THE BENEFITS OF SYSTEMATIC MONETARY POLICY

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INTRODUCTION

Good morning. I am delighted to be here today and to help kick off your annual Washington Policy Conference. It is also a pleasure to have the opportunity to be among fellow economists who share my passion for economics and the valuable insights it brings. Indeed, today I want to talk about economics and some of the implications it holds for monetary policy.

When I took this job just over 18 months ago, I told many people that I thought it was an interesting and fascinating time for the Federal Reserve. The challenges and opportunities included making the transition to a new Chairman in Ben Bernanke after nearly two decades of continuity and success under Alan Greenspan; implementing the new standards of Basel II; and transforming a financial services business from a massive processor of paper checks to a new highly automated digital business we call Check21. But little did I know just how interesting and challenging monetary policy would become.

Let me start by indicating that my views on monetary policy are shaped by both theory and practice. I have been a student of monetary theory and policy for over 30 years. Over this three decade span, it is safe to say that both the theory and practice of monetary policy have changed dramatically, for the better I might add. We have advanced our understanding about what constitutes good monetary policy and have incorporated into practice many of the lessons offered

by theory. Central bankers across the world have also learned and adopted best practices from each other.

Before I go any further, I should mention that the usual disclaimer applies. While the views I express here are shared by many students and practitioners of monetary policy outside and inside central banks, they are my views and not necessarily those of the Federal Reserve System or of my colleagues on the FOMC.

Today I want to talk about one aspect of good monetary policy. In particular, I want to discuss the importance of systematic monetary policy. For a long time, the received wisdom was that central banking was supposed to be mysterious and secretive – the less that was said about how monetary policy was conducted the better. Indeed, it wasn't until 1994 that the Federal Reserve decided to announce the decisions that were made after each FOMC meeting.

But times have changed. Transparency has replaced secrecy, and openness and communication have replaced mystery. While there are those who long for the mystique and thrilling days of yesteryear and wish for a little more mystery and a little less openness, I don't think the clock can be turned back – nor should it be.

This trend toward more open and transparent monetary policy is widespread. One cannot go to a conference on monetary policy anywhere in the world without hearing about the importance of transparency. There are a number of reasons this view has become so widely held. But the most prominent development in the last three decades that has led to this perspective is the recognition of the important role expectations play in understanding economic behavior. Expectations of the future play a crucial role in all sorts of decisions that people make today. This is particularly evident in financial markets, where investment decisions and the valuations of securities depend very directly on assessments of future economic outcomes. But it is equally true for individuals buying a home or a car, and for businesses considering capital expenditures.

Of course, this means that, to the extent monetary policy actions today and in the future are important for economic outcomes, expectations about the future decisions the Federal Reserve will make are also important. Thus, a monetary policy that is more systematic and predictable can reduce expectational errors and contribute to a more stable and efficiently functioning economy. This has led monetary policymakers to stress the importance of credibility and of

commitment to well-articulated and achievable objectives. It has also led to extensive research on monetary policy rules that can enhance the predictability of policy. [1]

SYSTEMATIC POLICY AND SOME EXAMPLES

Economic science and the science of monetary policy have come a long way in the last 30 years. However, they have not progressed to the point where we can specify a formula for setting monetary policy and turn decisions over to a computer. Judgment is still required. Nevertheless, what theory and practice have taught us is that there is great value in policymaking that is systematic, or what is sometimes called "rule-like" policymaking. This means making policy decisions using available information in a consistent and predictable manner. This does not mean one can know what the future holds or what future policy decisions will be. You often hear Fed officials speak of policy being data dependent, and indeed it is. But the data should feed into a decision-making process in a mostly systematic way. Some people like to think of this systematic part of policy as a "reaction function" or contingency plan with parameters that are largely stable over time.

One important characteristic of rule-like behavior is that the rule can be easily articulated to the public. This greatly improves the communication and transparency of monetary policy, which leads to fewer expectational errors because everyone has more informed predictions about the course of monetary policy.

Friedman's k-percent Rule

The idea that monetary policy should be conducted in a systematic and predictable way is not new. One of the earliest, and most controversial, proposals was Milton Friedman's famous k-percent money growth rule.[2] Friedman argued monetary policy was a major contributor to cyclical fluctuations. He argued that efforts by the central bank to "stabilize" or "fine-tune" the

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[1] See Plosser (2007) for a discussion of the importance of credibility and commitment.

