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.

Authorized for Public Release

Class I FOMC – Restricted Controlled (FR)

Report to the FOMC on Economic Conditions and Monetary Policy

Book B

Monetary Policy: Strategies and Alternatives

June 13, 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 and 2014. (Medium-term prescriptions derived from dynamic simulations of the rules are discussed below.) As shown in the left-hand columns, four of the six rules keep the federal funds rate at the effective lower bound in both the third and fourth quarters of 2013. The Taylor (1993) rule, which puts relatively little weight on the output gap, prescribes a federal funds rate of about 75 basis points next quarter followed by a further increase in the fourth quarter. The first-difference rule, which responds to the expected change in the output gap, prescribes a federal funds rate of about 40 basis points in the third quarter and about 80 basis points in the subsequent quarter.

The right-hand columns display the near-term prescriptions in the absence of the lower-bound constraint on the federal funds rate.[1] For the next two quarters, the inertial Taylor (1999) rule and the outcome-based rule prescribe federal funds rates just below zero. In contrast, the Taylor (1999) rule, which responds more strongly to the staff's estimate of the current output gap, and the nominal income targeting rule, which responds also to the cumulative shortfall of inflation below the assumed 2 percent target since 2008, prescribe markedly more negative values for the federal funds rate.

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." Since the last Tealbook, the staff has made several revisions to its historical and projected supply-side assumptions, incorporating both a faster decline in the natural rate of unemployment and a slightly more pronounced fall in trend labor force participation.[2] These changes in

---

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

[2] See Stephanie Aaronson, Bruce Fallick, Charles Fleischman, and Robert Tetlow, "Assessing the Recent Decline in the Unemployment Rate and Its Implications for Monetary Policy," memo to the Federal

Strategies

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Policy Rules

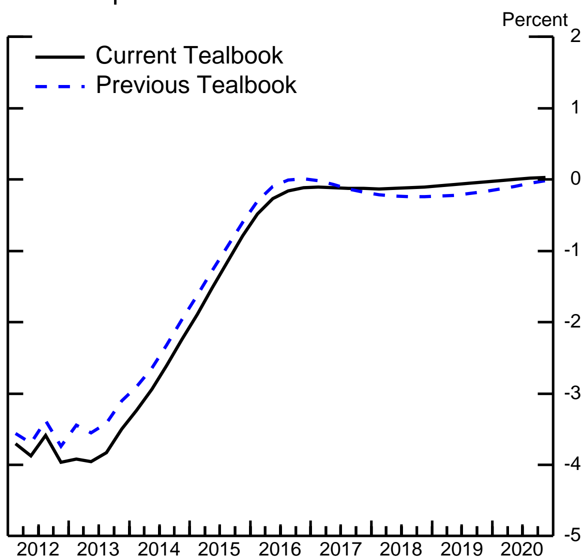
	Constrained Policy		Unconstrained Policy	
	2013Q3	2013Q4	2013Q3	2013Q4
Taylor (1993) rule	**0.76**	**1.11**	**0.76**	**1.11**
Previous Tealbook	*1.28*	*1.65*	*1.28*	*1.65*
Taylor (1999) rule	**0.13**	**0.13**	**–1.11**	**–0.61**
Previous Tealbook	*0.13*	*0.13*	*–0.40*	*–0.13*
Inertial Taylor (1999) rule	**0.13**	**0.13**	**–0.06**	**–0.14**
Previous Tealbook outlook	*0.13*	*0.13*	*0.05*	*0.06*
Outcome-based rule	**0.13**	**0.13**	**–0.05**	**–0.06**
Previous Tealbook outlook	*0.13*	*0.25*	*0.09*	*0.25*
First-difference rule	**0.38**	**0.78**	**0.38**	**0.78**
Previous Tealbook outlook	*0.40*	*0.78*	*0.40*	*0.78*
Nominal income targeting rule	**0.13**	**0.13**	**–0.75**	**–1.32**
Previous Tealbook outlook	*0.13*	*0.13*	*–0.53*	*–0.93*

Memo: Equilibrium and Actual Real Federal Funds Rate

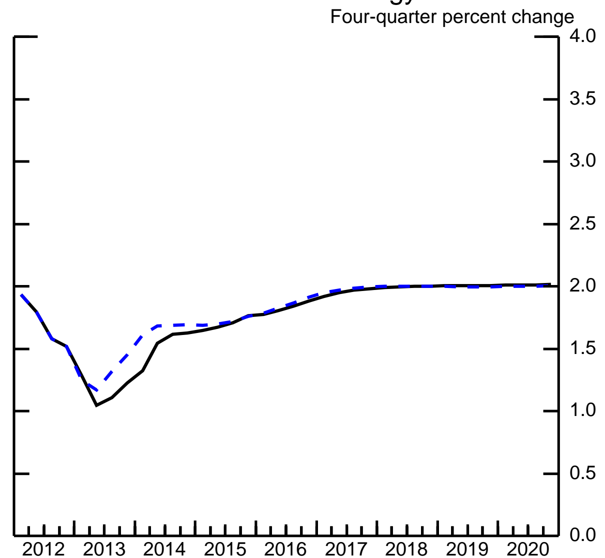
	Current Tealbook	*Previous Tealbook*
Tealbook-consistent FRB/US r^* estimate	–1.38	*–1.54*
Actual real federal funds rate	–1.15	*–1.12*

Key Elements of the Staff Projection

GDP Gap



PCE Prices ex. Food and Energy



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

supply-side assumptions extend back to the start of 2011. On net, these revisions imply a slightly wider unemployment gap over the medium term, consistent with the trajectory for the output gap—which is now about 20 to 40 basis points wider through 2015—shown in the bottom left panel of the exhibit. Though the unemployment gap is slightly wider, the unemployment rate—not shown on the exhibit—is now expected to cross the FOMC's 6½ percent threshold in the first quarter of 2015, two quarters earlier than in the April Tealbook. As shown in the bottom right panel, the staff's forecast for inflation is essentially unrevised, except for a small downward revision to the near-term projection that reflects primarily the effects of sequestration on medical costs.

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 after adjusting it to replicate the staff's economic forecast. The short-run r^* estimate corresponds to the real federal funds rate that, if maintained, would return output to potential in 12 quarters. Consistent with the staff's unchanged assessment that the output gap will essentially close by late 2016, the r^* estimate for the current quarter is little changed from the April Tealbook. As has been true since late 2008, the estimate of r^*—currently about −1.40 percent—remains below the estimated actual real federal funds rate of −1.15 percent. Since last September, the estimated value of r^* has risen by about 100 basis points, reflecting (among other things) a considerable reduction, on net, in the staff's estimate of the level of potential GDP; the shift forward in the 12-quarter evaluation window toward a more advanced stage of the economic recovery; and the stimulus provided by additional asset purchases.

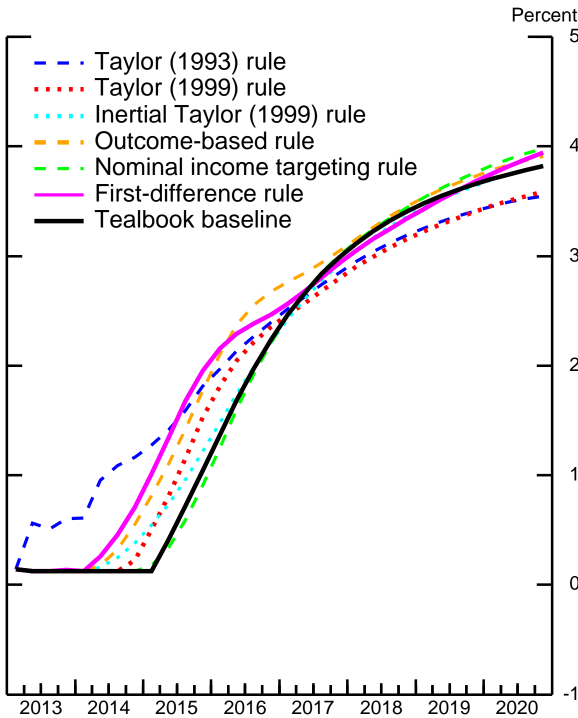
The second exhibit, "Policy Rule Simulations without Thresholds," reports dynamic simulations of the FRB/US model that incorporate endogenous responses of inflation and the output gap implied by having the federal funds rate follow the paths prescribed by the different policy rules, under the assumption that the funds rate is constrained by the effective lower bound.[3] (Alternative policy rule simulations that

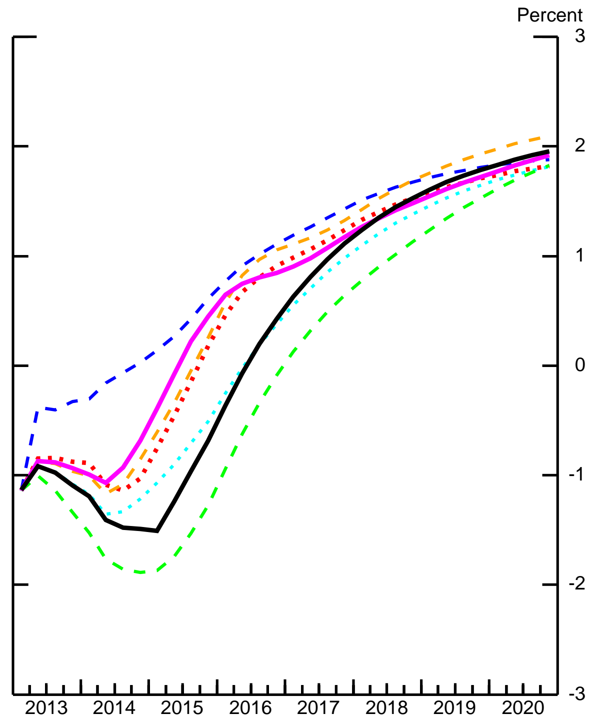
Open Market Committee (June 7, 2013). The staff now estimates that the natural rate rose from 5 percent prior to the recession to 6 percent in late 2009, but that improvements since that time in labor market functioning, together with permanent departures from the labor force of some of the long-term unemployed, have lowered it to 5¾ percent currently. The staff anticipates that these forces will continue to reduce the natural rate until it reaches its long-run level of 5¼ percent in late 2015, two years earlier than in the previous Tealbook.

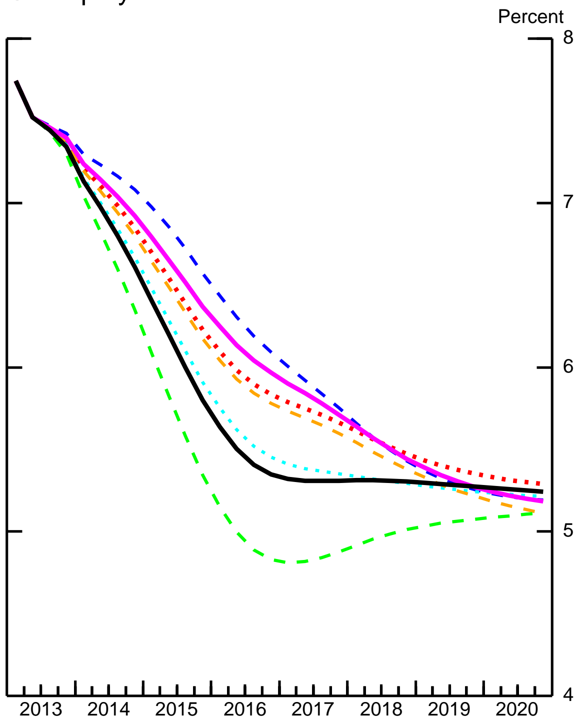
[3] The staff's baseline forecast incorporates the macroeconomic effects of the large-scale asset purchase programs that the FOMC has undertaken in recent years, and it embeds the assumption that the FOMC will purchase a total of $750 billion in longer-term Treasury securities and agency MBS during

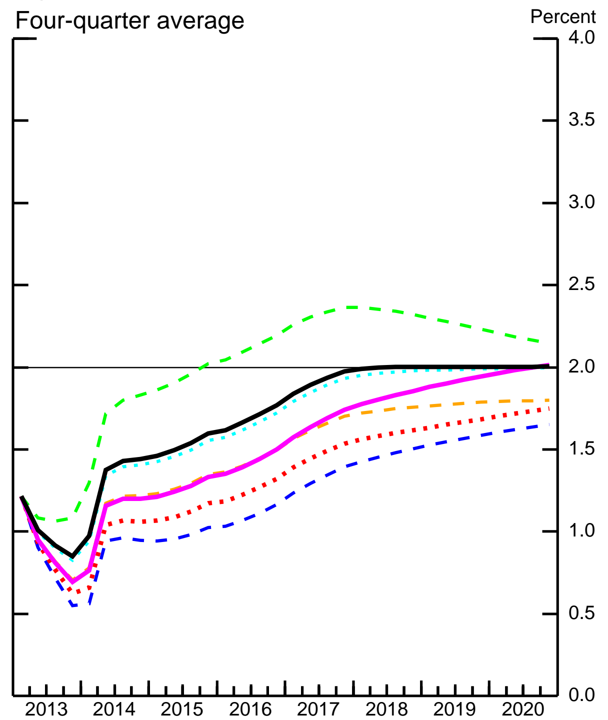
Strategies

Policy Rule Simulations without Thresholds









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

incorporate thresholds are discussed below.) Each rule is applied from the third quarter of 2013 onward, under the assumptions that financial market participants as well as price- and wage-setters believe that the FOMC will follow that rule and that agents fully understand and anticipate the implications of the rule for future real activity, inflation, and interest rates.

