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.

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Class I FOMC – Restricted Controlled (FR)

Report to the FOMC on Economic Conditions and Monetary Policy

Book B

Monetary Policy: Strategies and Alternatives

October 18, 2012

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.[1] These prescriptions take as given the staff's baseline projections for real activity and inflation in 2012 and 2013. Medium-term prescriptions derived from dynamic simulations of each rule are discussed below. As shown in the left-hand columns, all but one of the near-term prescriptions keep the federal funds rate at the effective lower bound through the first quarter of 2013. Only the Taylor (1993) rule, which puts relatively less weight on the output gap, prescribes an increase in the target federal funds rate, to 165 basis points for the fourth quarter of 2012 and 140 basis points for the first quarter of 2013.

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

The Tealbook baseline projections for the output gap and inflation are shown in the bottom half of the exhibit, titled "Key Elements of the Staff Projection." Over the near term, the outlook for inflation is essentially unchanged from the previous Tealbook. From 2017 through 2019, the staff has revised up its forecast of core inflation from just under 2 percent to just over 2 percent, consistent with the change in the staff outlook for the output gap, which is narrower over the medium term than in September and turns slightly positive in the third quarter of 2016. As described in Book A of the Tealbook, the projected path of the output gap is narrower than in the September projection primarily for two reasons. First, the staff has revised down its estimate of the level of potential GDP at the end of 2012 (but not its growth rate going forward) by nearly

[1] Details for each rule appear in Explanatory Note A.

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

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Policy Rules

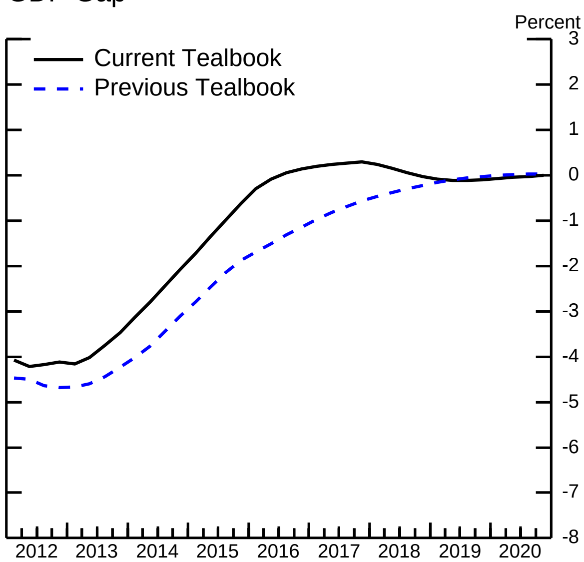
	Constrained Policy 2012Q4	Constrained Policy 2013Q1	Unconstrained Policy 2012Q4	Unconstrained Policy 2013Q1
Taylor (1993) rule	**1.65**	**1.40**	**1.65**	**1.40**
Previous Tealbook	*1.53*	*1.30*	*1.53*	*1.30*
Taylor (1999) rule	**0.13**	**0.13**	**–0.36**	**–0.63**
Previous Tealbook	*0.13*	*0.13*	*–0.76*	*–0.98*
Inertial Taylor (1999) rule	**0.13**	**0.13**	**0.07**	**–0.04**
Previous Tealbook	*0.13*	*0.13*	*0.01*	*–0.14*
Outcome-based rule	**0.13**	**0.13**	**0.10**	**–0.05**
Previous Tealbook	*0.13*	*0.13*	*–0.02*	*–0.23*
First-difference rule	**0.13**	**0.23**	**0.11**	**0.23**
Previous Tealbook	*0.13*	*0.13*	*0.03*	*0.04*
Nominal income targeting rule	**0.13**	**0.13**	**–0.21**	**–0.55**
Previous Tealbook	*0.13*	*0.13*	*–0.41*	*–0.86*

Memo: Equilibrium and Actual Real Federal Funds Rate

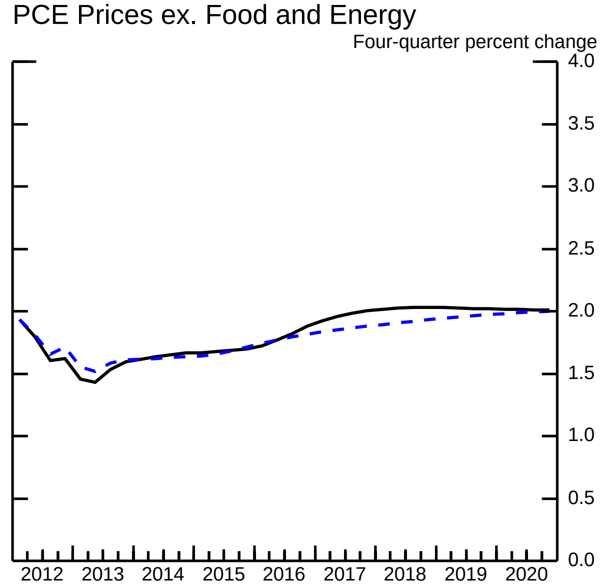
	Current Tealbook	*Current Quarter Estimate as of Previous Tealbook*	*Previous Tealbook*
Tealbook-consistent FRB/US *r** estimate	–1.90	–2.11	*–2.39*
Actual real federal funds rate	–1.47		*–1.67*

Key Elements of the Staff Projection

GDP Gap



PCE Prices ex. Food and Energy



Note: Estimates of *r**may change at the beginning of a quarter even when the staff outlook is unchanged because the twelve-quarter horizon covered by the calculation has rolled forward one quarter. Therefore, whenever the Tealbook is published early in the quarter, the memo includes a third column labeled "Current Quarter Estimate as of Previous Tealbook."

½ percent, thus narrowing the output gap. Second, over the medium term, economic activity is now projected to increase at a somewhat faster pace than was the case in the September projection, reflecting the policy accommodation provided by the Committee at the September meeting. Because of the narrowing in the output gap, the near-term prescriptions from the unconstrained rules have risen a bit compared with those in the September Tealbook.

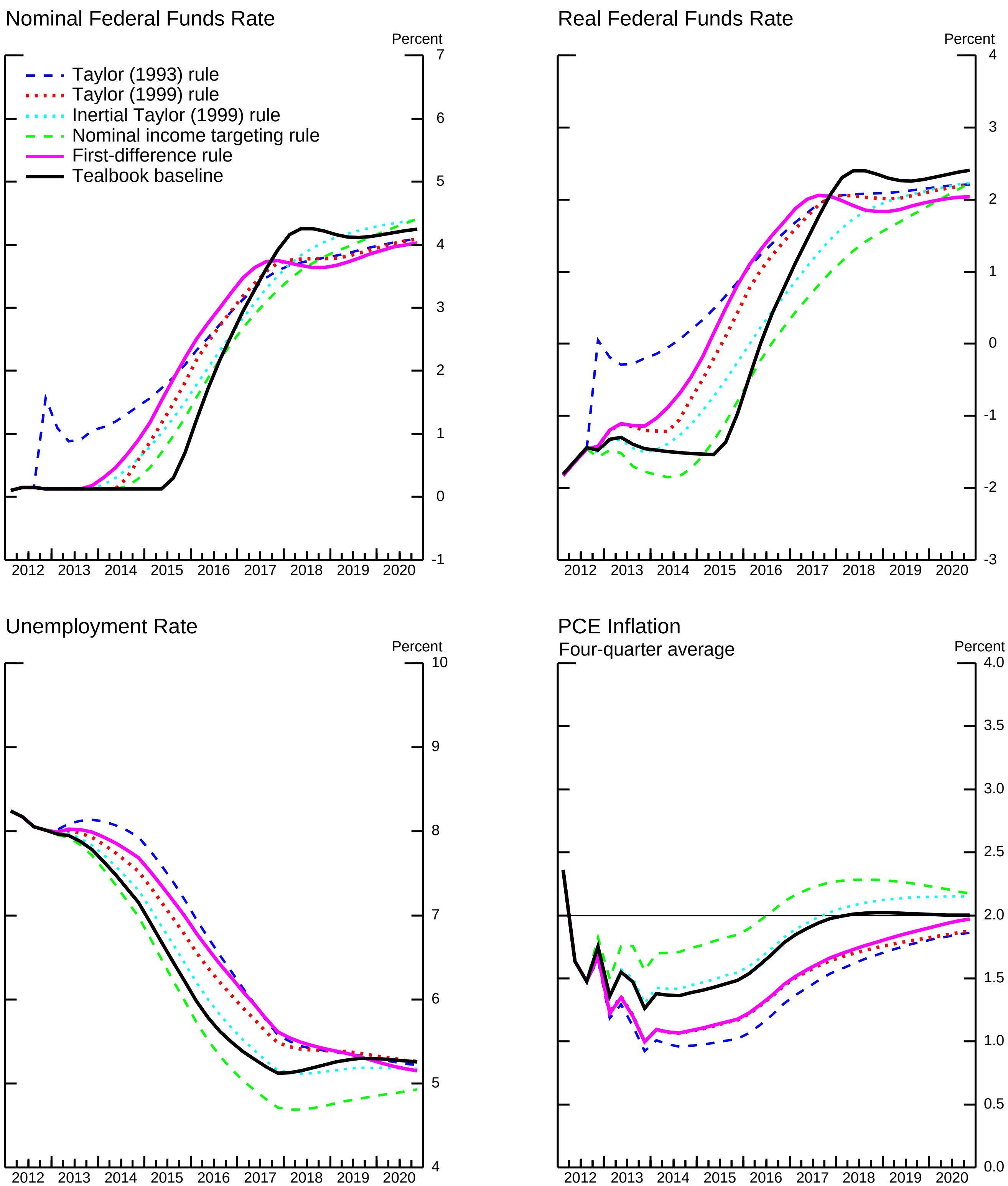
The top panel of the first exhibit also reports the Tealbook-consistent estimate of short-run r^*, which is generated by the FRB/US model when conditioned on the staff's outlook for the economy. The short-run r^* estimate corresponds to the real federal funds rate that, if maintained, would return output to potential in twelve quarters. Reflecting the staff's revision to the output gap, the r^* estimate is 20 basis points higher than in the September Tealbook. However, at −1.9 percent, it remains below the estimated actual real federal funds rate of about −1½ percent.

The second exhibit, "Policy Rule Simulations," reports dynamic simulations using the FRB/US model that incorporate the endogenous responses of inflation and the output gap to the different paths of the federal funds rate prescribed by the constrained versions of the six policy rules described above. The model is adjusted to match the staff's baseline outlook for the economy and then simulated using each of the policy rules. Each rule is implemented from the fourth quarter of 2012 onward, under the assumption that private agents fully understand and anticipate the implications of the rule for future real activity, inflation, and interest rates.[3] For comparison, the exhibit also displays the Tealbook baseline paths, which are conditioned on the prescriptions of the outcome-based rule, adjusted to be consistent with the Committee's September 2012 policy guidance.[4]

[3] The staff's baseline forecast incorporates the effects of the asset purchase programs that the FOMC has undertaken in recent years, as well as the effects of the new flow-based asset purchases that the Committee began in September, the ongoing maturity extension program, and the modifications to the Federal Reserve's reinvestment policies that were announced in September 2011. Via this procedure, the policy rule simulations incorporate the effects of these balance sheet policies; the rules themselves are not directly adjusted for the effects of balance sheet policies.

