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A Proposal to Clarify the Objectives and Strategy of Monetary Policy

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Abstract: Academic economists have perennially made arguments for the conduct of monetary policy constrained by an explicit rule. These arguments have gone nowhere. This paper advances a proposal to clarify Fed objectives and strategy in order to facilitate discussion leading to consensus over a desirable rule. The essence of the proposal is to replace the forecasts of the individual participants at FOMC meetings now contained in the Summary of Economic Projections with a consensus FOMC forecast accompanied by commentary on the strategy for monetary policy underlying the forecast.

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The academic argument for a rule to discipline the formulation of monetary policy has generated enormous amounts of discussion over the years with no clear influence on the actual conduct of monetary policy. In early 2012, the FOMC did adopt an inflation target but without articulation of a strategy for achieving it. The Great Recession has even challenged this step toward explicitness by the criticism that "inflation targeting" contributed to the Great Recession through downgrading concerns for financial stability (Curdia and Woodford 2009; Woodford 2012). The goal of a monetary policy conducted by a rule seems farther out of reach than ever.

Although written many years earlier, Lucas (1980 [1981], 255) still summarizes the chasm between monetary policymakers and mainstream academic economists:

> [O]ur ability as economists to predict the responses of agents rests, in situations where expectations about the future matter, on our understanding of the stochastic environment agents believe themselves to be operating in. In practice, this limits the class of policies the consequences of which we can hope to assess in advance to policies generated by fixed, well understood, relatively permanent rules (or functions relating policy actions taken to the state of the economy) . . . . [A]nalysis of policy which utilizes economics in a scientific way necessarily involves choice among alternative stable, predictable policy rules, infrequently changed and then only after extensive professional and general discussion, minimizing (though, of course, never entirely eliminating) the role of discretionary economic management.

Lucas (1980 [1981], 255) also noted, however:

> I have been impressed with how noncontroversial it [the above argument for rules] seems to be at a general level and with how widely ignored it continues to be at what some view as a "practical" level.

The proposal here attempts to bridge the gap between monetary policymakers and mainstream academic economists as well as critics who are concerned about Fed accountability. On the one side, academic proponents of rules want an arithmetical rule that prescribes individual changes in the funds rate. On the other side, policymakers contend that they do not and cannot follow an arithmetical rule. The proposal here accepts the latter view. However, the FOMC can still be explicit about its objectives and the strategy for achieving them. The proposal here would make explicit what can be made explicit. Also, policymakers are conservative in the sense of Edmund Burke in that they are not going to change the monetary regime in a discrete, dramatic way. The advantage of the proposal here is that it represents an evolution in existing procedures through progress toward increasing the transparency of those procedures.[1] Academic economists are likely to have more success in their quest for a rule if they follow the indirect strategy of pushing the Fed for more transparency about the systematic character of policy rather than pushing for immediate adoption of an arithmetical rule.

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[1] The proposal does not deal with arguments that the Fed should include financial stability as an additional goal beyond "maximum employment" and "price stability." The proposal entails first reaching consensus over desirable monetary policy without a separate objective for financial stability. With that foundation, debate can continue over the desirability of giving central banks an additional set of ad hoc tools in order to intervene in credit markets in a way that extends the long-standing availability of the discount window. Beyond that, one can debate whether policymakers should add financial stability as an objective that requires trading off against output and inflation.

At present, four times a year, the individual participants at FOMC meetings make forecasts of the economy in the Summary of Economic Projections (SEP).[2] These forecasts, which are based on an unarticulated assumption about "appropriate" monetary policy, are summarized statistically in various ways. In a separate, disconnected report (the "dot plot"), FOMC participants make unattributed forecasts of the funds rate target. The proposal advanced here is to replace these individual forecasts with a consensus FOMC forecast, termed the FOMC SEP.[3] The FOMC would accompany this consensus forecast with commentary explaining the strategy intended to determine the joint evolution of inflation misses and output gaps.

At present, communication in public testimony and speeches by the chair of the FOMC takes the form of a review of the economy accompanied by a judgmental near-term forecast with commentary on the likely path of the funds rate. (See, for example, Yellen 2017.) The commentary packages the funds rate path as a common sense response to an implicit priority assigned to the objectives of inflation and employment. If adopted, the proposal here would push the FOMC into talking about monetary policy as a strategy for achieving objectives. A strategy, however, comes from an assumption about the structure of the economy. Explicitness about strategy and the way it interacts with the structure of the economy would entail explicitness about the understanding of the FOMC about the monetary regime that it has created.

Section 1 elucidates how explicitness about the systematic character of monetary policy (strategy) is required in order to learn whether monetary policy is stabilizing or destabilizing.[4] Section 2 exposits the baseline policy rule when the FOMC makes no attempt to trade off among objectives (inflation, output, and possibly financial stability). Section 3 highlights the deficiencies in current FOMC procedures for communicating the strategy of monetary policy. Section 4 makes a proposal that would clarify the systematic behavior of monetary policy by making explicit FOMC objectives and strategy for achieving those objectives. Section 5 provides details on the implementation of the proposal. The proposal renders explicit the communication with markets that is now implicit and that is an integral part of the implementation of monetary policy. It is a natural extension of the efforts the FOMC has made since 1994 to be more transparent.

Section 6 illustrates how the proposal would elicit from the FOMC what is systematic about its procedures by conjecturing how it would have worked in the Great Recession. Section 7 places the proposal in the context of rules advanced in the past for the conduct of monetary policy. Section 8 makes the argument that the Fed would protect its independence by clarifying the rule-like behavior of monetary policy. In sum, the proposal is in the spirit of the research agenda laid out by John Taylor (1993) of adopting a rule by building on what is already systematic in the behavior of the FOMC—evolution not revolution.

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[2] FOMC "members" are the governors and the regional Bank presidents who vote. "Participants" include the members and also regional Bank presidents who are not currently voting members.

[3] Narayana Kocherlakota (2016), former president of the Federal Reserve Bank of Minneapolis, made a similar proposal. "[T]he Fed should release a quarterly *collective* medium-term forecast for inflation and unemployment. By collective, I mean that officials would actually vote on the forecast, much as they do on the minutes and on their regular monetary-policy statement." (italics in original)

[4] Hetzel (forthcoming) asks how central banks "learn" and how they transmit the knowledge gained.

1. Identifying the optimal rule

Traditionally, monetary policymakers have used the language of discretion rather than rules. The implicit assumption is that if each period the policy action chosen is optimal in light of the economy's most pressing problem then the concatenation of such optimal "point in time actions" will yield a long-run optimal policy. With Kydland and Prescott (1977), the profession rejected this argument. Apart from the Kydland-Prescott critique, a problem with the language of discretion is that without knowledge of the systematic character of policy that generates individual policy actions one cannot identify departures. One cannot then evaluate whether those departures are stabilizing or destabilizing. Succinctly, the language of discretion precludes learning in any systematic sense.

The language of discretion also does not allow for distinguishing between the multiple meanings of the word "monetary policy." As used here, monetary policy actions are the meeting-by-meeting information the FOMC conveys to markets about the funds rate path it anticipates will achieve its objectives. Monetary policy (the rule) is the systematic behavior of the FOMC that shapes the behavior of the term structure of interest rates. It is the way that the FOMC conditions the level and the slope of the term structure of interest rates to respond to "news" about the economy. The stance of monetary policy emerges out of the relationship between the real term structure of interest rates and the operation of the price system represented by the "natural" term structure, which is the behavior of the real term structure with no nominal price rigidities. That is, the natural term structure is the pattern of real interest rates that would emerge in a perfectly competitive market economy.

Recessions are infrequent events. It follows that the FOMC must have a baseline monetary policy that provides for stability of the economy. The issue of whether departures from this baseline policy regularly precede recessions and destabilize the economy or whether they instead occur with the onset of recession and stabilize the economy reflects a fundamental divide in macroeconomics. The failure of the FOMC to identify a baseline monetary policy renders difficult observation of whether departures from the baseline are a standard feature of recessions. One cannot then evaluate whether monetary policy causes recessions or mitigates them.

Does the baseline monetary policy work well by allowing the price system to work to keep output moving around potential while maintaining nominal expectational stability? Do departures then interfere with the working of the price system and precipitate recessions? Alternatively, does the baseline rule work well most of the time but periodically powerful outside forces overwhelm both its stabilizing properties and those of the price system. Using common labels in economics, monetarists and Keynesians differ over whether economic disorder originates in the behavior of central banks or in the behavior of the private sector.

Economists on the monetarist side of the divide believe that periodically central banks interfere with the operation of the price system. Especially, they create a negative output gap in order to lower inflation (at times also to maintain an overvalued exchange rate). However, the "long and variable lags" highlighted by Milton Friedman (1960) subvert the hoped for "soft landing" in which inflation declines in a moderate fashion while slack in the economy remains moderate (Hetzel 2015). In contrast, economists on the Keynesian side of the divide believe that periodically market forces in the form of pessimism about the future overwhelm the stabilizing forces of the price system. The default explanation of recessions in this spirit points to speculative excess accompanied by excessive accumulation of debt. The collapse of this unsustainable level of debt requires a prolonged, painful deleveraging. The purging of the imbalances accumulated during the prior period of

irrational exuberance overwhelms the stabilizing properties of the price system while offering the opportunity for expansionary monetary and fiscal policy to aid recovery. Without an understanding of the FOMC's baseline monetary policy, it is difficult to examine empirically the validity of these conflicting views.

The view of the world expressed here lies in the monetarist tradition. In this tradition, a general characterization of an optimal rule is as follows: the central bank should provide a stable nominal anchor in terms of the domestic price level and then allow market forces to determine real variables. The monetarist hypothesis is that with such a rule the price system will work well to attenuate cyclical fluctuations.[5] Design of an optimal rule then naturally starts with identification of the baseline monetary policy, which allows the stabilizing properties of the price system full rein.

The New Keynesian (NK) DSGE model consistent with this monetarist hypothesis about how the world works carries the moniker "divine coincidence." Blanchard and Gali (2007) invented the term to draw attention to a characteristic of the early NK models highlighted earlier by Goodfriend and King (1997). To elaborate, DSGE models possess a real-business-cycle (RBC) core characterized by the absence of nominal rigidities, or, equivalently, perfect price flexibility (Kydland and Prescott 1982). The working assumption in RBC models is that the price system works to produce optimal outcomes.

