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.

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Report to the FOMC on Economic Conditions and Monetary Policy

Book B

Monetary Policy: Strategies and Alternatives

September 12, 2013

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

Monetary Policy Strategies

The top panel of the first exhibit, "Policy Rules and the Staff Projection," provides near-term prescriptions for the federal funds rate from six policy rules: the Taylor (1993) rule, the Taylor (1999) rule, the inertial Taylor (1999) rule, the outcome-based rule, the first-difference rule, and the nominal income targeting rule. These prescriptions take as given the staff's baseline projections for real activity and inflation in 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 the next two quarters. The Taylor (1993) rule, which puts relatively little weight on the output gap, prescribes a federal funds rate of about 120 basis points in the coming quarter and 130 basis points in the first quarter of 2014. The first-difference rule, which responds to the expected change in the output gap, prescribes a federal funds rate of about 25 basis points for the coming quarter and about 50 basis points in the first quarter of 2014.

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 around zero. In contrast, the Taylor (1999) rule, which does not include a lagged value of the federal funds rate and responds more strongly to current inflation and the staff's estimate of the current output gap, prescribes negative values for the federal funds rate. The nominal income targeting rule responds both to the current estimate of the output gap as well as the cumulative shortfall of inflation below the assumed 2 percent target since 2008. As a result, this rule also prescribes negative values for the federal funds rate for the next two quarters.

The Tealbook baseline projections for the output gap and inflation are shown in the bottom half of the exhibit, titled "Key Elements of the Staff Projection." As shown in the bottom left panel, the staff's projection for the output gap is narrower in the near-term

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

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Policy Rules

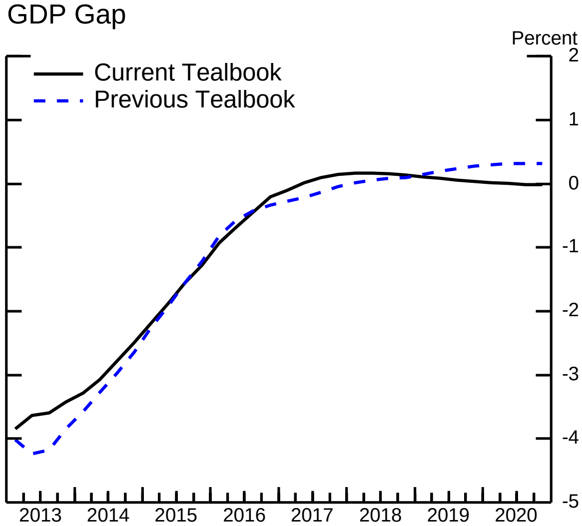
	Constrained Policy		Unconstrained Policy	
	2013Q4	2014Q1	2013Q4	2014Q1
Taylor (1993) rule	**1.18**	**1.28**	**1.18**	**1.28**
Previous Tealbook	*1.00*	*1.25*	*1.00*	*1.25*
Taylor (1999) rule	**0.13**	**0.13**	**–0.51**	**–0.33**
Previous Tealbook	*0.13*	*0.13*	*–0.89*	*–0.50*
Inertial Taylor (1999) rule	**0.13**	**0.13**	**0.03**	**–0.02**
Previous Tealbook outlook	*0.13*	*0.13*	*–0.03*	*–0.10*
Outcome-based rule	**0.13**	**0.13**	**0.10**	**0.08**
Previous Tealbook outlook	*0.13*	*0.13*	*0.11*	*0.13*
First-difference rule	**0.25**	**0.47**	**0.25**	**0.47**
Previous Tealbook outlook	*0.49*	*0.88*	*0.49*	*0.88*
Nominal income targeting rule	**0.13**	**0.13**	**–0.70**	**–1.32**
Previous Tealbook outlook	*0.13*	*0.13*	*–0.74*	*–1.32*

Memo: Equilibrium and Actual Real Federal Funds Rate

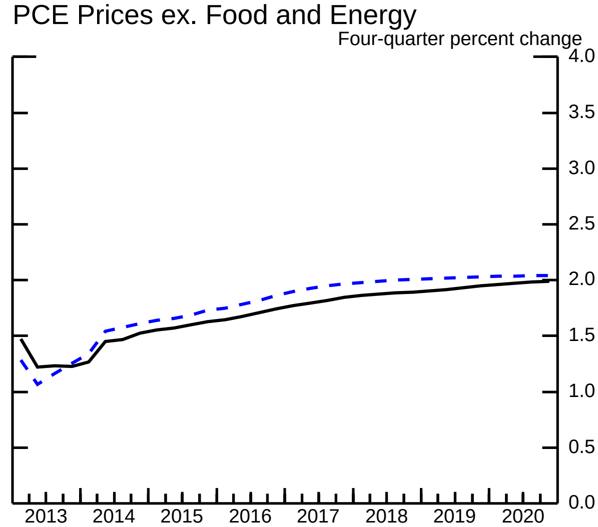
	Current Tealbook	*Previous Tealbook*
Tealbook-consistent FRB/US *r** estimate	–1.60	*–1.57*
Actual real federal funds rate	–1.09	*–0.93*

Key Elements of the Staff Projection

GDP Gap



PCE Prices ex. Food and Energy



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

than it was in the previous Tealbook, reflecting changes in the staff's estimated level of potential output as well as the upward revision to GDP growth for the first half of this year. Over the medium-term, however, the staff expects economic conditions to improve at a somewhat more modest pace than in July so that from 2015 onward, the projected output gap is generally close to the estimate reported in the previous Tealbook. As indicated in the bottom right panel, the staff forecast for inflation runs slightly below the July Tealbook projection, and therefore approaches the Committee's 2 percent objective slightly more slowly.[2]

The top panel of the first exhibit also reports the Tealbook-consistent estimate of short-run r^*, which is generated using the FRB/US model after adjusting it to replicate the staff's economic forecast. The short-run r^* estimate of the equilibrium real federal funds rate corresponds to the rate that would, if maintained, return output to potential in 12 quarters. Consistent with the staff's modest downward revision to the economic outlook over the medium-term, the r^* estimate for the current quarter is only slightly lower than in July. As has been true since late 2008, the estimate of r^*—currently about −1.6 percent—remains below the estimated actual real federal funds rate, which is now −1.1 percent.

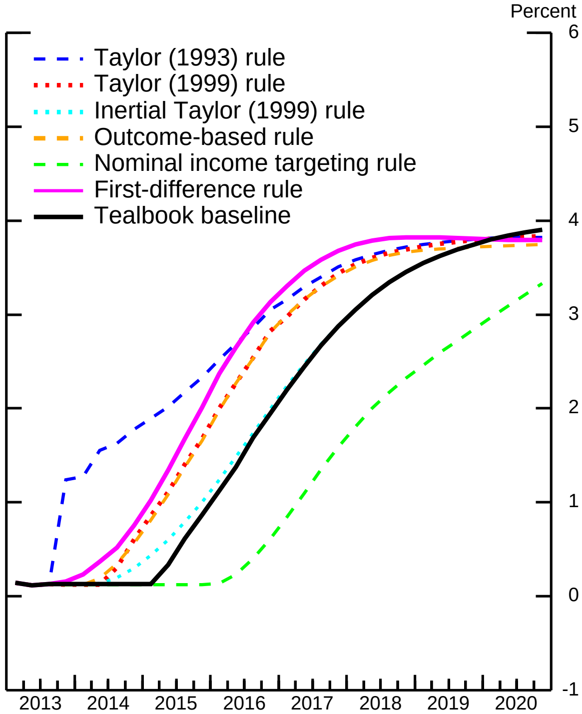
The second exhibit, "Policy Rule Simulations without Thresholds," reports dynamic simulations of the FRB/US model that incorporate endogenous responses of inflation and the output gap implied by having the federal funds rate follow the paths prescribed by the different policy rules, under the assumption that the federal funds rate is constrained by the effective lower bound but the Committee's thresholds related to inflation and the unemployment rate are ignored.[3] (Alternative policy rule simulations that incorporate thresholds are discussed below.) Each rule is applied from the fourth

[2] As discussed in the Domestic Economic Developments and Outlook section of Tealbook A, the revision to the inflation outlook largely reflects a methodological change implemented in this year's annual revision to the national income and product account data, in which the Bureau of Economic Analysis changed their procedure for estimating the non-market component of the personal consumption expenditures price index.

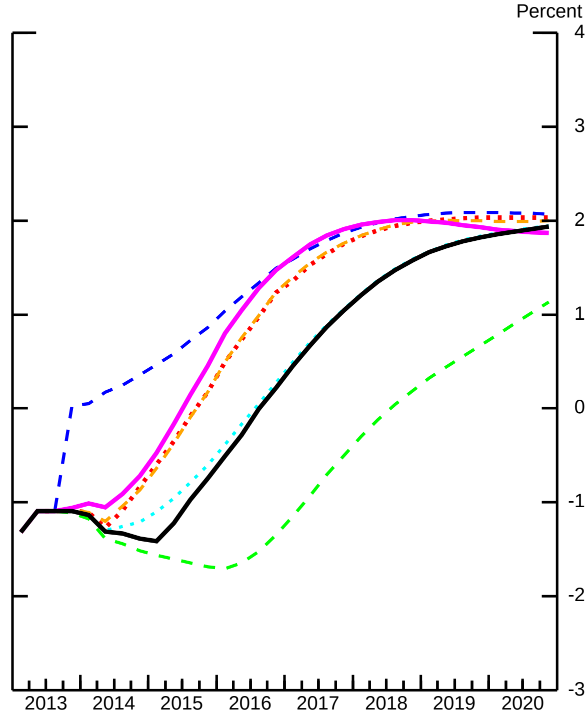
[3] The staff's baseline forecast incorporates the macroeconomic effects of the FOMC's large-scale asset purchase programs. Specifically, it embeds the assumption that the FOMC will purchase a total of about $1.2 trillion in longer-term Treasury securities and agency MBS during 2013 and the first half of 2014, with the pace of purchases declining in several steps beginning this year and reaching zero in the middle of next year. Based on these assumptions, all of the policy-rule simulations discussed here and below incorporate the projected effects of these balance sheet policies; the rules themselves, however, are not directly adjusted for the effects of balance sheet policies.

Policy Rule Simulations without Thresholds

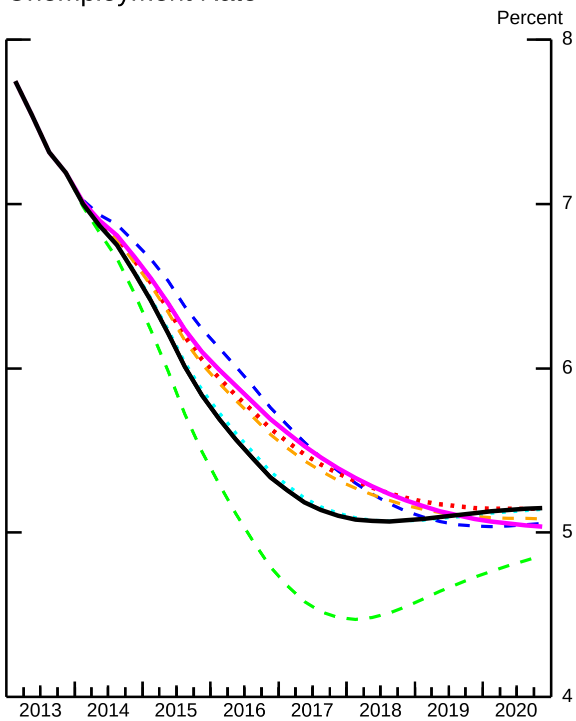
Effective Nominal Federal Funds Rate



Real Federal Funds Rate

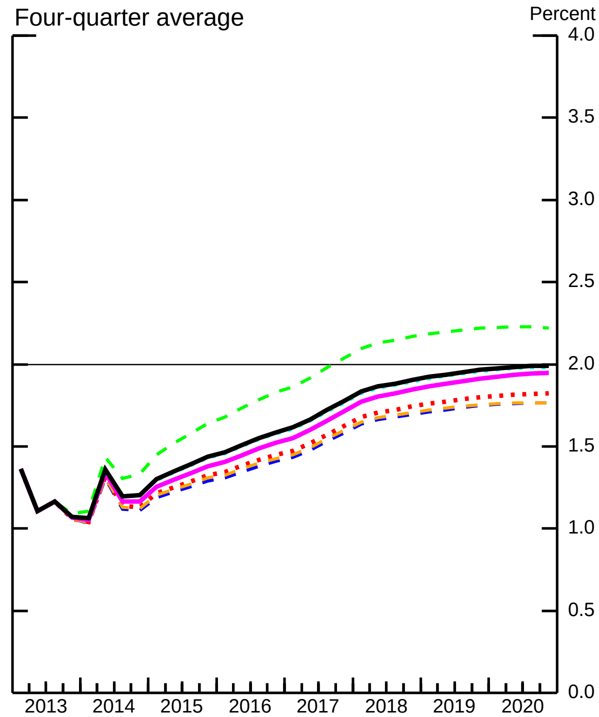


Unemployment Rate



PCE Inflation

Four-quarter average



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.

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.[4]

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 value, the federal funds rate in the baseline projection follows the prescriptions of the inertial Taylor (1999) rule. In the current baseline projection, the unemployment rate falls below its threshold during the first quarter of 2015, one quarter earlier than in the July Tealbook baseline. The federal funds rate begins to rise from its effective lower bound in the second quarter of 2015, gradually climbs to 3 percent by 2018, and reaches 3.9 percent by the end of 2020. Under this assumed policy rate path, the unemployment rate is projected to decline slowly towards the staff's estimate of the long-term natural rate of unemployment of 5.2 percent, which it reaches in the first half of 2017, and then decreases slightly further before settling back at the natural rate; headline inflation converges gradually to 2 percent by the end of the decade.