[4] As discussed in Book A of the Tealbook, the staff projection for the federal funds rate follows the estimated outcome-based rule, augmented with an intercept adjustment that reflects the Committee's forward guidance announcement at the end of its September meeting. The adjustment is calibrated to delay the first increase in the federal funds rate until the third quarter of 2015 under the economic outlook in the September Tealbook. Beginning in the third quarter of 2015, this intercept adjustment is steadily reduced and is zero beginning in the fourth quarter of 2017.

Policy Rule Simulations



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.

In the Tealbook baseline, the federal funds rate departs from the effective lower bound in the third quarter of 2015, one year later than in the September Tealbook. Reflecting the forward guidance in the September statement, the Tealbook baseline keeps the interest rate at its effective lower bound longer than what would otherwise be prescribed.[5] The federal funds rate increases to 4¼ percent by the second quarter of 2018, and hovers around that level through the end of the forecast period. The unemployment rate drops below 7 percent in 2015 and is expected to reach the staff's long-term estimate of the natural rate of unemployment by mid-2017.[6] Headline inflation is projected to average about 1.4 percent until the end of 2014, then rise slowly toward 2 percent.

The Taylor (1993) rule initially prescribes a tighter path for the federal funds rate than the other rules. As noted above, because the Taylor (1993) rule does not respond very strongly to the level of the output gap, it calls for an immediate increase in the federal funds rate to 160 basis points. The higher federal funds rate makes real activity and inflation weaker than in the baseline, prompting a partial reversal of the initial rate increase. Reflecting the early tightening, however, the rule implies a higher unemployment rate initially as well as lower levels of inflation over the whole projection period.

While the first-difference rule does not call for an increase in the federal funds rate until the first quarter of 2014, it implies policy rates from the fourth quarter of 2015 until the third quarter of 2017 that are higher than under all of the other rules. Because of the more-elevated average federal funds rate, the unemployment rate is higher and inflation lower in the near term.

Compared with the Taylor (1993) rule, the Taylor (1999) rule leads to a later tightening of policy and produces generally lower unemployment rates and slightly higher inflation rates over the projection period. However, because the policy rate is higher under the Taylor (1999) rule than in the baseline, the rule produces worse outcomes. The unemployment rate slowly converges to the staff's estimate of the

[5] Because of this adjustment, the baseline path for the federal funds rate includes a more rapid increase in the funds rate after liftoff than in past Tealbooks. The extent of the policy tightening implied by the rule between the third quarter of 2015 and the second quarter of 2018 is roughly comparable to the actual tightening observed between the second quarter of 2004 and the third quarter of 2006, when the overall increase in the federal funds rate was 425 basis points.

[6] The staff's estimate of the effective natural rate of unemployment declines from about 6¼ percent in the fourth quarter of 2012 to 5¼ percent by the end of 2017.

effective natural rate of unemployment while inflation, after declining to 1 percent, gradually increases to the 2 percent goal.

Under the inertial Taylor (1999) rule, the first increase of the federal funds rate takes place in the second quarter of 2014, one quarter before the Taylor (1999) rule would initiate tightening. This earlier firming of policy reflects the fact that the inertial Taylor (1999) rule subsequently prescribes a slower pace of policy tightening with higher future inflation, thereby generating a lower average path for the *real* federal funds rate through the rest of the decade, and so fueling a more rapid pickup in real activity and a lower path for the unemployment rate. The unemployment gap closes by mid-2017, when inflation is about 2 percent.

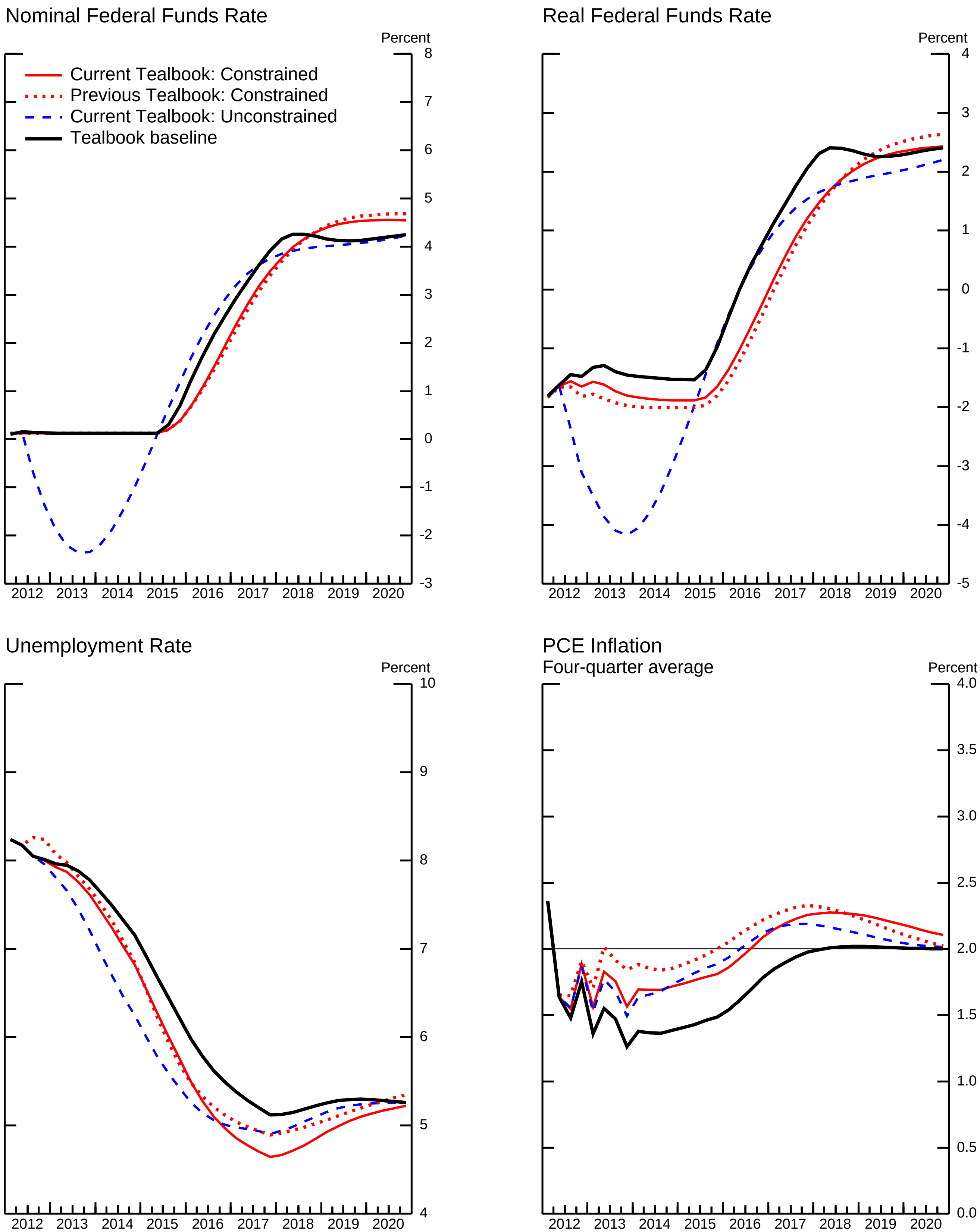
Under the nominal income targeting rule, the initial increase in the federal funds rate occurs in the fourth quarter of 2014, and for several years thereafter policy is generally more accommodative than under the other rules. In particular, the average level of the real federal funds rate through the rest of the decade is markedly lower than in the baseline. This more-accommodative policy is reflected in a more-rapid decline of the unemployment rate, culminating in a period in which it is below the natural rate, while inflation is uniformly higher than in the Tealbook baseline and modestly exceeds its 2 percent longer-run objective for a few years.

The next exhibit, “Constrained vs. Unconstrained Optimal Control Policy,” compares optimal control simulations derived for this Tealbook with those shown in September.[7] In these simulations, policymakers are assumed to place equal weights on keeping headline PCE inflation close to the Committee’s 2 percent goal, on keeping the unemployment rate close to the staff’s estimate of the effective natural rate of unemployment, and on minimizing changes in the federal funds rate. The simulations indicate that, with the federal funds rate constrained to remain positive, the optimal control path for the federal funds rate does not rise above the effective lower bound until the fourth quarter of 2015, the same as reported in the September Tealbook; the optimal path is also little revised beyond 2015.[8]

[7] The optimal policy simulations incorporate the assumptions about underlying economic conditions used in the staff’s baseline forecast, including the assumptions about balance sheet policy described above.

[8] Although the loss function uses headline inflation instead of core inflation, the real federal funds rate shown in the upper right panel of the exhibit 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

Constrained vs. Unconstrained Optimal Control Policy



The stability of the optimal policy path across the September and October Tealbooks may seem surprising in light of the staff's substantial downward revision in its projection for the unemployment rate in response to favorable incoming data, the Committee's decision to continue expanding its securities holdings until the outlook for the labor market improves substantially, and a lower path for the federal funds rate. The first two of these factors have caused the FRB/US estimate of $r*$ to rise since the September Tealbook, and by themselves they would have led to tighter optimal policy as well. In contrast to $r*$, however, optimal policy also depends on the outlook for inflation. As shown in the bottom panel of the first exhibit, the staff has not appreciably changed its forecast for inflation. From the FRB/US model's perspective, this stability is surprising: Given the staff's projection for stronger real activity, the model would have predicted noticeably higher inflation in both the near term and the longer run.[9] For this reason, it is necessary to shift down the intercepts of the model's wage and price equations to match the staff forecast prior to running the optimal control exercise. These adjustments lower the underlying outlook for inflation in the matched baseline, which essentially offsets the upward revision to the underlying outlook for real activity in the baseline, leaving the optimal path for the federal funds rate little changed, on net.

The constrained optimal control policy would promote a faster pace of economic recovery than in the staff's baseline outlook by raising rates more slowly than under any of the simple rules, while still keeping inflation close to the Committee's goal of 2 percent over the medium term. In this set of simulations, the gap between the unemployment rate and the staff's estimate of the effective natural rate of unemployment is closed by the fourth quarter of 2015, and the unemployment rate subsequently runs below the natural rate for a few years. Inflation initially exhibits a smaller decline than in the Tealbook baseline, after which it increases to the 2 percent objective by the third quarter of 2016 and then overshoots slightly, peaking at about 2¼ percent in 2018 and gradually returning to the 2 percent objective thereafter. The more-rapid convergence to the Committee's assumed objectives than in the Tealbook baseline, and the subsequent temporary overshooting, occur because policymakers respond to the lower bound

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.

