The Federal Reserve Board

Remarks by Vice Chairman Roger W. Ferguson, Jr.

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Monetary Credibility, Inflation, and Economic Growth

By now it must be universally agreed that low and stable inflation is a primary and essential goal for monetary policy, in large part because we believe it brings stability to financial systems and fosters sustainable economic growth over the longer run. In pursuit of this goal, central banks can report some success. According to the latest *World Economic Outlook* from the International Monetary Fund (IMF), consumer price inflation in the advanced economies over the decade beginning in 1997 and ending next year looks set to come in at an average annual rate of less than 2 percent, down from 3-1/2 percent for the previous ten years. The IMF figures for the United States show a smaller but still substantial decline in headline inflation, from about 3-3/4 percent to 2-1/2 percent. The drop in inflation for the non-industrial economies has been more striking, with average inflation falling from double to single digits over the same time periods.[1]

As someone who started work as a monetary policymaker in 1997, I am happy to acknowledge the accomplishments of many policymakers at the Federal Reserve and in other central banks around the world. Thanks to their success in fighting inflation, the central banking profession enjoys a very high standing. And as a related matter, we might say that monetary credibility, which I would define as the perception in the private sector that central banks will do what it takes to keep inflation under control, is also quite high.

This credibility is hard won, however, and can be easily lost. The Federal Open Market Committee (FOMC) at its most recent meeting increased the federal funds rate 25 basis points, to 4 percent, and observed:

> The cumulative rise in energy and other costs has the potential to add to inflation pressures; however, core inflation has been relatively low in recent months and longer-term inflation expectations remain contained. . .With underlying inflation expected to be contained, the Committee believes that policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, the Committee will respond to changes in economic prospects as needed to fulfill its obligation to maintain price stability.

Unfortunately, however, the story over the past twenty years is not so uniformly positive for growth. Again according to IMF figures, growth among the non-industrial economies appears to have increased to about 5-1/4 percent in the decade beginning in 1997, compared with growth of 3-3/4 percent in the previous ten years. Growth in the United States has also moved slightly higher over the two periods, from 3 percent to 3-1/4 percent. However, growth in the other industrial economies has softened, to less than 2-1/2 percent in the

recent decade from more than 3 percent in the previous one. This decline reflects slowing in some of the larger economies--Japan, Germany, Italy, and the Netherlands--as well as the effect of the Asian crisis in 1997 on newly industrialized Asian economies.[2]

To me, it is axiomatic that monetary credibility, by reducing the level and variability of inflation, lays the foundations for stronger and more-sustained economic growth. In my remarks today, I want to discuss anecdotal and academic evidence for the relationship between monetary policy credibility and economic growth and to do so in two segments: first, the link between monetary policy credibility and inflation performance and, second, the link between inflation performance and longer-run economic growth. Before proceeding, I must indicate that the views I am about to express are my own and do not necessarily reflect the views of other members of the Board of Governors or the Federal Open Market Committee.

Monetary Policy Credibility and Inflation Performance Outcomes

Does monetary credibility help secure lower inflation, less-variable inflation, and inflation that is less sensitive to shocks? Low and stable inflation must start with sound policy--that is, policy that keeps output near potential and offsets shocks to supply and demand appropriately. But beyond that, common intuition and numerous academic journal articles, a few of which I will discuss shortly, suggest that credibility can greatly enhance the virtues of sound policy. When the central bank is viewed to be both committed to and effective at keeping inflation contained, inflation expectations will tend to be anchored. And so long as the central bank pursues sensible policies, those expectations will tend to be self-fulfilling, as they should lead to movements in prices and wages that are consistent with inflation staying low and stable. Conversely, if credibility is lacking and inflation expectations are high, firms will be raising prices, and workers will be demanding large wage increases, making it more costly, in terms of jobs and output, for the central bank to tighten policy sufficiently to achieve low inflation.

One does not have to look far to see examples of the practical importance of monetary credibility. In the past two years, crude oil prices have about doubled. During the 1970s, similar run-ups set off sharp increases in global inflation. Today, by contrast, core inflation rates both in the United States and abroad, while they have moved up some, remain essentially contained. In large part, they remain so because central banks, including the Federal Reserve, have substantially bolstered their commitment to price stability since the 1970s and markets are now much more confident that monetary authorities will keep inflation from rebounding. Accordingly, rising oil prices have not triggered a sharp rebound in long-term inflation expectations, and we have not seen the anticipatory hikes in prices and wages that were so destabilizing a few decades back. In essence, monetary credibility helps the central bank do its job, by inducing private sector participants also to take actions that help achieve the central bank's low inflation objective. Of course, given the persistence of high energy prices that the global economy has confronted of late, policymakers cannot be complacent. Central bankers must reinforce their credibility and validate the confidence of market participants by actively leaning against inflationary pressures long before inflation itself builds. Again, the FOMC has done just that through its commitment to adjust policy as required to keep inflation at bay.