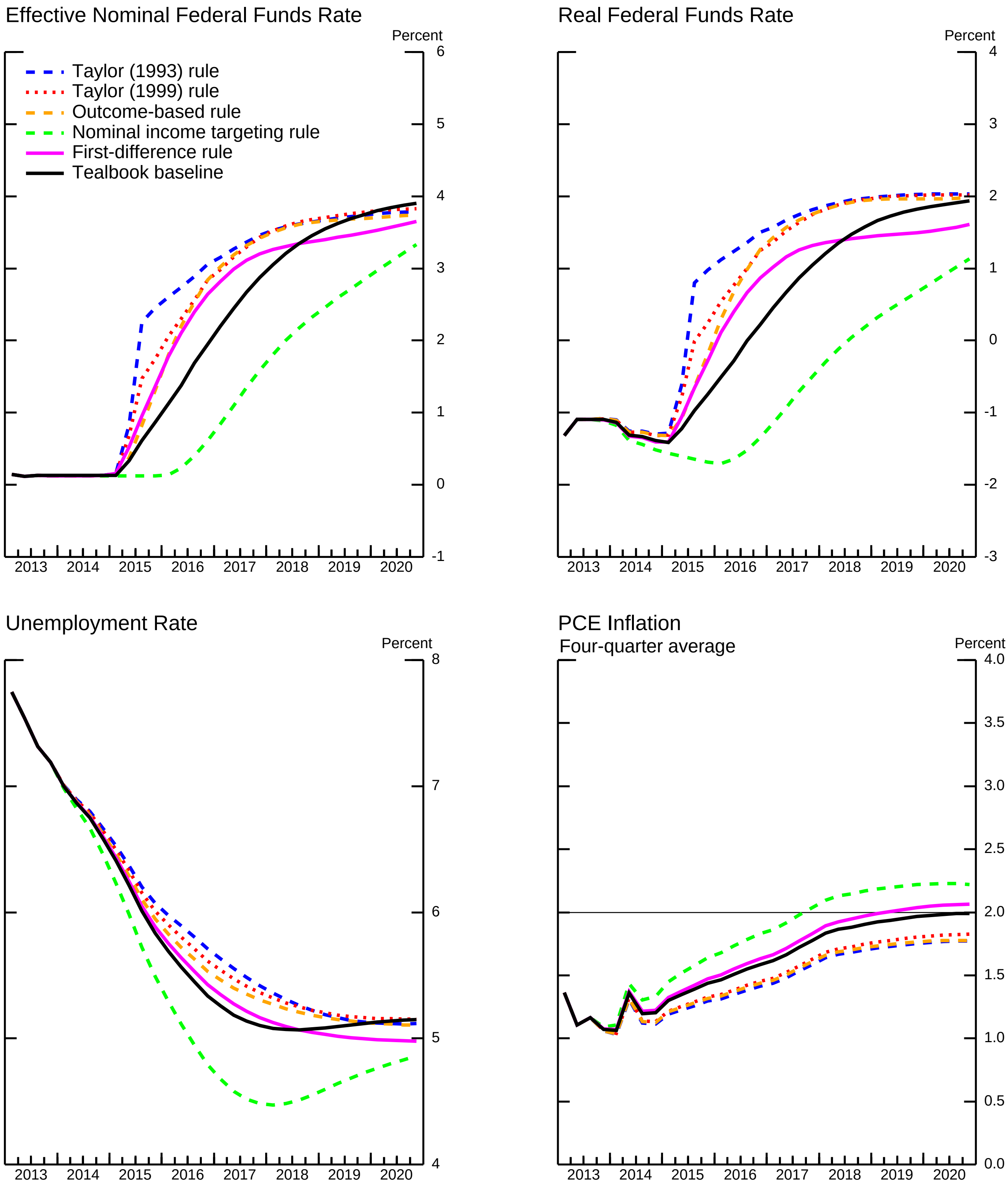
Without thresholds, most of the policy rules call for tightening to begin earlier than under the Tealbook baseline. Four of the rules put the real federal funds rate persistently above the path implied by the baseline forecast, policy settings that result in higher unemployment and lower inflation through most of the decade, compared with the baseline. Despite beginning to tighten earlier than under the baseline, the inertial Taylor (1999) rule generates only slightly less favorable outcomes for unemployment and basically the same path for inflation because this rule prescribes only a very gradual pace of tightening.[5]

[4] The FRB/US model used to generate the different simulations has changed since the July Tealbook so that the sectoral coverage corresponds to the revised national income and product account data, and its equations have been re-estimated based on the revised data. Moreover, the model features a modified wage/price block. These changes imply that inflation is somewhat less responsive to resource utilization, and that aggregate spending is somewhat less responsive to changes in the federal funds rate.

[5] The Taylor (1999) rule, which does not seek to smooth the path for the nominal interest rate, prescribes the first increase in the federal funds rate only one quarter earlier than the inertial Taylor (1999)

Strategies

Policy Rule Simulations with Thresholds



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

Only the nominal income targeting rule prescribes a later tightening than under the Tealbook baseline. This rule keeps the federal funds rate at the lower bound until the third quarter of 2016 and generates a real federal funds rate persistently below baseline for the rest of the decade, thereby inducing stronger future real activity and higher future inflation. Markets are assumed to anticipate these developments completely. Consequently, longer-term real interest rates are lower today than under the baseline policy. These more-accommodative conditions result in a markedly lower trajectory for the unemployment rate. In addition, greater resource utilization in the short run and higher expected future inflation both boost inflation in the near term.

The results presented in these and subsequent simulations depend importantly on the assumption that policymakers will adhere to the simulated rule in the future and that private sector expectations fully incorporate the paths for the federal funds rate, real activity, and inflation implied by the rule. This assumption plays a particularly critical role in the case of the nominal income targeting rule, which is associated with outcomes in which inflation runs above the 2 percent long-run goal for some years, even after the output gap is closed.[6]

The third exhibit, "Policy Rule Simulations with Thresholds," displays dynamic simulations in which the policy rules are subject to the thresholds that the Committee adopted in December 2012. For each of the rules, the thresholds are imposed by keeping 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 the Committee will switch to the specified rule when one of the threshold conditions is satisfied and to view this switch as permanent and fully credible. In each of the simulations discussed below, crossing the unemployment threshold turns out to be the catalyst for switching to the specified rule.

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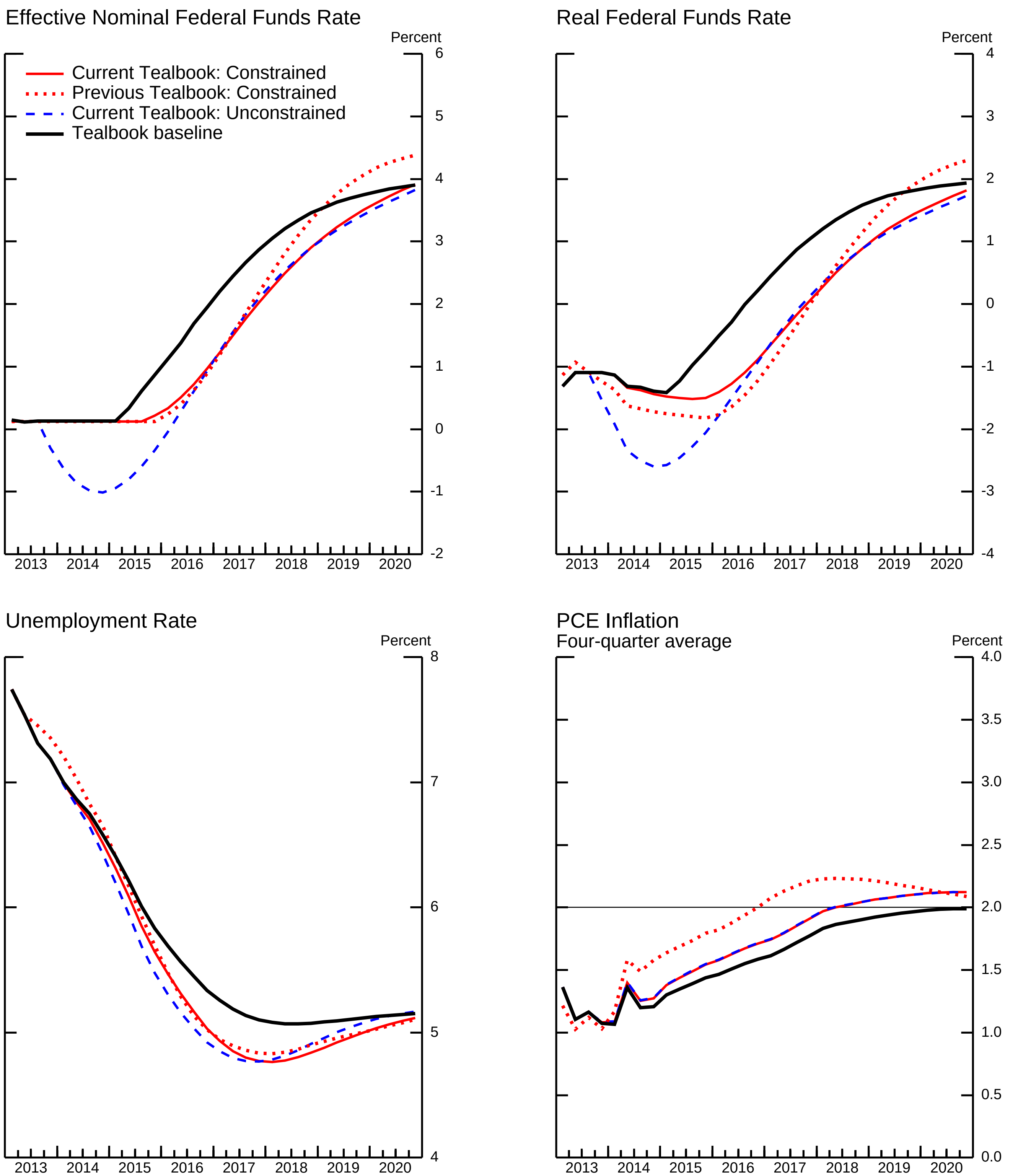
rule. But without inertia, the Taylor (1999) rule prescribes a markedly more rapid increase in the nominal federal funds rate thereafter, causing the real federal funds rate to be persistently higher than under the baseline policy.

[6] Most of the policy rules imply a similar degree of accommodation as in the previous Tealbook. The exception is the nominal income targeting rule which prescribes a departure of the federal funds rate from the effective lower bound three quarters later than in July and implies a real federal funds rate path that is between 20 and 90 basis points lower from 2016 onward. This change in policy prescription in part reflects the staff's lower projected path of the GDP deflator resulting from this year's revision in the national income and product account data, which affects the nominal income targeting rule but not the other rules.

Constrained vs. Unconstrained Optimal Control Policy



Note: The way policy simulations are generated in FRB/US has changed since June. The paths labeled "Previous Tealbook" in the exhibit have been computed under the new model assumptions, using the June baseline forecast. See footnotes 3 and 8 in the Monetary Policy Strategies text for further details.

For all of the rules except the nominal income targeting rule, imposing the thresholds leads to a later departure of the federal funds rate from the effective lower bound than that shown in the second exhibit. In these cases, the threshold-augmented rules prescribe the first increase in the federal funds rate in the first half of 2015, between two quarters and two years later than is prescribed by the same rules without thresholds.

The threshold strategy has the largest effects on the departure date under the Taylor (1993) and the first-difference rules. In particular, without thresholds these rules depart from the zero bound by the end of this year in the case of the Taylor (1993) rule and mid-2014 in the case of the first-difference rule. Imposing the thresholds on these rules postpones the departure from the zero bound by a year or more. As a result, unemployment declines faster and inflation is higher when the thresholds are imposed on these rules. In contrast, the threshold strategy postpones departure from the lower bound by only three quarters or less under the Taylor (1999), the inertial Taylor (1999), and the outcome-based rules, and such a strategy generates little difference in the outcomes for unemployment and inflation compared with those generated by the same rules without the thresholds.[7] Because the nominal income targeting rule does not prescribe raising the federal funds rate above its effective lower bound until after the unemployment rate falls below 6.5 percent, imposing the thresholds on the nominal income targeting rule does not alter the date for this rule's prescribed departure from the lower bound, and outcomes for inflation and unemployment are not affected.

These simulation results illustrate that the economic consequences of threshold-based forward guidance depend importantly on the policy that is expected to be followed after a threshold is crossed.

The fourth exhibit, "Constrained vs. Unconstrained Optimal Control Policy," compares the optimal control simulations derived using this Tealbook's baseline forecast with those reported in the July Tealbook.[8] Policymakers are assumed to place equal weights on keeping headline PCE inflation close to the Committee's 2 percent goal, on keeping the unemployment rate close to the staff's estimate of the natural rate of unemployment, and on minimizing changes in the federal funds rate. The optimal control

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

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

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

The simulations indicate that the federal funds rate implied by the constrained optimal control policy departs from the effective lower bound in the first quarter of 2016, one quarter earlier than in the constrained optimal control simulations in July, reflecting the staff's somewhat narrower estimate of the current output gap. Thereafter, the optimal control path for the federal funds rate is somewhat flatter compared with the previous Tealbook, reflecting the downward revision to the staff's economic outlook.[9]

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 slightly stronger economic recovery.[10] In particular, the unemployment rate drops below 6.5 percent by the first quarter of 2015 and reaches 5.2 percent—the staff's estimate of the natural rate of unemployment—in the third quarter of 2016; thereafter, the unemployment rate declines to 4.75 percent by 2018 before returning essentially to the natural rate by the end of 2020. In turn, the path of inflation is higher than under the baseline, reaching the Committee's 2 percent objective in the first half of 2018 and subsequently rising slightly higher before gradually moving back toward 2 percent after 2020. 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. In current circumstances, this generates—through the response of the private sector's expectations for future monetary policy and the repercussions for the economy—more favorable effects on financial conditions, real activity, and inflation in the near term.

