

## **Prefatory Note**

The attached document represents the most complete and accurate version available based on original files from the FOMC Secretariat at the Board of Governors of the Federal Reserve System.

Please note that some material may have been redacted from this document if that material was received on a confidential basis. Redacted material is indicated by occasional gaps in the text or by gray boxes around non-text content. All redacted passages are exempt from disclosure under applicable provisions of the Freedom of Information Act.

Class I FOMC – Restricted Controlled (FR)

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# Report to the FOMC on Economic Conditions and Monetary Policy



## Book B

### Monetary Policy: Strategies and Alternatives

January 19, 2012

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

## Monetary Policy Strategies

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Most of the staff estimates of short-run  $r^*$ —the real federal funds rate that, if maintained, would return output to its potential in 12 quarters—have decreased a little since the December Tealbook. As shown in the exhibit, “Equilibrium Real Federal Funds Rate,” all but one of the estimates remain below zero and below the estimated actual real federal funds rate. Compared with the previous Tealbook, the staff has revised its projections of economic activity over the medium term down a little. As a result, the estimates of short-run  $r^*$  generated by the FRB/US model and EDO model conditioned on the staff’s outlook for the economy (that is, the “Tealbook-consistent” measures) have decreased by 10 and 20 basis points, respectively. In response to a wider staff estimate for the output gap in the current quarter, the short-run  $r^*$  estimates derived from the small structural model and the single-equation model decreased as well, by 30 and 40 basis points, respectively, when compared with the December Tealbook.<sup>1</sup> In contrast, the short-run  $r^*$  estimates produced by the FRB/US and the EDO models (based on their own projections) are up slightly because the models’ output gap projections over the medium term have narrowed a bit, owing to modest downward revisions in the past and projected level of potential output.

The staff’s modest downward revision to the path of aggregate demand over the projection period, combined with its assessment that the inflation outlook is broadly unchanged, imply that policy prescriptions from optimal control simulations of the FRB/US model have edged down slightly compared with those reported in the previous Tealbook.<sup>2</sup> This result is shown in the exhibit “Constrained vs. Unconstrained Monetary Policy.” In these simulations, policymakers are assumed to place equal weights on keeping headline PCE inflation close to a 2 percent inflation goal, on keeping the

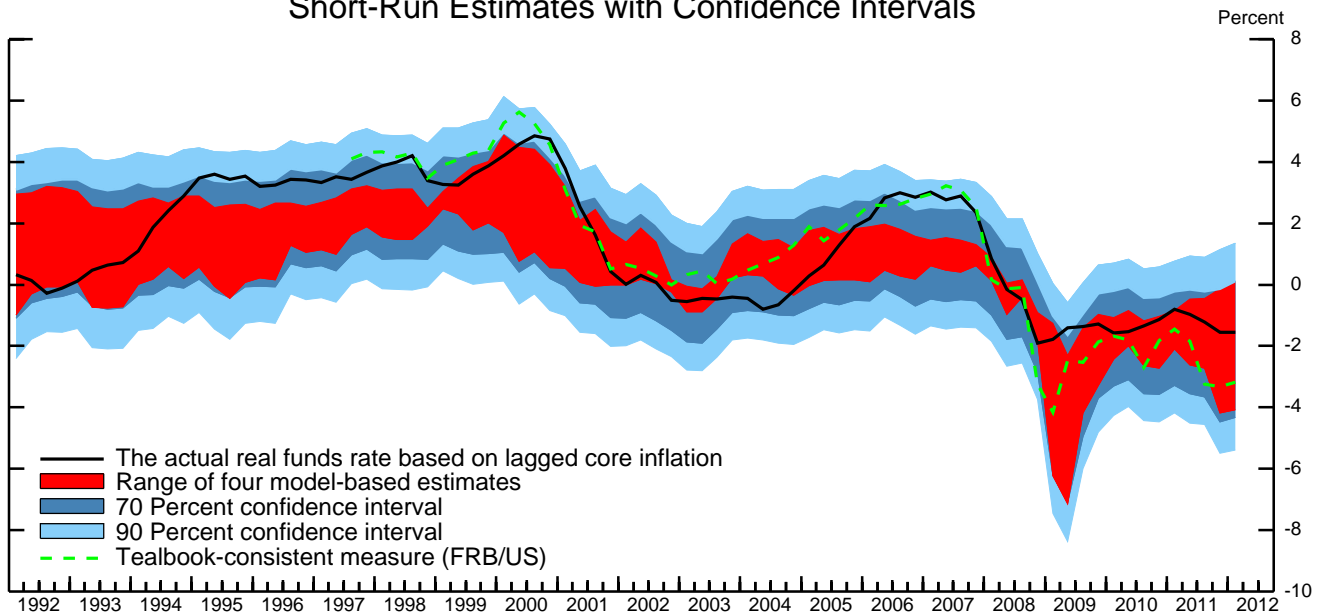
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<sup>1</sup> Government spending is also one of the variables affecting the small structural model’s estimate of short run  $r^*$ . The fact that incoming data on defense spending has been lower than expected has thus also contributed to the decrease in the  $r^*$  estimate generated by this model.

<sup>2</sup> The staff’s baseline forecast incorporates the effects of the large-scale asset purchase program that was completed at the end of June 2011, as well as the effects of the maturity extension program and the modifications announced in September to the Federal Reserve’s reinvestment policies. The optimal policy simulations therefore also incorporate the effects of these balance sheet policies.

## Equilibrium Real Federal Funds Rate

### Short-Run Estimates with Confidence Intervals



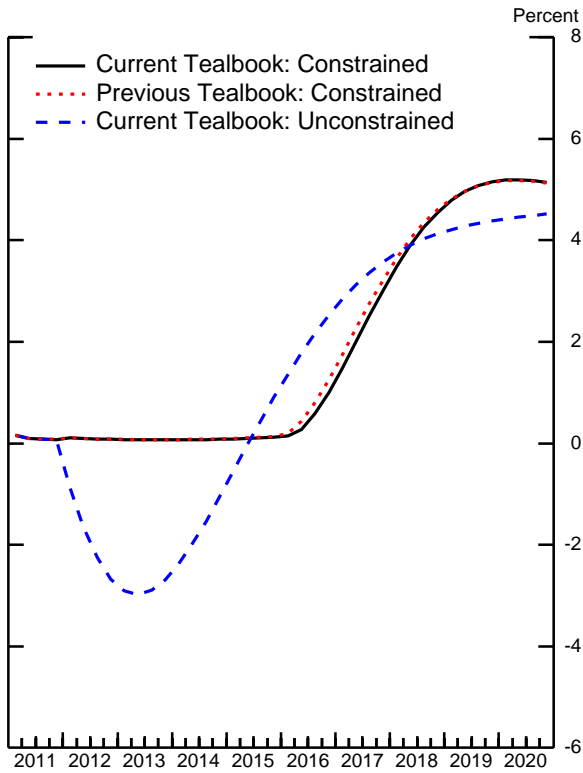
### Short-Run and Medium-Run Measures (Percent)

	Current Tealbook	Current Quarter Estimate as of Previous Tealbook	Previous Tealbook
<b>Short-Run Measures</b>			
Single-equation model	-1.9	-1.5	-1.8
Small structural model	-4.1	-3.8	-3.9
EDO model	0.1	0.0	-0.2
FRB/US model	-2.8	-3.0	-3.1
Confidence intervals for four model-based estimates			
70 percent confidence interval	-4.3 to 0.1		
90 percent confidence interval	-5.4 to 1.3		
Tealbook-consistent measures			
EDO model	-4.5	-4.3	-4.4
FRB/US model	-3.2	-3.1	-3.3
<b>Medium-Run Measures</b>			
Single-equation model	0.8	0.9	0.9
Small structural model	0.5	0.6	0.5
Confidence intervals for two model-based estimates			
70 percent confidence interval	-0.2 to 1.6		
90 percent confidence interval	-0.8 to 2.3		
TIPS-based factor model	1.7		1.7
<b>Memo</b>			
Actual real federal funds rate	-1.6		-1.5

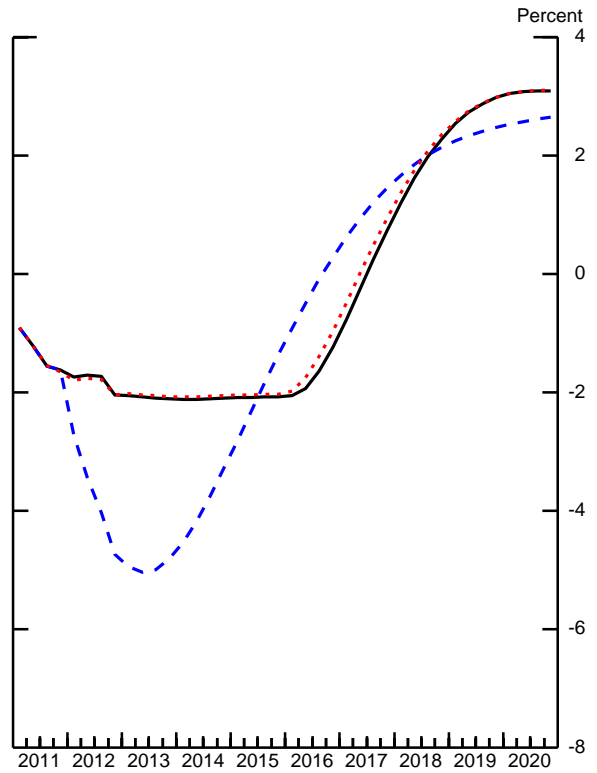
Note: Explanatory Note A provides background information regarding the construction of these measures and confidence intervals. The actual real federal funds rate shown is generated using lagged core inflation as a proxy for inflation expectations. For information regarding alternative measures, see Explanatory Note A. Estimates of  $r^*$  may change at the beginning of a quarter even when the staff outlook is unchanged because the twelve-quarter horizon covered by the calculation has rolled forward one quarter. Therefore, whenever the Tealbook is published early in the quarter, this table includes a third column labeled "Current Quarter Estimate as of Previous Tealbook."

### Constrained vs. Unconstrained Monetary Policy (2 Percent Inflation Goal)

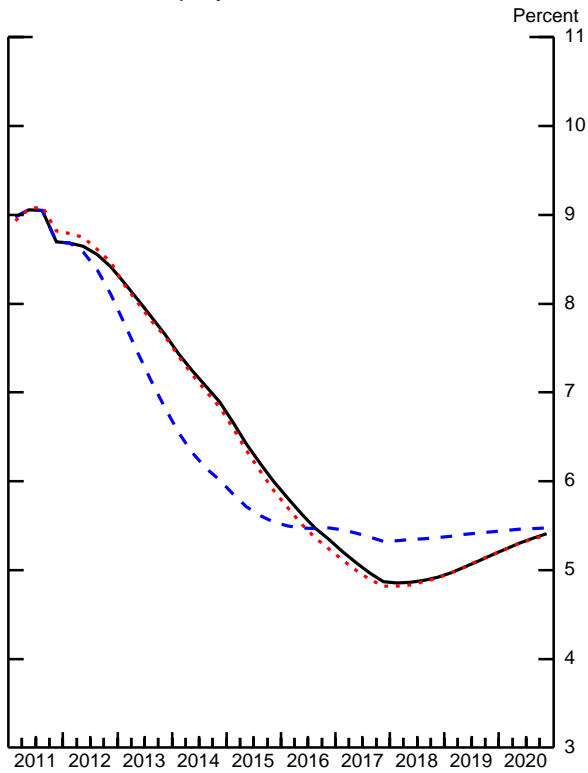
Nominal Federal Funds Rate



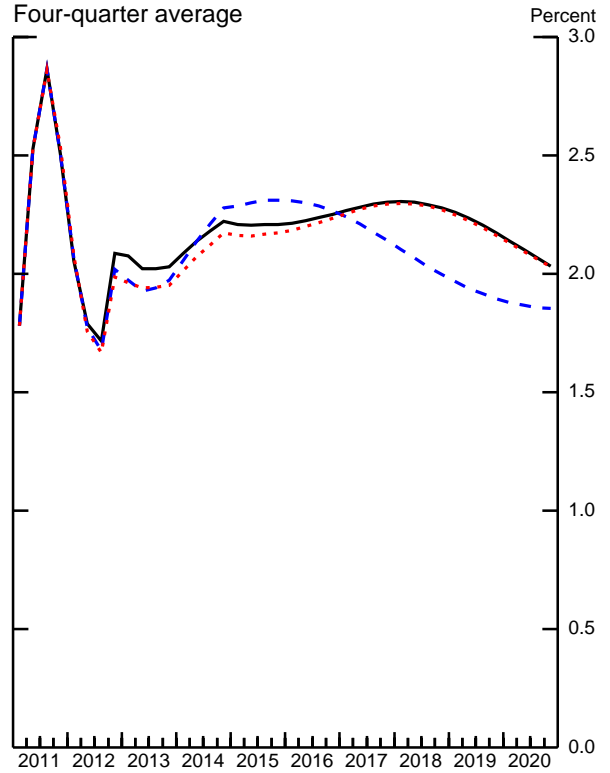
Real Federal Funds Rate



Civilian Unemployment Rate



PCE Inflation  
Four-quarter average



unemployment rate close to the staff's estimate of the effective natural rate of unemployment, and on minimizing changes in the federal funds rate.<sup>3</sup>

