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

January 24, 2013

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

Strategies

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 2013. (Medium-term prescriptions derived from dynamic simulations of the rules are discussed later.) As shown in the left-hand columns, all but two of the near-term prescriptions keep the federal funds rate at the effective lower bound through the second quarter of 2013. The Taylor (1993) rule, which puts relatively little weight on the output gap, prescribes an average federal funds rate of about 110 basis points in the first two quarters of 2013. The first-difference rule, which responds to the three-quarter-ahead change in the output gap, prescribes an average federal funds rate of 40 basis points in the first two quarters of 2013.[1]

The right-hand columns display the rule prescriptions that arise in the absence of the lower-bound constraint. The inertial Taylor (1999) rule and the outcome-based rule prescribe federal funds rates that are near zero for the next two quarters, while the Taylor (1999) rule and the nominal income targeting rule prescribe negative values for the federal funds rate. The more-accommodative prescriptions arising from the latter two rules reflect the stronger immediate response of the rules to the staff's estimate of the output gap, which remains appreciably negative.[2]

The Tealbook baseline projections for the output gap and inflation are shown in the bottom half of the exhibit, titled "Key Elements of the Staff Projection." As described in Book A of the Tealbook, the estimated path of the output gap is on average about 35 basis points narrower than in the December Tealbook, reflecting the staff's new assumptions of higher equity prices and a less-restrictive fiscal policy as well as modest

[1] As noted in Book A of the Tealbook, the staff has revised down the long-run value of the real funds rate from 2¼ percent to 2 percent, reflecting its assessment that the long-run growth of the economy is 2¼ percent compared to its previous estimate of 2½ percent. The intercepts of the different policy rules have been adjusted to reflect this change, both for the current and the previous Tealbook simulations.

[2] Although the rule prescriptions are not constrained to be at or above the lower bound, the inertial Taylor (1999) rule, the outcome-based rule, the nominal income targeting rule, and the first-difference rule all include and place substantial weight on the lagged federal funds rate, which is subject to the lower-bound constraint.

Strategies

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Policy Rules

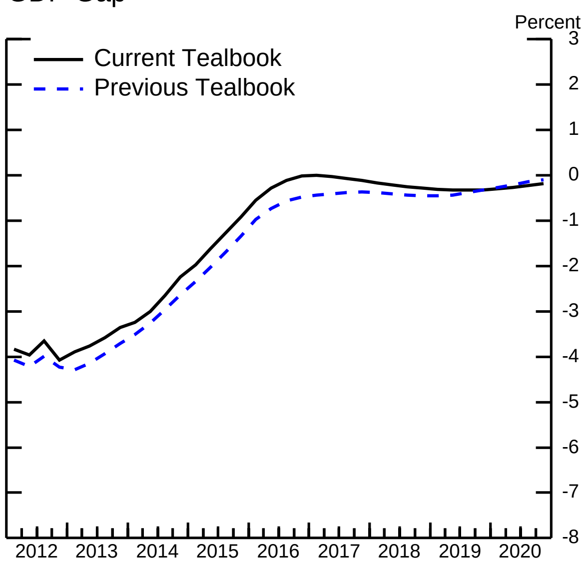
	Constrained Policy		Unconstrained Policy	
	2013Q1	2013Q2	2013Q1	2013Q2
Taylor (1993) rule	**1.04**	**1.12**	**1.04**	**1.12**
Previous Tealbook	*1.05*	*1.07*	*1.05*	*1.07*
Taylor (1999) rule	**0.13**	**0.13**	**–0.86**	**–0.73**
Previous Tealbook	*0.13*	*0.13*	*–1.04*	*–0.96*
Inertial Taylor (1999) rule	**0.13**	**0.13**	**0.01**	**–0.10**
Previous Tealbook	*0.13*	*0.13*	*–0.03*	*–0.17*
Outcome-based rule	**0.13**	**0.13**	**0.08**	**–0.03**
Previous Tealbook	*0.13*	*0.13*	*–0.08*	*–0.25*
First-difference rule	**0.33**	**0.47**	**0.33**	**0.47**
Previous Tealbook	*0.20*	*0.37*	*0.20*	*0.37*
Nominal income targeting rule	**0.13**	**0.13**	**–0.53**	**–1.02**
Previous Tealbook	*0.13*	*0.13*	*–0.54*	*–1.07*

Memo: Equilibrium and Actual Real Federal Funds Rate

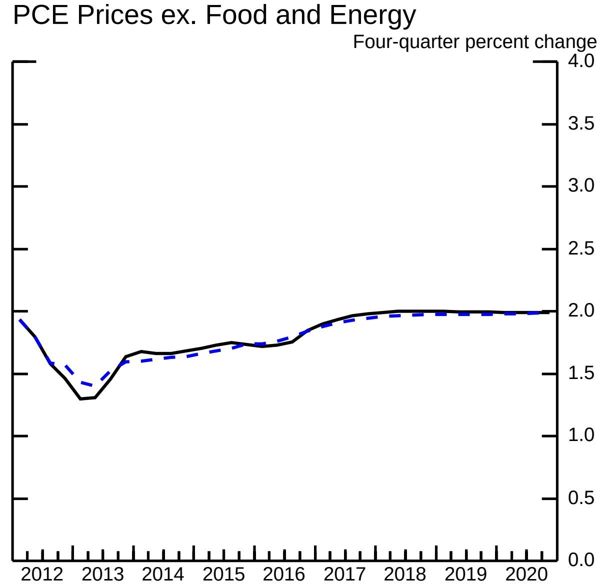
	Current Tealbook	*Current Quarter Estimate as of Previous Tealbook*	*Previous Tealbook*
Tealbook-consistent FRB/US *r** estimate	–1.83	-2.06	*–2.21*
Actual real federal funds rate	–1.33		*–1.45*

Key Elements of the Staff Projection

GDP Gap



PCE Prices ex. Food and Energy



Note: Since the previous Tealbook, the staff has revised down the long-run value of the real funds rate from 2.25 percent to 2 percent. The intercepts of the different policy rules have been adjusted to reflect this change, both for the current and previous Tealbook simulations. Estimates of *r**may change at the beginning of a quarter even when the staff outlook is unchanged because the twelve-quarter horizon covered by the calculation has rolled forward one quarter. Therefore, whenever the Tealbook is published early in the quarter, the memo includes a third column labeled "Current Quarter Estimate as of Previous Tealbook."

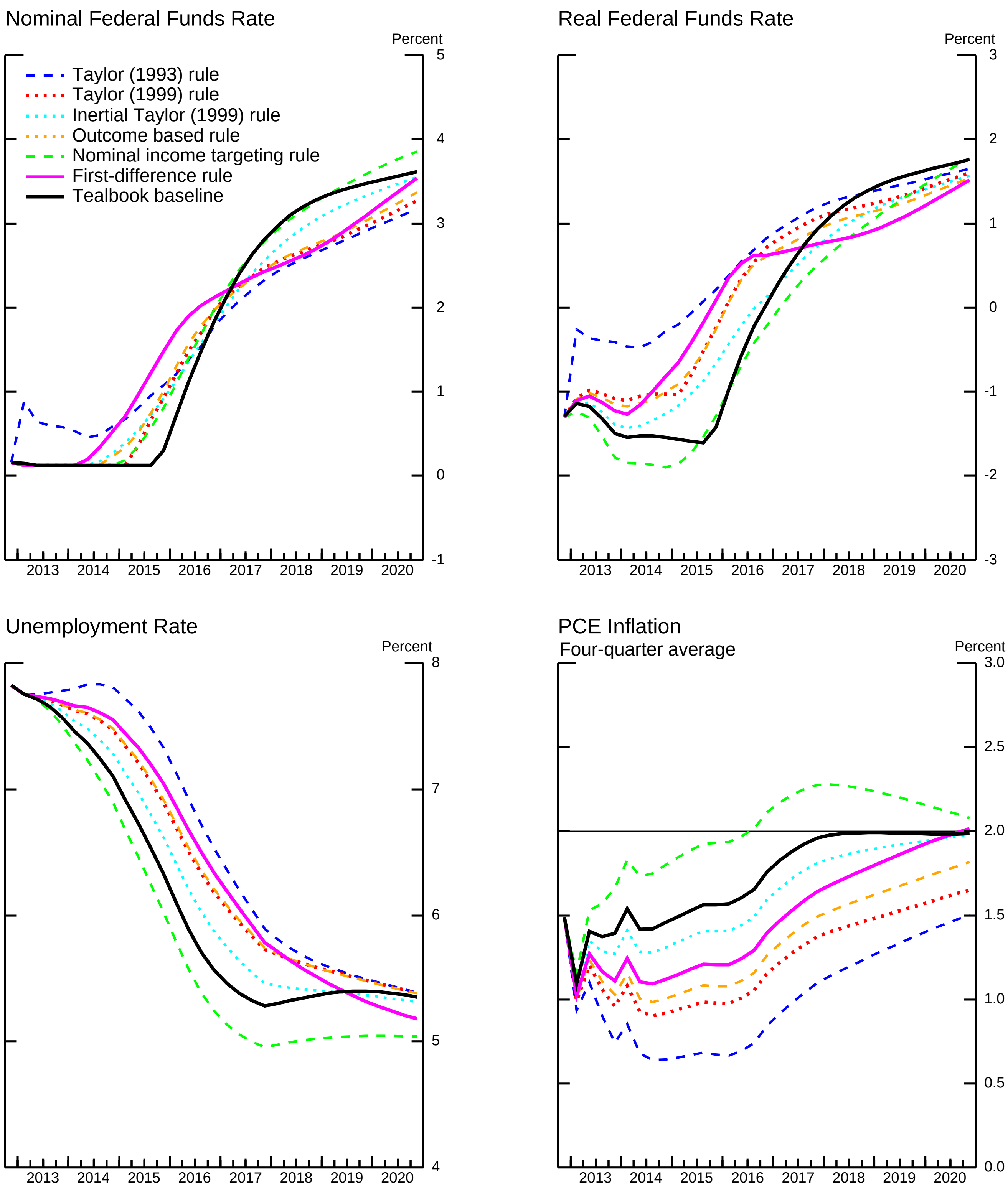
downward revisions to potential output. Compared to the December Tealbook, the staff now projects slightly lower core inflation in 2013 but essentially the same gradual convergence to 2 percent inflation over the subsequent years. With an improved outlook for economic activity and an essentially unchanged outlook for inflation, the near-term federal funds rate prescriptions from the unconstrained rules have increased slightly compared to those in the December Tealbook.

The top panel of the first exhibit also reports the Tealbook-consistent estimate of short-run r^*, which is generated by the FRB/US model when conditioned on the staff's outlook for the economy. The short-run r^* estimate corresponds to the real federal funds rate that, if maintained, would return output to potential in twelve quarters. Consistent with the staff's revised assessment of the output gap, the r^* estimate for the current quarter is about 20 basis points higher than in the December Tealbook. As in previous rounds, the estimate of r^*—currently about −1¾ percent— remains below the estimated actual real federal funds rate of about −1¼ percent.

The second exhibit, "Policy Rule Simulations without Thresholds," reports dynamic simulations using the FRB/US model that incorporate the endogenous responses of inflation and the output gap to the paths of the federal funds rate prescribed by the different policy rules under the assumption that the funds rate is constrained by the effective lower bound. The model is adjusted to match the staff's baseline outlook for the economy and then simulated using the different policy rules. Each rule is implemented from the first quarter of 2013 onward, under the assumption that private agents fully understand and anticipate the implications for future real activity, inflation, and interest rates of following the rule instead of the baseline policy.[3] The exhibit also displays the implications of the Tealbook baseline policy, which keeps the federal funds rate at its effective lower bound of 12.5 basis points as long as the unemployment rate is above 6.5 percent and projected inflation between one and two years ahead is less than 2.5 percent; once either of these thresholds is crossed, the federal funds rate follows the prescription

[3] The staff's baseline forecast incorporates the effects of the large-scale asset purchase programs that the FOMC has undertaken in recent years, as well as the modifications to the Federal Reserve's reinvestment policies that were announced in September 2011. The staff baseline also assumes that the FOMC will purchase an additional $500 billion in long-term Treasury securities and MBS during the first half of 2013, and incorporates some "disappointment" on the part of financial market participants as they gradually come to recognize that, contrary to what they currently appear to expect, the program will not be continued beyond this point. Based on these assumptions, the policy rule simulations incorporate the baseline effects of these balance sheet policies; the rules themselves are not directly adjusted for the effects of balance sheet policies.