[9] In many respects, the staff's view of inflation dynamics is similar to that generated by the model's New Keynesian Phillips curve. However, the staff generally views inflation as being much less sensitive to expected future economic conditions than is the case in the FRB/US model when run under rational expectations (as is the case in the optimal control exercise). In general, future economic conditions influence the staff inflation forecast only to the extent that they affect the survey measures of expected long-run inflation that underpin the staff's forecast.

constraint by promising to keep interest rates low for an extended period of time. As this policy is assumed to be completely credible, it boosts inflation expectations and reduces real interest rates during the initial years of the simulation.

If the nominal federal funds rate could fall below zero, the funds rate, under the optimal unconstrained policy, would decrease to –2.4 percent in the third quarter of 2013 and return to positive territory by the second quarter of 2015. Under these conditions, the unemployment rate would decline more rapidly than under the optimal constrained policy. Inflation would return to 2 percent by the second quarter of 2016, a pattern much like that in the constrained simulation. In subsequent years, inflation would slightly exceed the 2 percent objective—but less persistently than in the constrained case.

The fourth exhibit, “Outcomes under Alternative Policies,” tabulates the simulation results for key variables under the selected policy rules described above.

Strategies

Outcomes under Alternative Policies

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

Measure and scenario	2012 H1	2012 H2	2013	2014	2015	2016
Real GDP						
Extended Tealbook baseline	1.6	2.0	2.6	3.5	3.7	3.1
Taylor (1993)	1.6	2.0	1.6	2.8	3.5	3.5
Taylor (1999)	1.6	2.0	2.2	3.1	3.4	3.2
Inertial Taylor (1999)	1.6	2.0	2.5	3.3	3.6	3.2
First-difference	1.6	2.0	2.0	2.9	3.3	3.2
Nominal income targeting	1.6	2.0	2.8	3.7	3.8	3.3
Constrained optimal control	1.6	2.2	3.0	3.8	4.0	3.2
Unemployment rate[1]						
Extended Tealbook baseline	8.2	8.0	7.8	7.2	6.2	5.5
Taylor (1993)	8.2	8.0	8.1	7.9	7.2	6.3
Taylor (1999)	8.2	8.0	7.9	7.5	6.8	6.0
Inertial Taylor (1999)	8.2	8.0	7.8	7.3	6.4	5.7
First-difference	8.2	8.0	8.0	7.7	7.0	6.3
Nominal income targeting	8.2	8.0	7.7	7.0	6.0	5.2
Constrained optimal control	8.2	8.0	7.6	6.8	5.7	5.0
Total PCE prices						
Extended Tealbook baseline	1.6	1.9	1.3	1.4	1.5	1.8
Taylor (1993)	1.6	1.7	0.9	1.0	1.0	1.3
Taylor (1999)	1.6	1.8	1.0	1.1	1.2	1.4
Inertial Taylor (1999)	1.6	1.9	1.3	1.4	1.5	1.8
First-difference	1.6	1.8	1.0	1.1	1.2	1.5
Nominal income targeting	1.6	2.1	1.6	1.7	1.8	2.1
Constrained optimal control	1.6	2.2	1.6	1.7	1.8	2.1
Core PCE prices						
Extended Tealbook baseline	2.0	1.3	1.6	1.7	1.7	1.9
Taylor (1993)	2.0	1.1	1.3	1.2	1.2	1.4
Taylor (1999)	2.0	1.1	1.3	1.4	1.4	1.5
Inertial Taylor (1999)	2.0	1.3	1.6	1.7	1.8	1.9
First-difference	2.0	1.1	1.3	1.4	1.4	1.6
Nominal income targeting	2.0	1.4	1.9	2.0	2.1	2.2
Constrained optimal control	2.0	1.5	1.9	2.0	2.0	2.2
Federal funds rate[1]						
Extended Tealbook baseline	0.2	0.1	0.1	0.1	0.7	2.6
Taylor (1993)	0.2	1.6	1.1	1.4	2.1	2.9
Taylor (1999)	0.2	0.1	0.1	0.6	1.8	3.0
Inertial Taylor (1999)	0.2	0.1	0.1	0.6	1.5	2.6
First-difference	0.2	0.1	0.2	0.9	2.2	3.2
Nominal income targeting	0.2	0.1	0.1	0.3	1.3	2.4
Constrained optimal control	0.2	0.1	0.1	0.1	0.4	2.0

1. Percent, average for the final quarter of the period.

Monetary Policy Alternatives

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

The draft statement for Alternative B is largely unchanged from the September statement. In particular, it begins by observing that economic activity has continued to expand at a moderate pace in recent months, that growth in employment has been slow, and that the unemployment rate remains elevated—all as in the September statement. It then notes that household spending "has advanced a bit more quickly, but growth in business fixed investment has slowed." Alternative A contains much the same language except that it describes consumer spending with the words of the September statement: "household spending has continued to advance." Alternative C offers a somewhat more positive characterization of the data by noting that economic activity has expanded moderately "despite the adverse effects of the drought on agricultural production" and that "private domestic demand has continued to advance." Moreover, Alternative C says that "employment has increased further" and that "the unemployment rate, though still elevated, has declined." Alternatives A and B again note "some further signs of improvement" in the housing sector, "albeit from a depressed level," while Alternative C notes the improvement but not the depressed level. With respect to inflation, Alternatives A and B say that it "recently picked up somewhat, reflecting higher energy prices." Alternative C suggests greater concern by stating that inflation "recently picked up, mainly reflecting higher energy prices." Each alternative indicates that longer-term inflation expectations have remained stable.

Alternatives A and B also differ from Alternative C in how they communicate the outlook for real activity and employment. The language in Alternatives A and B is essentially the same as in the September statement, reiterating the Committee's concern that economic growth might not, on its own, be strong enough to generate sustained improvement in labor market conditions. Alternative B says that growth might not be strong enough unless there is "sufficient" policy accommodation, while the September statement said "further" policy accommodation. Alternative A retains "further," which some market participants might read as a signal that the Committee sees a need for more stimulus than will be provided by the flow-based asset purchases that it announced in

September. Alternative C indicates that the Committee expects economic growth to pick up gradually and consequently anticipates that the unemployment rate will continue to decline; this observation sets the stage for ending asset purchases upon completion of the maturity extension program (MEP) and for moving closer the projected start of policy normalization. All of the draft statements continue to highlight the significant downside risks to the outlook from strains in global financial markets. With respect to inflation, Alternatives A and B say, as in the September statement, that the Committee anticipates that inflation over the medium term "likely would run at or below its 2 percent objective." Alternative C says the Committee anticipates that inflation over the medium term "will run near its 2 percent objective."

The alternatives also offer different approaches to balance sheet policy. Alternative B maintains both the asset purchases and the language the Committee adopted in September: Purchases of agency MBS would continue at a pace of $40 billion per month and the MEP would run through year-end; the statement would again indicate that the Committee "will continue its purchases of agency mortgage-backed securities, undertake additional asset purchases, and employ its other policy tools as appropriate" if it does not observe substantial improvement in the outlook for labor market conditions in coming months. Alternative A would state explicitly that purchases of agency MBS will continue at a pace of $40 billion per month beyond the turn of the year and that the Committee will buy longer-term Treasury securities at a pace of $45 billion per month after completing the MEP. Alternative A also offers new language that is intended to give the public additional information about the factors the Committee will consider in deciding how long to continue asset purchases. In contrast, Alternative C implies that purchases of both MBS and Treasury securities will stop at year-end. All three alternatives envision that the Committee will continue to reinvest principal payments on its holdings of agency MBS and agency debt into MBS.

Under each alternative, the Committee would maintain the 0 to ¼ percent target range for the federal funds rate. Alternatives A and B indicate that the Committee anticipates maintaining exceptionally low levels of the funds rate "at least through mid-2015," as in the September statement. Both alternatives also retain the language that says "the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens." Alternative C offers the choice of retaining the words "for a considerable time" or replacing them with "for some time"; it also offers a choice between specifying an earlier anticipated date for the first increase in the federal funds rate or replacing the current forward guidance with new language that describes factors the Committee will consider in deciding when to raise its target for the funds rate but does not include a date.

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

Alternatives

Table 1: Overview of Policy Alternatives for the October 24 FOMC Statement

Selected Elements	**September Statement**	**October Alternatives**		
		A	**B**	**C**
Economic Outlook				
Outlook	. . . without further policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. . . . anticipates that inflation over the medium term likely would run at or below its 2 percent objective.	. . . remains concerned that, without **further** policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Unchanged	. . . remains concerned that, without **sufficient** policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Unchanged	. . . expects economic growth to be moderate over coming quarters and then to pick up gradually, supported in part by the highly accommodative stance of monetary policy, and consequently anticipates that the unemployment rate will continue to decline toward levels the Committee judges consistent with its dual mandate. . . . anticipates that inflation over the medium term will run near its 2 percent objective.
Balance Sheet				
MEP	Continue its program as announced in June	Ends in December	Continues to year-end	Continues to year-end
Additional Asset Purchases	$40 billion per month additional MBS	Continue MBS purchases at $40 billion per month **after** the end of the year; purchase longer-term Treasury securities at $45 billion per month after MEP ends.	Unchanged	Continue MBS purchases at $40 billion per month **through** the end of the year.
Reinvestment Policies	Reinvest principal payments from agency debt and MBS into agency MBS.	Unchanged	Unchanged	Unchanged
Guidance	If the outlook for the labor market does not improve substantially, the Committee will continue its purchases of agency mortgage-backed securities, undertake additional asset purchases, and employ its other policy tools as appropriate until such improvement is achieved in a context of price stability.	The Committee will continue purchases of agency MBS and Treasury securities until it judges that data on economic activity and labor market conditions are consistent with an outlook for sustained progress toward maximum employment and price stability.	Unchanged	The Committee is prepared to take further action as needed to promote sustained improvement in labor market conditions in a context of price stability.
Forward Rate Guidance				
Guidance	Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the recovery strengthens; . . . currently anticipates that exceptionally low levels for the federal funds rate are likely warranted at least through mid-2015.	Unchanged	Unchanged	for [a considerable | some] time; …at least through [late 2014 | mid-2014 | late 2013] **OR** In determining the appropriate time to increase its target, the Committee will consider actual and projected labor market conditions, medium-term outlook for inflation, and risks to achievement of Committee's objectives.

