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Flow-Based Balance Sheet Policies:
Communication Issues and Macroeconomic Effects

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To date, when the Committee has undertaken programs to make large changes in the size and composition of the Federal Reserve's balance sheet, it has announced its intention to purchase (and, in the case of the current maturity extension program, also to sell) a discrete quantity of securities over a relatively long period. The Committee's announcements have clearly stated the amount of securities it anticipates purchasing, but have been vague about the conditions that might lead it to change that amount. An alternative approach would be to announce a monthly rate at which the Federal Reserve will purchase securities, and to state explicitly that purchases will continue until specific economic outcomes are achieved or particular constraints become binding. Such a "flow-based" balance sheet policy, if clearly communicated, might lead market participants and the public more generally to expect that the Committee will pursue the program as long as appropriate to achieve its mandated goals, and so might increase household and business confidence. In this memo, we first consider design and communication issues related to policies that focus on the flow rate of purchases. We then present some model simulations to illustrate how such a policy could work. A final section considers potential statement language for a flow-based policy.

I. Considerations in the design of a flow-based policy

The staff's analysis of the effects of the Committee's prior asset purchase programs indicates that they affect term premiums and thus longer-term interest rates primarily via their effect on the private sector's expectations of the future path of the stock of longer-term securities that will be held by the Federal Reserve (and thus not held by private agents). In light of the central role that the stock of securities holdings plays in the transmission mechanism for balance sheet policies, it might seem that a flow-based program would be no more or less successful than a fixed-size program in producing the desired macroeconomic outcomes, so long as both programs involved the same expected path for securities holdings. Such a conclusion, however, would be unwarranted. If one program conveyed more information to the public about how the FOMC would adjust its holdings of longer-term assets in response to unanticipated changes in real activity and inflation, that program might prove more effective. Accordingly, a principal goal in designing an asset purchase program should be to convey clearly and accurately the Committee's intentions regarding the path of the SOMA portfolio. The effectiveness of the purchase program, whether lump-sum or flow-oriented, will depend a great deal on the public's understanding of the Committee's reaction function and stopping rule: how the Committee will adjust its purchases in response to incoming information, and what conditions would lead the Committee to halt its purchases.

It might seem natural to contrast the lump-sum and flow-based approaches by classifying them respectively as "fixed" and "open ended." Previous announcements of asset purchase programs have, however, indicated that the programs would be modified as appropriate. Indeed, the programs have been adjusted on occasion, as with the modifications made to LSAP1, the changes to reinvestment policy, and the continuation of the MEP. Thus, the previous lump-sum purchase programs have not been rigidly "fixed" programs; rather, they have been adjusted in response to unanticipated economic outcomes. The Committee did not, however, specify *ex ante* how it would adjust its purchases in response to unexpected outcomes. If the Committee is contemplating a new asset purchase program, it might wish to consider whether announcing an intended stock of purchases but no reaction function (as it did with previous LSAPs), or announcing a monthly flow and clearly stating the stopping condition, would better communicate the Committee's intentions for the SOMA portfolio.[2]

From this perspective, a purchase program that is announced in terms of a monthly flow, with a stopping rule defined in terms of the state of the economy, might be helpful in communicating that the Committee was prepared to do "whatever it takes" in pursuit of dual-mandate goals. If a flow-based program were keyed explicitly to the evolving state of the economy, it likely would imply a greater degree of flexibility than observed in practice with previous purchase programs. Consequently, the announcement of a flow-based purchase program might reduce both policymakers' and investors' concerns that purchases would end at a specified date even if the economy was still far from maximum employment and even if no inflation pressures had emerged by that time, or that purchases would continue to the specified date even if that would mean too-high inflation. Reducing the weight that market participants, and the public more broadly, assign to these eventualities might be helpful in moving the economy toward the Committee's longer-run goals, by promoting expectations of stronger real activity and fostering conditions for a self-sustaining recovery, and by helping to keep inflation expectations well anchored.

