Commentary: Challenges for Monetary Policy: New and Old

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Mervyn King's paper is jam-packed with interesting ideas and good common sense about monetary policy. I admire the clearly stated and rigorous macroeconomic analysis that he applies in this paper. I also admire the clearly stated and rigorous approach he takes to practical monetary policy-making.

King begins his paper by applauding central banks for achieving price stability in recent years. I agree that applause is due, but I think it is important to mention some of the consequences of this price stability and means used to achieve it.

Consequences and means of achieving price stability

It is striking that the greater price stability in recent years (in particular, seventeen years in the United States) has been associated with greater *output stability*—smaller and less frequent fluctuations in real GDP and employment. In the United States, this greater output stability is embodied in the two longest peacetime expansions in U.S. history—one in the 1980s and the other in the 1990s—separated by a relatively short national recession.

The simultaneous improvement in price stability and output stability can be illustrated using the concept of the trade-off between the variability of output and the variability of inflation shown in Chart 7 of

King's paper. Since the early 1980s, both the variability of inflation and the variability of real output in the United States have been smaller than in many earlier periods, especially compared with the period of the great inflation from the late 1960s through the 1970s. This decline in variability—either the standard deviation or the variance—is represented by a movement down and to the left in Chart 7, starting from the upper right-hand corner and moving toward the frontier illustrated by the curve. In other words, we have seen a movement from the inefficient region above the curve toward the efficient points on the curve. (See Bullard [1999]).

This improvement in output stability must be a surprise to those who objected to a primary focus on the goal price stability by central banks on the grounds that such a goal would have harmful real effects. But I think the explanation for the increase in output stability is straightforward. Most recessions have been preceded by run-ups of inflation. Hence, keeping inflation low and stable—and thereby preventing significant run-ups in inflation—has reduced the likelihood of recessions. In other words, the improvement in output stability—fewer recessions, longer expansions—is an important consequence of the improvement in price stability.

Another change that has accompanied the greater price stability is the increase in the responsiveness of monetary policy to swings in inflation and in output. For example, in the United States the parameter measuring the typical policy response of the federal funds rate to changes in the inflation rate has doubled from a value less than one in the late 1960s and 1970s, to a value more than one in the 1980s and 1990s.[1] Economic theory and stochastic simulations of macroeconomic models both predict that such a change in policy would improve price stability, so it is reasonable to conclude that this change in monetary policy has been the means by which the improved macroeconomic has been achieved. The idea that the response coefficient of the interest rate to changes in inflation should be greater than one—and, thus, greater than in the late 1960s and 1970s in the United States—might be one of the most significant contributions of recent research on policy rules.

A new normative macroeconomics

King uses the modern methodology of research on policy rules to investigate several important monetary policy issues in his paper. This methodology has become increasingly popular in recent years and is also used in the papers by Ben Bernanke and Mark Gertler (1999) and Lars Svensson (1999) at this conference. The research methodology can best be described as following a series of steps.

First, develop a candidate monetary policy rule that incorporates the issue under consideration, for example, a more aggressive reaction of the interest rate to real GDP as in the King paper, or a reaction of the interest rate to asset prices as in the Bernanke and Gertler paper.

Second, stick this candidate policy rule into a model of the economy, and simulate the model by stochastically shocking the equations to represent real-world shocks to supply and demand. Third, examine the behavior of inflation, output, employment, and other variables that emerge from the stochastic simulations. If the model simulations indicate better economic performance with the candidate policy rule than with alternative policy rules, then the candidate rule would be given high marks. If performance were worse than the alternatives, then the candidate rule would be given a poor evaluation.

This methodology is, of course, subject to the limitations of the accuracy of the models used in the simulations, so it is important to have good models. Improving the models, for example, by using the suggestions to deal with risk in financial markets made by Alan Greenspan in his talk at this conference, should be considered as part of the research methodology. I would like to discuss several of the monetary policy issues that King examines using this methodology in his paper.

The chance of hitting the zero lower bound on nominal interest rates.

Let me first consider the analysis of the zero lower bound for the nominal interest rate. Does a low inflation target—for example, an inflation target in the 2 percent range adopted by many countries that

target inflation implicitly or explicitly—run a high risk of running into the zero interest rate lower bound, and thereby losing its potential to stimulate the economy? Table 1 of the King paper uses recent simulation results reported in Taylor (1999b) to address this question. He considers stochastic simulations of two different monetary policy rules in four different models of the economy. Both policy rules have the interest rate reacting to inflation and real output, but one rule is more aggressive in the sense that the interest rate reacts by a greater amount to changes in inflation and output than the other does. This more aggressive policy rule also reacts to the lagged interest rate.