The exhibit also displays the implications of following the Tealbook baseline policy. That policy 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 average inflation five to eight quarters hence is projected to be less than 2.5 percent. After either of these variables crosses its threshold, the federal funds rate in the baseline projection follows the prescription of the inertial Taylor (1999) rule. In the current baseline projection, the unemployment rate falls below its threshold during the first quarter of 2015, two quarters earlier than in April; this steeper decline primarily reflects the staff's reassessment of the pace of improvement in labor market functioning. Thereafter, the federal funds rate rises above ¼ percent in mid-2015, and then climbs to 2¼ percent by late 2016 and to nearly 4 percent late in the decade. Under this assumed funds rate path, the unemployment rate is projected to gradually decline towards the staff's estimate of the long-term natural rate of unemployment of 5¼ percent by late 2017, accompanied by a gradual rise in headline inflation to 2 percent over the same period.[4]

Without thresholds, the different policy rules mostly call for tightening to begin appreciably earlier than under the Tealbook baseline. As a result, most of the rules cause

---

2013; it also incorporates some learning on the part of financial market participants as they gradually come to recognize that cumulative purchases will not be as large as they currently expect. Based on these assumptions, all of the policy rule simulations discussed here and on later pages incorporate the projected effects of these balance sheet policies; the rules themselves are not directly adjusted for the effects of balance sheet policies.

[4] Compared with the April Tealbook, the baseline path for the federal funds rate is somewhat higher until late in the decade, reflecting the net effect of two opposing forces. On the one hand, the staff's supply-side revisions imply somewhat more slack, on average, over the medium term, and by itself this change would make the projected path of the funds rate lower than in the April baseline. On the other hand, because of the rule's partial adjustment feature, the fact that the funds rate starts to adjust upwards two quarters earlier than in the April baseline contributes to a higher funds rate path not only during the second half of 2015 but also for the next few years. On balance, the latter effect dominates and the baseline path for the funds rate is persistently higher than in the previous Tealbook through the end of the decade. However, because the projected pace of tightening after liftoff is now less rapid than in the previous Tealbook (reflecting in part the revisions to the output gap), the difference between the current and April paths narrows markedly between 2015 and 2017.

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 keeps the real federal funds rate persistently below baseline for the rest of the decade, it generates stronger future real activity and higher future inflation. With markets assumed to fully anticipate these developments, longer-term real interest rates are lower today than under the baseline policy, which in turn makes overall financial conditions more accommodative today and stimulates real activity in the near term. In addition, greater resource utilization in the short run and higher expected future inflation act to boost near-term inflation. As has been true for some time, the outcomes for inflation and unemployment simulated from the nominal income targeting rule are similar in some ways to the optimal control paths described further below. In particular, as in the optimal control simulations, the nominal income targeting rule generates inflation above the 2 percent goal and unemployment below the natural rate for several years later in the decade.

For each of the simulated rules, the results depend importantly on the assumption that policymakers will adhere to the rule in the future and that policymakers and the public fully understand the implications of this commitment for the path of the economy. The crucial role of this commitment and its assumed credibility can be appreciated by noting the striking similarity in the paths of the nominal federal funds rate under the baseline and the nominal income targeting rule, which stands in contrast to the marked difference in outcomes for inflation and unemployment in the two simulations. Compared with the baseline forecast, the nominal income targeting rule generates a more rapid recovery in the unemployment rate and a quicker increase in inflation to 2 percent. These differences in outcomes result from the assumed commitments to very different reaction functions for interest-rate policy—in particular the promise under the nominal income targeting rule to adjust the nominal federal funds rate until the rule's target for nominal GDP has been achieved—and not from the small differences in the simulated paths for the *nominal* federal funds rate shown in the exhibits.

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.[5] 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 average inflation five to eight quarters hence is projected to be less than 2.5 percent. Financial market participants and price- and wage-setters are assumed to understand that policy will switch to the specified rule when one of the threshold conditions is crossed and to view this switch as permanent and fully credible. In each of the simulations discussed below, crossing the unemployment threshold turns out to be the catalyst for switching to the specified rule.

The simulations with thresholds bring out several important properties of the rules. First, imposing the thresholds postpones the departure of the federal funds rate from the effective lower bound for all of the rules except the nominal income targeting rule. In these cases, the departure is postponed by a year or more, resulting in a more-rapid convergence to maximum employment but with typically little effect on the path of inflation.[6] All of the threshold-augmented rules prescribe the first increase in the federal funds rate around mid-2015.

Second, the nominal income targeting rule currently generates the same prescriptions for the federal funds rate, and the same outcomes for inflation and unemployment, whether thresholds are imposed or not.

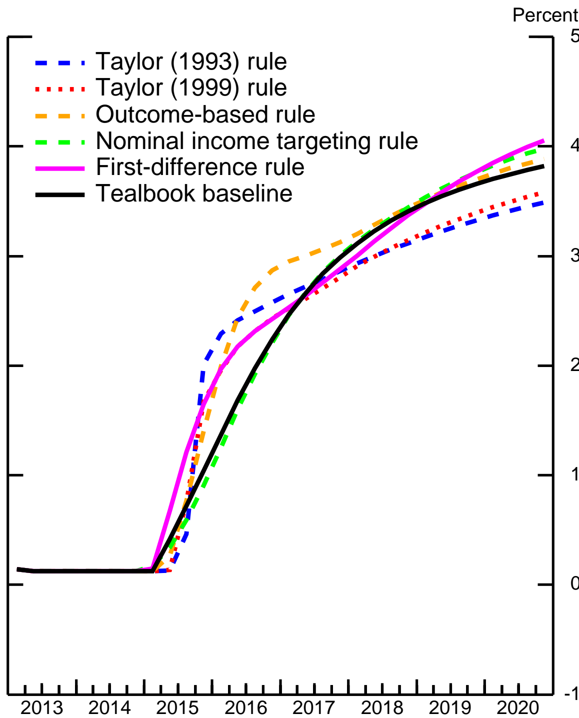
Third, the conduct of policy after the threshold is crossed exerts a major influence on the amount of stimulus implied by the threshold strategy. In particular, policy rules that entail relatively swift increases in the real federal funds rate after the unemployment threshold has been crossed—such as the Taylor (1993) rule and the Taylor (1999) rule—imply an overall more gradual decline in the unemployment rate than the other rules. As a result, these rules lead to a later crossing of the threshold and a later departure of the federal funds rate from the effective lower bound.

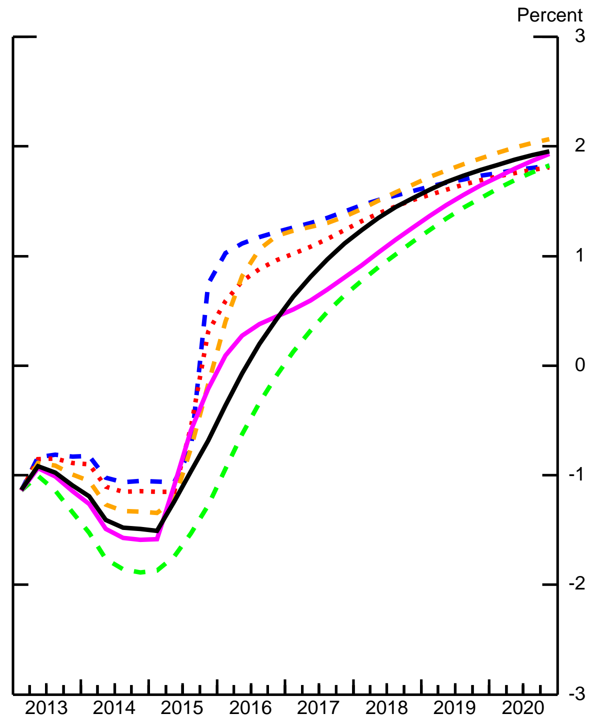
---

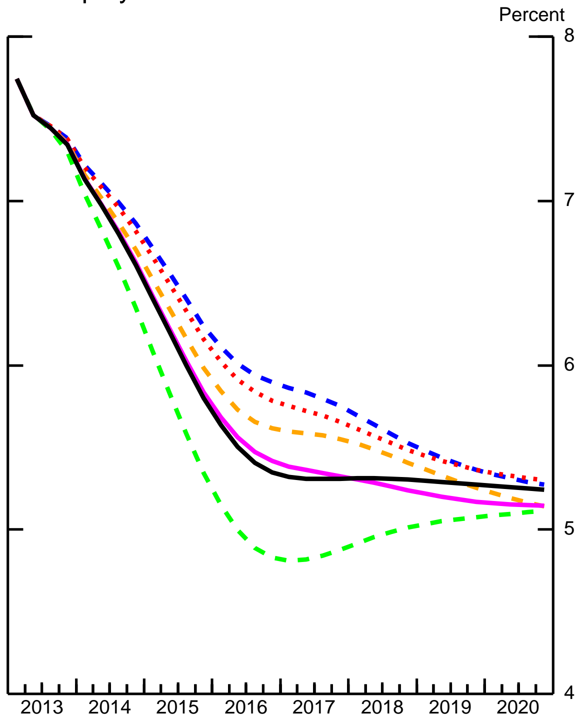
[5] Because the inertial Taylor (1999) with thresholds and the Tealbook baseline are the same, their results are not shown separately.

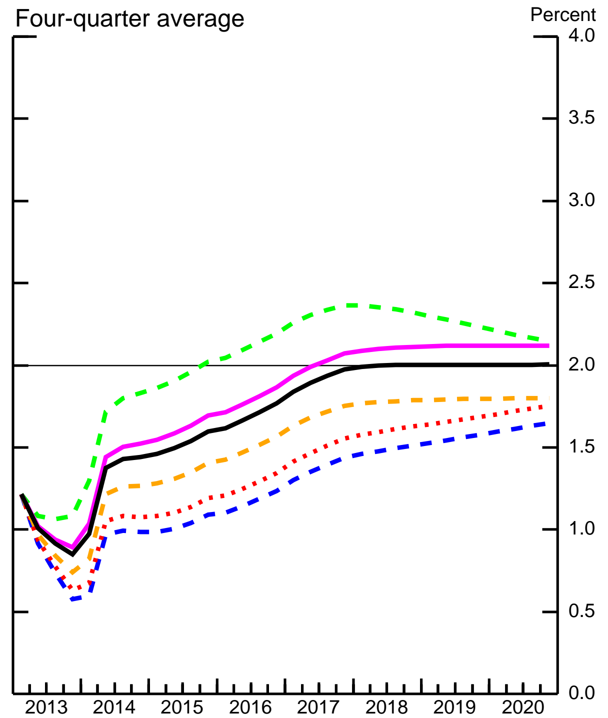
[6] An exception is the case of the first-difference rule, in which the thresholds combined with the rule's high degree of interest-rate smoothing imply that policy will remain accommodative for an extended period of time, boosting expected future inflation and consequently near-term inflation.

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.

Finally, the effectiveness of threshold-augmented rules rests heavily on policymakers' ability to make a credible commitment to follow a particular rule after a threshold is crossed, and on the private sector's ability to anticipate the paths for the federal funds rate, real activity, and inflation implied by that rule.

The fourth exhibit, "Constrained vs. Unconstrained Optimal Control Policy," compares the optimal control simulations derived using this Tealbook's baseline forecast with those based on the April forecast.[7] 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.[8]

The simulations indicate that, with the federal funds rate constrained to remain positive, the optimal control path for the federal funds rate rises above the effective lower bound in the third quarter of 2015—the same quarter as in the April Tealbook. Subsequently, the optimal control path for the federal funds rate rises to 3 percent by early 2018 and to almost 4 percent by the end of 2020.[9] The path for the federal funds rate prescribed by optimal control thus remains at the effective lower bound for one quarter longer than in the Tealbook baseline projection and rises a little more gradually over the following year.

By generating a lower path for the real federal funds rate than in the staff's baseline outlook, the constrained optimal control policy promotes a stronger economic recovery while allowing inflation to rise only about ¼ percentage point above the Committee's 2 percent goal. In particular, the unemployment rate drops below 6½ percent by late 2014 and reaches 5½ percent by the time the federal funds rate leaves its effective lower bound; thereafter, the unemployment rate declines to 4¾ percent by early 2017, thus running below the staff's estimate of the natural rate of unemployment for a

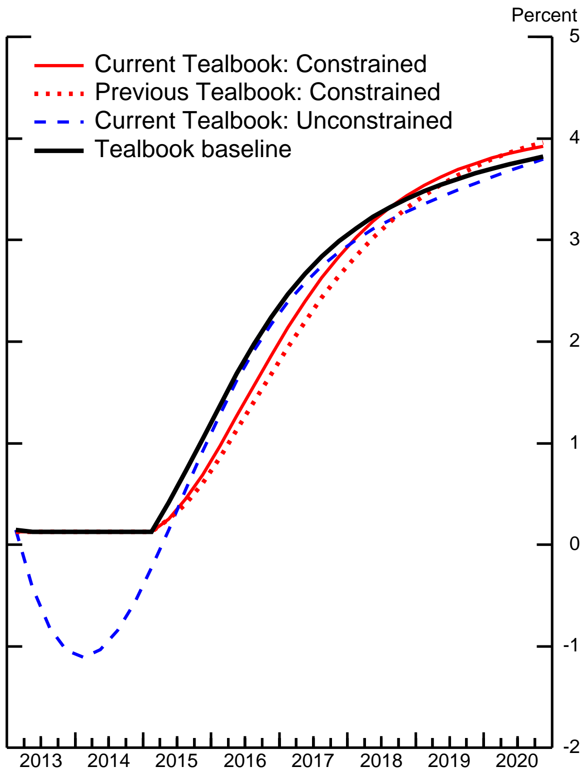
[7] The optimal control policy simulations incorporate the assumptions about underlying economic conditions used in the staff's baseline forecast, as well as the assumptions about balance sheet policies described in footnote 3.