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.

of the inertial Taylor (1999) rule.[4] In contrast to the policy assumption underlying the Tealbook baseline projection, the simulations of the different policy rules shown in the exhibit do not impose the thresholds that the Committee adopted in December 2012. (Alternative policy rule simulations augmented with thresholds are discussed later.)

In the Tealbook baseline, the federal funds rate departs from the effective lower bound in the fourth quarter of 2015, as in the December Tealbook. Subsequently, the federal funds rate increases to 3 percent by the beginning of 2018, and reaches 3½ percent at the end of the decade. The unemployment rate declines below its threshold value of 6.5 percent in the fourth quarter of 2015 and is expected to converge to the staff's estimate of the natural rate of unemployment by 2017.[5] Headline inflation is projected to rise gradually over time and then level off at 2 percent by 2018.

Without thresholds, the different policy rules all call for tightening to begin appreciably earlier than in the Tealbook baseline. As a result, most of the rules cause the *real* federal funds rate to be persistently higher than in the baseline forecast, thereby resulting in higher unemployment and lower inflation through most of the decade. The exception to this pattern is the nominal income targeting rule. Because this policy implicitly seeks to push inflation modestly above 2 percent later in the decade, it generates expectations of higher future inflation that, due to the forward-looking nature of wage and price setting, lead to a higher path for inflation in both the near term and later in the decade, and therefore a persistently lower path for the real federal funds rate than in the Tealbook baseline.[6] This more accommodative stance of monetary policy stimulates real activity and generates a noticeably more rapid decline in unemployment

[4] The use of the inertial Taylor (1999) rule with thresholds as the baseline rule represents a change from the October and December Tealbooks, which used the outcome-based rule augmented with intercept adjustments designed to be consistent with the date-based forward guidance in the Committee's October statement and the economic outlook as it stood at the time. The adjustments had the effect of delaying the onset of tightening until after mid-2015; in addition, they caused the subsequent rise in the federal funds rate to be more gradual than what the outcome-based rule without adjustments would have prescribed. This round's changes in the baseline rule do not substantially affect the Tealbook projections, in part because the inertial Taylor rule closely replicates the gradual rise in the funds rate after liftoff that was incorporated into the staff's October and December projections.

[5] The staff's estimate of the effective natural rate of unemployment declines from about 6 percent in the fourth quarter of 2013 to 5¼ percent by the end of 2017. It is assumed to remain at this level thereafter.

[6] As described in the Explanatory Notes, the nominal income targeting rule responds to the nominal income gap defined as the difference between nominal GDP and target nominal GDP. For the rule simulated here, target nominal GDP in 2007:Q4 is set equal to potential real GDP in 2007:Q4 times the GDP deflator in that quarter; subsequently, target nominal GDP grows at a rate that is 2 percentage points above that of potential real GDP.

than in the Tealbook baseline. As with the other policy rules, the prescriptions of the nominal income targeting rule are conditional on the public recognizing that monetary policy will adhere to the rule in the future. This assumption is particularly important for the nominal income targeting rule because it yields inflation above the 2 percent goal even after the output gap is closed.

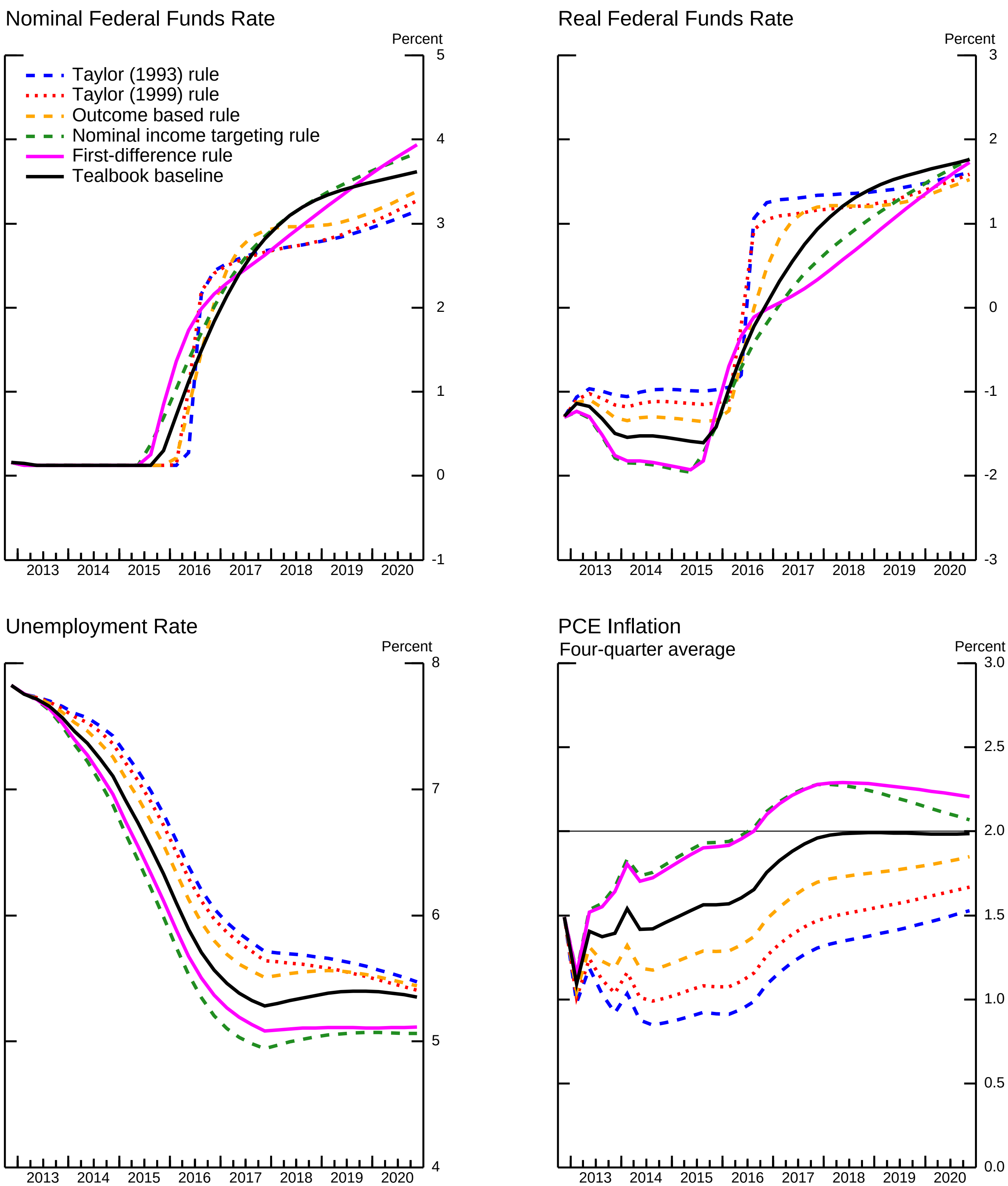
The third exhibit, "Policy Rule Simulations with Thresholds," displays dynamic simulations in which policy rules are subject to the thresholds that the Committee adopted in December 2012. For each of the rules, the thresholds are imposed by keeping the federal funds rate at its effective lower bound of 12.5 basis points as long as the unemployment rate is above 6.5 percent and projected inflation between one and two years ahead is less than 2.5 percent. In each of the simulations discussed below, crossing the unemployment threshold is the catalyst for switching to the specified rule. The private sector is assumed to understand the change in policy when a threshold condition is crossed and to view it as permanent and fully credible.

The simulations with thresholds bring out several important properties of the rules. First, because all of the policy rules without thresholds shown in the previous exhibit imply a departure of the federal funds rate from the effective lower bound before either threshold is crossed, imposing thresholds uniformly leads to a more-accomodative policy. The imposition of thresholds alters economic outcomes least for the nominal income targeting rule because this rule prescribes the most accommodative policy when no thresholds are imposed. Second, the conduct of policy after the threshold is crossed exerts a major influence on the effective stimulus provided by the threshold strategy. In particular, post-crossing policy rules that entail a more gradual increase in the federal funds rate imply a more rapid decline in unemployment along with higher inflation, resulting in an earlier crossing of the thresholds and an earlier departure of the federal funds rate from the effective lower bound. Third, the effectiveness of threshold-augmented rules depends critically on the ability of policymakers to commit to a particular rule after a threshold is crossed and the assumption of model-consistent expectations.

An illustration of the effect of the degree of inertia embodied in a policy rule on the amount of stimulus provided by the addition of thresholds is provided by simulations employing either the Taylor (1993) rule or the Taylor (1999) rule once the unemployment threshold is crossed. Because these rules are not subject to interest-rate inertia, they

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.

prescribe a rapid post-threshold tightening of monetary policy.[7] As a result, real activity remains noticeably weaker and inflation lower than in the Tealbook baseline, which employs the inertial Taylor (1999) rule. Indeed, this effect is large enough to push back the onset of tightening relative to the baseline. Even with the rapid post-threshold tightening, however, a close comparison of this exhibit with the previous one reveals that augmenting the Taylor (1993) rule and the Taylor (1999) rule with thresholds modestly improves macroeconomic outcomes.

In contrast, consider a case in which policy follows either the nominal income targeting rule or the first-difference rule once one of the thresholds is crossed. Because both of these rules are strongly inertial, they prescribe a more gradual increase in the federal funds rate and implicitly push inflation modestly above 2 percent later on in the decade. This more accommodative post-threshold stance of policy produces favorable expectational effects similar to those discussed in the previous exhibit for nominal income targeting in the absence of thresholds. Due to the forward-looking nature of wage and price setting, expectations of higher future inflation lead to higher current inflation and a lower path for the real federal funds rate before as well as after the unemployment threshold is crossed. The resulting boost in real activity is reflected in a more rapid decline in the unemployment rate than in the Tealbook baseline, thus precipitating an earlier departure of the federal funds rate from the effective lower bound.[8]

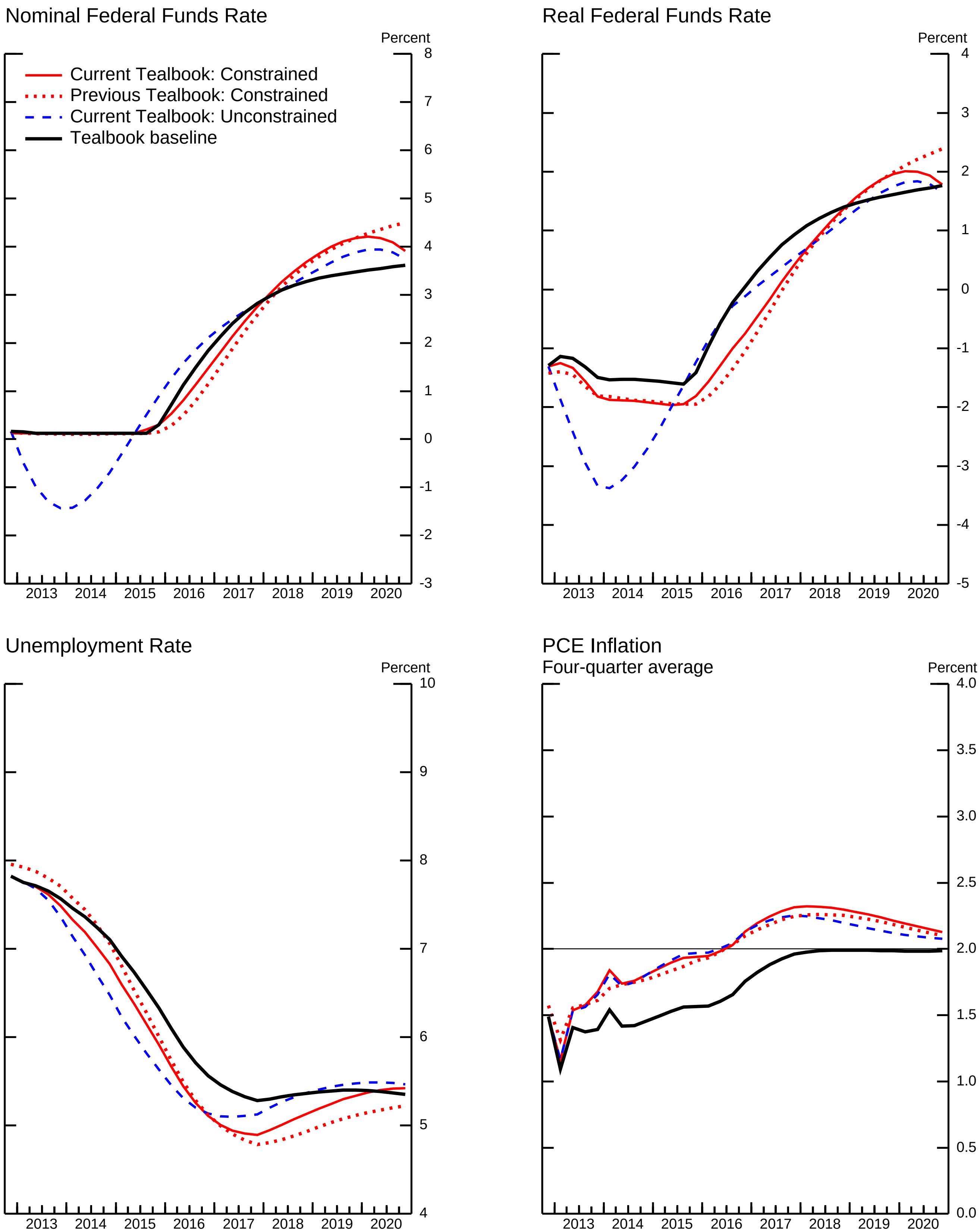
The fourth exhibit, “Constrained vs. Unconstrained Optimal Control Policy,” compares optimal control simulations derived for this Tealbook with those shown in

