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***“Making Monetary Policy:
Rules, Benchmarks,
Guidelines, and Discretion”***

Eric S. Rosengren
President & Chief Executive Officer
Federal Reserve Bank of Boston

*Federal Reserve Bank of Boston’s
61st Economic Conference*

Boston, Massachusetts
October 13, 2017



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Good morning and welcome to the Federal Reserve Bank of Boston’s 61st Economic Conference. I am very much looking forward to the presentations and discussions over the coming days. Before I begin, let me note as I always do that the views I express are my own, not necessarily those of my colleagues at the Board of Governors or on the Federal Open Market Committee (FOMC).

Let me also provide a bit of context for the conference. This year, our conference focuses on a topic currently debated in Congress but longstanding among economists – whether

monetary policy should follow a rules-based approach, or focus on outcomes (like maximum sustainable employment and stable prices) and allow policymakers discretion in determining how best to achieve them.

This forum continues the Boston Fed's tradition of examining economic issues and policy questions in a nonpartisan, data-focused way – with an emphasis on actionable issues that can impact the economic well-being of all citizens. Certainly, monetary policy impacts all Americans.

The extraordinary measures taken to combat the financial crisis and Great Recession have rekindled a longstanding debate: In pursuing the objectives mandated by Congress, is it in the public's best interest to allow policymakers discretion in setting interest rates, or – as recent legislation would suggest – is macroeconomic performance enhanced if policymakers adhere to a predetermined rule, for example, a "Taylor rule," named after one of our distinguished conference presenters, John Taylor.

The resolution of the rules vs. discretion debate will have significant consequences. And a hallmark of the Boston Fed's economic conference is an engaged consideration of impactful policy topics – monetary or otherwise – encouraging frank discussion and debate. In that spirit, over the next day and a half we will grapple with a range of questions central to the rules vs. discretion debate – and the way forward. My colleagues and I hope this conference provides a constructive forum for the vigorous and balanced consideration of these important issues.

An Overview of Policy Rules

Policy rules have long been central to discussions of monetary policy. I will cover some of the positive aspects, as well as some of the drawbacks.

On the positive side, rules can capture the response of monetary policy to various conditions over a historical period, thus providing an important benchmark and allowing policymakers to compare potential policies to historical norms. What's more, if the rules capture the central bank's actual behavior, they can make inherently complex policies more understandable and transparent to the public. This transparency can also aid in communicating the current and prospective stance of monetary policy – a task that has become more important as communications operate in real time, around the clock and around the globe, with information constantly processed by financial markets. Finally, such rules can provide more consistency through time, even as the membership of the central bank's policymaking committee changes.

However, in my view, policy rules can also have drawbacks. Let me provide one example. Thirty-five years ago, when Frank Morris was president of the Federal Reserve Bank of Boston, there was a raging debate underway about monetary policy rules – but they were different policy rules than are currently used. At that time, many economists were arguing for rules tied to simple money aggregates. Frank was one of the leading voices at that time in arguing that financial innovation had degraded the information content of money aggregates, and as a consequence, simple money-based rules would be poor guides for monetary policy.

With the benefit of hindsight, I think it is clear that Frank Morris was right: simple money aggregate rules did not stand the test of time. A review of the recent transcripts of FOMC

meetings (released with a five-year lag) – and more recent minutes, public speeches, and testimony – suggests very little time spent discussing monetary aggregates at the FOMC.

No simple policy rule has been widely adopted to direct policy at central banks around the world. One reason may be that picking the wrong rule can entail significant costs: an ineffective or inappropriate rule could produce distinctly sub-optimal results for the economy. It could also be quite costly to a central bank's reputation and communication efforts if the rule has to be abandoned as a consequence.

More modern policy rules, as first described by John Taylor in his 1993 and 1999 papers, have significant advantages over simple money aggregate rules, as they are firmly tied to the ultimate goals that Congress has set for the Federal Reserve (the so-called dual mandate of maximum sustainable employment and price stability) and to which it holds the central bank accountable. While the U.S. central bank has independence in how best to achieve these goals, the mandate itself is provided by a democratically-elected government. Thus, a policy rule that guides actions (interest rate decisions) to reduce misses in the mandate (deviations of inflation and employment from their targets) makes intuitive sense.

In my remarks today, I will highlight why I view policy rules tied to the central bank's mandate as extremely useful benchmarks. I will show, using figures from FOMC briefings five years ago that are now publicly available, that FOMC participants do indeed regularly refer to policy rules. However, the key point is that such briefings refer to a variety of policy rules – not one rule alone – as different policy rules can give very different policy prescriptions. Small deviations in the rule can lead to dramatically different policy outcomes. Of course, the same record will show that FOMC participants refer to a number of other non-rule benchmarks as

well.¹ My view is that it's not just rule diversity that's important, but diversity in the overall policy approach that builds in robustness.

In sum, I will attempt to document why benchmarking with policy rules is *essential* – as well as why legislating the use of simple policy rules would, in fact, be quite counterproductive.

