

Prefatory Note

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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

December 6, 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 2013. (Medium-term prescriptions derived from dynamic simulations of each rule are discussed later). As shown in the left-hand columns, all but two of the near-term prescriptions keep the federal funds rate at the effective lower bound through the second quarter of 2013. The Taylor (1993) rule, which puts relatively little weight on the output gap, prescribes an increase in the target federal funds rate to about 130 basis points in both the first and second quarters of 2013. In addition, the first-difference rule, which responds to the three-quarter-ahead change in the output gap, prescribes a target federal funds rate of 37 basis points for the second 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 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 that are well below zero. The more-accommodative prescriptions arising from the latter two rules reflect the stronger immediate response of the rules to the staff’s estimate of the output gap, which remains appreciably negative.²

The Tealbook baseline projections for the output gap and inflation are shown in the bottom half of the exhibit, titled “Key Elements of the Staff Projection.” As described in Book A of the Tealbook, the projected path of the output gap is wider in 2013 and 2014, relative to the October projection, reflecting a modest downward revision to the staff’s assessment of the underlying strength of household spending in light of

¹ Details for each rule appear in Explanatory Note A. Note that the prescriptions of the outcome-based rule reported in the table are not adjusted to conform with the Committee’s forward guidance, unlike the approach taken by the staff in using this rule to set the path of the federal funds rate in its baseline forecast.

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 substantial weight on the lagged federal funds rate, which is subject to the lower-bound constraint.

Policy Rules and the Staff Projection

Near-Term Prescriptions of Selected Policy Rules

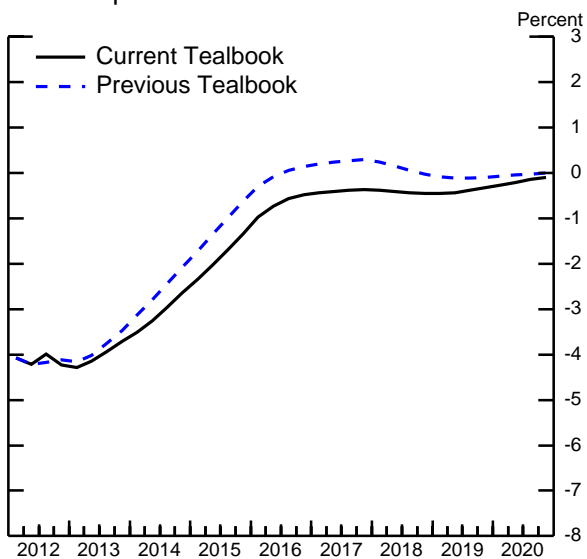
	Constrained Policy		Unconstrained Policy	
	<u>2013Q1</u>	<u>2013Q2</u>	<u>2013Q1</u>	<u>2013Q2</u>
Taylor (1993) rule	1.30	1.32	1.30	1.32
<i>Previous Tealbook</i>	1.40	1.43	1.40	1.43
Taylor (1999) rule	0.13	0.13	-0.79	-0.71
<i>Previous Tealbook</i>	0.13	0.13	-0.63	-0.54
Inertial Taylor (1999) rule	0.13	0.13	0.01	-0.10
<i>Previous Tealbook Outlook</i>	0.13	0.13	0.03	-0.05
Outcome-based rule	0.13	0.13	-0.03	-0.14
<i>Previous Tealbook Outlook</i>	0.13	0.13	0.01	-0.06
First-difference rule	0.20	0.37	0.20	0.37
<i>Previous Tealbook Outlook</i>	0.26	0.56	0.26	0.56
Nominal income targeting rule	0.13	0.13	-0.48	-0.96
<i>Previous Tealbook Outlook</i>	0.13	0.13	-0.42	-0.86

Memo: Equilibrium and Actual Real Federal Funds Rate

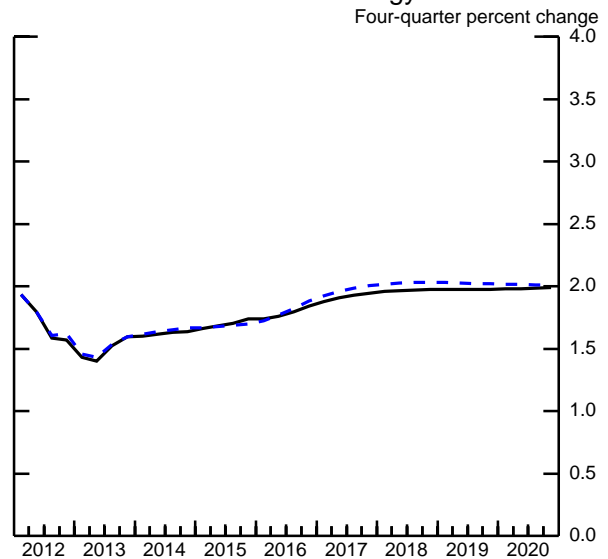
	Current Tealbook	<i>Previous Tealbook</i>
Tealbook-consistent FRB/US r^* estimate	-2.21	-1.90
Actual real federal funds rate	-1.45	-1.47

Key Elements of the Staff Projection

GDP Gap



PCE Prices ex. Food and Energy



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

surprisingly weak incoming data on consumer spending and income, as well as somewhat less favorable financial conditions.³ In contrast, the staff's projection of core inflation is essentially unchanged since the October Tealbook. Because of the slightly weaker outlook for economic activity, the near-term prescriptions from all of the unconstrained rules have decreased a bit compared with those in the October Tealbook.

The top panel of the first exhibit also reports the Tealbook-consistent estimate of short-run r^* , which is generated by the FRB/US model when conditioned on the staff's outlook for the economy. The short-run r^* estimate corresponds to the real federal funds rate that, if maintained, would return output to potential in twelve quarters. Consistent with the staff's revision to the output gap, the r^* estimate is about 30 basis points lower than in the October Tealbook. As in previous rounds, the estimate of r^* —currently about $-2\frac{1}{4}$ percent—remains below the estimated actual real federal funds rate of about $-1\frac{1}{2}$ percent.

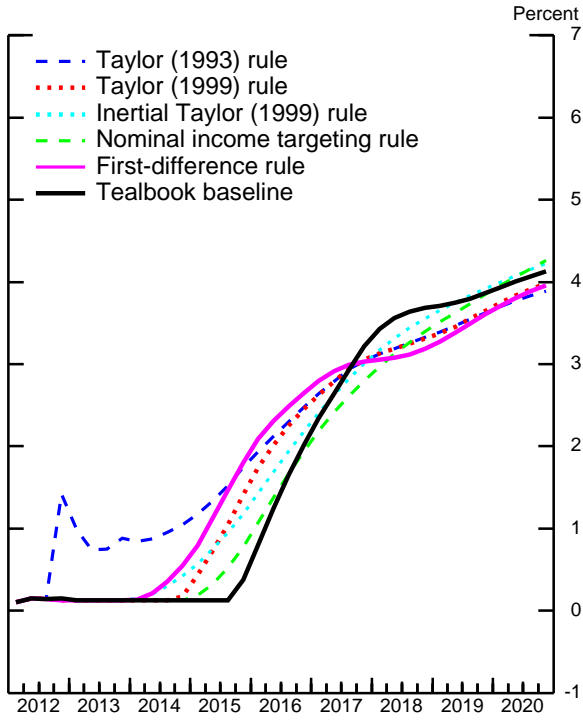
The second exhibit, “Policy Rule Simulations,” reports dynamic simulations using the FRB/US model that incorporate the endogenous responses of inflation and the output gap to the different paths of the federal funds rate prescribed by the constrained versions of the six policy rules described above. 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 first quarter of 2013 onward, under the assumption that private agents fully understand and anticipate the implications of the rule for future real activity, inflation, and interest rates.⁴ The exhibit also displays the Tealbook baseline

³ With regards to financial conditions, the staff's baseline assumption is that the asset purchase program will end in mid-2013. Market participants appear to expect purchases to continue longer, and so they are assumed to be disappointed when purchases end. The staff's output gap forecast embeds the assumption that market rates will reflect the smaller-than-expected total purchases by the beginning of the third quarter of 2013. The disappointment will result in a weaker stock market, a stronger dollar and higher longer-term real interest rates that widen the output gap by 8 basis points by the end of 2013, 24 basis points by the end of 2014, and 34 basis points by the end of 2015.

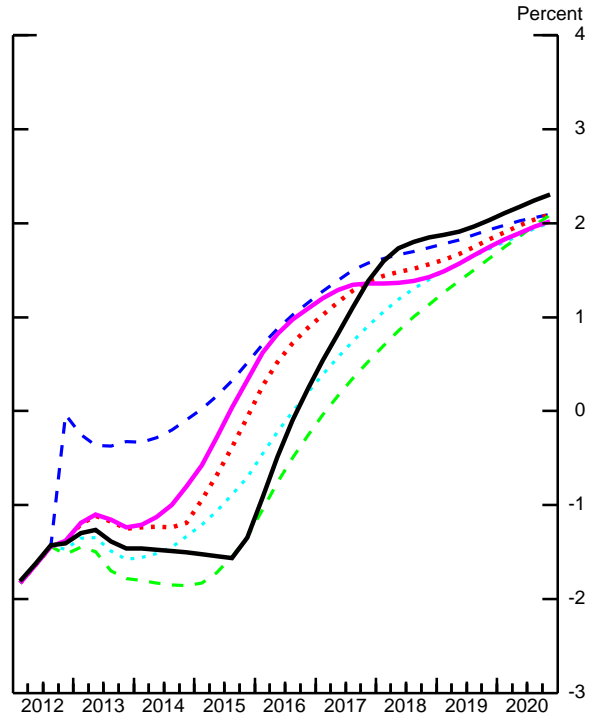
⁴ The staff's baseline forecast incorporates the effects of the large-scale asset purchase programs that the FOMC has undertaken in recent years, as well as the effects of the flow-based asset purchases through December, the continuation of the maturity extension program until the end of this year, and the modifications to the Federal Reserve's reinvestment policies that were announced in September 2011. The staff baseline also assumes that the FOMC will purchase an additional \$500 billion in long-term Treasury securities and MBS through mid-2013, and incorporates some “disappointment” on the part of financial market participants as they gradually come to recognize that the program will not be continued past this point, as they currently appear to expect. Based on these assumptions, the policy rule simulations incorporate the baseline effects of these balance sheet policies; the rules themselves are not directly adjusted for the effects of balance sheet policies.

Policy Rule Simulations

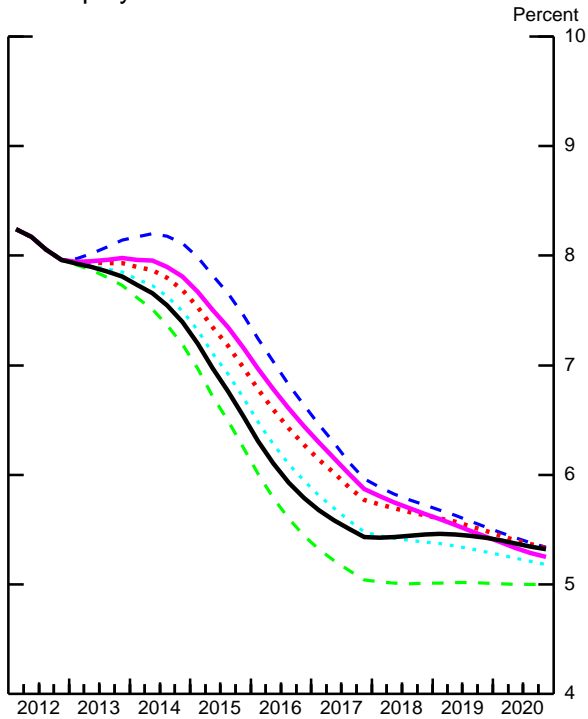
Nominal Federal Funds Rate



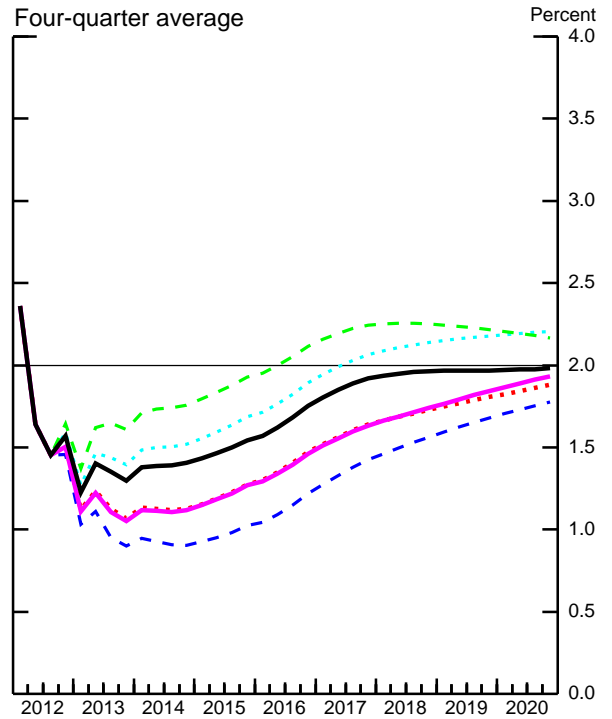
Real Federal Funds Rate



Unemployment Rate



PCE Inflation
Four-quarter average



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

paths, which are conditioned on the prescriptions of the outcome-based rule, adjusted to be consistent with the policy guidance reaffirmed in the October statement.⁵

In the Tealbook baseline, the federal funds rate departs from the effective lower bound in the fourth quarter of 2015, one quarter later than in the October Tealbook. Subsequently, the federal funds rate increases to 3.5 percent by the second quarter of 2018, and reaches 4.2 percent by the end of the decade. The unemployment rate reaches 6.5 percent at the end of 2015 and is expected to reach the staff's long-term estimate of the natural rate of unemployment by 2017 and remain close to this level thereafter.⁶ Headline inflation is projected to rise gradually over time and eventually converge to 2 percent after 2017.

