of reserve balances climbs in concert with the expansion of the asset side of the Federal Reserve's balance sheet. The monetary base then contracts during the exit period until the size of the portfolio is normalized.

Alternative Projections for the Monetary Base

Percent change, annual rate; not seasonally adjusted

Date	Alternative B	Alternative C	Alternative A	October Alternative B
Quarterly				
2013: Q4	33.2	33.2	33.2	47.0
2014: Q1	28.9	27.4	30.5	23.2
Q2	11.1	8.5	19.8	13.4
Q3	13.0	8.5	24.9	8.1
Q4	4.1	1.1	13.0	2.7
2015: Q1	1.6	0.1	5.9	-4.9
Q2	-5.6	-7.3	-4.7	-4.5
Q3	1.1	4.0	0.8	4.4
Q4	-1.4	-4.5	-1.6	-4.2
2016: Q1	-2.0	-6.8	-2.1	-6.6
Q2	-12.6	-13.0	-11.9	-12.7
Q3	-10.0	-10.2	-9.5	-9.9
Q4	-8.4	-8.5	-8.1	-8.2
Annual				
2013	37.7	37.7	37.7	42.0
2014	14.9	11.8	23.9	12.3
2015	-1.1	-1.9	0.1	-2.3
2016	-8.0	-9.3	-7.7	-9.1
2017	-9.6	-9.8	-9.2	-9.6
2018	-14.6	-14.9	-13.8	-14.5
2019	-15.9	-16.1	-15.4	-15.9
2020	-15.2	-15.3	-14.9	-15.1
2021	-12.3	-6.6	-13.7	-8.1
2022	4.1	4.8	-5.4	4.4
2023	4.8	4.7	4.8	4.5
2024	4.8	4.7	4.8	4.5
2025	4.8	4.7	4.8	4.6

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

MONEY

After advancing briskly in 2013, M2 is projected to increase at a rate roughly in line with that of nominal GDP in the first quarter of next year. Thereafter, M2 is forecast to expand more slowly than nominal GDP, in part because investors are assumed to reallocate a portion of their elevated M2 balances to riskier investments as economic conditions improve.[9] In 2015 and 2016, M2 growth is depressed as the projected rise in short-term market rates increases the opportunity cost of holding M2 assets.

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

Quarterly			
	2013:	Q4	7.1
	2014:	Q1	4.0
		Q2	3.4
		Q3	2.6
		Q4	2.8
	2015:	Q1	0.9
		Q2	-1.0
		Q3	-1.7
		Q4	-1.6
	2016:	Q1	-1.2
		Q2	-0.9
		Q3	-0.7
Annual			
		2013	6.1
		2014	3.3
		2015	-0.9
		2016	-0.7

Note: This forecast is consistent with nominal GDP and interest rates in the Tealbook forecast. Actual data through December 2, 2013; 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.

[9] The staff's M2 forecast is constructed using the staff's forecast of nominal income growth and model-based estimates of interest rate effects with judgmental adjustments.

Projections

(This page is intentionally blank.)

Projections

Appendix

This appendix presents the assumptions underlying the projections provided in the section titled "Balance Sheet, Income, and Monetary Base," as well as projections for each major component of the Federal Reserve's balance sheet.

GENERAL ASSUMPTIONS

The balance sheet projections are constructed at a monthly frequency from December 2013 to December 2025. The few balance sheet items that are not discussed below are assumed to be constant over the projection period at the level observed on November 29, 2013. The projections for all major asset and liability categories under each scenario are summarized in the tables that follow the bullet points.

The Tealbook projections for the scenario corresponding to Alternative B assume that the target federal funds rate begins to increase in the last quarter of 2015, well past the time that the unemployment rate declines below 6½ percent, and two quarters later than in the December staff forecast as well as in the balance sheet projections for Alternative B in the October Tealbook. The projections for the scenario corresponding to Alternative C assume liftoff in the second quarter of 2015. In the projection for the scenario corresponding to Alternative A, the first increase in the target federal funds rate is also assumed to occur in the last quarter of 2015, reflecting either an unemployment threshold of 6 percent or inflation and other financial conditions that delay liftoff a bit. In each case, the balance sheet projections assume no use of short-term draining tools to achieve the projected path for the target federal funds rate.[1]

