Lessons learned from the implementation of inflation targeting

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Overall the performance of monetary policy at central banks around the world has improved dramatically in the past quarter century. Inflation has come down to only a fraction of what it was during the great inflation era, and as price stability has been achieved, output stability has been achieved as well.

In my view there has been a direct causal connection between the changes in monetary policy and the improved measures of economic performance. As central banks focused on the goal of price stability and directed their instruments more systematically and predictably toward that goal, inflation came down, but, in addition, economic expansions got longer and recessions got milder and less frequent. Indeed, we are now enjoying an unprecedented global economic boom. If central banks continue to focus on price stability and keep inflation low and stable, there is every expectation that the current degree of macroeconomic stability will continue. This is the most essential lesson learned about monetary policy making in recent years and it is a lesson learned worldwide.

The implementation of inflation targets —first in Chile and New Zealand 15 years ago and then spreading around the world— clearly had much to do with changing and narrowing the focus of central banks on the goal of price stability. But the new focus on price stability was broader than the formal inflation targeting movement, at least if you define it as starting in Chile and New Zealand. Indeed, the decisions of the Federal Reserve (FED), supported by research in monetary economics at the FED and elsewhere, to end the great inflation of the United States 25 years ago, and then develop a strategy to maintain the goal of price stability starting in the 1980s, preceded the adoption of formal inflation targets. That these new policies and those of the early inflation targeting countries were so successful was a major force in spreading this new type of monetary policy around the world. The inflation targeting movement was essential to spreading the new ideas and techniques.

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I recall coming to the 75th Anniversary Conference in 2000. I was invited to give a paper entitled, *Using Monetary Policy Rules in Emerging Market Economies.* I argued —using monetary theory, the practical experience of central bankers in inflation targeting countries (such as Don Brash), and analogies— that monetary policy rules had been and could continue to be of great assistance in practice in the implementation of inflation targeting. One of the analogies that I used was that of a crew sailing a sailboat. An inflation target is like the destination for the sailboat —perhaps the home port the crew is trying to get to. Monetary policy rules are like the pages and diagrams in a guidebook to help the crew determine how to trim the sail, choose the angle of attack, make contingency plans for wind or current changes, and thereby get the boat to the home port. Of course, judgment is needed to deal with the unexpected, but without knowledge of the techniques of sailing you are not going to make it home.

In the five years since the 75th Anniversary Conference we have accumulated much additional experience with inflation targeting, and there are lessons learned from how the central banks have implemented inflation targets. In addition, several hundred papers on monetary policy rules have been published since then (according to Google Scholar or Econ Lit, about which see Carare and Tchaidze, 2005), and many researchers have used the framework of monetary policy rules in inflation targeting countries. There are many lessons learned from this work too.

In these brief remarks I will use a monetary policy rule framework and the extensive research on policy rules in inflation targeting countries to help draw out some lessons about implementation of inflation targeting. This approach has been used successfully by Laurence Meyer (2004) and Janet Yellen (2004) among others to evaluate practical decision making at the Federal Reserve.

THE PRICE STABILITY, NUMERICAL INFLATION TARGETS, AND POLICY RESPONSES

One very important lesson is that among the central banks that have price stability as the key policy goal, you do not see a great deal of difference in how the instruments of policy respond to changes in the economy when you compare those that have numerical inflation targets and those that do not. For example, the estimated monetary policy rules of inflation targeting countries show reactions of the interest rate to inflation and real output, just as the estimated policy rule of the Federal Reserve does. And the differences that do exist seem to be due to other features of the economy, such as the degree of openness or the aversion to exchange rate flexibility. Or to put it another way, there seems to be as much

difference between how policy is implemented in inflation targeting central banks as there is between them and those that do not have formal targets.

While one can draw these conclusions from the econometrics, my own view is largely formed from observing central bankers in action. For example, for the past several years I chaired a group of economic and finance officials which had the purpose of reviewing international macroeconomic policy issues.[1] The group included policymakers, frequently the central bank deputy governors, from the U.S., Japan, Canada, Britain, Sweden, Switzerland, and the European Central Bank (ECB). What struck me most about the meetings that I chaired was the great similarity between the two types of central banks when it came to discussing appropriate responses of the monetary instruments to changes in the economy such as the run up of oil prices. Judging from these discussions, which were implicitly, though not explicitly, about policy rules, the reactions of the instruments are very similar.