---

[7] The outcome-based rule prescribes a relatively rapid increase in the federal funds rate after the thresholds are crossed. The non-inertial behavior of this rule primarily reflects the responsiveness of its prescriptions to changes in the output gap. The outcome-based rule discussed here does not include any of the intercept adjustments that were applied to the rule to derive the staff’s baseline policy in the October and December Tealbooks; these October/December adjustments both delayed the onset of tightening until late 2015 and appreciably slowed the pace of tightening thereafter relative to what the unadjusted rule would have prescribed. As a result, the unadjusted outcome-based rule leads to a more rapid increase in the federal funds rate once the threshold is reached than in the staff’s previous baseline projections.

[8] The effects of imposing thresholds are most pronounced in the case of the first-difference rule. Without thresholds, the economic outlook under this rule is noticeably worse than in the Tealbook baseline, while with thresholds the outlook is noticeably better. This improvement occurs in large part because the first-difference rule is more inertial than the other rules and does not respond to the level of economic slack.

Constrained vs. Unconstrained Optimal Control Policy



December.[9] In these simulations, policymakers are assumed to place equal weights on keeping headline PCE inflation close to the Committee's 2 percent goal, on keeping the unemployment rate close to the staff's estimate of the effective natural rate of unemployment, and on minimizing changes in the federal funds rate.

The simulations indicate that, with the federal funds rate constrained to remain positive, the optimal control path for the federal funds rate does not rise above the effective lower bound until the fourth quarter of 2015, one quarter earlier than in the optimal control exercise shown in the December Tealbook. The optimal path is revised upward beyond 2015 as well, reflecting the narrower output gap in the staff projection.[10]

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 faster pace of economic recovery while still keeping inflation well within a half percentage point of the Committee's goal of 2 percent. As a result, the unemployment rate drops below 6.5 percent in the second quarter of 2015 and falls to 5.9 percent by the time of liftoff at the end of 2015; it then declines to 4.9 percent by the end of 2017, temporarily undershooting the staff's long-term estimate of the natural rate of unemployment. Inflation initially exhibits a decline similar to that in the Tealbook baseline, but it then increases to near the Committee's 2 percent objective by mid-2016. Thereafter, inflation overshoots the 2 percent target by 20 to 30 basis points before gradually moving back toward 2 percent. The more-rapid convergence to the Committee's assumed objectives than in the Tealbook baseline, and the subsequent persistent overshooting, occur because policymakers respond to the lower bound constraint by committing to a less-than-normally aggressive response to inflation for an extended period of time. As this policy is assumed to be completely credible, it boosts inflation expectations and reduces real interest rates in the short and medium run.

[9] The optimal 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 above.

[10] 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 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.

In the absence of the lower-bound constraint, the optimal federal funds rate would gradually decline to about –1½ percent by the end of 2013 and return to positive territory in the second quarter of 2015. Under this optimal unconstrained policy, the unemployment rate would decline more rapidly than under the optimal constrained policy. Inflation would increase to 2 percent by the beginning of 2016, a pattern much like that in the constrained simulation. In subsequent years, inflation would slightly exceed the 2 percent objective, but by somewhat less than in the constrained case.

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.

Strategies

Outcomes under Alternative Policies without Thresholds

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

Measure and scenario	2012 H2	2013	2014	2015	2016	2017
Real GDP						
Extended Tealbook baseline[1]	1.6	2.7	3.2	3.5	3.2	2.1
Taylor (1993)	1.6	1.9	2.3	3.0	3.3	2.7
Taylor (1999)	1.6	2.3	2.7	3.1	3.1	2.4
Inertial Taylor (1999)	1.6	2.5	3.0	3.3	3.2	2.4
Outcome based	1.6	2.3	2.7	3.1	3.1	2.5
First-difference	1.6	2.2	2.6	3.0	3.1	2.6
Nominal income targeting	1.6	2.9	3.5	3.7	3.2	2.2
Constrained optimal control	1.6	2.9	3.6	3.7	3.3	2.0
Unemployment rate[2]						
Extended Tealbook baseline[1]	7.8	7.6	7.1	6.3	5.6	5.3
Taylor (1993)	7.8	7.8	7.8	7.3	6.5	5.9
Taylor (1999)	7.8	7.7	7.5	6.9	6.2	5.7
Inertial Taylor (1999)	7.8	7.6	7.3	6.6	5.9	5.5
Outcome based	7.8	7.7	7.5	6.9	6.2	5.7
First-difference	7.8	7.7	7.6	7.0	6.3	5.8
Nominal income targeting	7.8	7.5	6.9	6.0	5.2	5.0
Constrained optimal control	7.8	7.5	6.8	5.9	5.1	4.9
Total PCE prices						
Extended Tealbook baseline[1]	1.4	1.4	1.5	1.6	1.8	2.0
Taylor (1993)	1.4	0.7	0.6	0.7	0.8	1.1
Taylor (1999)	1.4	1.0	0.9	1.0	1.2	1.4
Inertial Taylor (1999)	1.4	1.3	1.3	1.4	1.6	1.8
Outcome based	1.4	1.0	1.0	1.1	1.3	1.5
First-difference	1.4	1.1	1.1	1.2	1.4	1.6
Nominal income targeting	1.4	1.7	1.8	1.9	2.1	2.3
Constrained optimal control	1.4	1.7	1.8	1.9	2.1	2.3
Core PCE prices						
Extended Tealbook baseline[1]	1.0	1.6	1.7	1.7	1.8	2.0
Taylor (1993)	1.0	1.0	0.9	0.8	0.9	1.1
Taylor (1999)	1.0	1.2	1.1	1.2	1.2	1.4
Inertial Taylor (1999)	1.0	1.5	1.5	1.6	1.7	1.8
Outcome based	1.0	1.3	1.2	1.3	1.4	1.5
First-difference	1.0	1.3	1.3	1.4	1.5	1.7
Nominal income targeting	1.0	1.9	2.0	2.1	2.2	2.3
Constrained optimal control	1.0	1.9	2.0	2.1	2.2	2.3
Federal funds rate[2]						
Extended Tealbook baseline[1]	0.2	0.1	0.1	0.3	1.8	2.8
Taylor (1993)	0.2	0.6	0.6	1.1	1.8	2.3
Taylor (1999)	0.2	0.1	0.1	0.9	2.0	2.5
Inertial Taylor (1999)	0.2	0.1	0.3	0.9	1.8	2.6
Outcome based	0.2	0.1	0.2	1.0	2.0	2.5
First-difference	0.2	0.1	0.5	1.5	2.1	2.4
Nominal income targeting	0.2	0.1	0.1	0.8	2.0	2.8
Constrained optimal control	0.2	0.1	0.1	0.3	1.5	2.7

1. In the Tealbook baseline, the federal funds rate stays at its effective lower bound of 12.5 basis points as long as the unemployment rate is above 6.5 percent and projected inflation from 1 to 2 years ahead 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	2012 H2	2013	2014	2015	2016	2017
Real GDP						
Extended Tealbook baseline	1.6	2.7	3.2	3.5	3.2	2.1
Taylor (1993)	1.6	2.4	2.8	3.2	3.1	2.2
Taylor (1999)	1.6	2.4	2.9	3.3	3.1	2.2
Outcome based	1.6	2.5	3.0	3.4	3.1	2.1
First-difference	1.6	2.8	3.4	3.6	3.1	2.2
Nominal income targeting	1.6	2.9	3.5	3.7	3.2	2.1
Constrained optimal control	1.6	2.9	3.6	3.7	3.3	2.0
Unemployment rate[2]						
Extended Tealbook baseline	7.8	7.6	7.1	6.3	5.6	5.3
Taylor (1993)	7.8	7.7	7.4	6.8	6.1	5.7
Taylor (1999)	7.8	7.6	7.4	6.7	6.0	5.6
Outcome based	7.8	7.6	7.3	6.6	5.8	5.5
First-difference	7.8	7.5	7.0	6.1	5.4	5.1
Nominal income targeting	7.8	7.5	6.9	6.0	5.2	4.9
Constrained optimal control	7.8	7.5	6.8	5.9	5.1	4.9
Total PCE prices						
Extended Tealbook baseline	1.4	1.4	1.5	1.6	1.8	2.0
Taylor (1993)	1.4	0.9	0.9	0.9	1.1	1.3
Taylor (1999)	1.4	1.0	1.0	1.1	1.3	1.5
Outcome based	1.4	1.2	1.2	1.3	1.5	1.7
First-difference	1.4	1.6	1.8	1.9	2.1	2.3
Nominal income targeting	1.4	1.7	1.8	1.9	2.1	2.3
Constrained optimal control	1.4	1.7	1.8	1.9	2.1	2.3
Core PCE prices						
Extended Tealbook baseline	1.0	1.6	1.7	1.7	1.8	2.0
Taylor (1993)	1.0	1.2	1.1	1.1	1.2	1.3
Taylor (1999)	1.0	1.3	1.2	1.2	1.4	1.5
Outcome based	1.0	1.4	1.4	1.5	1.6	1.7
First-difference	1.0	1.9	2.0	2.1	2.2	2.3
Nominal income targeting	1.0	1.9	2.0	2.1	2.2	2.3
Constrained optimal control	1.0	1.9	2.0	2.1	2.2	2.3
Federal funds rate[2]						
Extended Tealbook baseline	0.2	0.1	0.1	0.3	1.8	2.8
Taylor (1993)	0.2	0.1	0.1	0.1	2.4	2.7
Taylor (1999)	0.2	0.1	0.1	0.1	2.4	2.7
Outcome based	0.2	0.1	0.1	0.1	2.0	2.9
First-difference	0.2	0.1	0.1	0.8	2.2	2.6
Nominal income targeting	0.2	0.1	0.1	0.7	2.0	2.8
Constrained optimal control	0.2	0.1	0.1	0.3	1.5	2.7

1. With the exception of constrained optimal control, monetary policy is specified to keep the federal funds rate at its effective lower bound of 12.5 basis points as long as the unemployment rate is above 6.5 percent and projected inflation from 1 to 2 years ahead 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.

(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 would continue purchases of agency-backed MBS and longer-term Treasury securities at the monthly rates that the Committee specified in its December statement. Alternative A would increase the pace of securities purchases to $100 billion per month. In contrast, Alternative C would substantially reduce the pace of purchases; it also would indicate that the Committee expects to reduce the pace of purchases further in coming months if the economy develops as anticipated. Alternatives A and B would repeat the "stopping condition" that the FOMC first used in its September statement: The Committee will continue its securities purchases until a substantial improvement in the outlook for the labor market is achieved in a context of price stability. Alternative C would state that the Committee expects to end purchases by midyear. All three alternatives would maintain the 0 to ¼ percent target range for the federal funds rate and retain threshold-based forward guidance for the funds rate (but all would drop the December language that said the Committee viewed the thresholds as consistent with its earlier date-based guidance). Alternatives B and C would keep the unemployment threshold at 6½ percent, as in December, while Alternative A would lower that threshold to 5½ percent. All of the alternatives would retain the 2½ percent threshold for projected inflation between one and two years ahead.