The RBC core of the NK DSGE model is then the benchmark for measuring optimality and "gaps." NK models in the spirit of Woodford (2003) add firms that set dollar prices for multiple periods—firms in the "sticky-price" sector. In response to shocks, the resulting nominal rigidities can create gaps between the actual values of real variables and their "natural" values, that is, the values consistent with the RBC core. Goodfriend and King (1997) noted that if the central bank maintains price stability it undoes the nominal friction and keeps output at its optimal or RBC value.

Blanchard and Gali (1997) pointed out that this "divine coincidence" between price stability and a zero output gap does not hold if markup shocks impact the Phillips curve. Markup shocks represent the exercise of monopoly power that raises prices while depressing output. The central bank can relax its goal of price stability in a way that allows some inflation in order to mitigate the decline in output. The relevance of markup shocks is an empirical matter, but the heyday of their presumed importance was in the 1970s when an accommodative monetary policy led to double-digit inflation (Hetzel 1998).[6]

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[5] With the instability in real money demand that developed after 1980, the k-percent money-growth rule of Milton Friedman (1960) no longer meets these criteria. Steady money growth rule would destabilize prices and thus not provide a stable nominal anchor.

[6] Especially since the financial crisis, economists have worked on DSGE models that add financial intermediation and an additional shock in the form of jumps in an external finance premium incurred by firms (see Christiano, Motto, and Rostagno 2010). Such models can represent the exercise of market power in the form of herd behavior of investors who jump from optimism to pessimism about the future. However, they leave unanswered the question of whether a severe recession would have occurred in the absence of contractionary monetary policy (Hetzel 2012, 2015). Note that the addition of a financial stability objective in these models implies that central banks should have caused an inflation overshoot and a positive output gap in the Great Recession. The only way to explain the simultaneous decline in output and prices in the recession is with contractionary

The Fed does not, of course, target price stability in the sense of a fixed price level. What then is the real-world counterpart of a monetary policy aimed at "divine coincidence?" Specifically, how does such a policy translate into the monetarist condition for an optimal rule that "the central bank should provide a stable nominal anchor in terms of the domestic price level and then allow market forces to determine real variables?" Two points are relevant. First, the focus of policy on price stability in a divine-coincidence NK DSGE model implies a rule that allows market forces to determine real variables. Phrased negatively, the central bank does not attempt to exploit Phillips-curve trade-offs. Second, giving full-rein to the price system to determine relative prices requires allowing inflation in the flexible-price sector to pass fully into the price level while stabilizing prices in the sticky-price sector. The second point is especially relevant for the Great Recession.[7]

2. What is the baseline monetary policy of the FOMC?

An understanding of the strategy underlying monetary policy starts from the fact that the FOMC uses as its policy instrument the funds rate, an overnight rate, which by itself possesses no significance. What is relevant is the entire term structure of interest rates. Former FOMC chairman Ben Bernanke (2005, 6) wrote:

> The Fed controls very short-term interest rates quite effectively, but the long-term rates that really matter for the economy depend not on the current short-term rate but on the whole trajectory of future short-term rates expected by market participants. Thus, to affect long-term rates, the FOMC must somehow signal to the financial markets its plans for setting future short-term rates…. [T]he FOMC has two general ways to help financial market participants divine the long-run course of policy. First, to the extent practical, the FOMC strives to be consistent in how it responds to particular configurations of economic conditions and transparent in explaining the reasons for its response…. Second … comments by FOMC officials about the Committee's general policy framework … help the public deduce how policy is likely to respond to future economic circumstances.

The problem the FOMC must solve is how to cause the term structure of interest rates to respond in a stabilizing way in response to fluctuations of the economy. When "news" in the form of new information about the economy arrives, say, that the economy is growing faster than

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monetary policy. The way that occurs is through a negative shock to the IS (consumption Euler) equation. Financial-frictions models require such a shock in order to counter the consumption boom that otherwise would be set off by an investment bust—an obvious counterfactual for recession. The central bank then fails to lower the policy rate in line with the corresponding reduction in the natural rate of interest, say, as a consequence of an inertial Taylor rule

[7] Aoki (2001, 57 and 75) worked out this implication of the NK DSGE model:

> [T]here is a trade-off between stabilizing the aggregate output gap and aggregate inflation, but … there is no trade-off between stabilizing [the] aggregate output gap and stabilizing core inflation…. [S]uppose there is an increase in the price of food and energy … putting an upward pressure on aggregate inflation…. The central bank could respond with a sharp contractionary policy and reduce aggregate demand by a large amount so as to decrease prices in the sticky-price sector…. However, our model shows that such a policy is not optimal. The optimal policy is to stabilize core inflation.

previously anticipated, the term structure should rise with the entire rise being in expected real forward rates rather than in inflation premia.[8] This discipline on monetary policy was the hallmark of the Volcker-Greenspan era when the FOMC restored credibility through convincing markets that it would not allow the inflation rate to drift with the business cycle as it had in the prior stop-go era.[9] This discipline is the expectational side of a policy aimed at divine coincidence, that is, a policy of price stability (Hetzel 2008).

Markets set forward rates and thus the yield curve based on forecasts of how the FOMC will set spot rates as the economy evolves.[10] As a result, the FOMC possesses the ability to shape how markets respond to "news." It follows that the FOMC must have a rule (strategy) that conditions markets to believe that it will move the funds rate in a systematic way that makes optimal a "real-only" movement in forward rates in response to news. The FOMC must follow a rule that determines not only the level of the funds rate but that also communicates how it will move the funds rate in response to incoming information. Effectively, the FOMC must conduct policy in a way that conditions market forecasts of the path of the funds rate to be consistent with a forecast of a real term structure of interest rates that keeps output growing along its potential path. The implicit threat to "shock" markets, hopefully never exercised, by creating a gap between the real rate and the natural rate endows the FOMC with the credibility reflected in the market expectation that the FOMC will maintain inflation at target.[11]

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[8] Before TIPS offered a measure of the real term structure of interest rates, the rule of thumb was that unanticipated cyclical strength in the economy should raise the short end of the term structure (near-term forward rates) significantly more than the long end (far off forward rates).

[9] During "inflation scares" when long-term bond yields exhibited large, discrete jumps, the FOMC raised the funds rate regardless of the amount of slack in the economy (Goodfriend 1993; Hetzel 2008, Ch. 13).

[10] The FOMC is the kingmaker. After 1980, instability in money demand meant that money was no longer reliably informative about the gap between the real rate of interest and the natural rate of interest (see footnote 5). The FOMC now conducts policy without reference to money. However, the unique power over money (bank reserves) creation and destruction exercised by the FOMC allows it to create a gap between the real rate and the natural rate. That power, which causes market spot rates to align with its funds rate target, when combined with a rule for setting spot rates, gives the FOMC its ability to shape the behavior of the yield curve. With IOER (interest on excess reserves) in effect since October 2008, the FOMC can set spot market rates directly and expand bank reserves beyond the point at which reserves would have caused the funds rate to decline without IOER. However, reserves creation and destruction remain the "stick in the closet." If market rates did not follow, say, an increase in the IOER rate (and associated funds rate range), the FOMC could always reduce reserves to the point at which the decline would cause market rates to follow, and conversely for a decrease in the IOER rate (and associated funds rate range).

[11] Over the last half of the 1960s and the 1970s, the go-stop pattern of monetary policy described the way in which the FOMC put considerable cyclical inertia into movements in the funds rate. During economic recoveries, in an attempt to hasten a decline in a negative output gap, the FOMC delayed raising rates. Subsequently, after the emergence of inflation, it created a negative output gap in an attempt to lower inflation. It did so by delaying lowering rates after cyclical peaks. The FOMC also allowed inflation to rise across business cycles. The attempt by the FOMC to manipulate output gaps

In order to maintain output growing at potential, over time, the FOMC must set the funds rate in a way that tracks the "natural" rate of interest where, again, "natural" refers to the RBC construct of an economy with competitive markets. In doing so, it conditions the real yield curve to discover its "natural" level and slope. Although the discipline placed on policy requires consistency over time on the part of the FOMC, the reality is that there exists no structural model of the economy and no arithmetical rule that reliably estimates the natural rate of interest. As a result, policy has to discover the natural rate of interest through an ongoing process of "trial and correction" (tâtonnement) with continuous correction through the monitoring of incoming news about the economy.[12] Although FOMC decisions are judgmental, the objective of keeping output growing at potential disciplines the process of continual revision in the expected path for the funds rate. That is, the FOMC will do whatever it takes to keep the economy growing at a rate that does not engender sustained changes in rates of resource utilization. William McChesney Martin termed this policy "lean-against-the-wind" (LAW).

As illustration, consider first the benchmark case in which output has been growing along its potential path but begins to deviate from that path in a sustained way, say, by growing faster than potential. In the event of unsustainable strength in the economy (sustained increases in the rate of resource utilization), the FOMC raises the funds rate relative to its prevailing value in a measured, persistent way. Converse statements hold for weakness. In the terminology in Hetzel (2008), "LAW with credibility" implies that markets forecast the behavior of forward rates and the implied yield curve based on the assumption that the FOMC will continue with these persistent steps until they cumulate to whatever degree necessary to maintain inflation on target.

Consider next the case of economic recovery in which output is growing above trend but from a starting point of a negative output gap. During recovery, a positive *growth* gap and increasing rates of resource utilization are desirable. In its deliberations, the FOMC assesses the strength of the recovery and reaches an implicit judgment over whether the term structure of interest rates is appropriate. That is, will the term structure cause output to follow a slowing glide path that leads to movement along the path of potential output? For example, given the existing yield curve, with a positive growth gap indicated by a persistently declining unemployment rate, the FOMC must decide whether output will overshoot potential output turning a negative output gap into a positive gap persistent enough to raise inflation above target.

