Systematic Monetary Policy and Communication

The Economic Club of New York

New York, NY

June 24, 2014

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President and CEO
Federal Reserve Bank of Philadelphia

FEDERAL RESERVE BANK
OF PHILADELPHIA

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Highlights

- President Plosser gives his views on the economy and the FOMC's most recent policy decisions. He also discusses the benefits of rule-like, systematic behavior in the design and conduct of monetary policy and how this behavior combined with greater transparency leads to more effective communication.

- President Plosser explains how a detailed monetary policy report could promote the FOMC to conduct policy in a more systematic manner, which he believes will lead to better decisions and better economic outcomes over the longer run. When policymakers deviate, it would require that they explain why.

- President Plosser uses five widely recognized simple rules to explore their implications for the future path of policy and highlights the real uncertainties that policymakers face making policy.

Introduction

Thank you, Roger Ferguson, for that kind introduction and congratulations on your term as chairman of this august organization. You have continued to deliver the great programs and speakers that so many have come to expect from the club. As many of you know, this is the centennial year for the Federal Reserve. In the spirit of such an anniversary, my hat goes off to The Economic Club of New York, which has been around for 107 years. What a great and storied history you have, and it is an honor to be here.

I should note that Congress created our decentralized central bank 100 years ago. That decentralized structure is one of our great strengths, but it requires that I begin with the usual disclaimer that the views I express are my own and do not necessarily reflect those of the Federal Reserve System or my colleagues on the Federal Open Market Committee (FOMC).

In my remarks this morning, I want to discuss the benefits of rule-like, systematic behavior in the design and conduct of monetary policy. Such behavior, combined with greater transparency, leads to communication that is more effective. This, in turn, helps the public understand the FOMC's strategies, individual policy decisions, and the likely path of policy.

I will go one step further and illustrate how the FOMC might take a step toward a more systematic policy framework by producing a detailed monetary policy report, similar to those issued by many central banks around the world. One aspect of such a report could highlight the policy paths implied by a few Taylor-like or robust rules and use them as benchmarks to set and communicate policy in a more systematic, rule-like way.

I will begin with a brief overview of my thoughts about the economy and the FOMC's most recent policy decisions before I discuss the role that systematic policy can play in the communication of policy.

The Economy and the Recent Policy Decision

First, the economy. My overall view of the economy is fairly optimistic. After a first quarter buffeted by winter storms, I believe we are poised to grow at a rate somewhat above trend for the remainder of this year and next before reverting back to trend, which I see as about 2.4 percent. Steady employment growth and healthier household balance sheets will support consumption activity. The current data suggest economic strength is fairly broad based, as evidenced by recent indicators and the optimism expressed by firms in both the manufacturing and service sectors.

As for inflation, recent readings have moved a bit higher, mitigating somewhat the concerns that low inflation will persist or decline further. We have ample monetary accommodation in the economy to ensure that we will be able to achieve our 2 percent target over time. It is important, however, that we continue to reinforce our

commitment to that goal so that inflation expectations remain well anchored near our target.

At the meeting last week, the FOMC released its latest Summary of Economic Projections (SEP). The outlook going forward was largely unchanged. While real GDP growth for 2014 was marked down, which reflected the disappointing first quarter, the outlook for the second half of the year and the projections for 2015 and 2016 were unchanged. Unemployment projections were reduced slightly, and the inflation forecast remained stable.

My own submission for economic growth was generally in line with my colleagues. But my forecast for unemployment was a bit lower in the near term. Specifically, I think the unemployment rate may reach 5.8 percent by the end of this year and 5.6 percent by the end of 2015. My view of inflation is that it will stabilize at about 2 percent in 2015.

Some market participants and commentators have focused on the so-called dot charts and the movement of the implied median funds rate for 2014–16. I would remind everyone that the dots are not a forecast of what policymakers think the Committee will actually do, but they are a reflection of the policymakers' views of appropriate policy.

Some have noted that the median path steepened ever so slightly. This should not come as a particular surprise as it likely just reveals greater confidence that the economy is improving. The rebound after the bad winter seems to be progressing, the outlook for unemployment is a bit better, and the inflation rate appears to be firming. The changes in the dots thus simply tell us something about individual policymakers reaction to the change in economic conditions. The FOMC statement notes that the Committee will adjust future funds rate decisions based on the progress toward our objectives. So, it is entirely reasonable that the expected path of "appropriate policy" should adjust as we close in on those objectives. Indeed, it would be surprising if they did not behave in such a manner.