SEPTEMBER FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in August suggests that economic activity has continued to expand at a moderate pace in recent months. Growth in employment has been slow, and the unemployment rate remains elevated. Household spending has continued to advance, but growth in business fixed investment appears to have slowed. The housing sector has shown some further signs of improvement, albeit from a depressed level. Inflation has been subdued, although the prices of some key commodities have increased recently. 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 is concerned that, without further policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely would run at or below its 2 percent objective.
3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee agreed today to increase policy accommodation by purchasing additional agency mortgage-backed securities at a pace of $40 billion per month. The Committee also will continue through the end of the year its program to extend the average maturity of its holdings of securities as announced in June, and it 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. These actions, which together will increase the Committee's holdings of longer-term securities by about $85 billion each month through the end of the year, should put downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.
4. The Committee will closely monitor incoming information on economic and financial developments in coming months. If the outlook for the labor market does not improve substantially, the Committee will continue its purchases of agency mortgage-backed securities, undertake additional asset purchases, and employ its other policy tools as appropriate until such improvement is achieved in a context of price stability. In determining the size, pace, and composition of its asset purchases, the Committee will, as always, take appropriate account of the likely efficacy and costs of such purchases.
5. To support continued progress toward maximum employment and price stability, the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens. In particular, the Committee also decided today to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that exceptionally low levels for the federal funds rate are likely to be warranted at least through mid-2015.

OCTOBER FOMC STATEMENT—ALTERNATIVE A

1. Information received since the Federal Open Market Committee met in ~~August~~ **September** suggests that economic activity has continued to expand at a moderate pace in recent months. Growth in employment has been slow, and the unemployment rate remains elevated. Household spending has continued to advance, but growth in business fixed investment ~~appears to have~~ **has** slowed. The housing sector has shown some further signs of improvement, albeit from a depressed level. Inflation ~~has been subdued, although the prices of some key commodities have increased~~ recently **picked up somewhat, reflecting higher energy prices**. Longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee ~~is~~ **remains** concerned that, without further policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely would run at or below its 2 percent objective.

3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee agreed today to ~~increase policy accommodation by~~ **continue** purchasing additional agency mortgage-backed securities at a pace of $40 billion per month **after the end of the year**. The Committee also ~~will continue through the end of the year~~ **agreed to purchase longer-term Treasury securities at a pace of $45 billion per month after** its program to extend the average maturity of its holdings of **Treasury** securities ~~as announced in June, and it~~ **ends in December. 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. These actions, which together will increase the Committee's holdings of longer-term securities by about $85 billion each month ~~through the end of the year~~, should put downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.

4. The Committee will closely monitor incoming information on economic and financial developments ~~in coming months~~. ~~If the outlook for the labor market does not improve substantially,~~ The Committee will continue its purchases of agency mortgage-backed securities **and Treasury securities**, ~~undertake additional asset purchases,~~ and employ its other policy tools as appropriate, until ~~such improvement is achieved~~ **it judges that data on economic activity and labor market conditions are consistent with an outlook for sustained progress toward maximum employment** in a context of price stability. In determining the size, pace, and composition of its asset purchases, the Committee will, as always, take appropriate account of the likely efficacy and costs of such purchases.

5. To support continued progress toward maximum employment and price stability, the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens. In particular, the Committee also decided today to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that exceptionally low levels for the federal funds rate are likely to be warranted at least through mid-2015.

Alternatives

OCTOBER FOMC STATEMENT—ALTERNATIVE B

1. Information received since the Federal Open Market Committee met in ~~August~~ **September** suggests that economic activity has continued to expand at a moderate pace in recent months. Growth in employment has been slow, and the unemployment rate remains elevated. Household spending has ~~continued to~~ advance**d a bit more quickly**, but growth in business fixed investment ~~appears to have~~ **has** slowed. The housing sector has shown some further signs of improvement, albeit from a depressed level. Inflation ~~has been subdued, although the prices of some key commodities have increased~~ recently **picked up somewhat, reflecting higher energy prices**. Longer-term inflation expectations have remained stable.

2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee ~~is~~ **remains** concerned that, without ~~further~~ **sufficient** policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely would run at or below its 2 percent objective.

3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee ~~agreed today to increase policy accommodation by~~ **will continue** purchasing additional agency mortgage-backed securities at a pace of $40 billion per month. The Committee also will continue through the end of the year its program to extend the average maturity of its holdings of **Treasury** securities ~~as announced in June~~, and it 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. These actions, which together will increase the Committee's holdings of longer-term securities by about $85 billion each month through the end of the year, should put downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.

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

5. To support continued progress toward maximum employment and price stability, the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens. In particular, the Committee also decided today to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that exceptionally low levels for the federal funds rate are likely to be warranted at least through mid-2015.

OCTOBER FOMC STATEMENT—ALTERNATIVE C

1. Information received since the Federal Open Market Committee met in ~~August~~ **September** suggests that economic activity has continued to expand at a moderate pace in recent months **despite the adverse effects of the drought on agricultural production**. ~~Growth in~~ Employment has **increased further** ~~been slow~~, and the unemployment rate, ~~remains~~ **though still** elevated**, has declined**. ~~Household spending~~ **Private domestic demand** has continued to advance~~, but growth in business fixed investment appears to have slowed~~. The housing sector has shown some further signs of improvement~~, albeit from a depressed level~~. Inflation ~~has been subdued~~, ~~although the prices of some key commodities have increased~~ recently **picked up, mainly reflecting higher energy prices; however,** 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 ~~is concerned that, without further policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions~~ **expects economic growth to be moderate over coming quarters and then to pick up gradually, supported in part by the highly accommodative stance of monetary policy, and consequently anticipates that the unemployment rate will continue to decline toward levels that the Committee judges consistent with its dual mandate**. ~~Furthermore~~ **However**, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term ~~likely would~~ **will** run ~~at or below~~ **near** its 2 percent objective.

3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee agreed today to ~~increase policy accommodation by~~ **continue** purchasing additional agency mortgage-backed securities at a pace of $40 billion per month **through the end of the year**. The Committee also will continue through the end of the year its program to extend the average maturity of its holdings of **Treasury** securities ~~as announced in June~~, and it 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. These actions, which together will increase the Committee's holdings of longer-term securities by about $85 billion each month through the end of the year, should put downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.

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

5. To support continued progress toward maximum employment and price stability, the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for **[** a considerable **|** **some** **]** time after the economic recovery strengthens. In

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particular, the Committee ~~also~~ decided today to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that exceptionally low levels for the federal funds rate are likely to be warranted at least through ~~mid-2015~~ **[late 2014 | mid-2014 | late 2013]**.

OR

5'. To support continued progress toward maximum employment ~~and~~ **in a context of** price stability, the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for **[** a considerable **| some]** time after the economic recovery strengthens. In particular, the Committee ~~also~~ decided today to keep the target range for the federal funds rate at 0 to ¼ percent ~~and currently anticipates that exceptionally low levels for the federal funds rate are likely to be warranted at least through mid-2015~~. **As rates of resource utilization rise toward levels consistent with maximum employment, the Committee will need to make monetary policy less accommodative in order to foster sustained economic expansion with inflation at its longer-run objective. In determining the appropriate time to increase its target for the federal funds rate, the Committee will consider a range of factors, including actual and projected labor market conditions, the medium-term outlook for inflation, and the risks to the achievement of the Committee's objectives.**

Alternatives

Alternatives

THE CASE FOR ALTERNATIVE B

The Committee, like the staff, might judge that the near-term outlook for economic activity now appears only modestly better than it did in mid-September and that the medium-term outlook, while a little stronger, has improved primarily because the policy steps the Committee took at its last meeting have made broader financial conditions more accommodative. Participants might think that the outsized gain in household employment reported for September, and the accompanying sharp drop in the unemployment rate, probably overstate the recent gains in labor market conditions and the improvement in the outlook for the labor market; policymakers may judge that the more moderate gain in payrolls is the more reliable measure. If so, the Committee may remain concerned that economic growth would not be adequate to return the unemployment rate to its mandate-consistent level over the next several years without an exceptionally accommodative monetary policy that includes continued asset purchases. Policymakers might also see the inflationary pressure from increases in oil prices as temporary and as likely to abate in the near future. Moreover, participants might note that measures of medium- and longer-run inflation compensation remain within the ranges seen during the past two years, that the median of longer-run expected inflation from the Michigan survey has declined in recent months and is now a bit below its average since 2005, and that the mean and median of the primary dealers' forecasts for inflation are essentially unchanged from their values ahead of the September FOMC meeting. Accordingly, they might judge that inflation expectations remain well anchored. For all these reasons, the Committee may consider it appropriate to stay on the course it set in September.

Moreover, policymakers may judge that downside risks to the outlook for growth in economic activity—particularly from the euro area crisis and unresolved U.S. fiscal policy decisions—remain quite elevated. Specifically, they may see non-trivial odds that the euro area crisis could deepen and impose a very substantial drag on the U.S. recovery. Some policymakers may also see a sizable probability that the Congress and the Administration will be unable to settle contentious fiscal issues in an orderly and timely manner, and that fiscal policy could consequently tighten sharply at the turn of the year. If so, they may judge it appropriate to keep policy unchanged for the time being while retaining the option to adjust the pace and composition of the Committee's asset purchases.

In light of the positive tone of some recent economic indicators and improved market sentiment toward Europe, other policymakers may view the economic outlook as somewhat brighter and see the risks to the outlook as having diminished since the Committee last met. Even so, with the unemployment rate still well above participants' estimates of its longer-run normal level and inflation for items other than energy prices subdued, these participants might think it prudent to postpone a decision about whether to continue asset purchases into 2013 until late this year, when they will have additional information about the underlying strength of the economic recovery and the outlook for fiscal policy.

Some participants may anticipate that labor market conditions will not improve substantially unless asset purchases continue well into next year but may be unsure whether MBS purchases alone will be sufficient or whether purchases of longer-term Treasury securities will prove necessary as well. Yet policymakers may also be uncertain whether the benefits of an ongoing expansion of the Committee's securities holdings will outweigh the associated costs and risks. In either case, these participants may favor making no change to the flow of asset purchases for the time being, because waiting will allow them to learn more about the efficacy and costs of the flow-based program before deciding whether to continue it beyond the turn of the year and, if so, whether to adjust its pace and composition.

With respect to the forward guidance for the federal funds rate, some policymakers may judge that explicit thresholds for unemployment and inflation would more clearly communicate the Committee's policy intentions than the language in the September statement.[1] But they might also think that the FOMC should explore the implications of quantitative thresholds more fully before deciding whether to include them in its statement. They also may judge that it would be better to introduce new forward guidance at a meeting that will be followed by a press conference.

Accordingly, the Committee might agree that it is best to continue the current pace and composition of its flow-based asset purchases at least until the end of the year and to maintain both the target and forward guidance for the federal funds rate, as in Alternative B.