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 a federal funds rate of 140 basis points for the current quarter before a reduction to just below 100 basis points in the first quarter of 2013. The higher federal funds rate makes real activity and inflation weaker than in the baseline, prompting a subsequent partial reversal of the initial rate increase. Reflecting the early tightening, however, the rule implies a higher unemployment rate throughout the medium term 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 third quarter of 2014, it implies real and nominal federal funds rates that are above those prescribed by all but the Taylor 1993 rule through mid-2017. Reflecting the more-elevated average federal funds rate, the unemployment rate is higher and inflation lower in the medium term than under all of the rules except the Taylor 1993 rule.

Compared with the Taylor (1993) rule, the Taylor (1999) rule prescribes a later tightening of policy and produces generally lower unemployment rates and slightly

⁵ 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 forward guidance in the Committee's October statement and the economic outlook as it stood at the time. Beginning in the third quarter of 2015, this intercept adjustment is steadily reduced and is zero beginning in the fourth quarter of 2017.

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

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 effective natural rate of unemployment while inflation declines to 1.1 percent before gradually increasing to the 2 percent goal.

Under the inertial Taylor (1999) rule, the first increase in the federal funds rate takes place in the third quarter of 2014, two quarters 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 is essentially closed by late 2017, when inflation is around 2 percent.

Under the nominal income targeting rule, the initial increase in the federal funds rate occurs in the second quarter of 2015, 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 during 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.⁷

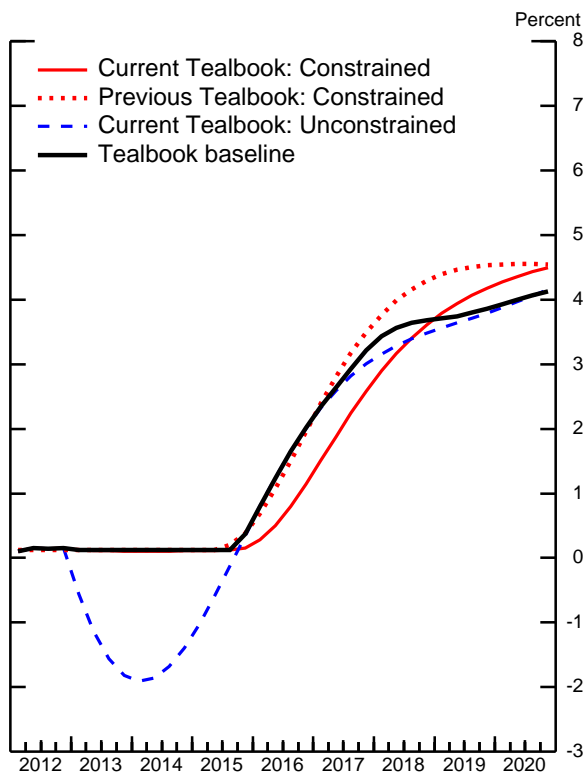
The next exhibit, "Constrained vs. Unconstrained Optimal Control Policy," compares optimal control simulations derived for this Tealbook with those shown in October.⁸ In these simulations, policymakers are assumed to place equal weights on

⁷ With the exception of the Taylor (1993) rule, the prescribed dates of departure from the effective lower bound under the various simple rules are sensitive to the assumption that the public recognizes at the start of the simulations both what rule the FOMC will follow and the full implications of that rule for future economic conditions, as this assumption can lead to significant near-term movements in real activity and inflation in the simulations. If the public were instead assumed to revise only gradually its expectations for the FOMC future policy actions, then the prescribed departure dates under the Taylor (1999) rule, the inertial Taylor rule, and the first-difference rule would be advanced relative to the results reported in the exhibit, while the prescribed departure date under the nominal income targeting rule would be pushed further off into the future.

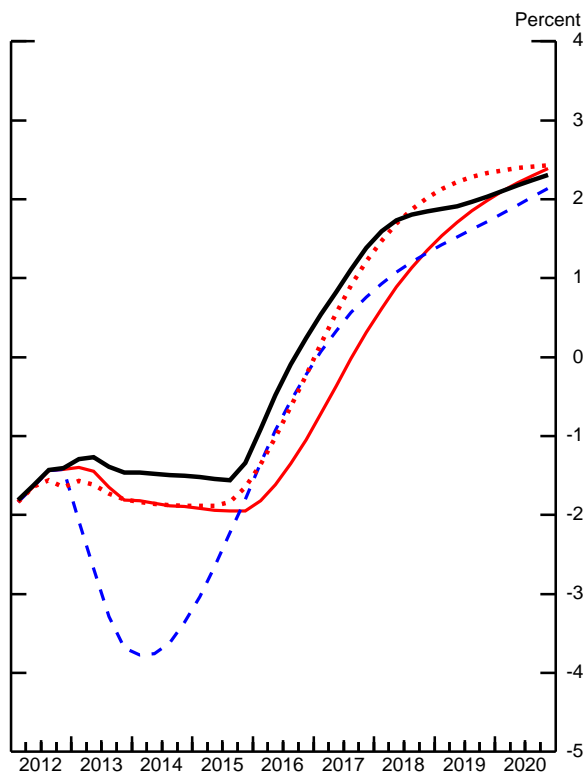
⁸ The optimal policy simulations incorporate the assumptions about underlying economic conditions used in the staff's baseline forecast, including the assumptions about balance sheet policies described above.

Constrained vs. Unconstrained Optimal Control Policy

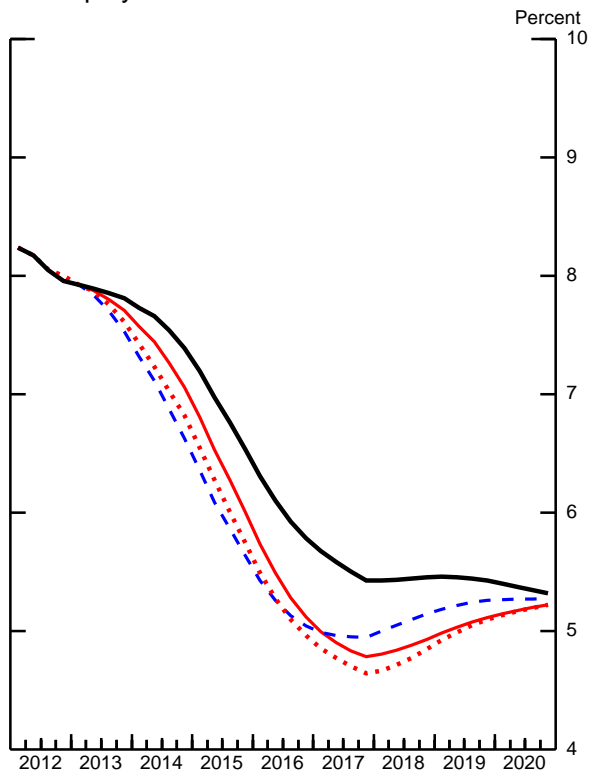
Nominal Federal Funds Rate



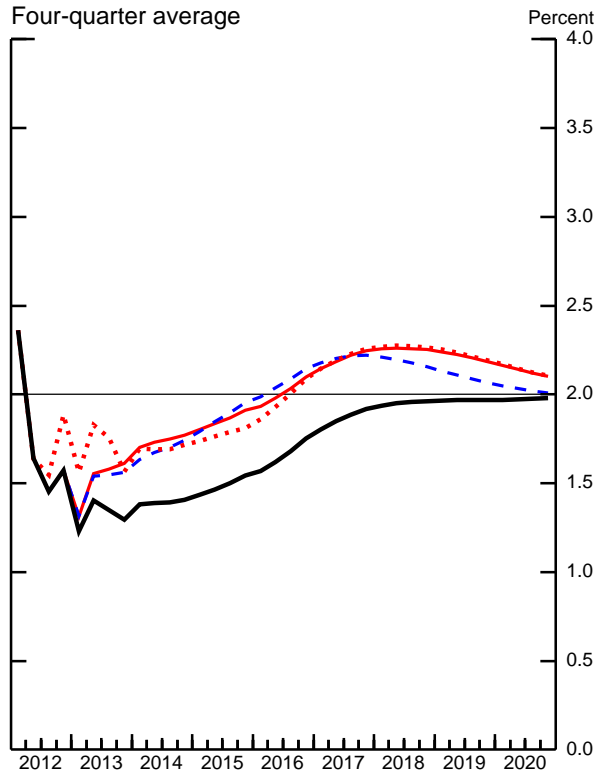
Real Federal Funds Rate



Unemployment Rate



PCE Inflation
Four-quarter average



Strategies

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 first quarter of 2016, one quarter later than in the optimal control exercise shown in the October Tealbook; the optimal path is revised down beyond 2015, reflecting the wider output gap in the staff projection.⁹ Under the optimal control path, when the federal funds rate rises above the lower bound, the unemployment rate is 5.7 percent and the projected rate of inflation over both subsequent years is close to 2 percent.

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. Under this policy, the gap between the unemployment rate and the staff's estimate of the effective natural rate of unemployment is closed by mid-2016, and the unemployment rate subsequently runs below the natural rate for a few years. Inflation initially exhibits a decline similar to that in the Tealbook baseline, but it then increases to the 2 percent objective by mid-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 persistent overshooting, occur because policymakers respond to the lower bound constraint by committing 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.

Under the optimal unconstrained policy, the federal funds rate would gradually decline to about -2 percent by early 2014 and return to positive territory only in late 2015. Under these conditions, the unemployment rate would decline more rapidly than under the optimal constrained policy. Inflation would return to 2 percent by mid-2016, a

⁹ Although the loss function uses headline inflation instead of core inflation, the real federal funds rate shown in the upper right panel of the exhibit is calculated as the difference between the nominal federal funds rate and a four-quarter moving average of core PCE inflation. Core PCE inflation is used to compute the real rate for this illustrative purpose because it provides a less volatile measure of inflation expectations than does a four-quarter moving average of headline inflation.

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.¹⁰

The fourth exhibit, “Optimal Control Policy: Commitment vs. Discretion,” displays simulations of the FRB/US model using two different concepts of optimality. Under the first concept (commitment), policymakers can choose conditional policies today that effectively constrain the Committee’s policy choices in future periods; under the second concept (discretion), policymakers are assumed to be unable to bind the policy decisions of future Committees and so choose policy today subject to the expected behavior of future policymakers. The commitment policy corresponds to the optimal control concept presented in the third exhibit and so the red lines in this exhibit trace the same paths as in the constrained case in the third exhibit. In the case of discretion, results are presented both with and without the effective lower bound imposed on the federal funds rate.