Table 1 shows that the probability of the interest rate hitting zero is generally low for the less aggressive rule, though, except for one of the models, somewhat higher for the more aggressive rule. The results indicate that an inflation target of around 2 percent would have a low probability of hitting the zero lower bound on nominal interest rates. However, in some cases, the probabilities of hitting the zero bound are over 10 percent, which might raise some concerns. It is important to point out, therefore, that even if the short-term interest rate hits zero the economy may perform reasonably well according to the models considered in Table 1 of the paper. There is no inescapable downward spiral when the interest rate hits zero. The reason is that the short-term interest rate is not the only way that monetary policy impacts on demand in these models. Rather, the long-term real interest rate or the real exchange rate are the ultimate links through which monetary policy affects the economy. According to the simulations, these other forward-looking variables have stabilizing effects, even if the nominal interest rate hits zero for a spell, and thereby prevent poor economic performance.

A more aggressive monetary policy rule?

For one of the models listed in Table 1 of the King paper, the aggressive policy rule gives a lower probability of hitting the zero interest rate bound than the less aggressive rule. King expresses some preference for that model over the others and therefore indicates a preference for this more aggressive rule.

As I stated at the start of these comments, I think monetary policy

helped bring about the better macroeconomic performance in recent years because it has been more aggressive in reacting to inflation and output than in past years. However, I would argue against trying to implement a policy that is even more aggressive, as is the aggressive policy rule in Table 1.

Although this more aggressive rule might work reasonably well in the models in Table 1, it does not work well in some other models. Simulations of the more aggressive rule have been performed in five other models in addition to those listed in Table 1, and the performance is not very good in some of those models.[2] For example, in an estimated model of Glenn Rudebusch and Lars Svensson, the more aggressive policy rule is unstable. In models developed by Jeffery Fuhrer and George Moore, and also by Laurence Ball, the rule leads to very high output variance. In other words, this more aggressive rule does not appear to be very robust to different models.

An additional problem with the more aggressive policy rule is that it places more weight on the real output gap. There is a large degree of uncertainty about measuring potential GDP (and, thus, the output gap). With this uncertainty it is optimal for simple policy rules to place less weight on output.

Price level targeting versus inflation targeting

The question about whether the central bank should try to keep the aggregate price close to a growing target price *level* instead of keeping the inflation rate close to a target *inflation rate* is one that researchers and policy-makers are asking more frequently now that low and stable inflation seems to have been achieved in many countries. One of the most novel parts of King's paper is a new approach to this question.

Many people have been concerned that price level targeting could be disruptive to the economy because it would require declines in the price level (deflation) if the price level rose above the target price level. King proposes a new policy rule to deal with this problem. His proposal is to add a price gap term to a conventional monetary policy rule that already has an inflation gap and an output gap. He would

place a very small weight on the price gap term, only 0.1 compared with 1.5 on the inflation gap.

This policy rule with price gap term is then placed into a macroeconomic model and the model is simulated. The model used for the simulation is a small model developed at the Bank of England. The simulations show that this rule greatly improves price stability with only a very small loss in output stability. More work is needed to calculate the benefits of the aggregate price level being stable around a given trend (compared to the inflation rate being stable) in order to see if the benefits are greater than the small costs of increased output variability. It is also important to check the results for robustness by simulating this new policy rule in other models. But, in any case, the idea of adjusting a policy rule by adding a price gap term in this way is potentially very useful.

How much weight should be put on output?

Yet another policy issue raised in the paper is how much weight should be placed on real output in a monetary policy rule. This is a controversial question. In my view, the key consideration is the uncertainty in measuring potential GDP. We know from recent experience in the United States and other countries that potential GDP is measured with great uncertainty. The uncertainty may have increased as the periods between recessions have increased. Orphanides (1999) argues that errors in calculating potential GDP in the 1970s may have been very large, and even if his error estimates are overstated, it is quite possible that a monetary policy that reacted to these large estimated gaps may have kept interest rates low for too long. Such uncertainty implies that the weight on output should be smaller. It also implies that more research should go into estimating potential GDP and reducing this uncertainty.