[9] As described in footnote 4, the FRB/US model used to compute the optimal control simulations has undergone several modifications that have reduced the sensitivity of real activity and inflation to changes in the federal funds rate. These modifications have only a modest effect for the optimal control paths of the federal funds rate and the unemployment rate, but imply a noticeably lower optimal control path for inflation than if the simulations had been computed with the July version of FRB/US, reflecting the reduced responsiveness of inflation to resource utilization. The flatter optimal control path of the federal funds rate in the current simulation compared with that in the previous Tealbook primarily reflects the downward revision to the staff's economic outlook.

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

In the absence of the lower-bound constraint, the optimal control path for the federal funds rate would decline to about –1 percent by late 2014 and become positive again in the first half of 2016. The unconstrained policy would bring the unemployment rate down a bit faster over the next few years and subsequently would make the unemployment rate converge faster to the natural rate than would be the case under the constrained policy. The path for inflation under the unconstrained optimal control policy is nearly identical to the constrained policy.

A feature of the constrained optimal control simulation is that the nominal federal funds rate converges only gradually towards its long-run value of 4 percent. This slow convergence reflects a number of factors including adverse economic conditions that would make aggregate demand persistently weak if the interest rate returned quickly to its long-run natural level, and the fact that the policymaker's objective function includes a term that penalizes changes in the federal funds rate and thus encourages interest rate smoothing. To ascertain the role played by interest rate smoothing, the fifth exhibit, "Optimal Control Policy with Lower Weight on Interest Rate Smoothing under Commitment," compares these results with the outcomes from an alternative optimal control simulation under commitment in which the penalty weight on the change in the federal funds rate is smaller.[11]

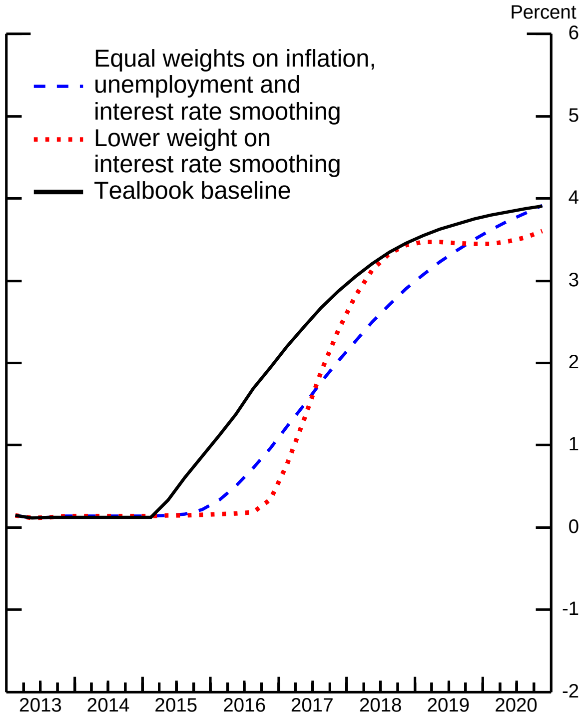
The simulations indicate that sharply reducing the weight on interest-rate smoothing in the policymaker's objective function has a sizable effect on the optimal trajectory for the nominal federal funds rate but leads to only small differences in macroeconomic outcomes. With minimal interest-rate smoothing, the policy rate lifts off from the effective lower bound later than in our standard simulation, but then rises more rapidly toward its longer-run level. As a consequence, the path of long-term interest rates is barely affected, and the two simulations generate almost identical trajectories for the unemployment rate and inflation.

For optimal control policy under commitment, the federal funds rate moves up from the effective lower bound later than without commitment because policymakers aim to stimulate the economy by lowering real rates in the current period via a promise that policy in the future will remain more accommodative. To abstract from this effect, the

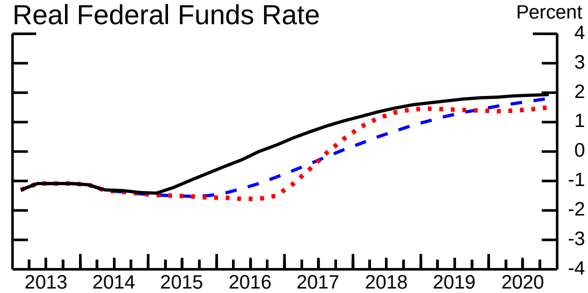
[11] Specifically, the weight on changes in the federal funds rate in the objective function is reduced to one twentieth of its original weight. Reducing the weight even further would cause convergence problems with the model.

Optimal Control Policy with Lower Weight on Interest Rate Smoothing under Commitment

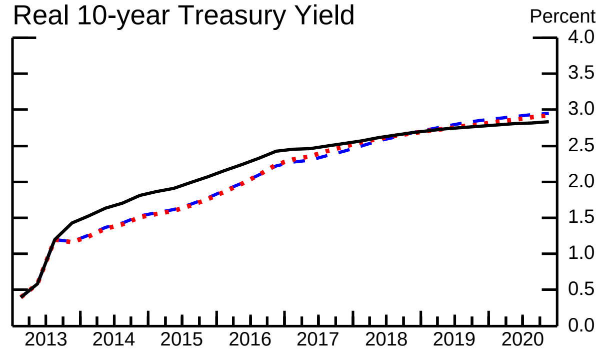
Effective Nominal Federal Funds Rate



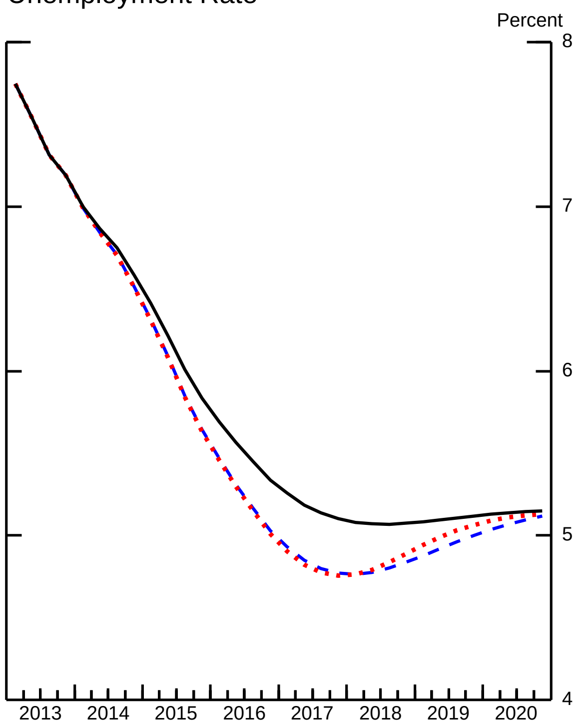
Real Federal Funds Rate



Real 10-year Treasury Yield

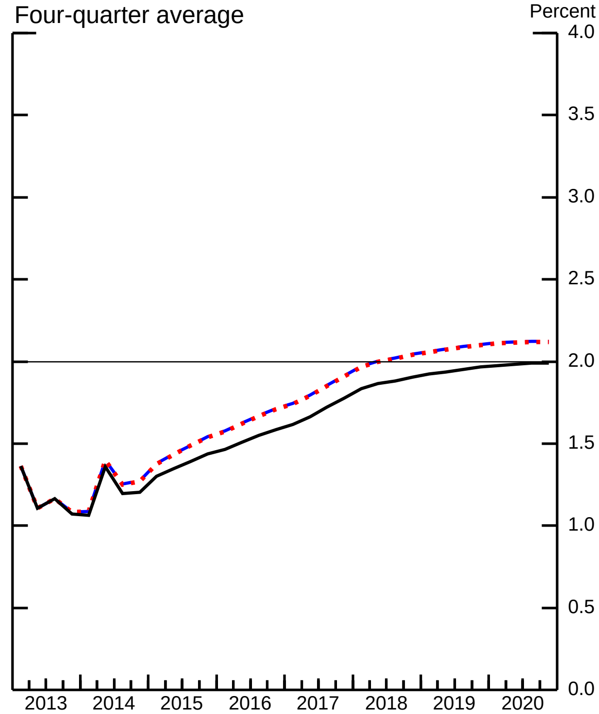


Unemployment Rate



PCE Inflation

Four-quarter average



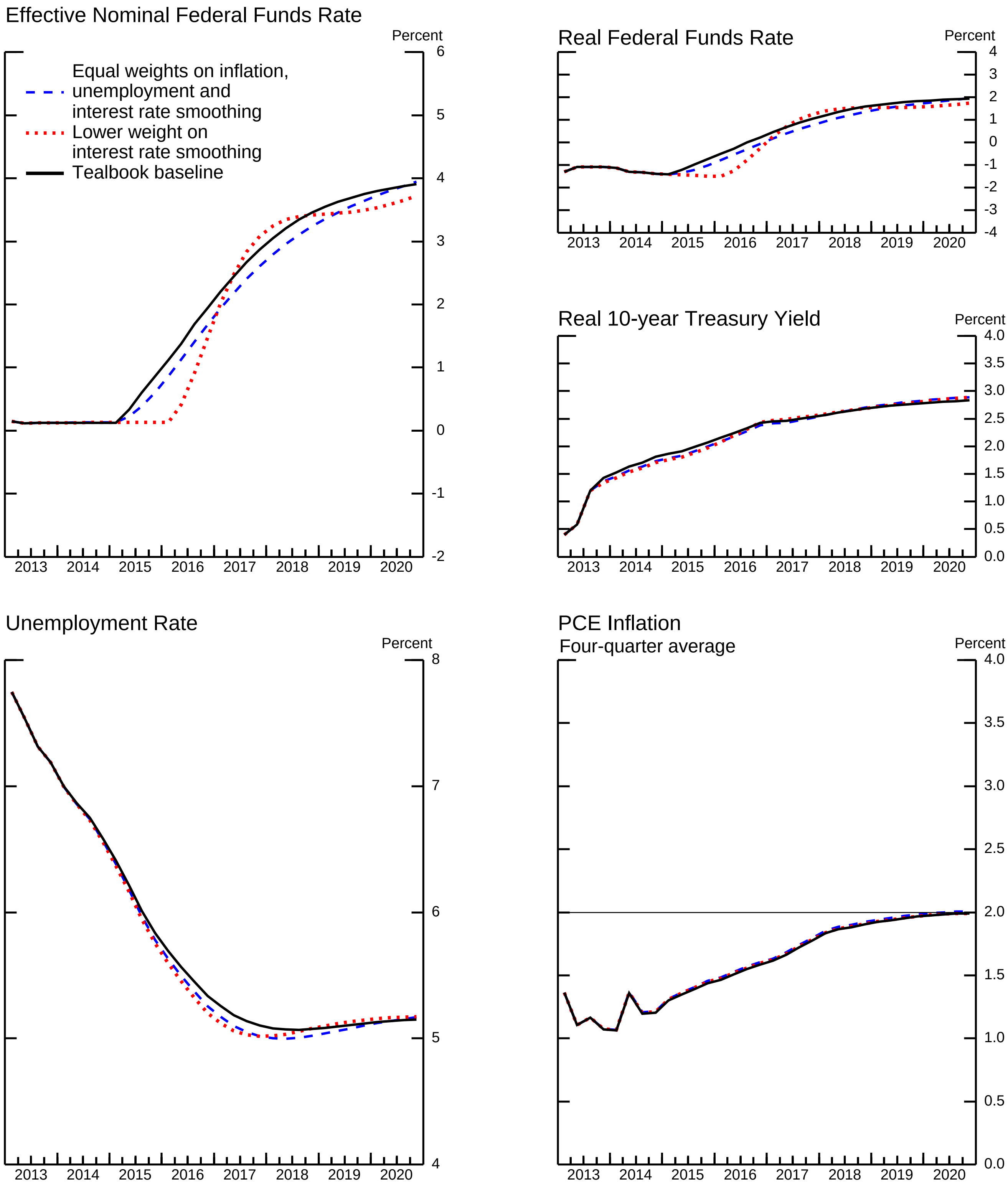
sixth exhibit, “Optimal Control Policies with Lower Weight on Interest Rate Smoothing under Discretion,” considers the case of a lower weight on interest rate smoothing for optimal control policy under discretion.

Under discretion, policymakers cannot credibly commit to carrying out a plan involving future policy choices that would be suboptimal at the time these choices have to be implemented. This assumption limits policymakers’ ability to influence private-sector expectations of the federal funds rate and other variables in the present. Instead, the private sector knows that future Committees will always make policy choices without regard for past policymaker promises, and this behavior leads to less stimulative policy in current circumstances. The simulations show that under a discretionary optimal control policy that places the standard weight on the interest-rate smoothing term, the federal funds rate departs from the lower bound in the third quarter of 2015, two quarters earlier than under commitment, and keeps monetary policy somewhat less accommodative thereafter, so the unemployment rate barely falls below its natural rate and inflation does not rise above the 2 percent objective.