ASSETS

Treasury Securities, Agency Mortgage-Backed Securities (MBS), and Agency Debt Securities

- The assumptions under Alternative B are:
  - In the scenario corresponding to Alternative B, the Committee is assumed to decrease the monthly pace of purchases to $40 billion of longer-term Treasury securities and $35 billion of agency MBS beginning in January 2014. The pace of purchases is reduced numerous times during the year, and purchases stop at the end of the third quarter of 2014. The Treasury securities purchased are assumed to have an average duration of about nine

[1] If term deposits or reverse repurchase agreements were used to drain reserves, the composition of liabilities would change: Increases in term deposits and reverse repurchase agreements would be matched by corresponding declines in reserve balances. Presumably, these draining tools would be wound down as the balance sheet returns to its steady-state growth path, so that the projected paths for securities presented here would remain valid.

Projections

years. The Treasury and MBS purchases expand the SOMA portfolio's holdings of longer-term securities by about $1.4 trillion over 2013 and 2014.

- The Committee is assumed to continue rolling over maturing Treasury securities at auction and reinvesting principal payments on agency MBS and agency debt securities into agency MBS until mid-2015, six months before the first increase in the federal funds rate. The assumption that maturing Treasury securities are rolled over at auction is not particularly important because, as a result of the maturity extension program, the SOMA portfolio currently holds less than $5 billion of Treasury securities that mature before January 2016.
- Starting in the second quarter of 2015—two quarters prior to the assumed increase in the target federal funds rate—all securities are allowed to roll off the portfolio as they mature or prepay. Subsequently, the portfolio declines only through redemptions and paydowns of SOMA assets.
- For agency MBS, the rate of prepayment is based on staff models using estimates of housing market factors from one of the Desk's analytical providers, long-run average prepayment speeds of MBS, and interest rate projections generated from the staff's FRB/US model.[2] The projected rate of prepayment is sensitive to these underlying assumptions.

- In the scenario corresponding to Alternative C, the Committee is assumed to decrease the monthly pace of purchases to $30 billion of longer-term Treasury securities and $30 billion of agency MBS beginning in January 2014. The pace of purchases is reduced to zero by the end in the second quarter of 2014. The Treasury securities purchased are assumed to have an average duration of about nine years. The Treasury and MBS purchases expand the SOMA portfolio's holdings of longer-term securities by about $1.3 trillion over 2013 and 2014. The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS until late 2014, six months prior to the assumed increase in the target federal funds rate. Thereafter, all securities are allowed to roll off the portfolio as they mature or prepay. Subsequently, the portfolio declines only through redemptions and paydowns of SOMA assets.
- In the scenario corresponding to Alternative A, the Committee is assumed to continue the current pace of purchases of longer-term Treasury securities and agency MBS through 2013. In the second half of 2014, the pace of purchases is reduced in several steps, and purchases end in December 2014. The Treasury securities purchased are assumed to have an average duration of about nine years. The Treasury and MBS purchases expand the SOMA portfolio's holdings of longer-term securities by about $1.8 trillion over 2013 and 2014. In addition, the Committee is assumed to maintain

[2] Projected prepayments of agency MBS reflect interest rate projections as of December 9, 2013.

its existing policy of reinvesting principal payments from its holdings of agency debt and agency MBS in agency MBS. Starting in mid-2015—two quarters prior to the assumed increase in the target federal funds rate—principal payments from all securities are allowed to roll off the portfolio. Subsequently, the portfolio declines only through redemptions and paydowns of SOMA assets.

- If interest rates are below (above) the coupon rate on outstanding Treasury securities, the market value at which the Federal Reserve purchases such securities will be greater (less) than their face value and the Federal Reserve records a premium (discount). In all alternatives, net premiums are roughly unchanged over the course of the purchase programs.
- The market value at which the Federal Reserve purchases new agency MBS will generally exceed their face value. As a result, MBS premiums under Alternatives A, B, and C, will rise by roughly $14 billion, $8 billion, and $5 billion, respectively.
- The level of central bank liquidity swaps is assumed to reach zero by the beginning of 2014.
- In all four scenarios, once reserve balances drop to $25 billion, the Desk begins to purchase Treasury bills to maintain this level of reserve balances going forward. Purchases of bills continue until such securities comprise one-third of the Federal Reserve's total Treasury securities holdings—about the average share prior to the crisis. Once this share is reached, the Federal Reserve buys coupon securities in addition to bills to maintain an approximate composition of the portfolio of one-third bills and two-thirds coupon securities.
- The level of foreign currency denominated assets held in the SOMA portfolio is assumed to stay constant at about $25 billion.