As can be seen from the unconstrained simulations under discretion, policymakers would like to provide additional stimulus by cutting the federal funds rate today. With that option ruled out by the lower-bound constraint, they therefore might consider an alternative strategy of promising to keep the policy rate lower in the future. Under discretion, however, policymakers’ inability to credibly bind future Committees to carry out the original plan limits their ability to influence private-sector expectations regarding the federal funds rate and other variables. Instead, the public knows that future Committees will always reoptimize policy without regard for past policymakers’ promises. As a result, policy under discretion evolves over time in a way that causes the federal funds rate to leave the lower bound sooner than under commitment, accompanied by higher unemployment and lower inflation.¹¹

Importantly, these exercises take the staff’s baseline assumption about the SOMA portfolio policy as given and so treat the federal funds rate as the sole instrument that the Committee adjusts in response to the state of the economy.¹² If policymakers wished to

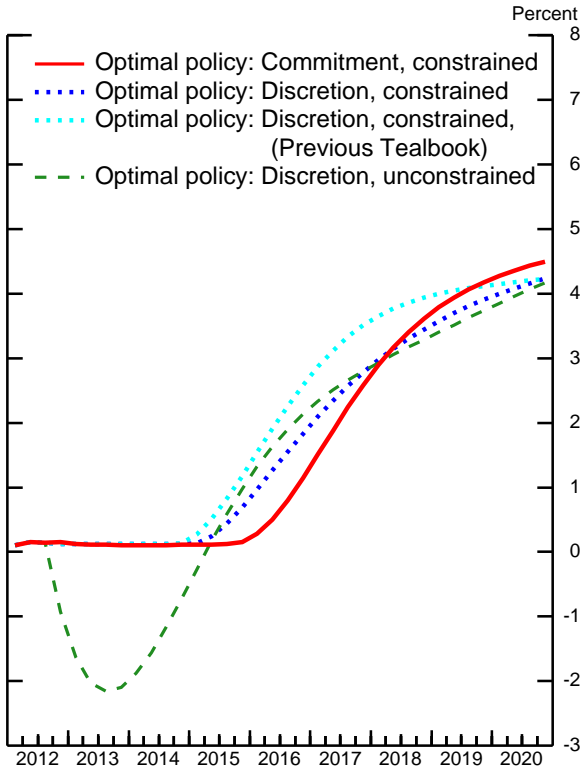
¹⁰ The differences, in terms of economic outcomes, between constrained and unconstrained optimal control policies have noticeably narrowed since the December 2011 Tealbook. This narrowing is in line with the intuition that additional policy accommodation provided this year and other factors have boosted aggregate demand and thereby reduced the impact of the lower-bound constraint.

¹¹ For further discussion of the different properties of commitment and discretion, see the box in Book B of the December 2010 Tealbook, “The Role of Commitment in Optimal Policy Simulations.”

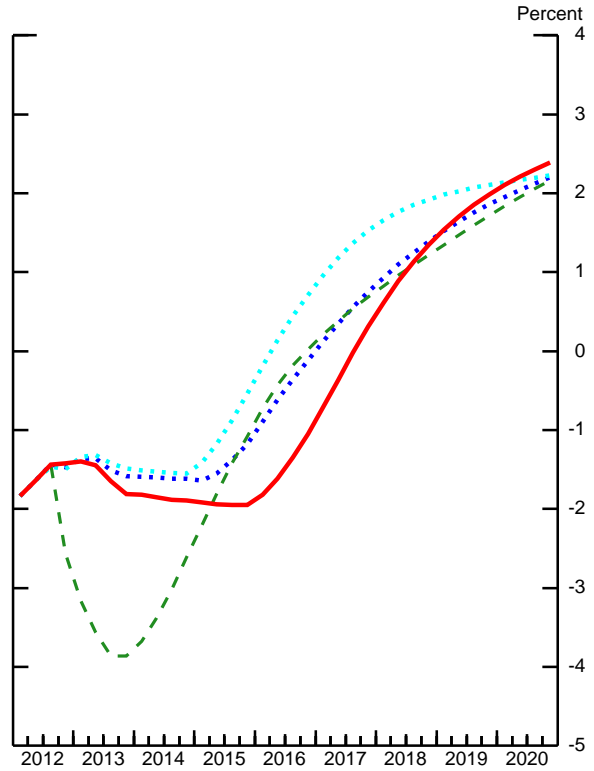
¹² As discussed in Book A of the Tealbook, the baseline assumption about the conduct of monetary policy is that the Federal Reserve will complete the maturity extension program as scheduled at

Optimal Control Policy: Commitment vs. Discretion

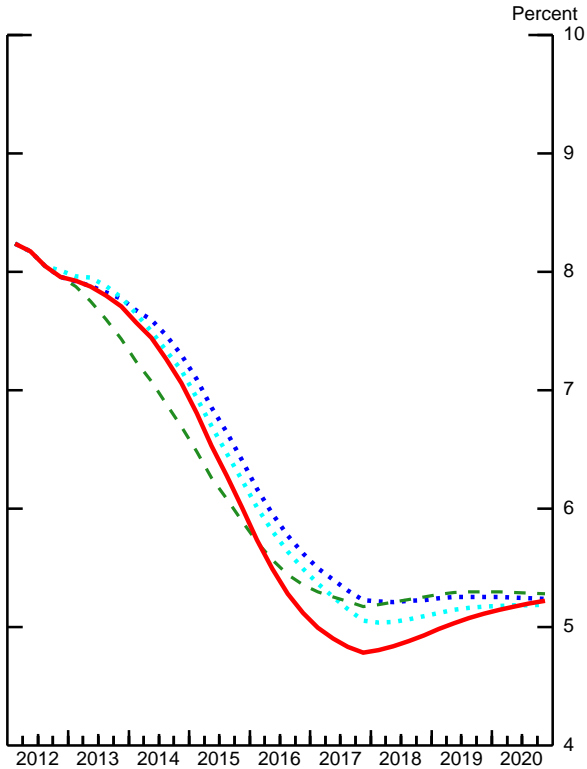
Nominal Federal Funds Rate



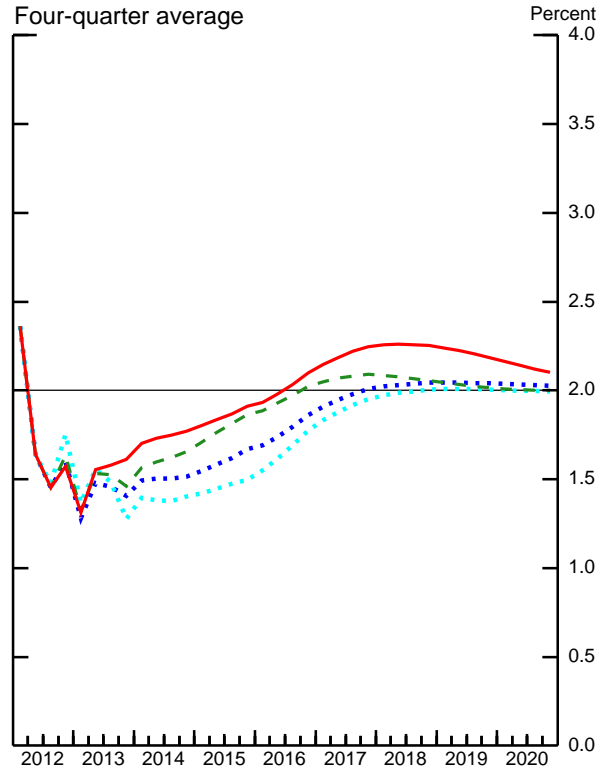
Real Federal Funds Rate



Unemployment Rate



PCE Inflation Four-quarter average



provide additional policy stimulus but saw little remaining scope to lower private sector expectations of the funds rate path because of limits on their ability to commit to future policy actions, they could still provide stimulus by expanding the Federal Reserve's holdings of longer-term securities. That such a step could be appropriate is suggested by the unconstrained optimal control simulations under either commitment or discretion, which uniformly call for pushing the funds rate noticeably below zero in the near term.

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

the end of this month, and purchase another \$40 billion of agency MBS over the course of the month. As noted above, the staff further assumes, as in October, that the Federal Reserve will purchase longer-term securities at a pace of about \$85 billion per month through the end of June 2013.

Outcomes under Alternative Policies

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

Measure and scenario	2012		2013	2014	2015	2016
	H1	H2				
<i>Real GDP</i>						
Extended Tealbook baseline	1.6	1.8	2.5	3.2	3.6	3.2
Taylor (1993)	1.6	1.8	1.6	2.5	3.3	3.5
Taylor (1999)	1.6	1.8	2.1	2.8	3.3	3.2
Inertial Taylor (1999)	1.6	1.8	2.4	3.0	3.5	3.3
First-difference	1.6	1.8	2.0	2.7	3.2	3.3
Nominal income targeting	1.6	1.7	2.7	3.4	3.7	3.4
Constrained optimal control	1.6	1.8	2.8	3.6	3.9	3.5
<i>Unemployment rate¹</i>						
Extended Tealbook baseline	8.2	8.0	7.8	7.4	6.5	5.8
Taylor (1993)	8.2	8.0	8.1	8.1	7.5	6.6
Taylor (1999)	8.2	8.0	7.9	7.7	7.0	6.3
Inertial Taylor (1999)	8.2	8.0	7.9	7.5	6.7	5.9
First-difference	8.2	8.0	8.0	7.8	7.2	6.4
Nominal income targeting	8.2	8.0	7.7	7.2	6.3	5.4
Constrained optimal control	8.2	8.0	7.7	7.1	6.0	5.1
<i>Total PCE prices</i>						
Extended Tealbook baseline	1.6	1.6	1.3	1.4	1.5	1.8
Taylor (1993)	1.6	1.3	0.9	0.9	1.0	1.2
Taylor (1999)	1.6	1.4	1.1	1.1	1.3	1.5
Inertial Taylor (1999)	1.6	1.6	1.4	1.5	1.7	1.9
First-difference	1.6	1.4	1.1	1.1	1.3	1.5
Nominal income targeting	1.6	1.7	1.6	1.8	1.9	2.1
Constrained optimal control	1.6	1.6	1.6	1.8	1.9	2.1
<i>Core PCE prices</i>						
Extended Tealbook baseline	2.0	1.2	1.6	1.6	1.7	1.8
Taylor (1993)	2.0	0.9	1.2	1.1	1.2	1.3
Taylor (1999)	2.0	1.1	1.4	1.4	1.5	1.6
Inertial Taylor (1999)	2.0	1.2	1.7	1.7	1.9	2.0
First-difference	2.0	1.0	1.4	1.3	1.5	1.6
Nominal income targeting	2.0	1.3	1.9	2.0	2.1	2.2
Constrained optimal control	2.0	1.2	1.9	2.0	2.1	2.2
<i>Federal funds rate¹</i>						
Extended Tealbook baseline	0.2	0.2	0.1	0.1	0.4	2.0
Taylor (1993)	0.2	1.4	0.9	1.0	1.7	2.5
Taylor (1999)	0.2	0.1	0.1	0.2	1.4	2.5
Inertial Taylor (1999)	0.2	0.1	0.1	0.4	1.2	2.2
First-difference	0.2	0.1	0.1	0.5	1.8	2.6
Nominal income targeting	0.2	0.1	0.1	0.1	0.8	1.9
Constrained optimal control	0.2	0.2	0.1	0.1	0.2	1.1

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.

In its description of recent economic developments, Alternative B begins by observing that, “apart from weather-related disruptions,” economic activity has continued to expand moderately and that employment growth has picked up a bit although the unemployment rate remains elevated. Like the October statement, Alternative B notes that household spending has advanced; in light of recent data, however, October’s observation that this spending category has been rising a bit more quickly is omitted. The draft statement also notes “further signs of improvement” in the housing sector.

Alternative A, unlike Alternative B, repeats the Committee’s October assessment that employment growth “has been slow,” that there have only been “some” further signs of improvement in the housing sector, and that the improvement in housing activity is taking place “from a depressed level.” Alternative C offers a somewhat more upbeat characterization of the data by describing employment growth as having “strengthened somewhat” and stating that the “unemployment rate, though still elevated, has declined.” Alternative C also drops the reference in the October statement to slower growth in business fixed investment, instead observing more broadly that private domestic demand has continued to advance.

With respect to inflation, Alternatives A and B say that it “has been running somewhat below the Committee’s longer-run objective, apart from temporary variations that largely reflect fluctuations in energy prices,” while Alternative C states that inflation “has been running close” to the Committee’s longer-run objective and does not cite energy prices. Each alternative indicates that longer-term inflation expectations have remained stable.

The language in Alternative B follows the October statement language on the outlook for real activity and employment, reiterating the Committee’s concern that, without sufficient policy accommodation, “economic growth might not be strong enough to generate sustained improvement in labor market conditions.” Alternative A’s language on this issue is also similar to October’s, except that “further” policy accommodation is

said to be needed to achieve the sustained labor market improvement. Alternative C indicates that the Committee expects economic growth to pick up gradually and that it anticipates that the unemployment rate will continue to decline at a pace consistent with the Committee's mandate. All of the draft statements continue to highlight the significant downside risks to the economic outlook from strains in global financial markets. With respect to inflation, Alternatives A and B state that the Committee anticipates that inflation over the medium term "likely will run at or below its 2 percent objective," while Alternative C indicates that inflation over the medium term "will run near its 2 percent objective."