As was the case with optimal control under commitment, reducing the weight on interest-rate smoothing in the objective function of a discretionary policymaker has a sizable effect on the optimal trajectory for the policy rate but has only a small effect on economic outcomes. In particular, with minimal weight on interest-rate smoothing, the nominal federal funds rate departs from the effective lower bound later but increases more rapidly thereafter than under the discretionary optimal control policy with equal weight on interest-rate smoothing. The two policies imply almost identical paths for longer-term rates, and, as a result, the trajectories for the unemployment rate and inflation are again quite similar. Even under discretion and with minimal weight on interest rate smoothing, however, the federal funds rate reaches 3 percent only by the end of 2017, and it remains below its 4 percent longer-run level even at the end of 2020, suggesting that persistently weak aggregate demand is an important factor underlying the low level of the federal funds rate later this decade.

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.

Optimal Control Policy with Lower Weight on Interest Rate Smoothing under Discretion



Strategies

Outcomes under Alternative Policies without Thresholds

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

Measure and scenario	2013		2014	2015	2016	2017
	H1	H2				
Real GDP						
Extended Tealbook baseline[1]	2.0	2.5	3.1	3.4	3.2	2.6
Taylor (1993)	2.0	2.5	2.6	3.1	3.3	2.9
Taylor (1999)	2.0	2.5	2.9	3.2	3.1	2.7
Inertial Taylor (1999)	2.0	2.5	3.1	3.4	3.3	2.6
Outcome based	2.0	2.5	2.9	3.2	3.1	2.7
First difference	2.0	2.5	2.8	3.1	3.1	2.7
Nominal income targeting	2.0	2.5	3.5	3.9	3.7	2.8
Constrained optimal control	2.0	2.5	3.3	3.7	3.5	2.6
Unemployment rate[2]						
Extended Tealbook baseline[1]	7.5	7.2	6.6	5.8	5.3	5.1
Taylor (1993)	7.5	7.2	6.8	6.2	5.8	5.4
Taylor (1999)	7.5	7.2	6.7	6.1	5.6	5.4
Inertial Taylor (1999)	7.5	7.2	6.6	5.9	5.4	5.1
Outcome based	7.5	7.2	6.6	6.0	5.6	5.3
First difference	7.5	7.2	6.7	6.1	5.7	5.4
Nominal income targeting	7.5	7.2	6.5	5.5	4.8	4.5
Constrained optimal control	7.5	7.2	6.5	5.6	5.0	4.8
Total PCE prices						
Extended Tealbook baseline[1]	0.6	1.6	1.2	1.4	1.6	1.8
Taylor (1993)	0.6	1.6	1.1	1.3	1.4	1.6
Taylor (1999)	0.6	1.6	1.1	1.3	1.5	1.6
Inertial Taylor (1999)	0.6	1.6	1.2	1.4	1.6	1.8
Outcome based	0.6	1.6	1.1	1.3	1.4	1.6
First difference	0.6	1.6	1.2	1.4	1.5	1.7
Nominal income targeting	0.6	1.6	1.3	1.6	1.8	2.0
Constrained optimal control	0.6	1.6	1.3	1.5	1.7	1.9
Core PCE prices						
Extended Tealbook baseline[1]	1.1	1.4	1.5	1.6	1.7	1.8
Taylor (1993)	1.1	1.3	1.4	1.5	1.6	1.7
Taylor (1999)	1.1	1.3	1.5	1.5	1.6	1.7
Inertial Taylor (1999)	1.1	1.4	1.5	1.6	1.7	1.8
Outcome based	1.1	1.3	1.4	1.5	1.6	1.7
First difference	1.1	1.4	1.5	1.6	1.7	1.8
Nominal income targeting	1.1	1.4	1.7	1.8	2.0	2.1
Constrained optimal control	1.1	1.4	1.6	1.7	1.9	2.0
Effective federal funds rate[2]						
Extended Tealbook baseline[1]	0.1	0.1	0.1	0.9	1.9	2.9
Taylor (1993)	0.1	1.2	1.8	2.3	3.0	3.5
Taylor (1999)	0.1	0.1	0.6	1.7	2.8	3.4
Inertial Taylor (1999)	0.1	0.1	0.3	1.0	2.0	2.9
Outcome based	0.1	0.1	0.6	1.7	2.8	3.4
First difference	0.1	0.2	0.8	2.0	3.1	3.7
Nominal income targeting	0.1	0.1	0.1	0.1	0.6	1.6
Constrained optimal control	0.1	0.1	0.1	0.2	0.9	2.0

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.

Strategies

Outcomes under Alternative Policies with Thresholds[1]

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

Measure and scenario	2013 H1	2013 H2	2014	2015	2016	2017
Real GDP						
Extended Tealbook baseline[1]	2.0	2.5	3.1	3.4	3.2	2.6
Taylor (1993)	2.0	2.5	2.9	3.1	3.0	2.7
Taylor (1999)	2.0	2.5	2.9	3.2	3.1	2.7
Outcome based	2.0	2.5	3.0	3.3	3.1	2.6
First difference	2.0	2.5	3.1	3.4	3.2	2.7
Nominal income targeting	2.0	2.5	3.5	3.9	3.7	2.8
Constrained optimal control	2.0	2.5	3.3	3.7	3.5	2.6
Unemployment rate[2]						
Extended Tealbook baseline[1]	7.5	7.2	6.6	5.8	5.3	5.1
Taylor (1993)	7.5	7.2	6.7	6.1	5.7	5.4
Taylor (1999)	7.5	7.2	6.6	6.0	5.6	5.4
Outcome based	7.5	7.2	6.6	5.9	5.5	5.3
First difference	7.5	7.2	6.6	5.9	5.4	5.2
Nominal income targeting	7.5	7.2	6.5	5.5	4.8	4.5
Constrained optimal control	7.5	7.2	6.5	5.6	5.0	4.8
Total PCE prices						
Extended Tealbook baseline[1]	0.6	1.6	1.2	1.4	1.6	1.8
Taylor (1993)	0.6	1.6	1.1	1.3	1.4	1.6
Taylor (1999)	0.6	1.6	1.1	1.3	1.5	1.6
Outcome based	0.6	1.6	1.1	1.3	1.4	1.6
First difference	0.6	1.6	1.2	1.5	1.6	1.8
Nominal income targeting	0.6	1.6	1.3	1.6	1.8	2.0
Constrained optimal control	0.6	1.6	1.3	1.5	1.7	1.9
Core PCE prices						
Extended Tealbook baseline[1]	1.1	1.4	1.5	1.6	1.7	1.8
Taylor (1993)	1.1	1.3	1.4	1.5	1.6	1.7
Taylor (1999)	1.1	1.4	1.5	1.5	1.6	1.7
Outcome based	1.1	1.3	1.4	1.5	1.6	1.7
First difference	1.1	1.4	1.5	1.7	1.8	1.9
Nominal income targeting	1.1	1.4	1.7	1.8	2.0	2.1
Constrained optimal control	1.1	1.4	1.6	1.7	1.9	2.0
Effective federal funds rate[2]						
Extended Tealbook baseline[1]	0.1	0.1	0.1	0.9	1.9	2.9
Taylor (1993)	0.1	0.1	0.1	2.5	3.1	3.5
Taylor (1999)	0.1	0.1	0.1	1.7	2.8	3.4
Outcome based	0.1	0.1	0.1	1.3	2.8	3.4
First difference	0.1	0.1	0.1	1.4	2.6	3.2
Nominal income targeting	0.1	0.1	0.1	0.1	0.6	1.6
Constrained optimal control	0.1	0.1	0.1	0.2	0.9	2.0

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.

Strategies

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

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

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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.

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Monetary Policy Alternatives

This Tealbook presents three policy alternatives—labeled A, B, and C—for the Committee's consideration. Alternative B maintains the current monthly pace of purchases but indicates that the Committee is prepared to moderate the pace of purchases—potentially later this year—if it sees further evidence of improvement in labor market conditions and inflation moving toward its 2 percent longer-run goal. Alternative A also maintains the current pace of asset purchases but suggests that the Committee is not as likely to reduce the pace of its purchases in the near term. Alternative C announces a modest reduction in the pace of asset purchases of $5 billion per month for agency MBS and also for Treasury securities. Alternatives B and C retain the forward guidance for the federal funds rate used in the Committee's July statement. Alternative A augments that forward guidance on several dimensions.

In summarizing recent economic developments, all the alternatives characterize the recent pace of economic activity as "moderate," and all cite fiscal policy as a factor restraining economic growth. The further increase in mortgage rates observed since July is also mentioned in all of the alternatives, but Alternative C suggests this development is not a source of much concern. Alternatives A and B acknowledge that some labor market indicators have continued to improve; Alternative A, however, also notes the apparent slowing in job gains. Alternative C presents a more upbeat characterization of the labor market, referring to "continuing" gains in payrolls. Alternatives A and B note that inflation has been running "below" the Committee's longer-term objective once changes in energy prices are excluded; Alternative C uses "somewhat below." All of the alternatives note that longer-term inflation expectations have remained stable.

In characterizing the economic outlook, all three alternatives say the Committee expects that, with appropriate policy accommodation, economic growth "will pick up from its recent pace" and the unemployment rate will decline gradually toward its mandate-consistent level. With respect to the risks to the outlook, all of the alternatives reaffirm the Committee's judgment that the downside risks to the outlook for the economy and the labor market have diminished since the fall of 2012. Alternative A cautions, however, that "the tightening of financial conditions observed in recent months, if sustained, could slow the pace of improvement in the economy and labor market," while Alternative B has optional language stating that the tightening of financial conditions is a source of concern. Alternative C offers a more sanguine view of the risks to the outlook, indicating more confidence that labor market conditions will continue to improve over the medium term. All three alternatives indicate that the Committee anticipates that inflation will move back toward its 2 percent objective over the medium term; Alternatives A and B repeat the July statement's language about the risks to economic performance that could result from inflation running persistently below the Committee's 2 percent objective, while Alternative C omits that language.

With respect to balance sheet policy, both Alternatives A and B indicate that, although labor market conditions have strengthened since the current asset purchase program began a year ago, the Committee has decided to continue the existing pace of its purchases, pending further evidence of economic improvement. Alternative B states that if the Committee sees evidence of further progress toward its objectives, reductions in the pace of purchases would be appropriate. Alternative A is more tentative about the near-term prospect of a reduction in the pace of purchases, stating that progress toward Committee objectives is "not yet sufficient to warrant an adjustment." Alternative C, on the other hand, indicates that the improvement in the labor market justifies "modest downward adjustments" in the Committee's asset purchases, to \$35 billion per month for agency MBS and \$40 billion per month for Treasury securities. All of the alternatives indicate that, while asset purchases are "not on a preset course," further progress toward Committee goals will likely lead to reductions in asset purchases. Optional language in Alternative B provides continuity with earlier Committee communications by stating that reductions will likely occur "later this year." Alternative C states that the Committee plans to reduce purchases further if the Committee sees further progress toward its goals. In addition, one version of paragraph 4 in Alternative C indicates that the Committee expects that by the time its asset purchases end, the unemployment rate will be around 7 percent and expected to decline further, and inflation will be moving back toward its 2 percent longer-run goal. Both versions of Alternative C note that, while the flow of purchases has been reduced, the Committee's sizable and still-increasing holdings of securities will maintain downward pressure on longer-term interest rates.

All of the alternatives maintain the 0 to ¼ percent target range for the federal funds rate and the 2½ percent "ceiling" threshold for projected inflation. Alternatives B and C retain the 6½ percent threshold for the unemployment rate, while Alternative A lowers this threshold to 6 percent. Alternative A also adds a second condition for projected inflation—an inflation "floor"—whereby the Committee indicates that it does not anticipate raising its federal funds rate target if inflation between one and two years ahead were projected to be below 1¾ percent. Alternative A also states that the Committee, in determining when and how much to reduce policy accommodation, will include the labor force participation rate and the growth of employment among the range of labor market indicators that it will consider. Finally, Alternative A indicates that the Committee currently anticipates that the federal funds rate target consistent with achieving maximum employment and 2 percent inflation will rise only gradually for a significant period after the Committee begins reducing policy accommodation.

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.