As noted above, a key feature of a flow-oriented balance-sheet policy is the stopping criterion— that is, the economic conditions that would bring purchases to an end. Specifying a stopping criterion necessarily makes the policy one that reacts to evolving economic conditions. For example, the Committee might announce that it will expand the SOMA portfolio at a fixed rate until the unemployment rate reaches some particular level.[3] If the economic outlook were to deteriorate, the private sector's expectations of balance-sheet policy would tend to adjust in an equilibrating direction: Because the date at which the unemployment rate would hit the trigger would be delayed by the weakening in the economy, the expected amount of balance sheet expansion would increase. Similarly, if the economy were to improve more rapidly than expected, the expected date at which the economy would hit the unemployment rate trigger would be brought forward, and thus the anticipated total amount of balance-sheet expansion

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[2] Of course, the Committee could announce an intended stock of purchases and indicate how the intended stock would vary if economic conditions were to evolve differently than the Committee expects.

[3] Here, and in the simulations that follow, we assume that the Committee commits to a *fixed* monthly rate of purchases. The FOMC could vary the rate of purchases with the state of the economy—with monthly purchases rising as economic conditions deteriorated, for example, and shrinking as the economy improved. The memo by David Reifschneider, John Roberts, and Jae Sim, "Incremental Balance Sheet Policies," sent to the Committee on October 24, 2011, considered policies with variable flow rates. In some versions of those policies, the prescribed flow rate was nearly constant, suggesting that the assumption of a constant flow rate may not be too constraining.

would shrink. Given its dual mandate, the Committee would make the flow of purchases contingent on inflation outcomes (or the outlook for inflation) as well.[4] The final section of the memo includes suggested statement language that makes explicit reference to inflation and inflation expectations.

Of course, the Committee might change its policy, including the stopping rule, if new information made such a change appropriate. Still, a flow-based policy with a clearly stated and publicly announced stopping function would reveal a great deal about the Committee's balance-sheet reaction function.

However, if the public does not have a clear understanding of the conditions that would bring purchases to an end, it might see a flow-based program as a highly provisional policy that is subject to frequent revision and potentially to early termination, in which case the announcement of such a program would be unlikely to have the desired positive effect on expectations. Past large-scale asset purchase programs have been effective in part because they have led to sharp revisions in investors' estimates of the future size of the Federal Reserve's securities portfolio, thereby prompting increases in asset prices. Policymakers may worry that a flow-based policy, unless communicated clearly and credibly, would not have that effect.

The Committee might also be concerned that the announcement of a flow-based approach would not deliver a significant reduction in term premiums until the public came to understand both the stopping criterion and policymakers' intention to continue purchases until the stopping criterion is achieved. The initial response in financial markets would depend on the extent to which market participants perceived the initial purchases as part of an ongoing sequence of purchases that would cumulate to an appreciable size. The Committee could, of course, help the public understand the new policy approach by including information about the stopping rule and its implications in the post-meeting statement. For example, if the Committee anticipated that the conditions specified in the stopping rule would be met no sooner than mid-2013, the statement could indicate that the Committee currently expects the purchases to continue until that date, or perhaps "at least well into next year." Or the Committee could say that it anticipates purchasing at least some minimum amount of securities. The appropriate date or amount to cite in the statement could be informed by model simulations of the stopping rule under various economic scenarios. Alternatively, other forms of policy communication could spell out details and implications of the flow-based policy. In particular, the Chairman's post-meeting press conference remarks could ensure that a flow-based policy was not seen as a more muted policy response than the lump-sum programs the Committee has announced to date, and these remarks could therefore help prevent markets from underestimating the amount of securities the Committee would be prepared to buy.

Policymakers may also be concerned that a flow-based asset purchase program, particularly if open ended, could potentially have larger adverse repercussions for market functioning or for the Federal Reserve's income than would a fixed-size purchase program. They may worry, for example, that the scale of the purchases implied by a plausible stopping rule would increase very

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[4] In the simulations that will be presented below, inflation never exceeds 2½ percent. As a consequence, if this were the (implicit or explicit) inflation trigger, it would not be breached. Even so, linking continued purchases to inflation outcomes could help stabilize inflation expectations and thus actual inflation.