In summarizing recent economic developments, all of the alternatives begin by noting that growth in economic activity slowed in recent months. Alternatives A and B attribute the slowing "in large part" to transitory factors; Alternative C implicitly attributes all of the slowing to transitory factors. Alternatives A and B observe that employment continued to expand at a moderate pace, but that the unemployment rate remains elevated. Alternative C acknowledges that the unemployment rate is still elevated, but emphasizes its substantial decline during the past year. All of the alternatives indicate that household spending and business fixed investment advanced; the three draft statements also note "further improvement" in the housing sector (rather than "further signs of improvement" as in the Committee's previous statement). Each of the alternatives states, as in December, that inflation "has been running somewhat below the Committee's longer-run objective, apart from temporary variations that largely reflect fluctuations in energy prices." In addition, each alternative reiterates that longer-term inflation expectations have remained stable. In each alternative, the main message of the

Alternatives

first paragraph is that the Committee is not alarmed by the fourth quarter's sluggish output growth, or by the evidence that headline inflation ran well below the Committee's 2 percent objective, because it views those outcomes as the result of short-lived factors.

The second paragraphs of Alternatives B and C reinforce this message by stating the Committee's expectation that economic growth "will proceed at a moderate pace" (in Alternative B) or "will return to a moderate pace" (in Alternative C), and that the unemployment rate will decline toward levels judged consistent with the dual mandate. Alternative B conditions that projection on "sufficient policy accommodation" while Alternative C implies that the Committee expects the recovery to be strong enough to warrant reducing the pace of asset purchases. Alternative A adopts a more tentative tone, stating that "the Committee judges that, without additional policy accommodation, economic growth likely would not be strong enough to generate sustained improvement in labor market conditions." In response to the improved situation in European financial markets, Alternatives B and C note some easing of strains in global financial markets; Alternative C also points to a reduction in downside risks to the outlook, while Alternative B indicates they remain significant. In contrast, Alternative A not only says that downside risks remain significant, it adds a reference to risks from "unresolved fiscal issues." (Alternative B offers the option of citing risks from unresolved fiscal issues.) With respect to inflation, Alternative B repeats the words of the December statement: "The Committee also anticipates that inflation over the medium term likely will run at or below its 2 percent objective." In contrast, Alternative A indicates that medium-term inflation likely will be "somewhat below" its 2 percent objective while Alternative C says that inflation likely will run "close to" its 2 percent objective over the medium term.

The following table summarizes key elements of the alternative statements. As always, the Committee could blend elements of the three draft statements, or substitute other language, to construct its desired statement. The summary table is followed by the complete drafts of the three statements and then by arguments for each alternative.

Table 1: Overview of Policy Alternatives for the January 30 FOMC Statement

Selected Elements	December Statement	January Alternatives A	January Alternatives B	January Alternatives C
Economic Outlook				
Outlook	The Committee remains concerned that, without sufficient policy accommodation, growth might not be strong enough to generate sustained improvement in labor market conditions.	The Committee judges that, without additional policy accommodation, growth likely would not be strong enough to generate . . .	The Committee expects that, with sufficient policy accommodation, growth will proceed at a moderate pace and the unemployment rate will gradually decline toward levels consistent with its dual mandate.	The Committee expects that growth will return to a moderate pace and that the unemployment rate will decline toward levels the Committee judges consistent with its dual mandate.
	inflation over the medium term likely will run at or below 2 percent	inflation over the medium term likely will run somewhat below 2 percent	unchanged	inflation over the medium term likely will run close to 2 percent
Balance Sheet Policies				
Agency MBS	$40 billion per month	$45 billion per month	unchanged	$20 billion per month
Longer-Term Treasuries	initially $45 billion per month	$55 billion per month	unchanged	$25 billion per month
Securities Reinvestment	reinvest principal payments from agency securities into agency MBS			
	roll over maturing Treasuries at auction			
Guidance	If the outlook for the labor market does not improve substantially, the Committee will continue its purchases of securities, and employ its other policy tools as appropriate, until such improvement is achieved in a context of price stability.	Unchanged		If the economy develops as anticipated, the Committee expects to further reduce the pace of its asset purchases in coming months and to bring them to an end by midyear. However, if the labor market does not improve as expected or if inflation is projected to be appreciably below 2 percent, the Committee is prepared to maintain or increase the pace of purchases of longer-term securities, and employ other policy tools as appropriate.
	In determining the size, pace, and composition of purchases, the Committee will, as always, take appropriate account of the likely efficacy and costs of such purchases.			
Federal Funds Rate				
Target	0 to ¼ percent			
Guidance	. . . the Committee expects that a highly accommodative policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens.			
	. . . currently anticipates this range will be appropriate at least as long as the unemployment rate remains above 6½ percent [5½ percent for Alternative A], inflation between one and two years ahead is projected to be no more than ½ percentage point above the 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored; will also consider other information; when the Committee begins to remove accommodation, it will take a balanced approach consistent with maximum employment and inflation of 2 percent			

Alternatives

DECEMBER FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in October suggests that economic activity and employment have continued to expand at a moderate pace in recent months, apart from weather-related disruptions. Although the unemployment rate has declined somewhat since the summer, it remains elevated. Household spending has continued to advance, and the housing sector has shown further signs of improvement, but growth in business fixed investment has slowed. Inflation has been running somewhat below the Committee's longer-run objective, apart from temporary variations that largely reflect fluctuations in energy prices. 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 remains concerned that, without sufficient policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely will run at or below its 2 percent objective.

3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee will continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month. The Committee also will purchase longer-term Treasury securities after its program to extend the average maturity of its holdings of Treasury securities is completed at the end of the year, initially 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, in January, will resume 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.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months. If the outlook for the labor market does not improve substantially, the Committee will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until such improvement is achieved in a context of price stability. In determining the size, pace, and composition of its asset purchases, the Committee will, as always, take appropriate account of the likely efficacy and costs of such purchases.

5. To support continued progress toward maximum employment and price stability, the Committee expects 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. The Committee views these thresholds as consistent with its earlier date-based guidance. 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.

JANUARY FOMC STATEMENT—ALTERNATIVE A

1. Information received since the Federal Open Market Committee met in ~~October~~ **December** ~~suggests~~ **indicates** that **growth in** economic activity ~~and employment have continued to expand at a moderate pace~~ **slowed** in recent months, ~~apart from~~ **in large part because of** weather-related disruptions **and other transitory factors**. **Employment has continued to expand at a moderate pace but** ~~Although~~ the unemployment rate ~~has declined somewhat since the summer, it~~ remains elevated. Household spending ~~has continued to~~ **and business fixed investment** advance**d**, and the housing sector has shown further ~~signs of~~ improvement~~, but growth in business fixed investment has slowed~~. Inflation has been running somewhat below the Committee's longer-run objective, apart from temporary variations that largely reflect fluctuations in energy prices. 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 ~~remains concerned~~ **judges** that, without ~~sufficient~~ **additional** policy accommodation, economic growth ~~might~~ **likely would** not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets **and unresolved fiscal issues** continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely will run ~~at or~~ **somewhat** below its 2 percent objective.

3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee will ~~continue purchasing additional~~ **increase the pace at which it purchases** agency mortgage-backed securities ~~at a pace of $40~~ **to $45** billion per month. The Committee also will **increase the pace at which it** purchase**s** longer-term Treasury securities ~~after its program to extend the average maturity of its holdings of Treasury securities is completed at the end of the year, initially at a pace of $45~~ **to $55** 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~~, in January, will resume~~ **of** rolling over maturing Treasury securities at auction. Taken together, these actions **will increase the Committee's holdings of longer-term securities by $100 billion per month and** should ~~maintain~~ **put additional** downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months. If the outlook for the labor market does not improve substantially, the Committee will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until such improvement is achieved in a context of price stability. In determining the size, pace, and composition of its asset purchases, the Committee will, as always, take appropriate account of the likely efficacy and costs of such purchases.

5. To support continued progress toward maximum employment and price stability, the Committee expects 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~~ **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. ~~The Committee views these thresholds as consistent with its earlier date-based guidance.~~ 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.

JANUARY FOMC STATEMENT—ALTERNATIVE B

1. Information received since the Federal Open Market Committee met in ~~October~~ **December** ~~suggests~~ **indicates** that **growth in** economic activity ~~and employment have continued to expand at a moderate pace~~ **slowed** in recent months, ~~apart from~~ **in large part because of** weather-related disruptions **and other transitory factors**. **Employment has continued to expand at a moderate pace but** ~~Although~~ the unemployment rate ~~has declined somewhat since the summer, it~~ remains elevated. Household spending ~~has continued to~~ **and business fixed investment** advance**d**, and the housing sector has shown further ~~signs of~~ improvement~~, but growth in business fixed investment has slowed~~. Inflation has been running somewhat below the Committee's longer-run objective, apart from temporary variations that largely reflect fluctuations in energy prices. 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 ~~remains concerned~~ **expects** that, ~~without~~ **with** sufficient policy accommodation, economic growth ~~might not be strong enough to generate sustained improvement in labor market conditions~~ **will proceed at a moderate pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate**. ~~Furthermore,~~ **Although** strains in global financial markets ~~continue to pose~~ **have eased somewhat, the Committee continues to see** significant downside risks to the economic outlook **[, in part reflecting unresolved fiscal issues]**. The Committee also anticipates that inflation over the medium term likely will run at or below its 2 percent objective.

3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee will continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month **and**~~. The Committee also will purchase~~ longer-term Treasury securities ~~after its program to extend the average maturity of its holdings of Treasury securities is completed at the end of the year, initially~~ 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~~, in January, will resume~~ **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.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months. If the outlook for the labor market does not improve substantially, the Committee will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until such improvement is achieved in a context of price stability. In determining the size, pace, and composition of its asset purchases, the Committee will, as always, take appropriate account of the likely efficacy and costs of such purchases.

Alternatives

5. To support continued progress toward maximum employment and price stability, the Committee expects 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. ~~The Committee views these thresholds as consistent with its earlier date-based guidance.~~ 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.

JANUARY FOMC STATEMENT—ALTERNATIVE C

1. Information received since the Federal Open Market Committee met in ~~October~~ **December** ~~suggests~~ **indicates** that **growth in** economic activity ~~and employment have continued to expand at a moderate pace~~ **slowed** in recent months~~, apart from~~ **because of** weather-related disruptions **and other transitory factors**. Although the unemployment rate **remains elevated, it** has declined ~~somewhat since the summer, it remains elevated~~ **substantially during the past year**. Household spending ~~has continued to~~ **and business fixed investment** advance**d**, and the housing sector has shown further ~~signs of~~ improvement~~, but growth in business fixed investment has slowed~~. Inflation has been running somewhat below the Committee's longer-run objective, apart from temporary variations that largely reflect fluctuations in energy prices. 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 remains concerned that, without sufficient policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions.~~ **The Committee expects that economic growth will return to a moderate pace and that the unemployment rate will decline toward levels the Committee judges consistent with its dual mandate.** Furthermore, strains in global financial markets ~~continue to pose significant~~ **and the associated** downside risks to the economic outlook **appear to have diminished**. The Committee also anticipates that inflation over the medium term likely will run ~~at or below~~ **close to** its 2 percent objective.