If markets and the FOMC are of the same mind about the future path of interest rates, the FOMC moves the funds rate in line with expected forward rates built into the yield curve. Even with FOMC credibility, however, the market may, and often does, forecast a different path for rates than the FOMC. Of course, with the passage of time, different forecasts of future forward rates are reconciled. Markets then have an incentive to forecast of the path of forward rates and the resulting

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made it difficult for markets to set the term structure of interest rates based on a forecast of the path of forward rates that would keep output growing at potential.

[12] The price system works, however, in that policymakers observe the consequences of a real rate different from the natural rate. For example, a sustained real rate below the natural rate implies real output grows at a rate that raises rates of resource utilization.

real yield curve required in order to cause output to return to and then move along its potential path.[13] At the same time, divergent forecasts for the future path of the funds rate result in a two-way "conversation" between markets and the FOMC. On the one hand, markets listen to the FOMC, especially, given the resources the staffs of its participants devote to forecasting.

In the event that the FOMC believes that the term structure needs to rise in order to restrain above-trend growth in rates of resource utilization (contain inflationary pressures), it has several options. It could raise the funds rate by ½ of a percentage point when the market was expecting a ¼ percentage point increase. Before the FOMC tied the discount rate to the funds rate, it could implement the "gong effect" by accompanying a funds rate increase with an increase in the discount rate. It can convey a sense of urgency through an intermeeting increase in the funds rate. The chair can give public speeches that highlight the FOMC's concerns. The markets will then anticipate significant persistence in funds rate increases and the term structure of interest rates will rise.

On the other hand, the FOMC listens to financial markets.[14] It compares its implicit forecast of the future path of the funds rate with the market path measured by the Fed funds futures and the euro-dollar markets. If the FOMC and market forecasts differ, the FOMC must address the reason. One possibility is that market participants differ in their assessment of the strength of the economy and in the level of interest rates required in order to keep output growing at potential. If the market path lies above the FOMC's implicit path, the FOMC must consider whether it is "behind the curve." The alternative interpretation is that markets attribute a different reaction function to the FOMC than the FOMC attributes to itself. The FOMC must then find a credible way to communicate its intentions. In the zero-lower-bound (ZLB) period after December 2008, when the FOMC had to maintain confidence that it would ensure a steady recovery, quantitative easing became one way of communicating this commitment.

3. Building on existing FOMC transparency

At present, the FOMC as a committee has four routine ways of communicating with financial markets. First, it votes on a statement for release after FOMC meetings. The statement of course records whether the FOMC has changed the funds rate target. While the statement explains the specific policy action or inaction, it serves equally to shape the perception of financial markets about

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[13] Svensson (1997, 1999) assumes that central banks maximize an objective function subject to constraints imposed by the structure of the economy in order to derive the optimal funds rate path. Such a characterization is an idealization in that central banks do not possesses such a model. The models used by central banks for forecasting are judgmental. There is an overlap with the Svensson characterization here in that the behavior of the central bank shapes the way in which markets forecast the path for the funds rate.

[14] Bernanke (2005, 7) wrote:

> [M]arket prices on actively-traded futures contracts on the funds rate or on the Eurodollar rate tell us a great deal about the funds rate that market participants expect to prevail at various dates in the future…. By watching financial markets and listening to the views of market participants, FOMC members are able to know with considerable accuracy what the markets expect for monetary policy. This information helps Committee members deduce how their own actions and statements are likely to affect asset prices and yields.

future policy actions. The first two paragraphs of the statement are critical. Publicly available transcripts of FOMC meetings, which are available after five full calendar years, demonstrate that the Committee expends an enormous amount of effort on crafting these paragraphs. The first paragraph summarizes the current state of the economy relative to its state at the last FOMC meeting. The second paragraph summarizes the Committee's consensus on the near-term evolution of the economy. Financial markets use this information to forecast the future behavior of the funds rate. "Monetary policy actions" then are not only the decision regarding the funds rate but also the communication by the FOMC that shapes the behavior of the term structure of interest rates.

In addition to the statement, the FOMC chair holds a press conference after FOMC meetings four times a year in which (s)he summarizes the consensus view of the Committee. Also, Minutes of the meetings, which are more a compilation of various views with qualitative information on the relative prevalence of the views rather than actual minutes, appear with a lag of several weeks. Finally, with four of the eight yearly meetings that include a press conference, there is a compilation of forecasts made by FOMC participants. This Summary of Economic Projections (SEP) includes forecasts of four-quarter real GDP ending in the final quarter for the current year, for each of the two future years, and for an undefined "longer run." There are similar forecasts for headline and core PCE inflation, for the level of the unemployment rate, and for the level of the funds rate range. These forecasts are presented both as ranges and as histograms. For the December 2016 SEP, Figure 1 shows the median, central tendency, and range of the projections.[15]

Of particular interest to financial markets is the "dot plot," which for the same yearly forecast horizons, shows with a dot each participant's assumed mid-point of the year-end funds rate range. For example, the downshift in the mass of dots from the March 2016 FOMC meeting to the June 2016 FOMC meeting moved down the term structure of interest rates. For the March meeting, all but one of the participants desired two *or more* funds rate increases by 2016 year-end. For the June meeting, all but two of the participants desired two *or just one* increase by year-end. Figure 2 shows the dot plot copied from Bloomberg for the December 2016 meeting. The upper line connects the median value of the dots for each year. The two lower lines show the funds rate path forecast by financial markets just before and just after the release of the FOMC statement and dot plot. The slight rise in the term structure shows that markets interpreted the FOMC communication as somewhat more hawkish.

While offering information to professional Fed watchers on the predilections of the FOMC, the SEP forecasts obscure what really counts for markets, that is, the FOMC consensus. First, the SEP forecasts are not forecasts based on what individual participants believe will be actual monetary policy. The instructions that participants receive ask for forecasts based on "appropriate policy." Both hawks and doves will then likely forecast inflation at target over medium and longer horizons even though the hawks will assume a higher path for the funds rate. Second, the individual forecasts of the economy are ambiguous because of the lack of association with the funds rate path on which they are based. The forecasts would possess more substance if for each participant the forecasts for the economy and the assumed funds rate path were presented as a pair. In that way, one would know the funds rate path that conditions the forecasts as well as the associated complex of variables forecast (output, unemployment, and inflation).

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[15] The central tendency excludes the three highest and three lowest projections. The range includes all participants' projections.

Even then, the forecasts would lack relevance in that what counts is the FOMC consensus over the desirable path for the funds rate and the associated forecasts for the economy. The proposal here entails a common FOMC forecast based on a common assumed funds rate path. For this reason, the term "FOMC SEP" is used to refer to the proposal. By removing the ambiguities inherent in the SEP forecasts as currently organized concerning the FOMC's desired influence on the term structure of interest rates, it would clarify the monetary policy actions of the FOMC. Over time, it would clarify the monetary policy of the FOMC by revealing the strategy of the FOMC for achieving its objectives.

The movement toward transparency that began with the announcement of the funds rate target at the February 1994 FOMC meeting has involved making public communication that had previously occurred through signals sent to the financial markets by the actions of the New York Fed Open Market Desk. The proposal advanced below continues this movement toward transparency. The proposal would also clarify FOMC monetary policy. Section 2 outlined a baseline strategy (monetary policy) in which the FOMC does not attempt Phillips-curve trade-offs. That is, the FOMC does not attempt to manipulate a relationship between the output gap and inflation. The proposal advanced below would clarify the strategy of how the FOMC attempts to implement its dual mandate. How relevant is this baseline strategy and when does the FOMC depart from it?

4. The proposal: a graphical framework for clarifying strategy

Figures 3, 4, and 5 summarize the proposal for replacing the present SEP, which summarizes the forecasts of individual participants, with a consensus FOMC forecast. Figure 3 shows a benchmark path (the solid line) for the price level (the PCE or personal consumption expenditures deflator) extending into the future. It starts from the most recently-available level of the PCE deflator and grows at the FOMC's inflation target, currently 2 percent per annum. Figure 3 also shows a path for the price level forecasted by the FOMC (the dashed line). The assumption in the graph is that inflation is growing below target so that the price level falls away from the benchmark line but over time inflation will return to 2 percent so that the forecasted path of the price level will in time grow parallel to the benchmark line.[16] Figure 4 shows a benchmark path (the solid line) for the estimated level of potential real GDP. The dashed line shows real GDP forecasted by the FOMC. The latter dashed line is drawn based on the assumption that initially there exists some slack in the economy, that is, assuming a negative output gap.[17]

Given the long-run neutrality of money, over time, real GDP will fluctuate around the benchmark potential path. The issue is whether monetary policy can attenuate fluctuations around this potential path due either to markup shocks (the exercise of private monopoly power) or due to aggregate-demand shocks. In the first case, monetary policy could in principle accommodate some

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[16] Because the target is for inflation, there is base drift in the price level. With each FOMC SEP forecast, drift is forgiven and the two lines will coincide at the current date. Figure 3 would also be accompanied by a Figure 3a showing forecasts for core PCE as a way of removing noise in headline PCE inflation.

[17] Figure 4 would also be accompanied by a Figure 4a showing forecasts for real final sales to private domestic purchasers as a measure of underlying demand. This measure omits changes in inventories and in net exports, which are generally transitory.

of the cost-push shock by allowing above-target inflation. In the second case, monetary policy could engineer an offsetting deviation of inflation from the longer-run target. As defined in Section 2, the baseline monetarist strategy is for the FOMC not to attempt any such Phillips curve trade-offs. Specifically, given credibility for its inflation target, the FOMC determines trend inflation through the way in which firms in the sticky-price sector (firms that set dollar prices for multiple periods) coordinate on the inflation target. The FOMC then communicates to markets its best guess of the path of the funds rate that will keep output moving along its benchmark path without the presumed help of managed inflation.