The simulations indicate that the optimal path for the federal funds rate does not begin to rise appreciably above zero until mid-2016, about the same as the previous Tealbook.<sup>4</sup> By keeping the funds rate near zero for such a long stretch of time and raising it at a moderate pace once tightening begins, optimal policy would promote a faster pace of economic recovery than in the staff's baseline outlook as well as an inflation rate over the medium run closer to the FOMC's assumed target of 2 percent. Specifically, the unemployment rate would first reach the staff's estimate of the effective natural rate of unemployment in mid-2016 with inflation at 2¼ percent.<sup>5</sup> In contrast, the baseline staff forecast shows the unemployment rate falling only to 6½ percent and inflation running closer to 1½ percent by the end of 2016 (not shown). Policymakers in the optimal control exercises respond to the lower bound constraint by credibly promising to keep interest rates low for an extended period of time, thereby boosting inflation expectations and reducing real rates over the early part of the simulation. As a result, in the second half of the simulation period, unemployment briefly undershoots the effective natural rate and inflation decreases slowly back to 2 percent.

If the nominal federal funds rate could fall below zero, the funds rate under optimal policy would decline to minus 3 percent in the second quarter of 2013 and would not turn positive until the third quarter of 2015. In this case, the unemployment rate would decline more rapidly than under the constrained policy and would then remain roughly stable at about 5½ percent after 2015. With the unemployment rate stabilized, inflation reaches its target level about two years earlier than in the constrained simulations.

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<sup>3</sup> These simulations embed the assumption that policymakers can credibly commit to a policy rate path that extends many years into the future, conditional on underlying economic conditions unfolding as expected.

<sup>4</sup> 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 funds rate and a four-quarter moving average of core PCE inflation. Core PCE inflation is used to compute the real rate because it provides a less volatile measure of inflation expectations than a four-quarter moving average of headline inflation, and because it makes the real rate path shown in this exhibit easier to compare with measures of the real rate reported elsewhere in the Tealbook.

<sup>5</sup> Reflecting the transitory effects of extended unemployment benefits, the staff's estimate of the effective NAIRU falls from 6½ percent in the first quarter of 2012 to 6 percent by the first quarter of 2014, and then declines further until it reaches 5¼ percent by the end of 2017.

As shown in the upper left panel of the exhibit “Policy Rules and Market-Based Expectations for the Federal Funds Rate,” the funds rate path implied by the estimated outcome-based policy rule is slightly below that contained in the December Tealbook. If policy follows this rule, the funds rate would move above its effective lower bound in the fourth quarter of 2014, the same quarter as in the previous Tealbook, and would then rise at a slightly slower pace, reaching just under 2½ percent, instead of 2¾ percent, by the end of 2016.<sup>6</sup> As shown in the upper right panel, information from financial markets suggests that investors’ expectations for the path of the federal funds rate have declined slightly since the December Tealbook. Market participants expect the funds rate not to rise appreciably above its current target range until the beginning of 2014, about a quarter later than in the previous Tealbook. Compared with the December Tealbook, uncertainty about the path of the federal funds rate implied by financial market data has declined somewhat.

The lower panel of the exhibit provides near-term prescriptions from simple policy rules.<sup>7</sup> As shown in the left-hand columns, prescriptions for the federal funds rate from most of the rules remain at or near the effective lower bound.<sup>8</sup> The right-hand columns display the prescriptions that would arise from these rules in the absence of the lower-bound constraint. Compared with the December Tealbook, the staff foresees a slightly wider output gap over the near term, resulting in lower near-term prescriptions from the simple rules.

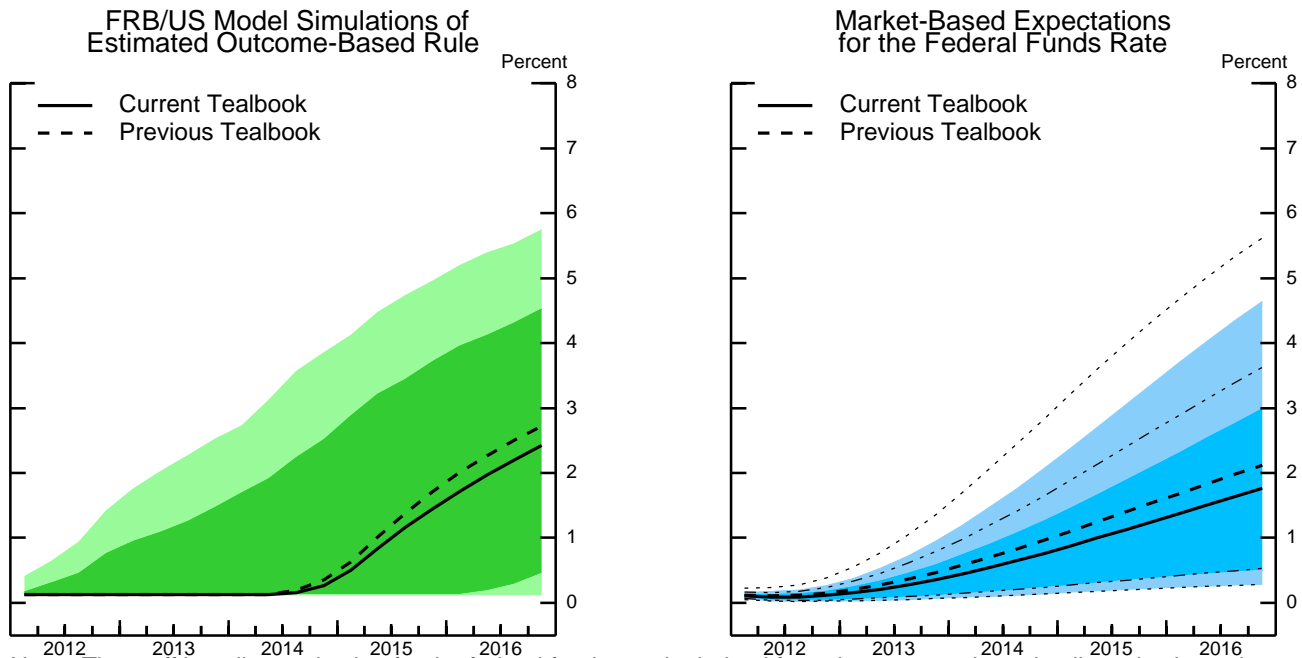
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<sup>6</sup> The estimated outcome-based rule depends on the lagged federal funds rate, defined as the actual policy rate observed in the previous quarter, which has been constrained by its effective lower bound since late 2008. The confidence interval implies a 10 percent chance that the federal funds rate is above 40 basis points in the current quarter. If instead the lagged values used in generating these probabilities had not been constrained by the effective lower bound from being negative in the previous quarters, this probability would be negligible.

<sup>7</sup> In contrast to the optimal control simulations, which use headline inflation in the policymakers’ objective function, the policy rule prescriptions use core inflation as the measure of 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. Thus, the use of headline inflation in the optimal control simulations and of core inflation in the policy rules are both consistent with the notion that policymakers are concerned with the medium-term behavior of headline inflation.

<sup>8</sup> The Taylor (1993) rule, which places less weight on the output gap, prescribes policy rates between 25 and 75 basis points for the first two quarters of 2012.

## Policy Rules and Market-Based Expectations for the Federal Funds Rate



Note: The staff baseline projection for the federal funds rate is derived from the outcome-based policy rule shown in the top-left panel. The top-right panel depicts the mean path and confidence intervals of future federal funds rates derived from market quotes as of January 18. In both panels, dark and light shadings represent the 70 and 90 percent confidence intervals respectively. Explanatory Note B provides further background information.

### Near-Term Prescriptions of Simple Policy Rules

	Constrained Policy		Unconstrained Policy	
	<u>2012Q1</u>	<u>2012Q2</u>	<u>2012Q1</u>	<u>2012Q2</u>
Taylor (1993) rule	<b>0.73</b>	<b>0.40</b>	<b>0.73</b>	<b>0.40</b>
<i>Previous Tealbook</i>	<i>0.90</i>	<i>0.59</i>	<i>0.90</i>	<i>0.59</i>
Taylor (1999) rule	<b>0.13</b>	<b>0.13</b>	<b>-2.09</b>	<b>-2.43</b>
<i>Previous Tealbook</i>	<i>0.13</i>	<i>0.13</i>	<i>-1.82</i>	<i>-2.15</i>
Estimated outcome-based rule	<b>0.13</b>	<b>0.13</b>	<b>-0.22</b>	<b>-0.61</b>
<i>Previous Tealbook</i>	<i>0.13</i>	<i>0.13</i>	<i>-0.11</i>	<i>-0.42</i>
Estimated forecast-based rule	<b>0.13</b>	<b>0.13</b>	<b>-0.37</b>	<b>-0.78</b>
<i>Previous Tealbook</i>	<i>0.13</i>	<i>0.13</i>	<i>-0.27</i>	<i>-0.61</i>
First-difference rule	<b>0.13</b>	<b>0.13</b>	<b>-0.13</b>	<b>-0.30</b>
<i>Previous Tealbook</i>	<i>0.13</i>	<i>0.13</i>	<i>-0.02</i>	<i>-0.14</i>
 Memo		<u>2012Q1</u>	<u>2012Q2</u>	
Staff assumption		0.08	0.10	
Fed funds futures		0.08	0.09	
Median expectation of primary dealers		0.13	0.13	
Blue Chip forecast (January 1, 2012)		0.10	0.10	

Note: In calculating the near-term prescriptions of these simple policy rules, policymakers' long-run inflation objective is assumed to be 2 percent. Explanatory Note B provides further background information.



## Monetary Policy Alternatives

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This Tealbook presents three policy alternatives—labeled A, B, and C—for the Committee’s consideration. Of course, the Committee could blend components of the various alternatives to construct its desired statement.

All three of the draft statements make adjustments to the Committee’s forward guidance regarding the anticipated path of the federal funds rate. Alternative B offers a choice between an explicit statement of the conditions for unemployment and inflation under which the Committee anticipates maintaining the current target range and a simpler statement that economic conditions are likely to warrant the current target range at least through 2014. Alternative A uses explicit conditional language like that offered in Alternative B, linking the retention of the current target range to economic conditions. Alternative C begins to remove policy accommodation, in part by shortening the period over which rates are anticipated to remain exceptionally low to “for an extended period.”

The alternatives also provide a number of options regarding balance sheet policies. Alternative A presents the Committee with a choice between two versions of an asset purchase program: one is discrete in nature (buying \$500 billion of agency mortgage-backed securities (MBS) by the end of January 2013), the other is a more flexible approach to asset purchases (announcing the purchase of MBS at a rate of \$40 billion per month, with adjustments as needed to foster the Committee’s objectives). Alternative B makes no adjustment to the balance sheet at this meeting, while Alternative C scales back the maturity extension program (MEP), cutting it in half and completing it by the end of February.