Reflecting their contrasting economic assessments, the alternatives also offer different approaches to balance sheet policy after December. Alternative B maintains the purchases of agency MBS at a pace of \$40 billion per month and indicates that, after the completion of the MEP at the end of the year, the Committee will purchase longer-term Treasury securities, "initially at a pace of \$45 billion per month."¹ The statement would indicate that the Committee "will continue its purchases of Treasury and agency mortgage-backed securities, and employ its other policy tools as appropriate" until substantial improvement in the outlook for the labor market is achieved in a context of price stability. Alternative A would increase the monthly flow of purchases of agency MBS to \$50 billion per month beginning in January and would increase the flow of purchases of longer-term Treasury securities to \$50 billion per month after the MEP concludes.² Moreover, the draft statement for Alternative A indicates that the purchases will continue until the Committee 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 contrast, Alternative C announces that purchases of both MBS and longer-term Treasury securities will stop at year-end. Both Alternatives A and B would continue to indicate that the Committee will also take into

¹ The sales side of the MEP will, by the end of the year, have brought down to near zero the Federal Reserve's holdings of Treasury securities of maturities within three years. Therefore, a renewal of the MEP is not feasible, and those alternatives (A and B) whose policy announcements include continued purchases of longer-term Treasury securities do not include sales of shorter-term Treasuries.

² Staff analysis suggests that agency MBS purchases of \$50 billion per month in addition to reinvestments appear feasible over the first six months of next year, even though such purchases would account for roughly 93 percent of gross TBA issuance. See the memo, "Agency MBS Market Functioning and Purchase Capacity under the Open-Ended Purchase Program" (by M. Wei of the Federal Reserve Board and M. Ezer, D. Finkelstein, J. Frost, D. Lucca, L. Molloy, J. Moore, M. Raskin, J. Remache, R. Shimonov, and N. Wuerffel of the Federal Reserve Bank of New York). This memo was sent to the Committee on November 30, 2012.

account the likely efficacy and costs of the purchases when deciding on their size, pace, and composition. All three alternatives envision that the Committee will continue to reinvest principal payments on its holdings of agency MBS and agency debt into agency MBS, and all three statements indicate that the Federal Reserve will, in January, resume rolling over maturing Treasury securities at auction.

Under each alternative, the Committee would maintain the 0 to ¼ percent target range for the federal funds rate. However, the alternatives take different approaches to the forward guidance regarding the path of the federal funds rate. Alternative A and one of the two versions of the forward guidance for Alternative B would provide quantitative thresholds that link the Committee’s eventual reconsideration of the target range for the federal funds rate to labor market conditions and the outlook for inflation.³ The draft language for Alternative B states that the Committee “currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6½ percent, inflation between one and two years ahead is projected to be no more than ½ percentage point above the Committee’s 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored.” Alternative A adopts this formulation too, except that the unemployment threshold is 6 percent.

Another new sentence in Alternative B indicates that the Committee views these thresholds as “consistent with its earlier date-based forward guidance.” This sentence does not appear in Alternative A because the 6 percent unemployment threshold in Alternative A would likely amount to a shift in forward guidance toward a longer period of exceptionally low levels of the federal funds rate than was indicated in October.

Further sentences in the new forward guidance in both Alternatives A and B state that other indicators of economic and financial conditions will also enter into the decision to tighten, and that when the Committee begins to remove policy accommodation, it “will take a balanced approach” in line with its statutory mandate.

The other version of the forward guidance in Alternative B is closer to the language used in October. Both versions of the forward guidance in the fifth paragraph

³ 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.

of Alternative B include optional additional language intended to clarify that the firming of the funds rate will occur after the Committee “sees a substantial improvement in the outlook for the labor market” and “the asset purchase program ends.” One variant of the fifth paragraph of Alternative C retains language from the October statement without this new clarifying phrase, while providing the option of stating that highly accommodative policy will remain appropriate for “some time” after the economic recovery strengthens instead of “for a considerable time.” This variant of the paragraph in Alternative C gives the choice of several dates, each prior to mid-2015, through which exceptionally low federal funds rates would be warranted. The other variant of the fifth paragraph of Alternative C describes qualitative factors the Committee will consider in deciding when to raise its target for the funds rate. Specifically, this variant states that the exceptionally low range for the federal funds rate will be appropriate until the Committee “has observed substantial improvement in labor market conditions, provided that the Committee projects that inflation over the medium term will be close to its [2 percent] objective and longer-term inflation expectations remain stable.”

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.

Table 1: Overview of Policy Alternatives for the December 12 FOMC Statement

Selected Elements	October Statement	December Alternatives		
		A	B	C
Economic Outlook				
Outlook	without sufficient policy accommodation, economic growth might not be strong enough	without further policy accommodation, economic growth might not be strong enough	unchanged	economic growth will pick up gradually ; unemployment rate will continue to decline at a mandate-consistent pace
	inflation likely would run at or below 2 percent	inflation likely will run at or below 2 percent		inflation will run near 2 percent
Balance Sheet Policies				
MEP	continue through end of year	complete at end of year		
Agency MBS	\$40 billion per month	raise to \$50 billion per month in January	unchanged	discontinue at end of year
Longer-Term Treasuries	none	\$50 billion per month after MEP is completed	initially \$45 billion per month after MEP is completed	none
Securities Reinvestment	principal payments from agency securities into agency MBS	unchanged		
	redeem maturing Treasuries	in January, resume rolling over maturing Treasury securities at auction		
Guidance	if outlook for labor market does not improve substantially, will continue employing policy tools as appropriate until...	essentially unchanged...		prepared to take further action as needed to promote sustained improvement in labor market conditions in a context of price stability
	... such improvement is achieved in a context of price stability	... conditions are consistent with outlook for sustained progress toward objectives	unchanged	
	will take account of efficacy and costs	unchanged		n.a.
Federal Funds Rate				
Target	0 to ¼ percent	unchanged		
Guidance	highly accommodative policy for a considerable time after economic recovery strengthens...	highly accommodative policy for a considerable time after [substantial improvement in outlook for labor market, asset purchase program ends, and] economic recovery strengthens...	highly accommodative policy for [a considerable some] time after economic recovery strengthens...	
	n.a.	<p>quantitative thresholds: at least as long as unemployment rate above [A: 6 B: 6½] percent, inflation one- to two-years ahead is no more than ½ percentage point above 2 percent, and longer-term inflation expectations remain well anchored; [B: these thresholds are consistent with earlier date-based guidance;] will also consider other information; when begin to remove accommodation, will take balanced approach consistent with [satisfactory progress toward objectives longer-run goals]</p> <p style="text-align: center;">OR</p>	<p>qualitative thresholds: until observe substantial improvement in labor market conditions, provided inflation over the medium term will be close to [2 percent] objective and inflation expectations remain stable</p> <p style="text-align: center;">OR</p>	
	date-based: at least through mid-2015	n.a.	unchanged	at least through [late 2014 mid-2014 late 2013]



OCTOBER FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in 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 advanced a bit more quickly, but growth in business fixed investment has slowed. The housing sector has shown some further signs of improvement, albeit from a depressed level. Inflation 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 remains concerned that, without sufficient policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely 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 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, 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.

DECEMBER FOMC STATEMENT—ALTERNATIVE A

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** suggests that economic activity has continued to expand at a moderate pace in recent months, **apart from weather-related disruptions**. Growth in employment has been slow, and the unemployment rate remains elevated. Household spending has **continued to** advanced ~~a bit more quickly~~, but growth in business fixed investment has slowed. The housing sector has shown some further signs of improvement, albeit from a depressed level. Inflation ~~recently picked up somewhat~~, **has been running somewhat below the Committee's longer-run objective, apart from temporary variations that largely** reflecting higher **fluctuations in** energy prices. Longer-term inflation expectations have remained stable.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee remains concerned that, without sufficient **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~~ **will** run at or below its 2 percent objective.
3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee ~~will continue purchasing~~ **agreed today to increase its purchases of** additional agency mortgage-backed securities at **to** a pace of \$40 **\$50** billion per month **beginning in January**. The Committee also will ~~continue through the end of the year~~ **purchase longer-term Treasury securities at a pace of \$50 billion per month after** its program to extend the average maturity of its holdings of Treasury securities, ~~and it~~ **is completed at the end of this year**. **The Committee** is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities **and, in January, will resume rolling over maturing Treasury securities at auction**. These actions, which together will increase the Committee's holdings of longer-term securities by about \$85 **\$100** billion each **per** 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 **Treasury and** agency mortgage-backed 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 [it sees a substantial improvement in the outlook for the labor market, the asset purchase program ends, and] 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~~ this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6 percent, inflation between one and two years ahead is projected to be no more than ½ percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with [maintaining satisfactory progress toward maximum employment in a context of price stability | its longer-run goals of maximum employment and inflation of 2 percent].

DECEMBER FOMC STATEMENT—ALTERNATIVE B

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** suggests that economic activity has continued to expand at a moderate pace in recent months, **apart from weather-related disruptions**. Growth in employment has ~~been slow~~ **picked up a bit**, and ~~but~~ the unemployment rate remains elevated. Household spending has **continued to** advanced ~~a bit more quickly~~, **and the housing sector has shown further signs of improvement**, but growth in business fixed investment has slowed. ~~The housing sector has shown some further signs of improvement, albeit from a depressed level.~~ Inflation recently ~~picked up somewhat~~, **has been running somewhat below the Committee's longer-run objective, apart from temporary variations that largely** reflecting higher **fluctuations in** energy prices. Longer-term inflation expectations have remained stable.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee remains concerned that, without sufficient policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely ~~would~~ **will** run at or below its 2 percent objective.
3. To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee will continue purchasing additional agency mortgage-backed securities at a pace of \$40 billion per month. The Committee also will ~~continue through the end of the year~~ **purchase longer-term Treasury securities after** its program to extend the average maturity of its holdings of Treasury securities, ~~and it~~ **is completed at the end of the year, initially at a pace of \$45 billion per month. The Committee** is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities **and, in January, will resume rolling over maturing Treasury securities at auction. Taken together,** these actions, ~~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 **Treasury and** 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 [it sees a substantial improvement in the outlook for the labor market, the asset purchase program ends, and] 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~~ this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6½ percent, inflation between one and two years ahead is projected to be no more than ½ percentage point above the Committee’s 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. The Committee views these thresholds as consistent with its earlier date-based guidance. In determining how long to maintain a highly accommodative stance of monetary policy, the Committee will also consider other information, including additional measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial developments. When the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with [maintaining satisfactory progress toward maximum employment in a context of price stability | its longer-run goals of maximum employment and inflation of 2 percent].

OR

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 [it sees a substantial improvement in the outlook for the labor market, the asset purchase program ends, and] 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.

DECEMBER FOMC STATEMENT—ALTERNATIVE C

1. Information received since the Federal Open Market Committee met in ~~September~~ **October** suggests that economic activity has continued to expand at a moderate pace in recent months, **apart from weather-related disruptions**. Growth in employment has ~~been slow~~ **strengthened somewhat**, and the unemployment rate, ~~remains~~ **though still** elevated, **has declined**. Household spending has advanced a bit more quickly, but growth in business fixed investment has slowed. **Private domestic demand has continued to advance, and** the housing sector has shown some further signs of improvement, ~~albeit from a depressed level~~. Inflation ~~recently picked up somewhat, reflecting higher energy prices~~ **has been running close to the Committee's longer-run objective**. Longer-term inflation expectations have remained stable.
2. Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee ~~remains concerned that, without sufficient policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions~~ **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 at a pace that the Committee judges consistent with its 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. **In light of the improving economic outlook, the Committee judges that it has provided sufficient policy accommodation** to support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its ~~current~~ mandate. **Accordingly**, the Committee will, **at the end of the year, discontinue** purchasing additional agency mortgage-backed securities at a pace of \$40 billion per month. **and complete** The Committee also will continue through the end of the year its program to extend the average maturity of its holdings of Treasury securities. ~~and it~~ **The Committee** is maintaining **continuing** its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities **and, in January, will resume rolling over maturing Treasury securities at auction**. These actions, which together will ~~increase~~ **keep** the Committee's holdings of longer-term securities by about \$85 billion each month through the end of the year, **at a level of about \$2.8 trillion, will maintain a highly accommodative stance of monetary policy and should put sustain** downward pressure on longer-term interest rates, support mortgage markets, and help to ~~make~~ **keep** broader financial conditions ~~more~~ accommodative.

Alternatives

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 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 **this exceptionally low range for the federal funds rate will be appropriate until it has observed substantial improvement in labor market conditions, provided that the Committee projects that inflation over the medium term will be close to its [2 percent] objective and longer-term inflation expectations remain stable.**

OR

- 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 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**].