substantially with a sharp deterioration in the outlook, potentially exceeding the level likely to be consistent with adequate market functioning.[5] Or they might be concerned that very large purchases would expose the Federal Reserve to the risk of large losses once interest rates finally return to normal levels. This would be a particularly important problem in the event of a large and sudden increase in longer-term interest rates—as might occur (to cite one possibility) if inflation expectations were to escalate sharply once the SOMA portfolio exceeded a certain level. However, policymakers might take some comfort from the experience of past asset purchase programs, during which expansion of the balance sheet proved consistent with well-anchored inflation expectations. In particular, they may judge that the scenarios in which the SOMA portfolio would undergo the greatest expansion would be those in which Federal Reserve asset purchases would help to keep inflation expectations from falling to an undesirably low level—as seems to have been the case in the second half of 2010, for example—rather than those in which inflation expectations threaten to move appreciably above 2 percent. Even so, the Committee might wish to guard against such risks by including, in any announcement of a flow-based asset purchase program, both an upper limit on asset purchases and an indication that continued purchases would be contingent, in part, on the stability of longer-term inflation expectations.

In the course of implementing a flow-based program, the Committee might learn about the efficacy or costs of purchases and so choose to stop or extend the program independent of the stopping rule. Such learning might come from evidence of emerging problems in market functioning. It may also arise from unexpected economic outcomes; for example, if the economy were to remain weak despite ongoing purchases, the Committee might conclude that the effects of purchases on the economy are smaller than had been thought. However, it is inevitably difficult to extract information on the efficacy or costs of purchases from macroeconomic outcomes unless shocks affecting the economy can be clearly identified. The Committee's statement could, of course, leave open the option to re-assess its policy over time in light of evidence on the efficacy or costs of the program. Policymakers may, however, be concerned that such an "escape clause" could damp the response of asset prices to the policy announcement.

II. An illustrative flow-oriented policy

To illustrate how a flow-oriented policy might work, we consider a specific policy. We assume that the Committee purchases longer-dated securities Treasury securities and agency mortgage-backed securities (MBS) at a combined rate of about $75 billion per month, a pace that is consistent with the rate of purchases considered in the accompanying memo by Carpenter *et al* and that is well below rates that might impinge on market functioning.[6] The mix of purchases is assumed to consist of 60 percent longer-dated Treasuries and 40 percent MBS, although, as noted in the aforementioned memo, as long as the Treasury purchases are tilted toward longer maturities, the exact composition of purchases does not affect the results very much. In addition, the federal funds rate is assumed to stay on a fixed baseline path through 2016. (While most

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[5] The memo by staff of the Federal Reserve Bank of New York and the Division of Monetary Affairs titled, "Market Functioning and Limits on Asset Purchases," sent to the Committee on July 25, 2012, discusses the upper limits to the level of securities holdings that are consistent with adequate market functioning.

[6] See the accompanying memo by Seth Carpenter, Michelle Ezer, Joshua Frost, Jane Ihrig, Elizabeth Klee, Lorie Logan, and Nathaniel Wuerffel, "Options for an Additional LSAP," August 28, 2012.

aspects of the baseline outlook are taken from the July Tealbook, the funds rate path has been modified to delay the first increase in the federal funds rate to mid-2015.)

We consider two levels of the unemployment rate as triggers for stopping purchases: 7.8 percent and 7.3 percent, respectively ½ and 1 percentage point below the current unemployment rate. Purchases are assumed to continue at the stated monthly rate until the quarterly average unemployment rate reaches the trigger. As discussed above, any such policy would also operate under constraints that indicated the maximum permissible inflation rate and the maximum amount of assets that could be accumulated under the policy. In the scenarios we consider here, however, inflation never exceeds 2½ percent and additions to the portfolio are at most $2 trillion, and we did not consider that, at these levels, the constraints would be binding. However, situations could arise in which inflation and asset limits might call for an end to purchases. In the July Tealbook, for example, the 90 percent confidence bound around the forecast for core PCE inflation extended from ¼ percent to 3¼ percent. Moreover, the adverse scenario considered here is considerably milder than the "European Crisis" scenario in the July Tealbook. In such a scenario, it is possible that holdings could, after several years, approach levels that might adversely affect market functioning.