I believe that we are closing in on our goals — perhaps faster than some people might think. So, while I supported the recent policy statement, I have growing concerns that we may have to adjust our communications in the not-too-distant future. Specifically, I believe the forward guidance in the statement may be too passive, given underlying economic conditions.

The Benefits of Systematic Monetary Policy

Let me now turn to the importance of conducting monetary policy in a systematic manner. By systematic policy, I mean conducting policy in a rule-like manner as opposed to relying on discretion. Decisions are always made period by period, but in a rules-based approach, the decisions are guided by the rules. Discretion is the opposite of rules-based decisionmaking. Discretionary decisions are made without being constrained by past promises or previous forward-looking statements.

The monetary policy debate over whether rule-like behavior is preferable to pure discretion dates back at least to Henry Simons in 1936.[1] More recently, in their Nobel Prize-winning work, Finn Kydland and Ed Prescott demonstrated that a credible commitment by policymakers to behave in a systematic rule-like manner leads to better outcomes than discretion.[2] Since then, numerous papers using a variety of models have investigated the benefits of rule-like behavior in monetary policy and found that there are indeed significant benefits. Policies characterized by commitment have been shown to lead to more economic stability. In fact, the mainstream theoretical models that we use for monetary and macroeconomic analysis are built on the notion that monetary policy is conducted in a rule-like manner.

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[1] Henry C. Simons, "Rules Versus Authorities in Monetary Policy," *Journal of Political Economy*, 44:1 (February 1936).
[2] Finn E. Kydland and Edward C. Prescott, "Rules Rather Than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy*, 85 (June 1977), pp. 473–91.

The benefits of a rule-like approach arise, in part, because consumers and businesses are forward looking. When policymakers credibly commit to a rule-like approach to setting policy, they can alter expectations in ways that make policy more effective and less uncertain.

The appropriate way to make policy systematic, or rule-like, is to base policy decisions on the state of the economy. That is, policymakers should describe the reaction function that determines how the current and future policy rate will be set depending on economic conditions. Policymakers are, of course, no more certain about future course of the economy than anyone else is; therefore, they cannot realistically commit to particular future values of the policy rate. Nonetheless, describing a reaction function or rule that explains how the policy rate will be determined in the future as a function of economic conditions can be highly informative.

Unfortunately, the science of monetary policy has not progressed to the point where we can specify the optimal rule for setting monetary policy. Given our current state of knowledge, judgment is still required in setting policy. One reason is that optimal rules, that is, those that maximize economic welfare, are highly dependent on the particular model from which they are derived, and there is no broad-based consensus for the right model. Another factor is that the optimal rule for one model can produce very bad outcomes in another model. A third reason is that optimal rules can often be quite complex, thus making them difficult to implement and to communicate to the public. In other words, they may not be very transparent.

However, these limitations to implementing optimal policy rules should not deter us from efforts to adopt a more systematic, rule-like approach to the conduct of policy. Indeed, there has been a great deal of progress made in identifying simple, robust rules

that appear to perform well in a variety of models and environments. The most well-known rule is attributable to John Taylor.[3] The Taylor rule is a reaction function that indicates how to set the policy rate as a function of deviations of inflation from the inflation target and some measure of economic slack.

The attractiveness of Taylor-like rules goes beyond their intuitive appeal or the fact that they seem to describe the actual behavior of monetary policy reasonably well. The reality is that Taylor-like rules yield very good results in a variety of theoretical models. While this is surprising to some, it is of enormous practical importance. Given our uncertainty about the true model of the economy, knowing that systematic policy in the form of a Taylor-like rule delivers good outcomes in a variety of models means that these simple, robust rules can provide useful guidance for policy. Moreover, rule-like policies also play an important role in central bank communication.

Communication

The fundamental reason that communication is so important is that monetary policy is more appropriately viewed as the path of the policy rate, not simply the current rate. This is evident today as the markets seem highly attentive to signals regarding the future path of the funds rate not simply its current setting.

Because systematic policy is easily communicated to the public, it also greatly improves the transparency and predictability of monetary policy, which reduces policy surprises. Businesses and consumers are more informed about the course of monetary policy because they understand how policymakers are likely to react to changing economic circumstances even if they are not certain what those economic conditions might be.

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[3] John B. Taylor, "Discretion Versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, North-Holland, 39, 1993, pp. 195–214.

Equally important in my view is that greater clarity about the policymakers' reaction function strengthens accountability. Thus, systematic policy, communicated transparently, strengthens accountability and serves to preserve the central bank's independence.