Liquidity Programs and Credit Facilities

- Credit through the Term Asset-Backed Securities Loan Facility (TALF) declines to zero by the end of 2015, reflecting loan maturities and prepayments.
- The assets held by TALF LLC decline from about $100 million currently to zero in 2015. Assets held by TALF LLC consist of investments of commitment fees collected by the LLC.[3] Consistent with events to date, the projections assume the LLC does not purchase any asset-backed securities. (It would have to make such purchases if an asset-backed security were received by the Federal Reserve Bank of New York in connection with a decision of a borrower not to repay a TALF loan.)

[3] On January 15, 2013, the Board of Governors approved the elimination of the U.S. Treasury's funding commitment and the repayment of the initial funding amount plus accrued interest. Additionally, the Board of Governors approved the disbursement of contingent interest payments from TALF LLC to Treasury and FRBNY that are approximately equal to the excess of the TALF LLC cash balance over the amount of outstanding TALF loans less funds reserved for future expenses of TALF LLC. The first payment occurred in February, and additional payments occur on a monthly basis.

- The assets held by Maiden Lane LLC decline from about $1 billion to zero in 2016.

LIABILITIES AND CAPITAL

- Federal Reserve notes in circulation are assumed to increase at an average annual rate of 6 percent through 2015, in line with the staff forecast. Afterwards, Federal Reserve notes in circulation expand at the same rate as nominal GDP in the extended Tealbook projection.
- The level of reverse repurchase agreements (RRPs) is assumed to be around $100 billion, about the average level of RRPs associated with foreign official and international accounts observed over the past three years.
- Balances held in the U.S. Treasury's General Account (TGA) follow recent patterns until the assumed initial increase in the target federal funds rate in each alternative. At that point, the TGA drops back to its historical target level of $5 billion because it is assumed that the Treasury will implement a new cash management system and invest funds in excess of $5 billion. The TGA remains constant at $5 billion over the remainder of the forecast period.
- Federal Reserve capital rises 12.5 percent per year from 2014 onward, in line with the average rate of the past ten years.[4]
- In general, increases in the level of Federal Reserve assets are matched by higher levels of reserve balances. All else equal, increases in the levels of liability items, such as Federal Reserve notes in circulation or other liabilities, or increases in the level of Reserve Bank capital, drain reserve balances. When increases in these liability or capital items would otherwise cause reserve balances to fall below $25 billion, purchases of Treasury securities are assumed in order to maintain that level of reserve balances.
- In the event that a Federal Reserve Bank's earnings fall short of the amount necessary to cover operating costs, pay dividends, and equate surplus to capital paid-in, a deferred asset would be recorded. This deferred asset is reported on the liability side of the balance sheet as "Interest on Federal Reserve notes due to U.S. Treasury." This liability takes on a positive value when weekly cumulative earnings have not yet been distributed to the Treasury and takes on a negative value when earnings fall short of the expenses listed above. In this Tealbook, none of the alternatives results in a deferred asset.

[4] The annual growth rate of capital affects the date of normalization of the size of the balance sheet, the size of the SOMA portfolio after normalization, and the level of annual remittances to the Treasury.

TERM PREMIUM EFFECTS[5,6]

- Under Alternative B, the term premium effect on the yield of the ten-year Treasury note in the fourth quarter of 2013 is negative 126 basis points, slightly more negative than in Alternative B in the October Tealbook. Over the remainder of the projection period, the term premium effect declines slowly toward zero, reflecting the actual and anticipated normalization of the portfolio.
- Under Alternative C, the contemporaneous term premium effect is negative 120 basis points. The effect is less negative than in Alternative B because there are fewer securities purchased and liftoff is earlier (and so balance sheet normalization starts earlier) than under Alternative B.
- Under Alternative A, the term premium effect is about negative 140 basis points in the current quarter. The effect is more negative than in Alternative B because more securities are purchased than under Alternative B.