[1] For a detailed analysis of quantitative thresholds, see the memo by E. Engen, J.P. Laforte, D. López-Salido, E. Nelson, W. Nelson, D. Reifschneider, and R. Tetlow, titled "Using Thresholds to Clarify the Conditionality in the Committee's Forward Guidance for the Federal Funds Rate," which was distributed to the Committee on October 16, 2012.

The Desk's latest survey of the primary dealers indicates that the median dealer expects flow-based asset purchases to continue into the first quarter of 2014; no dealer expects purchases to end before mid-2013. The survey also indicates that the dealers expect the Committee to continue acquiring longer-term Treasury securities at a pace of $45 billion per month after the MEP comes to a close. Thus the dealers appear to expect the flow-based asset purchases to end later, and so to cumulate to a larger total, than assumed in the baseline staff forecast.[2] The results of the dealer survey also indicate that the dealers expect no more than minor updating to the language of the statement and no change in the forward guidance at this meeting. Thus, the survey suggests that a statement along the lines of the draft for Alternative B would be in line with market expectations, so it probably would result in little change in interest rates, equity prices, or exchange rates.

The Case For Alternative A

Members may instead conclude that the medium-term outlook remains sufficiently weak to warrant making clear to the public that purchases of both agency MBS and longer-term Treasury securities will continue well into next year, particularly given that both core and headline inflation are running close to 1½ percent on a 12-month basis. Moreover, they, like the staff, might project that inflation will continue to run well below the Committee's 2 percent longer-run objective for the next several years even with asset purchases continuing to mid-2013. They also might judge that announcing in the October FOMC statement that purchases of MBS and Treasury securities will continue into next year would complement the forward guidance for the federal funds rate that the Committee adopted in September. Moreover, policymakers may think that continuing to purchase agency MBS at a pace of $40 billion per month would help strengthen the emerging recovery in the housing sector, a development that they might see as generating ancillary benefits such as raising consumer confidence, boosting household wealth, and increasing access to credit. In addition, participants may see the new language in paragraph 4 of the draft statement for Alternative A as desirable, because it signals that the Committee will not end asset purchases at the first signs of improvement in labor market conditions.

[2] The staff forecast is conditioned on the assumption that asset purchases proceed at a rate of $85 billion per month until they end in mid-2013, and cumulate to about $750 billion. Of course, the Committee has not fixed an end date or specified precisely the conditions that might warrant ending purchases or adjusting their pace.

Some members may judge that risks to the outlook stemming from U.S. fiscal policy, the euro area crisis, and slowing growth in China are heavily weighted to the downside. Moreover, members may view the consequences of a new adverse shock while the economy remains weak as significantly more costly than the consequences of some delay in tightening policy should economic performance or inflation surprise to the upside. If so, they may see the degree of uncertainty about the outlook and the asymmetry in risks and potential costs as arguing for providing clarity about future monetary policy by announcing now that asset purchases will continue into next year. These policymakers may want to adopt a statement such as the one presented in Alternative A, which says explicitly that the Committee will continue to acquire both agency MBS and longer-term Treasury securities after year-end.

The Desk's latest survey shows that most dealers already predict that the FOMC will continue to purchase both MBS and Treasury securities well beyond year-end and expect an announcement to that effect after the December FOMC meeting, but they anticipate little change in the Committee's statement at this meeting. Thus, while the content of a statement along the lines of Alternative A should not greatly surprise investors, the Committee's decision to make substantial changes in statement language would be a surprise. Investors might take the new wording of Alternative A, including the revisions to the language about the conditions that would lead the Committee to end those purchases, as a signal that asset purchases will last longer and cumulate to a larger total than they had projected, in which case longer-term real interest rates likely would decline somewhat, inflation compensation and equity prices might rise, and the dollar could depreciate. Or investors might read the statement of Alternative A, with its earlier-than-expected announcement that asset purchases will continue into 2013, as indicating that the FOMC has a relatively gloomy outlook for growth and employment. If so, equity prices could decline.

THE CASE FOR ALTERNATIVE C

The Committee might see the recent data as suggesting that, adjusting for the effects of drought on agricultural production, the underlying pace of economic recovery and rate of employment gains have improved in recent months. Policymakers might point not only to recent labor market reports but also to stronger-than-expected growth in consumer spending and housing starts. Indeed, smoothing through the month-to-month fluctuations in this year's data, policymakers may see the economic recovery as finally on a sustainable course that will generate ongoing improvements in labor market conditions. Furthermore, they may view financial strains in Europe—and therefore the downside risks to the U.S. economy—as having eased of late and see the Committee's action in September as having made overall financial conditions in the United States even more highly accommodative. Moreover, in the current environment policymakers may see the potential benefits of additional asset purchases as likely to be small. Participants may be concerned that inflation has picked up recently, even though largely in response to increased energy prices, and they might note that ten-year inflation compensation temporarily rose to the upper end of its recent range immediately after the Committee's September announcement and remains in the upper part of the range in which it has varied in recent years. Thus, they may agree that longer-term inflation expectations remain well anchored for the time being but see upside risks to the inflation outlook in both the near term and the medium run unless asset purchases end fairly soon. Some members may also be concerned that continuing asset purchases beyond the end of this year could put the Federal Reserve in the position of having to realize large losses when it eventually sells the MBS it has acquired.[3] Others may worry that substantial further purchases of safe assets when longer-term interest rates are already quite low could lead to imbalances in financial markets that might undermine financial stability. In light of these concerns, policymakers may prefer to adopt a statement such as that for Alternative C to indicate that the Committee is unlikely to continue expanding the Federal Reserve's balance sheet beyond the end of this year.

If policymakers see the recovery as now on a course that will generate continuing reductions in unemployment and also see upside risks to inflation, or if they are concerned that continuing to hold the federal funds rate near zero until mid-2015 or later would pose increasing risks to financial stability, they might consider it appropriate to begin scaling back the public's expectations of how long the federal funds rate will remain at its current exceptionally low level. If so, they might favor a statement like the version of Alternative C that includes paragraph C.5. Alternatively, as in paragraph C.5', they might prefer to eliminate the calendar date from the Committee's forward guidance and replace it with new language that describes in somewhat greater detail the key

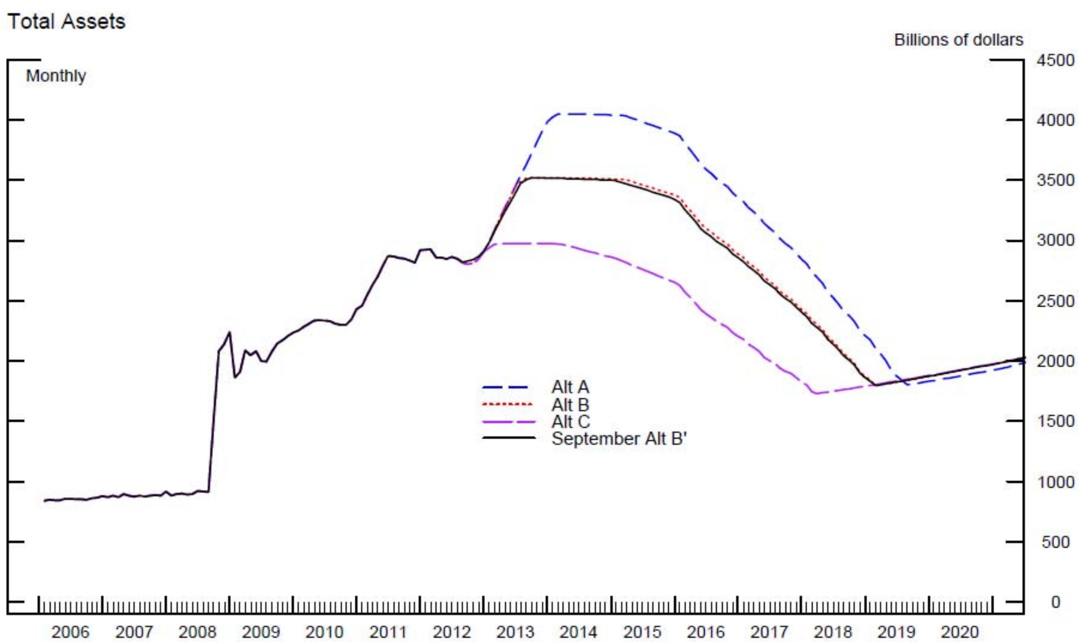
[3] For a broader discussion of the potential effects of additional asset purchases on the Federal Reserve's balance sheet and income see the memo by staff in the Division of Monetary Affairs at the Board of Governors and in the Markets Group at the Federal Reserve Bank of New York titled "Options for an Additional LSAP Program," sent to the Committee on August 28, 2012.

economic factors that the Committee will consider in deciding when and how quickly to increase its target for the federal funds rate.

A statement along the lines of Alternative C would greatly surprise market participants and would be interpreted as signaling a significantly faster removal of policy accommodation than investors had expected. According to the Desk's survey, the primary dealers anticipate no changes in the Committee's forward guidance at this meeting. Moving the projected date of the first increase closer to the present, as in paragraph 5 of Alternative C, would cause a sizable upward shift in market participants' expectations of the likely path for the federal funds rate, leaving interest rates significantly higher at maturities beyond a year or so. Equity prices would probably fall, and the dollar might appreciate. If the Committee were to drop the date from its forward guidance without providing a clear indication of the specific economic conditions that would cause the Committee to begin raising the target rate, as in paragraph 5' of Alternative C, investors might become uncertain about the Committee's intentions, and interest rate volatility could increase.

LONG-RUN PROJECTIONS OF THE BALANCE SHEET AND MONETARY BASE

The staff has prepared three scenarios for the Federal Reserve's balance sheet that correspond to the policy alternatives A, B, and C. Alternatives A and B include asset purchases that continue beyond the end of the maturity extension program (MEP) and assume that the Committee maintains an exceptionally low federal funds rate until August 2015. In contrast, Alternative C ends purchases of MBS at the same time as the MEP, at the end of this year, and has the federal funds rate lift off from its lower bound in August 2014. Projections under each scenario are based on assumptions about the trajectory of various components of the balance sheet. Details of these assumptions, as well as projections for each major component of the balance sheet, can be found in Explanatory Note D.



For the balance sheet scenario that corresponds to Alternative B, the Committee is assumed to continue its current purchases of MBS through the end of the year, when the MEP concludes, and then both continue MBS purchases and make additional purchases of Treasury securities through June 2013. These purchases from October 2012 through June 2013 expand the SOMA portfolio's holdings of longer-term securities by about

$750 billion.[4] This scenario is roughly consistent with the descriptions of the asset purchases detailed in the Alternative B statement if purchases last for about nine months.[5] After the end of the MEP, the Committee is assumed to reinstitute its policy of reinvesting principal payments from Treasury securities at auction, it is also assumed to continue reinvesting principal payments from agency MBS and agency debt securities into agency MBS. Overall, under this scenario, SOMA securities holdings increase to about $3.3 trillion by late-2013.