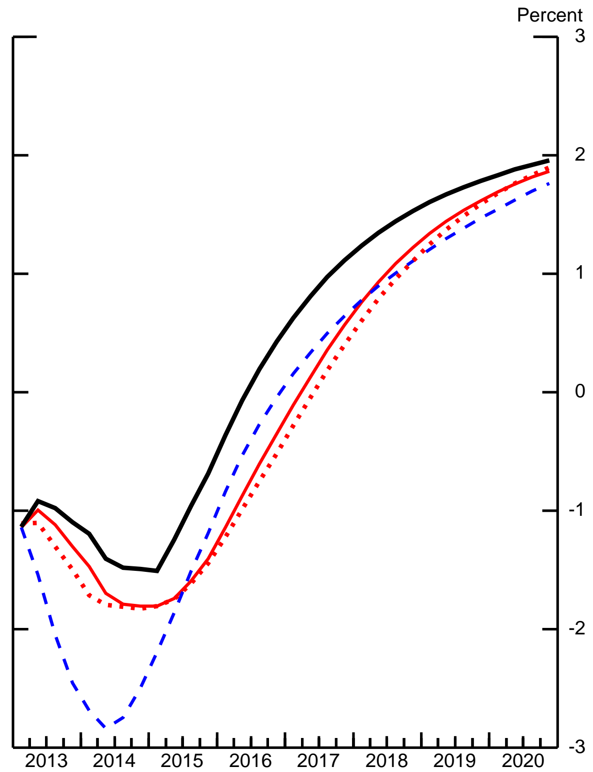
[8] The optimal control simulations do not incorporate thresholds.

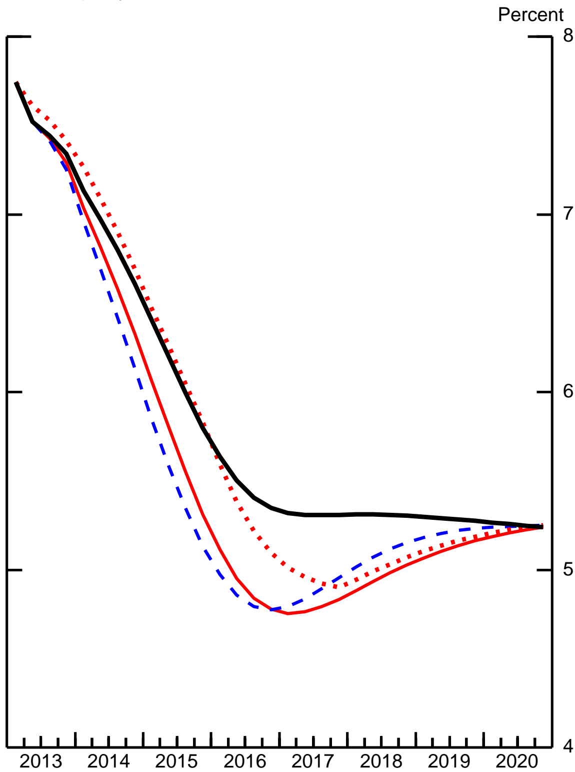
[9] Although the loss function uses headline inflation instead of core inflation, the real federal funds rate shown in the upper right panel of the exhibit, as in the other simulations reported in this section, is calculated as the difference between the nominal federal funds rate and a four-quarter 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.

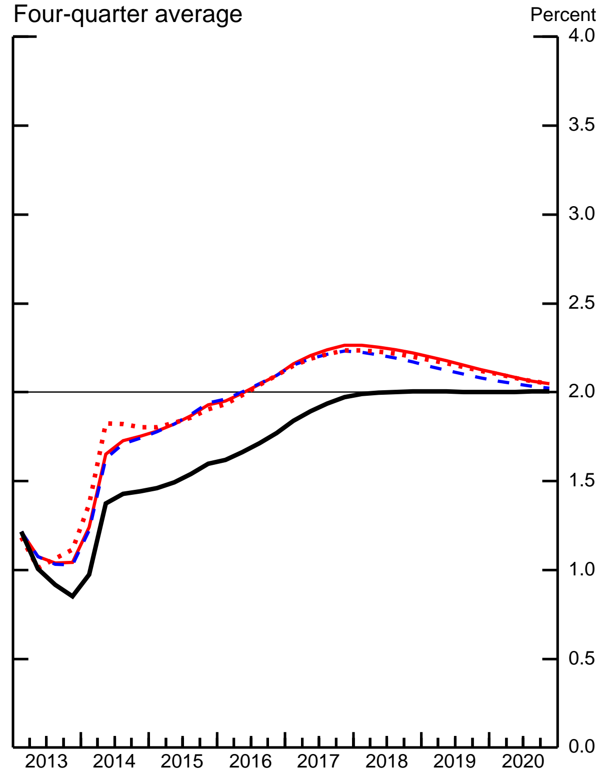
Strategies

Constrained vs. Unconstrained Optimal Control Policy









time.[10] Inflation reaches the Committee's 2 percent objective by early 2016 and subsequently rises to about 2¼ percent before gradually moving back toward 2 percent. The swifter achievement of the Committee's assumed objectives occurs because the optimal control policy credibly promises to remain highly accommodative for even longer than under the baseline policy, thereby yielding more favorable effects in the current circumstances on financial conditions, real activity, and inflation in the near term through effects on the private sector's expectations about future policy.

In the absence of the lower-bound constraint, the optimal control path for the federal funds rate would decline to about −1 percent by late 2013 and become positive again by mid-2015, rising thereafter a little quicker than in the case of constrained policy. The unconstrained policy would bring the unemployment rate down a little faster over the next few years and subsequently would keep the unemployment rate a little closer to the natural rate than would be the case under the constrained policy. The path for inflation is quite similar for the unconstrained and constrained policies.

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

[10] The policy prescriptions from optimal control are little changed from those in the previous Tealbook even though the simulated trajectory for the unemployment rate is noticeably lower than before because—as discussed above—the staff expects the natural rate of unemployment to decline more rapidly than before.

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]	1.7	2.5	3.4	3.6	2.8	2.1
Taylor (1993)	1.7	2.1	2.5	3.1	2.9	2.6
Taylor (1999)	1.7	2.3	2.9	3.3	2.7	2.4
Inertial Taylor (1999)	1.7	2.4	3.3	3.5	2.8	2.2
Outcome based	1.7	2.3	3.0	3.3	2.7	2.4
First difference	1.7	2.2	2.8	3.2	2.8	2.5
Nominal income targeting	1.7	2.6	3.9	4.0	2.9	2.0
Constrained optimal control	1.7	2.7	3.9	4.0	2.9	1.9
Unemployment rate[2]						
Extended Tealbook baseline[1]	7.8	7.3	6.6	5.8	5.4	5.3
Taylor (1993)	7.8	7.4	7.1	6.6	6.1	5.8
Taylor (1999)	7.8	7.4	6.8	6.2	5.8	5.7
Inertial Taylor (1999)	7.8	7.4	6.7	5.9	5.5	5.4
Outcome based	7.8	7.4	6.8	6.2	5.8	5.6
First difference	7.8	7.4	6.9	6.4	6.0	5.7
Nominal income targeting	7.8	7.3	6.3	5.3	4.8	4.9
Constrained optimal control	7.8	7.3	6.3	5.3	4.8	4.8
Total PCE prices						
Extended Tealbook baseline[1]	1.6	0.9	1.4	1.6	1.8	2.0
Taylor (1993)	1.6	0.6	0.9	1.0	1.2	1.4
Taylor (1999)	1.6	0.6	1.1	1.2	1.3	1.5
Inertial Taylor (1999)	1.6	0.8	1.4	1.6	1.7	1.9
Outcome based	1.6	0.7	1.2	1.3	1.5	1.7
First difference	1.6	0.7	1.2	1.3	1.5	1.7
Nominal income targeting	1.6	1.1	1.8	2.0	2.2	2.4
Constrained optimal control	1.6	1.0	1.8	1.9	2.1	2.3
Core PCE prices						
Extended Tealbook baseline[1]	1.1	1.2	1.6	1.8	1.9	2.0
Taylor (1993)	1.1	0.9	1.1	1.2	1.3	1.4
Taylor (1999)	1.1	1.0	1.2	1.3	1.4	1.5
Inertial Taylor (1999)	1.1	1.2	1.6	1.7	1.8	1.9
Outcome based	1.1	1.1	1.4	1.5	1.6	1.7
First difference	1.1	1.1	1.4	1.5	1.6	1.8
Nominal income targeting	1.1	1.5	2.0	2.2	2.3	2.4
Constrained optimal control	1.1	1.4	1.9	2.1	2.2	2.3
Federal funds rate[2]						
Extended Tealbook baseline[1]	0.2	0.1	0.1	1.0	2.2	3.0
Taylor (1993)	0.2	0.6	1.2	1.8	2.4	2.8
Taylor (1999)	0.2	0.1	0.2	1.5	2.4	2.8
Inertial Taylor (1999)	0.2	0.1	0.4	1.2	2.2	2.9
Outcome based	0.2	0.1	0.6	1.8	2.7	3.0
First difference	0.2	0.1	0.7	2.0	2.5	2.9
Nominal income targeting	0.2	0.1	0.1	0.9	2.2	3.0
Constrained optimal control	0.2	0.1	0.1	0.7	1.9	2.8

1. Policy in the Tealbook baseline 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 one-year-ahead inflation is less than 2.5 percent. Once either threshold is crossed, the federal funds rate follows the prescription of the inertial Taylor (1999) rule.
2. Percent, average for the final quarter of the period.

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]	1.7	2.5	3.4	3.6	2.8	2.1
Taylor (1993)	1.7	2.3	2.9	3.3	2.6	2.3
Taylor (1999)	1.7	2.3	3.0	3.4	2.6	2.3
Outcome based	1.7	2.4	3.2	3.4	2.6	2.2
First difference	1.7	2.5	3.4	3.6	2.8	2.2
Nominal income targeting	1.7	2.6	3.9	4.0	2.9	2.0
Constrained optimal control	1.7	2.7	3.9	4.0	2.9	1.9
Unemployment rate[2]						
Extended Tealbook baseline[1]	7.8	7.3	6.6	5.8	5.4	5.3
Taylor (1993)	7.8	7.4	6.9	6.2	5.9	5.8
Taylor (1999)	7.8	7.4	6.8	6.2	5.8	5.7
Outcome based	7.8	7.4	6.7	6.0	5.6	5.6
First difference	7.8	7.3	6.6	5.8	5.4	5.3
Nominal income targeting	7.8	7.3	6.3	5.3	4.8	4.9
Constrained optimal control	7.8	7.3	6.3	5.3	4.8	4.8
Total PCE prices						
Extended Tealbook baseline[1]	1.6	0.9	1.4	1.6	1.8	2.0
Taylor (1993)	1.6	0.6	1.0	1.1	1.2	1.4
Taylor (1999)	1.6	0.6	1.1	1.2	1.3	1.6
Outcome based	1.6	0.7	1.3	1.4	1.6	1.8
First difference	1.6	0.9	1.5	1.7	1.9	2.1
Nominal income targeting	1.6	1.1	1.8	2.0	2.2	2.4
Constrained optimal control	1.6	1.0	1.8	1.9	2.1	2.3
Core PCE prices						
Extended Tealbook baseline[1]	1.1	1.2	1.6	1.8	1.9	2.0
Taylor (1993)	1.1	0.9	1.2	1.2	1.3	1.4
Taylor (1999)	1.1	1.0	1.3	1.4	1.5	1.6
Outcome based	1.1	1.1	1.5	1.6	1.7	1.8
First difference	1.1	1.3	1.7	1.9	2.0	2.1
Nominal income targeting	1.1	1.5	2.0	2.2	2.3	2.4
Constrained optimal control	1.1	1.4	1.9	2.1	2.2	2.3
Federal funds rate[2]						
Extended Tealbook baseline[1]	0.2	0.1	0.1	1.0	2.2	3.0
Taylor (1993)	0.2	0.1	0.1	2.0	2.6	2.8
Taylor (1999)	0.2	0.1	0.1	1.7	2.4	2.8
Outcome based	0.2	0.1	0.1	1.4	2.9	3.1
First difference	0.2	0.1	0.1	1.7	2.4	2.9
Nominal income targeting	0.2	0.1	0.1	0.9	2.2	3.0
Constrained optimal control	0.2	0.1	0.1	0.7	1.9	2.8

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 one-year-ahead inflation is less than 2.5 percent. Once either of these thresholds is crossed, the federal funds rate follows the prescriptions of the specified rule. Policy in the Tealbook baseline also uses these threshold conditions and switches to the inertial Taylor (1999) rule once either of these thresholds is crossed.
2. Percent, average for the final quarter of the period.

Authorized for Public Release

(This page is intentionally blank.)