Alternatives

Table 1: Overview of Policy Alternatives for September FOMC Statement

<table>
<tr><th rowspan="2">Selected Elements</th><th rowspan="2">July Statement</th><th colspan="3">September Alternatives</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td colspan="5">Economic Outlook</td></tr>
<tr><td rowspan="3">Outlook</td><td>economic activity expanded at a modest pace during the first half of the year</td><td colspan="2">economic activity has been expanding at a moderate pace</td><td>economic activity is expanding at a moderate pace</td></tr>
<tr><td>labor market has shown further improvement, on balance, but the unemployment rate remains elevated</td><td>some labor indicators have improved [further], but the unemployment rate remains elevated & job gains appear to have slowed somewhat</td><td>some labor indicators have improved [further], but the unemployment rate remains elevated</td><td>labor market has improved further with continuing gains in payroll employment, although the unemployment rate remains elevated</td></tr>
<tr><td>partly reflecting transitory influences, inflation has been running below …</td><td colspan="2">apart from fluctuations due to energy prices, inflation has been running below …</td><td>apart from fluctuations due to energy prices, inflation has been running somewhat below …</td></tr>
<tr><td colspan="5">Balance Sheet Policies</td></tr>
<tr><td>Agency MBS</td><td>$40 billion per month</td><td colspan="2">unchanged</td><td>$35 billion per month</td></tr>
<tr><td>Longer-term Treasuries</td><td>$45 billion per month</td><td colspan="2">unchanged</td><td>$40 billion per month</td></tr>
<tr><td>Rationale for Purchases</td><td>to support a stronger recovery & inflation consistent with dual mandate</td><td>labor market not yet sufficiently improved to warrant purchase adjustment</td><td>although [activity expanding moderately] | [labor market stronger], await more evidence of sustained progress</td><td>modest downward adjustment in light of improved labor market</td></tr>
<tr><td rowspan="2">Guidance</td><td>prepared to increase or reduce the pace of its purchases to maintain appropriate policy</td><td>moderation in pace appropriate when Committee sees sufficient progress toward objectives</td><td>moderation in pace likely appropriate [later this year], if Committee sees further evidence consistent with progress toward objectives</td><td>additional measured reduction in pace likely appropriate [if Committee sees continued improvement in labor market & inflation] OR [if Committee sees sufficient further progress toward objectives; Committee anticipates unemployment at around 7 percent & expected to decline further, and inflation moving back toward 2 percent, when purchases end]</td></tr>
<tr><td>will continue to take appropriate account of the likely efficacy & costs… as well as progress toward its economic objectives</td><td colspan="3">asset purchases are not on a preset course, but will remain contingent on economic outlook as well as efficacy & costs</td></tr>
<tr><td colspan="5">Federal Funds Rate</td></tr>
<tr><td>Target</td><td>0 to ¼ percent</td><td colspan="3">unchanged</td></tr>
<tr><td>Guidance</td><td>Committee anticipates near-zero funds rate for a considerable time after purchases end & recovery strengthens; at least as long as unemployment rate is above 6½ percent, inflation one to two years ahead is no more than 2½ percent, & inflation expectations remain well anchored . . .</td><td>Committee anticipates near-zero funds rate for a considerable time after purchases end & recovery strengthens; at least as long as unemployment rate is above 6 percent, inflation one to two years ahead is no more than 2½ percent, & inflation expectations remain well anchored; or if projected inflation one to two years ahead is below 1¾ percent . . .</td><td colspan="2">unchanged</td></tr>
</table>

JULY FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in June suggests that economic activity expanded at a modest pace during the first half of the year. Labor market conditions have shown 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 been strengthening, but mortgage rates have risen somewhat and fiscal policy is restraining economic growth. Partly reflecting transitory influences, inflation has been running below the Committee's longer-run objective, but longer-term inflation expectations have remained stable.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic growth will pick up from its recent pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee sees the downside risks to the outlook for the economy and the labor market as having diminished since the fall. The Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance, but it anticipates that inflation will move back toward its objective over the medium term.
3. 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 today reaffirmed its view that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens. In particular, the Committee decided to keep the target range for the federal funds rate at 0 to ¼ percent and

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

FOMC STATEMENT—SEPTEMBER 2013 ALTERNATIVE A

1. Information received since the Federal Open Market Committee met in ~~June~~ **July** suggests that economic activity ~~expanded~~ **has been expanding** at a ~~modest~~ **moderate** pace ~~during the first half of the year~~. **Some indicators of** labor market conditions have shown **[** further **]** improvement in recent months, ~~on balance,~~ but the unemployment rate remains elevated **and job gains appear to have slowed somewhat**. Household spending and business fixed investment advanced, and the housing sector has been strengthening, but mortgage rates have risen ~~somewhat~~ **further** and fiscal policy is restraining economic growth. ~~Partly reflecting transitory influences~~ **Apart from fluctuations due to changes in energy prices**, inflation has been running below the Committee's longer-run objective, but longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic growth will pick up from its recent pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee sees the downside risks to the outlook for the economy and the labor market as having diminished since ~~the~~ **last** fall**, but the tightening of financial conditions observed in recent months, if sustained, could slow the pace of improvement in the economy and labor market**. The Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance, but it anticipates that inflation will move back toward its objective over the medium term.

3. **The Committee judges that the improvement in the outlook for the labor market and the extent of progress toward its economic objectives since it began its current asset purchase program are not yet sufficient to warrant an adjustment in the pace at which it is adding to its holdings of longer-term securities.** ~~To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate~~ **Accordingly**, the Committee decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. Taken together, these actions should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative**, which in turn should promote a stronger economic recovery and help to ensure that inflation, over time, is at the rate most consistent with the Committee's dual mandate**.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months **and** ~~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~~

Alternatives

~~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.~~ **At such time as the Committee sees sufficient progress toward its objectives for the labor market and inflation, some moderation in the pace of its securities purchases will become appropriate. Asset purchases are not on a preset course, and the Committee's decisions about their pace will remain contingent on the Committee's economic outlook as well as its assessment of the likely efficacy and costs of such purchases.**

5. To support continued progress toward maximum employment and price stability, the Committee today reaffirmed its view that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the asset purchase program ends and the economic recovery strengthens. In particular, the Committee decided to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above ~~6½~~ **6** 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. **Moreover, the Committee anticipates that it would not raise its target for the federal funds rate if inflation between one and two years ahead were projected to be below 1¾ percent.** In determining ~~how long to maintain a highly accommodative stance of monetary policy~~ **when to begin reducing policy accommodation and the appropriate pace at which to reduce accommodation**, the Committee will also consider other information, including additional measures of labor market conditions **such as the labor force participation rate and growth of employment**, 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. **In particular, the Committee currently anticipates that the level of the federal funds rate consistent with achieving its employment and price stability objectives will increase only gradually for a significant period after the Committee begins reducing policy accommodation.**

FOMC STATEMENT—SEPTEMBER 2013 ALTERNATIVE B

1. Information received since the Federal Open Market Committee met in ~~June~~ **July** suggests that economic activity ~~expanded~~ **has been expanding** at a ~~modest~~ **moderate** pace ~~during the first half of the year~~. **Some indicators of** labor market conditions have shown **[** 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 been strengthening, but mortgage rates have risen ~~somewhat~~ **further** and fiscal policy is restraining economic growth. ~~Partly reflecting transitory influences~~ **Apart from fluctuations due to changes in energy prices**, inflation has been running below the Committee's longer-run objective, but longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic growth will pick up from its recent pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. **[Although the tightening of financial conditions observed in recent months raises some concerns,]** the Committee sees the downside risks to the outlook for the economy and the labor market as having diminished **[, on net,]** since ~~the~~ **last** fall. The Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance, but it anticipates that inflation will move back toward its objective over the medium term.

3. **Although [economic activity has been expanding moderately and] labor market conditions have strengthened since the Committee began its asset purchase program a year ago, the Committee decided to await more evidence that progress will be sustained before adjusting the pace of its purchases.** ~~To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate~~ **Accordingly**, the Committee decided to continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month and longer-term Treasury securities at a pace of $45 billion per month. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. Taken together, these actions should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative**, which in turn should promote a stronger economic recovery and help to ensure that inflation, over time, is at the rate most consistent with the Committee's dual mandate**.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months **and** ~~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.~~ **If the Committee sees further evidence consistent with improvement in labor market conditions and inflation moving back toward its longer-run objective, then some moderation in the pace of asset purchases likely would become appropriate [later this year]. However, asset purchases are not on a preset course, and the Committee's decisions about their pace will remain contingent on the Committee's economic outlook as well as its assessment of the likely efficacy and costs of such purchases.**

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

FOMC STATEMENT—SEPTEMBER 2013 ALTERNATIVE C

1. Information received since the Federal Open Market Committee met in ~~June~~ **July** suggests that economic activity ~~expanded~~ **is expanding** at a ~~modest~~ **moderate** pace ~~during the first half of the year~~. Labor market conditions have shown further improvement ~~in recent months, on balance~~, **with continuing gains in payroll employment,** ~~but~~ **although** the unemployment rate remains elevated. Household spending and business fixed investment advanced, and the housing sector has ~~been strengthening, but~~ **continued to strengthen, even though** mortgage rates have risen ~~somewhat~~ **further** and fiscal policy is restraining economic growth. ~~Partly reflecting transitory influences~~ **Apart from fluctuations due to changes in energy prices**, inflation has been running **somewhat** below the Committee's longer-run objective, but longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee expects that, with appropriate policy accommodation, economic growth will pick up from its recent pace and the unemployment rate will gradually decline toward levels the Committee judges consistent with its dual mandate. The Committee sees the downside risks to the outlook for the economy and the labor market as having diminished since ~~the~~ **last** fall **[and has become more confident that labor market conditions will continue to improve over the medium term]**. The Committee ~~recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance, but it~~ **also** anticipates that inflation will move back toward its **2 percent** objective over the medium term.

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.~~ **In light of the improvement in the labor market since the Committee began its current asset purchase program a year ago, the Committee decided today to make modest downward adjustments in its asset purchases, to a monthly pace of [$35] billion from $40 billion for its purchases of additional agency mortgage-backed securities, and to a monthly pace of [$40] billion from $45 billion for longer-term Treasury securities.** The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. ~~Taken together, these actions~~ **The Committee's sizable and still-increasing holdings of longer-term securities** should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative**, which in turn should promote a stronger economic recovery and help to ensure that inflation, over time, is at the rate most consistent with the Committee's dual mandate**.

4. The Committee will closely monitor incoming information on economic and financial developments in coming months **and** ~~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. **If the Committee sees continued improvement in labor market conditions and inflation moving back toward its longer-run objective, then additional measured reductions in the pace of asset purchases likely would become**

Alternatives

appropriate. However, asset purchases are not on a preset course, and the Committee's decisions about their pace will remain contingent on the Committee's economic outlook as well as its assessment of the likely efficacy and costs of such purchases. ~~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.~~

OR

4'. ~~The Committee will closely monitor incoming information on economic and financial developments in coming months~~. **If the Committee sees sufficient further progress toward its objectives for the labor market and inflation, as it expects, then additional measured reductions in the pace of asset purchases would become appropriate.** 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. **In particular, the Committee anticipates that by the time its asset purchases end, the unemployment rate will be around 7 percent and expected to decline further, and inflation will be moving back toward its 2 percent longer-run goal.** ~~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.~~ **However, asset purchases are not on a preset course, and the Committee's decisions about their pace will remain contingent on its economic outlook as well as its assessment of the likely efficacy and costs of such purchases.**

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

The Case For Alternative B

If members judge that progress toward the Committee's objectives has been insufficient, or that continued progress is insufficiently certain, to warrant a reduction in the pace of purchases, they may conclude that it is appropriate to announce that asset purchases will continue at the current pace. If so, the Committee might decide to announce, as in Alternative B, that it will continue buying longer-term securities at the same pace as in recent months and will await more evidence that the economy will evolve about as anticipated before adjusting the pace of its purchases.

In particular, policymakers might judge that labor market conditions have, on balance, improved further, continuing the gradual strengthening in the labor market observed since the Committee began its asset purchase program a year ago. But they may view the gains in payroll employment in July and August as having been weaker than anticipated. Moreover, members may see the recent signals on labor utilization as unclear, noting that while the unemployment rate came down in August, so too did labor force participation. Policymakers may remain unsure about how quickly the restraint on economic growth stemming from the tighter fiscal policy put in place earlier this year will begin to wane, or about the extent to which the recent increase in mortgage rates will hold back home sales and residential investment. Moreover, they might also be concerned that higher oil prices could damp growth in consumer spending and make it less likely that economic activity will pick up over the remainder of the year. They might also conclude that the most recent data indicate that inflation is still running below the Committee's 2 percent objective, once fluctuations due to changes in energy prices are excluded. They may continue to judge that inflation is unlikely to exceed 2 percent over the medium term, particularly in light of still-considerable resource slack in the economy.

Some members may point to the moderate growth in the economy in the second quarter, as well as to continuing gains in private payrolls and declines in the unemployment rate in July and August in the face of ongoing fiscal drag, as evidence that the recovery is gaining traction. Furthermore, they might be inclined to slow the pace of asset purchases to limit the likelihood of excessive risk-taking in the financial sector. However, increases in medium- and longer-term interest rates since the middle of the year may have already reduced risk-taking by spurring market participants to pare back some of their leveraged investments in fixed-income instruments. Some members may judge that continuing the current pace of purchases much longer would risk an undesirably large increase in inflation over the medium run, or a rise in longer-term inflation expectations. But, with the unemployment rate still elevated and expected inflation well anchored, policymakers may not regard it as imperative to slow the pace of purchases at this meeting. Policymakers may worry that even a modest downward adjustment to the flow of purchases might lead to an undesirable further tightening of financial conditions; they may regard an announcement later in the year as less likely to trigger such a reaction, especially if they anticipate that there will be clearer evidence of an improvement in economic conditions by that time and that Committee communications will have laid additional groundwork for a moderation of purchases. As a result, policymakers may think that it would be prudent to wait for more information before deciding when and how much to slow the pace of asset purchases. They may therefore prefer a statement like Alternative B. Policymakers may see Alternative B as appropriately indicating that a moderation in the pace of purchases is the next move, based on the language added to paragraph 4 and the removal of the July statement language that referred to the Committee's options to "increase or reduce" the pace of purchases. If, in addition, policymakers judge that the economy is evolving broadly as anticipated, they may wish to include the optional language in Alternative B that refers to "later this year" as the likely time at which the moderation of the pace of purchases begins. If, however, they have become less confident about the outlook, members may prefer not to use this phrase.

Some members may judge that labor market conditions have been improving very slowly and that the rate of improvement is unlikely to pick up appreciably unless the Committee adopts a still-more accommodative policy stance, potentially including a higher, rather than a lower, pace of asset purchases. Members also may think that it could well become necessary to provide additional monetary policy stimulus in order to ensure that inflation moves up toward 2 percent in coming years. These policymakers may judge that the benefits of continuing purchases at least at their existing pace for a while longer outweigh the costs. However, in view of the inherent noisiness of monthly and quarterly data, these members may regard it as appropriate to continue to indicate that a reduction in the pace of purchases is likely if the economy continues to improve and to reaffirm the previously-announced thresholds for the forward guidance for the federal funds rate. Such policymakers might also judge that the modifications that Alternative B makes to the July statement, notably the indication that purchases are not on a preset course, leave the Committee well-positioned to increase the amount of policy accommodation if labor market conditions begin to weaken or if the economic outlook deteriorates.