Monetary policy is not transparent in the sense of the FOMC communicating a strategy. Considered in tandem, the relationship between the forecasted paths of the price level and real output relative to their benchmark paths reveals information about the strategy that defines monetary policy. Consider Figure 4 in this respect. It shows two alternative paths from point A to point F, which lies on the potential path. One path is A-B-D-E-F. That is, in order to correct the shortfall in inflation from target, the FOMC intends to engineer a positive output gap.[18] The other path is A-B-C-E-F. That is, in order to return inflation to target, the FOMC intends to rely on maintaining expected inflation equal to target while allowing transitory factors emanating from the flexible-price sector to dissipate. The first policy works off exploiting a Phillips curve relationship between inflation and output. In terms of New Keynesian models, the second policy relies on a credible rule that shapes the price-setting behavior of firms in the "sticky-price" sector. Within that environment of nominal expectational stability, the FOMC follows a rule that effectively allows the price system to set the real rate of interest in order to keep output growing at potential over time.[19] As explained in Section 2, it does so by following a rule that conditions financial markets to forecast the term structure of interest rates that will maintain output on the benchmark potential path without any need to forecast the effect of engineered deviations of inflation from its target.

Figure 5 shows the path for the funds rate assumed consistent with the forecasts of inflation and output. In this way, the FOMC clarifies its monetary policy actions by revealing how it desires to influence the term structure of interest rates. In order to implement monetary policy, the FOMC has to reach a consensus over how it desires to influence the term structure. The proposal here elucidates that consensus and the forecasts of the economy that condition it. Figure 5 also shows the

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[18] Comments by San Francisco Fed president John Williams suggested that as of August 2016 the FOMC favored this strategy. Jon Hilsenrath (2009) reported the following exchange at a meeting of Fed officials with representatives of Fed Up held before the start of the Jackson Hole Conference:

> "I don't want to be sacrificed for a war against an inflation enemy that isn't here," said Rod Adams, an African American Fed Up activist…. Fed officials weren't arguing…. John Williams, president of the Federal Reserve Bank of San Francisco, [replied] "We're going to run it [the economy] hot, get the unemployment rate down lower."

What counts, however, are comments by the chair speaking for the FOMC. The proposal here would clarify the ambiguity inherent in President Williams' statement of strategy.

[19] Comments by FOMC participants in early 2017 focused on the number of funds rate increases they expected to be appropriate in 2017. That commentary left unstated whether they believed the FOMC should run a positive output gap in order to bring inflation back to its two percent target.

funds rate path observed in futures markets.[20] In that way, it clarifies the debate required to implement the FOMC's monetary policy. For example, if the FOMC were missing on the upside both its inflation and output objectives and the funds rate path inferred from futures markets lay below the FOMC consensus path, how should the FOMC respond? Should it accept the market judgment or communicate its belief that markets are underestimating strength in the economy?

5. Implementation of the proposal

Implementation of the FOMC SEP proposal would build upon current procedures. Because of the extended discussion that would be required within the Committee, the FOMC SEP meetings would occur four times a year. What would change is that routinely the FOMC would discuss the strategy of monetary policy. Basically, the FOMC would come to a consensus over the qualitative look of Figures 3 and 4 and the intended relationship between the gaps (the differences between the dashed and solid lines) in these figures. What is the current rate of underlying inflation and how does that rate compare to the inflation target? What is the path of potential output—its level and growth rate? What then are the inflation gap and the output gap? With this background, how does the FOMC want to handle the relationship between the inflation gap and the output gap?

Through its attendance at FOMC meetings, the Board staff would learn the strategy of monetary policy. Does the FOMC deliberately intend to manage the output and inflation gaps in a way that trades off between them? Alternatively, provided that the FOMC's inflation objective is credible in shaping the nominal expectational environment that shapes price setting in the sticky-price sector, should the FOMC communicate to financial markets a path for the funds rate intended exclusively to move output along its potential path? In terms of the above example, should the Board staff base its forecasts for real output and the associated path for the funds rate on the path A-B-D-E-F or on the path A-B-C-E-F?

With this guidance on strategy, prior to FOMC meetings, the Board staff would circulate its judgmental forecast of the economy as done in the Tealbook (Part A)[21] Inevitably, FOMC participants will have different views on how to implement the strategy and how the funds rate path should evolve in order to implement a given strategy. In a way analogous to the Tealbook practice of offering alternative forecasts relative to its baseline forecast, the Tealbook would offer a range of forecasts believed to span the views of FOMC participants.

Historically, the Board staff has given weekly briefings to the governors. These briefings provide a summary update of the forecasts in the Tealbook from the previous FOMC meeting. The staff also circulates these briefings to the economics staffs of the regional Banks. With the FOMC SEP, staff at the regional banks would be encouraged to offer input so that by the time of the issue of the Tealbook prior to an FOMC meeting all the regional Banks would have had an opportunity to engage in dialogue with the Board staff. In that way, prior consultation would help to assure that the alternative Tealbook forecasts span the views of FOMC participants.

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[20] Figure 5 would be accompanied by commentary on the estimated term premia in the market forecast. Term premia, which offer insurance, create a divergence between the forward rates observed in futures markets and the actual funds rates expected by markets. See for example, Adrian et al (2013).

[21] In earlier years, this document was referred to as the Greenbook.

Part of the proposal includes reorganization of the format for debate at the four FOMC SEP meetings. Based on transcripts available through 2011, FOMC meetings start with staff presentations from the New York Desk on financial markets and from the Board staff on the domestic and foreign economies. A go-around on the economy that includes all FOMC participants follows. There is then a staff presentation on the policy options. A go-around on policy follows. Participants read prepared statements prior to each go-around with the regional Bank presidents including a review of the state of their district economies in the economic go-around. For the four FOMC SEP meetings, FOMC participants would write out these statements and distribute them prior to the meeting but not present them at the meeting.

At the four FOMC SEP meetings, FOMC discussion would concentrate on the choice of the alternative sets of Board staff forecasts of inflation, output, and the conditioning funds rate path. The Board staff would start with a summary presentation of its baseline forecast. Discussion would then center on an exchange of views between Board Staff and FOMC participants. The heads of the Division of Monetary Affairs and Research and Statistics would represent the Board staff at the table. The role of the FOMC chair would be to form a consensus over the choice among Tealbook (Part A) alternatives and the associated language in the Tealbook (Part B), which offers alternative language for the post-meeting statement.

The Tealbook forecasts are judgmental and could be adjusted but they are internally consistent and cannot be changed piecemeal. If the FOMC decided to adjust the Tealbook alternative it chose, the chair could sketch an outline of the changes. The staff would then prepare a consistent set of output and inflation tables. The final FOMC SEP forecasts would be voted on in a telephone conference and released with the Minutes, which appear with a lag of several weeks. FOMC members would retain the right to dissent. The FOMC is arguably the world's most civil debating society. Members work hard to achieve consensus and do not dissent lightly. It is likely that dissents would be no more common than at present. However, each FOMC participant would have the opportunity to write under his (her) own name as an addendum to the Minutes a comment on the alternative chosen indicating areas of agreement and disagreement.

Opposition to the proposal could arise from fear that it would reveal wide differences among FOMC participants about their objectives, strategy, and forecasts of the evolution of the economy. Diversity of views among FOMC participants, however, always exists. Lack of clarity about how the FOMC reaches consensus and how it communicates that consensus to financial markets can only limit the quality of internal debate and of public communication.

The proposal could raise the concern that it would create a false sense of precision about the ability of the FOMC to forecast the future and about its knowledge of the key benchmark path for potential output. Legitimately, monetary policymakers will argue that they possess very little confidence in their knowledge of the path of potential output and of the funds rate trajectory that will move output along that path while keeping inflation in line with its target. However, that lack of knowledge only reflects the inherent uncertainty over the evolution of the economy. Moreover, policy is not conditioned by a structural model of the economy that reveals the "natural" values of real variables. Inevitably, policy actions, which are made in real time, are judgmental. Although the FOMC objectives of keeping output moving along potential over the longer run and of maintaining inflation at target remain constant, achieving them requires a continual updating about the path of potential output and about the course of the economy relative to that path. It also requires continual checking that expected inflation remains anchored at two percent.

Even though the implementation of monetary policy is relentlessly data dependent, its success depends upon a consistent strategy—rule-like behavior. That consistency causes financial markets to update constantly the term structure of interest rates in response to incoming information in a way that keeps output moving around its potential path. The success of monetary policy also depends upon the expectational environment that maintains the expectation of longer-run inflation by financial markets and firms at the two percent target. Implicitly, FOMC procedures acknowledge the requirement of shaping the expectations of markets in order to ensure this behavior through consistent, rule-like behavior. The proposal here only clarifies for a wide public audience how the FOMC disciplines the term structure of interest rates to respond to incoming information in a way that stabilizes the economy.

6. An illustration using 2008

Discussion of the actions of the Fed in the 2007-2009 recession (the Great Recession) has focused on the Fed's credit market interventions in fall 2008. An advantage of the FOMC SEP proposal offered here is the sharp distinction drawn between monetary policy (the reaction function that summarizes the systematic procedures of the FOMC for influencing the term structure of interest rates) and credit-market interventions. It is interesting to conjecture how the proposal here would have elucidated the strategy of monetary policy in the Great Recession. Although this exercise indicates a particular strategy for monetary policy in 2008, the intention is not to argue for the validity of that characterization. The point is rather that individuals have to infer the strategy ex post because the FOMC does not articulate it ex ante.

Figure 6 shows the behavior of the headline personal consumption expenditures (PCE) deflator and its core counterpart normalized using 2005Q4 as a base. These series are compared to a benchmark level rising at an annualized rate of two percent. As shown by the two actual inflation series, relative to the benchmark both grew at rates in excess of two percent until mid-summer 2008. The headline PCE deflator exhibited the greatest excess as a result of the worldwide commodity price shock that began in summer 2004. It possible that to some extent the high rate of growth of the headline PCE deflator due to commodity prices passed through to the core deflator.

Starting with the June 2004 meeting, the FOMC raised the funds rate from a cyclical low of 1 percent to a cyclical high at the June 2006 meeting of 5.25 percent. By summer 2007, the high rate of inflation due to the extended commodity price shock had depressed real disposable income and growth in consumption weakened correspondingly (Hetzel 2012, Fig. 12.6). The peak of the business cycle occurred in December 2007. The FOMC had started lowering the funds rate from its cyclical peak of 5.25 percent at its September 2007 meeting out of concern that a disruption to the flow of credit to mortgage markets would weaken growth. Following its lean-against-the-wind procedures, it lowered the funds rate in steps to 2 percent at its April 2008 meeting. However, at that meeting, the FOMC signaled an end to the easing cycle.