The simulations are carried out with the FRB/US model.[7] The FRB/US model is used regularly by staff for many types of policy analysis; accordingly, carrying out the experiments below with this model makes the results comparable with previous staff analysis. That said, FRB/US is just one of many possible macroeconomic models, and conducting the analysis with alternative models might lead to different results. On the one hand, some outside researchers have found smaller effects of the second round of LSAPs than found by Board staff.[8] On the other hand, the simulations reported below do not incorporate the possibility that announcing and implementing a flow-based asset purchase program could improve household and business confidence because the automatic response to negative shocks implied by such a program would reduce the perceived probability of persistently weak growth.

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[7] In these simulations, we assume that the effects of the System's balance sheet holdings on term premiums are related to a present discounted value of the level of longer-term holdings now and in the future. This model is simpler than the model that the staff typically uses to analyze the effects of the System's balance-sheet position on term premiums; in particular, the more-elaborate model keeps track of the maturity distribution of the portfolio. We calibrated the simpler model to approximate the more-elaborate model, and the results are therefore not likely to be appreciably affected by this approximation. For a discussion of the simple present-value model, see Jane Ihrig, Elizabeth Klee, Andrew Levin, David López-Salido, Edward Nelson, David Reifschneider, Thomas Tallarini, Antonella Tutino, and Min Wei, "Quantitative Analysis of the Macroeconomic Effects of Alternative Strategies for Managing the Federal Reserve's Securities Holdings," memo sent to the Committee on April 22, 2010. For a discussion of the complete specification, see Canlin Li and Min Wei, "Term Structure Modeling with Supply Factors and the Federal Reserve's Large Scale Asset Purchase Programs," Finance and Economics Discussion Series paper no. 2012−37, Federal Reserve Board, July 2012.

[8] For previous Board staff results, see Hess Chung, Jean-Philippe Laforte, David Reifschneider, and John C. Williams (2012), "Have We Underestimated the Likelihood and Severity of Zero Lower Bound Events?," *Journal of Money, Credit, and Banking*, Vol. 44(S1), 47−82. Other estimates include Macroeconomic Advisers, "The Macro Effects of LSAPs II: A Comparison of Three Studies." *Monetary Policy Insights Policy Focus*, February 7, 2011, and Jeffrey Fuhrer and Giovanni Olivei, "The Estimated Macroeconomic Effects of the Federal Reserve's Large-Scale Treasury Purchase Program," *Federal Reserve Bank of Boston Public Policy Briefs 11−2*, April 28, 2011. A study by Christiane Baumeister and Luca Benati of the European Central Bank finds larger output effects: "Unconventional Monetary Policy and the Great Recession: Estimating the Effect of a Compression in the Yield Spread at the Zero Lower Bound," European Central Bank Working Paper 1258, October 2010.

The simulations embed an assumption that the public is surprised by the new LSAP; once the LSAP is announced, however, the public is assumed to immediately understand all aspects of the policy.[9] In particular, the public knows both the monthly rate of purchases and the stopping condition for the new balance sheet policy; the public also knows the date on which the federal funds rate will leave the lower bound and its trajectory thereafter. The public also is assumed to share with the FOMC a common outlook for the economy. We first consider cases in which the economy evolves as predicted; we then turn to some alternative scenarios in which news about the state of the economy comes as a surprise to both the public and the FOMC. In these simulations, financial-market decisions are assumed to be made under rational expectations; this also applies to decisions regarding wage- and price-setting. Other decision-makers are assumed to form expectations using the FRB/US model's VAR expectations mechanism.

These simulations have very modest goals: They simply illustrate how the balance sheet and the macroeconomy might evolve under several scenarios if these flow-oriented rules were used as the basis for asset purchase decisions. In these simulations, because the public is assumed to understand perfectly the FOMC's criteria for choosing the size of its securities portfolio and to share with the Committee a common outlook for the economy, the effects of the flow-based policy are identical to those of announcing a stock that will be purchased and a period over which the stock will be expanded. Some potential costs and benefits of a flow-based policy are not captured in these simulations. For example, the policy might be less effective if the public does not understand the implied reaction function. In contrast, a reduction in private-sector uncertainty arising from a clearer statement of the Committee's medium-term objectives and its reaction function could result in larger or more rapid reductions in unemployment than suggested by the simulations.