3. **In light of the outlook for labor markets and inflation, and its current assessment of the likely efficacy and costs of further asset purchases, the Committee decided to reduce the pace of its asset purchases. In particular,** ~~To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate,~~ the Committee will ~~continue purchasing~~ **purchase** additional agency mortgage-backed securities at a pace of ~~$40~~ **$20** billion per month **and** ~~The Committee also will purchase~~ longer-term Treasury securities ~~after its program to extend the average maturity of its holdings of Treasury securities is completed at the end of the year, initially~~ at a pace of ~~$45~~ **$25** billion per month. The Committee ~~is maintaining its existing policy of~~ **will continue to** reinvest~~ing~~ principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and~~, in January, will resume~~ **to** roll~~ing~~ over maturing Treasury securities at auction. Taken together, these actions **will increase the Committee's holdings of longer-term securities and** should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to ~~make~~ **keep** broader financial conditions ~~more~~ accommodative.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months. **If the economy develops as anticipated, the Committee expects to further reduce the pace of its asset purchases in coming months and to bring them to an end by midyear. However,** if ~~the outlook for~~ the labor market does not improve ~~substantially~~ **as expected or if inflation is projected to be appreciably below 2 percent**, the Committee ~~will continue~~ **is prepared to maintain or increase the pace of** its purchases of ~~Treasury and agency mortgage-backed~~ **longer-term** securities, and employ its other policy tools as appropriate~~, until such improvement is achieved in a context of price stability~~. In determining the size, pace, and composition of its asset purchases, the Committee will, as always, take appropriate account of the likely efficacy and costs of such purchases.

5. To support continued progress toward maximum employment and price stability, the Committee expects 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. ~~The Committee views these thresholds as consistent with its earlier date-based guidance.~~ 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.

THE CASE FOR ALTERNATIVE B

Although output growth appears to have slowed substantially in the fourth quarter of 2012, the drop seems to have been caused largely or entirely by transitory factors: sizable reductions in federal purchases, inventory investment, and exports; plus disruptions to production in the aftermath of Hurricane Sandy. In contrast, the growth rate of private domestic final purchases (the sum of personal consumption expenditures, business fixed investment, and residential investment) apparently increased during the fourth quarter, reflecting double-digit growth in business fixed investment, residential investment, and consumer spending on durable goods (particularly motor vehicles). The slowdown in output growth was not reflected in job growth to any substantial extent; total payrolls expanded at a pace of about 150,000 per month during the fourth quarter—only a bit below the third quarter pace—and growth of private payrolls actually stepped up from the third quarter to the fourth. Even so, the unemployment rate flattened out at 7.8 percent during the fourth quarter, a level well above participants' estimates of the longer-run normal rate of unemployment. Moreover, policymakers may see other indicators of labor market conditions, including the fraction of employees who are working part-time for economic reasons and the still very high level of long-duration unemployment, as indicating that there is substantial slack in labor markets. At the same time, underlying inflation appears to be running somewhat below the Committee's longer-run objective: While the recent monthly readings on headline consumer price inflation were negative, the drop reflected declines in energy prices; the inflation rate for non-energy goods and services and its 12-month moving average remained positive but well below 2 percent.[1]

In light of the available information, the Committee might anticipate that the factors that generated sluggish output growth last quarter will not persist into this year. Moreover, policymakers might see the recent indicators and the passage of the American Taxpayer Relief Act (ATRA) as suggesting no more than modest changes in the medium-term outlook for economic activity relative to the outlook at the time of the December FOMC meeting, and hence may again conclude that economic activity is likely to grow at a moderate rate consistent with a gradual convergence to maximum employment over time if the Committee continues to implement the balance sheet and interest rate policies that it announced in December. At the same time, the Committee might judge that there are still substantial downside risks to the economic outlook, both because the ATRA left

[1] Similarly, core and trimmed mean PCE inflation, and their 12-month moving averages, remained positive but well under 2 percent.

a number of important fiscal policy issues unresolved and because financial strains in Europe, though currently off the front page, have not been fully addressed. Policymakers also might observe that market-based indicators of longer-term inflation expectations were essentially unchanged over the intermeeting period and remain near the middle of the range observed in recent years. Accordingly, participants may judge that inflation expectations remain well anchored. If so, the Committee might conclude that continuing the recent pace of asset purchases for the time being, keeping the federal funds rate at its current low level, and maintaining the recently introduced threshold-based forward guidance for the funds rate, as in Alternative B, are all appropriate steps to promote substantial improvement in labor market conditions and to help ensure that inflation converges to 2 percent over time.

Some policymakers might see a still-more-accommodative policy stance as both warranted and necessary to generate a substantial improvement in labor market conditions over time; they may judge that the benefits of a larger and longer-lasting flow of asset purchases that results in a considerable further expansion of the Federal Reserve's securities holdings would be likely to outweigh any costs. Some other policymakers may read the economy's resilience in the face of shocks during 2012 as evidence that the recovery has become self-sustaining, and anticipate that growth in output and employment will increase over time even with a reduction in the pace of asset purchases. Moreover, some participants may doubt that additional asset purchases would have an appreciable effect on the real economy, and think that the costs and risks associated with a sizable further expansion of the Committee's securities holdings would be likely to outweigh the benefits. All of these participants may nevertheless agree that the Committee will have more information, at the time of its March meeting, about the extent to which economic activity will rebound from its fourth quarter deceleration. They also may agree that the Committee will have a better understanding of the costs and benefits of large-scale asset purchases after completing the assessment of efficacy and costs that it will undertake during its March meeting, and therefore will be in a better position to convey its thinking about the likely path of future asset purchases. Accordingly, policymakers may consider it appropriate to announce that the Committee will continue asset purchases at their current pace while remaining alert for signs that the balance between the costs and benefits of asset purchases might be shifting.

With respect to the forward guidance for the federal funds rate, even policymakers who are skeptical that quantitative thresholds enhance the clarity and transparency of the Committee's policy communications may agree that it would be inappropriate to change or drop the threshold language so soon after adopting it. However, the December statement included a transitional sentence saying that the Committee saw the thresholds as consistent with its earlier date-based guidance; the draft alternatives for this meeting drop that sentence in order to allow the thresholds to guide market expectations regarding the time of liftoff.

The Desk's latest survey of primary dealers indicates that most dealers expect the flow-based asset purchases to end in the fourth quarter of 2013 or first quarter of 2014; as before, only a few dealers expect purchases to end before the fourth quarter of this year and no dealer expects purchases to end by midyear. The median dealer expects the Committee to continue purchasing agency-backed MBS at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month until the end of this year—implying a $1 trillion increase in the Federal Reserve's securities holdings during 2013. The median dealer also expects the Committee to acquire another $60 billion of longer-term Treasury securities, but no additional MBS, during the first quarter of 2014. The survey shows no significant change in the expected path of the federal funds rate or in the most likely date of liftoff. Thus, a statement along the lines of Alternative B would not surprise market participants and seems likely to generate little market reaction; it also would be unlikely to alter market participants' views on the likely pace or cumulative amount of future asset purchases.

THE CASE FOR ALTERNATIVE A

In light of the tax increases in the ATRA and the cuts in federal spending that are likely to come in the next few months—either from sequestration or from future action by the Congress, some policymakers may see the medium-term outlook as weak enough, or the downside risks as large enough, to warrant announcing further policy accommodation immediately, as in Alternative A. With the unemployment rate well above their estimates of its longer-run normal level, long-duration unemployment still quite elevated, and trend inflation running below the Committee's 2 percent objective, these participants may judge that the amount of policy accommodation provided by the Committee's recent decisions regarding flow-based asset purchases and quantitative thresholds is unlikely to be sufficient to generate satisfactory progress toward the Committee's goals of maximum employment and 2 percent inflation. Moreover, they may see the increases in longer-term interest rates since the December FOMC meeting as counterproductive, given that it does not appear to reflect an improvement in the modal economic outlook, and so may want to push back against the rise in rates.

Though they may agree that there has been some reduction in downside risks originating from the euro area in recent months, some policymakers may continue to see risks from unresolved fiscal issues in the United States and judge that the risks to the economic outlook are still heavily weighted to the downside. With the economy still well below maximum employment, inflation below target, and short-term interest rates at their effective lower bound, some participants might judge that the consequences of a new adverse shock would be significantly more costly than the consequences of providing more policy accommodation to spur faster growth and return inflation toward 2 percent and then discovering that economic growth or inflation rise more than expected. If so, they may see the degree of uncertainty about the outlook and the asymmetry in risks and potential costs as arguing for a further increase in policy accommodation.

If they hold these views, participants might favor Alternative A. Specifically, they might see increasing the pace of asset purchases to $100 billion per month (specifically, to $45 billion per month of agency MBS and $55 billion per month of longer-term Treasury securities) as appropriate to promote a more rapid decline in unemployment.[2] Policymakers may anticipate that an increase in the pace of purchases would raise market participants' expectations of the ultimate stock of securities that the Federal Reserve will acquire under its flow-based purchase program, thereby putting additional downward pressure on longer-term interest rates and making financial conditions more accommodative. Moreover, some policymakers might think that stepping up purchases of agency MBS would help strengthen the recovery in the housing sector, not only by putting further downward pressure on mortgage rates but perhaps also by spurring mortgage originators to expand capacity to process applications from a rising number of potential homebuyers. Participants may see a stronger recovery in the housing sector as generating additional benefits such as raising consumer confidence, boosting household wealth, and easing the credit constraints facing some households. Policymakers also may judge that reducing the unemployment rate threshold in the forward guidance to 5½ percent (from 6½ percent in the December statement) would push out investors' expectation of the date on which short term interest rates might begin

[2] The Desk anticipates that increasing the pace of agency MBS purchases to $45 billion per month and the pace of purchases of longer-term Treasury securities to $55 billion per month would be feasible and would not disrupt market functioning.

to rise—and, given the Committee's stated exit principles, of the time at which asset sales might begin—and thus help to reduce longer-term interest rates and make broader financial conditions more accommodative.[3]

An announcement along the lines of Alternative A certainly would surprise market participants. Indeed, no dealer expects the FOMC to increase the pace of purchases during the first half of this year. Increasing the monthly pace of purchases could prompt investors to revise up their projections of the total amount of securities that the Federal Reserve will acquire under its flow-based asset purchase program. Reducing the unemployment threshold to 5½ percent would suggest a longer period of very low funds rates than dealers currently expect. Longer-term real interest rates likely would decline if participants responded to a statement like Alternative A by increasing their projections of the cumulative increase in Federal Reserve securities holdings and flattening their expected path for the federal funds rate. Inflation compensation and equity prices probably would rise, and the dollar could depreciate. However, if investors read the statement of Alternative A as indicating that the FOMC now has a gloomier outlook for growth and employment, equity prices would rise less or could even decline. Moreover, changing one of the thresholds so soon after adopting them might create confusion about the extent to which the Committee feels bound by its forward guidance and increase the volatility in asset prices.

THE CASE FOR ALTERNATIVE C

Some participants might see the recent data as suggesting that, after taking account of temporary factors, the underlying pace of growth in economic activity improved in recent months. These policymakers might point to the apparent rebound in growth of business fixed investment during the fourth quarter, and to evidence of further

[3] Simulations of FRB/US with thresholds in effect suggest that keeping the funds rate near zero until the unemployment rate reaches 5½ percent (or projected inflation reaches 2½ percent), and then switching to the inertial Taylor (1999) rule, would reduce the unemployment rate by about 25 basis points in late 2014 and 40 basis points in late 2016, and return the economy to full employment two quarters sooner, relative to following the same approach with a 6½ percent threshold. The simulations also suggest that setting the unemployment threshold at 5½ percent would also yield about 25 basis points higher inflation from 2014 through 2016 than if the threshold were 6½ percent. With the current staff forecast as the underlying baseline, the simulation of Alternative A with a 5½ percent threshold for unemployment and a 2½ percent threshold for projected inflation (and with securities purchases at a pace of $100 billion per month through the middle of this year, followed by tapering to zero at year-end) produces outcomes for unemployment and inflation that are quite close to the constrained optimal control paths shown in the final set of charts in the Monetary Policy Strategies section of this Tealbook.