THE CASE FOR ALTERNATIVE B

The Committee might judge that the medium-term outlook for economic activity has changed only modestly since the October meeting, and that fostering substantial improvement in the outlook for the labor market will require a continuation of the recent pace of asset purchases, as in Alternative B. Policymakers may see recent data, even after adjusting for weather effects, as reinforcing their judgment that real GDP growth is not, and, absent additional purchases, will not be sufficient to produce sustained progress toward maximum employment. Moreover, they may view inflation as having remained somewhat below the Committee's longer-run objective, especially when temporary variations that reflect recent fluctuations in energy prices are excluded; in addition, participants may see inflation as likely to remain subdued over the medium term. Participants might additionally note that measures of medium- and longer-run inflation compensation have been relatively stable over the intermeeting period and that the mean and median of the primary dealers' medium-term forecasts for inflation are roughly unchanged from their values ahead of the October FOMC meeting. Accordingly, participants might judge that inflation expectations remain well anchored. Against this backdrop, the Committee may conclude that it is appropriate to continue purchases of agency MBS at a pace of \$40 billion per month and, once the MEP is completed, to maintain the Federal Reserve's \$45 billion per month rate of acquisition of longer-term Treasuries.⁴

Policymakers may judge that downside risks to the outlook for economic activity—particularly from the euro-area crisis and unresolved U.S. fiscal policy decisions—remain quite elevated. While noting that financial conditions in the euro area have improved slightly, on balance, since October, policymakers may see non-trivial odds that the euro-area crisis could deepen next year and produce a very substantial drag on U.S. economic growth. Some policymakers may also see a sizable probability that fiscal policy could tighten more sharply at the turn of the year than in their baseline projections. Nonetheless, policymakers may anticipate that the January meeting will provide a better vantage point for assessing the fiscal situation, and for determining whether monetary policy accommodation, beyond that implied by the current pace of

⁴ The Desk's proposed distribution for the Treasury securities purchases under Alternatives A and B implies a 9-year duration of purchases, about the same as the duration of net purchases under the MEP but greater than under LSAP1 or LSAP2.

asset purchases, is needed to help lean against the effects of tighter fiscal policy on economic activity and inflation. A decision made in early 2013 rather than in December might also put policymakers in a better position to reach judgments about the extent of improvement in euro-area financial markets and to adjust for distortions to incoming data arising from the immediate impact of Hurricane Sandy. Taking these considerations together, policymakers may judge it appropriate to continue existing monthly flows of asset purchases at this meeting, and await additional information before deciding on any adjustment to the pace and composition of the Committee's asset purchases.

Some policymakers may view the economic outlook as somewhat brighter than in October and see the risks to the outlook as having diminished in recent months, perhaps because they tend to put greater weight on the underlying growth in payroll employment, the signs of improvement in the housing market, and reduced financial strains in the euro area. These policymakers may nonetheless judge that the information received to date does not imply a substantial improvement in the outlook for the labor market and conclude that the present flows of asset purchases should be continued at this meeting, as in Alternative B.

Some participants may concur that labor market conditions point to the need for continuing policy accommodation but may see the costs and risks associated with an ongoing expansion of the Committee's securities holdings as potentially outweighing the likely benefits at some stage. These participants may nevertheless favor continuing for the time being the present flows of purchases of longer-term securities. While staying on alert for signs that costs of asset purchases are becoming more important, members may currently judge that the costs of purchases are likely to be low in comparison with the benefits. Moreover, some members may view the language in Alternative B that the new year's Treasury purchases will proceed "initially at a pace of \$45 billion per month" as useful in conveying the message that purchases could be scaled back if evidence emerged of rising costs of purchases.

With respect to the forward guidance for the federal funds rate, policymakers may judge that explicit quantitative thresholds for unemployment and inflation would more clearly communicate the Committee's policy intentions than the date-based language in recent statements. They may regard a move to such thresholds as more likely than date-based guidance to promote a situation in which the responses of financial asset prices to changes in the outlook are of a direction and magnitude that are consistent with the

Committee's reaction function. They also may view the December meeting as a convenient time to introduce new forward guidance because the change can be explained and underscored at the post-meeting press conference.

Policymakers may also wish to make explicit that the threshold language, while intended to provide greater clarity about the Committee's reaction function, does not signal a change in the Committee's assessment of the likely future path of the federal funds rate. In particular, participants may view thresholds for the unemployment rate of 6½ percent and for projected inflation between one and two years ahead of "no more than ½ percentage point above the Committee's 2 percent longer-run goal" as broadly consistent with the version of the date-based forward guidance used since September.⁵ Policymakers may therefore favor inclusion in the Committee's statement of a sentence, like that in the fifth paragraph of Alternative B, indicating that the Committee views the thresholds language as consistent with its earlier date-based forward guidance. Policymakers may regard this sentence as useful to include in the December statement, as the Committee transitions from date-based to thresholds-based guidance concerning the federal funds rate target, but see no need to include this sentence in subsequent statements. The draft statement in Alternative B also indicates that the Committee will continue to take a balanced approach toward meeting its objectives after a threshold is crossed. The Committee might wish to provide such guidance in light of the important role that expectations of interest-rate policy after the Committee begins to remove policy accommodation play in shaping current financial conditions. If they favor adopting quantitative thresholds, policymakers may also view a reference to the Committee's "longer-run goals of maximum employment and inflation of 2 percent" as a valuable way to round off the new forward guidance language, on the grounds that this reference underlines the distinction between the thresholds and the Committee's statutory objectives. Alternatively, if policymakers regard this distinction as adequately highlighted by the paragraph's earlier reference to the Committee's longer-run goal of 2 percent inflation, they may prefer to conclude the forward guidance language with a reference to "maintaining satisfactory progress toward maximum employment in a context of price stability."

⁵ Such a judgment would be in line with the staff analysis provided in the memo, "Using Thresholds to Clarify the Conditionality in the Committee's Forward Guidance for the Federal Funds Rate," cited earlier.

Some policymakers, while agreeing with the overall settings of policy associated with Alternative B, may think that date-based forward guidance is a more effective way of communicating policy. Other policymakers might accept the desirability in principle of including thresholds in the statement but may regard the quantitative specification of the thresholds as an issue that requires further analysis before thresholds could be announced. These policymakers may prefer a statement along the lines of the variant in paragraph 5' of Alternative B that preserves the date-based forward guidance language.

Members may see the additional optional language in both versions of paragraph 5 of Alternative B—language that indicates that a highly accommodative policy will continue after the Committee “sees a substantial improvement in the outlook for the labor market, the asset purchase program ends, and the economic recovery strengthens”—as potentially helpful in further clarifying the likely sequence of the Committee’s policy steps as the economy improves. However, other members may regard this distinction as already well understood by market participants. They may view the optional language as unnecessary and liable to create confusion if added to the statement.

The Desk’s latest survey of 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 MBS purchases of \$40 billion a month and to continue acquiring longer-term Treasury securities at a pace of \$45 billion per month after the MEP comes to a close, as in Alternative B. The survey further suggests that dealers assign a high probability to the eventual adoption by the Committee of threshold language, and that thresholds of 6½ percent for unemployment and 2½ percent for inflation (as in Alternative B) are broadly consistent with market participants’ expectations of the quantitative form that thresholds would likely take. However, the survey also indicates that dealers do not see a move to thresholds at this meeting as all that likely. All told, a December statement along the lines of Alternative B would not surprise market participants in terms of the announced flows of asset purchases, but the shift to thresholds-based forward guidance would be somewhat unexpected. The degree to which this new form of the forward guidance led to an appreciable market reaction would likely be tempered by the indication in the statement that the Committee regards the thresholds as consistent with its earlier date-based guidance. However, longer-term interest rates could rise somewhat if the phrase “initially at a pace of \$45 billion per month” is taken to imply that purchases may be scaled back in a few months.

THE CASE FOR ALTERNATIVE A

Some policymakers may instead see the medium-term outlook as still sufficiently weak to justify announcing further policy accommodation immediately, as in Alternative A. These members may have doubted that the amount of policy accommodation provided via the last two meetings' decisions regarding flow-based asset purchases was sufficient to generate satisfactory progress toward the Committee's goals of maximum employment and 2 percent inflation in the longer term. Information since the October meeting may have reaffirmed their earlier assessment that, absent an increase in the pace of asset purchases, sustained improvement in labor market conditions is likely to take an unacceptably long time.

Those members who see the outlook as unsatisfactory may also point to the fact that the gradual firming in economic activity that they projected earlier appears less likely given the softer tone of incoming economic data, particularly on household income and spending. Moreover, members may see recent inflation rates as somewhat below the Committee's longer-run goal of 2 percent and, especially now that upward pressure on energy prices has abated, might expect that inflation will continue to run appreciably below the Committee's 2 percent longer-run objective for the next several years, even with asset purchases continuing at their present \$85 billion per month pace well into next year. Thus, for some members, the underlying weakness in economic activity and low inflation may suggest the need for further policy accommodation, in the form of a stepping-up in the pace of purchases of both longer-term Treasury securities and agency mortgage-backed securities.

Moreover, policymakers may think that stepping up the pace of purchases of agency MBS 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 and boosting household wealth. They may further regard an announcement of increased purchases of longer-term Treasury securities as providing desirable downward pressure on longer-term interest rates while continuing the broad outlines of the Treasury purchase policy included in the MEP. These policymakers may anticipate that these further purchases of Treasuries and agency MBS would raise market participants' expectations of the ultimate stock of securities acquired by the Federal Reserve under the flow-based purchase program, and thereby make financial conditions more accommodative. Policymakers might view such a shift to greater accommodation as

warranted by the weak outlook that is in prospect in the absence of further expansionary measures. Furthermore, participants may see the purchases made by the Committee since September as having had stronger effects on financial conditions than they had anticipated, without an offsetting increase in costs, suggesting that larger purchases would be desirable.

Other members who previously viewed the Committee as having established an appropriately accommodative monetary policy stance may have come to reassess their position in light of recent months' financial market developments. These members may regard financial conditions as having become less accommodative in the last couple of months as a result of lower equity prices and a higher dollar, and they may see financial conditions as poised to become still less accommodative in the absence of a shift to a greater pace of purchases. If so, they might view the pace of purchases previously decided upon by the Committee, while appropriate in September and October, as now inadequate.

While acknowledging some improvement in the outlook for the euro area since the October meeting, members may feel that risks to the economic outlook stemming from the euro-area crisis are still heavily weighted to the downside. Moreover, they may see further downside risks associated with a sharper-than-expected U.S. fiscal tightening and a greater-than-anticipated slowdown in China. Members may also judge that the consequences of a new adverse shock at a time when the economy remains weak are 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 further policy accommodation. They may also think it would be useful to indicate that asset purchases will continue until the Committee "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 addition, policymakers might view a move to a thresholds-based formulation of the forward guidance for the federal funds rate as a useful complement to their announcement of increased flows of purchases and their guidance regarding the purchase policy.

The Desk's latest survey shows a median dealer expectation that the Committee will announce that it will continue purchases of MBS at a pace of \$40 billion per month and Treasury securities at \$45 billion per month. An announcement like Alternative A

that raised the flows of each of these monthly purchases to \$50 billion per month would thus come as a considerable surprise to market participants, and it would likely prompt investors to mark upward the projected amount of securities that the Federal Reserve will acquire under its flow-based program. Moreover, while dealers do expect threshold language to be adopted by the FOMC eventually, the 6 percent unemployment threshold in Alternative A is lower, and so implies a more expansionary policy, than dealers expect to be associated with thresholds-based guidance. In response to a statement like Alternative A, longer-term real interest rates likely would decline somewhat, reflecting a higher projected peak for Federal Reserve securities holdings and a lower expected path for the federal funds rate. Inflation compensation and equity prices might rise, and the dollar could depreciate. However, if investors read the statement of Alternative A as indicating that the FOMC has a relatively gloomy outlook for growth and employment, equity prices would rise by less or could even decline.

THE CASE FOR ALTERNATIVE C

Some participants might see the recent data as suggesting that, adjusting for temporary factors such as the effects of the drought and the disruptions from Hurricane Sandy, the underlying pace of economic recovery and rate of employment gains have improved, on balance, in recent months. Policymakers might point not only to recent months' labor market reports but also to the further signs of improvement in the housing market. Indeed, after smoothing through the month-to-month fluctuations in recent data, policymakers may see the economic recovery as having reached a sustainable course that is likely to be associated with ongoing improvements in labor market conditions. Furthermore, they may view financial strains in Europe—and the corresponding downside risks to the U.S. economy—as having eased further since October. As a result, they may see the monetary policy settings put in place by the Committee since September as having provided sufficient accommodation and so choose to bring asset purchases to a close at year-end, as in Alternative C.

Moreover, some policymakers may regard the potential benefits of additional asset purchases under present circumstances as likely to be small and unlikely to outweigh the costs. They may view the accommodation already provided by Federal Reserve purchases as having laid the groundwork for the unemployment rate to decline at a pace consistent with achieving the Committee's statutory mandate over the medium term. In addition, participants may see inflation as having been near the Committee's

longer-term goal of 2 percent and as likely to pick up if withdrawal of policy accommodation does not begin before long. They may agree that longer-term inflation expectations remain well anchored for the time being but perceive upside risks to the inflation outlook in both the near term and the medium run unless asset purchases are promptly discontinued and policy normalization commences sooner than expected in markets.