Policy Rules as Helpful Guides

Figure 1 shows the path of inflation over nearly 50 years. The inflation rate certainly appears to behave quite differently prior to 1990 than after, with the earlier period reflecting higher average inflation rates and larger cyclical moves, and the latter period showing less volatility and rates centered around 2 to 3 percent.

Certainly, this change in inflation dynamics in part reflects central banks' efforts to fulfill their key role of ensuring price stability, which has been interpreted by many central banks as having an inflation target around 2 percent. As central banks have consistently worked to attain a 2 percent inflation target, inflation expectations have become "well-anchored" around that 2 percent goal. In fact, one of the major advantages of simple policy rules is that they can reinforce the expectations of firms and households that inflation is likely to return to 2 percent in the future.

Figure 2 shows the unemployment rate over nearly 50 years. Unlike the inflation chart, the broad dynamics of the unemployment rate movements are more consistent over time. One regularity of note is that unemployment always falls below its natural rate as the recovery matures, and shortly thereafter rises noticeably above it. While the Federal Reserve's dual

mandate involves achieving a low but sustainable unemployment rate, the chart suggests that maintaining a low but sustainable unemployment rate has been quite difficult.

Because policy rules that encourage monetary policymakers to move interest rates to achieve low sustainable unemployment and price stability are well-aligned with the Federal Reserve's dual mandate, it is, in fact, quite common for members of the FOMC to use such policy rules as benchmarks. **Figure 3** shows the set of policy rules provided during FOMC briefings from 2011, the most recent period for which memos and transcripts are now publicly available.² Note that there are several policy rules shown, including John Taylor's rules from his 1993 and 1999 papers, as well as other variants commonly used in the literature. The variants of the rules all have the dual mandate embedded in their specifications – that is, deviations from potential output (roughly equivalent to full employment) and the inflation target generate a prescribed federal funds rate.

While the rules share many common attributes, their modest differences can generate very different interest rate “solutions,” as is shown in the table presented in **Figure 4**. Note that the interest rate recommended by this set of rules for the second quarter of 2012 ranged from negative 2.15 to positive 0.59. This wide dispersion in policy prescriptions highlights how sensitive these models can be to relatively modest modeling differences. A second important feature to note is that all but one rule resulted in a prescription for negative interest rates, with the rule based on John Taylor's 1999 paper implying an interest rate of -2.15 percent – a rate that might not be feasible in practice, given the powerful incentive it would create for holding cash.

Why a Legislated Rule Would Be Problematic

Since the Federal Reserve regularly refers to monetary policy rules in its monetary policy deliberations, why not require the Fed to follow a prescribed rule or a rule that it selects? While using rules to capture how the Fed has historically reacted to misses in the mandate is quite useful, as a benchmark, I would argue that rigid adherence to a rule would result in a host of problems.

First, simple interest rate rules do not capture the full range of policy instruments available to the central bank. While some might view this as a positive feature of rules rather than a design flaw, I do not. Since the financial crisis, the Federal Reserve has – necessarily, and with positive results – expanded its balance sheet, changed the composition of the balance sheet, and changed the duration of the balance sheet.

Figure 5 shows the size of the Federal Reserve's balance sheet over the past 25 years. While the balance sheet was not used as a policy tool until the Great Recession and its aftermath, in my view, the Fed is very likely to need it again in the future,³ a consequence of living in a low-inflation and low nominal interest rate environment. Policy rules can, and – as seen in **Figure 4** – actually did, imply negative short-term interest rates. While modestly negative policy rates have been used by some central banks, the existence of zero-return cash still makes the use of significantly negative policy rates problematic under current institutional arrangements. As a result, rather than adopt negative rates, the Federal Reserve, like many other central banks, expanded its balance sheet when additional accommodation was needed. And – as **Figure 6** shows – the Fed also changed the *composition* of its balance sheet, increasing the fraction of longer-maturity Treasury securities, and adding government-guaranteed mortgage-backed securities.

Once short-term interest rates had reached the effective lower bound, these actions were undertaken to lower longer-term interest rates so as to provide additional macroeconomic stimulus, consistent with the negative-rate signals being sent by many simple policy rules. These actions seem to have flattened the Treasury yield curve and reduced interest rates relative to the Treasury yield curve.

Unfortunately, as I have noted in the past, low productivity, low population growth, and low inflation targets imply low equilibrium nominal interest rates. As a result, it is quite likely in my view that short-term interest rates may again hit the effective lower bound in future recessions – again necessitating policy tools not currently captured in most simple policy rules.

A second problem I see is that parameters often specified as *constants* in simple policy rules have proven to be quite *variable*. For example, in many formulations of simple policy rules, the equilibrium real interest rate is set as a constant. However, **Figure 7** shows that the FOMC members have been reducing their estimates of the equilibrium real federal funds rate quite significantly. (This reflects changes in policymakers' views of the rate that would be consistent with no change in inflation and unemployment.) Instead of being constant, their estimates have moved – and moved enough to significantly alter the expected number of quarter-point increases required to reach the “normal” or equilibrium rate.