The draft statements also differ in their characterization of economic conditions. Alternatives A and B say that the economy has been expanding “moderately” even though global economic growth has slowed. By contrast, Alternative C states that the economic recovery “has strengthened somewhat” and makes no reference to global growth. Alternatives A and B acknowledge that indicators of labor market conditions point to further improvement, but note that the unemployment rate remains elevated. Alternative C, conversely, acknowledges that the unemployment rate is elevated, but instead emphasizes the declines in the unemployment rate and the positive tone of some other indicators. Alternatives A and B state that “inflation has been subdued in recent months,” whereas Alternative C states that inflation “has moderated somewhat” from the first half of last year.

Regarding the economic outlook, Alternative B indicates that the Committee expects economic growth over coming quarters to be modest, with a result that the unemployment rate declines only slowly. Alternative A points to modest economic growth over coming quarters “absent further policy action,” and characterizes the expected decline in the unemployment rate as “only very” gradual. Under Alternative C, the Committee would state that it expects a firming in the pace of economic growth with the unemployment rate declining (without a modifier). In terms of inflation, Alternative A provides the option of either characterizing the Committee’s expectation for inflation as running “below” or “at or below” levels that are consistent with the Committee’s mandate; Alternative B states that inflation is likely to run “at or below” such levels. Alternative C notes that the Committee anticipates that inflation will “run at levels” consistent with its dual mandate. Alternative C states that the Committee will continue to pay close attention to inflation, while Alternatives A drops this reference, and Alternative B leaves its inclusion as an option.

The final paragraph of each statement provides an indication about future policy actions. Alternative A states that the Committee “will employ its tools as needed,” in order to suggest that the Committee is open to additional policy action. Alternative B subsumes the discussion of future policy action into the discussion of balance sheet policies, but suggests that the Committee could make changes to those policies to strengthen the recovery. Alternative C is neutral, noting that the Committee “will assess the economic outlook” and “is prepared” to use its tools to promote its objectives.

The following table highlights 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 January 25 FOMC Statement**

Selected Elements	December Statement	January Alternatives		
		A	B	C
<b>Balance Sheet</b>				
<i>MEP</i>	\$400 billion; complete by end of June 2012	unchanged		cut to \$200 billion and complete by February 2012
<i>Additional Purchases</i>	none	\$500 billion of agency MBS by end of January 2013	none	
		<i>OR</i>		
		\$40 billion of agency MBS per month; will adjust this program as needed to foster objectives		
<i>Reinvestment Policies</i>	principal payments of agency debt and MBS into agency MBS; Treasuries into Treasuries	unchanged		
<b>Forward Rate Guidance</b>				
<i>Explicit Statement</i>	none	at least as long as unemployment exceeds [6½] percent and	at least as long as unemployment exceeds [7] percent and	none
		inflation rate is projected to be either below or close to 2 percent, and long-term expectations remain anchored; Committee expects conditions to prevail at least through 2014		
<i>Simpler Statement</i>	at least through mid-2013	none	through 2014	for an extended period
<b>Future Policy Action</b>				
<i>Future Actions</i>	prepared to employ its tools to promote stronger economic recovery	will employ its tools as needed to promote stronger economic recovery in a context of price stability	prepared to adjust holdings as appropriate	prepared to employ its tools as appropriate to promote objectives of maximum employment and price stability

Alternatives

## DECEMBER FOMC STATEMENT

1. Information received since the Federal Open Market Committee met in November suggests that the economy has been expanding moderately, notwithstanding some apparent slowing in global growth. While indicators point to some improvement in overall labor market conditions, the unemployment rate remains elevated. Household spending has continued to advance, but business fixed investment appears to be increasing less rapidly and the housing sector remains depressed. Inflation has moderated since earlier in the year, and 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 continues to expect a moderate pace of economic growth over coming quarters and consequently anticipates that the unemployment rate will decline only gradually toward levels that the Committee judges to be consistent with its dual mandate. Strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation will settle, over coming quarters, at levels at or below those consistent with the Committee's dual mandate. However, the Committee will continue to pay close attention to the evolution of inflation and inflation expectations.
3. To support a stronger economic recovery and to help ensure that inflation, over time, is at levels consistent with the dual mandate, the Committee decided today to continue its program to extend the average maturity of its holdings of securities as announced in September. The Committee is maintaining its existing policies of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. The Committee will regularly review the size and composition of its securities holdings and is prepared to adjust those holdings as appropriate.
4. The Committee also decided to keep the target range for the federal funds rate at 0 to  $\frac{1}{4}$  percent and currently anticipates that economic conditions—including low rates of resource utilization and a subdued outlook for inflation over the medium run—are likely to warrant exceptionally low levels for the federal funds rate at least through mid-2013.
5. The Committee will continue to assess the economic outlook in light of incoming information and is prepared to employ its tools to promote a stronger economic recovery in a context of price stability.

**JANUARY FOMC STATEMENT—ALTERNATIVE A**

1. Information received since the Federal Open Market Committee met in ~~November~~ **December** suggests that the economy has been expanding moderately, notwithstanding some ~~apparent~~ slowing in global growth. While indicators point to some **further** improvement in overall labor market conditions, the unemployment rate remains elevated. Household spending has continued to advance, but **growth in** business fixed investment ~~appears to be increasing less rapidly~~ **has slowed**, and the housing sector remains depressed. Inflation has ~~moderated since earlier in the year~~ **been subdued in recent months**, and 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 ~~continues to expect a moderate~~ **that, absent further policy action, the** pace of economic growth **would remain modest** over coming quarters and consequently anticipates that the unemployment rate ~~will~~ **would** decline only **very** gradually toward levels that the Committee judges to be consistent with its dual mandate. Strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that over coming quarters, inflation will ~~settle~~ **run** at levels [ at or ] below those consistent with the Committee's dual mandate. ~~However, the Committee will continue to pay close attention to the evolution of inflation and inflation expectations.~~
3. To support a stronger economic recovery and to help ensure that inflation, over time, is at levels consistent with the dual mandate, the Committee decided today to **purchase up to an additional \$500 billion of agency mortgage-backed securities by the end of January 2013. In addition, the Committee intends to** continue its program to extend the average maturity of its holdings of securities as announced in September. The Committee is **also** maintaining its existing policies of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. **These programs should put downward pressure on longer-term interest rates, provide support to mortgage markets, and help make broader financial conditions more accommodative.** The Committee will regularly review the size and composition of its securities holdings and is prepared to adjust those holdings as appropriate.

**OR**

- 3'. To support a stronger economic recovery and to help ensure that inflation, over time, is at levels consistent with the dual mandate, the Committee decided today to **purchase additional agency mortgage-backed securities, initially at a rate of \$40 billion per month. The Committee will adjust the pace of purchases and determine the ultimate size of the program in light of the evolving economic outlook and as needed to foster its objectives. In addition, the Committee intends to** continue its program to extend the average maturity of its holdings of securities as announced in September. The Committee is **also** maintaining its existing policies of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. **These programs should put downward pressure on longer-term interest rates, provide support to mortgage markets, and help make broader financial conditions more accommodative.** The Committee will regularly review the size and composition of its securities holdings and is prepared to adjust those holdings as appropriate.

Alternatives

4. The Committee also decided to keep the target range for the federal funds rate at 0 to ¼ percent and ~~currently~~ **now** anticipates that ~~economic conditions—including low rates of resource utilization and a subdued outlook for inflation over the medium run—are likely to warrant~~ **this** exceptionally low levels **range** for the federal funds rate ~~at least through mid-2013~~ **will be appropriate at least as long as the unemployment rate exceeds [ 6½ ] percent, the inflation rate (as measured by the price index for personal consumption expenditures) at a one- to two-year horizon is projected to be either below or close to 2 percent, and longer-term inflation expectations continue to be well anchored. On the basis of currently available information, the Committee expects these conditions to prevail at least through 2014.**
5. The Committee will ~~continue to assess the economic outlook in light of incoming information and is prepared to~~ employ its tools **as needed** to promote a stronger economic recovery in a context of price stability.

**JANUARY FOMC STATEMENT—ALTERNATIVE B**

1. Information received since the Federal Open Market Committee met in ~~November~~ **December** suggests that the economy has been expanding moderately, notwithstanding some ~~apparent~~ slowing in global growth. While indicators point to some **further** improvement in overall labor market conditions, the unemployment rate remains elevated. Household spending has continued to advance, but **growth in** business fixed investment ~~appears to be increasing less rapidly~~ **has slowed**, and the housing sector remains depressed. Inflation has ~~moderated since earlier in the year~~ **been subdued in recent months**, and 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 ~~continues to expect~~ **a moderate pace of** economic growth over coming quarters **to be modest** and consequently anticipates that the unemployment rate will ~~decline only gradually~~ **make only slow progress** toward levels that the Committee judges to be consistent with its dual mandate. Strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that over coming quarters, inflation will ~~settle~~ **run** at levels at or below those consistent with the Committee's dual mandate. [ However, the Committee will continue to pay close attention to the evolution of inflation and inflation expectations. ]
3. To support a stronger economic recovery and to help ensure that inflation, over time, is at levels consistent with the dual mandate, **the Committee intends to maintain a highly accommodative stance for monetary policy. 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 economic conditions—including low rates of resource utilization and a subdued outlook for inflation over the medium run—are likely to warrant **this** exceptionally low levels **range** for the federal funds rate at least through ~~mid-2013~~ **will be appropriate at least as long as the unemployment rate exceeds [ 7 ] percent, the inflation rate (as measured by the price index for personal consumption expenditures) at a one- to two-year horizon is projected to be either below or close to 2 percent, and longer-term inflation expectations continue to be well anchored. On the basis of currently available information, the Committee expects these conditions to prevail at least through 2014.**

**OR**

- 3'. To support a stronger economic recovery and to help ensure that inflation, over time, is at levels consistent with the dual mandate, **the Committee expects to maintain a highly accommodative stance for monetary policy. 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 economic conditions—including low rates of resource utilization and a subdued outlook for inflation over the medium run—are likely to warrant exceptionally low levels for the federal funds rate at least through ~~mid-2013~~ **2014.**

Alternatives

4. The Committee **also** decided ~~today~~ to continue its program to extend the average maturity of its holdings of securities as announced in September. The Committee is maintaining its existing policies of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. The Committee will regularly review the size and composition of its securities holdings and is prepared to adjust those holdings as appropriate **to promote a stronger economic recovery in a context of price stability.**
5. ~~The Committee will continue to assess the economic outlook in light of incoming information and is prepared to employ its tools to promote a stronger economic recovery in a context of price stability.~~



**JANUARY FOMC STATEMENT—ALTERNATIVE C**

1. Information received since the Federal Open Market Committee met in ~~November~~ **December** suggests that the economic ~~ic~~ **has been expanding moderately, notwithstanding some apparent slowing in global growth recovery has strengthened somewhat.** While indicators point to some improvement in overall labor market conditions, **Although** the unemployment rate remains elevated, **it has declined recently, and employment continues to increase.** Household spending has ~~continued to advance~~ **d further**, but **and** business fixed investment ~~appears to be increasing less rapidly and~~ **has continued to expand, but** the housing sector remains depressed. Inflation has moderated ~~since earlier in the~~ **somewhat since the first half of last** year, and 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 ~~continues to expect~~ **s a moderate firming in the** pace of economic growth over coming quarters and consequently anticipates that the unemployment rate will decline ~~only~~ gradually toward levels that the Committee judges to be consistent with its dual mandate. ~~Strains in global financial markets continue to pose significant downside risks to the economic outlook.~~ The Committee also anticipates that over coming quarters, inflation will ~~settle,~~ **run** at levels ~~at or below those~~ consistent with the Committee's dual mandate. ~~However,~~ The Committee will continue to pay close attention to the evolution of inflation and inflation expectations.
3. To support a ~~stronger~~ **the** economic recovery ~~and to help~~ **while** ensuring that inflation, over time, is at levels **that are** consistent with the dual mandate, the Committee decided today to ~~continue its~~ **reduce by half the size of the** program to extend the average maturity of its holdings of securities as announced in September **and to complete the program by the end of February.** The Committee is maintaining its existing policies of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction. The Committee will regularly review the size and composition of its securities holdings and is prepared to adjust those holdings as appropriate.
4. The Committee also decided to keep the target range for the federal funds rate at 0 to ¼ percent and ~~currently~~ **now** anticipates that economic conditions—including low rates of resource utilization and a subdued outlook for inflation over the medium run—are likely to warrant exceptionally low levels for the federal funds rate ~~at least through mid-2013~~ **for an extended period.**
5. The Committee will ~~continue to~~ assess the economic outlook in light of incoming information and is prepared to employ its tools **as appropriate** to promote a ~~stronger economic recovery in a context of~~ **its objectives of maximum employment and** price stability.