One reason for this signaling was that economy appeared to stabilize in 2008Q2. Temporary factors made it appear that the economy was reviving. A decline in the magnitude of net exports boosted GDP (more of domestic demand was accounted for by domestic production rather than by foreign imports). The enormous boost to disposable income provided by the Bush tax cuts temporarily halted the decline in real personal consumption expenditures that had begun in December

2007 (Hetzel 2012, 213).[22] Most important, the FOMC became concerned about the persistent overshoot in its inflation target and also about depreciation of the dollar. Its communication delivered the message that the easing cycle was over so that the next move in the funds rate was likely to be upward.[23]

For observations the day following an FOMC meeting, Figure 7 plots the difference between the 3-month (6-month) Treasury bill rate and the funds rate target. The difference is positive when markets expect the FOMC to raise the funds rate. In this situation, markets believe that the FOMC wants to restrain growth. Conversely, a negative difference indicates a market belief that the FOMC wants to boost growth through funds rate reductions. The series declined after the May 9, 2007 FOMC meeting and declined significantly after the September 18, 2007 FOMC meeting. At the April 30, 2008 meeting, the FOMC lowered the funds rate from 2.25 percent to 2 percent. However, in line with the messages sent by the FOMC about the likely direction of the next move in the funds rate, as shown in Figure 7, the yield curve jumped after April 2008 FOMC meeting.

This evidence suggests that the FOMC attempted to use the developing negative output gap in 2008 in order to lower headline inflation. That view receives support from Figures 8 and 9. Consider Figure 8. The solid line comprises two components. First, it uses a measure of the path of potential real output starting from a base for real GDP in 2005Q4. Each quarter that base value is updated using estimates of potential real GDP growth from the Tealbook.[24] That updating yields an estimated path for potential real GDP.[25] The potential nominal GDP path of Figure 8 adds growth at

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[22] The following figures are for annualized growth rates of monthly real PCE:

12/2007 – 2/2008: -1.9%
3/2008 – 5/2008: 1.7%
6/2008 – 9/2008: -3.8%
10/2008 – 12/2008: -4.5%

There is a pause to these negative growth rates in the months of March, April, and May. That pause came from the boost to income from the Bush tax cut, which President Bush signed into law on February 12, 2008. The actual rebates arrived in the month of May, but households anticipated their arrival. Real personal disposable income increased at an average monthly rate of $12.1 billion over the months January 2007 through September 2007; at the average rate of $6.6 billion over the months October 2007 through April 2008; and then jumped by $562.1 billion in May 2008. A cost to tax cuts is the way in which they obscure the underlying state of the economy.

[23] See the Appendix: "Communicating an end to the easing cycle" and Hetzel (2012, pp. 217-219).

[24] The entry is "potential GDP" in the table "Decomposition of Structural Labor Productivity Nonfarm Business Sector."

[25] Econometricians make joint estimates of NAIRU (the unemployment rate consistent with maintaining inflation unchanged), which provides an estimate of the unemployment gap, and potential output, which provides an estimate of the output gap. For example, the unemployment rate fell rapidly in 2011 while output grew only moderately. As a result, econometricians reduced their estimate of potential output growth. Econometricians also go from an unemployment gap to an output gap using an Okun's law relationship. Adjustments to this relationship can change the level of

an annualized rate of two percentage points (the assumed inflation target) to the potential real GDP path. The values (triangles) labelled "actual" are contemporaneously-available values taken from the Philadelphia Fed real-time data base. As a result, these "actual" values correspond to the prior quarter on the graph.

As shown in Figure 8, after 2005Q4, "actual" nominal GDP as observed contemporaneously moved along the benchmark path. Figure 8 shows the "actual" value falling below path in 2009Q1. Because of the one-quarter lag in these observations, the initial falling away corresponds to 2008Q4. Figure 9 uses the same path for potential real output as Figure 8. Again, the "actual" values are those observed contemporaneously. They are for the quarter prior to the date shown on the graph and again are taken from the Philadelphia Fed real-time data base. Figure 9 shows the actual value falling away earlier. Again because of the one-quarter lag, the initial sustained falling away corresponds to 2008Q1. (Revised figures show a sharper decline especially in 2008Q3 and 2008Q4.) As shown in footnote 22, real PCE growth became negative in December 2007. That is, in 2008, the FOMC attempted to keep nominal GDP growing at a stable rate as a way of mitigating high headline inflation through producing slack in the economy.

Monetary policy in 2008 falls into the general pattern that accompanies recessions in the post-World War II era. Consider the process of raising the funds rate as the economy recovers from a recession. After a cycle trough, when the FOMC becomes convinced that economic recovery possesses sufficient momentum in order to handle a succession of funds rate increases, it begins the process of raising the funds rate in a measured but persistent fashion until the economy weakens. At that point, if the FOMC is not concerned with inflation, it begins the process of ratcheting down the funds rate. However, if it is concerned with inflation, it imparts downward inertia to the funds rate with the implicit intention of developing a negative output gap. In these instances, recession follows (Hetzel 2008, Chs. 23, 24; Hetzel 2012, Chs. 7, 8; Hetzel 2015 and 2016).

It appears as though in 2008 the FOMC attempted to allow a negative output gap to develop in order to lower headline inflation. The purpose here is not to argue whether such a policy was optimal. The purpose is to make the point that an understanding of the strategy of monetary policy is left to those outside the FOMC to ferret out.

7. Why not just use the Taylor rule?

Proponents of a rule-based monetary policy have advocated rules that eliminate as much as possible the exercise of judgment by the FOMC. The proposal here, which would require the FOMC to provide quarterly publication of Figures 3, 4, and 5, would not limit the role of judgment. Because forecasting the behavior of the economy is fraught with so much uncertainty, the focus on forecasts highlights the need for judgment. Although the objectives of monetary policy are fixed and discipline policy actions over time, the search for the natural rate of interest is one of judgmental trial and correction in the absence of a structural model of the economy.

Proponents of rules that generate individual policy actions should, however, accept the proposal here as a desirable movement in the direction of increased transparency. The proposal

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estimated potential output, in the 2011 case lowering it. The graphs are illustrative in that they do not allow for level adjustments in potential output.

continues the progress made since 1994 in revealing to the general public the kind of information revealed in arcane language to Fed watchers. The proposal also provides for increased accountability. Consider in this respect the Great Recession. The combination of disinflation and a negative output gap of large magnitude generates a prima facie case that monetary policy was contractionary. If the proposal here had been in place, one could go back and look at the strategy contained in the FOMC SEP commentary. One would then have some hope of disentangling the cause of the recession as originating either in a large negative external shock or a deficient policy for dealing with the shocks of the period. In the terminology of François Velde (2004), one would be better able to distinguish between poor hand and poor play. In sum, an explicit strategy offers some hope of learning about the optimal monetary policy.

John Taylor (1993, 1999, and 2015) reinvigorated interest in rules to guide monetary policy with a formula for setting the funds rate now known as a "Taylor rule." Specifically, according to the rule, the FOMC sets the funds rate based on a formula that assumes a known, constant benchmark rate of interest. It then moves the funds rate relative to that benchmark based on a measure of lagged inflation plus deviations of inflation from a target of 2 percent and on deviations of output from trend. Such a rule is attractive in that it yields numerical values for the funds rate and can therefore be used in model simulations. Moreover, as shown in Figure 10, for the period 1987 through 2008, the Taylor-rule formula does predict the level of the funds rate.[26] In estimated models of the U. S. economy, it has therefore become standard to include a functional form like the Taylor rule to capture the behavior of the Fed.

It is important to keep in mind two caveats in using the Taylor rule as a guide to monetary policy. First, the fact that the formula allows estimated models to predict the behavior of the funds rate does not mean that monetary policy is optimal. In the Great Recession, when instability in financial markets likely caused a sharp decline in the natural rate of interest, inertial Taylor rules seem particularly suspect. As shown in Figure 10, going into recessions, the Taylor rule predicts levels of the funds rate near cyclical highs. If monetary policy were countercyclical, the funds rate would decline prior to cyclical peaks as the economy weakens (Hetzel 2012, 2015, and 2016).

While the fit of the Taylor rule over the period 1987 through 2008 is impressive, it probably reflects a non-representative period of exceptional economic stability. As shown in Figure 11, long-run real GDP growth was quite stable over this period. However, a reduction in labor force growth and productivity growth in the second half of the first decade of the 2000s probably lowered the benchmark interest rate of 2 percent assumed in the estimation of Taylor rules. A decline in the benchmark rate would depress the funds rate prescribed by the Taylor rule plotted in Figure 10 relative to the actual funds rate in 2008.

Second, the Taylor rule is a reduced form. Its measure of slack (an output or unemployment gap) provides a measure of the cyclical state of the economy and thus predicts the relationship of the funds rate to the cycle average (the constant term). While the coefficient on the output gap measures the strength of cyclical movements, the coefficient on the inflation term measures the relationship between low frequency (trend) movements in inflation and in interest rates. As would be expected if

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[26] In correspondence with the author, John Taylor wrote, "[T]he rule was derived from looking at many simulations which were done as part of research searching for an optimal rule using my multi-country model and many other models."

inflation is only capturing the trend in the funds rate, the relationship between inflation and the funds rate would disappear when the series are first-differenced (Granger and Newbold 1974).

The formula that generates the Taylor rule predictions in Figure 10 is shown in formula (1). The estimated coefficients in a level-form regression approximate the "a" (inflation miss) and "b" (unemployment gap) coefficients. In a level-form regression from 1987 through 2008 using the series shown in Figure 10, the estimated value of "a" is .8 (13.3), which is close to the coefficient of .5 assumed in Figure 10 while the estimated value of "b" is -1.9 (-25.7), which is close to the coefficient of -2 assumed in Figure 10 (t-statistics in parentheses) . When the regression is estimated in first differences, however, the estimated value of "a" is -.8 (-9.2), which is of the opposite sign from the coefficient of .5 assumed in Figure 10. The estimated value of b is -.7 (-6.2), which differs significantly from the coefficient of -2.

$$(1) \quad FFR = r^* + \pi + a(\pi - 2) + b(u - u^*)$$

As a reduced-form, a Taylor rule can offer a misleading explanation of how the FOMC controls inflation. During normal periods, when credibility shapes the price-setting behavior of firms, the FOMC does not respond directly to measured inflation. At the end of a tightening cycle, however, when the economy begins to weaken, if the FOMC is concerned that inflation is too high, it then responds directly to observed inflation and as a result imparts inertia to downward movements in short-term interest rates. It does so in an implicit attempt to create a negative output gap in order to lower inflation. From the monetarist perspective, that interference with the price system is the initiating factor in recessions.