USING POLICY RULES AS CROSS-CHECKS IN PRACTICE

There is wide agreement that monetary policy rules are useful for describing the interest rate decision of central banks (see Poole, 2005; and Mohanty and Klau, 2004, for example). However, there is still disagreement about whether and how central banks actually use such rules as they implement their inflation targeting policy. Consider, for example, a very recent paper by Blinder and Reis (2005) which uses policy rules to describe FED decisions and evaluate policy actions. While using policy rules this way, they make a point of emphasizing that the FED does not "use" such a rule to make interest rate decisions. To quote them: "As an empirical matter, the monetary policy decisions of the Greenspan era are well described by a Taylor rule ... But any Taylor rule for the Greenspan FED needs to be interpreted as an econometric allegory, not as a literal description...." By a literal description they mean that the Federal Open Market Committee (FOMC) would mechanically follow a policy rule, but I do not know of anyone who has advocated that. When I first proposed an interest rate policy rule I was clear that "such rules cannot and should not be mechanically followed by policymakers."

As Orphanides and Willliams (2005) diplomatically and objectively put it: "Researchers have struggled with exactly what inflation targeting means in terms of economic models. To some a Taylor rule, or any other monetary policy

[1] The formal group, first founded in the early 1960s, is Working Party Three of the Organisation for Economic Cooperation and Development (OECD).

rule with an explicit long-run inflation target, is a form of inflation targeting; to others inflation targeting is identified with the first order conditions of a central bank optimization problem with rational expectations."

In my view, experience shows that policy rules have been used to help formulate policy in practice, not by mechanically following any rule but in other ways. Central bank staffs sometimes review recommendations of policy rules with the monetary policy committee along with simulations of interest rate paths implied by the rules in future periods. This would serve as a "cross-check" to see if the decisions were out of line.

In a paper I prepared for this year's Jackson Hole conference I gave an example of such cross checking that is in the public record; it is from the February 3, 1999, FOMC meeting. There was a discussion about why policy rules showed the need for higher interest rates than the actual settings, and it turned out that the reason for this was not the policy rule, but rather the estimate of the Non-Accelerating Inflation Rate of Unemployment (NAIRU). As Don Kohn put it: "As it happens, a 4-1/2 percent NAIRU also would help reconcile the current stance of monetary policy with the results of Taylor-type rules. Governor Gramlich and Governor Meyer have noted recently that the versions of this rule the staff calculates all tend to show that the federal funds rate is too low. This undershoot results from the existence of a large gap of actual over potential output, by standard calculations. If the NAIRU is at the lower 4-1/2 percent level, however, the gap about disappears, and the current funds rate is more nearly consistent with the Committee's past pattern of reactions to actual and forecasted levels of output and inflation and with Taylor's rule."

COMMON PRINCIPLES FOR CHANGING THE POLICY INSTRUMENTS

Another way to think about how policy rules are used is to focus on the principles embedded in them. One obvious principle embedded in policy rules is the goal of price stability, which algebraically is simply the inflation target, say 2 percent, in the rule. But the principles go well beyond this and apply to the decisions about how to change the instruments of policy. A very important principle is the "greater than one" principle in which the interest rate is to be promptly raised by more than any increase in the current inflation rate. A third important principle is that the interest rate should react to conditions in the real economy. This principle implies the need for pre-emption, where you may have to adjust interest rates before inflation starts to increase, and the other is the need to react strongly if the economy starts to fall into recession.

In my view these principles have been followed by all successful central banks including the FED and the formal inflation targeting banks, and it is another important lesson learned from the implementation of inflation targeting. There are other principles of monetary policy that cannot be written down mathematically, such as the principle of injecting large quantities of liquidity in a liquidity crisis or a payments crisis, but even these principles can be studied as deviations from algebraic policy rules.