Appendix

POLICY RULES USED IN "MONETARY POLICY STRATEGIES"

The table below gives the expressions for the selected policy rules used in "Monetary Policy Strategies." In the table, R_t denotes the nominal federal funds rate for quarter t, while the right-hand-side variables include the staff's projection of trailing four-quarter core PCE inflation for the current quarter and three quarters ahead (π_t and $\pi_{t+3|t}$), the output gap estimate for the current period as well as its one-quarter-ahead forecast (gap_t and $gap_{t+1|t}$), and the forecast of the three-quarter-ahead annual change in the output gap ($\Delta^4 gap_{t+3|t}$). The value of policymakers' long-run inflation objective, denoted π^*, is 2 percent. The nominal income targeting rule responds to the nominal income gap, which is defined as the difference between nominal income yn_t (100 times the log of the level of nominal GDP) and a target value yn_t^* (100 times the log of target nominal GDP). Target nominal GDP in 2007:Q4 is set equal to the staff's estimate of potential real GDP in that quarter multiplied by the GDP deflator in that quarter; subsequently, target nominal GDP grows 2 percentage points per year faster than the staff's estimate of potential GDP.

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

[1] See Erceg and others (2012).

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

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

Authorized for Public Release

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 output projection from FRB/US, the staff's large-scale econometric model of the U.S. economy. This estimate depends on a very broad array of economic factors, some of which take the form of projected values of the model's exogenous variables. The memo item in the exhibit reports the "Tealbook-consistent" estimate of r^*, which is generated after the paths of exogenous variables in the FRB/US model are adjusted so that they match those in the extended Tealbook forecast. Model simulations then determine the value of the real federal funds rate that closes the output gap conditional on the exogenous variables in the extended baseline forecast.

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

FRB/US MODEL SIMULATIONS

The exhibits of "Monetary Policy Strategies" that report results from simulations of alternative policies are derived from dynamic simulations of the FRB/US model. 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.

Authorized for Public Release

(This page is intentionally blank.)

Authorized for Public Release

Monetary Policy Alternatives

This Tealbook presents three policy alternatives—labeled A, B, and C—for the Committee's consideration. As always, the Committee could blend elements of the draft statements to construct its desired statement.

In summarizing recent economic developments, all of the alternatives note that economic activity has been expanding at a moderate pace. As in the May FOMC statement, all of the alternatives state that "household spending and business fixed investment advanced, and the housing sector has strengthened further." All characterize fiscal policy as restraining economic growth; Alternative A also notes slower manufacturing activity. Alternative B indicates that there has been "further improvement" in labor market conditions in recent months, while Alternative C indicates that labor market conditions have "continued to improve," citing "ongoing gains in payroll employment." Alternative A offers a less positive characterization of the labor market, indicating that labor market conditions have shown "some improvement," on balance. All three alternatives continue to characterize the unemployment rate as elevated. In line with the previous FOMC statement, Alternatives B and C indicate that inflation "has been running somewhat below the Committee's longer-run objective" and that longer-term inflation expectations "have remained stable." Alternative A also mentions the stability of inflation expectations, but states that inflation has been running "below" its longer-run objective, "even apart from" temporary variations in energy prices.

In characterizing the economic outlook, both Alternatives B and C continue to state that, with appropriate policy accommodation, the Committee expects economic growth to proceed at a moderate pace and the unemployment rate to decline gradually toward mandate-consistent levels. Alternatives B and C also continue to say that the Committee "anticipates that inflation over the medium term likely will run at or below its 2 percent objective." Alternative B indicates that the downside risks to the outlook for the economy, and also the labor market, have diminished since the fall. Alternative C interprets recent developments even more favorably, stating that downside risks have diminished, as in Alternative B, and adding that "the Committee is becoming more confident that labor market conditions will continue to improve over the medium run."

Alternative A takes a different approach, indicating that the outlook, conditioned on "a balanced approach to fostering maximum employment and price stability," is for moderate growth, a gradually declining unemployment rate, and inflation moving up to its 2 percent objective, "or even modestly higher for a time." Alternative A also retains the language that the Committee "continues to see downside risks to the economic outlook."

Regarding balance sheet policy, Alternatives A and B continue purchases of agency MBS and longer-term Treasury securities at the same monthly rates as those the Committee specified in May. In contrast, Alternative C reduces the monthly flow of purchases of both agency MBS and longer-term Treasury securities to [$35] billion each per month. All of the alternatives again report that the Committee will continue its securities purchases "until the outlook for the labor market has improved substantially in a context of price stability," that the Committee is prepared to alter the pace of purchases "as the outlook for the labor market or inflation changes," and that it "will continue to take appropriate account of the likely efficacy and costs of such purchases as well as the extent of progress toward its economic objectives." In addition, the new language in Alternative B that points to "diminished" downside risks to the outlook for "the economy and the labor market" is intended to signal that the Committee is prepared to reduce the pace of purchases if the data in coming months show continuing improvement in labor market conditions. All three alternatives note that the Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and mortgage-backed securities and of rolling over maturing Treasury securities at auction. In addition, Alternative A adds language declaring that the Committee now intends "to rely upon the paydowns of principal rather than sales of agency mortgage-backed securities when it eventually becomes appropriate to reduce its holdings of those securities."

All three alternatives would maintain the 0 to ¼ percent target range for the federal funds rate and retain quantitative threshold-based forward guidance for the funds rate. All the alternatives would keep the 2½ percent threshold for projected inflation between one and two years ahead. Alternatives B and C would also retain the unemployment rate threshold at 6½ percent, while Alternative A would lower this threshold to either 6 or 5½ percent. Alternative C states that the Committee "reaffirms" (rather than "currently anticipates") that the federal funds rate will remain exceptionally low at least until one of the thresholds is crossed; the use of "reaffirms" is meant to

emphasize that reducing the pace of asset purchases does not signal a change in the Committee's reaction function for the federal funds rate. Alternative A differs from Alternatives B and C in providing additional guidance about how the Committee plans to remove policy accommodation. In particular, Alternative A notes that the Committee "expects… that it will be appropriate" to adjust policy "gradually in order to foster strong growth in employment and inflation at 2 percent, or [even] modestly higher for a time."

The following table summarizes key elements of the alternative statements. The summary table is followed by complete drafts of the three statements and then by arguments for each alternative.

Table 1: Overview of Policy Alternatives for June FOMC Statement

Selected Elements	April-May Statement	June Alternatives		
		A	**B**	**C**
Economic Outlook				
Outlook	with appropriate policy accommodation, growth will proceed at a moderate pace and the unemployment rate will gradually decline; inflation likely will run at or below 2 percent	with appropriate policy accommodation, growth will proceed at a moderate pace, the unemployment rate will gradually decline, and inflation will move up to 2 percent or [even] modestly higher for a time	unchanged	
Balance Sheet Policies				
Agency MBS	$40 billion per month	$40 billion per month; intends to rely upon paydowns of principal when it eventually becomes appropriate to reduce its holdings	unchanged	$35 billion per month
Longer-term Treasuries	$45 billion per month	unchanged		$35 billion per month
Rationale for Purchases	to support a stronger recovery and ensure inflation consistent with dual mandate	unchanged		
Securities Reinvestment	reinvest principal payments from agency debt and agency MBS into agency MBS	unchanged		
	roll over maturing Treasuries	unchanged		
Guidance	if outlook for labor market does not improve substantially, will continue purchases, and employ other policy tools as appropriate, until such improvement is achieved	unchanged		
	will continue to take appropriate account of the likely efficacy and costs of such purchases as well as the extent of progress toward its economic objectives	unchanged		
Federal Funds Rate				
Target	0 to ¼ percent	unchanged		
Guidance	for a considerable time after purchases end and recovery strengthens	unchanged		
	at least as long as unemployment rate is above 6½ percent, inflation one to two years ahead is no more than 2½ percent, and inflation expectations remain well anchored	at least as long as unemployment rate is above [6|5½] percent, inflation one to two years ahead is no more than 2½ percent, and inflation expectations remain well anchored	unchanged	
	will consider other information; will take balanced approach to removing accommodation	will consider other information; expects that when the time comes to reduce policy accommodation, it will be appropriate to do so gradually in order to foster strong growth in employment and inflation at 2 percent, or [even] modestly higher	unchanged	

May FOMC Statement

1. Information received since the Federal Open Market Committee met in March suggests that economic activity has been expanding at a moderate pace. Labor market conditions have shown some improvement in recent months, on balance, but the unemployment rate remains elevated. Household spending and business fixed investment advanced, and the housing sector has strengthened further, but fiscal policy is restraining economic growth. 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 expects that, with appropriate policy accommodation, economic growth will proceed at a moderate pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee continues to see 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 decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. Taken together, these actions should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.
4. The Committee will closely monitor incoming information on economic and financial developments in coming months. The Committee will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. The Committee is prepared to increase or reduce the pace of its purchases to maintain appropriate policy accommodation as the outlook for the labor market or inflation changes. In determining the size, pace, and composition of its asset purchases, the Committee will continue to take appropriate account of the likely efficacy and costs of such purchases as well as the extent of progress toward its economic objectives.
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. In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent.

FOMC STATEMENT—JUNE 2013 ALTERNATIVE A

1. Information received since the Federal Open Market Committee met in ~~March~~ **May** suggests that economic activity has been expanding at a moderate pace. Labor market conditions have shown some improvement in recent months, on balance, but the unemployment rate remains elevated. Household spending and business fixed investment advanced, and the housing sector has strengthened further, but **manufacturing activity has slowed and** fiscal policy is restraining economic growth. Inflation has been running ~~somewhat~~ below the Committee's longer-run objective, **even** apart from temporary variations that largely reflect fluctuations in energy prices. Longer-term inflation expectations have remained stable.

2. ~~Consistent with~~ **In pursuing** its statutory mandate, the Committee ~~seeks~~ **takes a balanced approach** to foster**ing** maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic growth will proceed at a moderate pace, ~~and~~ the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate, ~~The Committee also anticipates that~~ **and** inflation over the medium-term ~~likely~~ will ~~run at or below~~ **move up to** its 2 percent objective, **or [even] modestly higher for a time**. **Nonetheless,** the Committee continues to see downside risks to the economic outlook.

3. To support a stronger economic recovery and to help ensure that inflation~~, over time,~~ ~~is at~~ **does not remain below** the rate most consistent with its dual mandate, the Committee decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. **In addition, the Committee now intends to rely upon paydowns of principal rather than sales of agency mortgage-backed securities when it eventually becomes appropriate to reduce its holdings of those securities.** 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. The Committee will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. The Committee is prepared to increase or reduce the pace of its purchases to maintain appropriate policy accommodation as the outlook for the labor market or inflation changes. In determining the size, pace, and composition of its asset purchases, the Committee will continue to take appropriate account of the likely efficacy and costs of such purchases as well as the extent of progress toward its economic objectives.

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~~ **[6 | 5½]** percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. When the Committee ~~decides to~~ **eventually** begin**s** to ~~remove~~ **reduce** policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment **and price stability**. **In particular, the Committee expects that when the time comes to reduce policy accommodation, it will be appropriate to do so gradually in order to foster strong growth in employment** and inflation ~~of~~ **at** 2 percent**, or [even] modestly higher for a time**.

Alternatives

FOMC STATEMENT—JUNE 2013 ALTERNATIVE B

1. Information received since the Federal Open Market Committee met in ~~March~~ **May** suggests that economic activity has been expanding at a moderate pace. Labor market conditions have shown ~~some~~ **further** improvement in recent months, on balance, but the unemployment rate remains elevated. Household spending and business fixed investment advanced, and the housing sector has strengthened further, but fiscal policy is restraining economic growth. Inflation has been running somewhat below the Committee's longer-run objective, ~~apart from temporary variations that largely reflect fluctuations in energy prices.~~ **but** longer-term inflation expectations have remained stable.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic growth will proceed at a moderate pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee ~~continues to~~ see**s the** downside risks to the ~~economic~~ outlook **for the economy and the labor market as having diminished since the fall**. 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 decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. Taken together, these actions should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.
4. The Committee will closely monitor incoming information on economic and financial developments in coming months. The Committee will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. The Committee is prepared to increase or reduce the pace of its purchases to maintain appropriate policy accommodation as the outlook for the labor market or inflation changes. In determining the size, pace, and composition of its asset purchases, the Committee will continue to take appropriate account of the likely efficacy and costs of such purchases as well as the extent of progress toward its economic objectives.
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. In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent.

FOMC Statement—June 2013 Alternative C

1. Information received since the Federal Open Market Committee met in ~~March~~ **May** ~~suggests~~ **indicates** that economic activity has been expanding at a moderate pace. Labor market conditions have ~~shown some improvement~~ **continued to improve** in recent months, ~~on balance,~~ **with ongoing gains in payroll employment,** ~~but~~ **although** the unemployment rate remains elevated. Household spending and business fixed investment advanced, and the housing sector has strengthened further, but fiscal policy is restraining economic growth. Inflation has been running somewhat below the Committee's longer-run objective, ~~apart from temporary variations that largely reflect fluctuations in energy prices.~~ **but** longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic growth will proceed at a moderate pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee ~~continues to~~ see**s the** downside risks to the ~~economic~~ outlook **for the economy and the labor market as having diminished since the fall and is becoming more confident that labor market conditions will continue to improve over the medium term.** 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 adding to its holdings of longer-term securities**. **However, in light of the improvement in the outlook for the labor market since the Committee began its current asset purchase program last September,** the Committee decided to ~~continue purchasing~~ **purchase** additional agency mortgage-backed securities at a pace of ~~$40~~ **[$35]** billion per month and longer-term Treasury securities at a pace of ~~$45~~ **[$35]** billion per month. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. ~~Taken together, these actions~~ **The Committee's sizable and still increasing holdings of longer-term securities** should ~~maintain~~ **continue to put** downward pressure on longer-term interest rates, support mortgage markets, and help to ~~make~~ **keep** broader financial conditions ~~more~~ **highly** accommodative.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months. The Committee will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate, until the outlook for the labor market has improved substantially in a context of price stability. The Committee is prepared to increase or reduce the pace of its purchases to maintain appropriate policy accommodation as the outlook for the labor market or inflation changes. In determining the size, pace, and composition of its asset purchases, the Committee will continue to take appropriate account of the

Authorized for Public Release

likely efficacy and costs of such purchases as well as the extent of progress toward its economic objectives.