Another parameter that is often viewed as a constant in simple policy rules is the estimate of full employment or potential output. **Figure 8** shows that FOMC participants have moved their estimates of full employment quite significantly. While I have argued elsewhere that these estimates may move too much, even more modest changes would imply significant deviations from a policy rule that assumed the natural unemployment rate was a constant.

Proposed legislation covering monetary policy rules requires explanations, which can be audited, for any deviations in the proposed rule – or deviations from the prescriptions of the rule. However, Figure 7 and Figure 8 illustrate why such explanations might be needed at *many* FOMC meetings, given the changing views of economic relationships as we get more information about how the economy is actually responding. And because such explanations would involve estimates of inherently unobservable concepts that are subject to significant uncertainty, one can imagine that discussion around these explanations could become quite complicated.

Figure 9 shows how the actual interest rate prescription emanating from a particular rule would change given variation in key values – specifically, if one used values for full employment (the non-accelerating inflation rate of unemployment, or NAIRU) and the equilibrium real rate of interest that reflect the variation over the past five years in FOMC participants’ median estimates in the Fed’s Summary of Economic Projections, or SEP. The first line examines the past five years using John Taylor’s 1993 rule with an estimate of a real interest rate of 2.25 percent and a NAIRU of 5.45 percent, similar to the assumptions in the January 2012 SEP. The second line uses a 1993 Taylor rule with a 0.75 percent estimate of the equilibrium real rate of interest and a NAIRU of 4.6 percent, similar to the estimates from the September 2017 SEP.⁴ The two lines are quite different, using the same rule but different estimates of the real equilibrium interest rate and NAIRU – reflecting the actual estimates of FOMC participants over the past five years. Note that the differences in the two lines are material, in the context of monetary policy decisions.

Do Simple Policy Rules Capture Actual Policy Reaction?

Figure 10 shows errors in estimating the 1993 Taylor rule, with recession shading and lines tied to various periods of financial instability. The chart shows that the simple 1993 Taylor rule does not do a particularly good job of tracking how the FOMC actually moved the federal funds rate, particularly during periods of financial instability. In a paper I wrote with Joe Peek and Geoff Tootell,⁵ we analyzed how policy reacts not only to inflation and unemployment, but to financial stability concerns, as reflected in mentions of financial stability in the FOMC transcripts.⁶ The paper more rigorously shows that concerns about financial stability, which are not modeled in the Taylor rule, are reflected in FOMC actions.

This reflects differences in how FOMC participants think about variables that the rules, and rules legislation, treat as constants or are not included at all. It also possibly reflects the use of different weights on inflation and unemployment rate misses, and the use of forecasts rather than outcomes. But it also reflects the fact that, in practice, the Federal Reserve reacts to financial stability shocks.

The leading example for this point is the last financial crisis. In 2007, the actual federal funds rate decreased much sooner than would have been implied by the 1993 Taylor rule. In the case of 2007, a much slower reaction to the impending financial problems would have exacerbated what was already a very serious economic downturn.

The failure to incorporate financial stability, or anything that reflects “tail risks” rather than expected outcomes, will not fully capture how policymakers react in real time. During recessions and financial crises, this can be a significant omission.

Concluding Observations

Simple policy rules are useful for many reasons, not least of which is in capturing how monetary policy has reacted historically. This makes these rules very useful benchmarks, providing useful guidance on how current policymakers are acting relative to how earlier FOMC participants reacted to misses on inflation and full employment.

However, a legislated policy rule that is rigid could lead to large policy mistakes, as key inputs to policy rules that can change over time are estimated with substantial error. From my perspective, policy effectiveness will be better served, instead, by a more robust formulation of monetary policy that draws on a diverse set of guidelines and benchmarks – which is the exercise Fed policymakers conduct every six weeks for actual FOMC meetings.

Thank you, and again I extend a warm welcome to all of you participating in the conference.

¹ Such as: a variety of optimal policy simulations, equilibrium real rate comparisons, and alternative scenarios.

² For more information on the historical use of monetary policy rules, see: https://www.federalreserve.gov/monetarypolicy/files/20170707_mprfullreport.pdf.

³ For additional perspective on use of the Federal Reserve balance sheet as a monetary policy tool, see April 2017 remarks by Eric S. Rosengren, [The Federal Reserve Balance Sheet and Monetary Policy](#).

⁴ To specify the rule in terms of the Fed's mandate, the output gap has been replaced by the gap between the longer-run and actual rates of unemployment, using Okun's Law. Calculation uses the PCE inflation rate. Additional information may be found [here](#).

⁵ Peek, Rosengren, and Tootell. (2016) "Does Fed Policy Reveal a Ternary Mandate?" Federal Reserve Bank of Boston Working Paper 16-11.

⁶ In this paper, we also allow for interest rate smoothing (including a lag of the federal funds rate), and estimate the response to inflation and unemployment, rather than calibrating them as the original 1993 Taylor paper does. And we estimate responses of the funds rate to forecasts, rather than data realizations.