In this regard, Taylor-like rules have many of these desirable features. They are systematic, based on a limited number of variables, perform well in a variety of models, and can therefore provide important guidance for policy decisions. If our policy is guided by state-contingent rules, then by reporting our assessment about the evolution or forecast of key economic variables, the public will get a better understanding and appreciation of the likely path of policy. Indeed, that is likely to be the best information we can provide regarding the future path of policy.

Rules as Benchmarks: A Step Forward

Given model uncertainty and data measurement problems, there are, of course, limitations to the use of a simple rule. A robust rule is intended to work well on average, but central banks look at many variables in determining policy. Inevitably, there will be times when economic developments fall outside the scope of our models and warrant unusual monetary policy action. Events such as 9/11, the Asian financial crisis, the collapse of Lehman Brothers, and the 1987 stock market crash may require departures from a simple rule.

However, in such unusual circumstances, policymakers will be expected to explain the departures from the rule. With a rule as a baseline, departures can be quantified and inform us how excessively tight or easy policy might be relative to normal. If the events are temporary, policymakers will have to explain how and when policy is likely to return to normal. Thus, a simple rule provides a valuable benchmark for assessing and communicating the appropriate stance of policy.

The operational question is how might we go about the effort to implement a more rules-based policy?

One strategy could be to indicate the likely behavior of interest rates based on a few Taylor-like rules that have been consistent with the conduct of monetary policy in the past or ones that are considered robust across various models. Doing so would require agreement on a particular model in order to produce the resulting rule-based behavior. For the Fed, the economic model developed by the Board's staff seems like a reasonable place to start. Such an exercise could also be enhanced, I believe, by using some of the dynamic stochastic general equilibrium, or DSGE, models that have been developed within the Federal Reserve System.

As a start, the results of this type of exercise could be published in the FOMC's current biannual monetary policy report to Congress. Perhaps we might consider releasing these reports on a quarterly basis in keeping with other central banks. The Committee could then indicate whether and why it anticipates policy to be somewhat more restrained or more accommodative relative to the projections given by the various rules. The monetary policy report could also include various views that may differ from the baseline summaries.

A major benefit of this exercise would be to illustrate the various dimensions of uncertainty that policymakers face. Financial markets often prefer certainty about the future path of monetary policy, but that is unrealistic and not necessarily desirable. For example, this exercise would indicate the extent of model uncertainty, forecast uncertainty, and the variations implied by different rules. Many central banks use fan charts and other devices to highlight such bands of uncertainty about the forecast, and the Fed should do the same.

Overall, this exercise would provide a better sense of the likely direction of policy and the variables most related systematically to that policy. It would also lead the FOMC to

discuss policy in the context of rules and a systematic approach to decision-making, which I believe will lead to better decisions and better economic outcomes over the longer run. Moreover, it would require policymakers to explain why they choose to deviate from the benchmarks and the guidelines they provide.

An Example

As I discussed, communication is an important aspect of monetary policy. I have long been an advocate of the Fed producing a periodic monetary policy report similar to other central banks. It is simply too difficult to convey monetary policy design and strategy within the confines of the brief statements issued at the conclusion of each FOMC meeting. Therefore, what I am about to suggest should not be viewed in isolation but as one part of such a periodic report to the public.

So, let me illustrate how we might begin to incorporate a more systematic and transparent approach to rule-like decision-making. I view this as one step in a journey, not as the end result.

My example uses five simple rules that have been discussed in the literature and describes their implications for the projected path of the funds rate from now through 2015. Since these rules are contingent on economic conditions, I will use the midpoint of the forecasts derived from the most recent SEP and apply an Okun's law relationship to convert projections of unemployment into projections of economic slack. I should immediately note that this is not a completely coherent exercise as each participant's projections were based on his or her own view of optimal policy and, as you are well aware, those views differ. Put differently, the midpoint of the projections arises from an amalgam of different models and thus represents no one's forecast or model. Thus, the results are likely to be more diverse than otherwise expected. So my example is purely illustrative yet easily replicable. However, given the relevance of the SEP, I thought the exercise would be more interesting than if I used an off-the-shelf economic model.