III. Simulation results

Figure 1 shows the macroeconomic effects of the flow-based balance-sheet policy described in the previous section. The red dotted line shows the effects under a 7.8 percent unemployment-rate trigger; the blue dashed line, with a 7.3 percent trigger. Under the 7.8 percent trigger, purchases continue until the fourth quarter of 2013, and total just over $1 trillion, bringing the portfolio of longer-term assets to $3.7 trillion. Consistent with the Committee's exit principles, the portfolio then stays level until around the time of the first increase in the federal funds rate. The longer-term asset holdings that are the key driver of term premiums in this model are then reduced at a steady pace over the succeeding five years.[10] Under this balance-sheet policy, the term premium falls immediately by 35 basis points, and the ten-year Treasury yield falls to 1¼ percent. The policy provides substantial stimulus to the economy, such that the unemployment rate by the end of 2014 is ½ percentage point below the Tealbook baseline value; the fact that the first increase in the federal funds rate is later than in the July Tealbook accounts for about one-

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[9] To the extent that market participants anticipate the new LSAP, the effects on term premiums, and thus on the overall economy, will be smaller than those obtained in these simulations. But to the extent that market expectations would be disappointed by the absence of a new program, term premiums would rise and macroeconomic outcomes would be worse. The simulations thus provide an assessment of the total effect of the program, even if the impact effect on announcement is reduced because the program is not a surprise.

[10] While the stock of longer-term assets takes five years to return to normal, the overall size of the SOMA portfolio would likely normalize more quickly. See the memo by staff from the Division of Monetary Affairs and the Federal Reserve Bank of New York, "The Effect of an Additional $1T LSAP on Exit Strategy," August 28, 2012, for further discussion.

third of the improvement. Inflation moves more quickly back to its long-run objective than in the baseline, and is thus close to 2 percent in 2014, 0.3 percentage point higher than baseline.

Under the 7.3 percent trigger (the blue dashed lines), purchases continue until 2014:Q2 and total $1.4 trillion, bringing the stock of long-term assets in the portfolio to just over $4 trillion. As in the preceding case, the effects of these purchases are identical to those associated with an equivalent stock-oriented announcement—namely, that the System would purchase $1.4 trillion over six quarters. Macroeconomic outcomes are better in this case, with the unemployment rate reaching the natural rate (5¼ percent) by the end of 2017, three years sooner than in the baseline. Inflation slightly overshoots its long-run target, reaching 2¼ percent in the 2015–2018 period. However, on average through 2020, inflation is closer to the 2 percent target in this case than in the baseline.

The figure also presents the outcomes from the constrained optimal-control (OC) exercise shown in the July Tealbook—the long-dash green lines. In this case, the SOMA portfolio holdings and term-premium effects are the same as in the Tealbook baseline, but the path for the federal funds rate is chosen optimally, under the assumption that the Committee can make a conditional commitment to that path. As can be seen, according to these simulations, the outcomes for optimal control and the flow-based policy with the 7.3 percent trigger are fairly similar. Indeed, through 2014, the unemployment paths in these two cases are nearly identical, and both simulations show inflation slightly overshooting the long-run objective later in the decade. Of course, any results of this kind are inevitably model-dependent, and other models could yield different views about the relative merits of these two policies.

Figure 2 shows how the flow-based policy in Figure 1 would respond if aggregate-demand conditions turned out to be different from those in the baseline. The solid black line in Figure 2 repeats the outcome under the 7.8 percent unemployment rate trigger and baseline aggregate demand that was shown in Figure 1. The dotted red line shows the outcome under the same policy but weaker aggregate demand conditions. In this scenario, the weaker aggregate demand comes as a surprise, both to the public and to the FOMC. Thus, initially, both the public and the FOMC hold the same expectations for the evolution of the economy as in the baseline. Over each of the next four quarters, however, the economy experiences shocks that lead to weaker-than-expected aggregate demand. Each quarter, expectations take account of the news that appears in that quarter, but not of the subsequent, as yet unrevealed, adverse shocks. In the scenario shown in the dashed blue lines, aggregate demand is stronger than in the baseline—by the same absolute amount as in the weak-demand scenario, and with the news arriving in the same, period-by-period, manner.