[5] Staff estimates include all current and projected asset purchases and use the model outlined in the appendix of the memo titled "Possible MBS Large-Scale Asset Purchase Program" written by staff at the Federal Reserve Bank of New York and the Board of Governors and sent to the Committee on January 18, 2012. More details of the model can be found in Li, Canlin and Min Wei (2013), "Term Structure Modeling with Supply Factors and the Federal Reserve's Large Scale Asset Purchase Programs," *International Journal of Central Banking*, vol. 9, no. 1, pp. 3-39 (also in FEDS working paper series, 2012-37).

[6] The staff projection of the term premium effect depends on assumptions about the size of the asset purchase program and the balance sheet normalization strategy. If market participants anticipate a different sized program or a different exit strategy, the staff estimates of the term premium effect may not be the same as those priced into market rates.

Federal Reserve Balance Sheet
End-of-Year Projections -- Alternative B

Billions of dollars

	Nov 29, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,926	4,014	4,329	3,574	2,627	2,065	2,276	2,513
Selected assets								
Liquidity programs for financial firms	0	0	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	0	0	0	0	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	1	0	0	0	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	1	1	0	0	0	0	0	0
Securities held outright	3,662	3,739	4,079	3,364	2,450	1,910	2,137	2,388
U.S. Treasury securities	2,164	2,215	2,414	2,002	1,314	965	1,357	1,750
Agency debt securities	58	57	33	4	2	2	2	2
Agency mortgage-backed securities	1,440	1,467	1,632	1,357	1,133	943	778	636
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	208	217	197	154	120	96	78	64
Unamortized discounts	-10	-11	-14	-11	-9	-7	-6	-5
Total other assets	65	67	67	67	67	67	67	67
Total liabilities	3,871	3,959	4,268	3,498	2,531	1,944	2,122	2,319
Selected liabilities								
Federal Reserve notes in circulation	1,184	1,190	1,342	1,496	1,640	1,801	1,981	2,178
Reverse repurchase agreements	128	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,549	2,658	2,816	1,894	786	39	39	39
Reserve balances held by depository institutions	2,498	2,509	2,802	1,880	772	25	25	25
U.S. Treasury, General Account	33	140	5	5	5	5	5	5
Other Deposits	17	9	9	9	9	9	9	9
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	55	61	76	96	122	154	195

Source: Federal Reserve H.4.1 statistical releases and staff calculations.
Note: Components may not sum to totals due to rounding.

Projections

Federal Reserve Balance Sheet
End-of-Year Projections -- Alternative C

Billions of dollars

	Nov 29, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,926	4,013	4,131	3,397	2,485	2,078	2,289	2,525
Selected assets								
Liquidity programs for financial firms	0	0	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	0	0	0	0	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	1	0	0	0	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	1	1	0	0	0	0	0	0
Securities held outright	3,662	3,740	3,889	3,194	2,313	1,927	2,153	2,402
U.S. Treasury securities	2,164	2,215	2,332	1,921	1,248	1,040	1,418	1,800
Agency debt securities	58	57	33	4	2	2	2	2
Agency mortgage-backed securities	1,440	1,467	1,524	1,269	1,062	885	732	599
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	208	217	188	146	114	90	74	60
Unamortized discounts	-10	-11	-12	-10	-8	-6	-5	-5
Total other assets	65	67	67	67	67	67	67	67
Total liabilities	3,871	3,958	4,070	3,321	2,389	1,957	2,135	2,330
Selected liabilities								
Federal Reserve notes in circulation	1,184	1,190	1,342	1,499	1,651	1,815	1,994	2,190
Reverse repurchase agreements	128	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,549	2,657	2,619	1,716	633	39	39	39
Reserve balances held by depository institutions	2,498	2,509	2,605	1,702	619	25	25	25
U.S. Treasury, General Account	33	140	5	5	5	5	5	5
Other Deposits	17	9	9	9	9	9	9	9
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	55	61	76	96	122	154	195

Source: Federal Reserve H.4.1 statistical releases and staff calculations.
Note: Components may not sum to totals due to rounding.