8. Rules and independence

Central bankers emphasize the need for independence. Public support for that independence rests on a sense of legitimacy, which in turns comes from a belief that policymakers are accountable. For that to happen, policymakers need clarity about their objectives and their strategy for achieving those objectives.

The Constitution of the United States assigns to Congress the power "to coin money and regulate the value thereof." Originally, that meant the Congress could establish a mint that would provide dollars in specie in return for a specified weight in gold or silver. That assignment of powers came out of the British system of government in which Parliament had control of the mint. In the United States, this assignment of powers assures that Congress retains control over fiscal policy through the control of the seigniorage that comes from money creation.

Congress, however, lacks the capacity to direct the operation of monetary policy. It has delegated that responsibility to the Federal Reserve. At the same time, it has also effectively delegated to the Fed the responsibility for determining the nature of the monetary standard not just the responsibility to run it. This delegation of power is awesome and debate over accountability is natural. A perennially popular reform is to advocate limiting the regional character of the Fed, either by removing the regional Reserve Bank presidents from the FOMC or by requiring their appointment by the President. Given the short tenures of most governors and the four-year terms of the chair and vice chair of the Board of Governors, the practical result would be to increase the influence over monetary policy of the administration relative to Congress. To date, Congress has maintained its constitutional prerogatives by not removing the checks and balances of a regional system.

Another strand of reform is the attempt to make the Fed a part of the country's informal constitutional framework through adoption of an explicit rule (Friedman 1962; Hetzel 1997). Fed spokespersons have protested that the rules proposed entail an arithmetical formula for the determination of the funds rate. They are correct in asserting that setting the funds rate involves ongoing judgment—a process of trial and correction with continual feedback from financial markets and the economy. However, when successful, that process is disciplined by a fixed north star in terms of maintaining expected inflation equal to target and of maintaining growth of output along its potential path. The proposal here makes that discipline explicit and provides for the formulation of monetary policy in the spirit of a rule.

Monetary policy is complicated because it emerges out of the interaction of the behavior of the FOMC and of financial markets. The monetary standard emerges out of the interaction of monetary policy and the structure of the economy. The complexity of monetary policy and of the monetary standard renders accountability difficult. By providing a framework that makes explicit FOMC objectives and its forecasts both of the economy and of the path of the funds rate, the proposal here would facilitate the communication with the public required for accountability.

Congress has delegated to the Federal Reserve the authority to define the monetary standard. At the same time, the Fed has never articulated the nature of that standard. The resulting ambiguity imparts fragility to the standard. If adopted, the proposal here would clarify the nature of the standard and encourage widespread debate over how to make monetary policy into an enduring source of institutional stability.

Appendix: Communicating an end to the easing cycle

The message communicated to markets shifted between the March 18, 2008 FOMC meeting and the April 29-30, 2008 meeting. In the March 13, 2008 Tealbook (Greenbook), estimated growth in real final sales to private domestic purchasers for the entire year 2008 turned negative (-1.6 percent). The Tealbook "Current Economic and Financial Conditions. Part 1: Summary and Outlook, I-7, March 13, 2008" wrote:

> We are anticipating a further retrenchment in consumer spending in the next few months: Consumer confidence has plummeted; soaring energy prices are biting into household purchasing power; the labor market is weakening; and real estate values are dropping. As a result, we expect that real PCE will be little changed in the first quarter.

At the March meeting, the Minutes (Board 3/18/2008, 7) recorded a primary concern for recession:

> [M]ost members judged that a substantial easing in the stance of monetary policy was warranted at this meeting. The outlook for economic activity had weakened considerably since the January meeting, and members viewed the downside risks to economic growth as having increased. Indeed, some believed that a prolonged and severe economic downturn could not be ruled out…. [T]hey noted that, through a range of channels, lower short-term real interest rates should help buoy economic activity…. Even with a substantial easing at this meeting, most members saw overall inflation as likely to moderate in coming months….

The end-of-meeting statement for the March FOMC meeting (Board 3/18/2008, 7) read:

> Inflation has been elevated, and some indicators of inflation expectations have risen. The Committee expects inflation to moderate in coming quarters, reflecting a projected leveling-out of energy and other commodity prices and an easing of pressures on resource utilization.

Going forward through the summer, contrary to the expectation for "inflation to moderate" due to a "levelling-out of energy and other commodity prices," inflation rose. Year-over-year headline PCE inflation rose from 2.4 percent in July 2007 to 4.4 percent in July 2008 while the comparable figures for core PCE inflation were 2.2 percent and 2.5 percent, respectively.

The Tealbook "Current Economic and Financial Conditions. Part 1: Summary and Outlook, I-6and I-9, April 23, 2008" remained pessimistic and believed that the stimulative effects of the Bush tax cut would be short-lived.

> Real personal consumption expenditures have been moving essentially sideways since late last year. With mounting job losses and outsized increases in energy prices holding down real income, falling home values cutting into household net worth, and consumer sentiment deteriorating further, we would, all else equal, expect a noticeable decline in PCE in the second quarter. However, the tax rebates are anticipated to boost the change in spending by 1½ percentage points in the second quarter, leading us to project PCE to increase at an annual rate of ¼ percent…. Abstracting from the effects of the tax rebates, real PCE is expected to remain weak throughout the year.

Nevertheless, the Minutes (Board 4/29-30/2008, 9) for the April 29-30 FOMC meetings sent a message to markets that the easing cycle was likely at an end:

> [A]lthough downside risks to growth remained, members were also concerned about the upside risks to the inflation outlook, given the continued increases in oil and commodity prices and the fact that some indicators suggested that inflation expectations had risen in recent months.… [R]isks to growth were now thought to be more closely balanced by the risks to inflation. Accordingly, the Committee felt that it was no longer appropriate for the statement to emphasize the downside risks to growth…. In that regard, several members noted that it was unlikely to be appropriate to ease policy in response to information suggesting that the economy was slowing further or even contracting slightly in the near term, unless economic and financial developments indicated a significant weakening of the economic outlook.

The end-of-meeting statement repeated the language from the prior statement about the expectation for "inflation to moderate" but added the qualification: "[U]ncertainty about the inflation outlook remains high. It will be necessary to continue to monitor inflation developments carefully."

Chairman Bernanke (2008) stated:

> Another significant upside risk to inflation is that high headline inflation, if sustained, might lead the public to expect higher long-term inflation rates, an expectation that could ultimately become self-confirming…. We are attentive to the implications of changes in the value of the dollar for inflation and inflation expectations and will continue to formulate policy to guard against risks to both parts of our dual mandate, including the risk of an erosion in longer-term inflation expectations.

By the time of the August 2008 meeting, the Tealbook contained the following commentary, "Considering the totality of the evidence, we continue to think that a significant weakening of activity is in train" (p. I-1). Nevertheless, the Board staff assumed that the next change in the funds rate would be an increase. "As before, we assume that the federal funds rate will remain at 2 percent over the rest of 2008 and be raised to 2 ¾% over the first half of 2009" (p. I-2). As part of the long-term outlook, the staff forecast that "the federal funds rate continues to climb to just above 4 percent by the end of 2012" (p. I-15).

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Figure 1

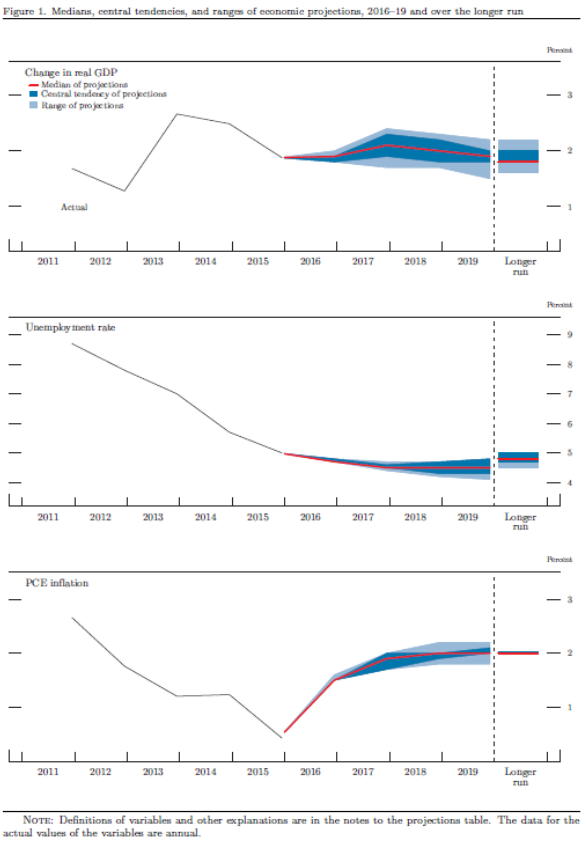
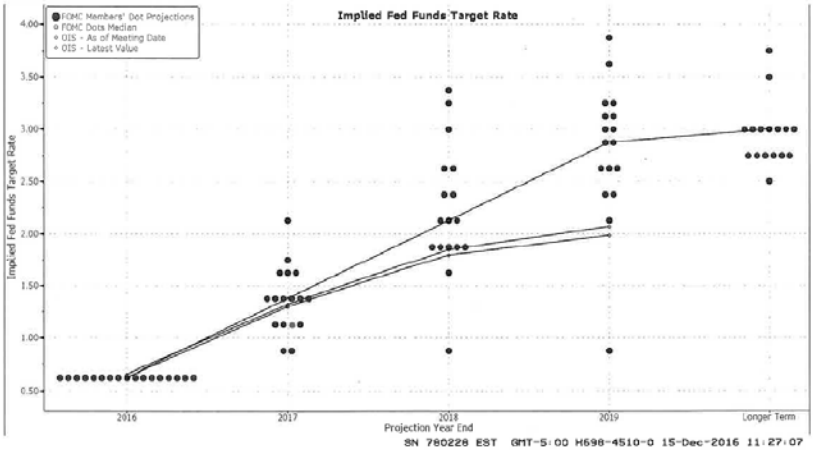
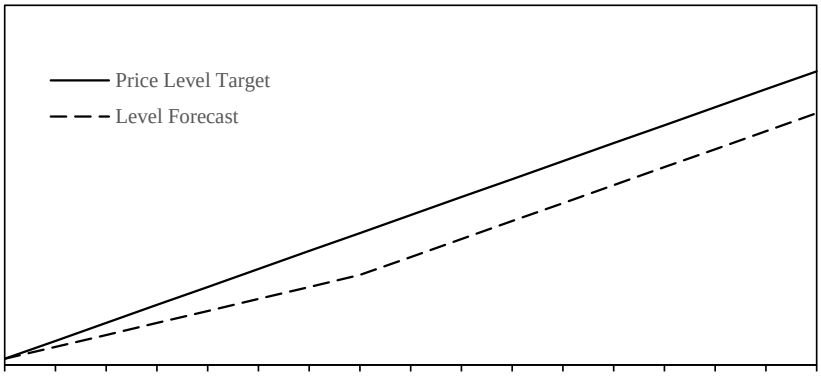