In the weak-demand scenario, purchases continue until 2014:Q4, and total almost $2 trillion, bringing the long-term assets in the SOMA portfolio to $4½ trillion. To focus on the effects of the balance-sheet policy, we assume that the federal funds rate remains at the same level as in the baseline flow projection through 2016. The ten-year Treasury yield is initially little different from its value under the baseline flow scenario. That result is not surprising, because the need for greater stimulus is not initially apparent either to policymakers or the public. After four quarters of adverse news, however, the ten-year Treasury yield is more than 40 basis points lower than under the flow-policy baseline. Reflecting the sequence of adverse shocks and the fact that policy affects the economy with a lag, the unemployment rate rises, and by late 2013, is

above 8½ percent, more than ½ percentage point higher than under the baseline. Thereafter, however, the unemployment rate moves down, and by early 2016, the additional stimulus in this case drives the unemployment rate lower than in the baseline flow-policy scenario. Inflation is initially below that in the baseline flow-policy scenario, but in response to the considerable policy stimulus provided in this case, inflation somewhat overshoots its long-run objective, reaching 2¼ percent late in the decade.

In the absence of the balance-sheet expansion in this scenario, unemployment would have risen considerably more. Additional simulations (not shown) suggest that forgoing securities purchases while setting the federal funds rate according to the estimated policy rule that the staff uses in formulating the baseline Tealbook forecast would allow the unemployment rate to rise about a percentage point more than under the balance-sheet policy illustrate here, while inflation would drop to 1 percent.

Turning now to the strong-demand scenario (the blue dashed lines), purchases last only two quarters, bringing the Federal Reserve's holdings of longer-dated securities to about $3 trillion. Thus, purchases stop very soon after it becomes clear that the economy is performing better than expected. For comparability with the previous scenario, we keep the federal funds rate on the same trajectory as in the baseline flow projection through 2016. By 2014, the unemployment rate is ¾ percentage point below the flow-policy baseline. Inflation is notably higher than in the baseline, reaching 2½ percent by 2015. While such a level of expected inflation might point to the need for the cessation of purchases, the gradual arrival of news indicating stronger growth triggers an end to purchases before it becomes clear that inflation will reach this level. This overshooting in inflation would be ameliorated if the funds rate were allowed to respond to economic conditions rather than being assumed to follow the baseline path through 2016.

IV. Communicating a flow-based approach

The simulation exercises discussed in the preceding section suggest that a flow-based LSAP can be effective in improving macroeconomic outcomes while at the same time allowing the Committee flexibility to tailor the ultimate size of its asset purchases in response to incoming information. That conclusion reflects the strong assumptions that that investors, price-setters, and wage-setters all understand the Committee's goals and its stopping rule for the flow LSAP. Accordingly, an announcement of a flow LSAP would put a premium on clear communication. The following pages provide three illustrative examples of language that the Committee might use in its post-meeting statement and other communication vehicles to help investors and the public understand a flow LSAP. (The examples show only the sentences that might be used to describe the objectives of the flow LSAP and the stopping condition; they do not show complete statements.) Key phrases in each variant are shown in italics.

1. The Committee could specify the goals of the LSAP in terms of specific, observable variables and could specify the stopping rule in terms of quantitative thresholds or triggers for those variables. For example:

> To support *an ongoing reduction in the unemployment rate over the medium run, and to help ensure that inflation, over time, is close to 2 percent*, the Committee decided today to begin a new asset-purchase program. Specifically, the Committee intends to increase

its holdings of longer-term Treasury securities at a pace of about [$40] billion per month and of agency mortgage-backed securities at a pace of about [$30] billion per month. *Consistent with its commitment to a balanced approach to minimizing deviations of employment and inflation from their mandate-consistent levels, the Committee will continue to add to its holdings at least until the unemployment rate has declined to [7.8] percent and the Committee anticipates a continued decline in unemployment with no further increase in its securities holdings, so long as the Committee projects that PCE inflation will not exceed [2.5] percent over the medium-term and longer-term inflation expectations remain stable.* Given its present assessment of the economic outlook, the Committee currently anticipates that it will continue adding to its securities holdings at this pace at least until mid-2013. The Committee will regularly review the pace and composition of its securities purchases and will determine the overall amount of these purchases in light of actual and projected progress toward its objectives and ongoing assessments of the efficacy and costs of the program.