Some members may also be concerned that a continuation of asset purchases beyond the end of this year would likely be inconsistent with the exit strategy principles announced by the Committee in June 2011, and they may worry that making an adjustment to the exit strategy principles at this point could weaken the credibility of the Committee's announcements about future monetary policy. In addition, members could see further asset purchases as raising the odds that the Federal Reserve realizes significant losses during exit and be worried about the communications and political issues that such losses could raise.⁶

Some policymakers, moreover, may be skeptical that the downward pressure on longer-term interest rates from additional Treasury and MBS purchases would have a significant effect on macroeconomic outcomes. For example, they may feel that lower longer-term interest rates would prompt corporations to restructure their balance sheets but would have little impact on their investment and hiring decisions. Alternatively, they may worry that further purchases by the Federal Reserve of safe assets when longer-term interest rates are already quite low could lead to excessive risk-taking and other imbalances that might undermine financial stability over time. In light of these concerns, policymakers may prefer to adopt a statement like that in Alternative C, which indicates that the Committee will cease expanding the Federal Reserve's balance sheet at the end of this year.

If policymakers judge that the recovery is presently on a course that will generate sustained reductions in unemployment, and that the present stance of monetary policy risks a rise in 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,

⁶ See the analysis of Federal Reserve income under various purchase scenarios in the memo, "Options for Continuation of Open-Ended Asset Purchases in 2013" (by A. Figura, J. Huther, J. Ihrig, J. Kandrac, D. Kim, E. Klee, D. Reifschneider, J. Roberts, and M. Wei of the Federal Reserve Board, and A. Cambron, M. Ezer, J. Frost, D. Leonard, J. Remache, and N. Wuerffel of the Federal Reserve Bank of New York). This memo was sent to the Committee on November 30, 2012.

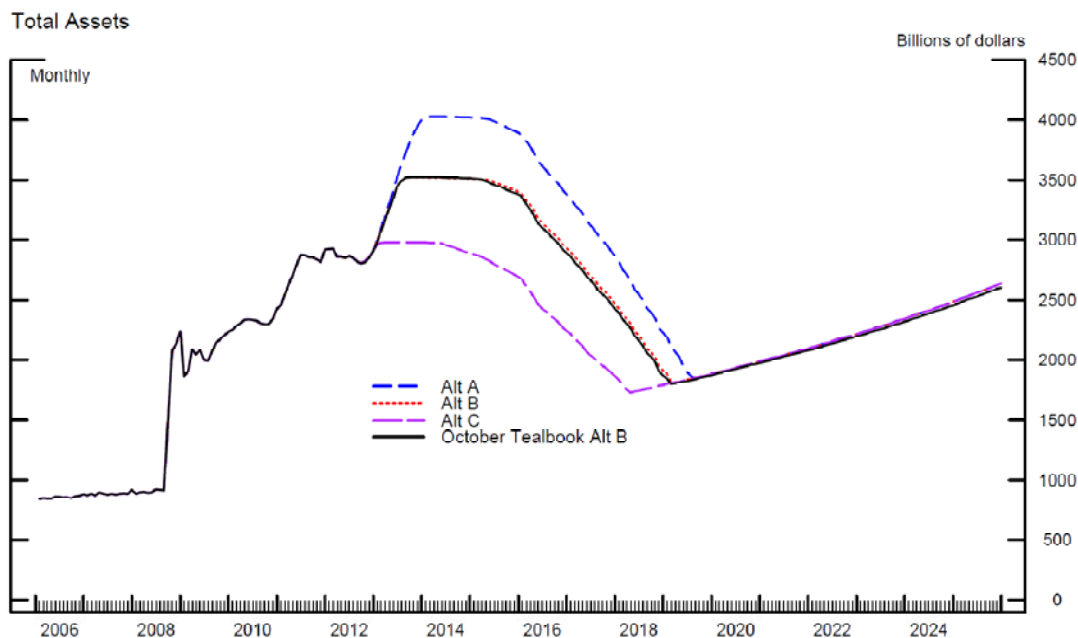
they might consider it appropriate to begin scaling back the public's expectations of how long the federal funds rate will remain at its current exceptionally low level. If so, they might favor a statement like the version of Alternative C that includes paragraph C.5', which alters the existing date-based forward guidance in the direction of a 2013 or 2014 date for initial policy firming. 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 lays out in somewhat greater detail the key economic factors that will figure in the Committee's decisions concerning 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 more rapid removal of policy accommodation than investors had expected. According to the Desk's survey, primary dealers expect purchases of longer-term securities to continue well beyond December, and to proceed at their present pace. The primary dealers also anticipate little change to 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. The upward movement in longer-term interest rates would be reinforced by the announcement, in Alternative C, that additional asset purchases will be discontinued at the end of the year. Equity prices would probably fall significantly, 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 lead 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 Alternatives A, B, and C.⁷ All options assume that the maturity extension program is completed at the end of December and that \$40 billion of agency mortgage-backed securities (MBS) are purchased in December, resulting in about \$250 billion in purchases of longer-term securities from October to December 2012. Alternatives A and B include asset purchases that continue beyond the end of the year and assume that the Committee maintains an exceptionally low federal funds rate until October 2015. In contrast, Alternative C ends purchases at the end of this year and has the federal funds rate lift off from its lower bound in October 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.

Alternatives



⁷ For additional analysis of a number of possible asset purchase options, see the memo titled “Options for Continuation of Open-Ended Asset Purchases in 2013” by Board and FRBNY staff sent to the Committee on November 30, 2012 (hereafter “the options memo for the December FOMC”).

For the balance sheet scenario that corresponds to Alternative B, the Committee is assumed to continue MBS purchases at \$40 billion per month and make additional purchases of longer-term Treasury securities of \$45 billion per month through June 2013. These roughly \$500 billion in additional purchases in 2013, when combined with the \$250 billion in purchases from October through December 2012, imply a total expansion of SOMA holdings of longer-term securities of about \$750 billion.⁸ This scenario might be viewed as roughly consistent with the description of asset purchases in Alternative B.⁹ Overall, under this scenario, SOMA securities holdings increase to about \$3.3 trillion by December 2013.

In the Alternative B scenario, we assume that the first increase in the target federal funds rate is in October 2015 as in the staff forecast.¹⁰ The date of liftoff is a key determinant of the trajectory of the balance sheet. In April 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.¹¹ In April 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 March 2021. Through these redemptions and sales, the size of the portfolio is normalized by March 2019.^{12, 13} The balance sheet then begins to expand,

⁸ This amount does not include purchases conducted in September 2012. Although the SOMA portfolio's holdings of longer-term securities increases by about \$750 billion between October 2012 and June 2013, total securities holdings increase by less because of the asset sales and redemptions under the MEP.

⁹ 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 near 8 percent in mid-2013 to 7¾ percent in mid-2014 and to 7½ percent in late 2014. Alternatively, by mid-2013, the Committee could end the purchase program based on its assessment of the efficacy and costs of additional asset purchases.

¹⁰ At the time of liftoff, the unemployment rate is projected to be 6.5 percent, and core PCE inflation is expected to be 1.7 percent. This liftoff date for the federal funds rate is two months later than that assumed in the balance sheet projections for Alternative B in the October Tealbook and is consistent with the policy assumption in the current staff forecast in Tealbook Book A.

¹¹ After the end of the MEP, the Committee is assumed to reinstate its policy of reinvesting principal payments from Treasury securities at auction. It is also assumed to continue reinvesting principal payments from agency MBS and agency debt securities into agency MBS. The effect of assuming reinvestment of Treasury securities at auction is very modest; after the completion of the MEP, there will be less than \$6 billion of Treasury securities in the SOMA portfolio that mature before January 2016.

¹² 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

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

The additional purchases of securities through the middle of 2013 significantly increase the level of SOMA holdings and reserve balances through the medium term. Sales of agency MBS after the federal funds rate increases are projected to result in realized capital losses.¹⁴ These capital losses in conjunction with the rise in interest expense on reserve balances substantially reduce Federal Reserve net income; the Federal Reserve makes modest remittances to the Treasury in 2017, 2018, and 2019, but no deferred asset is recorded.¹⁵

In the scenario for Alternative A, the Committee is assumed to continue its current purchases of MBS through the end of the year, as well as complete the MEP. Beginning in January 2013, the Committee is assumed to increase the pace of purchases of Treasury securities and agency MBS to \$50 billion each per month. Around midyear, the Committee is assumed to begin to taper purchases and at year-end it stops all purchases. These purchases total \$1 trillion in 2013, which, when combined with the \$250 billion in purchases from October through December 2012, ultimately expand the SOMA portfolio's holdings of longer-term securities by about \$1.25 trillion. This

repurchase agreements or term deposits—but would not produce an overall change in the size of the balance sheet.

¹³ The size of the balance sheet is assumed to be normalized when the securities portfolio reverts to its longer-run trend level, determined largely by currency in circulation plus Federal Reserve capital and a projected steady-state level of reserve balances. The projected timing of the normalization of the size of the balance sheet depends importantly on the level of reserve balances that is assumed to be necessary to conduct monetary policy; currently, we assume that level of reserve balances to be \$25 billion. A higher demand for reserve balances would, all else equal, lead to an earlier normalization of the size of the balance sheet.

¹⁴ Under Reserve Bank accounting, securities held in the SOMA portfolio are recorded on an amortized cost basis. As a result, realized losses and gains on securities sold affect the Federal Reserve's net income; unrealized losses and gains are not reflected in net income.

¹⁵ Alternative B is similar to the \$750 billion purchase program scenario presented in the options memo for the December FOMC. Balance sheet and income projections in that memo are based on the interest rate assumptions from the October Tealbook. Based on those interest rate assumptions, the projections for the \$750 billion purchase program in the options memo and for Alternative B in the October Tealbook suggested that the Federal Reserve experiences a temporary period of operating losses. As a result, remittances to Treasury cease for a time and a small deferred asset is booked on the balance sheet at year-end in 2017, 2018, and 2019, peaking at about \$4 billion in 2018. Remittances are higher, and a deferred asset is not booked, in the current projection for Alternative B because the interest rate assumptions are lower than in the previous Tealbook in 2015 through 2020, reflecting a downward revision to the projection for economic activity and an associated widening of the output gap. The lower assumed path of interest rates significantly dampens the rise in interest expense and reduces realized capital losses relative to the last Tealbook.

scenario might be viewed as roughly consistent with the descriptions of asset purchases in Alternative A, with the tapering allowing the Committee to wind down purchases as the economy makes “sustained progress toward maximum employment in a context of price stability.”¹⁶ The Committee continues reinvesting principal payments from agency MBS and agency debt securities into agency MBS, and, after the MEP is complete, reinstates its policy of reinvesting principal payments from Treasury securities at auction. In this scenario, total assets increase to \$4.0 trillion. In April 2015, six months prior to the assumed first increase in the federal funds rate in October 2015, all reinvestment is assumed to cease 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. The size of the portfolio is normalized by August 2019—about three-and-a-half years after sales begin, and somewhat longer than the timeframe anticipated in the exit strategy principles.¹⁷ (See the box, “Implications of Additional Securities Purchases for the Exit Strategy Principles” for more discussion.)

The additional purchases of securities in this scenario substantially boost the level of reserve balances. As the federal funds rate rises in 2016 and 2017, the interest expense on reserve balances increases quickly. The interest expense combined with the losses realized on the sales of agency MBS result in an operating loss, which causes remittances to the Treasury to cease and a small deferred asset to be recorded on the balance sheet at year-end in 2017, 2018, and 2019. The deferred asset peaks at about \$4 billion in early 2019.¹⁸

¹⁶ Under the staff’s baseline forecast, by mid-2013, the longer run outlook will have improved somewhat. In late 2013, payrolls will have been increasing at a pace of close to 170,000 per month for a few months, the unemployment rate will have fallen some, and real GDP will be expanding at about a 3 percent annual rate. The outlook for labor market conditions as of late 2013 would include a half percentage point decline in the unemployment rate through late 2014 and a one and a quarter percentage point decline through late 2015.

¹⁷ In Alternative A, MBS are sold over a five-year period. 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.

¹⁸ Alternative A is similar to the \$1.25 trillion purchase programs presented in the options memo for the December FOMC. In those projections, as well as in October Tealbook’s Alternative A, a deferred asset was recorded on the balance sheet at year end from 2017 to 2021, peaking at about \$45 billion in 2020. The deferred asset is smaller in the current projection reflecting a lower assumed path for interest rates than in the October Tealbook. The lower interest rate path, in turn, implies a more modest increase in interest expense on reserve balances and lower realized capital losses on MBS sales over the projection period.

For the scenario that corresponds to Alternative C, the Committee is assumed to purchase MBS only through the end of this year, after which no additional asset purchases are undertaken. In this scenario, the federal funds rate is assumed to lift off in October 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 April 2014, and the portfolio begins to contract. Sales of agency securities commence in April 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 April 2018, 11 months earlier than under Alternative B.