[2] See Friedman (1960).

real economy were fraught with danger because we didn't know enough about the short run dynamics of monetary actions to reliably predict their effects on the real economy. As a result, monetary policy ended up being a source of real instability rather than a stabilizing influence.

In addition, Friedman correctly argued that sustained inflation was always a monetary phenomenon and that in a world of paper or fiat money, the central bank had the obligation to preserve money's purchasing power so that markets would not be distorted by inflation. Price stability would therefore promote a more efficient allocation of resources. At the time, this view of the importance of price stability was controversial, but today it is widely accepted.

Thus, Friedman highlighted two central features of good monetary policy that are hallmarks of the rules that I will turn to shortly. First, he argued that monetary policy should be formulated in a way that stabilized the purchasing power of money. Second, he stressed monetary policy should not be used to "fine-tune" real economic activity because attempting to do so often introduced instability into the real economy instead of improving economic performance. His actual proposal was that the Federal Reserve should announce that the money supply would be allowed to grow at k-percent a year -- period. With k a suitably low number, such a policy rule would ensure that inflation would never become a problem and that monetary policy would cease to be an independent source of cyclical fluctuations.

The Friedman rule is simple and easy to communicate. It also gives a high degree of predictability to monetary policy. Had it been implemented, it surely would have prevented the double-digit inflation the U.S. economy suffered in the late 1970s, as well as much of the subsequent economic disruptions in the early 1980s that occurred as inflation was brought back down to acceptable levels.

Yet the rule has several shortcomings that have limited its appeal. Most important, many economists view money demand as volatile, so that a constant supply of money could lead to more variability in inflation, and perhaps output, than necessary. Thus, most economists believe that some sort of policy that responds to the state of the economy could perform better.[3]

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[3] Bennett McCallum (1988) has proposed a version of the Friedman rule that calls for varying the growth rate of the monetary base in response to variations in nominal GDP and a proxy for long-run trends in money demand. The

Taylor's Rule

The most well-known form of systematic policy was proposed by John Taylor.[4] The Taylor rule prescribes how the central bank should set the short-term interest rate, which is the preferred operating instrument for most central banks. Thus, central banks can relate to it more easily than the quantity-based rules of Friedman. The rule also allows for feedback from the real economy to the setting of the interest rate.

The Taylor rule calls for setting the nominal fed funds rate based on three factors. The first factor is an estimate of the economy's inflation adjusted or real interest rate plus the Fed's targeted or desired rate of inflation. This you might refer to as the baseline interest rate.

The second factor calls for assessing the rate of inflation relative to the central bank's targeted inflation rate. If the inflation rate is above the target, the Taylor rule says that the funds rate must rise. In most specifications the funds rate must rise more than one-for-one with the deviation of inflation relative to target. For example, in Taylor's original formulation the weight given on the deviation of inflation from target was 1.5. This means that if inflation was 3 percent and the desired inflation rate was 2 percent, then the funds rate must be set 1.5 percentage points above the baseline rate. This "aggressive" reaction to deviations of inflation from target is a characteristic that Taylor and others have emphasized as being essential to a well-functioning policy.

The third element in the Taylor rule calls for adjusting the funds rate based on departures of real GDP from some measure of "potential" GDP. The weight given to this factor is usually less than the weight assigned to inflation deviations. Nevertheless, the rule calls for a lower funds rate when output is below potential.

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rule specifies a target for nominal GDP that is the sum of the economy's long-run trend growth of real GDP and a desired or targeted inflation rate. If nominal GDP growth is above the target, the rule calls for reducing the growth rate of the monetary base and vice versa. It also allows for the evolution of money demand to influence base growth so that more or less money is supplied as technology and other factors affect the demand for money.

The McCallum rule addresses some of the criticisms of the Friedman rule in that it accommodates changes in money demand and allows for feedback from the real economy to monetary policy. However, central banks around the world have largely adopted nominal interest rates as the monetary policy instrument of choice rather than a nominal money stock measure. Consequently, the McCallum rule has not had much impact in practice.

[4] See Taylor (1993).

The Taylor rule has garnered a great deal of attention and study – substantially more than other rules. The reasons are twofold. First, the rule specifies policy actions in terms of movements in the interest rate and thus is called an instrument rule. As I mentioned before, this corresponds with how most central banks implement monetary policy. Second, the rule is dependent on both deviations of inflation from some target and deviations of output from some measure of potential. Reacting to these factors seems consistent with the Federal Reserve's dual mandate and captures much of the essence of what monetary policymakers see themselves as doing.