How do central banks actually implement such principles without mechanically following a policy rule? This varies greatly from central bank to central bank, but I believe the literal description by which central banks have achieved the "greater than one" principle, for example, works roughly as follows: when there is an increase in inflation, or a forecast of an increase, the central bank's models will show that an increase in the interest rate will be needed to reverse it, or prevent it. For any good monetary model, this will require an increase in the **real** interest rate, and will therefore require increasing the nominal interest rate by more than one for one with the increase in inflation. So, if the central banks are using their models this way, then the "greater than one" principle will be implemented.

THE ROLE OF THE EXCHANGE RATE

Another important lesson learned from the implementation of inflation targeting concerns the exchange rate, an important issue that has been raised by Sebastian Edwards (2005). As explained in Taylor (2001), many of the international models used to derive optimal policy rules for central banks in the developed countries in the 1980s, implied that the weight on the exchange rate in the policy rules should be very low, and for this reason it was set to zero for simplicity in the simple rules that included inflation and real output. But those models were for large developed countries leaving open the possibility that the weights could be larger and more significant in small open economies where the exchange rate plays a larger role. Indeed, recent empirical research on policy rules in inflation targeting in emerging market countries (see Mohanty and Klau, 2004) finds a very clear significant response, even in the early inflation targeting countries such as Chile. When the exchange rate is put into a policy rule along with inflation and real output, a negative sign is found, implying that these inflation targeting central banks reduce interest rates in the face of exchange rate appreciation, and apparently even controlling for the impacts on the exchange rate on inflation.

More research is needed to understand these responses, but that these reactions to the exchange rate are present is already an important lesson learned from the implementation of inflation targeting. Of course, that the central bank reacts to the exchange rate in this way is by no means inconsistent with inflation targeting, any more than responding to real Gross Domestic Product (GDP) is inconsistent with inflation targeting. Indeed, such responses may be part of a preemptive strategy to ward off incipient changes in inflation.

A closely related issue concerns the correct policy for sterilized exchange market intervention. There has been no such intervention in the United States for more than five years, and the same is true for the euro zone, and for inflation targeting countries such as Great Britain and Canada. In my view the foreign exchange markets have become accustomed to this change in intervention strategy compared to the past, and that is one reason why volatility is down. But intervention is still common in emerging market inflation targeting countries and, given the presence of the exchange rate in the policy rules, needs to be studied more systematically.

EXCHANGE RATE PASS-THROUGH

Another important lesson learned is that pass-through of exchange rates to core inflation has declined significantly since the adoption of inflation targeting and the focus on price stability more generally. There is a debate whether this is due to the change in policy or to other factors such as increased international competition with globalization. I have argued that the inflation targets have been a factor.

IMPLICATIONS OF INTERNATIONAL MONETARY POLICY

As we look forward to future conferences at the Bank of Mexico, it is worth asking whether future research or policy can benefit from our experience with inflation targeting. One area that I have a great deal of interest in is finding ways for international monetary policy to adopt some of the same principled or rule-like features that central banks have adopted in recent years. For example, since 2003 efforts have been underway to provide clearer guidelines for the actions of the International Monetary Fund (IMF) in financial crises, so that the IMF can operate in a more principled or rules like fashion. A more predictable IMF can increase certainty, reduce volatility, and lower the chances of contagion in the international monetary system, much like more predictable central bank policy can reduce volatility.

CONCLUSION

It is a major accomplishment that monetary policy, by focusing on the goal of price stability, has improved so much in so many countries in the last 25 years. I have argued here that formal inflation targeting has been essential in spreading the ideas of price stability around the world, but that history shows that the price stability movement is broader and actually preceded the formal adoption of inflation targeting in the early 1990s.

I also argued that monetary policy rules are an important tool both for implementing inflation targeting and for evaluating inflation targeting policies historically, drawing lessons for the future. In this regard, more research along the lines of Meyer and Yellen, but applied to inflation targeting countries would be very fruitful. In the meantime it is clear that adhering to certain predictable principles for changing the instruments of policy is essential to the successful implementation of inflation targeting. These principles include the greater than one principle, responding to the state of the real economy, providing liquidity in a payments crisis, and perhaps reacting directly to exchange rates in small open or emerging market countries.

Applying the ideas of predictability and accountability that have worked so well in domestic monetary policy to international monetary policy should be a high priority for future research.

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