The preceding example uses a threshold ("at least until") for the unemployment rate and a trigger ("so long as") for PCE inflation. The Committee might prefer to specify a trigger for the unemployment rate by writing "until" (rather than "at least until") the unemployment rate has declined to some level. If so, the simulation exercises reported earlier suggest that the Committee might also prefer to specify a somewhat lower numerical value for the unemployment rate and a somewhat later projected date for the end of purchases.

2. The Committee could specify the goals of the LSAP and the stopping rule using qualitative statements about the extent and persistence of improvement in one or more goal variables, along with a qualitative upper limit on inflation. For example:

> To promote *a strengthening of the pace of economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate*, the Committee decided today to begin a new large-scale, asset purchase program. Specifically, the Committee now intends to increase its holdings of longer-term Treasury securities at a pace of about [$40] billion per month and of agency mortgage-backed securities at a pace of about [$30] billion per month. The Committee will continue to expand its securities holdings *until it has observed ongoing and durable improvement in labor market conditions consistent with a self-sustaining recovery, so long as it projects that inflation over the medium term will be close to its 2 percent objective and longer-term inflation expectations remain stable. Given its current assessment of the economic outlook, the Committee currently anticipates that this program will continue at least until mid-2013*. The Committee will regularly review the pace and composition of its securities purchases and will determine the overall amount of these purchases in light of actual and projected progress toward its objectives and ongoing assessments of the efficacy and costs of the program.

By defining the stopping condition in non-quantitative terms ("until it has observed ongoing and durable improvement in labor market conditions consistent with a self-sustaining recovery" and "inflation close to its 2 percent objective"), this approach would give investors and the public less information about the stopping rule than would be provided by the first

illustrative example, though the combination of "at least until mid-2013" and a Summary of Economic Projections (or Committee consensus forecast) that is conditioned upon a flow LSAP might be enough to allow interested observers to infer the stopping rule. To ensure that the public gains a reasonably clear understanding of the Committee's intentions, the Chairman could use his opening statement during the post-meeting press conference to elucidate the Committee's medium-term objectives and the stopping rule. The minutes of the FOMC meeting also might provide greater detail about the Committee's new approach.

3. The Committee might prefer to state its objectives and the stopping rule in qualitative terms, but to specify a lower limit and an upper limit on total purchases and to indicate that the total amount of purchases and the time period over which it will continue buying securities will be state-contingent. For example:

> To promote *a persistently stronger pace of economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate*, the Committee decided today to begin a new large-scale, asset purchase program. Specifically, the Committee intends to increase its holdings of longer-term Treasury securities at a pace of about [$40] billion per month and of agency mortgage-backed securities at a pace of about [$30] billion per month *at least through [mid-2013], so long as it projects that medium-term inflation will be close to its mandate-consistent level and longer-term inflation expectations remain stable. The Committee is prepared to continue adding to its holdings subsequently, and to increase its holdings by as much as [$2 trillion over two years], if it judges that doing so is necessary to promote ongoing improvement in labor market conditions in a context of price stability*. The Committee will determine the ultimate size of the purchase program, and may adjust the pace and composition of its purchases, in light of actual and projected progress toward its medium-term objectives and its ongoing assessments of the efficacy and costs of the program.

An approach such as this could provide flexibility while protecting against the risk that the public might see a flow-based LSAP as likely to be too small, in total, to have an appreciable effect and also protecting against the risk that an open-ended program could prove unacceptably large. As with the second example (above), other policy communications could help the public understand the Committee's intentions.