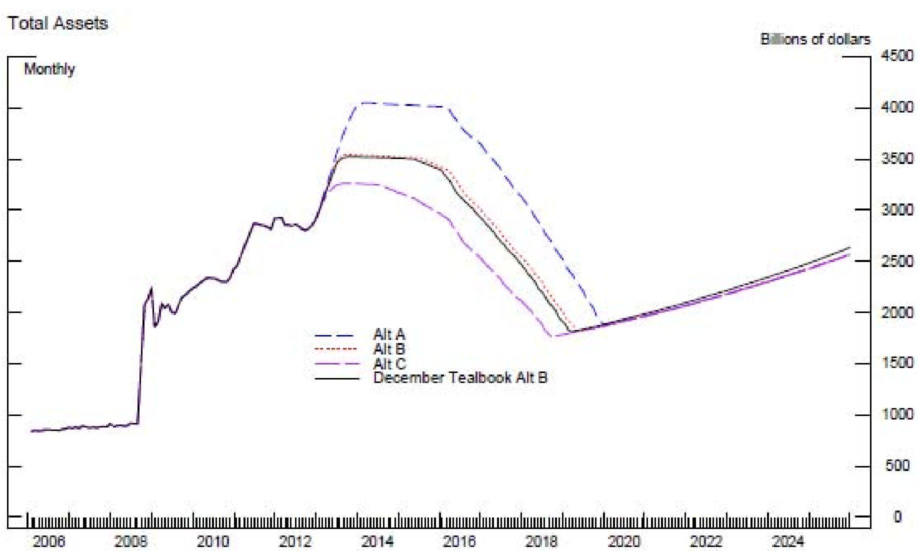
improvement in the housing sector. Indeed, after smoothing through the fluctuations in recent data, some policymakers may see the economy as likely to be on a sustainable course that will be associated with ongoing improvements in labor market conditions. Moreover, they may view financial strains in Europe—and the corresponding downside risks to the U.S. economy—as having eased further since December. They also may see the ATRA as having substantially reduced uncertainty about future tax rates—and thus as having reduced an impediment to growth—even if it left other fiscal issues unresolved for now. If so, these policymakers might see the monetary policy actions that the Committee has set in train since September as likely to provide too much policy accommodation, leading to an undesirable rise in future inflation that could prove difficult to reverse. As a result, they may choose to slow the pace of asset purchases immediately, to signal a high likelihood of further reductions in the pace of purchases in coming months, and to announce that the Committee expects to end asset purchases by midyear if the economy develops as anticipated, as in Alternative C.

Some policymakers may regard the potential benefits of additional asset purchases under present circumstances as likely to be small and as unlikely to outweigh the associated costs. They may be skeptical that additional purchases would have a significant effect on growth in output and employment. For example, they may feel that lower longer-term interest rates would prompt corporations to restructure their balance sheets but have little impact on their investment and hiring decisions. Alternatively, participants might worry that further Federal Reserve purchases of safe assets when interest rates are already quite low could lead to excessive risk-taking and other imbalances that might undermine financial stability over time. Even if they judge that further asset purchases would offer some benefit, participants may be concerned that anything more than a modest further increase in the size of the SOMA securities portfolio could greatly complicate exit from the current highly accommodative policy stance. In particular, they may be concerned that selling an even larger MBS portfolio over three to five years—as envisioned in the exit principles announced by the Committee in June 2011—would prove difficult and would disrupt issuance of new MBS. In addition, they might see further asset purchases as substantially raising the odds that the Federal Reserve would realize significant losses during the eventual normalization of policy, and be concerned about the potentially difficult communications and political issues that such losses could raise. Moreover, policymakers may worry that changing the exit strategy could weaken the credibility of the Committee's future monetary policy announcements. Such concerns might lead policymakers to prefer a policy action and associated statement like that in Alternative C. Indeed, some participants might prefer to end asset purchases immediately rather than tapering purchases to midyear. Some other policymakers, however, might find it appropriate to slow the pace of purchases without stating that the Committee intends to reduce the pace to zero by midyear. They might see doing so as giving the Committee more time to assess the efficacy, costs, and risks of its purchase program, or as reducing the risk that ongoing purchases will cause disruptions in market functioning.

A statement like of Alternative C would come as a considerable surprise to market participants and might well be interpreted as signaling a significantly earlier removal of policy accommodation than investors had expected. According to the Desk's survey, most dealers expect purchases of longer-term securities to continue at their present pace well beyond midyear. Hence a statement along the lines of Alternative C likely would lead investors to mark down significantly their expectations of the Committee's cumulative asset purchases and so cause an increase in longer-term yields. In addition, the changes to the Committee's inflation outlook and its assessment of risks—in paragraph 2 of the statement—might cause an upward shift in market participants' expectations of the likely path for the federal funds rate, reinforcing the increase in intermediate- and long-term interest rates. Equity prices would probably fall, and the dollar might appreciate.

LONG-RUN PROJECTIONS OF THE BALANCE SHEET AND MONETARY BASE

The staff has prepared three scenarios for the Federal Reserve's balance sheet that correspond to Alternatives A, B, and C. All three policy alternatives include additional asset purchases in 2013.[4] Alternative B continues purchases at the monthly rates that the Committee specified in its December statement, $45 billion per month of longer-term Treasury securities and $40 billion per month of agency MBS. Alternative A increases the pace of securities purchases, while Alternative C decreases the pace. All three alternatives maintain the 0 to ¼ percent target range for the federal funds rate and retain threshold-based forward guidance for the funds rate based on the outlook for unemployment and inflation. Projections under each scenario are based on assumptions about the trajectory of various components of the balance sheet. Details of these assumptions, as well as projections for each major component of the balance sheet, can be found in Explanatory Note D.[5]



[4] As announced in December, the Committee is assumed to maintain its policy of reinvesting principal payments from Treasury securities at auction. It is also assumed to continue reinvesting principal payments from agency MBS and agency debt securities into agency MBS. The effect of assuming reinvestment of Treasury securities at auction is very modest; as a result of the maturity extension program, there are currently less than $6 billion of Treasury securities in the SOMA portfolio that mature before January 2016.

[5] The entire expected path of the portfolio has implications for the evolution of economic activity, interest rates and Federal Reserve income. To the extent that market participants have different expectations for the size, pace, and composition of purchases as well as the execution of the exit strategy than is assumed in these scenarios, the resulting effects on economic activity, interest rates and Federal Reserve income will differ from those presented here.

For the balance sheet scenario that corresponds to Alternative B, the Committee is assumed to continue MBS purchases at $40 billion per month and purchases of longer-term Treasury securities of $45 billion per month through June 2013. These roughly $500 billion in additional purchases in 2013, when combined with the $250 billion in purchases from October through December 2012, imply a total expansion of SOMA holdings of longer-term securities of about $750 billion.[6] This scenario might be viewed as roughly consistent with the description of asset purchases in the statement language of Alternative B.[7] Overall, under this scenario, SOMA securities holdings are about $3.3 trillion at the end of December 2013.

In the Alternative B scenario, we assume that the first increase in the target federal funds rate is in December 2015, as in the staff forecast.[8] The date of liftoff is a key determinant of the trajectory of the balance sheet. In June 2015, six months before the first increase in the target federal funds rate, all reinvestment is assumed to cease, and the SOMA portfolio begins to contract. In June 2016, six months after the initial increase in the target federal funds rate, the Committee begins to sell its holdings of agency securities at a pace that reduces the amount of these securities in the portfolio to zero in five years, that is, by May 2021. Through these redemptions and sales, the size of the portfolio is normalized by May 2019.[9, 10] The balance sheet then begins to expand, with

[6] Although the SOMA portfolio's holdings of longer-term securities increases by about $750 billion between October 2012 and June 2013, total securities holdings increase by less because of the asset sales and redemptions under the maturity extension program.

[7] The statement indicates that the Committee will continue asset purchases until a substantial improvement in the outlook for the labor market is achieved in a context of price stability. It also notes that the Committee will "take appropriate account of the likely efficacy and costs of such purchases." In the staff economic outlook, by mid-2013, there will be accumulating evidence of a pickup in economic growth and an outlook for substantial improvement in the unemployment rate, which is projected to decline from near 7¾ percent in mid-2013 to 7¼ percent in mid-2014 and to 7 percent in late 2014. Alternatively, by mid-2013, the Committee could end the purchase program based on its assessment of the efficacy and costs of additional asset purchases.

[8] At the time of liftoff, the unemployment rate is projected to be just below 6.5 percent, and core PCE inflation is expected to be 1.7 percent. This liftoff date for the federal funds rate is two months later than that assumed in the balance sheet projections for Alternative B in the December Tealbook.

[9] The tools to drain reserve balances (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.

[10] The size of the balance sheet is assumed to be normalized when the securities portfolio reverts to its longer-run trend level, 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

increases in SOMA holdings essentially matching the growth of Federal Reserve Bank capital and currency in circulation. Total assets are $2.6 trillion at the end of 2025.

The additional purchases of securities through the middle of 2013 significantly increase the level of SOMA holdings and reserve balances through the medium term. Sales of agency MBS after the federal funds rate increases are projected to result in realized capital losses.[11] These capital losses in conjunction with the rise in interest expense on reserve balances substantially reduce Federal Reserve net income; however, Federal Reserve remittances to the Treasury are projected to remain positive and no deferred asset is recorded.

In the scenario for Alternative A, the Committee is assumed to step-up the pace of purchases of longer-term Treasury securities to $55 billion per month and of agency MBS to $45 billion per month, starting in February. Around midyear, the Committee is assumed to begin to taper purchases and at year-end it stops all purchases. These purchases total $1 trillion in 2013, which, when combined with the $250 billion in purchases from October through December 2012, ultimately expand the SOMA portfolio's holdings of longer-term securities by about $1.25 trillion. This scenario might be viewed as roughly consistent with the descriptions of asset purchases in the statement language of Alternative A.[12] The Committee continues reinvesting principal payments from agency MBS and agency debt securities into agency MBS and maintains its policy of rolling over maturing Treasury securities at auction. In this scenario, SOMA security holdings increase to $3.8 trillion. In the Alternative A scenario, we assume that the first increase in the target federal funds rate is pushed out to July 2016, consistent with the reduction in the threshold for the unemployment rate to 5½ percent in the statement language. In January 2016, six months prior to the assumed first increase in the federal funds rate, all reinvestments are projected to cease and the SOMA portfolio begins to contract. Six months after the lift off of the federal funds rate, sales of agency securities

conduct monetary policy; currently, we assume that level of reserve balances to be $25 billion. A higher steady-state level for reserve balances would, all else equal, lead to an earlier normalization of the size of the balance sheet.

[11] Under Reserve Bank accounting, securities held in the SOMA portfolio are recorded on an amortized cost basis. As a result, realized losses and gains on securities sold affect the Federal Reserve's net income; unrealized losses and gains are not reflected in net income.

[12] Under the staff's baseline forecast, by late 2013, the unemployment rate will have fallen to 7.6 percent and real GDP will be expanding at about a 3 percent annual rate. The outlook for labor market conditions as of late 2013 would include a half percentage point decline in the unemployment rate through late 2014 and a one and a quarter percentage point decline through late 2015. Alternative A provides more policy accommodation than in the staff forecasts, suggesting an even stronger outlook.

begin and continue for five years. The size of the portfolio is normalized by January 2020—about three-and-a-half years after sales begin, and somewhat longer than the timeframe anticipated in the exit strategy principles.[13]

The additional purchases of securities in this scenario substantially boost the level of reserve balances. As the federal funds rate rises in 2016, 2017, and 2018, the interest expense on reserve balances increases quickly. The interest expense combined with the losses realized on the sales of agency MBS result in a very low level of remittances to the Treasury in 2018, but no deferred asset is recorded.[14]

For the scenario that corresponds to Alternative C, the Committee is assumed to decrease the pace of purchases of longer-term Treasury securities to $25 billion per month and of agency MBS to $20 billion per month in February and March. In the second quarter, the Committee further reduces its purchase pace and completes all purchases by the end of June. The purchases total $250 billion in 2013, resulting in cumulative purchases of $500 billion in longer-term securities since October 2012. In this scenario, the federal funds rate is assumed to lift off in December 2014, one year earlier than in Alternative B.[15] Corresponding to this earlier increase in the federal funds rate, reinvestment of principal from maturing or prepaying securities end and redemptions begin in June 2014, and the portfolio begins to contract. Sales of agency securities commence in June 2015 and last for five years. SOMA securities holdings in this scenario peak at $3.0 trillion, and the size of the balance sheet is normalized in September 2018, eight months earlier than under Alternative B.

Across scenarios, the peak amount of reserve balances and the level of reserve balances outstanding at liftoff are directly related to the magnitude of assumed asset purchases. Under Alternative A, reserve balances peak at about $2.7 trillion, while under Alternative B, reserve balances peak at $2.2 trillion. Under Alternative C, reserve

[13] In Alternative A, MBS are sold over a five-year period in order to be consistent with the timing assumed in Alternative B. If sales were assumed to be completed over about three and a half years, the portfolio would normalize in three years. However, the sales pace implied by this strategy could possibly be near the upper-end of the sustainable pace of sales that would preserve market functioning.