Taylor also attempted to fit actual FOMC decisions to his rule and, much to many observers surprise, the rule described the movements of the fed funds rate remarkably well. Indeed, a number of researchers have examined the extent to which monetary policy has followed a Taylor rule with some success. Interestingly, one of the findings is that from 1987 through about 2003, a Taylor rule describes fairly well the movements in the fed funds rate, and it is widely agreed that monetary policy was quite effective during this period. As I just noted, one of the characteristics that Taylor and others emphasize is the importance of aggressive reaction of the funds rate to deviations of inflation from some assumed target. And, indeed, the estimated Taylor rules over this period exhibit this property. Of course, the FOMC has not formally adopted a target for inflation, but many believe that an implicit one exists. Yet when researchers try to fit a Taylor rule to pre-1987 policy decisions, they find that it doesn't fit as well. In particular, the response of the funds rate to inflation is not aggressive, which may account for the fact that inflation was not contained during the 1970s.[5] Put another way, the Taylor rule suggests that policy should have moved more aggressively against inflation in the 1970s than it in fact did.

GENERAL THEORETICAL PERSPECTIVE

The attractiveness of Taylor-type rules for monetary policy goes beyond their intuitive appeal or the fact they seem to describe the behavior of monetary policy reasonably well. The reality is

[5] The most notable article in this regard is by Clarida, Gali, and Gertler (2000).

that Taylor-like rules yield very good results when judged by the metric of economic welfare in a variety of theoretical settings. While this is surprising to some, it has enormous practical importance. Given our uncertainty about the true model of the economy, knowing that systematic policy in the form of a Taylor-like rule delivers good outcomes across different models means that it can provide useful guidance for policy.

As I mentioned at the outset of my talk, an important and essential element of all macroeconomic and monetary theories of the last three decades is the recognition of the role played by expectations – including expectations about the course of monetary policy. More precisely, most theoretical investigations into how monetary policy should work conclude that policy should be systematic and that optimal policy – that is, the policy that delivers the best outcomes for the economy – takes the form of a rule.

Thus it is important to think about monetary policy as being systematic or rule-like. One important desirable feature of simple interest rate rules such as Taylor's is – it is a rule. That is, it systematically describes the behavior of policy. The advantages of simple rules are many. First, they are transparent, and allow for simple and effective communication of policy decisions. The result is that policymakers can more easily be held accountable and it is easy for the public and financial market participants to form expectations about policy. Thus, relying on simple rules enhances the credibility of monetary policy and helps anchor expectations. Second, when rules are simple and transparent, the public's expectations are easily aligned with the Fed's intentions, which minimize policy surprises and the detrimental effects often caused by such surprises. Thus, I place significant importance on systematic behavior both as a prescription for good policy and in terms of my own policy deliberations.

We can gain useful insights about what desirable properties a simple systematic policy should possess by looking at what types of optimal rules arise in various theoretical environments. Computing optimal monetary policy – that is the policy that maximizes economic well-being – is usually quite complicated and model specific. Since there is no consensus on the best model of the economy, there can be no consensus on which monetary policy rule is optimal. Optimal policy in one setting may not be optimal policy in some other setting. The optimal policies that do arise in various model settings, however, can serve as useful benchmarks for analyzing the performance of simple rules.

As I alluded to previously, simple rules, in the spirit of Taylor's original rule, have been found to perform remarkably well in that they produce outcomes not too far from those delivered by the optimal rule. This result seems to hold in a wide variety of models of the type that are actually used to shape our forecasts and our understanding of actual economic events.[6] The implication is that using simple rules to benchmark policy is in practice a useful exercise.

These well-performing simple rules have three elements that are qualitatively important. First, as in the original Taylor rule, the interest rate generally responds aggressively to inflation. Interest rate responses to deviations of inflation from target are more than one-for-one. Second, the rules are often, but not always, inertial. By that I mean that today's interest rate responds to past interest rates, which in turn means that policy responses are likely to be somewhat gradual. Finally, the rules imply that the interest rate should respond positively to deviations of output from some measure of "potential."