Aside from such anecdotal evidence, much formal research supports the view that a strong commitment to price stability helps reduce and stabilize inflation. For example, Gagnon and Ihrig, staff economists at the Federal Reserve, have studied the effects of monetary policy on the response of inflation to currency depreciation.[3] They show that, over the past few

decades, the sensitivity of inflation to currency depreciation has generally declined in industrial economies. For 18 of the 20 industrial countries studied, the authors find that the rate of pass-through of currency depreciation to inflation fell as the rate of inflation declined between 1971 and 2000, with pass-through in the second half of the sample period averaging about a third of what it was in the first half. In addition, they find that these declines tended to be larger in countries where central banks increased the weight they placed on fighting inflation. The Gagnon and Ihrig result represents evidence that a strong commitment to price stability can lead to more-stable prices, but it leaves open the extent to which central bank credibility--as opposed to policy action--contributes to this outcome.

Other research, conducted by Laxton and N'Diaye at the IMF, shows that a model of inflation and unemployment performs better when inflation expectations are entered into the model as a function of long-term bond yields than when such expectations are assumed to depend on past inflation alone.[4] Thus, their research affirms the influence of inflation expectations on actual inflation. Whether these expectations reflect monetary credibility, as the researchers argue, remains unclear.

Finally, there is considerable literature on the effects of central bank independence on inflation.[5] In one standard view, politically motivated desires to stimulate the economy, run budget deficits, or redistribute wealth in favor of one social group or another are important sources of inflationary pressure. These pressures have long been part of the political landscape, and indeed, it was for these reasons that the framers of the Federal Reserve sought to insulate the Fed from political pressures.[6]

That central bank independence frees the monetary authority to pursue price stability more diligently, resulting in lower and less-variable inflation, is supported by many studies.[7] Inflation tends to be lower in countries where there are legal and other institutional safeguards to central bank independence. Of course, such results still do not tell us whether central bank independence matters mainly because it allows the central bank to pursue better policies or because it boosts the central bank's credibility.

In spite of this ample academic evidence of the role of good policy and central bank independence in achieving price stability, we must face the fact that the particular contribution of monetary credibility, as contrasted with the contribution of central bank policies themselves, is difficult to measure. Not only does effective central bank policy lead to good inflation outcomes, but it is the primary contributor to monetary credibility. Sound policy and credibility are tightly, and perhaps inextricably, intertwined and cannot be separately measured with current statistical techniques.

Am I bothered by the paucity of direct academic evidence regarding the specific role of monetary credibility? Not at all. The research I have briefly described makes clear that a commitment to fighting inflation, low inflation expectations, and central bank independence all contribute to restraining inflation. Thus, it would be surprising if monetary credibility did not play a role, even if, because it cannot be directly measured, its specific contribution is hard to gauge. Moreover, theory and intuition tell us that monetary credibility will be greatest when the central bank does what it is supposed to do: offset economic shocks to keep price pressures from building and thereby keep inflation itself low and stable. The effective central bank will pursue such policies regardless of how important it believes the role of monetary credibility to be.

Inflation Performance and Economic Growth

Assuming that monetary credibility does make it easier for central banks to pursue the objective of price stability, what can we say about how stable prices affect the bottom line--economic activity and growth? Empirical research attempting to establish solid links between low inflation and sustainable economic growth has met with mixed success, in part because of the many complicated factors determining both inflation and growth.

Following seminal work by Stanley Fischer, researchers seem to agree that extreme inflation rates, say above 40 percent per year, are associated with reduced economic growth.[8] Such high rates of inflation are often a sign of an economy in or approaching crisis, and once inflation crosses the threshold of 40 percent, inflation is considerably more unstable and likely to rise. Under such conditions, firms have great difficulty in setting prices and consumers in appraising them. In general, growth slows during such crises, as evidenced by the collapse of the Argentine economy during its hyperinflation at the end of the 1980s or the ravages of the European hyperinflations of the 1920s.

In these situations, the association between growth and inflation is clear, although causality can be difficult to disentangle. But what can we say about lower inflation rates? Is the pace of economic development slower when inflation is at 15 percent than when it is at 5 percent? Research by IMF staff economists Khan and Senhadji has turned up a negative association between inflation and growth. Using nonlinear estimation techniques, these economists report finding thresholds above which inflation significantly slows growth.[9] The thresholds identified in this work are 1 percent to 3 percent for industrial economies and 11 percent to 12 percent for developing economies.

To be completely fair regarding the academic literature, however, others have not found such a clear relationship. Levine and Renelt (1992), for example, found no robust relationship in exhaustive cross-section studies, and many researchers using other techniques have also failed to detect a significant relationship.[10]

The problem may lie in identifying the direction of causation: In the short-to-medium run, causality may run from higher growth to higher inflation, as business-cycle pressures push spending and activity above the economy's capacity. This direction of causality may obscure the negative relationship, running from higher inflation to lower growth, presumed to hold in the longer term.