Figure 2



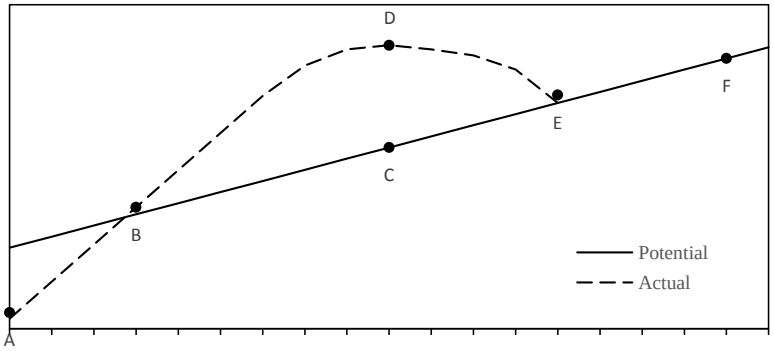
Notes: Figure 1 is from the Board of Governors website under "Monetary Policy," "Federal Open Market Committee," "2016 FOMC Meetings," "December 13-14," "FOMC: Press Conference," "Projections Materials.: Figure 2 shows the dot plot also contained in this material. The Figure 2 here shows an upper line connecting the median value of the dots and two market forecasts, one before and one after the FOMC meeting, of the future funds rate from the OIS (overnight index rate) swaps market. Figure 2 is courtesy of Bloomberg.

Figure 3
Target Path for Price Level with no Base Drift and Forecasted Path



Notes: Target path for price level with no base drift given an inflation targeto f two percent and normalized to one at time t.

Figure 4
Forecast Path for Potential Real Output and Actual Real Output



Notes: Graph shows two hypothetical paths for real output: ABCEF and ABDEF.

Figure 5
Funds Rate Path Forcasted by FOMC and Market

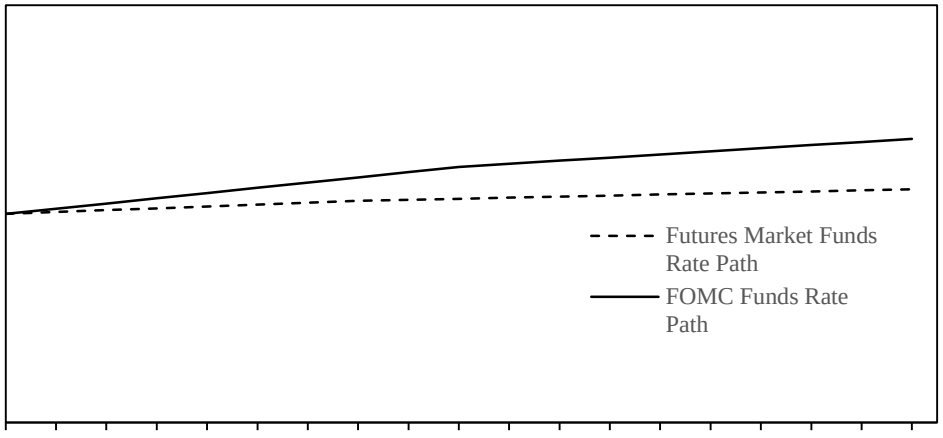
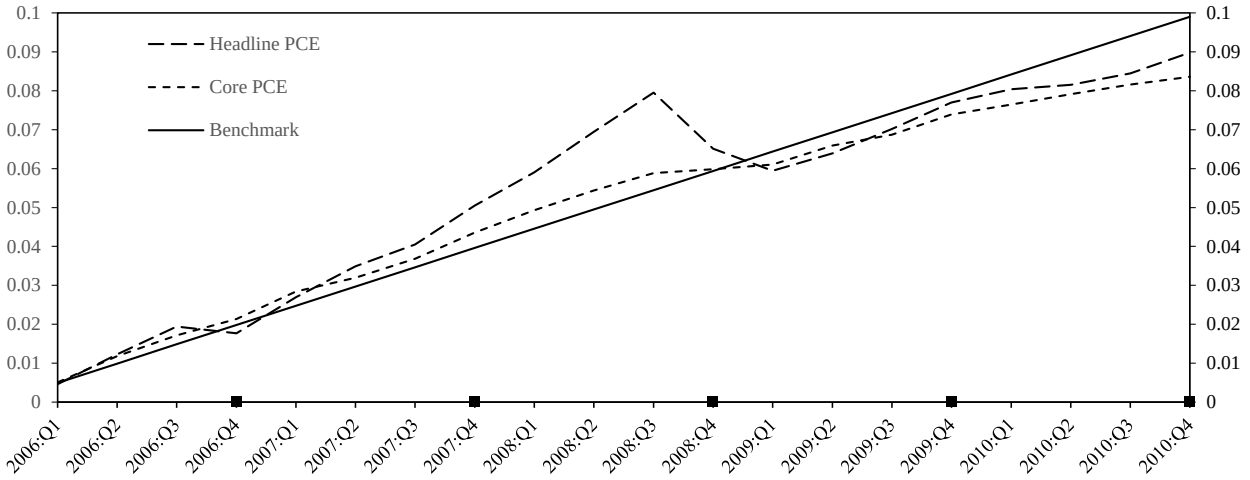
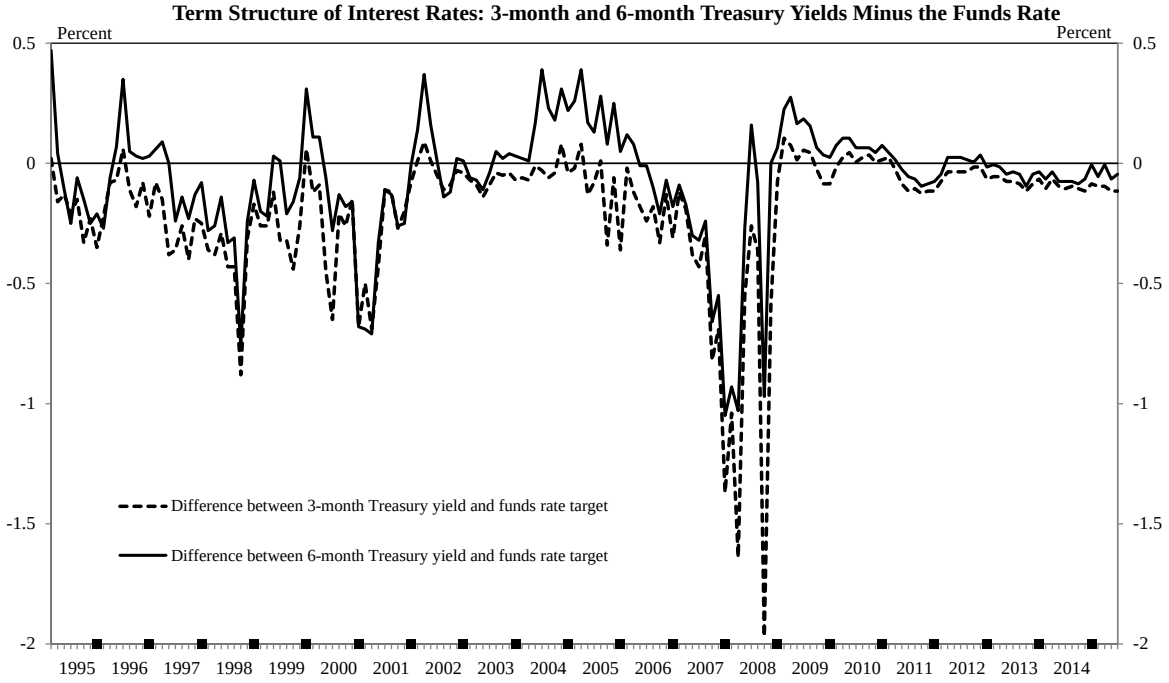


Figure 6
Headline and Core PCE Deflator with 2% Benchmark



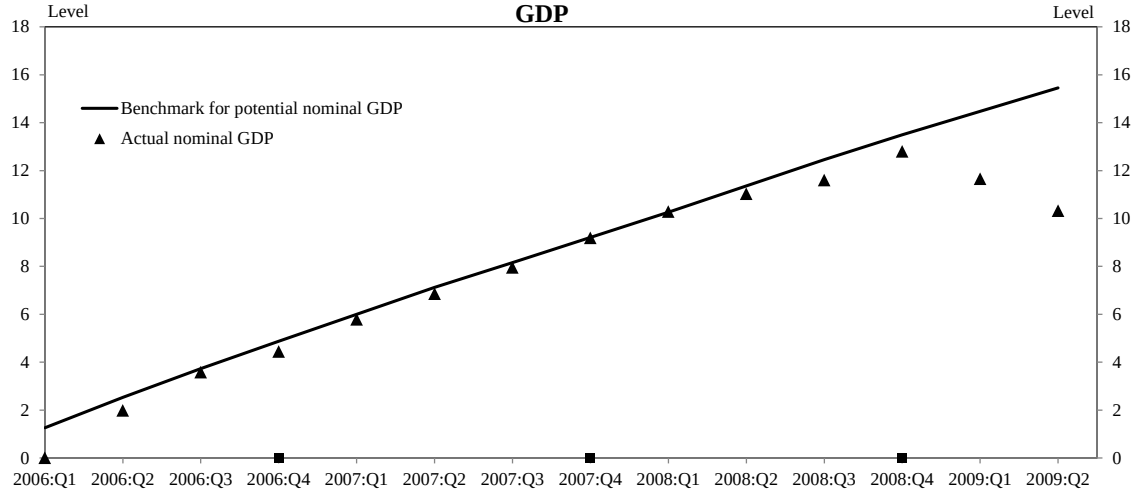
Notes: The benchmark grows at an annualized rate of 2 percent. The other lines show the level of the headline and core PCE deflator. Series are normalized to equal 1 in 2005 Q4. Values expressed as natural logarithms. Data from Haver analytics. Heavy tick marks indicate fourth quarter.