According to the Desk's latest survey, primary dealers continue to view the third quarter of 2015 as the most likely date for the first increase in the federal funds rate, and they all anticipate that when the first increase occurs the unemployment rate will be at or below 6½ percent. For the September meeting, in the event that the Committee chooses to reduce the pace of asset purchases, dealers view the most likely outcome as a decision to reduce the pace of purchases per month by a total of $10 billion, with equal reductions in the pace of purchases for agency MBS and longer-term Treasury securities. That said, dealers also assign sizable odds to a Committee decision that leaves the rate of purchases unchanged. Thus, the balance sheet policy component of an announcement like Alternative B, in which purchases are continued at their existing pace, would likely surprise markets to some extent. Longer-term interest rates would likely decline, at least in real terms; inflation compensation and equity prices might rise, and the dollar might depreciate. Volatility might increase as investors digested the Committee's communications and updated their assessment of the Committee's reaction function. The nature and extent of market reaction might well depend on whether the statement includes the phrase "later this year," suggesting that the Committee is still on the modal state-contingent path outlined in prior communications, and on the information provided in the Summary of Economic Projections and in the postmeeting press conference. If these communications, taken together, convey that the Committee continues to see itself on the path described in earlier communications, the market reaction would likely be modest, while if the communications imply that the Committee is following a more-accommodative reaction function than previously thought or saw the economy as on a materially weaker course than previously anticipated, the reaction could be more pronounced.

THE CASE FOR ALTERNATIVE C

If policymakers judge that there has been sufficient improvement in the labor market outlook since the Committee began its current purchase program a year ago to begin moving promptly toward ending the program, they might choose to start dialing back purchases now and to issue a postmeeting statement along the lines of Alternative C. Policymakers might view economic news over the intermeeting period as broadly consistent with the modal outlook for the economy that underlay the discussions of their contingent plan for asset purchases in the June and July Committee meetings. These participants may therefore judge that the correct course is to use the occasion of the September meeting to make a modest downward adjustment to the pace of the Committee's asset purchases, and to signal that additional measured reductions in the pace of asset purchases would likely become appropriate if the Committee sees continuing improvement in labor market conditions and if inflation is moving back toward its longer-run objective.

Policymakers may see the expansion of payroll employment observed in recent months as establishing that the economy and labor market have sufficient momentum to make further progress toward the Committee's objectives. The renewed decline in the unemployment rate in July and August, in addition to the continued gains in private payrolls, might be cited as reinforcing the picture of ongoing labor market improvement. Policymakers may acknowledge that the recent slowing in job gains and the continuing weakness of the labor force participation rate create some uncertainty about the extent of strengthening in the labor market. However, policymakers may judge that the behavior of the unemployment rate still provides a generally reliable indication of overall labor market conditions. Thus, they might continue to regard the labor market data received in recent months as, on balance, further confirmation of the strengthening of the labor market. Participants might also cite the moderate expansion of the economy, especially in the face of significant restraint from fiscal policy, and the resilience of the housing market as evidence of sustainable economic improvement; they may judge that despite the recent increase in mortgage rates, housing market demand will continue to be supported by still-favorable home affordability. In addition, the most recent readings on consumer price inflation may have made some participants less worried about downside risks to near-term inflation.

Some other policymakers may want to reduce the pace of purchases at this meeting because they judge that the benefits of additional purchases no longer outweigh the costs. These participants may be skeptical that the asset purchase program is having a significant effect on overall macroeconomic outcomes, or they may judge that it is supporting residential construction at the expense of other types of investment spending. Furthermore, they may see the prospective costs of continuing purchases at the current pace as sizable. 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. If these participants see the potential costs associated with a still-larger balance sheet as highly uncertain, they may be willing to slow the pace of purchases in measured steps while more information accrues about those costs and about the underlying economic situation.

Taking the evidence together, policymakers may conclude that it is appropriate to undertake at least a modest reduction in the pace of purchases at this meeting, as in Alternative C. At the same time, policymakers favoring Alternative C could point out that it conditions additional measured reductions on evidence of further progress toward the Committee's goals. Thus, a decision like Alternative C, although it would start dialing back purchases, would not put the Committee's purchases on a preset course, and the Committee would retain the option of adjusting the size and timing of future adjustments in the pace of purchases if the outlook for the labor market deteriorated or if inflation seemed likely to fall persistently below the Committee's longer-run goal.

Some policymakers might see the improvement in the labor market outlook and an evaluation of the benefits and costs of asset purchases as providing a case for a larger step-down in the pace of purchases than the total reduction of $10 billion per month built into Alternative C. They might nevertheless decide to keep the total reduction to $10 billion in September, after taking account of the recent signs of softness in private spending and the danger of a sizable market reaction to an immediate major reduction in the pace of purchases.

If policymakers wish to communicate more explicitly the link between the purchase program and economic developments, they may choose to use language like that in paragraph C.4′, which indicates that the Committee expects the economy to evolve in a way that implies additional measured reductions in purchase pace are likely in coming quarters, and lays out a version of the Committee's state-contingent plan, in which purchases end as the unemployment rate moves down toward 7 percent and inflation moves back toward its longer-run goal. However, other participants may prefer statement language, such as that in paragraph C.4, that does not refer to the 7 percent value for the unemployment rate, perhaps because they are concerned about putting too much weight on the unemployment rate as the single indicator of labor market conditions.[1]

In general, gauging the market reaction to Alternative C is complicated by the wide range of views among market participants about the likely action at this meeting as well as by the potential for the first reduction in purchases to have an important signaling effect. A decision to adopt a statement like Alternative C would surprise some, but not most, market participants. As noted earlier, the Desk's survey of the primary dealers indicates that a reduction of $5 billion for the pace of purchases of both agency MBS and Treasury securities is the median dealer expectation, although dealers also assign sizable odds to a decision to maintain purchases at their existing pace. Thus, an announcement of a reduction in the pace of purchases like that in Alternative C might not produce much market reaction. If language like paragraph C.4′ were used in the announcement, however, investors might view the Committee as having a less-accommodative reaction function than market participants had previously thought, as the Committee has previously declined to put an explicit state-contingent plan for asset purchases into the postmeeting statement. In response to this changed perception of Committee behavior, longer-term interest rates and inflation compensation might rise, equity prices might fall, and the dollar might appreciate. Volatility might increase as investors digested the Committee's communications and proceeded to update their assessment of the Committee's reaction function.

THE CASE FOR ALTERNATIVE A

Policymakers may view the recent data as notably weaker than the Committee expected when it discussed its contingent plan for asset purchases during its June and July meetings. As a result, they may wish to continue purchases at their present pace and issue a statement that does not suggest that a reduction in the pace of purchases is likely in the near future, as in Alternative A. These policymakers, while acknowledging that real GDP growth for the second quarter was revised up during the intermeeting period, might see the second quarter's strength as temporary. In this connection, they might point to the fact that the staff's projection for real GDP growth over the next four quarters

[1] The memo by B. Durdu, E. Engen, and J. Roberts, "Economic Conditions and the Federal Reserve's Balance Sheet Under a Simple Rule to Guide Large-Scale Asset Purchases," sent to the Committee on September 6, 2013, provides simulation analysis of the relationship between a simple policy rule for asset purchases and the behavior of the unemployment rate.

now shows a slower pickup than in the July Tealbook. Additionally, these policymakers may be skeptical that the declines in the unemployment rate registered in July and August will continue, inasmuch as they were accompanied by only modest gains in private payrolls and occurred against the background of a still-low and declining labor force participation rate and still-high levels of long-duration unemployment and of individuals working part time for economic reasons. All told, some policymakers may judge that there has been only modest fundamental improvement in overall labor market conditions in the past year.

In addition, some participants may conclude that financial market conditions have tightened substantially in recent months, with mortgage rates having increased further, equity prices having moved down, and the foreign exchange value of the dollar having appreciated in the intermeeting period. These participants may worry that the financial tightening could be sustained or become more severe, resulting in serious negative repercussions for the outlook, perhaps along the lines of the "Higher Interest Rates with Housing Spillovers" alternative simulation in Tealbook Book A. They may see a statement like Alternative A as more likely than Alternative B to provide the amount of downward pressure on longer-term interest rates needed to contain the tightening in financial conditions, perhaps because they see Alternative B's language as leaning toward an imminent reduction in the pace of purchases.

Some participants may judge that a reduction in the unemployment threshold to 6 percent, as in Alternative A, could help to reverse some of the recent run-up in longer-term interest rates and put the economic recovery on a firmer footing. Policymakers may also see a statement like Alternative A as useful because of the language providing a floor to the inflation threshold in the forward guidance for the federal funds rate. Participants may view such language as helping to underscore the message that the Committee is willing to defend its longer-term inflation goal from below as well as from above. Moreover, they may regard the language in paragraph 5 of Alternative A, indicating that the labor force participation rate and growth of employment will enter the Committee's decisions about "when to begin reducing policy accommodation and the appropriate pace at which to reduce accommodation," as helpful in providing concrete examples of indicators other than the unemployment rate that the Committee considers in judging the evolution of the labor market.

Moreover, some participants may conclude that a balanced approach to achieving both the Committee's goals requires providing an amount of accommodation sufficient to bring projected inflation temporarily above 2 percent. Alternatively, policymakers may expect the equilibrium real rate of interest to be on a persistently low trajectory for several years ahead, reflecting continuing headwinds from the financial crisis; accordingly, they may conclude that, when accommodation begins to be withdrawn, the setting of the nominal federal funds rate target should take into account the subdued level of the equilibrium real federal funds rate. In either case, policymakers might anticipate that the federal funds rate target consistent with achieving the dual mandate will rise only gradually for a significant period after the reduction of policy accommodation begins. Members may view statement language to this effect, as in the fifth paragraph of Alternative A, as valuable in providing further clarity about the Committee's reaction function and, by lowering investors' expectations of the policy rate path, adding to the amount of policy accommodation currently being provided by the Committee.

Some participants may judge not only that the modal outlook is unsatisfactory but also that downside risks to that outlook remain sizable. Such risks might go beyond those posed by recent financial market developments; in particular, another Congressional impasse on the federal debt limit or the budget could elevate policy uncertainty and further restrain household spending and business investment later this year. Heightened geopolitical concerns might also be seen as a factor that could lead to higher oil prices and lower consumer confidence. At the same time, with underlying inflation continuing to run below 2 percent, some policymakers may see little risk that inflation or inflation expectations will move up; indeed, they might remain concerned about downside risks to inflation, especially in light of still-substantial resource slack and contained wage gains. If so, they may see the configuration of risks as pointing to the need for greater policy stimulus now.

An announcement along the lines of that in Alternative A would surprise market participants; it could be perceived as a deferral of the Committee's intention to dial back asset purchases and could be viewed as at odds with the widely held expectation that the start of tapering will be announced either at the September meeting or sometime later this year. Moreover, the changes to the forward guidance would be a significant surprise to markets, especially when announced alongside an unchanged purchase program. In response to an announcement like that in Alternative A, longer-term interest rates would likely decline, inflation compensation and equity prices might rise, and the dollar might depreciate. If, however, investors took a statement like Alternative A as indicating that the FOMC has become more pessimistic about the outlook for economic growth and employment than market participants had anticipated, or if they took the introduction of the inflation floor as signifying a heightened Committee concern that inflation might fall, equity prices might not rise or could even decline. Volatility might well increase as investors revised their assessment of the Committee's reaction function.

DIRECTIVE

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

The 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 $40 billion per month, beginning in October. 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.

July 2013 Directive

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

Directive for September 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 September 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 September 2013 Alternative C

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

Projections

BALANCE SHEET, INCOME, AND MONETARY BASE

The staff has prepared three scenarios for the Federal Reserve's balance sheet that correspond to Alternatives A, B, and C. All three alternatives include additional asset purchases, though the pace and cumulative amount of purchases differ across the alternatives.[1] Alternative B continues purchases at the current monthly pace in the near term but then moderates the pace later this year; the pace of purchases would be reduced further through the first half of 2014, and purchases would end by mid-year.[2] Alternative C has a modest reduction in the pace of purchases immediately and additional measured reductions at later meetings, with purchases ending in March 2014. Alternative A maintains the current pace of purchases through the end of this year; thereafter, it gradually reduces the pace of purchases, and brings the program to a close in December 2014.

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 all alternatives assume that the SOMA portfolio shrinks only through redemptions of Treasury securities and paydowns of principal from MBS; consistent with the strategy outlined in the press conference statement following the June FOMC meeting, no sales of agency MBS are incorporated in the balance sheet projections.