## THE CASE FOR ALTERNATIVE B

The Committee may view the economic information received since the last meeting as indicating that progress towards its objectives is likely to remain modest. If so, it may wish to issue a statement like that in Alternative B, which includes no new asset purchases, but shifts out the date referenced in the Committee's forward guidance to "through 2014" and, in one variant, would provide greater clarity about how the Committee's outlook for the anticipated path for the federal funds rate relates to economic developments. These changes in forward guidance could be seen as helpful in easing financial conditions without committing to additional balance sheet action at this stage.

The Committee, like the staff, may view the recent economic indicators as having countervailing implications for the economy over the medium run, leaving the outlook just a bit weaker than at the time of the last Tealbook. The unemployment rate has declined in recent months, and other indicators have shown some improvement in labor market conditions, but the level of the unemployment rate remains elevated. Household spending has continued to advance, but the rise in business investment appears to have slowed sharply in the fourth quarter, and the housing sector continues to be depressed. Looking forward, the Committee may continue to see only a modest economic expansion and a slow decline in the unemployment rate, with that decline importantly attributable to the expiration of unemployment benefits. Although the gloom surrounding fiscal and financial developments in Europe appears to have lightened a bit, without a clear resolution to the issues there, the Committee may see the downside risks posed to the economic outlook as still significant. With the effects of the shocks witnessed in the first half of last year having subsided, inflation has been subdued in recent months, and the Committee may expect that over coming quarters, inflation will run at rates at or below those consistent with the Committee's objectives.

Because the Committee would state under Alternative B that it anticipates inflation running at or below its target rate, members may wish to remove the statement that the Committee will pay "close attention" to inflation and inflation expectations. That sentence was introduced at a time when inflation was running above levels that the Committee thought consistent with the dual mandate but was projected to decline, and the risks to inflation remained to the upside. The sentence provided a sense that the Committee would be appropriately cautious about inflation in those circumstances. In the current situation, members may think that the sentence could be deleted because, with inflation having moderated substantially and the risks to inflation roughly balanced, the reassurance it provided is no longer needed. Moreover,

the second paragraph of the FOMC statement generally reflects the Committee's outlook for economic variables, so an implicit reference to possible future actions may not belong in that paragraph.

Alternative B provides two variants of the forward guidance.<sup>1</sup> Under the version in paragraph 3, the Committee would state that it "intends" to maintain an accommodative stance for policy and then go on to note that it anticipates that keeping the federal funds rate at its current level will be appropriate so long as the unemployment rate exceeds 7 percent, the inflation rate (as measured by the price index for personal consumption expenditures) at a one- to two-year horizon is projected to be either below or close to 2 percent, and longer-term inflation expectations remain well anchored. The statement would then note that the Committee expects these conditions to prevail at least through 2014. In the past, some participants have been hesitant to employ numerical thresholds in this way out of concern that the thresholds could be mistaken by the public for the Committee's objectives for inflation and unemployment. However, if the consensus statement is adopted at this meeting, the risk of such confusion should be greatly reduced. Indeed, this approach would help to clarify the Committee's reaction function. A threshold of 7 percent for the unemployment rate would be broadly consistent with the level of the unemployment rate at the time of lift off prescribed by some calibrations of simple rules for monetary policy, such as the Taylor (1999) rule with a NAIRU of 5½ percent, an inflation rate and inflation target of 2 percent, an equilibrium real interest rate of 2 percent, and an Okun's Law coefficient of 2.5.<sup>2</sup> The Tealbook extended projection, which uses a reaction function estimated from historical data, sees the federal funds rate rising in late 2014, at a time when the unemployment rate is projected to be roughly 7¾ percent. If market participants based their expectations on such an empirically derived rule, the language in paragraph 3 would signal that the Committee is prepared to maintain the current setting for the federal funds rate somewhat longer than currently anticipated. Nevertheless, such a formulation would leave the Committee considerable flexibility. If the economic expansion were to unexpectedly gather steam and inflationary pressures were to mount, such that inflation was projected to pickup notably or inflation expectations showed signs of becoming unmoored, the statement implies that

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<sup>1</sup> Because the innovation of Alternative B would be the modification to the forward guidance, and no additional balance sheet policy actions would be taken at this meeting, the ordering of paragraphs 3 and 4 has been reversed relative to the December statement.

<sup>2</sup> The memo "Approaches to Clarifying the Conditionality in the Committee's Forward Guidance" prepared for the FOMC in September 2011 (Brian Doyle, Spence Hilton, Michael Kiley, Andrew Levin, David Lopez-Salido, Steve Meyer, Ed Nelson, Matt Raskin, David Reifschneider, and Robert Tetlow of the Board of Governors and the Federal Reserve Bank of New York) provides greater detail about different thresholds and their relationships to various policy rules.

the Committee would likely act to contain such pressures. Making the inflation threshold in terms of a projection provides the Committee flexibility to look through transitory shocks to inflation. Setting the threshold at “close to 2 percent,” rather than precisely at 2 percent, would reinforce the notion that the Committee could allow inflation to temporarily run above 2 percent in order to bring the unemployment rate down more rapidly, but that the Committee would expect any such overshooting to be modest. Nevertheless, because the Committee would also point to longer-term inflation expectations, it would be signaling that, even if near-term inflation remained low, rising inflation expectations could lead to a firming in the stance of policy.

Paragraph 3' of Alternative B provides a simpler formulation, under which the Committee would push back its indication of the possible time of lift-off without providing specific information on the economic conditions that it sees as consistent with an unchanged target rate. In that version, the Committee would state that it “expects” to maintain a highly accommodative stance of monetary policy and use language very similar to that used in the December statement. To provide a bit more accommodation, however, the Committee would move the date referenced in the forward guidance from “at least through mid-2013” to “at least through 2014.” Such a formulation would express the Committee’s anticipation that it will hold the federal funds rate at its current level for longer than has been previously announced, but it could also provide the Committee with greater flexibility to adjust policy in response to a wide range of variables, relative to the language in paragraph 3.

Some policymakers may be inclined toward additional asset purchases at this meeting in order to make more-satisfactory progress toward the Committee’s objectives. Indeed, the minutes of the December meeting noted that a number of members believed that economic conditions at that time could well have warranted additional policy action. The unemployment rate remains very high, and compared with the last Tealbook, the staff anticipates that economic activity in the near term will decelerate more than previously thought because of weaker spending by the federal government and somewhat less favorable global economic conditions. A staff memorandum prepared for this meeting suggests that an LSAP program including purchases of an additional \$500 billion of agency MBS would be expected to reduce the unemployment rate by about  $\frac{1}{4}$  percentage point and to increase inflation by a bit less.<sup>3</sup> That said, policymakers may see the improvement in the unemployment rate that additional asset

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<sup>3</sup> For a more complete discussion, please refer to the memo “Possible Large-Scale Asset Purchase Program” (by Michelle Ezer, Josh Frost, Matthew Raskin, Julie Remache, and Nate Wuerffel of the Federal Reserve Bank of New York and Seth Carpenter, Jane Ihrig, Elizabeth Klee, Canlin Li and Min Wei of the Federal Reserve Board of Governors) that was sent to the Committee on January 18, 2012.

purchases could generate as small when compared to the potential risks and costs of such an action. For example, participants may worry that their ability to normalize the balance sheet in a timely manner, when such a shift in policy becomes necessary, would be hindered by a further expansion of asset holdings. In addition, an increase in the supply of reserve balances in conjunction with a larger balance sheet could serve to push inflation expectations higher if the public were to harbor similar worries. Finally, policymakers may view the risk to the Federal Reserve's net income from an unanticipated rise in interest rates would be unacceptably large with an expanded balance sheet. If such were the case, policymakers may prefer adjustments to the forward guidance of the statement, rather than a new LSAP program, as a means of providing further policy stimulus at this meeting.

Alternatively, policymakers may place higher weight on the recent declines in the unemployment rate than does the staff and may read other indicators of labor market conditions—declining initial claims, increasing employment, and improving household sentiment—as also suggesting a distinct improvement in overall labor market conditions. Moreover, although short-term measures of inflation appear to have moderated, some policymakers may not yet see this change as sufficient to provide confidence that inflationary pressures have fully abated. Nevertheless, with the uncertainty surrounding the outlook being unusually large, policy makers may wish to await additional information on the outlook for the unemployment rate and inflation, which could confirm that the economic expansion is more fully established, before beginning the process of removing monetary policy accommodation.

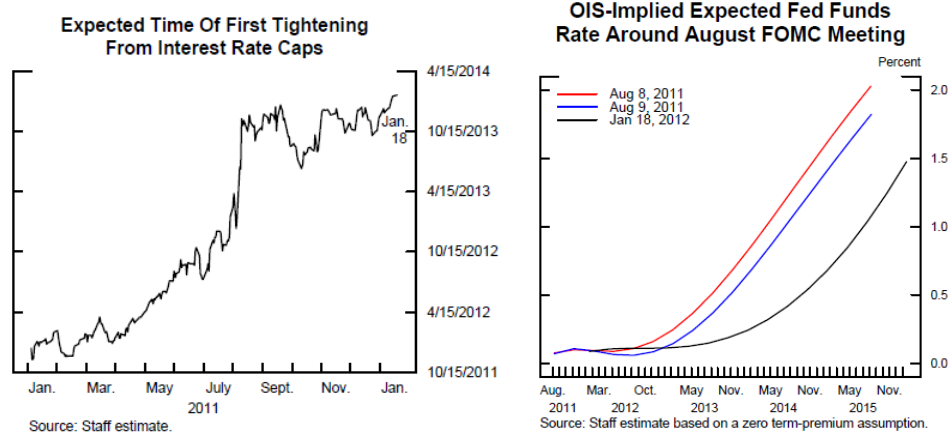
The Desk's survey of primary dealers suggests that market participants expect the Committee to adjust its forward guidance, but do not expect additional balance sheet policies to be announced at this meeting. Market quotes suggest that investors see significant odds on the Committee raising the federal funds rate at some point over the course of 2014. Thus, a statement like that in Alternative B would likely push out expectations for the date of the first rise in the funds rate and lead to some easing of financial conditions. The possible size of the effects on policy expectations and longer-term interest rates is discussed in the box entitled "Forward Rate Guidance and Policy Expectations." The box concludes that the adoption of language along the lines of paragraph 3' could lead longer-term interest rates to fall, perhaps by as much as 10 to 15 basis points. The foreign exchange value of the dollar would likely decline some; equity prices would presumably rise, although that effect could be muted to the extent that market participants viewed the statement as suggesting a weaker outlook for the economy. Employing the more-explicit, conditional forward guidance in paragraph 3 would likely have a

## Forward Rate Guidance and Policy Expectations

As the Committee considers possible changes to the forward rate guidance included in the FOMC statement, it may be useful to review the estimated effects on policy expectations and Treasury yields of the introduction of the “at least through mid-2013” language in the August 9, 2011, statement. Overall, the introduction of that language appears to have played an important role, both initially and over time, in shaping investors’ expectations regarding the path of the target federal funds rate.

Immediately following the release of the August statement, quotes on interest rate caps implied that investors pushed out their expected date of tightening by two quarters from the second quarter of 2013 to the fourth quarter of 2013 (left-hand figure below). In addition, as illustrated by the red and blue lines in the figure to the right, the expected funds rate path beyond 2014 derived from overnight index swap (OIS) rates dropped about 20 basis points on the day of the announcement. Moreover, the Treasury yield curve (not shown), flattened noticeably that day, with 2- and 10-year Treasury yields declining about 10 and 20 basis points, respectively.