Figure 1
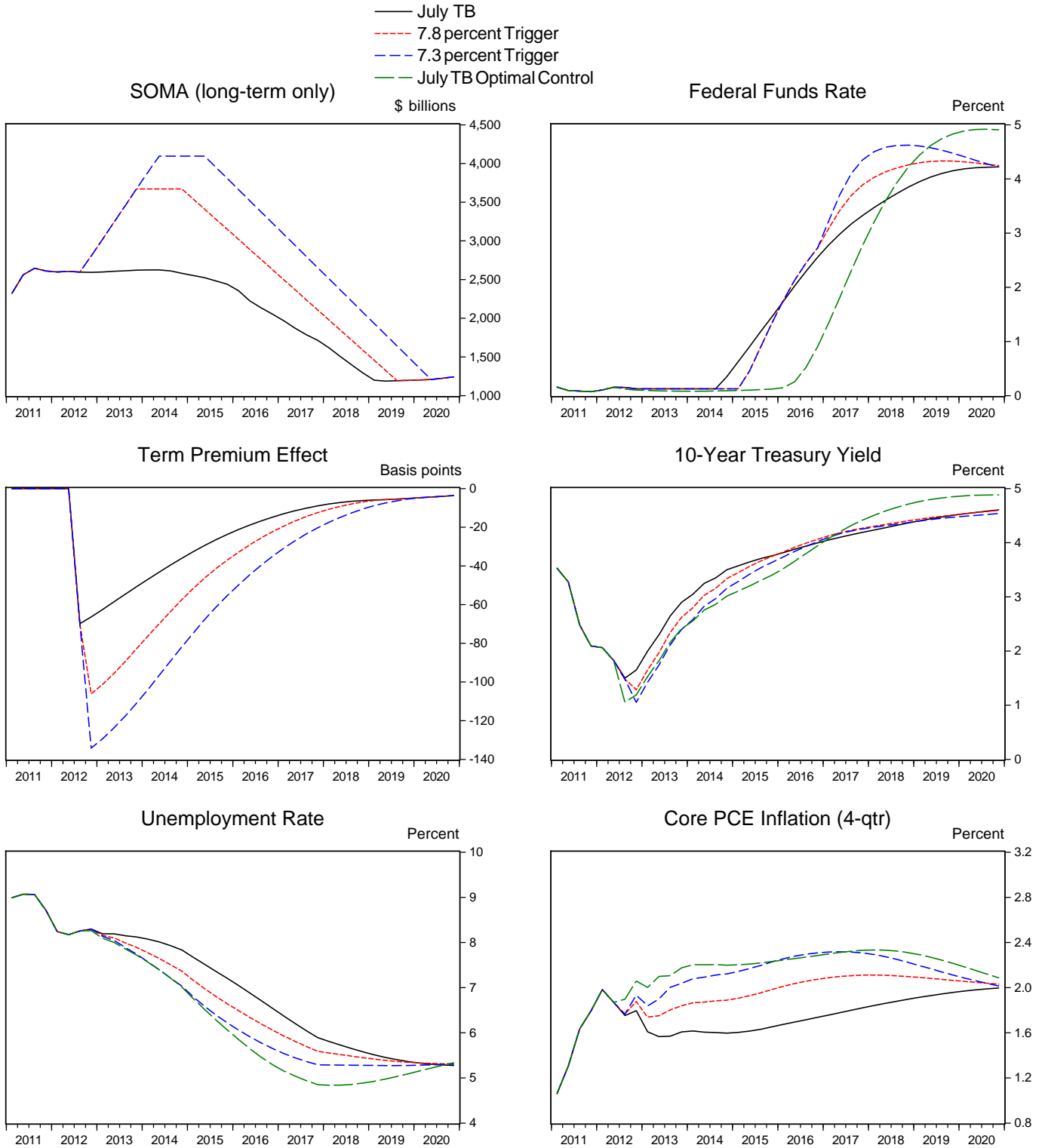Macroeconomic Effects of Alternative Balance Sheet Policies

— July TB
---- 7.8 percent Trigger
---- 7.3 percent Trigger
-- July TB Optimal Control

SOMA (long-term only)

$ billions

Federal Funds Rate

Percent

Term Premium Effect

Basis points

10-Year Treasury Yield

Percent

Unemployment Rate

Percent

Core PCE Inflation (4-qtr)

Percent

Figure 2
Macroeconomic Effects of Alternative Balance Sheet Policies

——— 7.8 Trigger
------- Weaker economy
-- -- Stronger economy

SOMA (long-term only)

Federal Funds Rate

Term Premium Effect

10-Year Treasury Yield

Unemployment Rate

Core PCE Inflation (4-qtr)