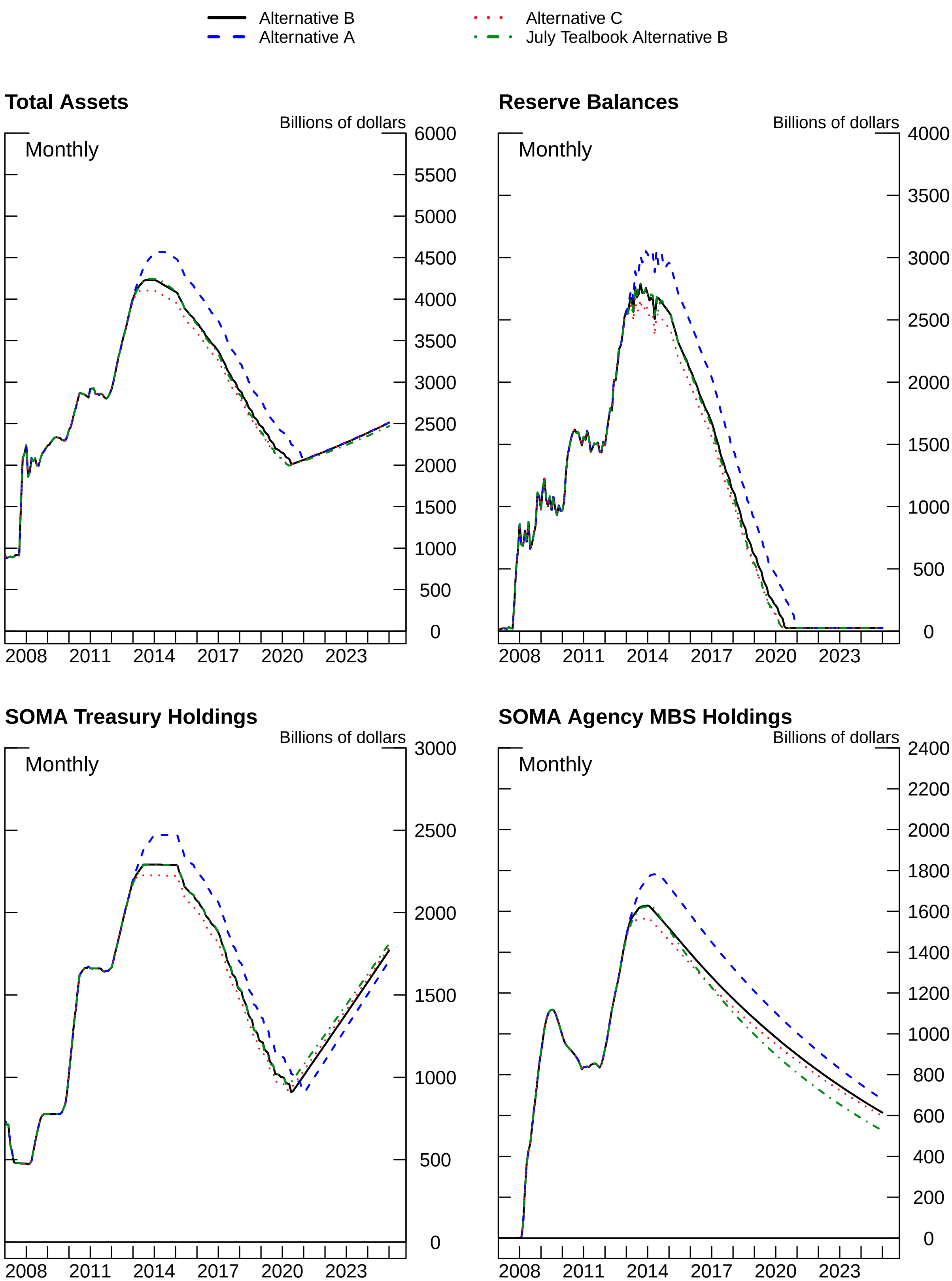
For the balance sheet scenario that corresponds to Alternative B, the Committee is assumed to continue expanding its holdings of agency MBS by $40 billion per month and of longer-term Treasury securities by $45 billion per month into the fall, and then to

[1] 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 assumption that maturing Treasury securities are rolled over at auction is not particularly important because, as a result of the maturity extension program, the SOMA portfolio currently holds less than $5 billion of Treasury securities that mature before January 2016.

[2] Slight deviations in the start date and the pace of reductions do not materially affect the balance sheet projections.

[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.

Total Assets and Selected Balance Sheet Items



Projections

reduce the pace of these purchases gradually through June 2014.[4] The staff projects that the unemployment rate will stand at about 7 percent when purchases stop. Under these assumptions, purchases total about $1.2 trillion over 2013 and the first half of 2014, as in the July Tealbook Alternative B.[5]

As shown in the exhibit "Total Assets and Selected Balance Sheet Items," SOMA securities holdings under the purchase program assumed for Alternative B peak at about $4 trillion in the fall of 2014, with $2.3 trillion in Treasury securities holdings and $1.7 trillion in agency securities holdings. As in the staff forecast in Tealbook Book A, we assume that the first increase in the target federal funds rate is in the second quarter of 2015.[6] Two quarters before the first increase in the target federal funds rate, all reinvestments and rollovers are assumed to cease, and the SOMA portfolio begins to contract.[7] The size of the portfolio is normalized by mid-2021, as in the projection for Alternative B in the July Tealbook. The balance sheet then begins to expand, with increases in SOMA holdings essentially matching the growth of currency in circulation and Federal Reserve Bank capital.[8] Total assets are $2.5 trillion at the end of 2025, with a little more than $600 billion in MBS holdings remaining in the SOMA portfolio.

[4] The staff assumes that the main effect of asset purchases on financial conditions is related to 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.

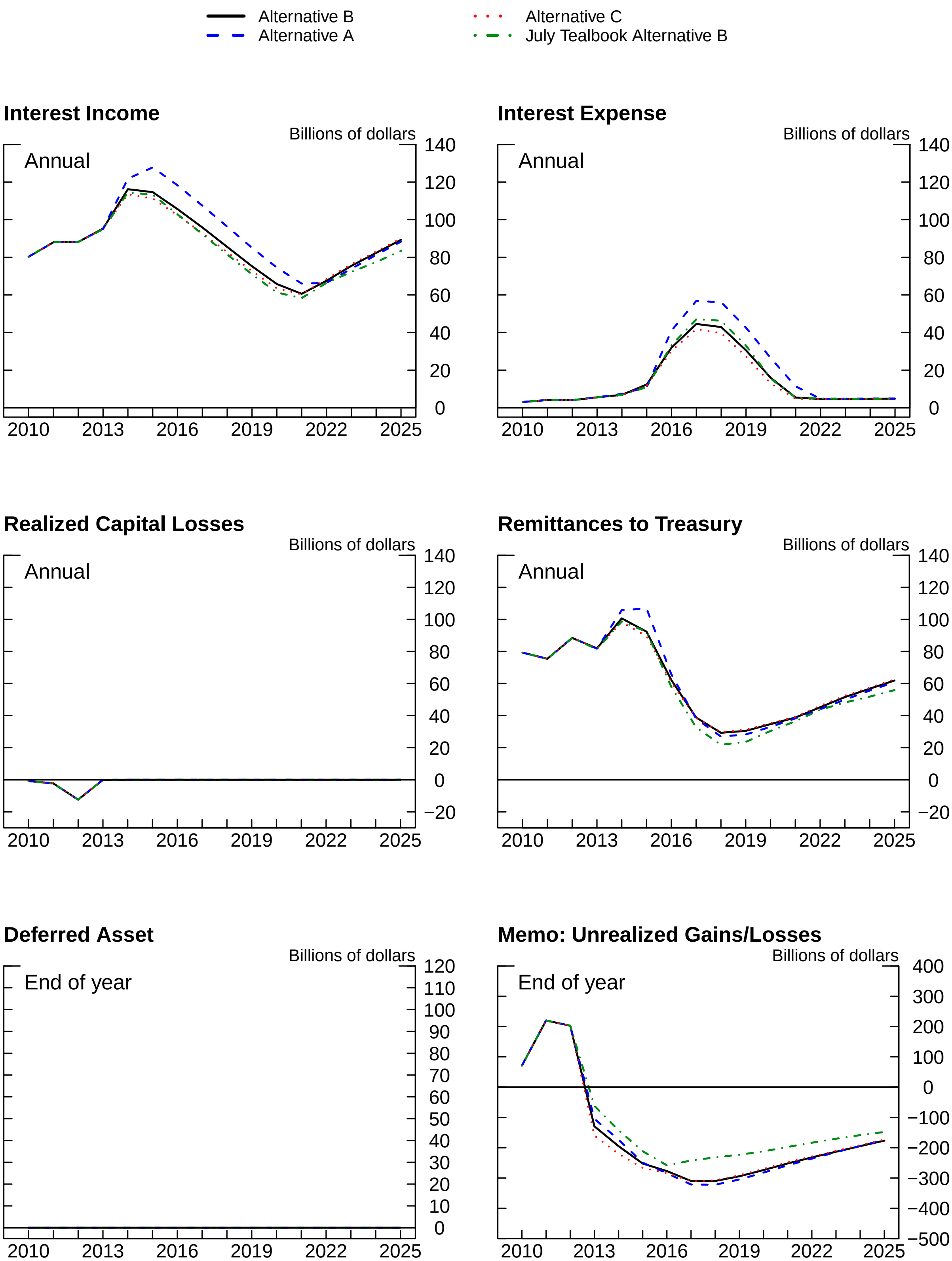
[5] The balance sheet scenario assumed for Alternative B is consistent with the state-contingent plan for securities purchases laid out by the Chairman in recent communications and discussed by the Committee at its June meeting, as well as with the current staff forecast presented in Tealbook Book A.

[6] This liftoff date for the federal funds rate is one quarter earlier than that assumed in the balance sheet projections for Alternative B in the July Tealbook. At the time of liftoff, the unemployment rate is projected to have fallen below the Committee's 6.5 percent threshold, and inflation is expected to be moving towards the Committee's 2 percent objective.

[7] 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.

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

Income Projections



The second exhibit, "Income Projections," shows the implications for Federal Reserve income across the alternatives. Under Alternative B, interest income rises until reinvestments cease and then declines as the SOMA portfolio begins to contract through redemptions and paydowns of principal. As the federal funds rate rises after liftoff, interest expense on reserve balances climbs. As a result, Federal Reserve remittances to the Treasury decline, although they are projected to remain positive over the entire projection period. Annual remittances peak at about $100 billion in 2014 and trough at $30 billion later in the decade, and no deferred asset is recorded. Cumulative remittances from 2009 through 2025 are about $1 trillion, well above the level that would have been observed without the asset purchase programs. The effect of the recent rise in interest rates on cumulative remittances depends on the entire projected path of the federal funds rate and longer term rates. Given the modest changes to these assumed interest rate paths in the medium- and longer-term staff projection, projected cumulative remittances are only marginally affected.

As interest rates have risen over the past several months, the unrealized gain position of the portfolio has declined. The portfolio moved from a position of having an unrealized gain of $185 billion at the end of the first quarter of this year to a $35 billion gain position at the end of the second quarter, and to an estimated $50 billion unrealized *loss* position at the end of August 2013.[9] For Alternative B, the portfolio is projected to report an unrealized loss of about $130 billion at the end of this year, a $70 billion larger loss than projected in the July Tealbook.

In the scenario that we assume for Alternative C, the Committee announces an immediate reduction of monthly purchases of longer-term Treasury securities and of agency MBS by $5 billion each. The Committee is assumed to reduce the pace of these purchases to zero by March 2014, at which time the unemployment rate is projected to be approaching 7 percent and inflation is headed toward its 2 percent longer-run goal. Purchases total about $1 trillion in 2013 and 2014. In this scenario, the federal funds rate

Projections

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.

[9] The Federal Reserve reports the change in the quarter-end unrealized gain/loss position of the SOMA portfolio to the public with a lag in the "Federal Reserve Banks Combined Quarterly Financial Report," available on the Board's website at http://www.federalreserve.gov/monetarypolicy/bst_fedfinancials.htm#quarterly. The August unrealized position is an estimate based on Board staff projections.

is assumed to lift off in mid-2015, as in Alternative B. Reinvestment of principal from maturing or prepaying securities ends and redemptions begin at the end of 2014, causing the portfolio to begin to contract. SOMA securities holdings in this scenario peak at about $3.9 trillion in September 2014, and the size of the balance sheet is normalized by mid-2021 as in Alternative B. Federal Reserve remittances to the Treasury are projected to remain positive throughout the projection period, and no deferred asset is recorded. Cumulative remittances from 2009 to 2025 are slightly less than under Alternative B.

In the scenario for Alternative A, the Committee is assumed to continue the current pace of purchases of longer-term Treasury securities and agency MBS through the end of the year, to then reduce purchases gradually, and to end purchases by the end of 2014. Under these assumptions, purchases total about $1.5 trillion over 2013 and 2014. This more accommodative policy stance than in Alternative B would be consistent with a projection of the macroeconomy that is a bit weaker than in the staff forecast or a desire on the part of the Committee to provide more accommodation. In this scenario, SOMA securities holdings increase to a peak of about $4.3 trillion in March 2015. The first increase in the target federal funds rate occurs in the fourth quarter of 2015—two quarters later than in Alternative B—when the unemployment threshold and inflation floor included in Alternative A are projected to be crossed. All reinvestments are projected to cease in the second quarter of 2015, so the SOMA portfolio begins to contract. The size of the portfolio is normalized at the end of 2021, about two quarters later than in the scenario corresponding to Alternative B, reflecting the larger asset purchase program and the later start to balance sheet normalization.

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 annual Federal Reserve remittances to the Treasury peak at $107 billion in 2015. As the federal funds rate rises after liftoff, the interest expense on reserve balances increases, reducing Federal Reserve net income. Federal Reserve remittances to the Treasury are projected to remain positive over the entire projection period, and no deferred asset is recorded. Cumulative remittances from 2009 through 2025 are slightly higher than that projected 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.[10] Reserve balances peak at about $3 trillion, $2.8 trillion, and $2.7 trillion under Alternatives A, B, and C, respectively. When the federal funds rate lifts off from its lower bound, reserve balances are $3 trillion, $2.7 trillion, and $2.6 trillion under Alternatives A, B, and C, respectively.