Projections

Federal Reserve Balance Sheet
End-of-Year Projections -- Alternative A

Billions of dollars

	Nov 29, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,926	4,014	4,704	3,917	2,908	2,208	2,281	2,518
Selected assets								
Liquidity programs for financial firms	0	0	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	0	0	0	0	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	1	0	0	0	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	1	1	0	0	0	0	0	0
Securities held outright	3,662	3,739	4,450	3,705	2,729	2,052	2,141	2,393
U.S. Treasury securities	2,164	2,215	2,609	2,197	1,473	1,007	1,278	1,687
Agency debt securities	58	57	33	4	2	2	2	2
Agency mortgage-backed securities	1,440	1,466	1,809	1,503	1,254	1,042	860	703
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	208	218	205	161	125	99	81	66
Unamortized discounts	-10	-11	-18	-15	-12	-10	-8	-7
Total other assets	65	67	67	67	67	67	67	67
Total liabilities	3,871	3,959	4,643	3,842	2,812	2,087	2,127	2,324
Selected liabilities								
Federal Reserve notes in circulation	1,184	1,190	1,342	1,496	1,641	1,803	1,983	2,180
Reverse repurchase agreements	128	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,549	2,658	3,187	2,233	1,062	177	39	39
Reserve balances held by depository institutions	2,498	2,509	3,173	2,220	1,049	163	25	25
U.S. Treasury, General Account	33	140	5	5	5	5	5	5
Other Deposits	17	9	9	9	9	9	9	9
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	55	61	76	96	122	154	195

Source: Federal Reserve H.4.1 statistical releases and staff calculations.
Note: Components may not sum to totals due to rounding.

Projections

Alternative Projections for the 10-Year Treasury Term Premium Effect

Date	Alternative B	Alternative C	Alternative A	October Alternative B
	Basis Points			
	Quarterly Averages			
2013: Q4	–126	–120	–140	–119
2014: Q1	–122	–115	–136	–115
Q2	–117	–110	–132	–110
Q3	–112	–105	–127	–105
Q4	–107	–100	–121	–99
2015: Q1	–101	–95	–115	–94
Q2	–96	–90	–110	–89
Q3	–91	–85	–104	–84
Q4	–86	–80	–99	–80
2016: Q1	–82	–76	–93	–75
Q2	–77	–71	–88	–71
Q3	–73	–67	–84	–67
Q4	–69	–63	–79	–63
2017: Q4	–54	–50	–63	–49
2018: Q4	–42	–39	–49	–38
2019: Q4	–33	–30	–38	–30
2020: Q4	–25	–24	–30	–23
2021: Q4	–20	–19	–23	–18
2022: Q4	–16	–15	–18	–14
2023: Q4	–12	–12	–14	–11
2024: Q4	–9	–8	–10	–8
2025: Q4	–6	–6	–7	–6

(This page is intentionally blank.)

Abbreviations

ABCP	asset-backed commercial paper
ABS	asset-backed securities
AFE	advanced foreign economy
BEA	Bureau of Economic Analysis, Department of Commerce
BHC	bank holding company
BOE	Bank of England
BOJ	Bank of Japan
CDS	credit default swaps
C&I	commercial and industrial
CLO	collateralized loan obligation
CMBS	commercial mortgage-backed securities
CP	commercial paper
CRE	commercial real estate
Desk	Open Market Desk
ECB	European Central Bank
EME	emerging market economy
ETF	exchange-traded fund
FDIC	Federal Deposit Insurance Corporation
FOMC	Federal Open Market Committee; also, the Committee
G-7	Group of Seven (Canada, France, Germany, Italy, Japan, U.K., U.S.)
G-20	Group of Twenty (Argentina, Australia, Brazil, Canada, China, European Union, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, U.K., U.S.)
GCF	general collateral finance
GDP	gross domestic product
LIBOR	London interbank offered rate
LSAP	large-scale asset purchase
MBS	mortgage-backed securities

NIPA	national income and product accounts
OIS	overnight index swap
OTC	over-the-counter
PCE	personal consumption expenditures
REIT	real estate investment trust
REO	real estate owned
repo	repurchase agreement
RMBS	residential mortgage-backed securities
RRP	reverse repurchase agreement
SCOOS	Senior Credit Officer Opinion Survey on Dealer Financing Terms
SFA	Supplemental Financing Account
SOMA	System Open Market Account
S&P	Standard & Poor's
TALF	Term Asset-Backed Securities Loan Facility
TBA	to be announced (for example, TBA market)
TGA	U.S. Treasury's General Account
TIPS	Treasury inflation-protected securities
TPE	Term premium effects