Of course, as a central banker, it makes sense to me that lower and more-stable inflation, by making the returns to saving and investment more predictable and by diminishing the likelihood of shocks to the financial system, should encourage economic growth. For example, the United States has experienced a higher average, and less volatile, growth rate since the mid-1980s. This "Great Moderation" has been attributed by most observers, at least in part, to improved monetary policy and, by extension, to lower and more-stable inflation.[11] Low and stable inflation offers other benefits as well, which may affect the growth rate of gross domestic product (GDP) over time. These include reducing the arbitrary redistributions of wealth and income associated with higher and more-variable inflation and shrinking the distortions to resource allocation in the tax code. [12] Accordingly, and I am obviously not alone in this view, it is clear that central banks should strive to achieve low, stable inflation.

Of course, low inflation is at best a necessary, but not sufficient, condition for growth. In many poor economies, inflation may be less of an obstacle to development than poor

governance, inadequate education, and legal systems that fail to protect property rights or to enforce commercial contracts. Yet, no tradeoff forces countries to choose between lowering inflation and reforming their institutions. On the contrary, high inflation is often a sign of institutional breakdown, and reducing inflation may help to rebuild confidence in economic and political prospects.

Conclusion

In conclusion, let us not forget that the declines in inflation over the past two decades and the resulting boost to monetary credibility we currently enjoy were earned with some economic pain, as the pace of economic activity was slowed, at times severely, to bring inflation down. With longer-run inflation expectations better anchored now throughout the world, I believe that global economic growth will be stronger and more resilient as a result. If the academic evidence does not yet unequivocally support this conclusion, perhaps it is because we are only starting to see the return to sacrifices made in the past. My generation of central bankers has the job of maintaining the victories of the previous generation and of using all our tools to keep inflation expectations contained and inflation low and stable. We owe our predecessors and our fellow citizens nothing less.

Footnotes

1. The non-industrial economies are those designated by the IMF as "other emerging market and developing economies." According to the IMF, CPI inflation for that group has fallen from an average of nearly 57 percent in the 1987-96 period to an average of 7-1/2 percent in the 1997-2006 period. Return to text

2. IMF classifications put the newly industrialized Asian economies of Korea, Taiwan, Hong Kong, and Singapore among the advanced economies. Return to text

3. Joseph E. Gagnon and Jane Ihrig (2004), "Monetary Policy and Exchange Rate Pass-through," *International Journal of Finance and Economics*, vol. 9, pp. 315-38 Return to text

4. Douglas Laxton and Papa N'Diaye (2002), "Monetary Policy Credibility and the Unemployment-Inflation Tradeoff: Some Evidence from 17 Industrial Countries," International Monetary Fund Working Paper/02/220, December. Return to text

5. See, among others, Alex Cukierman (1992), *Central Bank Strategy, Credibility, and Independence: Theory and Evidence*, MIT Press: Cambridge, Mass. Return to text

6. See Jon Faust (1996), "Whom Can We Trust to Run the Fed? Theoretical Support for the Founders' Views;" *Journal of Monetary Economics*, vol. 37 (April), pp. 267-83. Return to text

7. Three examples are: Alberto Alesina and Lawrence Summers (1993), "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence," *Journal of Money, Credit, and Banking*, vol. 25 (May), pp. 151-62; Sylvester Eijffinger, Eric Schaling, and Marco Hoeberichts (1998), "Central Bank Independence: A Sensitivity Analysis," *European Journal of Political Economy*, vol. 14 (February), pp. 73-88; and Adam Posen (1998), "Central Bank Independence and Disinflationary Credibility: A Missing Link?" *Oxford Economic Papers*, vol. 50 (July), pp. 335-59. Return to text

8. Stanley Fischer (1993), "The Role of Macroeconomic Factors in Growth," *Journal of Monetary Economics*, December, pp. 458-512. See also Michael Bruno and William Easterly (1996), "Inflation and Growth: In Search of a Stable Relationship (245 KB PDF)," *Review*, Federal Reserve Bank of St. Louis, May/June, pp. 139-46. Return to text

9. Mohsin S. Khan and Abdelhak S. Senhadji (2001), "Threshold Effects in the Relationship between Inflation and Growth," *IMF Staff Papers*, vol. 48, pp. 1-21. An earlier IMF staff paper also found a negative, nonlinear relationship. See Atish Ghosh and Steven Phillips (1998), "Warning: Inflation May Be Harmful to Your Growth," *IMF Staff Papers*, vol. 45, pp. 672-710. Return to text

10. Ross Levine and David Renelt (1992), "A Sensitivity Analysis of Cross-Country Growth Regressions," *American Economic Review*, vol. 82 (September), pp. 942-63. Return to text

11. The volatility of U.S. GDP has declined markedly since the mid-1980s from the volatility of the previous couple of decades. This moderation has several possible explanations, and better monetary policy is seen as one. Others include milder economic shocks, improved inventory management, and financial innovation. On the last, see Karen E. Dynan, Douglas W. Elmendorf, and Daniel E. Sichel (2005), "Can Financial Innovation Help to Explain the Reduced Volatility of Economic Activity?" paper prepared for Carnegie-Rochester Conference on Public Policy, "Financial Innovation, Risk, and Fragility," April 15-16, forthcoming in the *Journal of Monetary Economics*. Return to text

12. See, for example, Martin Feldstein, ed. (1999), *The Costs and Benefits of Price Stability*, Chicago: University of Chicago Press. Return to text

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