In the Alternative B scenario, consistent with the statement language that the federal funds rate is expected to be at exceptionally low levels "at least through mid-2015," we assume that the first increase in the target federal funds rate is in August 2015.[6] The date of liftoff is a key determinant of the trajectory of the balance sheet. In February 2015, six months before the first increase in the target federal funds rate, all reinvestment is assumed to cease, and the SOMA portfolio begins to contract. In February 2016, six months after the initial increase in the target federal funds rate, the Committee begins to sell its holdings of agency securities at a pace that reduces the amount of these securities in the portfolio to zero in five years, that is, by January 2021. Through these redemptions and sales, the size of the portfolio is normalized by February 2019.[7, 8] The balance sheet then begins to expand, with increases in SOMA holdings

[4] This amount does not include purchases conducted in September. If the current pace of purchases continues at about $45 billion per month in Treasury securities and $40 billion per month in MBS, total purchases from October 2012 through June 2013 will be $763 billion. In addition, although the SOMA portfolio's holdings of longer-term securities increases by $763 billion, total securities holdings increase by less because of the asset sales under the MEP.

[5] The statement indicates that the Committee will continue asset purchases until a substantial improvement in the outlook for the labor market is achieved in a context of price stability. In the staff economic outlook, by mid-2013 there will be accumulating evidence of a pickup in economic growth and an outlook for substantial improvement in the unemployment rate, which is projected to decline from 8 percent in mid-2013 to 7½ percent in mid-2014 and to 7¼ percent in late 2014.

[6] This liftoff date for the federal funds rate is two months later than that assumed in the balance sheet projections from the September Tealbook Book B Alternative B' and is consistent with the current staff forecast in Tealbook Book A.

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

[8] The projected timing of the normalization of the size of the balance sheet depends importantly on the level of reserve balances that is assumed to be necessary to conduct monetary policy; currently, we assume that level of reserve balances to be $25 billion. A higher demand for reserve balances would, all else equal, lead to an earlier normalization of the size of the balance sheet.

essentially matching the growth of Federal Reserve Bank capital and currency in circulation. Total assets are $2 trillion at the end of 2020.

The additional purchases of securities in this scenario substantially boost the volume of reserve balances. As the federal funds rate increases rapidly in 2016 and 2017, the interest expense on reserve balances rises quickly. This expense, combined with the realized losses on sales of agency MBS, imply that the Federal Reserve has an operating loss, and, as a result, remittances to Treasury cease and a small deferred asset is recorded on the balance sheet at year-end in 2017, 2018 and 2019, peaking at about $8 billion in 2018.[9,10]

In the scenario for Alternative A, the Committee is assumed to continue its current purchases of MBS through the end of the year, when the MEP is completed, and then continue MBS purchases and additional purchases of Treasury securities through the end of 2013. These purchases from October 2012 through December 2013 ultimately expand the SOMA portfolio's holdings of longer-term securities by about $1.25 trillion.[11] This scenario is roughly consistent with the descriptions of the asset purchases detailed in the Alternative A statement if purchases last for about fifteen months.[12] The Committee continues reinvesting principal payments from agency MBS and agency debt securities into agency MBS, and, after the MEP is complete, reinstitutes its policy of reinvesting principal payments from Treasury securities at auction. In this scenario, total assets increase to $4.1 trillion in 2014. In February 2015, six months prior to the assumed first increase in the federal funds rate in August 2015, all reinvestment is assumed to cease

[9] Under Reserve Bank accounting, losses and gains on securities held by the SOMA portfolio are only realized when securities are sold.

[10] Alternative B is similar to the $750 billion LSAP scenario presented in the September FOMC memo "Options for an Additional LSAP Program" by Board and FRBNY staff. In the memo, however, as in the September Tealbook's Alternative B', remittances to the Treasury remained positive and there was no deferred asset. Remittances are lower, and a deferred asset is accumulated, in the current projection for Alternative B because the federal funds rate is assumed to rise more steeply than in the previous Tealbook and because a larger fraction of the projected purchases are assumed to be agency MBS, which are subsequently sold during exit.

[11] This amount does not include purchases conducted in September.

[12] The statement indicates that the Committee will continue its purchases of MBS and Treasury securities until "it judged that data on economic activity and labor market conditions are consistent with an outlook for sustained progress toward maximum employment in a context of price stability." Under the staff baseline forecast, by late 2013 payrolls will have been increasing at a pace of close to 200,000 per month for a few months, the unemployment rate will have fallen some, and real GDP will be expanding at about 3 percent. The outlook for labor market conditions as of late 2013 would include a half percentage point decline in the unemployment rate through late 2014 and a one and a half percentage point decline through late 2015.

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and the SOMA portfolio begins to contract. Six months after the lift off of the federal funds rate, sales of agency securities begin and continue for five years.[13] The size of the portfolio is normalized by August 2019. As in Alternative B, increased interest expense and realized losses on sales of agency MBS cause a deferred asset to be recorded on the balance sheet; under this alternative, there is a deferred asset from 2017 through the end of the projection period.

For the scenario that corresponds to Alternative C, the Committee is assumed to purchase MBS only through the completion of the MEP at the end of this year, after which no additional asset purchases are assumed. In this scenario, the federal funds rate is assumed to lift off in August 2014, one year earlier than in Alternatives B and A. Corresponding to this earlier increase in the federal funds rate, reinvestment of principal from maturing or prepaying securities ends in February 2014, and the portfolio begins to contract. Sales of agency securities commence in February 2015 and last for five years. Total assets in this scenario peak at $3 trillion, and the size of the balance sheet is normalized in March 2018, 11 months earlier than under Alternative B.

Across scenarios, the volume of reserve balances is directly related to the assumed asset purchases. Under Alternative A, reserve balances peak at about $2.7 trillion, while under Alternative B, reserve balances peak at $2.2 trillion. Under Alternative C, reserve balances rise only slightly from their current level to $1.7 trillion. For the scenarios corresponding to Alternatives B and A, reserve balances are $2 trillion and $2.5 trillion, respectively, when the federal funds rate lifts off from its lower bound in August 2015. For the scenario corresponding to Alternatives C, reserve balances are $1.5 trillion when the federal funds rate lifts off from its lower bound in August 2014.

In the scenario corresponding to Alternative B, the monetary base increases from 2012 to 2013 because of the purchase program. Once exit begins, the monetary base shrinks at a notable pace through the second quarter of 2019, primarily reflecting a decline in reserve balances as securities are redeemed or sold. Starting in the third quarter of 2019, after reserve balances are assumed to have stabilized at $25 billion, the monetary base begins to expand again, in line with the growth of Federal Reserve notes

[13] In Alternative A, MBS are sold over a five-year period, and the size of the portfolio normalizes about three and a half years after sales begin—somewhat longer than the timeframe anticipated in the exit strategy principles. If sales were assumed to be completed over about three and a half years, the portfolio would normalize in three years; however, for consistency, we have maintained the same assumption about the timeframe of sales—five years—as in Alternative B.

in circulation. Under Alternative A, the monetary base increases from 2012 to 2014 because of the purchase program and then contracts during exit until after the size of the portfolio is normalized. Under Alternative C, the monetary base increases a bit from 2012 to 2013 — rising with delayed settlement of MBS purchases —and then contracts, on net, until after the size of the portfolio is normalized.

Growth Rates for the Monetary Base

Date	Alternative B	Alternative A	Alternative C	Memo: September Alt B'
	Percent, annual rate			
	Monthly			
Apr-12	-12.3	-12.3	-12.3	-12.2
May-12	-8.7	-8.7	-8.7	-8.7
Jun-12	-5.1	-5.1	-5.1	-5.1
Jul-12	7.7	7.7	7.7	7.7
Aug-12	7.7	7.7	7.7	18.7
Sep-12	-12.4	-12.4	-12.4	6.0
Oct-12	1.1	1.2	-0.1	-1.1
Nov-12	28.9	29.1	27.6	16.0
Dec-12	23.1	23.1	23.6	17.3
	Quarterly			
2011 Q3	21.0	21.0	21.0	21.0
2011 Q4	-5.9	-5.9	-5.9	-5.9
2012 Q1	5.5	5.5	5.5	5.5
2012 Q2	-3.9	-3.9	-3.9	-3.9
2012 Q3	0.8	0.8	0.8	5.3
2012 Q4	7.5	7.6	6.9	8.6
2013 Q1	28.3	28.3	15.9	22.8
2013 Q2	30.1	30.3	-4.8	25.3
	Annual - Q4 to Q4			
2010	0.9	0.9	0.9	0.9
2011	32.9	32.9	32.9	32.9
2012	2.5	2.5	2.3	3.9
2013	25.1	37.4	4.9	23.6
2014	-0.6	4.9	-2.2	-0.7
2015	-2.4	-2.5	-7.7	-3.2
2016	-14.3	-13.5	-17.2	-14.5
2017	-16.9	-15.7	-18.9	-16.7
2018	-23.9	-22.6	-6.7	-23.9

Note: Not seasonally adjusted.

Alternatives

DEBT, BANK CREDIT, AND MONEY FORECASTS

Domestic nonfinancial sector debt is projected to expand at an annual rate of about 4¾ percent in the fourth quarter of 2012, and then slow slightly to 4 percent in 2013 and 3¾ percent in 2014. The expected slowing is almost entirely the result of smaller projected increases in federal government debt, from an annual rate of 10 percent in the fourth quarter of 2012 to 7 percent in 2013 and 5¾ percent in 2014. We forecast nonfinancial business debt to increase at a moderate pace over the projection period, reflecting favorable financing conditions in the near term and a rise in capital expenditures in the medium term. The level of home mortgage debt is projected to hit bottom by the end of the year and to rise slowly thereafter at an annual rate of around 1 percent, in line with the expectation that financing conditions will remain relatively tight and that housing demand and house prices will increase only gradually. Meanwhile, the rise in consumer credit is projected to pickup from an annual rate of 6 percent in the fourth quarter of 2012 to 7½ percent in 2014, driven by further increases in demand for student loans, lending to finance consumer durables expenditures, and a gradual easing in credit conditions.

We expect commercial bank credit to increase at an annual rate of about 3½ percent in the fourth quarter of 2012, 4 percent in 2013, and 4¾ percent in 2014. Core loans—the sum of commercial and industrial (C&I), real estate, and consumer loans—are projected to increase modestly for the remainder of 2012 and to pick up somewhat in 2013 and 2014. After having expanded robustly for most of 2012, C&I loans are expected to rise at a more moderate rate over the forecast period, in part reflecting low expected interest rates on alternatives to bank borrowing. We anticipate that growth in both residential real estate and consumer loans will pick up somewhat from their currently weak paces, reflecting improvements in borrowers' credit quality and further gradual easing of standards and terms on such loans. We also expect residential real estate lending to be supported by gradual increases in residential investment. Commercial real estate loans are projected to increase slowly over the forecast period, as high vacancy rates, depressed prices for commercial properties, and the poor credit quality of existing loans are likely to suppress activity in this sector. Banks' securities holdings are expected to rise at a moderate pace, with smaller increases in 2013 and 2014 than were posted in 2012, as deposit growth ebbs and bank loans strengthen.