Figure 7
Term Structure of Interest Rates: 3-month and 6-month Treasury Yields Minus the Funds Rate



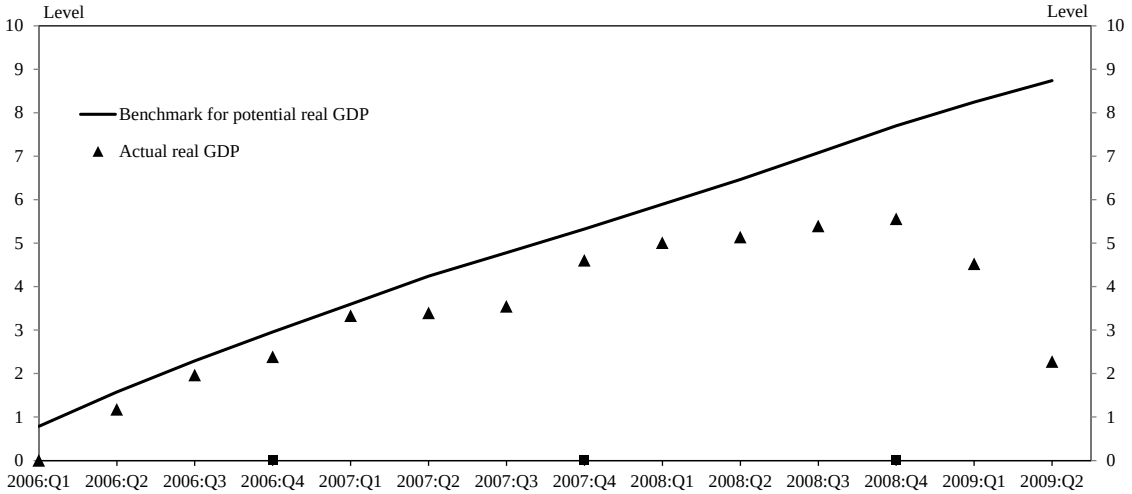
Notes: The series are the difference between three-month and six-month Treasury yields and the funds rate target. Treasury yields are from Board of Governors statistical release H.15 starting January 7, 2002 and from G.13 before. Starting October 2, 2001, yields are constant maturity. Before, they are the three-month and six-month yields. Observations are for the day after an FOMC meeting. Heavy tick marks indicate December.

Figure 8
Estimates of Potential Nominal GDP and Contemporaneously-Available Actual Nominal GDP



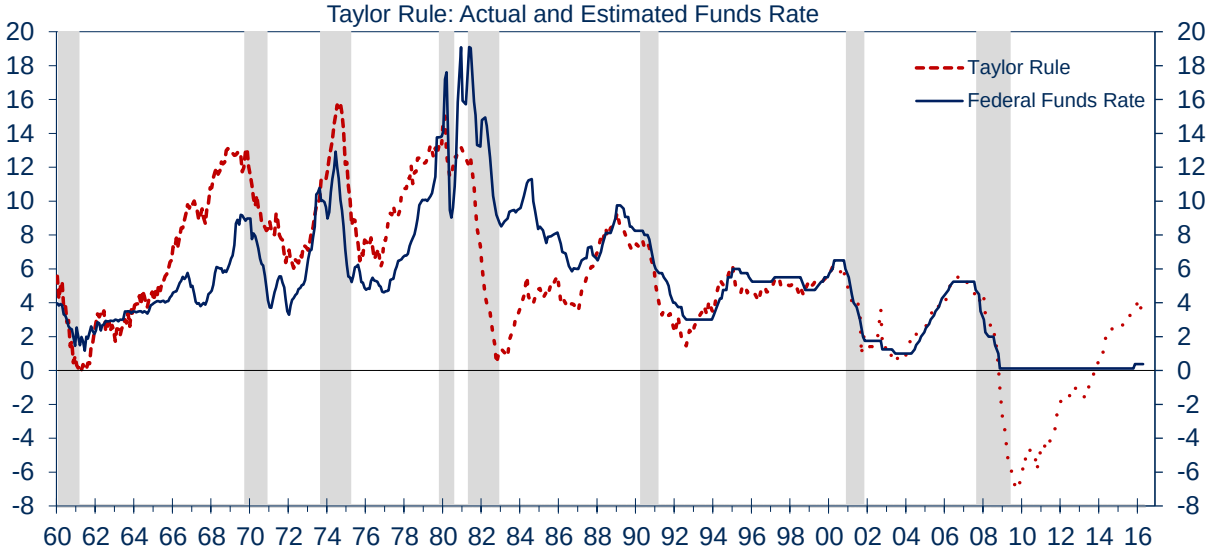
Notes: The benchmark for potential nominal GDP uses as the base contemporaneous estimates of 2005:Q4 nominal GDP. Potential nominal GDP then is assumed to grow at the Greenbook's estimate of potential real output growth plus 2%. The actual values for nominal GDP are for the quarter prior to the date shown and are from the Philadelphia Fed Real-Time Data Series. Series were normalized by contemporaneously available figures for 2005:Q4 nominal GDP. Heavy tick marks indicate fourth quarter of the year.

Figure 9
Estimates of Potential Real GDP and Contemporaneously-Available Actual Real GDP



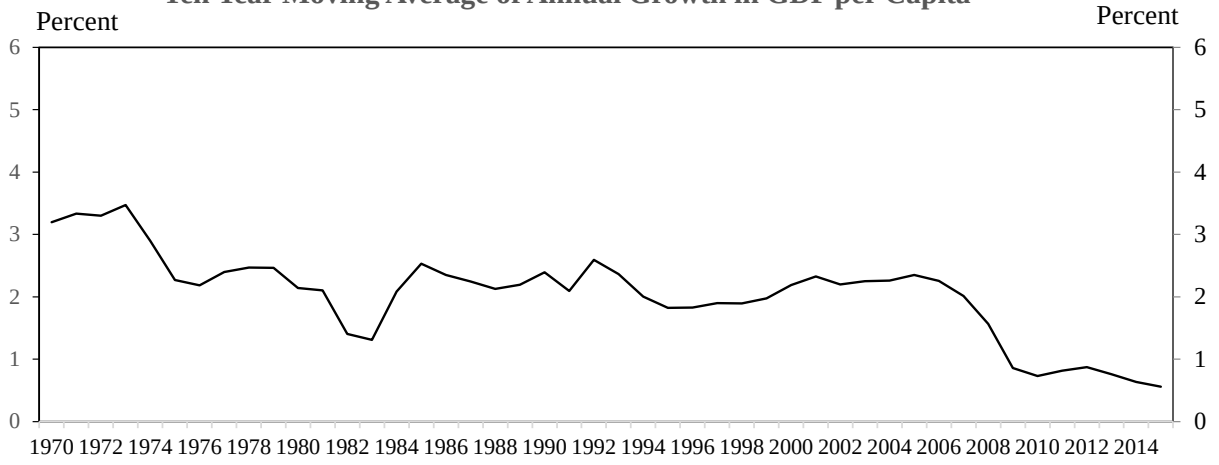
Notes: The benchmark for potential real GDP uses as the base contemporaneous estimates of 2005:Q4 real GDP. Potential real GDP then is assumed to grow at the Greenbook's estimate of potential output growth. The actual values for real GDP are for the quarter prior to the date shown and are from the Philadelphia Fed Real-Time Data Series. Series were normalized by contemporaneously available figures for 2005:Q4 real GDP. Heavy tick marks indicate fourth quarter of the year.

Figure 10
Taylor Rule: Actual and Estimated Funds Rate



Notes: The Taylor Rule is FFR = r* + π + a(π - 2) + b(u - u*). Observations correspond to FOMC meetings. FFR is the funds rate. The "neutral" interest rate r* is 2. π is the 12-month percentage change in the core personal consumption expenditures price index (PCEPI) in the month prior to each FOMC meeting. Starting August 2000, core PCEPI is measured from the real-time data release archived in Alfred maintained by the St. Louis Fed. Before August 2000, when the real time figures are no longer archived, core PCEPI is measured from the currently-available data series. The inflation target is 2. u is the real-time unemployment rate as reported in the month prior to each FOMC meeting taken from Alfred. Before 1987, u* is the current CBO estimate of the natural rate of unemployment. From 1987 to 2010, u* is the natural rate of unemployment (NAIRU) estimated by the staff of the Board of Governors taken from the Philadelphia Fed Real Time Data Research Center. Thereafter, u* is the midpoint of the range of the FOMC Survey of Economic Projections (SEP) for the longer run unemployment rate. FFR is from Haver Analytics. The inflation gap coefficient "a" is 0.5 and the unemployment gap coefficient "b" is -2 and is taken from Yellen (4/11/2012), fn. 15. The form of the modified Taylor rule is from Taylor (1999).

Figure 11
Ten Year Moving Average of Annual Growth in GDP per Capita



Notes: The series plots a ten-year moving average of annual percentage changes in real GDP per capita. Source Haver Analytics.