The rules I have chosen are these: first, the original Taylor 1993 rule; second, a variant of Taylor's original rule, sometimes called the Taylor 1999 rule, which places greater emphasis on the output gap; third, a version of the Taylor 1999 rule that allows for considerable interest-rate smoothing and is called the inertial Taylor 1999 rule; fourth, a performance- or outcome-based rule developed by staff at the Philadelphia Fed that is simply an estimated rule that best mimics previous FOMC actions; and fifth, a first-difference rule that is based on academic work of Athanasios Orphanides and is designed to take into account the imprecision and uncertainties of our measurements of the level of the output gap or slack and the underlying or steady state real rate of interest.[4]

I have plotted the outcome of this exercise in Figure 1. So what can we take away from this picture? First, all the rules suggest that liftoff of the funds rate from the zero bound should occur next quarter. This is considerably sooner than many seem to be expecting.

Second, we can also see that although the rules point to policy being tighter, they do present somewhat different profiles of the future path of interest rates. The Taylor 93 and Taylor 99 rules have a steeper path over the next several quarters than the other rules. The primary reason for this is that both of these rules are playing catchup as they would have had liftoff occur earlier. After catchup, they increase more slowly. This dispersion in the pace of tightening also reflects model uncertainty. But ignoring or dismissing the rules does not avoid the problem such uncertainty poses. Robust rules, such as the first-difference rule, tend to have better outcomes on average across models.

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[4] See the Appendix for the precise mathematical formulations of each of these rules and the relevant references.

Third, we see that three of the policy paths are not that different from each other. Taylor 93, Taylor 99, and the performance based rules tend to converge to between 2.5 and 3.0 percent by mid-2015 and remain close thereafter.

My own assessment of appropriate policy is similar to that described by the first-difference rule. However, my point is not to decide which path is correct, but to illustrate how such benchmarks can be useful for communications.

For example, the exercise might suggest that policy choices that fall outside the bounds of these rules should be viewed with some caution. That does not mean they would be wrong but they would require careful and substantial discussion and justification.

Even for policy choices that might fall within the bounds, the exercise can provide meaning, quantitative and qualitative, to phrases such as rates are expected to be "lower than normal."

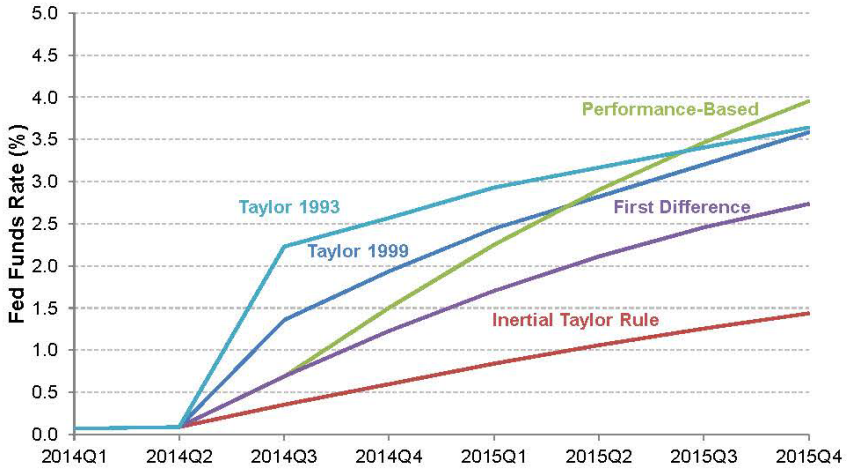
Another way of highlighting the uncertainty surrounding the future path of policy is to consider different paths for the economy. Consider Figure 2. Here I employ the first difference rule but consider the implications of a stronger and a weaker path for the economy. To illustrate the range of policy paths that could ensue, I use three different forecasts, the midpoint forecast from the SEP, as in the previous chart, as well as two hypothetical forecasts. The first takes a combination of the lowest inflation and highest unemployment forecasts (a weak forecast), and the second does just the opposite by combining the highest inflation and lowest unemployment forecasts (a strong forecast). Of course, neither represents a particular forecast or model; they combine various elements of different forecasts. Thus, the exercise represents a fairly extreme construction of forecast uncertainty. In any event, we observe a wide range for the predicted funds rate paths as in the first experiment. The weakest forecast anticipates a funds rate of nearly 1 percent by the end of 2015, while the strongest forecast envisions a funds rate of about 4.7 percent in part because both inflation and unemployment

"overshoot" their long-run and sustainable values and corrections must follow. Note, however, that even the weakest economic view coupled with the first-difference rule has the funds rate rising above the zero lower bound next quarter. This picture is analogous, but not in a precise way, to a fan chart.