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~~ **reaffirms** that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6½ percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer-run goals of maximum employment and inflation of 2 percent.

THE CASE FOR ALTERNATIVE B

Based on information received during the intermeeting period, policymakers may continue to expect the pace of economic recovery to be moderate, and inflation to be subdued, for some time. The Committee may judge that recent data point to modest further advances in consumer and business spending along with further recovery in the housing market, which are helping to offset the contraction in government spending that is restraining overall economic growth. Recent indicators also suggest that labor market conditions have continued to improve, with payroll employment expanding moderately in April and May, although the unemployment rate—at 7.6 percent in May—is still well above participants' estimates of its long-run normal level. Based on these developments, they may conclude that the outlook for the labor market, while better than last September, has not yet "improved substantially." Moreover, the Committee may judge that progress towards its objectives is not yet sufficient to warrant a reduction in the pace of purchases. With regard to inflation, participants might see the incoming data as consistent with inflation running at or below the Committee's 2 percent objective in the medium run, particularly in light of still-considerable resource slack in the economy. Against this backdrop and based on their current assessments of the likely efficacy and costs of asset purchases, policymakers may conclude that the likely benefits of continuing to purchase longer-term securities at the current pace outweigh the potential costs. If so, participants may wish to continue acquiring longer-term securities at the same pace as in recent months and to make an announcement along the lines of Alternative B, which adds language that is intended to signal that the Committee is preparing to reduce the pace of purchases if the data in coming months show sufficient further improvement in labor market conditions.

Some participants may see the fact that moderate economic growth has continued in the face of ongoing fiscal drag as an indication that the recovery is gaining traction, and so they may judge it appropriate to slow the pace of asset purchases in the near future to reduce the risk of an undesirable increase in inflation over the medium run or of a buildup of excessive risk-taking in the financial sector. However, with the unemployment rate still elevated, recent gains in payrolls only moderate, inflation apparently quite subdued, and signs of financial vulnerabilities in credit markets not widespread, they may not see a need to slow the pace of purchases at this meeting. Furthermore, they may be unsure about whether the economy has experienced the full effects of the tighter fiscal policy put in place earlier this year and may view it as prudent

to wait for more information before deciding to adjust the pace of asset purchases. Some participants may worry that the size of the balance sheet could be nearing the level beyond which the costs of further expansion would outweigh benefits. Nevertheless, they may conclude that that level has not yet been reached and prefer to acquire securities at the current pace while continuing to evaluate the efficacy and costs of asset purchases, leaving open the possibility of dialing back or discontinuing purchases if their future assessments were to indicate that the marginal costs associated with the purchase program have begun to exceed the marginal benefits.

Alternatively, some participants may conclude that aggregate economic activity and labor market conditions have improved to some extent, but they may see a still-more-accommodative policy stance as attractive in order to generate a more-substantial improvement in labor market conditions and to move inflation toward 2 percent more rapidly in coming years. These participants may judge that the benefits of a longer-lasting—and likely larger—asset purchase program could outweigh the costs. They may even see other steps to provide additional accommodation, such as lowering the unemployment rate threshold, as potentially appropriate. Nevertheless, in view of the inherent noisiness of monthly data and the possible risks and costs associated with larger and more rapid asset purchases or the other means of providing additional accommodation under consideration, policymakers may decide to maintain the existing pace of purchases, as in Alternative B, recognizing that doing so leaves open the possibility of increasing the pace of asset purchases, continuing the purchases for longer than currently expected by the Committee, or providing additional forward guidance about the federal funds rate if the economic outlook were to weaken.

According to the Desk's latest survey, primary dealers do not expect major changes in the statement at this meeting. The median dealer's expectations for the cumulative increase in the SOMA in 2013 and 2014 and for the timing of reductions in the pace of asset purchases did not change appreciably since the previous dealer survey. However, surveys of broader groups of market participants, along with anecdotal evidence, indicate that many market participants now expect a reduction in the current pace of asset purchases to occur earlier than they had expected in April. Altogether, this evidence suggests that a policy decision along the lines of Alternative B would largely be in line with many market participants' expectations; nevertheless, the new language that the Committee sees diminished downside risks to the outlook for the economy and the

labor market could be somewhat surprising, and interest rates might move higher, equity prices could fall, and the dollar could appreciate.

THE CASE FOR ALTERNATIVE C

Some participants might see the recent data as confirming prospects for sustained economic growth even in the face of more-restrictive fiscal policy, and so be more confident that the economic recovery is now on a firm footing. Indeed, they may judge that the pace of expansion in private demand, despite the fiscal contraction, points to further improvement in the labor market outlook as the fiscal headwinds diminish. In addition, some participants may now view the risks to economic growth as roughly balanced, with the near-term effects of this year's shift in fiscal policy expected to wane and further improvements in the housing sector and the labor market anticipated to generate additional gains in spending. They may also judge that overall financial conditions, bolstered by the ongoing recovery in housing prices and recent increases in equity prices, remain very supportive of economic growth. Moreover, some participants may now see a reduction in the pace of asset purchases as appropriate in light of the cumulative improvements in the outlook for the economy and the labor market since last September. In particular, given the decline in the unemployment rate since last summer as well as ongoing gains in private payroll employment, participants may judge that a modest reduction in the pace of purchases would be consistent with the "varying the pace" language in the May FOMC statement. Indeed, some policymakers may already see a substantial improvement in the outlook for the labor market, and so be inclined to bring the purchase program to a close. However, particularly in light of the recent elevated market volatility, they may think that it is better to taper the purchases, rather than simply end them now, out of concern that an unexpected abrupt end could cause market strains for a time. For all of these reasons, participants might prefer a statement like Alternative C that reduces the pace of purchases of Treasury securities and agency MBS.

Some policymakers may be skeptical that the current program of purchasing longer-term securities is reducing interest rates appreciably, or that it is having a significant effect on macroeconomic outcomes. Furthermore, they may judge the prospective costs of continuing purchases at the current pace to be significant. In particular, they may be concerned that further asset purchases could lead to excessive risk-taking in financial markets, undermine financial stability, and ultimately put the

achievement of the dual mandate at risk. Even if participants see the costs of a still-larger balance sheet as highly uncertain, they may wish to proceed more slowly to accumulate more information about those costs and about the underlying economic situation. Other participants might be concerned that the Federal Reserve's large and growing balance sheet may eventually contribute to an unhinging of long-term inflation expectations. In addition, some policymakers may worry that a statement along the lines of Alternative B could unwind the shift in market expectations for the purchase program that followed the Chairman's recent Congressional testimony, making it more difficult to reduce the pace of asset purchases in the future and so risking an undesirable increase in inflation over the medium term.

A decision to adopt a statement like Alternative C at this meeting would come as a surprise to market participants and might be seen as an indication that the Committee will end asset purchases sooner and acquire an appreciably smaller total stock of securities than market participants currently anticipate. The effect of such a surprise might cause longer-term interest rates to rise even further, reduce equity prices, and increase volatility in financial markets. The extent of these effects would depend on how much the policy decision influenced investors' outlook for the economy and their expectations for the stance of monetary policy going forward.

THE CASE FOR ALTERNATIVE A

Some participants may conclude that a balanced approach to achieving both components of the dual mandate requires a still-more-stimulative policy stance. They may judge it likely that, without more-accommodative forward guidance about the federal funds rate or a larger asset purchase program than suggested by Alternative B, inflation would continue to run below the Committee's 2 percent target over the next few years, output and employment would grow at no more than a moderate rate, and the unemployment rate would remain unacceptably high in the medium term. Moreover, they may see other labor market indicators, such as the low labor force participation rate and the high levels of long-duration unemployment and individuals working part-time for economic reasons, as indicating that there has been only modest fundamental improvement in labor market conditions. Concerns about the outlook may be reinforced by weak manufacturing activity and indicators of business conditions and sentiment that are at low or modest levels. Accordingly, some policymakers might prefer Alternative A, which provides more monetary accommodation than Alternative B.

Some participants may not only judge that the modal outlook is unsatisfactory but also that downside risks to that outlook remain sizable. Continued uncertainty about fiscal policy could restrain household spending and business investment over the rest of this year more significantly than appears to have been the case to date, and fiscal and financial headwinds in Europe remain considerable. At the same time, with inflation recently falling further below 2 percent and measures of longer-term inflation compensation having declined over the intermeeting period, some policymakers may see little risk that inflation or inflation expectations will move up; indeed, they may now be more concerned with downside risks to inflation, especially in light of still-substantial resource slack and contained wage costs. Policymakers may judge that with the federal funds rate at its effective lower bound, and with already heavy reliance on forward guidance and asset purchases to provide accommodation, the Committee's ability to address any downside shocks is limited. As a result, policymakers may see the potential consequences of a new adverse shock as more costly than the consequences of providing more policy accommodation only to find 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 as arguing for providing greater policy stimulus now.

Alternative A provides more accommodation than Alternative B by lowering the forward guidance threshold for the unemployment rate and by providing additional guidance about the eventual removal of policy accommodation.[1] In particular, Alternative A says "the Committee expects that when the time comes to reduce policy accommodation, it will be appropriate to do so gradually in order to foster stronger employment growth and inflation at 2 percent, or [even] modestly higher for a time." Alternative A would also imply holding a larger stock of assets for a longer time than under Alternative B, by stating that the Committee intends to rely on paydowns of principal rather than sales of agency MBS when it becomes appropriate to reduce its MBS holdings. Some participants may view a reduction in the unemployment threshold and an announcement that the Committee does not intend to sell MBS as an effective way to reinforce downward pressure on longer-term interest rates, provide more support to interest-sensitive sectors of the economy, and further strengthen the ongoing recovery in

[1] If the Committee chooses to reduce the unemployment threshold from 6½ percent to 6 percent, recent staff simulations of the FRB/US model suggest that such a reduction would postpone the departure of the federal funds rate from the effective lower bound by two quarters. The result would be a modestly more-rapid recovery in which the unemployment rate reaches the natural rate of unemployment about two quarters earlier along with a slightly quicker return of inflation to its 2 percent objective.

the housing sector. In addition, some participants may expect that more robust growth in the housing sector will have the additional effect of boosting household net worth, increasing consumer confidence and further supporting consumer spending.

An announcement like Alternative A would surprise market participants. In response to a lower expected path of future short-term interest rates, longer-term interest rates would likely decline, inflation compensation and equity prices might rise, and the dollar might depreciate. If, however, investors took a statement like Alternative A to indicate that the FOMC has become more pessimistic about the outlook for economic growth and employment than market participants had anticipated, equity prices might not rise or could even decline. Changing the threshold for the unemployment rate might create some confusion among investors about the extent to which the Committee feels bound by its forward guidance, potentially boosting the volatility of asset prices and the risk premiums built into market yields. The ability of forward guidance to achieve the Committee's dual objectives might also be undercut if the public doubted that the Committee would credibly adhere to the policy in the future.

DIRECTIVE

The directive that was issued after the April-May meeting appears on the next page, followed by drafts for a June directive that correspond to each of the policy alternatives. The directives for Alternatives A and B are unchanged; the draft for C suggests a modest update to make the language of the directive consistent with the corresponding post-meeting statement.

The draft directives for Alternatives A and B instruct the Desk to continue purchasing additional agency mortgage-backed securities at a pace of about $40 billion per month and to continue purchasing longer-term Treasury securities at a pace of about $45 billion per month. The draft directive for Alternative C instructs the Desk to purchase agency mortgage-backed securities at a pace of about [$35] billion per month, and to purchase longer-term Treasury securities at a pace of about [$35] billion per month, beginning in July. All three of the draft directives direct the Desk to maintain the current policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction.

Authorized for Public Release

April-May Directive

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to undertake open market operations as necessary to maintain such conditions. The Desk is directed to continue purchasing longer-term Treasury securities at a pace of about $45 billion per month and to continue purchasing agency mortgage-backed securities at a pace of about $40 billion per month. The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions. The Committee directs the Desk to maintain its policy of rolling over maturing Treasury securities into new issues and its policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

Directive for June 2013 Alternative A

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to undertake open market operations as necessary to maintain such conditions. The Desk is directed to continue purchasing longer-term Treasury securities at a pace of about $45 billion per month and to continue purchasing agency mortgage-backed securities at a pace of about $40 billion per month. The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions. The Committee directs the Desk to maintain its policy of rolling over maturing Treasury securities into new issues and its policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

Directive for June 2013 Alternative B

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to undertake open market operations as necessary to maintain such conditions. The Desk is directed to continue purchasing longer-term Treasury securities at a pace of about $45 billion per month and to continue purchasing agency mortgage-backed securities at a pace of about $40 billion per month. The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions. The Committee directs the Desk to maintain its policy of rolling over maturing Treasury securities into new issues and its policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

Directive for June 2013 Alternative C

Consistent with its statutory mandate, the Federal Open Market Committee seeks monetary and financial conditions that will foster maximum employment and price stability. In particular, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to undertake open market operations as necessary to maintain such conditions. **Beginning with the month of July,** the Desk is directed to ~~continue purchasing~~ **purchase** longer-term Treasury securities at a pace of about ~~$45~~ **$35** billion per month and to ~~continue purchasing~~ **purchase** agency mortgage-backed securities at a pace of about ~~$40~~ **$35** billion per month. The Committee also directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency mortgage-backed securities transactions. The Committee directs the Desk to maintain its policy of rolling over maturing Treasury securities into new issues and its policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in agency mortgage-backed securities. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

Authorized for Public Release

(This page is intentionally blank.)