[14] Relative to the December Tealbook Alternative A, this projection does not record a deferred asset. This change reflects the staff's downward revision to long-run potential GDP growth, which implies slightly lower interest rate paths from 2017 onward relative to the last Tealbook; the lower interest rate paths reduce projected realized capital losses relative to projections in the December Tealbook.

[15] The scaling back of the asset purchase program may be seen as consistent with a stronger economy than in the baseline, suggesting that it would be appropriate to raise the funds rate sooner than under the baseline projection.

balances rise from their current level to $1.9 trillion. For the scenario corresponding to Alternative A, reserve balances are $2.2 trillion when the federal funds rate lifts off from its lower bound in July 2016. For the scenario corresponding to Alternative B, reserve balances are $1.9 trillion when the federal funds rate lifts off from its lower bound in December 2015. For the scenario corresponding to Alternative C, reserve balances are $1.7 trillion when the federal funds rate lifts off from its lower bound in December 2014.

In the scenario corresponding to Alternative B, the monetary base increases significantly from 2012 to 2013 because of the purchase program and the accompanying increase in reserve balances. Once exit begins, the monetary base shrinks rapidly through the second quarter of 2019, primarily reflecting a decline in reserve balances as securities are redeemed or sold. Starting in the third quarter of 2019, after reserve balances are assumed to have stabilized at $25 billion, the monetary base begins to expand, in line with the growth of Federal Reserve notes in circulation. Under Alternative A, the monetary base increases from 2012 to 2014 as the level of reserve balances climbs in concert with the expansion of the Federal Reserve's balance sheet. The base then contracts during the exit until after the size of the portfolio is normalized. Under Alternative C, the monetary base increases from 2012 to 2013 because of the purchase program and then contracts, on net, until after the size of the portfolio is normalized.

Alternatives

Growth Rates for the Monetary Base

Date	Alternative B	Alternative A	Alternative C	December Alternative B
Percent, annual rate				
Monthly				
Apr-12	-12.2	-12.2	-12.2	-12.2
May-12	-8.7	-8.7	-8.7	-8.7
Jun-12	-5.1	-5.1	-5.1	-5.1
Jul-12	7.7	7.7	7.7	7.7
Aug-12	7.8	7.8	7.8	7.8
Sep-12	-12.4	-12.4	-12.4	-12.4
Oct-12	-8.9	-8.9	-8.9	-8.9
Nov-12	11.1	11.1	11.1	32.6
Dec-12	14.7	14.7	14.7	37.9
Quarterly				
2011 Q3	21.0	21.0	21.0	21.0
2011 Q4	-5.9	-5.9	-5.9	-5.9
2012 Q1	5.5	5.5	5.5	5.5
2012 Q2	-3.9	-3.9	-3.9	-3.9
2012 Q3	0.8	0.8	0.8	0.8
2012 Q4	-0.8	-0.8	-0.8	6.6
2013 Q1	35.3	36.6	32.7	36.4
2013 Q2	43.0	48.5	27.2	30.2
Annual - Q4 to Q4				
2010	0.9	0.9	0.9	0.9
2011	32.9	32.9	32.9	32.9
2012	0.4	0.4	0.4	2.2
2013	28.2	42.9	17.6	25.7
2014	-0.8	2.6	-1.9	-0.6
2015	-2.0	-0.8	-4.9	-1.3
2016	-10.5	-6.9	-14.9	-13.2
2017	-16.3	-14.3	-17.9	-16.5
2018	-21.7	-20.0	-19.8	-23.4
2019	-12.5	-27.3	4.0	-7.4
2020	4.6	4.6	4.6	4.6
2021	4.5	4.3	4.5	4.6
2022	4.6	4.5	4.6	4.6
2023	4.6	4.5	4.6	4.7
2024	4.5	4.5	4.5	4.7
2025	4.5	4.5	4.5	4.7

Note: Not seasonally adjusted.

DEBT, BANK CREDIT, AND MONEY FORECASTS

Domestic nonfinancial sector debt is projected to expand over the forecast period ending in 2015 at an average annual rate of 3¾ percent, about one percentage point lower than in 2012, as growth of federal government debt steps down and private nonfinancial debt accelerates somewhat. We forecast that nonfinancial business debt will grow at a moderate rate over the projection period, consistent with the anticipated pace of investment spending. Having contracted for the past five years, home mortgage debt is expected to grow slowly over the forecast period, as still tight financing conditions and a substantial amount of negative home equity are expected to continue to weigh on debt growth. Meanwhile, we project that consumer credit will grow at a robust pace over the forecast horizon, reflecting continued strong demand for student and auto loans and a pickup in spending on consumer durables.

Commercial bank credit is expected to increase moderately over the forecast period. Core loans—the sum of commercial and industrial (C&I), real estate, and consumer loans—are projected to rise gradually through 2015. Following rapid growth in 2012, we anticipate that C&I loans will expand more in line with nominal GDP growth over the medium term. Commercial real estate loans are projected to accelerate modestly over the forecast period, as several factors that are currently restraining growth—high vacancy rates, depressed prices for commercial properties, and the poor credit quality of existing loans—are likely to ease somewhat. The growth rates of residential real estate loans on banks' books and consumer loans on banks' books are both expected to step up slightly from their currently weak paces, reflecting some further gradual easing of standards and terms on such loans as the economy strengthens. Banks' securities holdings are projected to rise more slowly during the forecast period than they did in 2012 as deposit growth ebbs and demand for bank loans strengthens.

In the first half of 2013, we expect growth in both M2 and its largest component, liquid deposits, to be moderate in comparison with the rapid expansion observed over recent years as investors gradually react to the expiration of the unlimited FDIC insurance on noninterest-bearing transaction deposits, thereby dampening growth of M2 assets.[16] Subsequently, M2 is forecast to continue to grow at a pace below that of

16 The Dodd-Frank Act provided temporary, unlimited deposit insurance coverage for noninterest-bearing transaction accounts at FDIC-insured institutions from December 31, 2010, through December 31, 2012. For additional background, see the box "Expiration of Unlimited FDIC Deposit Insurance" in the Financial Developments section of Tealbook Book A.

nominal income, as the expected improvement in financial and economic conditions over the forecast period encourages investors to reallocate their portfolios away from M2 assets and toward riskier investments. M2 is projected to contract toward the end of 2015 in response to the anticipated increase in short-term market interest rates and the accompanying rise in the opportunity cost of holding money.

Growth Rates for M2	
(Percent, seasonally adjusted annual rate)	
Monthly Growth Rates	Tealbook Forecast*
Jun-12	6.2
Jul-12	11.1
Aug-12	8.7
Sep-12	9.1
Oct-12	9.9
Nov-12	6.0
Dec-12	12.7
Jan-13	3.3
Feb-13	1.0
Mar-13	0.7
Apr-13	0.6
May-13	0.6
Quarterly Growth Rates	
2012 Q3	8.6
2012 Q4	9.1
2013 Q1	4.9
2013 Q2	0.6
2013 Q3	1.9
2013 Q4	2.0
2014 Q1	1.9
2014 Q2	2.5
2014 Q3	2.9
2014 Q4	3.1
Annual Growth Rates	
2012	7.5
2013	2.4
2014	2.6
2015	1.7

*This forecast is consistent with nominal GDP and interest rates in the Tealbook forecast. Actual data through January 14, 2013; projections thereafter.

Alternatives

DIRECTIVE

The directive that was issued in December appears on the next page, followed by drafts for a January directive that correspond to each of the policy alternatives. These drafts suggest a number of updates to make the language of the directive consistent with the Committee's post-meeting statements.

The draft directive for Alternative B instructs the Desk to continue purchasing additional agency MBS 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 A directs the Desk to purchase additional agency MBS at a pace of about $45 billion per month and to purchase longer-term Treasury securities at a pace of about $55 billion per month. The draft directive for Alternative C instructs the Desk to purchases agency MBS at a pace of about $20 billion per month and to purchase longer-term Treasury securities at a pace of about $25 billion per month. None of the directives specifies an end-date for purchases, but the draft statement for Alternative C indicates that the Committee expects to end purchases by midyear. All three of the draft directives direct the Desk to continue the current practice of reinvesting principal payments on all agency debt and agency MBS in agency MBS. All three also instruct the Desk to continue rolling over maturing Treasury securities at auction.

December directive

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, 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 complete the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about $267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about $267 billion. Following the completion of this program, the Committee directs the Desk to resume its policy of rolling over maturing Treasury securities into new issues. From the beginning of January, the Desk is directed to purchase longer-term Treasury securities at a pace of about $45 billion per month. The Committee directs the Desk to maintain its existing policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities. The Desk is also directed to continue purchasing agency mortgage-backed securities at a pace of about $40 billion per month. The Committee directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency MBS transactions. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

Alternatives

Directive for January 2013 Alternative A

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster **maximum employment** and ~~promote sustainable growth in output~~ price stability. ~~To further its long-run objectives~~**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 ~~complete the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about \$267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about \$267 billion~~ **undertake open market operations as necessary to maintain such conditions**. ~~From the beginning of January~~ **Beginning February 1**, the Desk is directed to **increase the pace of** purchase**s of** longer-term Treasury securities ~~at a pace of~~ **to** about ~~\$45~~ **\$55** billion per month ~~The Desk is also directed to continue purchasing~~ **and to increase the pace of purchases of** agency mortgage-backed securities ~~at a pace of~~ **to** about ~~\$40~~ **\$45** 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 MBS transactions. ~~Following the completion of this program,~~ The Committee directs the Desk to ~~resume~~ **maintain** its policy of rolling over maturing Treasury securities into new issues **and** ~~The Committee directs the Desk to maintain~~ its ~~existing~~ policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities ~~in the System Open Market Account~~ 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 January 2013 Alternative B

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster **maximum employment** and ~~promote sustainable growth in output~~ price stability. ~~To further its long-run objectives~~ **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 ~~complete the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about $267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about $267 billion~~ **undertake open market operations as necessary to maintain such conditions**. ~~From the beginning of January,~~ The Desk is directed to **continue** purchas**ing** longer-term Treasury securities at a pace of about $45 billion per month **and** ~~The Desk is also directed~~ 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 MBS transactions. ~~Following the completion of this program~~ The Committee directs the Desk to ~~resume~~ **maintain** its policy of rolling over maturing Treasury securities into new issues **and** ~~The Committee directs the Desk to maintain~~ its ~~existing~~ policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities ~~in the System Open Market Account~~ 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 January 2013 Alternative C

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster **maximum employment** and ~~promote sustainable growth in output~~ price stability. ~~To further its long-run objectives~~ **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 ~~complete the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about \$267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about \$267 billion~~ **undertake open market operations as necessary to maintain such conditions**. ~~From the beginning of January~~ **Beginning February 1**, the Desk is directed to **reduce the pace of** purchase**s of** longer-term Treasury securities ~~at a pace of~~ **to** about ~~\$45~~ **\$25** billion per month ~~The Desk is also directed to continue purchasing~~ **and to reduce the pace of purchases of** agency mortgage-backed securities ~~at a pace of~~ **to** about ~~\$40~~ **\$20** 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 MBS transactions. ~~Following the completion of this program,~~ The Committee directs the Desk to ~~resume~~ **maintain** its policy of rolling over maturing Treasury securities into new issues **and** ~~The Committee directs the Desk to maintain~~ its ~~existing~~ policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities ~~in the System Open Market Account~~ 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.

Explanatory Notes

A. 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 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 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 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	$R_t = R_{t-1} + 0.5(\pi_{t+3\|t} - \pi^*) + 0.5\Delta^4 gap_{t+3\|t}$
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 intercept of the inertial Taylor (1999) rule, are set at 2 percent for the same reason. The 2 percent

[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 2 ¼ 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.

Explanatory Notes

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, quarterly real interest rate; see Orphanides (2003).

Near-term prescriptions from these rules are calculated using Tealbook projections for inflation and the output gap. The inertial Taylor (1999) rule, the first-difference rule, the estimated outcome-based rule, and the nominal income targeting rule include the lagged policy rate as a right-hand-side variable. When the Tealbook is published early in the quarter, the lines denoted "Previous Tealbook" report rule prescriptions based on the previous Tealbook's staff outlook, jumping off from the actual value of the lagged funds rate in the previous quarter. When the Tealbook is published late in the quarter, 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 this quarter.

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.