I have indicated throughout my talk the imprecision of our knowledge about the economy. My understanding is no more precise than the understanding of colleagues or private-sector economists. These two exercises highlight the model and forecast uncertainty policymakers face. Rather than trying to target particular future values of the policy rate, a monetary policy report under a rules-based approach could convey the uncertainty and still assure that decisions will be driven by the state of the economy. These two exercises indicate a need to explain more fully why policy is deviating from what is suggested by these rules.

No doubt, there is a variety of views on this issue, but I think the policy process itself and our communication of policy would benefit greatly from producing a detailed monetary policy report with some of the features I have discussed today.

Figure 1: Five Policy Rules with SEP Forecast Inputs



Source: FOMC June 2014 SEP, authors' calculations

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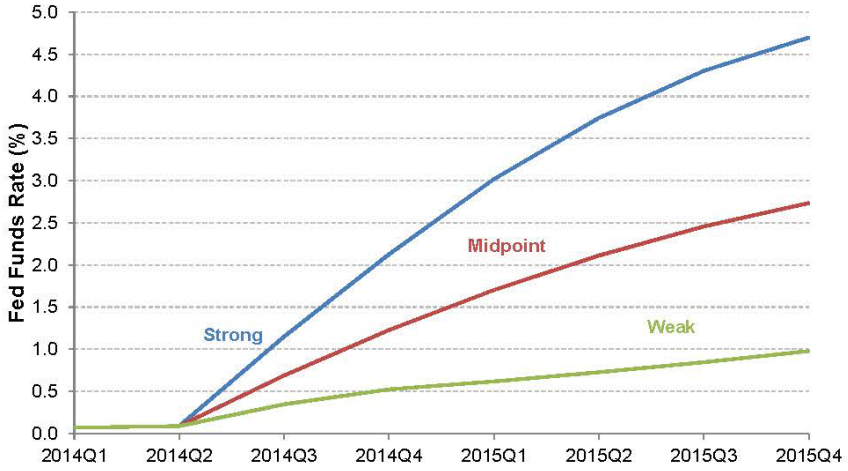
Figure 2: First-Difference Rule with Various SEP Forecast Inputs



Source: FOMC June 2014 SEP, authors' calculations

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Appendix

Taylor 1993

$$i_t = R^* + \pi_t^{avg} + 0.5\left(\pi_t^{avg} - 2\right) + 0.5(y_t - y_t^*)$$

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

(http://web.stanford.edu/~johntayl/Papers/Discretion.PDF)

Taylor 1999

$$i_t = R^* + \pi_t^{avg} + 0.5\left(\pi_t^{avg} - 2\right) + (y_t - y_t^*)$$

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

(http://www.nber.org/chapters/c7419.pdf)

First Difference from Orphanides (2003)

$$i_t = i_{t-1} + 0.5\left(\pi_{t+3}^{avg} - 2\right) + 0.5(\Delta^4 y_{t+3} - \Delta^4 y_{t+3}^*)$$

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

(http://www.federalreserve.gov/pubs/feds/2003/200336/200336pap.pdf)

Carlstrom and Fuerst Inertial Taylor Rule (2008)

$$R_t = 0.76R_{t-1} + 0.24(2.32 + 1.44(\pi_t - \pi^*) + 0.15ygap_t)$$

Carlstrom, Charles T. and Timothy S. Fuerst, "Inertial Taylor Rules: The Benefit of Signaling Future Policy," *Federal Reserve Bank of St. Louis Review* 90(3, Part 2) (May/June 2008), pp. 193–203.

(https://research.stlouisfed.org/publications/review/08/05/part2/Carlstrom.pdf)

Philadelphia Fed Estimated Outcome-Based Rule

This rule is estimated over the period of 1Q1988 through 4Q2007 using Greenbook forecasts. π_t^{avg} is the four-quarter average of core PCE.

$$f_t = 1.20f_{t-1} - 0.39f_{t-2} + 0.19\left(0.35 + 1.74\pi_t^{avg} + 3.61(y_t - y_t^*) - 2.68(y_{t-1} - y_{t-1}^*)\right) + d_t - 1.20d_{t-1} + 0.39d_{t-2}$$

Where d_t is a dummy variable with the values $d_t = \begin{cases} 0, & t < 1998\ Q1 \\ 0.25, & t = 1998\ Q1 \\ 0.50, & t = 1998\ Q2 \\ 0.75, & t \geq 1998\ Q3. \end{cases}$

(Equation form on page 38
http://www.federalreserve.gov/monetarypolicy/files/FOMC20080130bluebook20080124.pdf)

Estimation done by FRBP using Greenbook forecasts from 1Q1988 through 4Q2007.