Alternatives



The introduction of the forward guidance also apparently led near-term policy rate expectations to be better anchored and less sensitive to macro data surprises. In particular, the middle panel of the table below shows average absolute changes in rates on Eurodollar futures contracts expiring around mid-2013 over a thirty-minute window surrounding important macroeconomic data releases. These calculations are based on data over the five months since August 9, 2011, where the changes in rates are normalized by the magnitude of standardized macroeconomic surprises.<sup>1</sup> The top panel of the table shows corresponding changes in contracts with similar horizons over the five-month period between March 1 and August 8. The ratios between the post- and pre-August responses, reported in the bottom panel, suggest that the sensitivities of futures rates to macroeconomic news declined significantly following the August FOMC meeting, consistent with the interpretation that the forward guidance was perceived by market participants as having considerable credibility.<sup>2</sup>

<sup>1</sup> The following economic releases were used: nonfarm payrolls, capacity utilization, housing starts, new home sales, existing home sales, ISM, industrial production, retail sales, Michigan consumer sentiment, consumer confidence, CPI ex Food & Energy, and PCE prices.

<sup>2</sup> Also consistent with this interpretation are the notable declines in measures of policy uncertainty, such as option-implied and realized volatilities of the Eurodollar futures rates, since the August 2011 FOMC meeting.

On the other hand, the fact that futures rates continued to respond to macro data surprises following the statement, although to a lesser degree, suggests that investors correctly interpreted the forward guidance as conditional on the future evolution of the economic outlook.

<b>Average Absolute Responses of Eurodollar Futures Rates to Macroeconomic News (in basis points)</b>				
Pre "mid-2013" language				
<b>Futures Contract</b>	<b>Sep-12</b>	<b>Dec-12</b>	<b>Mar-13</b>	<b>Jun-13</b>
<b>Average Response</b>	<b>6.39</b>	<b>8.39</b>	<b>8.02</b>	<b>9.37</b>
Post "mid-2013" language				
<b>Futures Contract</b>	<b>Mar-13</b>	<b>Jun-13</b>	<b>Sep-13</b>	<b>Dec-13</b>
<b>Average Response</b>	<b>2.31</b>	<b>2.59</b>	<b>3.02</b>	<b>4.54</b>
<b>Post/Pre Ratio of Average Responses</b>	<b>0.36</b>	<b>0.31</b>	<b>0.38</b>	<b>0.48</b>

Experience with the introduction of the forward guidance in August of last year suggests that the shift in the expected lift-off date to the end of 2014 under paragraph 3' of Alternative B could have an appreciable effect on policy expectations and longer-term yields. For example, if the revised forward guidance resulted in an expected federal funds rate path that remained at the middle of the current target range through the end of 2014, the result might be viewed as a policy shock of about -45 basis points at the end of 2014 based on the policy rate path as of January 18, 2011 (shown by the black line in the chart of OIS curves above). Of course, the impact of this shock on longer-term rates depends importantly on how the shock to nearer-term policy expectations is propagated to longer horizons. One plausible assumption might be that the effect of this policy shock on policy expectations at longer horizons decays geometrically at a rate of about 10 percent per quarter—a rate roughly consistent with historical evidence on the effects of policy shocks. Under this assumption, the implied effect of the change in forward guidance on longer-term Treasury yields would be a decline of 10-15 basis points. Of course, if the forward guidance were seen as less than fully credible, the effect on longer-term interest rates would be reduced.

The effect of the revised forward guidance under paragraph 3 of Alternative B, which indicates that the Committee intends to maintain the current target range for the federal funds rate at least as long as unemployment is above 7 percent and inflation is projected to be either below or close to 2 percent, is more difficult to gauge. Since private sector forecasters, like the staff, foresee only a gradual decline in the unemployment rate and generally subdued inflation, the effect of this forward guidance on longer-term yields would likely be larger than that of the guidance in paragraph 3'. However, the effects on longer-term yields would depend on a number of factors, including the credibility of the forward guidance at longer horizons; market participants' expectations regarding the effects of the easier policy stance on unemployment, inflation, and inflation expectations; and investors' views about the pace of withdrawal of policy accommodation once the thresholds are reached.



somewhat larger effect on financial market prices, but, as noted in the box, the extent of the effects is unclear and would depend on a number of factors.

## THE CASE FOR ALTERNATIVE A

The Committee may see the incoming data over the intermeeting period as confirming that the pace of the economic recovery will continue to be unacceptably slow and so wish to provide more substantial monetary policy accommodation, along the lines of Alternative A. The Committee may read the negative indicators about the health of labor markets, such as the low labor force participation rate and the level of long-duration unemployment, as suggesting that only very modest improvement is being made, notwithstanding the pickup in payroll employment and the recent decline in the unemployment rate. Given the state of the labor market and the depth of the recession, members may also be worried that the economy is at risk of an erosion of the skills and labor force attachment of unemployed workers, along the lines of the “Lost Decade” alternative simulation.

More broadly, policymakers may read the incoming information showing a moderate rise in consumer spending, lackluster business investment, and a pullback in defense outlays as pointing to only a modest pace of expansion in the near term. Participants may see inflation as having been subdued recently and anticipate that, in coming quarters, inflation will probably run at levels below those that the Committee considers consistent with its dual mandate. As a result, they may see the economy as likely falling short of both of the Committee’s objectives for a protracted period. Indeed, Committee participants may place some weight on the optimal control simulations of the FRB/US model, which indicate that, even given the monetary policy accommodation now in place, additional action to ease financial conditions could achieve a better outcome in terms of the Committee’s dual objectives. Alternatively, members may see considerable risk from a possible worsening of financial conditions in Europe—with potential spillovers to the United States as outlined in the “European Crisis” alternative simulation—and therefore see additional accommodation now as offering potentially valuable insurance against a very adverse outcome. Finally, a number of participants expressed an inclination to engage in additional asset purchases at the December meeting but elected to wait until the current meeting and the release of the Committee’s consensus statement about the framework for monetary policy.

To provide additional accommodation, Alternative A would both adjust the forward guidance, as in the more explicit version of Alternative B, and announce a new MBS purchase



program. Two variants of the asset purchase program are presented. Under the first, the Committee would announce its intention to purchase up to \$500 billion in MBS; under the second, the Committee would announce a flow of purchases of MBS, initially at a rate of \$40 billion per month. A purchase program in MBS, rather than Treasury securities, could be seen as preferable because the housing market continues to be depressed. Focusing on MBS would not only ease broad financial market conditions, but would also likely spur additional easing in financing conditions in the housing sector. The Committee may prefer a large, discrete purchase program that entails a specific amount of planned purchases if it believes that such a program is appropriately calibrated to the needs of the economy or if it believes that future adjustments to the size of the program, if needed, could be made relatively easily. Members may prefer a more flexible, flow-based program if they believe that such an approach would provide greater opportunity to tailor the ultimate size of the purchase program to the evolving economic outlook.<sup>4</sup>

As noted above, the staff estimates that such a program would result in modest additional progress toward both of the Committee's goals, with a reduction in the unemployment rate of about  $\frac{1}{4}$  of a percentage point and an increase in inflation of a bit less. In the near term, Federal Reserve income would be boosted by an expanded securities portfolio. In the longer run, the larger balance sheet would expose the Federal Reserve to greater interest rate risk; however even under a scenario in which interest rates are 100 basis points higher than in the baseline scenario, the Federal Reserve would continue to make remittances to the Treasury.

Either variant of the purchase program would be coupled with an adjustment to the forward guidance for the expected path of the federal funds rate along the lines of the explicit conditional approach shown in Alternative B. The Committee would state that the federal funds rate would likely remain at its current exceptionally low level so long as the unemployment rate remained above  $6\frac{1}{2}$  percent, inflation was projected to come in either below or close to 2 percent, and longer-term inflation expectations remained well anchored. The choice of  $6\frac{1}{2}$  percent for the unemployment rate threshold would reflect a step in the direction of increased commitment. For example, in the constrained optimal control simulation, in which the central bank is able to credibly commit to a path for policy, the federal funds rate is not increased from

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<sup>4</sup> For a more complete discussion of the considerations for discrete and flow-based purchase programs and potential communication challenges, see the memo "Alternative Approaches to Additional Asset Purchases" (Seth Carpenter, Jane Ibrig, David López-Salido, and Edward Nelson of the Federal Reserve Board of Governors and Matthew Raskin and Julie Remache of the Federal Reserve Bank of New York) that was sent to the Committee on January 18, 2012.

its current level until the unemployment rate falls below 6 percent in mid-2016. The more aggressive forward guidance in Alternative A would provide additional monetary policy accommodation on top of the new LSAP program. The result would be a somewhat greater boost to economic activity and inflation over coming quarters.

Even if policymakers would prefer to wait for greater clarity on the outlook for the economy before engaging in additional asset purchases, they may nevertheless conclude that additional purchases were appropriate at this meeting because they are concerned about downside risks to economic activity. Participants may judge that any further deterioration of economic conditions would be extremely costly, given the elevated level of the unemployment rate and projections of inflation that remain below the levels the Committee considers consistent with its objectives for a substantial period, as depicted in the “Disinflation” alternative simulation. In addition, given the reserve draining tools at the Committee’s disposal and the fact that purchase programs of either variety could be reduced or stopped if deemed appropriate, participants may see little cost to embarking on additional purchases, given that their effects could be reversed if economic developments suggested doing so was appropriate.

A statement along the lines of that in Alternative A would surprise financial market participants. Although around half of the respondents to the Desk survey expect some additional asset purchases over the next year, virtually none anticipate the announcement of such a program at the current meeting. In addition, while the survey suggests that some adjustment to the forward guidance is anticipated, the language in A would be more accommodative than expected. Taken together, the path of expected short rates and term premiums would both likely decline some, implying a fall in longer-term interest rates. In addition, equity markets would probably rally some, and the foreign exchange value of the dollar would tend to decline. The movement equity prices could be attenuated somewhat, however, if market participants read the statement overall as suggesting that the Committee’s assessment of the economic outlook had been marked down significantly.

## **THE CASE FOR ALTERNATIVE C**

Policymakers may view the information received since the December meeting as indicating that the economic recovery has strengthened, suggesting that less monetary policy accommodation will be necessary to support progress toward the Committee’s goals, as in Alternative C. Although the unemployment rate remains elevated by historical standards, it has declined noticeably in recent months, payroll employment continues to rise, and initial claims for

unemployment benefits have trended lower. Household spending continues to expand, and notwithstanding its recent slowing, business fixed investment is still rising.

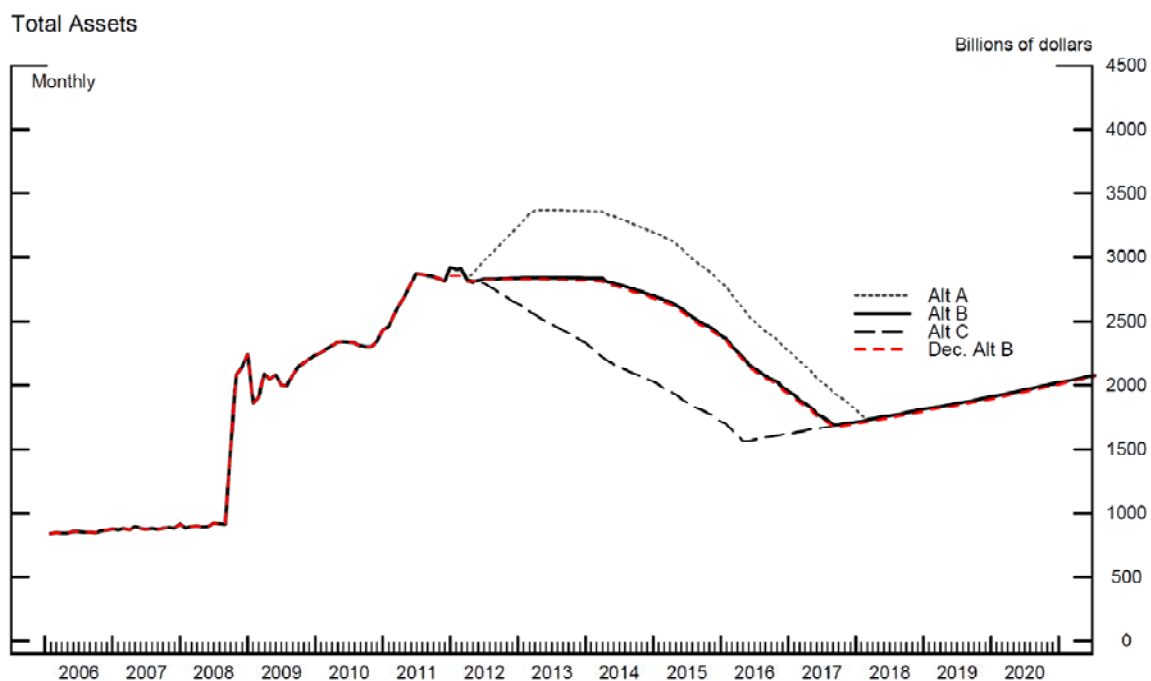
Against this backdrop, and coupled with the fact that sentiment surrounding financial and fiscal conditions in Europe appear to have improved, at least slightly, members may see the medium-run outlook for the economy as brighter than a few months ago, as in the “Stronger recovery” alternative simulation presented in the Tealbook. Alternatively, members may believe that the current degree of monetary accommodation is more likely to lead to inflationary pressures and risks destabilizing inflation expectations, rather than an appreciable improvement in the economic outlook, perhaps as contemplated in the “Weaker supply side” alternative simulation. In either case, Committee members may judge it appropriate to begin the process of unwinding the current degree of monetary policy accommodation, and in particular, may wish to cut in half the total amount of purchases and sales to be conducted under the MEP. Members may also be concerned that inflationary pressures could build rapidly and, as a result, may wish to signal clearly to markets that the target for the federal funds rate might be increased sooner than previously anticipated if inflation became a significant concern. The Committee could signal such vigilance by changing the forward guidance to indicate that economic conditions are likely to warrant the current low range for the federal funds rate “for an extended period” rather than “at least through mid-2013” as in the December statement. This formulation may have additional appeal if participants viewed the reference to a specific date in the Committee’s statement as problematic. Although providing a specific date in the forward guidance may have been useful in previous announcements to give the public a better understanding of the Committee’s reaction function, participants’ projections for the federal funds rate are now being published in the Summary of Economic Projections, and so there may be no additional benefit to including a date in the statement.