This last feature arises because any well-designed rule should be responsive to economic fundamentals. But by that I do not mean that these rules call for policymakers to try to manage the real economy. In particular, although these rules respond to the state of the economy, they are still true to Friedman's caveat against active management or "fine-tuning." This is a subtle but important point and differs in principle from the standard stories we are used to hearing about monetary policy. I will return to this critical point in a few moments. Generally, the interest rate response to output movements is usually quite a bit weaker than the response to inflation, but nonetheless important.

Of course, the best-performing simple rule will vary quantitatively with the economic model under consideration. But what is surprising is that its performance in any particular model is often <u>not</u> very sensitive to moderate changes in the weights placed on inflation deviations or output deviations used in the rule. In the jargon of the economics profession, simple rules appear to be robust. Thus, the basic lessons of making an aggressive interest rate response to inflation and less aggressive movements in response to economic conditions serve as useful guides in thinking about systematic policy.

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[6] See Levin and Williams (2001).

Also, I wish to reemphasize that these rules are not designed to manage the economy, but to manage policy in a way that allows the economy to efficiently use resources given the economic disturbances that it experiences. That is, one should not think of the Fed as moving interest rates to manage or stabilize real economic outcomes, but rather think of the Fed as placing the interest rate at the level that allows for the best economic outcome given the environment. The fact that the central bank's interest rate should be somewhat lower when the economy is weak than when it is strong, should not be confused with a desire for active management of the real economy. This is an important distinction and one that I think is misunderstood, so let me try to clarify it with a familiar example.

THE REAL BUSINESS CYCLE MODEL

A more concrete way to emphasize this point, one that I view as critical for thinking about monetary policy, is to examine economic behavior in what is called a real business cycle model.[7] Many of you are familiar with this model, and while it does not provide a fully accurate representation of the true economy – and we don't have a model that does — it possesses features that are embedded in many major macroeconomic models of the U.S. economy, including FRBUS, the Board's econometric model, and the forecasting models of many of the Reserve Banks. These econometric models have a real business cycle framework at their core, because that paradigm has a lot of desirable features and helps explain, at least qualitatively, a good portion of economic behavior.

In the real business cycle model the real interest rate moves in response to various shocks. For example, take a persistent positive productivity shock that allows the economy to produce more with the same amount of resources. What happens is fairly intuitive and qualitatively much in line with how most of us think the actual economy behaves.

In response to this shock, all factors of production, capital and labor, are more productive. As a result, firms desire to invest more, which increases the capital stock. They are also willing to pay

[7] See Plosser (1989) for an introduction to this literature.

higher wages to their now more productive workers, and this encourages more labor supply and higher employment.

Consumers, who see both asset prices rising and their wages increasing, are wealthier and want to consume more. Because it takes time for additional productive capacity to come on line, initially demand exceeds supply at the old interest rate. As a result, the equilibrium real interest rate, which will equate supply and demand, is now higher, in line with the higher marginal product of capital.

If a policymaker were setting the interest rate, he should set it exactly at this competitive outcome, not because he is trying to smooth economic activity, but because this higher interest rate allows for the most efficient allocation of resources and allows the economy to accumulate resources, including capital, at an optimal rate -- and thus, to grow optimally.

In the more complex world we live in, this example serves as an important lesson for monetary policymakers. They must try to set the interest rate at a level that is efficient. No easy task, but much different than trying to smooth economic activity in response to shocks.

SIMPLE RULES IN PRACTICE

There are, of course, limitations to the use of simple rules. First, by their nature they are not designed to work well in all circumstances. They basically work well on average. Thus, they provide useful benchmarks in assessing the stance of policy. However, there will inevitably be special circumstances or shocks that fall outside the scope of our economic models that will warrant monetary policy action. Events such as 9/11, the Asian financial crisis, or perhaps the stock market crash of 1987 may justify some departure of policy from simple rule-like behavior. But these events are mostly obvious and it is easy to explain the departures without planting doubts about the ultimate direction or goals of policy. However, even in these instances the rules serve to quantify the degree of departure and act as guidelines in informing us how excessively tight or easy policy might be. It is also the case that such events are temporary in nature and thus at some point special monetary actions would be reversed or eliminated. Otherwise, policymakers run the risk of undermining the more fundamental goals of policy. Indeed,

persistent departures from simple rule-like behavior have generally resulted in bad economic outcomes.

Another challenge facing the implementation of simple policy rules is that the underlying measures they rely on are for the most part unobservable. The underlying real rate of interest that is consistent with the equilibrium growth path of the economy is not directly observable. Neither is the appropriate measure of the output gap.