Across scenarios, the peak amount of reserve balances and the level of reserve balances outstanding at liftoff are directly related to the magnitude of assumed asset purchases. Under Alternative A, reserve balances peak at about \$2.7 trillion, while under Alternative B, reserve balances peak at \$2.2 trillion. Under Alternative C, reserve balances rise only slightly from their current level to \$1.7 trillion. For the scenarios corresponding to Alternatives B and A, reserve balances are \$1.9 trillion and \$2.4 trillion, respectively, when the federal funds rate lifts off from its lower bound in October 2015. For the scenario corresponding to Alternative C, reserve balances are \$1.5 trillion when the federal funds rate lifts off from its lower bound in October 2014.

In the scenario corresponding to Alternative B, the monetary base increases substantially from 2012 to 2013 because of the purchase program and the accompanying increase in reserve balances. Once exit begins, the monetary base shrinks rapidly through the second quarter of 2019, primarily reflecting a decline in reserve balances as securities are redeemed or sold. Starting in the third quarter of 2019, after reserve balances are assumed to have stabilized at \$25 billion, the monetary base begins to expand again, in line with the growth of Federal Reserve notes in circulation. Under Alternative A, the monetary base increases from 2012 to 2014 as the level of reserve balances climbs in concert with the expansion of the Federal Reserve's balance sheet. The base then contracts during the exit until after the size of the portfolio is normalized. Under Alternative C, the monetary base increases a bit from 2012 to 2013—rising with the delayed settlement of MBS purchases undertaken in 2012 as well as with the growth of currency—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	October Alternative B
Percent, annual rate				
Monthly				
Apr-12	-12.2	-12.2	-12.2	-12.3
May-12	-8.7	-8.7	-8.7	-8.7
Jun-12	-5.1	-5.1	-5.1	-5.1
Jul-12	7.7	7.7	7.7	7.7
Aug-12	7.8	7.8	7.8	7.7
Sep-12	-12.4	-12.4	-12.4	-12.4
Oct-12	-8.9	-8.9	-8.9	1.1
Nov-12	32.6	32.5	32.5	28.9
Dec-12	37.9	37.8	38.5	23.1
Quarterly				
2011 Q3	21.0	21.0	21.0	21.0
2011 Q4	-5.9	-5.9	-5.9	-5.9
2012 Q1	5.5	5.5	5.5	5.5
2012 Q2	-3.9	-3.9	-3.9	-3.9
2012 Q3	0.8	0.8	0.8	0.8
2012 Q4	6.6	6.5	6.6	7.5
2013 Q1	36.4	38.2	24.0	28.3
2013 Q2	30.2	38.6	-4.2	30.1
Annual - Q4 to Q4				
2010	0.9	0.9	0.9	0.9
2011	32.9	32.9	32.9	32.9
2012	2.2	2.2	2.2	2.5
2013	25.7	40.4	5.5	25.1
2014	-0.6	2.5	-1.0	-0.6
2015	-1.3	-1.5	-6.6	-2.4
2016	-13.2	-12.5	-16.7	-14.3
2017	-16.5	-15.9	-18.3	-16.9
2018	-23.4	-22.8	-8.5	-23.9
2019	-7.4	-21.3	4.4	-6.2
2020	4.6	4.6	4.6	4.4
2021	4.6	4.6	4.6	4.4
2022	4.6	4.6	4.6	4.5
2023	4.7	4.7	4.7	4.6
2024	4.7	4.7	4.7	4.7
2025	4.7	4.7	4.7	4.7

Note: Not seasonally adjusted.



Implications of Additional Securities Purchases for the Exit Strategy Principles

Since the Committee described its exit strategy principles in June 2011, the SOMA portfolio and its likely evolution, along with the outlook for the economy and interest rates, have changed considerably. The change in reinvestment policy increased the share of agency MBS in the portfolio, the maturity extension program lengthened the average duration of the portfolio, the outright agency MBS purchases have expanded the size of the portfolio, and the Committee's extended forward guidance language has pushed out expectations for the timing of the unwinding of the highly accommodative stance of monetary policy. If open-ended purchases continue into 2013, the portfolio will expand further in size and duration.

The balance sheet projections for Alternatives A, B, and C take account of these changes in the portfolio as well as the staff's assumptions regarding the implementation of the Committee's exit strategy principles.¹ In particular, the projections assume that sales of agency MBS proceed over five years, starting six months after the first increase in the target federal funds rate. Under Alternatives B and C, such sales are sufficient to normalize the size of the Federal Reserve's balance sheet over three years or less, consistent with the exit strategy principles. However, under Alternative A, normalization takes somewhat longer—about three and a half years. It would be possible to normalize the size of the balance sheet over three years even in this case if the sales of agency MBS were conducted over a shorter period. However, at some stage the size of the Federal Reserve's portfolio will reach a point where normalization over three years will require sales of agency securities at a pace that may be difficult to achieve without adverse effects on market functioning.² The June 2011 FOMC minutes noted that the Committee is prepared to make adjustments to its exit strategy principles in light of economic and financial developments. Against this backdrop, the Committee may wish to revisit these principles if purchases of longer-term securities continue for long enough. For example, the Committee might want to allow for somewhat longer periods over which to sell agency securities and normalize the size of the balance sheet.

¹ In the June 2011 FOMC minutes, the exit strategy principles noted the anticipated steps and sequence of actions for the removal of policy accommodation and the normalization of the balance sheet. These were listed as:

1. Cease reinvesting some or all principal payments on securities holdings;
2. Modify forward guidance for the path of the federal funds rate and initiate temporary reserve-draining operations;
3. Raise the federal funds target rate and adjust the interest rate on excess reserves to move the federal funds rate toward the target rate;
4. Sell agency securities gradually and steadily over three to five years with the size of the portfolio expected to normalize over two to three years.

² The effect of the pace of agency MBS sales on market functioning is discussed in the memo by Board and FRBNY staff titled "The effect of an additional \$1 trillion LSAP on the exit strategy" sent to the Committee on August 28, 2012.

The Committee could also consider more substantial changes to its exit strategy principles. For example, the Committee could consider strategies in which the portfolio is normalized by allowing securities to run off without the use of sales, or by selling Treasury securities instead of or in addition to agency securities, or by selling securities before raising the target for the federal funds rate. Such changes could materially impact both the level of reserves around the time of lift-off—and so the extent to which reserve draining tools may need to be employed—and the path of income and remittances to the Treasury.³

³ For example, the staff memo on purchase options distributed prior to this meeting noted that allowing securities to run off without sales was consistent with a higher path for Federal Reserve income during exit as well as greater remittances to the Treasury but normalization of the size of the balance sheet would be delayed by about a year under the options with larger purchases.

DEBT, BANK CREDIT, AND MONEY FORECASTS

Domestic nonfinancial sector debt is projected to expand at an annual rate of 4¾ percent in the fourth quarter of 2012, driven by significant expansion in federal government debt and a modest rise in private nonfinancial debt. For the remainder of the forecast period ending in 2015, we expect the rise in domestic nonfinancial debt to slow to about a 3¾ percent pace, on average, as federal debt advances less rapidly and private debt accelerates only gradually. Nonfinancial business debt is forecast to increase at a moderate pace over the projection period, reflecting favorable financing conditions and increasing capital expenditures. The level of home mortgage debt is projected to bottom out in 2013 but only edge up thereafter, as financing conditions are expected to remain tight and a substantial amount of remaining negative home equity continues to damp debt growth. Meanwhile, we project consumer credit to accelerate over most of the forecast period, from a growth rate of about 5½ percent in the fourth quarter of this year to about 7¼ percent in 2015, driven by continued strong demand for student loans and a pickup in spending on consumer durables.

We anticipate commercial bank credit to increase at a moderate pace over the forecast period. Core loans—the sum of commercial and industrial (C&I), real estate, and consumer loans—are projected to increase steadily. C&I loans are expected to rise at a moderate rate over the forecast period, consistent with the projected growth in business investment. We expect growth in both residential real estate and consumer loans to pick up gradually from their currently weak pace, reflecting improvements in borrowers' credit quality and a further gradual easing of standards and terms on such loans. We also anticipate residential real estate lending to be supported by a pickup in residential investment. Commercial real estate loans are projected to accelerate only very slowly over the next three years, as high vacancy rates, depressed prices for commercial properties, and the poor credit quality of existing loans are likely to continue to suppress activity in this sector. Banks' securities holdings are expected to rise at a modest pace, with smaller increases over the forecast period than were posted in 2012, as deposit growth ebbs and demand for bank loans strengthens.

We expect M2 to contract in the first quarter of 2013 following the expiration of the unlimited FDIC insurance on noninterest-bearing transaction deposits at year-end.¹⁹ Subsequently, M2 is forecast to grow, but at a pace below that of nominal income, as the expected improvement in financial and economic conditions over the forecast horizon encourages investors to reallocate their portfolios away from M2 assets and toward riskier investments. M2 is projected to contract towards the end of 2015 in response to the liftoff in the federal funds rate and the accompanying rise in the opportunity cost of holding money.

These reallocations away from M2 assets over the forecast period are expected to depress growth of liquid deposits—the largest component of M2—relative to the rapid pace observed over recent years. With respect to the other components of M2, continuing a trend seen since the end of 2008, retail money funds and small time deposits are projected to contract until late in the forecast period; with interest rates expected to remain low, yields on these products are projected to offer only limited benefits relative to those on investment alternatives. Currency growth is expected to moderate to a pace somewhat above that of nominal income and to continue at that pace through the projection period.

¹⁹ The Dodd-Frank Act provides temporary, unlimited deposit insurance coverage for noninterest-bearing transaction accounts at FDIC-insured institutions from December 31, 2010, through December 31, 2012. For additional background, see the box “Expiration of Unlimited FDIC Deposit Insurance” in the Financial Developments section of Tealbook, Book A.

Growth Rates for M2

(Percent, seasonally adjusted annual rate)

Monthly Growth Rates	Tealbook Forecast*
Apr-12	5.5
May-12	3.8
Jun-12	5.1
Jul-12	9.0
Aug-12	4.5
Sep-12	10.1
Oct-12	11.2
Nov-12	5.9
Dec-12	7.3
Jan-13	-7.5
Feb-13	-4.0
Mar-13	2.0
Quarterly Growth Rates	
2012 Q3	6.7
2012 Q4	8.7
2013 Q1	-0.9
2013 Q2	1.6
2013 Q3	2.1
2013 Q4	2.0
2014 Q1	2.0
2014 Q2	2.3
2014 Q3	2.5
2014 Q4	2.6
2015 Q1	2.8
2015 Q2	2.4
2015 Q3	0.9
2015 Q4	-0.4
Annual Growth Rates	
2012	7.3
2013	1.2
2014	2.4
2015	1.4

* This forecast is consistent with nominal GDP and interest rates in the Tealbook forecast. Actual data through November 26, 2012; projections thereafter.

DIRECTIVE

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

The draft directives for all three Alternatives instruct the Desk to complete the MEP of \$267 billion on schedule by the end of December 2012, and to continue purchasing longer-term Treasury securities after December (either by \$50 billion per month in Alternative A, or by \$45 billion per month in Alternative B). All three directives also instruct the Desk to resume, in January, rolling over maturing Treasury securities at auction. The draft directive for Alternative A directs the Desk to continue purchasing additional agency MBS at a pace of about \$40 billion per month until the end of December 2012 and to raise the flow of purchases to \$50 billion beginning in January 2013; it does not specify an end-date for these purchases. The draft directive for Alternative B instructs the Desk to continue purchasing additional agency MBS at a pace of about \$40 billion per month; it, too, does not specify an end-date. The directive for Alternative C instructs the Desk to continue its purchases of agency MBS at a pace of \$40 billion per month until the end of December 2012. Each of the draft directives would also direct the Desk to continue the current practice of reinvesting principal payments on all agency debt and agency MBS in agency MBS.

October 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 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.

December 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~~ **complete** the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about \$267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about \$267 billion. ~~For the duration~~ **Following the completion** of this program, the Committee directs the Desk to ~~suspend~~ **resume** its policy of rolling over maturing Treasury securities into new issues. **From the beginning of January, the Desk is directed to purchase longer-term Treasury securities at a pace of about \$50 billion per month.** The Committee directs the Desk to maintain its existing policy of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities. The Desk is also directed to continue purchasing agency mortgage-backed securities at a pace of about \$40 billion per month **until the end of December 2012, and to purchase agency mortgage-backed securities at a pace of about \$50 billion per month beginning in January.** 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.