However, I would hesitate to reduce the weight on output to zero, even in the face of uncertainty and even if price stability were the only goal. Reacting to output is a form of pre-emptive strike and is an important part of a forward-looking monetary policy. I am also still influenced by many earlier studies of the stabilizing properties of a fixed money

growth rule for which higher output would increase the demand for money and imply an automatic increase in the interest rate. Having an interest rate policy rule with these features would improve stability.

King also uses estimates of the inflation-output variability trade-off to examine the appropriate weight on output in a central bank policy rule. I agree with him that the trade-off represented by this curve "is at the heart of public debate over monetary policy." Recent estimates at the Bank of England, such as those of Batini (1999), show that the estimated variability trade-off between inflation variability and output variability may have a very sharp bend. In other words, there is only a small region where the opportunity costs of either more inflation stability or more output stability are not huge. This sharp bend suggests that a wide range of social preferences for inflation stability versus output stability may result in the same weight on output in the policy rule. I agree that we need more work on the shape of the curve, so that any policy inferences should be made with caution at this time. But I disagree that the variability curve is unstable over time. Variability curves estimated recently by Fuhrer (1994), by Ball (1999) and by Rudebusch and Svensson (1999) are very close to the variability trade-off curve I estimated in the 1970s.

Using policy rule research in practice

It is striking that the technical analysis of monetary policy issues in this paper—whether the zero bound on interest rates, the aggressiveness of policy responses, the weight on real GDP, or the impact of price level targeting—is solely in terms of policy rules. Yet, it appears that the decision-making process used by the Bank of England is not, at least explicitly, based on policy rules. This raises the important question of how policy rule research—such as that in the King paper—is to be used in practice.

King is, of course, correct when he says that our current "lack of knowledge makes mechanical policy rules incredible." But this does not mean that a procedure such as "inflation forecast targeting" is the only alternative. It is important to distinguish between "inflation targeting" and "inflation *forecast* targeting." (See Svensson [1997] for a useful discussion of definitions.)

Inflation targeting is simply the idea that central banks should commit to a goal of price stability, whether in the form of an explicit numerical target for inflation as in New Zealand or the United Kingdom, or in the form of a more implicit goal as in the United States. Inflation *forecast* targeting is an operational way to implement inflation targeting, and it appears to be the type of operating strategy used by the Bank of England. Inflation forecast targeting is a policy in which the central bank changes the interest rate by an amount that will bring its *forecast* of inflation, conditional on a path for the interest rate, into line with its inflation target. The amount of the increase will depend on how sensitive the inflation forecast is to the interest rate in the view of those who make the monetary policy decision.

The behavior of the central bank's interest rate is implicit in an inflation forecast targeting procedure. There is no obvious connection between the actual behavior of the interest rate that emerges from this procedure and the path implied by any of the policy rules investigated in this paper. Hence, it is hard to see how the results of the policy rule research in the paper could be incorporated into practical policy-making with this type of operating strategy. I think more research is needed on the connection between policy rule research and the operations of central banks.

There are alternatives to inflation forecast targeting that can make the connection to policy rules clearer. One alternative is for policymakers and their staffs to use a policy rule as a *guideline*—not as a mechanical formula—recognizing that only part of policy can be determined by such a rule, and that discretion is needed in certain cases such as the U.S. stock market break in 1987, the increase in risk premia in 1998, or changes in productivity growth throughout the late 1990s. But this discretion is constrained by policy rules in the sense that it is only the *deviation* of the interest rate from the paths given by the policy rules that represent discretion, not the entire path of the interest rate itself. If one of the rules that looks good in the policy rule research in King's paper was, in fact, used as a guideline, then actual policy would be well approximated by such a rule. Hence, such a procedure would be able to deliver the improved macroeconomic performance from good policy rules, as predicted by the models used for the policy evaluation.

I believe that this type of rules-based implementation of monetary policy would help us achieve good policies in the future. But more work needs to be done on ways to implement policy decisions in practice so that the actual interest rate paths correspond to those of good policy rules that are found in research such as that in King's fine paper.

Endnotes

[1] Empirical evidence for this point is reported in many papers that have compared estimated reaction functions in different historical periods. See Taylor (1999a) for an example.

[2] These simulation results are also drawn from my introduction to the recent conference volume, which compares different policy rules in different models (see Taylor [1999b]).

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