We project that M2 will increase faster than nominal income through the remainder of 2012, as investors continue to respond to uncertainty about global economic and financial conditions by adding to their already elevated deposit balances. We expect a significant portion of these elevated balances to unwind in early 2013 due to the expiration of the unlimited FDIC insurance on noninterest-bearing transaction deposits, leading M2 to rise at a slower pace than nominal income.[14] M2 growth is forecast to remain below that of nominal income after this unwinding, as improvements in financial and economic conditions encourage investors to reallocate their portfolios towards riskier assets.

Turning to the components of M2, liquid deposits are expected to expand at a brisk pace for the remainder of 2012, and then to slow somewhat over the rest of the forecast period. In contrast, retail money market funds and small time deposits are projected to decline through late 2014. We project that currency growth will gradually decline to a pace consistent with its long-term average of 6 percent, and then continue at that rate through the end of the forecast period.

[14] The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 provides unlimited deposit insurance coverage for noninterest-bearing transaction accounts in excess of $250,000 from December 31, 2010, through December 31, 2012.

Alternatives

Growth Rates for M2

(Percent, seasonally adjusted annual rate)

Monthly Growth Rates	Tealbook Forecast*
Jan-12	16.2
Feb-12	3.7
Mar-12	4.2
Apr-12	5.5
May-12	3.9
Jun-12	5.1
Jul-12	9.0
Aug-12	4.5
Sep-12	10.1
Oct-12	6.6
Nov-12	4.0
Dec-12	3.6
Quarterly Growth Rates	
2012 Q1	8.7
2012 Q2	4.6
2012 Q3	6.7
2012 Q4	6.3
2013 Q1	-0.4
2013 Q2	1.9
2013 Q3	2.2
2013 Q4	2.2
2014 Q1	2.6
2014 Q2	2.7
2014 Q3	2.7
2014 Q4	2.8
Annual Growth Rates	
2012	6.7
2013	1.5
2014	2.7

* This forecast is consistent with nominal GDP and interest rates in the Tealbook A forecast. Actual data through October 8, 2012; projections thereafter.

DIRECTIVE

The directive that was issued in September appears on the next page, followed by drafts for an October directive that correspond to each of the policy alternatives.

The draft directives for all three Alternatives instruct the Desk to take appropriate steps to complete, by the end of December 2012, the MEP of $267 billion that was announced in June. The draft directives for Alternatives A and B also tell the Desk to continue purchasing additional agency MBS at a pace of about $40 billion per month; they do not specify an end date. The directive for Alternative C instructs the Desk to continue purchasing additional agency MBS at a pace of $40 billion per month "until the end of the year." Each of the draft directives would also instruct the Desk to continue the current practice of reinvesting principal payments on all agency debt and agency MBS in agency MBS.

If the Committee were to decide to continue purchasing longer-term Treasury securities after the MEP concludes, that decision would be reflected in the December directive.

Alternatives

September 2012 Directive

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to continue the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about $267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about $267 billion. For the duration of this program, the Committee directs the Desk to suspend its policy of rolling over maturing Treasury securities into new issues. The Committee directs the Desk to maintain its existing policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities. The Desk is also directed to begin purchasing agency mortgage-backed securities at a pace of about $40 billion per month. The Committee directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency MBS transactions. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

October 2012 Directive—Alternative A

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to continue the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about $267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about $267 billion. For the duration of this program, the Committee directs the Desk to suspend its policy of rolling over maturing Treasury securities into new issues. The Committee directs the Desk to maintain its existing policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities. The Desk is also directed to ~~begin~~ **continue** purchasing agency mortgage-backed securities at a pace of about $40 billion per month. The Committee directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency MBS transactions. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

October 2012 Directive—Alternative B

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to continue the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about $267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about $267 billion. For the duration of this program, the Committee directs the Desk to suspend its policy of rolling over maturing Treasury securities into new issues. The Committee directs the Desk to maintain its existing policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities. The Desk is also directed to ~~begin~~ **continue** purchasing agency mortgage-backed securities at a pace of about $40 billion per month. The Committee directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency MBS transactions. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

October 2012 Directive—Alternative C

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to continue the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about $267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about $267 billion. For the duration of this program, the Committee directs the Desk to suspend its policy of rolling over maturing Treasury securities into new issues. The Committee directs the Desk to maintain its existing policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities. The Desk is also directed to ~~begin~~ **continue** purchasing agency mortgage-backed securities at a pace of about $40 billion per month **until the end of 2012**. The Committee directs the Desk to engage in dollar roll and coupon swap transactions as necessary to facilitate settlement of the Federal Reserve's agency MBS transactions. The System Open Market Account Manager and the Secretary will keep the Committee informed of ongoing developments regarding the System's balance sheet that could affect the attainment over time of the Committee's objectives of maximum employment and price stability.

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Explanatory Notes

A. Policy Rules Used in "Monetary Policy Strategies"

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

Taylor (1993) rule	$R_t = 2.25 + \pi_t + 0.5(\pi_t - \pi^*) + 0.5gap_t$
Taylor (1999) rule	$R_t = 2.25 + \pi_t + 0.5(\pi_t - \pi^*) + gap_t$
Inertial Taylor (1999) rule	$R_t = 0.85R_{t-1} + 0.15(2.25 + \pi_t + 0.5(\pi_t - \pi^*) + gap_t)$
Outcome-based rule	$R_t = 1.2R_{t-1} - 0.39R_{t-2} + 0.19[0.79 + 1.73\pi_t + 3.66gap_t - 2.72gap_{t-1}]$
First-difference rule	$R_t = R_{t-1} + 0.5\left(\pi_{t+3|t} - \pi^*\right) + 0.5\Delta^4 gap_{t+3|t}$
Nominal income targeting rule	$R_t = 0.75R_{t-1} + 0.25(2.25 + \pi^* + yn_t - yn_t^*)$

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, quarterly real interest rate of 2¼ percent, a value used in the FRB/US model. The intercepts of the Taylor (1993, 1999) rules, and the long-run intercept of the inertial Taylor (1999) rule, are set at 2¼ percent—instead of Taylor's original value of 2 percent—for the same reason. The 2¼ percent real rate estimate also enters the long-run intercept of the nominal income targeting rule. The prescriptions of the first

[1] See Erceg and others (2012).

Explanatory Notes

difference rule do not depend on the level of the output gap or the long-run, quarterly real interest rate; see Orphanides (2003).

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

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B. Estimates of the Equilibrium and Actual Real Rates

An estimate of the equilibrium real rate appears as a memo item in the first exhibit, “Policy Rules and the Staff Projection.” The concept of the short-run equilibrium real rate underlying the estimate corresponds to the level of the real federal funds rate that is consistent with output reaching potential in twelve quarters using the projection for the economy of FRB/US, the staff’s large-scale econometric model of the U.S. economy. This estimate depends on a very broad array of economic factors, some of which take the form of projected values of the model’s exogenous variables. The estimate reported is the “Tealbook-consistent” estimate of r^*, which is generated after the paths of exogenous variables in the FRB/US model are adjusted so that they match those in the extended Tealbook forecast. Model simulations then determine the value of the real federal funds rate that closes the output gap conditional on the exogenous variables in the extended baseline forecast.

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

C. FRB/US Model Simulations

The exhibits of "Monetary Policy Strategies" that report results from simulations of alternative policies are derived from dynamic simulations of the FRB/US model. The simulated policy rule is assumed to be in force over the whole period covered by the simulation. For the optimal control simulations, the dotted line labeled "Previous Tealbook" is derived from the optimal control simulations, when applied to the previous Tealbook projection.

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

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

GENERAL ASSUMPTIONS

The balance sheet projections are constructed at a monthly frequency from October 2012 to December 2020. The few balance sheet items that are not discussed below are assumed to be constant over the projection period at the level observed on September 30, 2012. The projections for all major asset and liability categories under each scenario are summarized in the tables that follow the bullet points.

The Tealbook projections for the scenarios corresponding to Alternatives B and A assume that the target federal funds rate begins to increase in August 2015, consistent with the forward guidance in the FOMC's statement that the target federal funds rate is expected to be at exceptionally low levels "at least through mid-2015." This date of liftoff is consistent with the current staff economic forecast but is two months later than assumed in the balance sheet projections for Alternative B in the September Tealbook. The projection for the scenario corresponding to Alternative C assumes the target federal funds rate lifts off in August 2014, consistent with the draft statement language "at least through [late 2014 | mid-2014 | late 2013]" and a year earlier than in Alternative B. In each case, the balance sheet projections assume that no use of short-term draining tools is necessary to achieve the projected path for the target federal funds rate.[2]

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

ASSETS

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

- The assumptions under Alternative B are:
  - The Committee is assumed to continue its current purchases of MBS through the end of the year, when the MEP concludes, and then continue MBS purchases and additional purchases of Treasury securities through June 2013. Purchases of Treasury securities will continue at a pace of about $45 billion per month and purchases of MBS securities will continue at a pace of $40 billion per month. The Treasury securities purchased after the conclusion of the MEP are assumed to have an average duration of about nine years, roughly the net duration of purchases and sales under the MEP. The purchases between October 2012 and June 2013 expand the SOMA portfolio's holdings of longer-term securities by $763 billion.
  - The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS.
  - Starting in February 2015—six months prior to the assumed increase in the target federal funds rate—all securities are allowed to roll off the portfolio as they mature or prepay.
  - The Federal Reserve begins to sell agency MBS and agency debt securities in February 2016, six months after the assumed date of the first increase in the target federal funds rate. Holdings of agency securities are reduced over five years and reach zero by January 2021.
  - For agency MBS, the rate of prepayment is based on staff models using estimates of housing market factors from one of the Desk's analytical providers, long-run average prepayment speeds of MBS, and interest rate projections from the Tealbook.[3] The projected rate of prepayment is sensitive to these underlying assumptions.

- In the scenario corresponding to Alternative A, the Committee is assumed to continue its current purchases of MBS through the end of the year, when the MEP concludes, and then continue MBS purchases and additional purchases of Treasury securities through December 2013. Purchases of Treasury securities will continue at a pace of about $45 billion per month and purchases of MBS securities will continue at a pace of $40 billion per month. The Treasury securities purchased after the conclusion of the MEP are assumed to have an average duration of about nine years. The purchases between October 2012 and December 2013 expand the SOMA portfolio's holdings of longer-term securities by $1.28 trillion. In addition, the Committee is assumed to maintain its existing policy of reinvesting principal payments from its holdings of agency debt and agency MBS in agency MBS. In February 2015, six months prior to the assumed increase in the federal funds rate in August 2015, principal payments from all securities

[3] Projected prepayments of agency MBS reflect interest rate projections as of October 15, 2012.

are allowed to roll off the portfolio. Sales of agency securities begin in February 2016 and continue for five years.