B. 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 the projection for the economy of 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 estimate reported is 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.

C. 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. The 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.

D. Long-Run Projections of the Balance Sheet and Monetary Base

This explanatory note presents the assumptions underlying the projections provided in the section titled "Long-Run Projections of the Balance Sheet and Monetary Base," as well as projections for each major component of the balance sheet.

GENERAL ASSUMPTIONS

The balance sheet projections are constructed at a monthly frequency from January 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 December 31, 2012. 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 December 2015. This date of liftoff is consistent with the current staff economic forecast and the thresholds described in the December 2012 FOMC statement, and it is two months later than assumed in the balance sheet projections for Alternative B in the December Tealbook. The projections for the scenario corresponding to Alternative A assume the target federal funds rate lifts off in July 2016, consistent with the thresholds described in the proposed Alternative A statement language and seven months later than in Alternative B. The projections for the scenario corresponding to Alternative C assume the target federal funds rate lifts off in December 2014, a year earlier than in Alternative B. In each case, the balance sheet projections assume that no use of short-term draining tools is necessary to achieve the projected path for the target federal funds rate.[3]

[3] If term deposits or reverse repurchase agreements were used to drain reserves prior to raising the federal funds rate, 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 Treasury securities presented here remain valid.

Explanatory Notes

ASSETS

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

- The assumptions under Alternative B are:
  - The Committee is assumed to continue purchases of Treasury securities at a pace of $45 billion per month and purchases of MBS at a pace of $40 billion per month through June. The Treasury securities purchased are assumed to have an average duration of about nine years. The purchases between October 2012 and June 2013 expand the SOMA portfolio's holdings of longer-term securities by about $750 billion.
  - The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS.
  - Starting in June 2015—six months 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.
  - The Federal Reserve begins to sell agency MBS and agency debt securities in June 2016, six months after the assumed date of the first increase in the target federal funds rate. Holdings of agency securities are reduced over five years and reach zero by May 2021.
  - 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 from the Tealbook.[4] The projected rate of prepayment is sensitive to these underlying assumptions.

- In the scenario corresponding to Alternative A, the Committee is assumed to increase the monthly pace of purchases to $55 billion of longer-term Treasury securities and $45 billion of MBS from February through June 2013. After June 2013, the pace of purchases slows, and purchases end in December 2013. The Treasury securities purchased are assumed to have an average duration of about nine years. These purchases expand the SOMA portfolio's holdings of longer-term securities by $1.25 trillion between October 2012 and December 2013. In addition, the Committee is assumed to maintain its existing policy of reinvesting principal payments from its holdings of agency debt and agency MBS in agency MBS. In January 2016, six months prior to the assumed increase in the target federal funds rate in July 2016, principal payments from all securities are allowed to roll off the portfolio. Sales of agency securities begin in January 2017 and continue for five years.

- In the scenario corresponding to Alternative C, the Committee is assumed decrease the monthly pace of purchases to $25 billion of longer-term Treasury securities and $20

[4] Projected prepayments of agency MBS reflect interest rate projections as of January 22, 2013.

Explanatory Notes

billion MBS in February and March 2013. After March 2013, the pace of purchases slows further, and purchases end in June 2013. The Treasury securities purchased are assumed to have an average duration of about nine years. These purchases expand the SOMA portfolio's holdings of longer-term securities by $500 billion between October 2012 and June 2013. The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS until June 2014—six months prior to the assumed increase in the target federal funds rate under this alternative. Starting in June 2014, all securities are allowed to roll off the portfolio as they mature or prepay. The Federal Reserve begins to sell agency MBS and agency debt securities in June 2015. Holdings of agency securities are reduced over five years and reach zero by May 2020.

- Because current and expected interest rates in the near term are below the average coupon rate on outstanding Treasury securities, the market value at which these securities are purchased will generally exceed their face value, with a larger premium for longer-maturity securities. As a result, in Alternatives A, B, and C, premiums are boosted by roughly $38 billion, $24 billion, and $6 billion, respectively, by the time asset purchases end relative to a scenario without these Treasury securities purchases. The increase in premiums is reflected in higher total assets and in higher reserve balances.
- The asset purchases under all three alternatives put downward pressure on market interest rates, in particular primary and secondary mortgage rates.
- The current and near-term market values of new agency MBS purchases are assumed to be four percent above face value. As a result, for Alternatives A, B, and C, the $572 billion, $360 billion, and $230 billion of agency MBS purchases, respectively, will cause unamortized premiums on the Federal Reserve's balance sheet to rise by roughly $23 billion, $14 billion, and $9 billion, respectively, relative to a scenario without these MBS purchases. The increase in premiums is reflected in higher total assets and in higher reserve balances.
- The level of central bank liquidity swaps is assumed to decline, as draws under the recent foreign central bank swap auctions mature, and is assumed to return to zero in 2014.
- In all three 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.

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 $1 billion currently to zero in 2015. Assets held by TALF LLC consist of investments of commitment fees collected by the LLC and the U.S. Treasury's initial funding. On January 15, 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 equal, approximately, the excess of the TALF LLC cash balance over the amount of outstanding TALF loans. The first payment occurs in February, and payments will continue as TALF loans are repaid. In this projection, the LLC is assumed not to 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.)
- The assets held by Maiden Lane LLC decline to zero in 2016.

LIABILITIES AND CAPITAL

- Federal Reserve notes in circulation grow in line with the staff forecast for money stock currency through 2015. Afterwards, Federal Reserve notes in circulation grow at the same rate as nominal GDP in the extended Tealbook projection.
- The level of reverse repurchase agreements (RRPs) is assumed to be around $70 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 as 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 grows 15 percent per year, in line with the average rate of the past ten years.[5]
- 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.

[5] The annual growth rate of capital affects the date of normalization of the size of the balance sheet and the size of the SOMA portfolio. Growth in Reserve Bank capital has been modest over the past two years; however, even if Federal Reserve capital were assumed to be constant, normalization only would be pushed later by about a quarter.

- 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. The alternatives do not presently record a deferred asset.

TERM PREMIUM EFFECTS[6]

- Under Alternative A, the term premium effect on the yield of the ten-year Treasury note is negative 117 basis points in the current quarter. The effect wanes over time as the length of time the securities will be held by the Federal Reserve shortens and as securities subsequently roll off the portfolio or are sold until the size of the portfolio is normalized.
- Under Alternative B, the contemporaneous term premium effect is negative 109 basis points. This estimate is between the term premium effect associated with a $1.25 trillion purchase program and the term premium effect associated with a $750 billion purchase program. Over the first half of this year, as market participants come to realize that the purchases will end in June, the term premium effect converges to one associated with a $750 billion purchase program. 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 term premium effect is negative 80 basis points. The effect is less negative than in Alternative B because there are fewer securities purchases in 2013 and the liftoff date is earlier so asset sales begin sooner than under Alternatives B and A.

[6] 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 "Term Structure Modeling with Supply Factors and the Federal Reserve's Large Scale Asset Purchase Programs" by Li and Wei, FEDS working paper #37, 2012.

10-Year Treasury Term Premium Effect				
Date	Alternative B	Alternative A	Alternative C	December Alternative B
Basis Points Quarterly Averages				
2013 Q1	-109	-117	-80	-104
2013 Q2	-99	-114	-75	-94
2013 Q3	-88	-110	-71	-83
2013 Q4	-83	-104	-66	-78
2014 Q1	-78	-99	-61	-73
2014 Q2	-73	-93	-57	-69
2014 Q3	-68	-88	-53	-64
2014 Q4	-63	-82	-48	-59
2015 Q1	-59	-77	-44	-55
2015 Q2	-54	-72	-40	-51
2015 Q3	-50	-66	-37	-47
2015 Q4	-46	-62	-33	-43
2016 Q4	-32	-44	-22	-29
2017 Q4	-21	-30	-15	-20
2018 Q4	-15	-21	-11	-14
2019 Q4	-12	-15	-10	-11
2020 Q4	-10	-12	-9	-10
2021 Q4	-9	-11	-9	-9
2022 Q4	-8	-9	-7	-8
2023 Q4	-6	-7	-6	-6
2024 Q4	-5	-5	-4	-4
2025 Q4	-3	-4	-3	-3

Federal Reserve Balance Sheet
End-of-Year Projections -- Jan TB Alt B

Billions of dollars

	Dec 31, 2012	2013	2015	2017	2019	2021	2023	2025
Total assets	2,919	3,541	3,431	2,546	1,869	2,068	2,303	2,569
Selected assets								
Liquidity programs for financial firms	9	8	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	9	8	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	2,670	3,267	3,201	2,361	1,722	1,946	2,190	2,464
U.S. Treasury securities	1,666	1,930	1,927	1,549	1,384	1,946	2,190	2,464
Agency debt securities	77	57	33	4	2	0	0	0
Agency mortgage-backed securities	927	1,279	1,241	808	335	0	0	0
Net portfolio holdings of TALF LLC	1	1	0	0	0	0	0	0
Total other assets	237	264	230	185	147	122	113	105
Total liabilities	2,864	3,478	3,348	2,436	1,723	1,876	2,048	2,232
Selected liabilities								
Federal Reserve notes in circulation	1,127	1,196	1,348	1,481	1,608	1,761	1,933	2,117
Reverse repurchase agreements	107	70	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,618	2,202	1,920	877	36	36	36	36
Reserve balances held by depository institutions	1,492	2,102	1,908	865	25	25	25	25
U.S. Treasury, General Account	93	93	5	5	5	5	5	5
Other Deposits	34	6	6	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	63	83	110	146	192	255	337

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

Explanatory Notes

Federal Reserve Balance Sheet
End-of-Year Projections -- Jan TB Alt A

Billions of dollars

	Dec 31, 2012	2013	2015	2017	2019	2021	2023	2025
Total assets	2,919	4,018	4,013	3,136	1,879	2,068	2,300	2,568
Selected assets								
Liquidity programs for financial firms	9	8	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	9	8	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	2,670	3,719	3,758	2,929	1,716	1,938	2,181	2,457
U.S. Treasury securities	1,666	2,208	2,208	1,824	1,163	1,938	2,181	2,457
Agency debt securities	77	57	33	4	2	0	0	0
Agency mortgage-backed securities	927	1,453	1,517	1,101	550	0	0	0
Net portfolio holdings of TALF LLC	1	1	0	0	0	0	0	0
Total other assets	237	289	255	207	164	130	119	110
Total liabilities	2,864	3,955	3,930	3,026	1,734	1,876	2,045	2,231
Selected liabilities								
Federal Reserve notes in circulation	1,127	1,196	1,348	1,491	1,614	1,760	1,929	2,115
Reverse repurchase agreements	107	70	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,618	2,677	2,500	1,454	40	36	36	36
Reserve balances held by depository institutions	1,492	2,577	2,401	1,443	28	25	25	25
U.S. Treasury, General Account	93	93	93	5	5	5	5	5
Other Deposits	34	6	6	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	63	83	110	146	192	255	337

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

Explanatory Notes

Federal Reserve Balance Sheet
End-of-Year Projections -- Jan TB Alt C

Billions of dollars

	Dec 31, 2012	2013	2015	2017	2019	2021	2023	2025
Total assets	2,919	3,262	2,970	2,115	1,869	2,068	2,303	2,569
Selected assets								
Liquidity programs for financial firms	9	8	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	9	8	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	2,670	3,011	2,766	1,952	1,738	1,954	2,197	2,470
U.S. Treasury securities	1,666	1,800	1,797	1,435	1,648	1,954	2,197	2,470
Agency debt securities	77	57	33	4	2	0	0	0
Agency mortgage-backed securities	927	1,153	936	512	88	0	0	0
Net portfolio holdings of TALF LLC	1	1	0	0	0	0	0	0
Total other assets	237	241	203	163	130	114	106	99
Total liabilities	2,864	3,199	2,886	2,005	1,723	1,876	2,048	2,232
Selected liabilities								
Federal Reserve notes in circulation	1,127	1,196	1,348	1,481	1,608	1,761	1,933	2,117
Reverse repurchase agreements	107	70	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,618	1,922	1,458	445	36	36	36	36
Reserve balances held by depository institutions	1,492	1,823	1,446	434	25	25	25	25
U.S. Treasury, General Account	93	93	5	5	5	5	5	5
Other Deposits	34	6	6	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	63	83	110	146	192	255	337

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

Explanatory Notes