Authorized for Public Release

Projections

BANK CREDIT AND MONEY[1]

Growth in commercial bank credit is projected to pick up gradually over the forecast period, reaching 5 percent in 2015. The moderate acceleration reflects a strengthening in demand for bank loans as economic activity continues to improve, as well as some easing of credit conditions for real estate loans. In particular, the staff anticipates that commercial real estate loans, after decreasing every year since 2009, will resume growing at a moderate rate, as high vacancy rates on certain property types edge lower and the credit quality of existing loans in this sector improves further. Similarly, growth of residential real estate loans carried on banks' books is expected to move up somewhat as standards and terms on such loans gradually ease amid an improvement in household balance sheets and housing fundamentals. We anticipate that the pace of expansion of consumer loans will also increase, reflecting continued rapid growth of automobile loans and a modest acceleration in household spending on other consumer durables. In contrast, the rapid growth of commercial and industrial loans observed through the first quarter of 2013 is expected to normalize over the next few years to a rate that is more in line with nominal GDP growth. Meanwhile, with demand for bank loans firming and deposit growth moderating, we expect banks' holdings of securities to expand at a somewhat slower pace than in 2012.

M2 is projected to increase at a pace below that of nominal income through 2014 and then contract in 2015. Beginning later this year and through 2014, the growth of M2 and its largest component, liquid deposits, is expected to moderate relative to the rapid expansion observed over recent years, with a gradual improvement in financial conditions encouraging investors to shift their portfolios away from the safe and liquid assets in M2 and toward riskier financial assets. In 2015, M2 is expected to decline in response to the projected increase in short-term market interest rates and the accompanying rise in the opportunity cost of holding money.

[1] To reduce demand on staff resources, this section will no longer contain a discussion of domestic nonfinancial debt.

M2 Monetary Aggregate Projections
(Percent change, annual rate; seasonally adjusted)[1]

Monthly			
	2013:	June	4.6
		July	3.9
		Aug.	3.9
		Sept.	3.9
		Oct.	1.5
		Nov.	1.5
		Dec.	1.5
	2014:	Jan.	2.8
		Feb.	2.8
		Mar.	2.8
		Apr.	2.3
		May	2.3
Quarterly			
	2013:	Q2	4.3
		Q3	4.0
		Q4	2.3
	2014:	Q1	2.3
		Q2	2.5
		Q3	2.6
		Q4	2.7
	2015:	Q1	-0.4
		Q2	-2.1
		Q3	-1.3
		Q4	-0.3
Annual			
		2013	3.9
		2014	2.5
		2015	-1.0

Note: This forecast is consistent with nominal GDP and interest rates in the Tealbook forecast. Actual data through June 3, 2013; projections thereafter.

1. Growth rates are computed from period averages with the exception of annual growth rates which are the change from fourth quarter of previous year to fourth quarter of year indicated.

Projections

BALANCE SHEET, INCOME, AND MONETARY BASE

The staff has prepared three scenarios for the Federal Reserve's balance sheet that correspond to interpretations of Alternatives A, B, and C. All three alternatives include additional asset purchases, though the pace and cumulative amount of purchases differ.[2] Alternative B continues purchases at the current pace through September, at which point the monthly purchases are reduced; purchases conclude by year-end. Alternative A maintains the current pace of purchases through March 2014. Thereafter, purchases continue at a slower pace through June 2014. Alternative C decreases the pace of purchases immediately and ends purchases in August.

Projections under each scenario are based on assumptions about the trajectory of various components of the balance sheet and the balance sheet normalization strategy.[3] The projections for Alternatives B and C assume that the Committee follows an exit strategy consistent with the principles articulated in the minutes of the June 2011 FOMC meeting, which includes sales of agency MBS over a five-year period. The projections in Alternative A, on the other hand, assume no sales of agency MBS and that the SOMA portfolio declines only through the passive redemption of SOMA assets.[4] The accompanying box, "Alternative B without Agency MBS Sales," discusses the implications of assuming no sales of agency MBS for the scenario corresponding to Alternative B.[5]

For the balance sheet scenario that corresponds to Alternative B, the Committee is assumed to continue expanding its holdings of agency MBS by $40 billion per month and of longer-term Treasury securities by $45 billion per month through September 2013, and

[2] The Committee is assumed to continue rolling over maturing Treasury securities at auction and reinvesting principal payments from agency MBS and agency debt securities into agency MBS until six months before the first increase in the federal funds rate. The effect of assuming that maturing Treasury securities are rolled over at auction is very modest; as a result of the maturity extension program, there are currently less than $5 billion of Treasury securities in the SOMA portfolio that mature before January 2016.

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

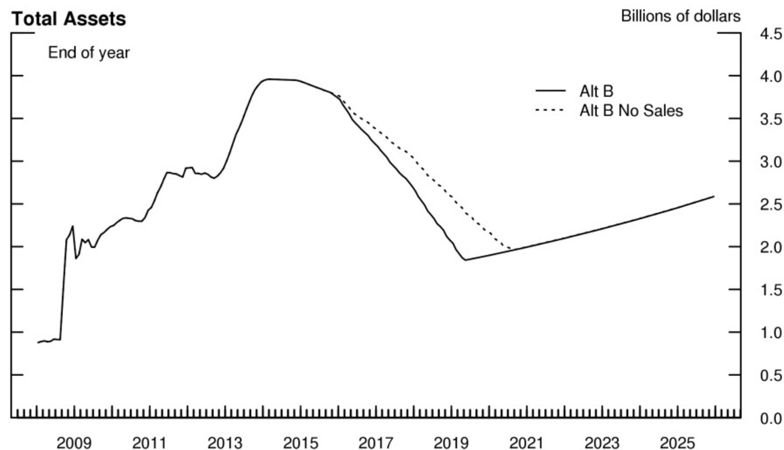
[4] This assumption is consistent with the new language for Alternative A that notes that the Committee now intends "to rely upon the paydowns of principal rather than sales of agency mortgage-backed securities when it eventually becomes appropriate to reduce its holdings of those securities."

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

Alternative B without Agency MBS Sales

The balance sheet projection for Alternative B assumes agency MBS are sold over five years, consistent with the June 2011 exit strategy principles. In this box, we present a projection for the balance sheet under Alternative B that compares the staff's standard exit strategy assumptions with the assumption that agency MBS holdings decline only through passive redemptions.[1]

With no sales of agency MBS, payments of principal on both agency and Treasury securities are projected to reduce SOMA holdings by approximately $300 billion per year from 2015 to 2020. This passive decline in securities holdings is a bit slower than in Alternative B, implying that the size of the balance sheet normalizes in mid-2020, a year later than in the baseline scenario, as shown in the chart below. Without sales of agency MBS, SOMA holdings of agency MBS are projected to decline to about $500 billion by the end of the projection period in 2025, but might not fall to zero until 30 years after purchases end depending on the pace of principal payments.

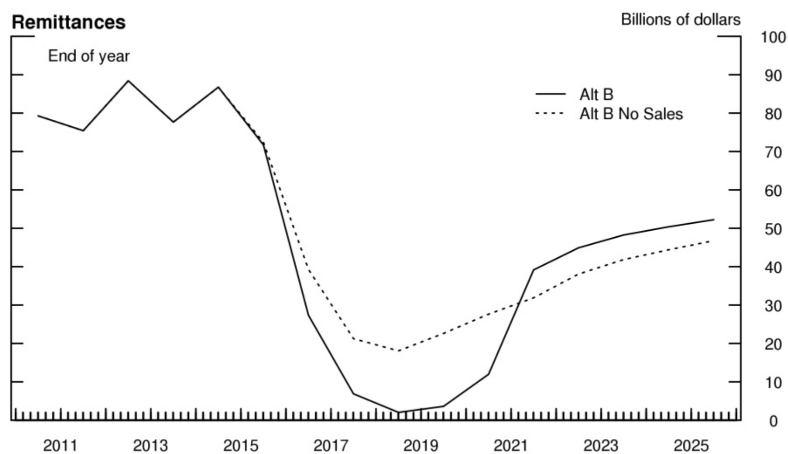


Projections

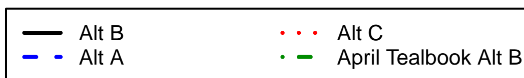
[1] See the memo titled "Update on Balance Sheet and Income Projections under Alternative Normalization Strategies" by Kunal Gooriah, Jeff Huther, Jane Ihrig, Beth Klee, Deborah Leonard, and Zeynep Senyuz (sent to the Committee on June 7, 2013) for additional balance sheet and income projections associated with a no agency MBS sales scenario.

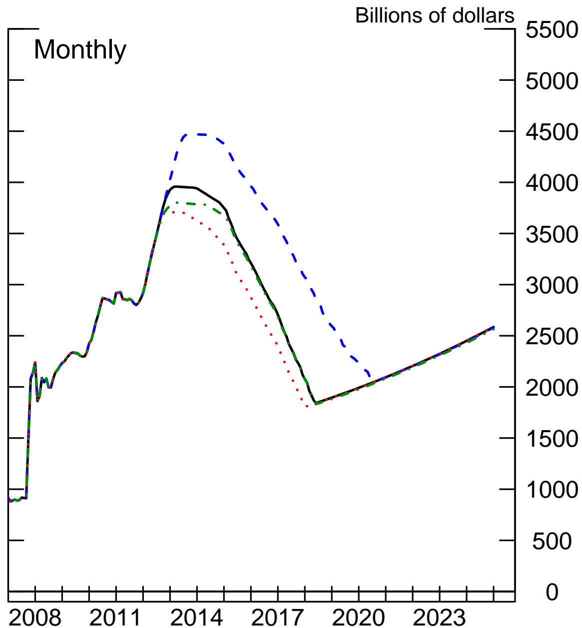
Authorized for Public Release

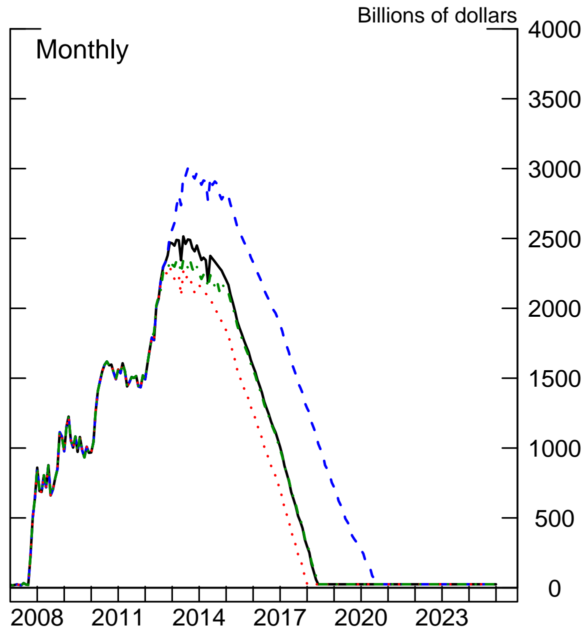
By not selling agency MBS, realized capital losses are eliminated, but the less rapid normalization of the balance sheet implies that interest expense on reserve balances is higher in many years than in Alternative B. On net, Federal Reserve net income is higher than under Alternative B because the elimination of realized losses more than offsets the increase in interest expense. Under the no MBS sales scenario, annual remittances to the Treasury trough at $18 billion in 2018, noticeably higher than the near zero trough for remittances projected in Alternative B, shown in the figure below. On net, not selling agency MBS generates about $45 billion more in cumulative remittances between 2009 and 2025 than if agency MBS were sold over five years.