- In the scenario corresponding to Alternative C, the Committee is assumed to purchase MBS only through the completion of the MEP at the end of this year; no additional asset purchases are assumed. The FOMC continues to reinvest the proceeds from principal payments on its agency securities holdings in agency MBS until February 2014—six months prior to the assumed increase in the target federal funds rate. Starting in February 2014, all securities are allowed to roll off the portfolio as they mature or prepay. The Federal Reserve begins to sell agency MBS and agency debt securities in February 2015. Holdings of agency securities are reduced over five years and reach zero by January 2020.
- Because current and expected interest rates in the near term are below the average coupon rate on outstanding Treasury securities, the market value at which these securities are purchased will generally exceed their face value, with a larger premium for longer-maturity securities. As a result, each alternative will add premiums to the balance sheet. In Alternative C, premiums net of amortization will increase $5 billion. In Alternatives B and A, premiums are boosted by roughly $40 billion and $50 billion, respectively, by the time asset purchases end. The increase in premiums is reflected in higher total assets and in higher reserve balances.
- The asset purchases in all three alternatives put downward pressure on market interest rates, in particular primary and secondary mortgage rates.
- The current and near-term market value of agency MBS is assumed to be four percent above face value. As a result, for Alternatives B, A, and C, the $360 billion, $600 billion, and $120 billion of agency MBS purchases, respectively, will cause unamortized premiums on the Federal Reserve's balance sheet to rise by roughly $14 billion, $24 billion, and $5 billion, respectively, relative to a scenario without these MBS purchases. The increase in premiums is reflected in higher total assets and in higher reserve balances.
- The level of central bank liquidity swaps is assumed to decline gradually, as the recent foreign central bank swap auctions mature, and then return to zero in 2013.
- In all scenarios, once reserve balances drop to $25 billion, the Desk begins to purchase Treasury bills to maintain this level of reserve balances going forward. Purchases of bills continue until such securities comprise one-third of the Federal Reserve's total Treasury securities holdings—about the average share prior to the crisis. Once this share is reached, the Federal Reserve buys coupon securities in addition to bills to maintain an approximate composition of the portfolio of one-third bills and two-thirds coupon securities.

Liquidity Programs and Credit Facilities

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

- The assets held by TALF LLC remain at about $1 billion through 2014 before declining to zero the following year. Assets held by TALF LLC consist of investments of commitment fees collected by the LLC and the U.S. Treasury's initial funding. In this projection, the LLC does not purchase any asset-backed securities received by the Federal Reserve Bank of New York in connection with a decision of a borrower not to repay a TALF loan.
- The assets held by Maiden Lane LLC decline to zero in 2016.

LIABILITIES AND CAPITAL

- Federal Reserve notes in circulation grow in line with the staff forecast for money stock currency through 2015. Afterwards, Federal Reserve notes in circulation grow at the same rate as nominal GDP in the extended Tealbook projection.
- The level of reverse repurchase agreements (RRPs) is assumed to remain around $70 billion, about the average level of RRPs associated with foreign official and international accounts observed over the past three years.
- Balances held in the U.S. Treasury's General Account (TGA) follow recent patterns until the assumed initial increase in the target federal funds rate in each alternative. At that point, the TGA slowly drops back to its historical target level of $5 billion as it is assumed that the Treasury will implement a new cash management system and invest funds in excess of $5 billion. The TGA remains constant at $5 billion over the remainder of the forecast period.
- We maintain the Supplementary Financing Account (SFA) balance at its current level of zero throughout the forecast.
- Federal Reserve capital grows 15 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 recorded in lieu of reducing the Reserve Bank's capital and is reported on the liability side of the balance sheet as "Interest on

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

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 Alternative B, a small deferred asset – peaking at about 8 billion in 2018 – is recorded on the balance sheet at year-end in 2017, 2018 and 2019. In Alternative A, a deferred asset is recorded from 2017 through the end of the projection horizon, with a peak year-end value of about $36 billion in 2019.

TERM PREMIUM EFFECTS[4]

- Under Alternative B, the current staff estimates of the contemporaneous term premium effect on the yield of the ten-year Treasury note is negative 93 basis points. Based on the projection for the balance sheet, that term premium effect converges slowly toward zero over the forecast period as the portfolio normalizes. The term premium is about the same as it was in September Alternative B'.
- Under Alternative A, the term premium effect is negative 114 basis points. The effect is more negative than in Alternative B because of the larger assumed securities purchases.
- Under Alternative C, the term premium effect is negative 66 basis points. The effect is less negative than in Alternative B because there are no additional securities purchases in 2013 and the liftoff date is earlier so asset sales begin sooner than under Alternative B.

[4] Staff estimates include all current and projected asset purchases and use the model outlined in the appendix of the January 18, 2012, memo "Possible MBS Large-Scale Asset Purchase Program" written by staff at the Federal Reserve Bank of New York and the Board of Governors. More details of the model can be found in "Term Structure Modeling with Supply Factors and the Federal Reserve's Large Scale Asset Purchase Programs" by Li and Wei, FEDS working paper #37, 2012.

10-Year Treasury Term Premium Effect				
Date	Alternative B	Alternative A	Alternative C	Memo: September Alt B'
Basis Points Quarterly Averages				
2012 Q4	-93	-114	-66	-93
2013 Q1	-90	-111	-62	-89
2013 Q2	-86	-107	-58	-86
2013 Q3	-81	-103	-54	-81
2013 Q4	-76	-98	-50	-76
2014 Q1	-72	-93	-46	-71
2014 Q2	-67	-87	-42	-66
2014 Q3	-62	-81	-38	-61
2014 Q4	-57	-75	-35	-57
2015 Q1	-53	-70	-32	-52
2015 Q2	-49	-64	-29	-48
2015 Q3	-44	-59	-26	-43
2015 Q4	-40	-54	-23	-39
2016 Q1	-37	-49	-20	-35
2016 Q2	-33	-44	-18	-32
2016 Q3	-30	-40	-16	-29
2016 Q4	-27	-36	-14	-25
2017 Q1	-24	-32	-13	-23
2017 Q2	-21	-29	-11	-20
2017 Q3	-19	-25	-10	-17
2017 Q4	-17	-23	-9	-15
2018 Q1	-15	-20	-8	-13
2018 Q2	-13	-17	-7	-12
2018 Q3	-12	-15	-7	-10
2018 Q4	-10	-13	-6	-9
2019 Q1	-9	-12	-6	-8
2019 Q2	-8	-10	-6	-7
2019 Q3	-8	-9	-6	-6
2019 Q4	-7	-8	-5	-6
2020 Q1	-6	-7	-5	-5
2020 Q2	-6	-6	-5	-5
2020 Q3	-6	-6	-4	-5
2020 Q4	-5	-5	-4	-4

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

Billions of dollars

	Sep 30, 2012	2012	2014	2016	2018	2020
Total assets	2,802	2,908	3,511	2,891	1,873	1,976
Selected assets						
Liquidity programs for financial firms	13	13	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0
Central bank liquidity swaps	13	13	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	2	2	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	2	1	0	0	0	0
Securities held outright	2,564	2,650	3,258	2,685	1,710	1,848
U.S. Treasury securities	1,645	1,657	1,927	1,707	1,218	1,828
Agency debt securities	83	77	39	16	2	0
Agency mortgage-backed securities	835	916	1,292	961	490	20
Net portfolio holdings of TALF LLC	1	1	1	0	0	0
Total other assets	221	241	252	206	162	128
Total liabilities	2,747	2,846	3,430	2,783	1,730	1,787
Selected liabilities						
Federal Reserve notes in circulation	1,086	1,108	1,249	1,402	1,530	1,671
Reverse repurchase agreements	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,578	1,658	2,099	1,300	127	36
Reserve balances held by depository institutions	1,464	1,607	2,048	1,290	116	25
U.S. Treasury, General Account	85	45	45	5	5	5
Other Deposits	29	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	-8	0
Total capital	55	62	82	108	143	189

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

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

Billions of dollars

	Sep 30, 2012	2012	2014	2016	2018	2020
Total assets	2,802	2,909	4,043	3,359	2,213	1,943
Selected assets						
Liquidity programs for financial firms	13	13	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0
Central bank liquidity swaps	13	13	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	2	2	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	2	1	0	0	0	0
Securities held outright	2,564	2,649	3,765	3,134	2,038	1,808
U.S. Treasury securities	1,645	1,657	2,197	1,977	1,454	1,784
Agency debt securities	83	77	39	16	2	0
Agency mortgage-backed securities	835	915	1,530	1,141	582	23
Net portfolio holdings of TALF LLC	1	1	1	0	0	0
Total other assets	221	243	276	224	175	135
Total liabilities	2,747	2,847	3,961	3,251	2,070	1,754
Selected liabilities						
Federal Reserve notes in circulation	1,086	1,108	1,249	1,402	1,530	1,671
Reverse repurchase agreements	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,578	1,658	2,626	1,764	483	36
Reserve balances held by depository institutions	1,464	1,608	2,575	1,754	473	25
U.S. Treasury, General Account	85	45	45	5	5	5
Other Deposits	29	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	-31	-34
Total capital	55	62	82	108	143	189

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

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

Billions of dollars

	Sep 30, 2012	2012	2014	2016	2018	2020
Total assets	2,802	2,907	2,862	2,206	1,790	1,976
Selected assets						
Liquidity programs for financial firms	13	13	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0
Central bank liquidity swaps	13	13	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	2	2	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	2	1	0	0	0	0
Securities held outright	2,564	2,661	2,655	2,040	1,656	1,863
U.S. Treasury securities	1,645	1,657	1,657	1,437	1,448	1,863
Agency debt securities	83	77	39	16	2	0
Agency mortgage-backed securities	835	927	959	586	206	0
Net portfolio holdings of TALF LLC	1	1	1	0	0	0
Total other assets	221	230	206	166	134	112
Total liabilities	2,747	2,845	2,780	2,098	1,647	1,786
Selected liabilities						
Federal Reserve notes in circulation	1,086	1,108	1,249	1,402	1,530	1,671
Reverse repurchase agreements	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,578	1,655	1,449	615	36	36
Reserve balances held by depository institutions	1,464	1,604	1,438	605	25	25
U.S. Treasury, General Account	85	45	5	5	5	5
Other Deposits	29	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0
Total capital	55	62	82	108	143	189

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

Explanatory Notes