A statement along the lines of Alternative C would greatly surprise markets. The Desk’s survey of primary dealers does not suggest that any respondents anticipate a change to the statement in the direction of tightening; to the contrary, the survey reports a fairly widespread anticipation of some easing of the stance of the policy in coming months. As a result, a statement along the lines of Alternative C would generate a substantial revision to the anticipated path for the federal funds rate and for the Federal Reserve’s balance sheet policies, and interest rates along the yield curve would rise noticeably. Equity prices would likely fall, and the foreign exchange value of the dollar would probably rise.

## LONG-RUN PROJECTIONS OF THE BALANCE SHEET AND MONETARY BASE

The staff has prepared three scenarios for the Federal Reserve’s balance sheet that correspond to the policy alternatives A, B, and C. The scenario for Alternative A reflects a \$500 billion agency MBS purchase program included in paragraph 3 of the draft statement for that alternative, but is consistent with the open-ended purchase program in paragraph 3’ if purchases last, and are expected to last, for one year. 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 C.

Alternatives



For the balance sheet scenario that corresponds to Alternative B, the Committee is assumed to complete the maturity extension program (MEP) that it announced in September, purchasing a total of \$400 billion (par value) of Treasury securities with remaining maturities of six years or more and selling the same par amount of securities with remaining maturities of three years or less by the end of June 2012. The Committee also continues to reinvest principal payments from its holdings of agency debt and MBS into agency MBS, while principal from maturing Treasury securities is reinvested at auction according to the Desk’s current practice (that is, reinvesting roughly proportionally across all Treasury securities that are being issued on the date the securities mature). These policy choices would keep System Open Market Account (SOMA) securities holdings roughly constant at about \$2.6 trillion. All reinvestment is assumed

to cease in April 2014, six months before the first increase in the target federal funds rate in the staff economic forecast, and then the balance sheet begins to contract. In April 2015, the Committee begins to sell its remaining holdings of agency MBS and agency debt securities at a pace that reduces the amount of these securities in the portfolio to zero in five years—that is, by March 2020.<sup>5</sup> The combination of no reinvestment and the sale of agency securities normalizes the size of the balance sheet by September 2017.<sup>6,7</sup> The balance sheet then begins to expand, with increases in SOMA holdings essentially matching the growth of Federal Reserve capital and notes in circulation. The balance sheet reaches a size of \$2 trillion by the end of 2020.

In the scenario for Alternative A, the Committee is assumed not only to complete the MEP and continue the current reinvestment strategy but also to purchase an additional \$500 billion of agency MBS, at a pace of about \$40 billion per month beginning in February 2012 and extending through January 2013. In this scenario, total assets peak at \$3.4 trillion in June 2013, while SOMA securities holdings peak at \$3.1 trillion in March 2014. As in Alternative B, reinvestment ends in April 2014, the target federal funds rate lifts off in October 2014, sales of agency securities commence in April 2015, and holdings of agency securities fall to zero over five years.<sup>8</sup> The additional purchases of agency MBS under Alternative A postpone the normalization of the size of the balance sheet until February 2018, five months later than under Alternative B.

For the scenario that corresponds to Alternative C, the Committee continues its current reinvestment policy but scales back the MEP to \$200 billion and completes these operations in February 2012. In this scenario, the federal funds rate lifts off at the beginning of 2013, about a year and a half earlier than assumed in the other alternatives and, correspondingly, reinvestment

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<sup>5</sup> Given the maturity schedule of the agency debt securities held in the SOMA, the volume of sales necessary to reduce holdings of these securities to zero over the five-year period is minimal.

<sup>6</sup> The tools to drain reserve balances (reverse repurchase agreements and the Term Deposit Facility) are not modeled in any of the scenarios presented. Use of these tools would result in a shift in the composition of Federal Reserve liabilities—a decline in reserve balances and a corresponding increase in reverse repurchase agreements or term deposits—but would not produce an overall change in the size of the balance sheet.

<sup>7</sup> 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.

<sup>8</sup> Under Reserve Bank accounting, losses on the SOMA portfolio are only realized when securities are sold. Under the current projections, losses are projected to be smaller than net earnings. Considerable uncertainty surrounds these projections, however, and under plausible assumptions, losses could exceed earnings; in that case, remittances to the Treasury would cease and a deferred asset would be booked.

of principal from maturing or prepaying securities ends earlier, in mid-2012.<sup>9</sup> Sales of agency securities also commence earlier, in mid-2013. The size of the balance sheet is normalized in mid-2016, almost a year and a half sooner than under Alternative B, primarily reflecting the earlier assumed liftoff date for the federal funds rate and thus the earlier halt to reinvestment of principal and an earlier start of asset sales.

The size of the balance sheet normalizes in the same month under Alternative B as it did in the December Tealbook baseline. From February 2018 onward, under all scenarios, the paths for total assets in the current projections align with the baseline path in the December Tealbook.

On the liability side of the balance sheet, the forecasted path for reserve balances for Alternative B is roughly unchanged from the previous Tealbook's baseline. Under Alternative A, reserve balances peak at \$2.1 trillion—almost \$500 billion higher than in Alternative B—by the end of the new large scale asset purchase program.

In the scenario corresponding to Alternative B, the monetary base is projected to expand in 2012 before beginning to contract in the second quarter of 2013 and to continue shrinking through the third quarter of 2017, reflecting the decline in reserve balances. Starting in the fourth quarter of 2017, after reserve balances are assumed to have stabilized at \$25 billion, the monetary base expands again, in line with the growth of Federal Reserve notes in circulation. The monetary base under Alternative A expands along with the rise in reserve balances that comes from the additional asset purchases. As the balance sheet is normalized, it follows a path similar to that in Alternative B. Under Alternative C, the contraction in the monetary base begins sooner, mirroring the earlier normalization in the balance sheet.

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<sup>9</sup> The prepayment paths for agency MBS holdings and the premiums calculated under Alternative C are based on the interest rate path used in Alternative B. This simplifying assumption likely overstates somewhat both prepayments on MBS, which are reinvested into new MBS with longer expected maturities until the reinvestment policy ceases, and premiums on all securities in Alternative C. As a result, the size of the balance sheet is likely larger, and the date of normalization is likely later than would be the case if the interest rate path was recalibrated based on this scenario.

Growth Rates for the Monetary Base				
Date	Alternative B	Alternative A	Alternative C	<i>Memo</i> : December Tealbook
Percent, annual rate				
Monthly				
Jan-11	23.3	23.3	23.3	23.3
Feb-11	57.6	57.6	57.6	57.6
Mar-11	97.8	97.8	97.8	97.8
Apr-11	74.4	74.4	74.4	74.4
May-11	42.1	42.1	42.1	42.1
Jun-11	35.9	35.9	35.9	35.9
Jul-11	27.0	27.0	27.0	27.0
Aug-11	2.0	2.0	2.0	2.0
Sep-11	-10.6	-10.6	-10.6	-10.6
Oct-11	-4.5	-4.5	-4.5	-4.5
Nov-11	-8.0	-8.0	-8.0	-8.0
Dec-11	-4.5	-4.5	-4.5	12.1
Jan-12	5.8	5.9	5.7	15.1
Feb-12	22.7	22.4	21.9	10.3
Mar-12	4.0	7.1	1.9	4.4
Apr-12	-38.5	-26.1	-41.4	-29.5
May-12	-2.2	17.1	-4.9	0.9
Jun-12	18.3	37.9	15.8	15.4
Quarterly				
2011 Q1	36.8	36.8	36.8	36.8
2011 Q2	69.3	69.3	69.3	69.3
2011 Q3	21.0	21.0	21.0	21.0
2011 Q4	-5.9	-5.9	-5.9	-4.1
2012 Q1	5.5	5.8	5.1	9.7
2012 Q2	-8.1	3.2	-10.4	-5.9
2012 Q3	5.6	25.2	-2.7	4.7
2012 Q4	5.5	23.4	-8.5	5.4
Annual - Q4 to Q4				
2010	0.9	0.9	0.9	0.9
2011	32.9	32.9	32.9	33.5
2012	2.1	15.1	-4.1	3.5
2013	0.9	6.8	-11.4	0.5
2014	-4.8	-4.6	-14.5	-4.8
2015	-11.4	-12.0	-16.1	-11.3
2016	-19.8	-20.3	-10.5	-19.6

Note: Not seasonally adjusted.

## DEBT, BANK CREDIT, AND MONEY FORECASTS

The staff projects that domestic nonfinancial sector debt will increase at an annual rate of 4¼ percent in 2012, reflecting continued rapid expansion in federal government debt and a modest rise in private nonfinancial debt. Debt is expected to increase at a 4 percent pace in 2013, as slower growth in federal debt is offset by more rapid growth in private debt. Nonfinancial business debt expands at a modest pace over the forecast period, in part to finance increases in capital expenditures. We project growth of household debt to remain fairly sluggish throughout the forecast horizon, reaching only 1½ percent in 2013. Despite historically low mortgage rates, we expect home mortgage debt to continue to contract through early next year, reflecting stringent lending standards and further declines in house prices. Consumer credit rises at a moderate pace through the first half of this year and then accelerates gradually over the remainder of the forecast period, supported by projected increases in spending on consumer durables and improvements in credit availability.

The staff expects that commercial bank credit will increase moderately over the forecast period. Core loans—which include commercial and industrial (C&I), real estate, and consumer loans—are projected to expand modestly during 2012 and 2013, consistent with the anticipated gradual improvements in economic activity, credit quality, and banks' willingness to lend over that period. C&I loans are projected to increase steadily over the forecast horizon. Results from the January Senior Loan Officer Opinion Survey on Bank Lending Practices indicate that such lending has been boosted recently as a result of decreased competition from European banks and their affiliates and subsidiaries, a phenomenon that we expect to continue in the near term. In contrast, commercial real estate loans are projected to contract, primarily because high vacancy rates and depressed prices for commercial properties and the poor credit quality of existing loans are likely to continue to weigh on activity in this sector. As for lending to households, residential real estate loans on banks' books are likely to move up only slightly over the forecast period while consumer loans increase moderately over the next two years. Banks' securities holdings are forecast to rise at a moderate pace, driven by steady growth in core deposits combined with only modest expansion in bank loans.