As shown in the final exhibit, "Alternative Projections for the Monetary Base," in the scenario corresponding to Alternative B, the monetary base increases through the end of 2014 because of the purchase program and the accompanying increase in reserve balances. Once exit begins, the monetary base shrinks, on net, through mid-2021, primarily because of redemptions of securities and the corresponding reduction in reserve balances. Starting around mid-2021, after reserve balances are assumed to have stabilized at $25 billion, the monetary base begins to expand in line with the growth of currency in circulation. Under Alternative C, the monetary base increases through the end of 2014 because of the purchase program and then contracts, on net, until the size of the portfolio is normalized. Projected increases in the monetary base are less than the increases under Alternative B, due to a smaller program size and an earlier end date for the purchases. Under Alternative A, the monetary base increases through early 2015, 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.

[10] 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 B	Alternative C	Alternative A	July Alternative B
Monthly				
2013: May	35.6	35.6	35.6	35.6
Jun	36.3	36.3	36.3	36.3
Jul	33.3	33.3	33.3	50.0
Aug	36.9	36.9	36.9	50.3
Sep	25.5	25.3	25.6	24.6
Oct	24.4	23.2	24.6	21.3
Nov	41.1	38.8	42.0	35.2
Dec	29.4	25.7	31.6	26.8
2014: Jan	9.2	6.0	12.9	8.9
Quarterly				
2013: Q2	38.6	38.6	38.6	38.6
Q3	35.1	35.1	35.1	44.1
Q4	31.1	29.6	31.6	29.6
2014: Q1	20.1	17.0	23.9	18.9
Q2	7.9	3.7	15.6	9.2
Q3	8.6	3.9	17.4	11.6
Q4	1.3	0.9	8.9	-1.2
Annual				
2013	36.6	36.1	36.8	38.9
2014	9.7	6.5	17.5	9.9
2015	-1.5	-1.5	0.1	-1.3
2016	-9.2	-9.4	-7.5	-9.7
2017	-9.8	-10.0	-9.4	-10.2
2018	-14.8	-15.0	-14.1	-15.1
2019	-16.6	-16.8	-16.1	-17.3
2020	-15.6	-15.7	-15.4	-15.9
2021	-7.0	-3.0	-14.5	-3.8
2022	4.8	4.8	0.7	4.1
2023	4.9	4.9	4.9	4.3
2024	4.9	4.9	4.9	4.5
2025	4.9	4.9	4.9	4.6

Note: For years, Q4 to Q4; for historical months and quarters and for projected quarters, calculated from corresponding average levels; for projected months, calculated from corresponding month-end levels.

Projections

MONEY

M2 is estimated to have expanded briskly over the third quarter, as investors apparently tilted their portfolios toward safe and liquid assets in M2 amid the sell-off in fixed income markets. We anticipate that M2 will grow more in line with nominal GDP for the remainder of 2013. Beginning in 2014, M2 is projected to grow more slowly than nominal GDP in part because investors are assumed to reallocate a portion of their elevated M2 balances to riskier investments as financial and economic conditions improve; this shift in portfolio composition is expected to persist through the remainder of the forecast horizon.[11] M2 growth is further depressed in 2015 and 2016 as the opportunity cost of holding M2 assets is increased by the assumed rise in short-term market rates.

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

Quarterly		
2013:	Q3	7.9
	Q4	4.9
2014:	Q1	2.7
	Q2	2.1
	Q3	2.4
	Q4	2.5
2015:	Q1	0.4
	Q2	-1.4
	Q3	-1.9
	Q4	-2.2
2016:	Q1	-1.5
	Q2	-1.3
	Q3	-0.7
	Q4	-0.3
Annual		
	2013	5.7
	2014	2.4
	2015	-1.3
	2016	-1.0

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

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

[11] The staff's judgmental forecasts of M2 are constructed using the staff's forecast of nominal income growth and model-based estimates of interest rate effects.

Projections

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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 September 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 August 30, 2013. The projections for all major asset and liability categories under each scenario are summarized in the tables that follow the bullet points.

The Tealbook projections for the scenario corresponding to Alternative B assume that the target federal funds rate begins to increase in the second quarter of 2015. This date of liftoff is consistent with the current staff economic forecast and the thresholds described in the July 2013 FOMC statement, and it is one quarter earlier than assumed in the balance sheet projections for Alternative B in the July Tealbook. The projections for the scenario corresponding to Alternative C assume the same liftoff date as in Alternative B. In the projections for the scenario corresponding to Alternative A, the first increase in the target federal funds rate occurs in the fourth quarter of 2015, in line with the 6 percent threshold for the unemployment rate and the inflation rate floor of 1¾ percent. In each case, the balance sheet projections assume no use of short-term draining tools to achieve the projected path for the target federal funds rate.[1]

ASSETS

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

- The assumptions under Alternative B are:
  - 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 into the fall of 2013. Then, purchases are assumed to continue—though at a decreasing pace—and conclude by mid-2014. The Treasury securities purchased are assumed to have an average duration of about nine years. The Treasury and MBS

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

Projections

purchases in 2013 and the first half of 2014 expand the SOMA portfolio's holdings by about $1.2 trillion.

- The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS into the fourth quarter of 2014.
- Starting late in the fourth quarter of 2014—two quarters prior to the assumed increase in the target federal funds rate—all securities are allowed to roll off the portfolio as they mature or prepay. The portfolio declines only through redemptions and paydowns of SOMA assets.
- For agency MBS, the rate of prepayment is based on staff models using estimates of housing market factors from one of the Desk's analytical providers, long-run average prepayment speeds of MBS, and interest rate projections generated from the staff's FRB/US model.[2] The projected rate of prepayment is sensitive to these underlying assumptions.

- In the scenario corresponding to Alternative C, the Committee is assumed to decrease the monthly pace of purchases to $40 billion of longer-term Treasury securities and $35 billion of agency MBS beginning in October 2013. The pace of purchases is reduced further later this year, and purchases end in the first quarter of 2014. The Treasury securities purchased are assumed to have an average duration of about nine years. The Treasury and MBS purchases expand the SOMA portfolio's holdings of longer-term securities by about $1 trillion in 2013 and 2014. The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS until the end of 2014, six months prior to the assumed increase in the target federal funds rate. Thereafter, all securities are allowed to roll off the portfolio as they mature or prepay. The portfolio declines only through redemptions and paydowns of SOMA assets.

- In the scenario corresponding to Alternative A, the Committee is assumed to continue the current pace of purchases of longer-term Treasury securities and agency MBS until the end of 2013. Thereafter, the pace of purchases is reduced in several steps, and purchases end in December 2014. The Treasury securities purchased are assumed to have an average duration of about nine years. The Treasury and MBS purchases expand the SOMA portfolio's holdings of longer-term securities by about $1.5 trillion in 2013 and 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—two quarters prior to the assumed increase in the target federal funds rate— principal payments from all securities are allowed to roll off the portfolio. The portfolio declines only through redemptions and paydowns of SOMA assets.

- If interest rates are below (above) the coupon rate on outstanding Treasury securities, the market value at which the Federal Reserve purchases securities will be greater (less) than

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

their face value and the Federal Reserve records a premium (discount). In all alternatives, net premiums are roughly unchanged over the length of the purchase programs.

- The market value at which the Federal Reserve purchases new agency MBS will generally exceed their face value. As a result, MBS premiums under Alternatives A, B, and C, will rise by roughly $25 billion, $14 billion, and $12 billion, respectively.
- 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 $200 million currently to zero in 2015. Assets held by TALF LLC consist of investments of commitment fees collected by the LLC.[3] Consistent with events to date, the projections assume the LLC does not purchase any asset-backed securities. (It would have to make such purchases if an asset-backed security were received by the Federal Reserve Bank of New York in connection with a decision of a borrower not to repay a TALF loan.)
- The assets held by Maiden Lane LLC decline from about $1.5 billion 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.

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

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

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

TERM PREMIUM EFFECTS[5,6]

- Under Alternative B, the contemporaneous term premium effect on the yield of the ten-year Treasury note is about negative 121 basis points, slightly less negative than for Alternative B in the July Tealbook. Over the remainder of the projection period, the term premium effect declines slowly toward zero, reflecting the actual and anticipated normalization of the portfolio.
- Under Alternative C, the term premium effect is about negative 116 basis points. The effect is less negative than in Alternative B because there are fewer securities purchased than under Alternative B.
- Under Alternative A, the term premium effect is about negative 134 basis points in the current quarter. The effect wanes over time as securities roll off the portfolio.

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

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

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

Billions of dollars

	Aug 30, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,649	4,004	4,088	3,373	2,470	2,063	2,273	2,510
Selected assets								
Liquidity programs for financial firms	0	1	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	0	1	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	0	0	0	0	0	0	0
Securities held outright	3,386	3,730	3,838	3,164	2,293	1,910	2,135	2,387
U.S. Treasury securities	2,028	2,192	2,288	1,881	1,217	1,009	1,387	1,770
Agency debt securities	66	57	33	4	2	2	2	2
Agency mortgage-backed securities	1,291	1,480	1,517	1,279	1,074	898	746	614
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	203	216	193	151	117	92	75	61
Unamortized discounts	-5	-9	-9	-7	-6	-4	-4	-3
Total other assets	64	65	65	65	65	65	65	65
Total liabilities	3,594	3,949	4,026	3,296	2,372	1,940	2,116	2,312
Selected liabilities								
Federal Reserve notes in circulation	1,165	1,189	1,340	1,496	1,636	1,793	1,970	2,166
Reverse repurchase agreements	95	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,325	2,649	2,575	1,691	628	40	40	40
Reserve balances held by depository institutions	2,267	2,559	2,560	1,676	612	25	25	25
U.S. Treasury, General Account	26	80	5	5	5	5	5	5
Other Deposits	32	10	10	10	10	10	10	10
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	55	62	77	98	124	156	198

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

Projections

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

Billions of dollars

	Aug 30, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,649	3,975	3,961	3,259	2,381	2,063	2,272	2,510
Selected assets								
Liquidity programs for financial firms	0	1	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	0	1	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	0	0	0	0	0	0	0
Securities held outright	3,386	3,703	3,715	3,053	2,207	1,911	2,137	2,387
U.S. Treasury securities	2,028	2,172	2,223	1,816	1,167	1,040	1,410	1,788
Agency debt securities	66	57	33	4	2	2	2	2
Agency mortgage-backed securities	1,291	1,474	1,459	1,232	1,037	869	724	597
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	203	215	189	148	114	90	74	60
Unamortized discounts	-5	-9	-9	-7	-5	-4	-3	-3
Total other assets	64	65	65	65	65	65	65	65
Total liabilities	3,594	3,920	3,899	3,182	2,284	1,939	2,116	2,312
Selected liabilities								
Federal Reserve notes in circulation	1,165	1,189	1,340	1,496	1,636	1,793	1,970	2,166
Reverse repurchase agreements	95	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,325	2,620	2,448	1,577	540	40	40	40
Reserve balances held by depository institutions	2,267	2,530	2,433	1,561	524	25	25	25
U.S. Treasury, General Account	26	80	5	5	5	5	5	5
Other Deposits	32	10	10	10	10	10	10	10
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	55	62	77	98	124	156	198

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

	Aug 30, 2013	2013	2015	2017	2019	2021	2023	2025
Total assets	3,649	4,018	4,491	3,737	2,762	2,085	2,276	2,514
Selected assets								
Liquidity programs for financial firms	0	1	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	0	1	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	0	0	0	0	0	0	0
Securities held outright	3,386	3,741	4,226	3,516	2,576	1,925	2,134	2,387
U.S. Treasury securities	2,028	2,202	2,470	2,062	1,365	918	1,302	1,706
Agency debt securities	66	57	33	4	2	2	2	2
Agency mortgage-backed securities	1,291	1,482	1,723	1,449	1,209	1,004	829	679
Net portfolio holdings of TALF LLC	0	0	0	0	0	0	0	0
Unamortized premiums	203	218	211	165	128	100	81	65
Unamortized discounts	-5	-8	-11	-9	-7	-6	-4	-4
Total other assets	64	65	65	65	65	65	65	65
Total liabilities	3,594	3,963	4,429	3,660	2,664	1,962	2,120	2,316
Selected liabilities								
Federal Reserve notes in circulation	1,165	1,189	1,340	1,496	1,637	1,794	1,972	2,169
Reverse repurchase agreements	95	100	100	100	100	100	100	100
Deposits with Federal Reserve Banks	2,325	2,664	2,976	2,052	917	59	40	40
Reserve balances held by depository institutions	2,267	2,573	2,960	2,037	902	44	25	25
U.S. Treasury, General Account	26	80	5	5	5	5	5	5
Other Deposits	32	10	10	10	10	10	10	10
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	55	62	77	98	124	156	198

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

Projections

Alternative Projections for the 10-Year Treasury Term Premium Effect

Date	Alternative B	Alternative C	Alternative A	July Alternative B
Basis Points				
Quarterly Averages				
2013: Q3	–121	–116	–134	–125
Q4	–117	–112	–131	–121
2014: Q1	–112	–107	–127	–116
Q2	–107	–102	–123	–111
Q3	–102	–97	–118	–106
Q4	–97	–93	–112	–100
2015: Q1	–92	–88	–107	–95
Q2	–87	–83	–102	–90
Q3	–83	–78	–96	–85
Q4	–78	–74	–91	–80
2016: Q4	–62	–59	–73	–63
2017: Q4	–49	–46	–58	–49
2018: Q4	–38	–36	–45	–39
2019: Q4	–30	–28	–35	–30
2020: Q4	–23	–22	–27	–24
2021: Q4	–18	–18	–21	–19
2022: Q4	–15	–14	–17	–16
2023: Q4	–11	–11	–13	–13
2024: Q4	–8	–8	–10	–9
2025: Q4	–6	–6	–7	–7

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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