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

December 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~~ **complete** the maturity extension program it announced in June to purchase Treasury securities with remaining maturities of 6 years to 30 years with a total face value of about \$267 billion by the end of December 2012, and to sell or redeem Treasury securities with remaining maturities of approximately 3 years or less with a total face value of about \$267 billion. ~~For the duration~~ **Following the completion** of this program, the Committee directs the Desk to ~~suspend~~ **resume** 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 continue purchasing agency mortgage-backed securities at a pace of about \$40 billion per month **until the end of December 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	$R_t = R_{t-1} + 0.5(\pi_{t+3 t} - \pi^*) + 0.5\Delta^4 gap_{t+3 t}$
Nominal income targeting rule	$R_t = 0.75R_{t-1} + 0.25(2.25 + \pi_t + yn_t - yn_t^*)$

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

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 November 2012 to December 2025. The few balance sheet items that are not discussed below are assumed to be constant over the projection period at the level observed on October 31, 2012. The projections for all major asset and liability categories under each scenario are summarized in the tables that follow the bullet points.

The Tealbook projections for the scenarios corresponding to Alternatives B and A assume that the target federal funds rate begins to increase in October 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 October Tealbook. The projection for the scenario corresponding to Alternative C assumes the target federal funds rate lifts off in October 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.¹

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

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 longer-term Treasury securities through June 2013. Purchases of Treasury securities will continue at a pace of \$45 billion per month and purchases of MBS 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 equal to 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 April 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 April 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 March 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.² The projected rate of prepayment is sensitive to these underlying assumptions.
- In the scenario corresponding to Alternative A, the Committee is assumed to continue its current purchases of MBS through the end of the year, when the MEP concludes, and then continue MBS purchases and additional purchases of longer-term Treasury securities through December 2013. From January through June 2013, the pace of purchases of Treasury securities and MBS will be \$50 billion per month each. After June 2013, the pace of purchases slows, and purchases end in December 2013. The Treasury securities purchased after the conclusion of the MEP are assumed to have an average duration of about nine years. These purchases expand the SOMA portfolio's holdings of longer-term securities by \$1.25 trillion between October 2012 and December 2013. In addition, the Committee is assumed to maintain its existing policy of reinvesting principal payments from its holdings of agency debt and agency MBS in agency MBS. In April 2015, six months prior to the assumed increase in the target federal funds rate in October 2015,

² Projected prepayments of agency MBS reflect interest rate projections as of December 3, 2012.

- principal payments from all securities are allowed to roll off the portfolio. Sales of agency securities begin in April 2016 and continue for five years.
- In the scenario corresponding to Alternative C, the Committee is assumed to purchase MBS only through 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 April 2014—six months prior to the assumed increase in the target federal funds rate under this alternative. Starting in April 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 April 2015. Holdings of agency securities are reduced over five years and reach zero by March 2020.
 - Because current and expected interest rates in the near term are below the average coupon rate on outstanding Treasury securities, the market value at which these securities are purchased will generally exceed their face value, with a larger premium for longer-maturity securities. As a result, in Alternatives B and A, premiums are boosted by roughly \$33 billion and \$41 billion, respectively, by the time asset purchases end. In Alternative C, premiums will increase \$5 billion. The increase in premiums is reflected in higher total assets and in higher reserve balances.
 - The asset purchases under all three alternatives put downward pressure on market interest rates, in particular primary and secondary mortgage rates.
 - The current and near-term market 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, \$620 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, \$25 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, as draws under the recent foreign central bank swap auctions mature; it is assumed to return to zero in early 2013.
 - In all three scenarios, once reserve balances drop to \$25 billion, the Desk begins to purchase Treasury bills to maintain this level of reserve balances going forward. Purchases of bills continue until such securities comprise one-third of the Federal Reserve's total Treasury securities holdings—about the average share prior to the crisis. Once this share is reached, the Federal Reserve buys coupon securities in addition to bills to maintain an approximate composition of the portfolio of one-third bills and two-thirds coupon securities.

Liquidity Programs and Credit Facilities

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

- The assets held by TALF LLC 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 is assumed to not purchase any asset-backed securities. (It would have to make such purchases if an asset-backed security were received by the Federal Reserve Bank of New York in connection with a decision of a borrower not to repay a TALF loan.)
- The assets held by Maiden Lane LLC decline to zero in 2016.

LIABILITIES AND CAPITAL

- Federal Reserve notes in circulation grow in line with the staff forecast for money stock currency through 2015. Afterwards, Federal Reserve notes in circulation grow at the same rate as nominal GDP in the extended Tealbook projection.
- The level of reverse repurchase agreements (RRPs) is assumed to be around \$70 billion, about the average level of RRP associated with foreign official and international accounts observed over the past three years.
- Balances held in the U.S. Treasury's General Account (TGA) follow recent patterns until the assumed initial increase in the target federal funds rate in each alternative. At that point, the TGA drops back to its historical target level of \$5 billion as it is assumed that the Treasury will implement a new cash management system and invest funds in excess of \$5 billion. The TGA remains constant at \$5 billion over the remainder of the forecast period.
- Federal Reserve capital grows 15 percent per year, in line with the average rate of the past ten years.³
- In general, increases in the level of Federal Reserve assets are matched by higher levels of reserve balances. All else equal, increases in the levels of liability items, such as Federal Reserve notes in circulation or other liabilities, or increases in the level of Reserve Bank capital, drain reserve balances. When increases in these liability or capital items would otherwise cause reserve balances to fall below \$25 billion, purchases of Treasury securities are assumed in order to maintain that level of reserve balances.
- In the event that a Federal Reserve Bank's earnings fall short of the amount necessary to cover operating costs, pay dividends, and equate surplus to capital paid-in, a deferred asset would be recorded. This deferred asset is reported on the liability side of the balance sheet as "Interest on Federal Reserve notes due to U.S. Treasury." This liability takes on a positive value when weekly cumulative earnings have not yet been distributed

³ 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.

to the Treasury and takes on a negative value when earnings fall short of the expenses listed above. In Alternative A, a small deferred asset—peaking at about \$4 billion in 2018—is recorded on the balance sheet at year-end in 2017, 2018 and 2019.⁴

TERM PREMIUM EFFECTS⁵

- Under Alternative A, the term premium effect on the yield of the ten-year Treasury note is negative 113 basis points in the current quarter. The effect wanes over time as the length of time the securities will be held by the Federal Reserve shortens and as securities subsequently roll off the portfolio or are sold until the size of the portfolio is normalized.
- Under Alternative B, the contemporaneous term premium effect is negative 113 basis points. This estimate is the same as in Alternative A and reflects the fact that market participants are expecting an asset purchase program more in line with Alternative A. Over the first half of next year, as market participants come to realize that the purchases will end in June, the term premium effect converges to one associated with the \$750 billion purchase program. Over the remainder of the projection period, the term premium effect declines slowly toward zero, reflecting the actual and anticipated normalization of the portfolio.
- Under Alternative C, the term premium effect is negative 69 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 Alternatives B and A.

⁴ In our projections, Federal Reserve capital is much larger than the peak value of the deferred asset.

⁵ Staff estimates include all current and projected asset purchases and use the model outlined in the appendix of the memo titled “Possible MBS Large-Scale Asset Purchase Program” written by staff at the Federal Reserve Bank of New York and the Board of Governors and sent to the Committee on January 18, 2012. More details of the model can be found in “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	October Alternative B

Basis Points
Quarterly Averages

2012 Q4	-113	-113	-69	-93
2013 Q1	-104	-110	-65	-90
2013 Q2	-94	-107	-61	-86
2013 Q3	-83	-103	-57	-81
2013 Q4	-78	-98	-53	-76
2014 Q1	-73	-92	-49	-72
2014 Q2	-69	-86	-45	-67
2014 Q3	-64	-81	-41	-62
2014 Q4	-59	-75	-38	-57
2015 Q1	-55	-70	-34	-53
2015 Q2	-51	-64	-31	-49
2015 Q3	-47	-59	-28	-44
2015 Q4	-43	-54	-25	-40
2016 Q4	-29	-37	-17	-27
2017 Q4	-20	-24	-11	-17
2018 Q4	-14	-16	-9	-10
2019 Q4	-11	-11	-9	-7
2020 Q4	-10	-9	-8	-5
2021 Q4	-9	-8	-7	
2022 Q4	-8	-6	-6	
2023 Q4	-6	-5	-5	
2024 Q4	-4	-4	-4	
2025 Q4	-3	-3	-3	

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

Billions of dollars

	<u>Oct 31, 2012</u>	<u>2013</u>	<u>2015</u>	<u>2017</u>	<u>2019</u>	<u>2021</u>	<u>2023</u>	<u>2025</u>
Total assets	2,825	3,521	3,402	2,469	1,884	2,097	2,345	2,635
Selected assets								
Liquidity programs for financial firms	13	0	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	13	0	0	0	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	2	1	0	0	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	0	0
Securities held outright	2,579	3,253	3,170	2,283	1,736	1,973	2,230	2,527
U.S. Treasury securities	1,645	1,923	1,923	1,511	1,439	1,973	2,230	2,527
Agency debt securities	82	57	33	4	2	0	0	0
Agency mortgage-backed securities	852	1,273	1,215	768	295	0	0	0
Net portfolio holdings of TALF LLC	1	1	0	0	0	0	0	0
Total other assets	229	266	231	186	148	125	116	108
Total liabilities	2,771	3,450	3,307	2,344	1,720	1,880	2,057	2,254
Selected liabilities								
Federal Reserve notes in circulation	1,100	1,179	1,329	1,466	1,604	1,764	1,942	2,138
Reverse repurchase agreements	100	70	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,559	2,190	1,898	798	36	36	36	36
Reserve balances held by depository institutions	1,435	2,123	1,887	787	25	25	25	25
U.S. Treasury, General Account	100	61	5	5	5	5	5	5
Other Deposits	24	6	6	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	71	94	124	165	218	288	381

Explanatory Notes

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

	<u>Oct 31, 2012</u>	<u>2013</u>	<u>2015</u>	<u>2017</u>	<u>2019</u>	<u>2021</u>	<u>2023</u>	<u>2025</u>
Total assets	2,825	3,998	3,895	2,863	1,883	2,099	2,346	2,636
Selected assets								
Liquidity programs for financial firms	13	0	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	13	0	0	0	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	2	1	0	0	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	0	0
Securities held outright	2,579	3,709	3,645	2,664	1,727	1,969	2,226	2,524
U.S. Treasury securities	1,645	2,153	2,153	1,737	1,370	1,969	2,226	2,524
Agency debt securities	82	57	33	4	2	0	0	0
Agency mortgage-backed securities	852	1,499	1,459	922	355	0	0	0
Net portfolio holdings of TALF LLC	1	1	0	0	0	0	0	0
Total other assets	229	287	250	199	156	130	120	111
Total liabilities	2,771	3,927	3,801	2,738	1,718	1,881	2,059	2,255
Selected liabilities								
Federal Reserve notes in circulation	1,100	1,179	1,329	1,466	1,604	1,764	1,942	2,138
Reverse repurchase agreements	100	70	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,559	2,664	2,389	1,190	36	36	36	36
Reserve balances held by depository institutions	1,435	2,598	2,378	1,179	25	25	25	25
U.S. Treasury, General Account	100	61	5	5	5	5	5	5
Other Deposits	24	6	6	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	-2	0	0	0
Total capital	55	71	94	124	165	218	288	381

Explanatory Notes

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

	<u>Oct 31, 2012</u>	<u>2013</u>	<u>2015</u>	<u>2017</u>	<u>2019</u>	<u>2021</u>	<u>2023</u>	<u>2025</u>
Total assets	2,825	2,979	2,692	1,866	1,884	2,097	2,345	2,634
Selected assets								
Liquidity programs for financial firms	13	0	0	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0	0	0
Central bank liquidity swaps	13	0	0	0	0	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	2	1	0	0	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	0	0
Securities held outright	2,579	2,750	2,501	1,711	1,758	1,985	2,240	2,536
U.S. Treasury securities	1,645	1,653	1,652	1,275	1,709	1,985	2,240	2,536
Agency debt securities	82	57	33	4	1	0	0	0
Agency mortgage-backed securities	852	1,040	816	432	48	0	0	0
Net portfolio holdings of TALF LLC	1	1	0	0	0	0	0	0
Total other assets	229	227	191	155	126	112	105	99
Total liabilities	2,771	2,908	2,598	1,742	1,719	1,880	2,057	2,254
Selected liabilities								
Federal Reserve notes in circulation	1,100	1,179	1,329	1,466	1,604	1,764	1,942	2,138
Reverse repurchase agreements	100	70	70	70	70	70	70	70
Deposits with Federal Reserve Banks	1,559	1,648	1,189	195	36	36	36	36
Reserve balances held by depository institutions	1,435	1,581	1,178	184	25	25	25	25
U.S. Treasury, General Account	100	61	5	5	5	5	5	5
Other Deposits	24	6	6	6	6	6	6	6
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0	0	0
Total capital	55	71	94	124	165	218	288	381

Explanatory Notes

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