The staff forecasts that M2, which expanded at a robust rate in 2011, will rise much more slowly in 2012, at a pace that is noticeably above that of nominal income. Continued uncertainty about European financial developments, an outlook for moderate economic growth, and very low short-term market interest rates will likely encourage investors to maintain their current elevated portfolio allocations to M2 assets this year. Subsequently, as financial strains begin to fade and



investors slowly shift their portfolios toward riskier assets, the rise in M2 is expected to slow further to a pace appreciably below that of nominal GDP. The expansion in M2 in 2013 is also held down by the expiration of unlimited FDIC insurance on non-interest bearing demand deposits at the end of 2012. Turning to the components of M2, liquid deposits, which include demand deposits, are projected to expand moderately until the first quarter of 2013, but then slow. Similarly, after increasing moderately through the end of 2012, retail money funds start to contract at the beginning of 2013. By contrast, small time deposits are projected to contract throughout the forecast period. Meanwhile, currency is expected to rise at a pace slightly greater than its historical average due to strong international demand associated with global financial uncertainty.

Growth Rates for M2

(Percent, seasonally adjusted annual rate)

Monthly Growth Rates	Tealbook Forecast*
Jun-11	9.9
Jul-11	22.7
Aug-11	24.5
Sep-11	2.5
Oct-11	6.0
Nov-11	5.8
Dec-11	5.6
Jan-12	15.9
Feb-12	7.0
Mar-12	3.5
Apr-12	3.1
May-12	3.1
Jun-12	3.1
Quarterly Growth Rates	
2011 Q3	16.4
2011 Q4	7.2
2012 Q1	9.2
2012 Q2	3.6
Annual Growth Rates	
2010	3.1
2011	9.5
2012	5.3
2013	1.9

\* This forecast is consistent with nominal GDP and interest rates in the Tealbook forecast. Actual data through December 2011; projections thereafter.

Alternatives

## DIRECTIVE

The directive that was issued in December is given below, followed by drafts for a January directive that correspond to each of the policy alternatives. Under the directive for Alternative B, the Desk would be instructed to leave the total face value of domestic securities in the SOMA about unchanged. Under Alternative A, the Committee would instruct the Desk either to execute purchases of agency MBS in order to raise the total face value of the domestic securities holdings to about \$3.1 trillion by the end of January 2013, or to purchase agency MBS in order to raise the face value of holdings of domestic securities by approximately \$40 billion per month until instructed otherwise. In addition, the directives for Alternatives A and B would instruct the Desk to take appropriate steps to complete by the end of June 2012 the \$400 billion maturity extension program that was announced last September. The directive for Alternative C would instruct the Desk to limit the amounts of purchases and sales associated with the maturity extension program to \$200 billion each and to complete these operations by the end of February. All of the draft directives instruct the Desk to continue the current practice of rolling over maturing Treasury securities at auction and of reinvesting principal payments on all agency debt and agency MBS in agency MBS.

### December 2011 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  $\frac{1}{4}$  percent. The Committee directs the Desk to continue the maturity extension program it began in September to purchase, by the end of June 2012, Treasury securities with remaining maturities of approximately 6 years to 30 years with a total face value of \$400 billion, and to sell Treasury securities with remaining maturities of 3 years or less with a total face value of \$400 billion. The Committee also directs the Desk to maintain its existing policies of rolling over maturing Treasury securities into new issues and of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities in order to maintain the total face value of domestic securities at approximately \$2.6 trillion. The Committee directs the Desk to engage in dollar roll 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.

## January 2012 Directive—Alternative A

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee seeks conditions in reserve markets consistent with federal funds trading in a range from 0 to ¼ percent. The Committee directs the Desk to continue the maturity extension program it began in September to purchase, by the end of June 2012, Treasury securities with remaining maturities of approximately 6 years to 30 years with a total face value of \$400 billion, and to sell Treasury securities with remaining maturities of 3 years or less with a total face value of \$400 billion. **[ The Committee also directs the Desk to execute purchases of agency mortgage-backed securities by the end of January 2013 in order to increase the total face value of domestic securities held in the System Open Market Account to approximately \$3.1 trillion. | The Committee also directs the Desk to execute purchases of agency mortgage-backed securities in order to increase the total face value of domestic securities held in the System Open Market Account by approximately \$40 billion per month. ]** The Committee also directs the Desk to maintain its existing policies of rolling over maturing Treasury securities into new issues and of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities ~~in order to maintain the total face value of domestic securities at approximately \$2.6 trillion.~~ 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.

**January 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  $\frac{1}{4}$  percent. The Committee directs the Desk to continue the maturity extension program it began in September to purchase, by the end of June 2012, Treasury securities with remaining maturities of approximately 6 years to 30 years with a total face value of \$400 billion, and to sell Treasury securities with remaining maturities of 3 years or less with a total face value of \$400 billion. The Committee also directs the Desk to maintain its existing policies of rolling over maturing Treasury securities into new issues and of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities in order to maintain the total face value of domestic securities at approximately \$2.6 trillion. The Committee directs the Desk to engage in dollar roll 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.

## January 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~~ **modify** the maturity extension program it began in September **so as** to purchase, by the end of ~~June~~ **February** 2012, Treasury securities with remaining maturities of approximately 6 years to 30 years with a total face value of ~~\$400~~ **\$200** billion, and to sell Treasury securities with remaining maturities of 3 years or less with a total face value of ~~\$400~~ **\$200** billion. The Committee also directs the Desk to maintain its existing policies of rolling over maturing Treasury securities into new issues and of reinvesting principal payments on all agency debt and agency mortgage-backed securities in the System Open Market Account in agency mortgage-backed securities in order to maintain the total face value of domestic securities at approximately \$2.6 trillion. The Committee directs the Desk to engage in dollar roll 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.

## Explanatory Notes

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### A. Measures of the Equilibrium Real Rate

The concepts of the equilibrium real rate reported in the exhibit “Equilibrium Real Federal Funds Rate,” are defined as the level of the real federal funds rate that is consistent with output at potential within a specified time horizon. The short-run equilibrium rate is defined as the rate that would close the output gap in twelve quarters given the corresponding model’s projection of the economy. The medium-run concept is the value of the real federal funds rate projected to prevail in seven years, under the assumption that monetary policy acts to bring actual and potential output into line in the short run and then keeps them equal thereafter.

Measure	Description
<b>Single-equation Model</b>	The measure of the equilibrium real rate in the single-equation model is based on an estimated aggregate-demand relationship between the current value of the output gap and its lagged values as well as the lagged values of the real federal funds rate.
<b>Small Structural Model</b>	The small-scale model of the economy consists of equations for six variables: the output gap, the equity premium, the federal budget surplus, the trend growth rate of output, the real bond yield, and the real federal funds rate.
<b>EDO Model</b>	Estimates of the equilibrium real rate using EDO—an estimated dynamic-stochastic-general-equilibrium (DSGE) model of the U.S. economy—depend on data for major spending categories, prices and wages, and the nominal federal funds rate as well as the model’s structure and estimate of the output gap.
<b>FRB/US Model</b>	Estimates of the equilibrium real rate using FRB/US—the staff’s large-scale econometric model of the U.S. economy—depend on a very broad array of economic factors, some of which take the form of projected values of the model’s exogenous variables.
<b>Tealbook-consistent</b>	Two measures are presented based on the FRB/US and the EDO models. Both models are matched to the extended Tealbook forecast. Model simulations determine the value of the real federal funds rate that closes the output gap conditional on the exogenous variables in the extended baseline forecast.

Explanatory Notes

Measure	Description
<b>TIPS-based Factor Model</b>	Yields on TIPS (Treasury Inflation-Protected Securities) reflect investors' expectations of the future path of real interest rates. The TIPS-based measure of the equilibrium real rate is constructed using the seven-year-ahead instantaneous real forward rate derived from TIPS yields as of the Tealbook publication date. This forward rate is adjusted to remove estimates of the term and liquidity premiums based on a three-factor, arbitrage-free term-structure model applied to TIPS yields, nominal yields, and inflation.

The actual real federal funds rate 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 target federal funds rate (or the center of the target range, if there is a target range), on the Tealbook Book B publication date.

Estimates of the real federal funds rate depend on the proxies used for expected inflation. The table below shows estimates of the real federal funds rates using alternative proxies: lagged core PCE inflation, which is used to construct the actual real federal funds rate shown in the table that displays the  $r^*$  measures; lagged four-quarter headline PCE inflation; and projected four-quarter headline PCE inflation beginning with the next quarter. The table also displays the Tealbook-consistent FRB/US-based measure of the short-run equilibrium real rate and the average of the projected real federal funds rate over the next twelve quarters using each of the different proxies for expected inflation.

Proxy used for expected inflation	Actual real federal funds rate (current value)	Tealbook-consistent FRB/US-based measure of the equilibrium real funds rate (current value)	Projected real funds rate (twelve-quarter-ahead average)
<b>Lagged core inflation</b>	-1.6	-3.2	-1.3
<b>Lagged headline inflation</b>	-2.4	-3.2	-1.3
<b>Projected headline inflation</b>	-1.3	-3.1	-1.2



## B. Analysis of Policy Paths and Confidence Intervals

### RULE SPECIFICATIONS

For the following rules,  $i_t$  denotes the federal funds rate for quarter  $t$ , while the right-hand-side variables include the staff's projection of trailing four-quarter core PCE inflation ( $\pi_t$ ), the forecast of inflation two and three quarters ahead ( $\pi_{t+2|t}$  and  $\pi_{t+3|t}$ ), the output gap estimate for the current period as well as its one quarter ahead forecast ( $y_t - y_t^*$  and  $y_{t+1|t} - y_{t+1|t}^*$ ), and the forecast of three-quarter-ahead annual average GDP growth relative to potential ( $\Delta^4 y_{t+3|t} - \Delta^4 y_{t+3|t}^*$ ). The assumed value of policymakers' long-run inflation objective is denoted  $\pi^*$ . The outcome-based and forecast-based rules were estimated using real-time data over the sample 1988:1–2006:4; each specification was chosen using the Bayesian information criterion. Each rule incorporates a 75 basis point shift in the intercept, specified as a sequence of 25 basis point increments during the first three quarters of 1998. The first two simple rules were proposed by Taylor (1993, 1999). The prescriptions of the first-difference rule do not depend on assumptions regarding  $r^*$  or the level of the output gap; see Orphanides (2003).

<b>Outcome-based rule</b>	$i_t = 1.20i_{t-1} - 0.39i_{t-2} + 0.19[1.17 + 1.73\pi_t + 3.66(y_t - y_t^*) - 2.72(y_{t-1} - y_{t-1}^*)]$
<b>Forecast-based rule</b>	$i_t = 1.18i_{t-1} - 0.38i_{t-2} + 0.20[0.98 + 1.72\pi_{t+2 t} + 2.29(y_{t+1 t} - y_{t+1 t}^*) - 1.37(y_{t-1} - y_{t-1}^*)]$
<b>Taylor (1993) rule</b>	$i_t = 2 + \pi_t + 0.5(\pi_t - \pi^*) + 0.5(y_t - y_t^*)$
<b>Taylor (1999) rule</b>	$i_t = 2 + \pi_t + 0.5(\pi_t - \pi^*) + (y_t - y_t^*)$
<b>First-difference rule</b>	$i_t = i_{t-1} + 0.5(\pi_{t+3 t} - \pi^*) + 0.5(\Delta^4 y_{t+3 t} - \Delta^4 y_{t+3 t}^*)$

### FRB/US MODEL SIMULATIONS

Prescriptions from the outcome-based rule are computed using dynamic simulations of the FRB/US model, implemented as though the rule were followed starting at this FOMC meeting. The dotted line labeled “Previous Tealbook” is based on the current specification of the policy rule, applied to the previous Tealbook projection. Confidence intervals are based on stochastic simulations of the FRB/US model with shocks drawn from the estimated residuals over 1969–2009.

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## INFORMATION FROM FINANCIAL MARKETS

The expected funds rate path is based on quotes for federal funds and forward rate agreements as well as implied three-month forward rates from swaps, and the confidence intervals for this path are constructed using prices of interest rate caps. The computations use the staff's baseline assumptions about term premiums.

## NEAR-TERM PRESCRIPTIONS OF SIMPLE POLICY RULES

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

## REFERENCES

Taylor, John B. (1993). "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39 (December), pp. 195–214.

————— (1999). "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules*. University of Chicago Press, pp. 319–341.