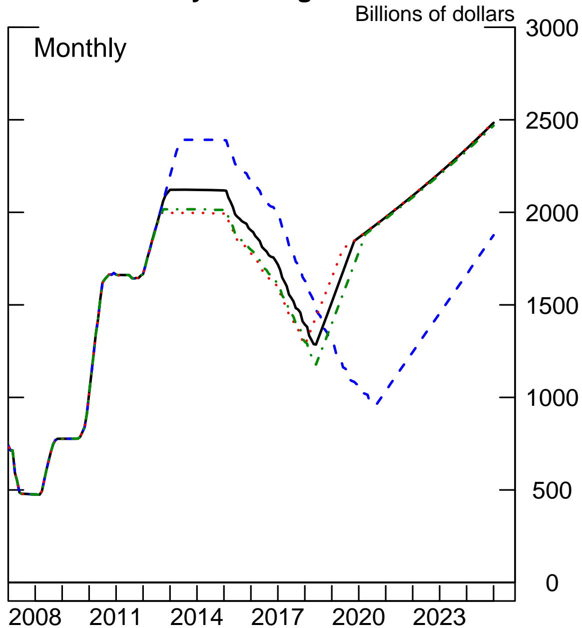


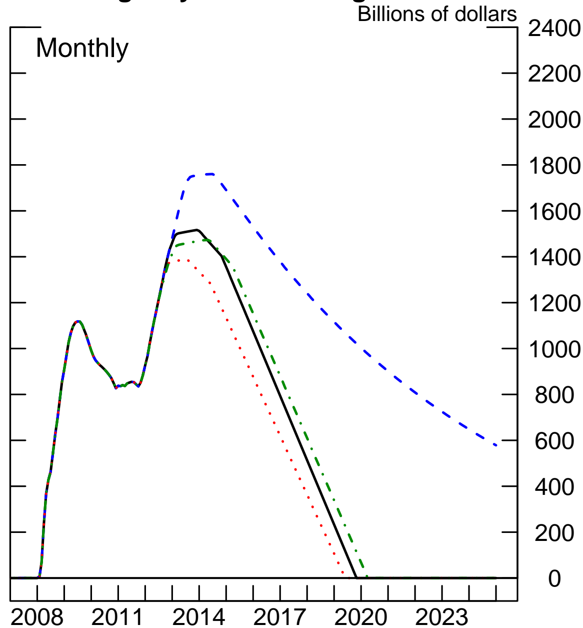
Total Assets and Selected Balance Sheet Items











Projections

then reduce these purchases through year-end. Purchases total about $900 billion in 2013, up from $750 billion assumed in the April Tealbook and in the staff forecast reviewed in the current Tealbook Book A. This scenario might be viewed as broadly consistent with the description of asset purchases in the statement language of Alternative B.[6]

As shown in the exhibit "Total Assets and Selected Balance Sheet Items," under the purchase program assumed in Alternative B, SOMA securities holdings peak at about $3.7 trillion in January 2014, with $2.1 trillion in Treasury securities holdings and $1.6 trillion in agency securities holdings. Given the exit strategy principles adopted by the Committee in June 2011, the date of liftoff is a key determinant of the trajectory of the balance sheet. Consistent with the 6½ percent threshold for the unemployment rate, we assume that the first increase in the target federal funds rate is in May 2015, as in the staff forecast in Tealbook Book A.[7,8] In November 2014, 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 November 2015, 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 over five years, that is, by October 2020. 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] As discussed in the Monetary Policy Alternatives section of Tealbook Book B, the wording of Alternative B is intended to suggest that the Committee could reduce the pace of purchases if the data in coming months show continuing improvement in labor market conditions.

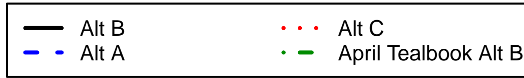
[7] At the time of liftoff, the unemployment rate is projected to be below the 6½ percent threshold, and inflation is expected to be a bit below the Committee's 2 percent objective in the medium run.

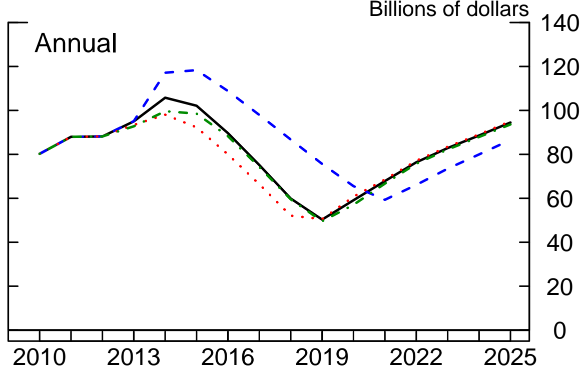
[8] This liftoff date for the federal funds rate is two quarters earlier than that assumed in the balance sheet projections for Alternative B in the April Tealbook.

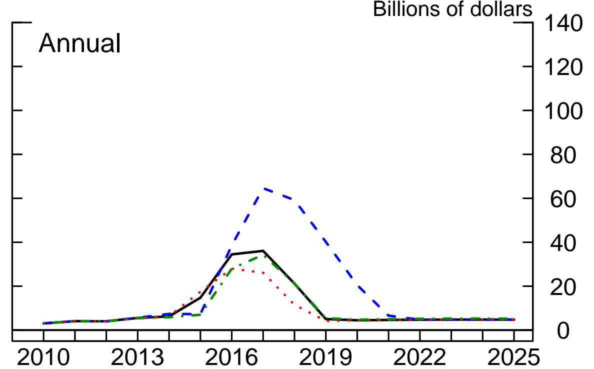
[9] Temporary reserve draining tools (reverse repurchase agreements and term deposits) are not modeled in any of the scenarios presented. Use of these tools would result in a shift in the composition of Federal Reserve liabilities—a decline in reserve balances and a corresponding increase in reverse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

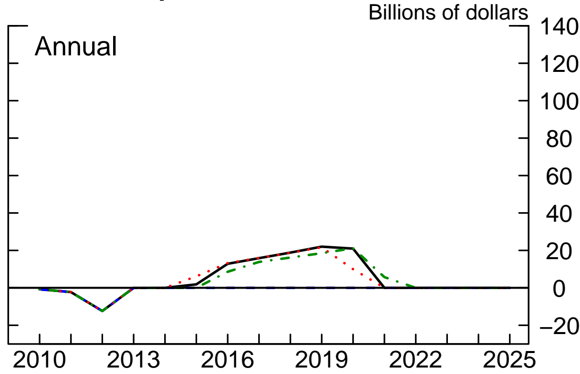
[10] The size of the balance sheet is assumed to be normalized when the securities portfolio reverts to its longer-run trend level, determined largely by currency in circulation plus Federal Reserve capital and a projected steady-state level of reserve balances. The projected timing of the normalization of the size of the balance sheet depends importantly on the level of reserve balances that is assumed to be necessary to 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.

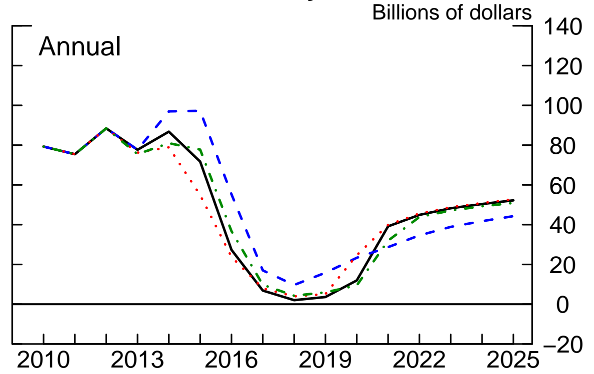
Income Projections

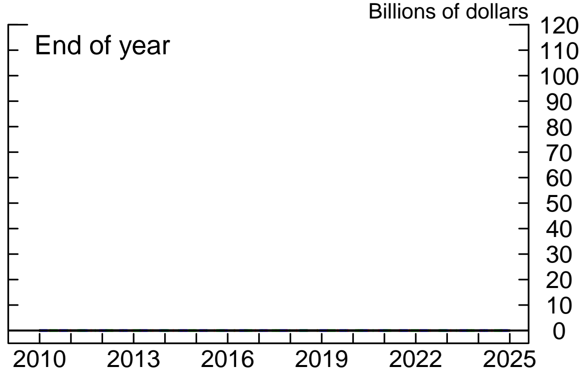


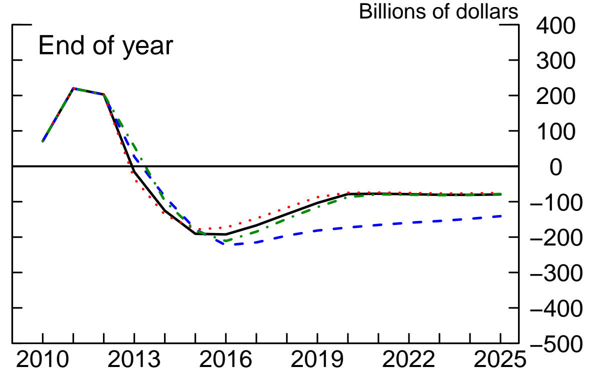












Projections

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

The second exhibit, "Income Projections," shows the implications for Federal Reserve income across the alternatives. In the scenario for Alternative B, interest income rises until reinvestments cease and then declines as the SOMA portfolio begins to contract. As the federal funds rate rises after liftoff, interest expense on reserve balances climbs. Sales of agency MBS are projected to result in realized capital losses.[11] These capital losses, in conjunction with the rise in interest expense on reserve balances and the decrease in interest income, substantially reduce Federal Reserve net income for a few years. Federal Reserve remittances to the Treasury are projected to remain positive over the entire projection period, but fall to very low levels for a number of years. No deferred asset is accumulated. Annual remittances peak at about $90 billion in 2014 and trough slightly above zero later in the decade. Cumulative remittances from 2009 through 2025 are about $810 billion, well above the level that would have been observed without the asset purchase programs.

In the scenario for Alternative A, the Committee is assumed to continue the current pace of purchases of longer-term Treasury securities and additional agency MBS through the first quarter of 2014. At the beginning of the second quarter of 2014, the Committee is assumed to begin stepping down the pace of purchases, and in mid-2014 it ends the purchase program. Purchases total about $1.4 trillion over 2013 and the first half of 2014. This scenario might be viewed as consistent with the descriptions of asset purchases in the statement language of Alternative A.[12] In this scenario, SOMA securities holdings increase to a peak of about $4.2 trillion. The first increase in the target federal funds rate occurs in late 2015, later than in Alternative B because of the 5½ percent threshold for the unemployment rate. In mid-2015, all reinvestments are projected to cease and the SOMA portfolio begins to contract. This scenario assumes MBS holdings are reduced through paydowns of principal rather than sales of agency MBS. The size of the portfolio is normalized in mid-2021, about two years later than in

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

[12] Under the projection for Alternative A, the unemployment rate will have fallen to under 7 percent in mid-2014, inflation is expected to be around 1½ percent, and real GDP will be expanding at an annual rate of more than 3 percent. Moreover, the unemployment rate is projected to decline further through 2015, while inflation is expected to tick up.

the scenario corresponding to Alternative B, reflecting the larger LSAP program, the later start to balance sheet normalization, and the lack of MBS sales.

The additional purchases of securities in this scenario substantially boost the level of the SOMA portfolio and reserve balances in the near term. Net interest income increases initially and then remains elevated until reinvestments are assumed to end, and Federal Reserve remittances to the Treasury peak at about $100 billion in 2015. As the federal funds rate rises after liftoff, the interest expense on reserve balances increases. This rise in interest expense, paired with a decrease in interest income associated with a contracting portfolio, reduce Federal Reserve net income somewhat. Federal Reserve remittances to the Treasury are projected to remain positive over the entire projection period and no deferred asset is recorded. Cumulative remittances remain robust, and, from 2009 through 2025, are about $870 billion, somewhat higher than under Alternative B.

For the scenario that corresponds to Alternative C, the Committee announces a decrease in the pace of purchases of both longer-term Treasury securities and additional agency MBS to $35 billion per month beginning in July.[13] The Committee is assumed to cease purchases by the end of August, with purchases totaling about $650 billion in 2013.[14] In this scenario, the federal funds rate is assumed to lift off in late 2014.[15] Corresponding to this earlier increase in the federal funds rate, reinvestment of principal

[13] The staff assumes that the main effect of asset purchases on financial conditions comes from the expected size and composition of the Federal Reserve's portfolio over time. As a result, the macroeconomic effects of a change in the pace of purchases will depend importantly on how the change influences investors' expectations of the evolution of the overall size and composition of the Federal Reserve's portfolio. For reference, see the memo titled "Changing the Pace of Asset Purchases" (by S. Carpenter, W. English, S. Meyer, W. Nelson, D. Reifschneider, and R. Tetlow of the Federal Reserve Board, and J. Egelhof, S. Friedman, L. Logan, and S. Potter of the Federal Reserve Bank of New York) that was sent to the Committee on April 22, 2013.

[14] The scaling back of the asset purchase program may be seen as consistent with policymakers seeing the economic recovery as having reached a self-sustaining course based on the improvement in its outlook for the labor market since last September when the Committee first tied its decision about additional asset purchases to the outlook for labor market conditions. Alternatively, by August 2013, the Committee could end the purchase program based on its assessment that the prospective costs of further purchases are likely to outweigh the benefits.

[15] The scenario assumes that the Committee raises the federal funds rate before either the threshold for the unemployment rate or the threshold for projected inflation is crossed, perhaps because policymakers are concerned that longer-term inflation expectations would become unanchored if policy is not tightened or because the Committee concludes that continuing to keep the federal funds rate target at the zero lower bound would undermine future financial stability.

from maturing or prepaying securities ends and redemptions begin in mid-2014, and the portfolio begins to contract. Sales of agency securities commence six months after liftoff and last for five years. SOMA securities holdings in this scenario peak at $3.4 trillion, and the size of the balance sheet is normalized about one-half year earlier than under Alternative B. Federal Reserve remittances to the Treasury are projected to remain positive throughout the projection period, and no deferred asset is recorded. Cumulative remittances from 2009 to 2025 are about $800 billion, somewhat less than under Alternative B.

The differences across the scenarios regarding the projected peak amount of reserve balances and the level of reserve balances at liftoff are directly related to the magnitude of assumed asset purchases.[16] Reserve balances peak at about $3.0 trillion, $2.5 trillion, and $2.3 trillion under Alternatives A, B, and C, respectively. When the federal funds rate lifts off from its lower bound, reserve balances are $2.8 trillion, $2.4 trillion, and $2.2 trillion under Alternatives A, B, and C, respectively.

As shown in the final exhibit, "Alternative Projections for the Monetary Base," in the scenario corresponding to Alternative B, the monetary base increases through early 2014 because of the purchase program and the accompanying increase in reserve balances. Once exit begins, the monetary base shrinks, on net, through mid-2019, primarily reflecting redemptions and sales of securities and the corresponding reduction in reserve balances. Starting in late 2019, after reserve balances are assumed to have stabilized at $25 billion, the monetary base begins to expand in line with the growth of currency in circulation. Under Alternative A, the monetary base increases through mid-2014, longer than under Alternative B, as the level of reserve balances climbs in concert with the expansion of the Federal Reserve's balance sheet. The monetary base then contracts during the exit period until the size of the portfolio is normalized. Under Alternative C, the monetary base increases through the end of this year because of the purchase program and then contracts, on net, until about one quarter after the size of the portfolio is normalized.