Furthermore, it is important to recognize that there are various strategies for quantifying Taylor-like rules. That is, there are variations on a theme that try to address various measurement and theoretical issues. For example, rather than focusing on the level of output gaps, some versions of the rule use the difference in the growth rate of real GDP and some measure of the growth rate of "potential" or trend GDP. This avoids the notoriously difficult problems of estimating the level of "potential" GDP.

Another variation on the rule is to consider more forward-looking elements that focus on forecasts of inflation and output as opposed to current or recent past values of these variables. But the distinction is more apparent than real since forecasts depend on current values in crucial ways.

Finally, the science of monetary policy is not stagnant. Thus it is important that the best policy rules may evolve as our understanding of the economy evolves. But we should not be afraid of such evolution nor view it as a reason not to commit to behaving in a systematic manner. Instead it should heighten our efforts to communicate and ensure the transparency of our actions.

Thus, any effort to use the implications of such rules entails some degree of uncertainty and choice of the appropriate specification. But that is not reason to ignore or abandon the concept and use of such systematic policy rules as guides. Monetary policymakers face lots of uncertainties and unknowns regardless of how decisions are reached. Uncertainties are not an excuse for pure discretion. One advantage of simple and robust rules is that they can help focus attention on the types of measurements and data that are important for policy and encourage research to improve our estimates. We also have to remember that an important reason for relying on systematic policy is to anchor expectations about the future, thereby reducing the

inefficiencies and distortions that arise from expectational errors. Thus, in practice, one might look at several versions of the rule's specification to assess the stance of policy.

SUMMARY

Let me just summarize the basic desirable features that systematic policy in the form of simple rules provide. They are desirable because they are systematic and imply policy responses that are forecastable by the public. Further, by being systematic they anchor inflation expectations. When those become unanchored, the effects of policy become more uncertain. The economic episodes where the public became uncertain of the Federal Reserve's intentions regarding inflation have been especially costly. So an important part of the appeal of simple rules is that they aid in maintaining credibility for low inflation. Finally, simple rules make monetary policy easy to monitor and to gauge when policy is departing from business as usual. More importantly, simple rules help gauge the extent of that departure and helps policymakers explain the reasons for the departure – further improving monetary policy communications and transparency. Thus, making policy decisions using simple rules as benchmarks based on publicly observable information serves to assure the public that the Fed is behaving in a manner consistent with its long-run objectives. It also helps avoid having the public's expectations become disconnected from monetary policy's long-run objectives.

THE CURRENT ENVIRONMENT – SOME EXTRAORDINARY CIRCUMSTANCES

The current economic environment does have some extraordinary features, namely the tremendous difficulties that are affecting the smooth working of capital markets. Some interest rate spreads remain high, and financial capital has taken serious hits at a number of institutions. Thus, I believe we are in a situation where monetary policy cannot be made by focusing solely on inflation and deviations of output from potential. The current turmoil in financial markets has already had a significant impact on the economy and has the potential to continue to restrain economic growth going forward.

To be more concrete, many versions of the simple rules that I refer to when gauging the current stance of monetary policy call for a funds rate that is above the current funds rate. But the severity of the events affecting the smooth functioning of financial markets suggests that rates, perhaps, should be somewhat lower than simple rules might suggest. However, determining the appropriate extent of such extra accommodation is difficult to quantify, but should also be disciplined by systematic policy.

Consequently, there are, and should be, limits to such departures from the guidance given by simple rules. One cannot, and should not, ignore other fundamental aspects of policy, especially the tendency for inflation to accelerate when policy is unduly easy. Moreover, departures from the more systematic elements of making policy decisions must be relatively transitory and reversed in due course if we are to keep expectations of future inflation well-anchored. Otherwise we risk eroding the public's confidence in monetary policy's commitment to deliver price stability, and we know from the 1970s and early 1980s that the cost of regaining the public's confidence can be quite high.

The benefits of operating in an environment with the transparency afforded by simple rules is that it gives monetary policymakers the ability to anchor expectations and affords them the opportunity to temporarily deviate from the simple rules in extraordinary circumstances without eroding central bank credibility. We are now, perhaps, in a period of extraordinary circumstances and have deviated from the benchmarks suggested by simple rules. But such deviations should be temporary and limited and promptly reversed when conditions return to normal.

Monetary policymakers should continue to pursue their efforts to develop and put into practice more rule-like behavior. It is one of the more important paths to sound monetary policy over the long-run.

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