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

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

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

### GENERAL ASSUMPTIONS

The balance sheet projections are constructed at a monthly frequency from January 2012 to December 2020. The few balance sheet items that are not discussed below are assumed to be constant over the projection period at the level observed on December 31, 2011. 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 A and B assume that the target federal funds rate begins to increase in October 2014, consistent with the monetary policy path in the Tealbook extension derived from the outcome-based rule, while the projection for the scenario corresponding to Alternative C assumes the target rate lifts off in January 2013. The balance sheet projections assume that no use of short-term draining tools is necessary to achieve the projected path for the federal funds rate.<sup>1</sup>

### ASSETS

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

- The assumptions under Alternative B are:
  - Over the nine months beginning in October 2011, the FOMC is assumed to purchase \$400 billion in par value of Treasury securities with remaining maturities of six years or more and sell the same par amount of Treasury securities with remaining maturities of three years or less. The FOMC will reinvest the proceeds from principal payments on its agency securities holdings primarily in newly issued agency MBS in the To-Be-Announced (TBA) market. Treasury securities are rolled over at auction according to the Desk’s current practice (that is, reinvesting roughly proportionally across all Treasury securities that are being issued on the date the securities mature).

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<sup>1</sup> 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 cause reserve balances to fall. Presumably, these draining tools would be wound down as the balance sheet returns to its steady state growth path, so that the projected paths for Treasury securities presented in the Tealbook remain valid.

- Principal payments from Treasury securities and agency MBS and agency debt securities are reinvested until April 2014—six months prior to the assumed increase in the target federal funds rate.<sup>2</sup>
- The Federal Reserve begins to sell agency MBS and agency debt securities in April 2015, roughly 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 2020.
- For agency MBS, the rate of prepayment is based on staff models using estimates of housing market factors from one of the program’s investment managers, long-run average prepayment speeds of MBS, and interest rate projections from the Tealbook.<sup>3</sup> The projected rate of prepayment is sensitive to these underlying assumptions.
- In the scenario corresponding to Alternative A, the Committee is assumed to begin purchasing current coupon agency MBS in February 2012 at a rate of about \$40 billion per month through January 2013 for a total \$500 billion. In addition, the Committee is expected to complete the MEP and maintain its policies of reinvesting principal payments from its holdings of agency securities into agency MBS and of rolling over maturing Treasury securities at auction. As in the baseline, reinvestment ends in April 2014—six months prior to the assumed increase in the federal funds rate—and agency securities sales begin in April 2015, continuing for five years.
- In the scenario corresponding to Alternative C, the Committee is expected to limit its previously announced MEP so that it purchases \$200 billion in long-term securities and sells \$200 billion in short-term securities, completing operations in February 2012. Principal payments from Treasury securities continue to be reinvested at auction, and principal payments from agency MBS and agency debt securities are reinvested in agency MBS until July 2012, six months prior to the assumed increase in the federal funds rate. Sales of agency securities begin in July 2013, and continue for five years.
- Because current and expected near-term rates 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, although the par value of securities holdings remains constant under the MEP, premiums associated with the securities, and hence total assets, will rise by about \$30 billion. Reserve balances will increase by the same amount.
- The large-scale asset purchase program in Alternative A would put downward pressure on market interest rates, in particular mortgage rates, and result in more MBS

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<sup>2</sup> Projected prepayments of agency MBS reflect interest rates as of January 18, 2012.

<sup>3</sup> Projected prepayments on the existing stock of agency MBS are from an FRBNY staff model that is based on the prepayment model of one of the investment managers; projected prepayments associated with agency MBS expected to be purchased in the future rely on a Board model that is based on the Bond Market Association prepayment model.

prepayments than in the baseline. The lower path for interest rates also leads to purchases of Treasury securities made at prices that include a greater net premium relative to their face value than in the baseline.

- The current and near-term market value of agency MBS is assumed to be four percent above its face value. As a result, for Alternative A, premiums will rise by roughly \$20 billion relative to the baseline, reflecting the \$500 billion LSAP program. This will boost total assets and reserve balances by the same amount.
- The level of central bank liquidity swaps is assumed to be elevated through March 2012, reflecting the results of the recent 84-day foreign central bank swap auctions, but then return to zero in April 2012.
- In all scenarios, a minimum level of \$25 billion is set for reserve balances. Once reserve balances drop to this level, the Desk first purchases Treasury bills to maintain this level of reserve balances going forward. Purchases of bills continue until such securities comprise one-third of the Federal Reserve's total Treasury securities holdings—about the average share prior to the crisis. Once this share is reached, the Federal Reserve buys coupon securities in addition to bills to maintain an approximate composition of the portfolio of one-third bills and two-thirds coupon securities.

### **Liquidity Programs and Credit Facilities**

- Credit through the Term Asset Backed Securities Loan Facility (TALF) declines to zero by the end of 2015, reflecting loan maturities and prepayments.
- The assets held by TALF LLC remain at about \$1 billion through 2014 before declining to zero the following year. Assets held by TALF LLC consist of investments of commitment fees collected by the LLC and the U.S. Treasury's initial funding. In this projection, the LLC does not purchase any asset-backed securities received by the Federal Reserve Bank of New York in connection with a decision of a borrower to not repay a TALF loan.
- The assets held by Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC decline to zero gradually over time.

### **LIABILITIES AND CAPITAL**

- Federal Reserve notes in circulation grow in line with the staff forecast for money stock currency through the last quarter of 2013. Afterwards, Federal Reserve notes in circulation grow at the same rate as nominal GDP, as in the extended Tealbook projection.
- Over the next three months, the level of reverse repurchase agreements is assumed to decline to \$70 billion, about the average level observed over the past three years.

- The U.S. Treasury's General Account (TGA) follows the staff forecast through June 2012.<sup>4</sup> Then, the TGA slowly drops back to its historical target level of \$5 billion by January 2013 as it is assumed that the Treasury will implement a new cash management system and invest funds in excess of \$5 billion. The TGA remains constant at \$5 billion over the remainder of the forecast period.
- We maintain the Supplementary Financing Account (SFA) balance at its current level of zero throughout the forecast.
- Federal Reserve capital grows 15 percent per year, in line with the average rate of the past ten years.
- In general, increases in the level of Federal Reserve assets are matched by higher levels of reserve balances. Increases in the levels of liability items, such as Federal Reserve notes in circulation or other liabilities, or increases in the level of Reserve Bank capital, drain reserve balances. When increases in these liability or capital items would otherwise cause reserve balances to fall below \$25 billion, purchases of Treasury securities are assumed in order to maintain that level of reserve balances.
- In the event that a Federal Reserve Bank's earnings fall short of the amount necessary to cover operating costs, pay dividends, and equate surplus to capital paid-in, a deferred asset would be recorded. This deferred asset is recorded in lieu of reducing the Reserve Bank's capital and is reported on the liability side of the balance sheet as "Interest on Federal Reserve notes due to U.S. Treasury." This liability takes on a positive value when weekly cumulative earnings have not yet been distributed to the Treasury, while this liability takes on a negative value when earnings fall short of the expenses listed above. In the projections, System-wide earnings are always sufficient to cover these expenses, and this line item is set to zero.

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<sup>4</sup> The staff forecast for end-of-month U.S. Treasury operating cash balances includes forecasts of both the TGA and balances associated with the U.S. Treasury's Tax and Loan program. Because balances associated with the Tax and Loan program are only \$2 billion, for the time being, this forecast is used as a proxy for the level of TGA balances.

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

Billions of dollars

	<u>Dec 31, 2011</u>	<u>2012</u>	<u>2014</u>	<u>2016</u>	<u>2018</u>	<u>2020</u>
Total assets	2,921	3,242	3,199	2,272	1,810	2,017
Selected assets						
Liquidity programs for financial firms	100	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0
Central bank liquidity swaps	100	0	0	0	0	0
Lending through other credit facilities	9	3	1	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	9	3	1	0	0	0
Support for specific institutions	34	29	21	11	7	4
Credit extended to AIG	0	0	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	34	29	21	11	7	4
Securities held outright	2,605	2,982	2,970	2,092	1,665	1,893
U.S. Treasury securities	1,663	1,651	1,600	1,232	1,338	1,893
Agency debt securities	104	77	39	16	2	0
Agency mortgage-backed securities	838	1,255	1,331	843	324	0
Net portfolio holdings of TALF LLC	1	1	1	0	0	0
Total other assets	171	227	206	169	138	120
Total liabilities	2,867	3,180	3,117	2,164	1,667	1,828
Selected liabilities						
Federal Reserve notes in circulation	1,034	1,111	1,245	1,396	1,551	1,712
Reverse repurchase agreements	100	70	70	70	70	70
Deposits with Federal Reserve Banks	1,713	1,982	1,786	683	30	30
Reserve balances held by depository institutions	1,562	1,967	1,781	678	25	25
U.S. Treasury, General Account	86	16	5	5	5	5
Other Deposits	65	0	0	0	0	0
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0
Total capital	54	62	82	108	143	189

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

Explanatory Notes

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

Billions of dollars

	<u>Dec 31, 2011</u>	<u>2012</u>	<u>2014</u>	<u>2016</u>	<u>2018</u>	<u>2020</u>
Total assets	2,921	2,838	2,700	1,954	1,810	2,017
Selected assets						
Liquidity programs for financial firms	100	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0
Central bank liquidity swaps	100	0	0	0	0	0
Lending through other credit facilities	9	3	1	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	9	3	1	0	0	0
Support for specific institutions	34	29	21	11	7	4
Credit extended to AIG	0	0	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	34	29	21	11	7	4
Securities held outright	2,605	2,600	2,495	1,789	1,673	1,896
U.S. Treasury securities	1,663	1,651	1,600	1,232	1,462	1,896
Agency debt securities	104	77	39	16	2	0
Agency mortgage-backed securities	838	873	856	540	208	0
Net portfolio holdings of TALF LLC	1	1	1	0	0	0
Total other assets	171	205	183	154	130	117
Total liabilities	2,867	2,776	2,618	1,846	1,667	1,828
Selected liabilities						
Federal Reserve notes in circulation	1,034	1,111	1,245	1,396	1,551	1,712
Reverse repurchase agreements	100	70	70	70	70	70
Deposits with Federal Reserve Banks	1,713	1,579	1,287	364	30	30
Reserve balances held by depository institutions	1,562	1,563	1,282	359	25	25
U.S. Treasury, General Account	86	16	5	5	5	5
Other Deposits	65	0	0	0	0	0
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0
Total capital	54	62	82	108	143	189

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>Dec 31, 2011</u>	<u>2012</u>	<u>2014</u>	<u>2016</u>	<u>2018</u>	<u>2020</u>
Total assets	2,921	2,634	2,025	1,620	1,810	2,017
Selected assets						
Liquidity programs for financial firms	100	0	0	0	0	0
Primary, secondary, and seasonal credit	0	0	0	0	0	0
Central bank liquidity swaps	100	0	0	0	0	0
Lending through other credit facilities	9	3	1	0	0	0
Term Asset-Backed Securities Loan Facility (TALF)	9	3	1	0	0	0
Support for specific institutions	34	29	16	11	7	4
Credit extended to AIG	0	0	0	0	0	0
Net portfolio holdings of Maiden Lane LLC, Maiden Lane II LLC, and Maiden Lane III LLC	34	29	16	11	7	4
Securities held outright	2,605	2,426	1,861	1,487	1,698	1,915
U.S. Treasury securities	1,663	1,590	1,341	1,265	1,698	1,915
Agency debt securities	104	77	39	16	0	0
Agency mortgage-backed securities	838	760	482	206	0	0
Net portfolio holdings of TALF LLC	1	1	1	0	0	0
Total other assets	171	175	146	121	104	98
Total liabilities	2,867	2,573	1,943	1,512	1,667	1,828
Selected liabilities						
Federal Reserve notes in circulation	1,034	1,111	1,245	1,396	1,551	1,712
Reverse repurchase agreements	100	70	70	70	70	70
Deposits with Federal Reserve Banks	1,713	1,375	612	30	30	30
Reserve balances held by depository institutions	1,562	1,359	607	25	25	25
U.S. Treasury, General Account	86	16	5	5	5	5
Other Deposits	65	0	0	0	0	0
Interest on Federal Reserve Notes due to U.S. Treasury	2	0	0	0	0	0
Total capital	54	62	82	108	143	189

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

Explanatory Notes