[16] The level of reserve balances is also contingent on the evolution of other balance sheet items.

Alternative Projections for the Monetary Base

Percent change, annual rate; not seasonally adjusted

Date		Alternative A	Alternative B	Alternative C	April Alternative B
Monthly					
2012:	Dec	13.7	13.7	13.7	13.7
2013:	Jan	21.5	21.5	21.5	21.5
	Feb	37.1	37.1	37.1	37.1
	Mar	42.6	42.6	42.6	42.6
	Apr	35.8	35.8	35.8	29.2
	May	9.3	9.3	9.3	48.7
	Jun	6.2	6.2	6.2	51.7
	Jul	39.7	39.2	37.0	23.1
	Aug	46.5	46.0	41.5	33.8
Quarterly					
2012:	Q4	-0.5	-0.5	-0.5	-0.5
2013:	Q1	25.1	25.1	25.1	25.1
	Q2	28.7	28.7	28.7	41.3
	Q3	29.5	29.3	26.0	35.7
	Q4	29.8	25.1	9.4	15.3
2014:	Q1	27.5	8.6	-1.9	4.4
	Q2	21.9	-1.1	-2.5	0.7
	Q3	15.0	5.8	4.7	2.4
Annual [1]					
2012		0.3	0.3	0.3	0.3
2013		31.4	29.9	24.2	32.6
2014		16.3	2.4	-1.7	1.3
2015		-1.6	-2.7	-5.3	-1.2
2016		-8.7	-15.5	-16.5	-13.0
2017		-10.6	-17.9	-19.2	-16.6
2018		-16.1	-26.8	-28.8	-24.0
2019		-18.8	-16.8	-1.4	-15.8
2020		-18.2	5.1	5.2	4.5
2021		-11.7	5.2	5.2	4.6
2022		5.0	5.1	5.2	4.6
2023		5.0	5.1	5.1	4.5
2024		5.0	5.0	5.0	4.4
2025		5.0	5.0	5.0	4.4

1. Percent change from fourth quarter of previous year to fourth quarter of period indicated.

Projections

Appendix

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

GENERAL ASSUMPTIONS

The balance sheet projections are constructed at a monthly frequency from June 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 May 31, 2013. The projections for all major asset and liability categories under each scenario are summarized in the tables that follow the bullet points.

The Tealbook projections for the scenario corresponding to Alternative B assume that the target federal funds rate begins to increase in May 2015. This date of liftoff is consistent with the current staff economic forecast and the thresholds described in the May 2013 FOMC statement, and it is two quarters earlier than assumed in the balance sheet projections for Alternative B in the April Tealbook. In the projections for the scenario corresponding to Alternative A, the first increase in the target federal funds rate occurs in late 2015, consistent with a reduction in the threshold for the unemployment rate to 5½ percent. The projections for the scenario corresponding to Alternative C assume the target federal funds rate lifts off in late 2014. In each case, the balance sheet projections assume no use of short-term draining tools to achieve the projected path for the target federal funds rate.[1]

Projections

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

ASSETS

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

- The assumptions under Alternative B are:
    - The Committee is assumed to continue expanding its holdings of agency MBS by $40 billion per month and of longer-term Treasury securities by $45 billion per month through September 2013. After September 2013, purchases are assumed to continue, but at a steadily decreasing rate, concluding by the end of the year. The Treasury securities purchased are assumed to have an average duration of about nine years. The purchases in 2013 expand the SOMA portfolio's holdings of longer-term securities by about $900 billion.
    - The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS.
    - Starting in November 2014—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 November 2015, 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 October 2020.
    - For agency MBS, the rate of prepayment is based on staff models using estimates of housing market factors from one of the Desk's analytical providers, long-run average prepayment speeds of MBS, and interest rate projections generated from the staff's FRB/US model.[2] The projected rate of prepayment is sensitive to these underlying assumptions.

- In the scenario corresponding to Alternative A, the Committee is assumed to continue the current pace of purchases of longer-term Treasury securities and additional agency MBS through March 2014. Thereafter, the pace of purchases slows, and purchases end in June 2014. 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 about $1.4 trillion in 2013 and the first half of 2014. 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. Starting in mid-2015, principal payments from all securities are allowed to roll off the portfolio. This scenario does not entail sales of agency MBS, and as a result, the portfolio declines only through the passive redemption of SOMA assets.

[2] Projected prepayments of agency MBS reflect interest rate projections as of June 10, 2013.

- In the scenario corresponding to Alternative C, the Committee is assumed to decrease the monthly pace of purchases to $35 billion of longer-term Treasury securities and $35 billion of additional agency MBS beginning in July 2013. Purchases cease by the end of August. 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 about $650 billion in 2013. The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS until mid-2014. Thereafter, 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 six months after liftoff. Holdings of agency securities are reduced over five years and reach zero in 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 the Federal Reserve purchases securities 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 $18 billion, $9 billion, and $5 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 market value at which the Federal Reserve purchases new agency MBS will generally exceed their face value. As a result, for Alternatives A, B, and C, the $470 billion, $230 billion, and $110 billion of agency MBS purchases, respectively, will cause premiums on the Federal Reserve's balance sheet to rise by roughly $18 billion, $9 billion, and $3 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 gradually, reaching zero by the end of 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.
- The level of foreign currency denominated assets held in the SOMA portfolio is assumed to stay constant at $23 billion.

Liquidity Programs and Credit Facilities

- Credit through the Term Asset-Backed Securities Loan Facility (TALF) declines to zero by the end of 2015, reflecting loan maturities and prepayments.

- The assets held by TALF LLC decline from about $400 million currently to zero in 2015. Assets held by TALF LLC consist of investments of commitment fees collected by the LLC. On January 15, 2013, the Board of Governors approved the elimination of the U.S. Treasury's funding commitment and the repayment of the initial funding amount plus accrued interest. Additionally, the Board of Governors approved the disbursement of contingent interest payments from TALF LLC to Treasury and FRBNY that equal, approximately, the excess of the TALF LLC cash balance over the amount of outstanding TALF loans less funds reserved for future expenses of TALF LLC. The first payment occurred in February, and additional payments occur on a monthly basis. Consistent with events to date, the projections assume the LLC does not purchase any asset-backed securities. (It would have to make such purchases if an asset-backed security were received by the Federal Reserve Bank of New York in connection with a decision of a borrower not to repay a TALF loan.)
- The assets held by Maiden Lane LLC decline to zero in 2016.

LIABILITIES AND CAPITAL

- Federal Reserve notes in circulation are assumed to grow at an average annual rate of 6 percent through 2015, in line with the staff forecast. 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 $100 billion, about the average level of RRPs associated with foreign official and international accounts observed over the past three years.
- Balances held in the U.S. Treasury's General Account (TGA) follow recent patterns until the assumed initial increase in the target federal funds rate in each alternative. At that point, the TGA drops back to its historical target level of $5 billion 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.[3]
- 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

[3] The annual growth rate of capital affects the date of normalization of the size of the balance sheet, the size of the SOMA portfolio after normalization, and the level of annual remittances to the Treasury. Growth in Reserve Bank capital has been modest over the past two years; if Federal Reserve capital were assumed to grow at a slower rate, the normalization date would be slightly later, the size of SOMA would be a bit smaller after normalization, and annual remittances would, on net, be modestly larger.

items would otherwise cause reserve balances to fall below $25 billion, purchases of Treasury securities are assumed in order to maintain that level of reserve balances.

- In the event that a Federal Reserve Bank's earnings fall short of the amount necessary to cover operating costs, pay dividends, and equate surplus to capital paid-in, a deferred asset would be recorded. This deferred asset is reported on the liability side of the balance sheet as "Interest on Federal Reserve notes due to U.S. Treasury." This liability takes on a positive value when weekly cumulative earnings have not yet been distributed to the Treasury and takes on a negative value when earnings fall short of the expenses listed above. In this Tealbook, none of the alternatives result in a deferred asset.

TERM PREMIUM EFFECTS[4]

- Under Alternative A, the term premium effect on the yield of the ten-year Treasury note is negative 135 basis points in the current quarter.[5] 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 until the size of the portfolio is normalized.
- Under Alternative B, the contemporaneous term premium effect is negative 102 basis points. 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 90 basis points. The effect is less negative than in Alternative B because there are fewer securities purchased in 2013 and the liftoff date is earlier so asset sales begin sooner than under Alternative B.

[4] 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 C. Li and M. Wei, FEDS working paper 2012-37.

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

Alternative Projections for the 10-Year Treasury Term Premium Effect

Date	Alternative A	Alternative B	Alternative C	April Alternative B
	Basis Points			
	Quarterly Averages			
2013: Q2	–135	–102	–90	–114
Q3	–133	–100	–87	–101
Q4	–130	–94	–82	–91
2014: Q1	–125	–89	–76	–86
Q2	–120	–83	–71	–80
Q3	–115	–78	–66	–75
Q4	–109	–72	–61	–70
2015: Q1	–104	–67	–56	–65
Q2	–98	–62	–51	–60
Q3	–93	–57	–47	–56
Q4	–88	–52	–43	–51
2016: Q4	–70	–36	–29	–36
2017: Q4	–55	–24	–20	–24
2018: Q4	–43	–17	–15	–17
2019: Q4	–34	–14	–13	–13
2020: Q4	–27	–13	–12	–12
2021: Q4	–22	–12	–11	–11
2022: Q4	–18	–10	–9	–9
2023: Q4	–14	–8	–7	–7
2024: Q4	–11	–6	–6	–5
2025: Q4	–8	–4	–4	–4

Projections

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

Billions of dollars

	May 31, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,390	3,927	3,750	2,707	1,894	2,093	2,322	2,586
Selected assets								
Liquidity programs for financial firms	2	8	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	2	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	3,124	3,642	3,507	2,517	1,750	1,973	2,212	2,484
U.S. Treasury securities	1,888	2,122	2,118	1,718	1,514	1,973	2,212	2,484
Agency debt securities	71	57	33	4	2	0	0	0
Agency mortgage-backed securities	1,165	1,462	1,356	795	234	0	0	0
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	201	216	182	128	83	58	48	40
Unamortized discounts	-2	-4	-3	-2	-2	-2	-1	-1
Total other assets	62	64	64	64	64	64	64	64
Total liabilities	3,335	3,864	3,667	2,597	1,749	1,901	2,068	2,249
Selected liabilities								
Federal Reserve notes in circulation	1,148	1,189	1,340	1,465	1,600	1,753	1,920	2,101
Reverse repurchase agreements	94	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,084	2,566	2,219	1,024	41	41	41	41
Reserve balances held by depository institutions	2,016	2,465	2,203	1,008	25	25	25	25
U.S. Treasury, General Account	35	90	5	5	5	5	5	5
Other Deposits	33	11	11	11	11	11	11	11
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.

Projections

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

Billions of dollars

	May 31, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,390	4,025	4,377	3,591	2,594	2,093	2,319	2,580
Selected assets								
Liquidity programs for financial firms	2	8	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	2	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	3,124	3,734	4,114	3,373	2,412	1,938	2,181	2,457
U.S. Treasury securities	1,888	2,197	2,390	1,989	1,294	1,034	1,454	1,876
Agency debt securities	71	57	33	4	2	2	2	2
Agency mortgage-backed securities	1,165	1,480	1,691	1,379	1,116	901	725	579
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	201	220	204	158	121	95	77	61
Unamortized discounts	-2	-3	-4	-4	-3	-3	-2	-2
Total other assets	62	64	64	64	64	64	64	64
Total liabilities	3,335	3,962	4,294	3,481	2,448	1,901	2,064	2,244
Selected liabilities								
Federal Reserve notes in circulation	1,148	1,189	1,340	1,471	1,604	1,752	1,916	2,095
Reverse repurchase agreements	94	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,084	2,665	2,844	1,900	736	41	41	41
Reserve balances held by depository institutions	2,016	2,564	2,828	1,884	720	25	25	25
U.S. Treasury, General Account	35	90	5	5	5	5	5	5
Other Deposits	33	11	11	11	11	11	11	11
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.

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

Billions of dollars

	May 31, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,390	3,709	3,389	2,397	1,894	2,095	2,325	2,589
Selected assets								
Liquidity programs for financial firms	2	8	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	2	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	3,124	3,432	3,160	2,218	1,756	1,976	2,215	2,487
U.S. Treasury securities	1,888	1,997	1,993	1,593	1,647	1,976	2,215	2,487
Agency debt securities	71	57	33	4	2	0	0	0
Agency mortgage-backed securities	1,165	1,378	1,134	621	107	0	0	0
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	201	206	167	117	75	56	47	38
Unamortized discounts	-2	-3	-2	-1	-1	-1	-1	-1
Total other assets	62	64	64	64	64	64	64	64
Total liabilities	3,335	3,646	3,306	2,287	1,749	1,903	2,070	2,252
Selected liabilities								
Federal Reserve notes in circulation	1,148	1,189	1,340	1,465	1,601	1,755	1,923	2,105
Reverse repurchase agreements	94	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,084	2,349	1,859	716	41	41	41	41
Reserve balances held by depository institutions	2,016	2,248	1,843	700	25	25	25	25
U.S. Treasury, General Account	35	90	5	5	5	5	5	5
Other Deposits	33	11	11	11	11	11	11	11
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.

Projections

Authorized for Public Release

(This page is intentionally blank.)

Abbreviations

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

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