

# The Monetary Policy Model

National Association of Business Economics (NABE) Annual Meeting  
Boston, Massachusetts  
September 11, 2006

I am sure that all of us find it sobering to meet on the fifth anniversary of the tragic events of September 11, 2001. Many of you were present at the NABE annual meeting at the World Trade Center that day and were fortunate to escape before the great towers came down.

It is a distinct honor to be here today to accept the Adam Smith Award. I'll be talking about the subject I know best—monetary policy. I would have used the title, “My Monetary Policy Model” except for the fact that the model I use is not mine.

Our current understanding of monetary economics has been built on contributions over many hundreds of years. In preparing this lecture, I reminded myself of just how clearly Adam Smith understood monetary issues by going back to reread sections of the *Wealth of Nations*. Smith begins the book with three short chapters on the division of labor. Chapter 4 is entitled, “Of the Origin and Use of Money.” Smith explains that division of labor requires exchange, and exchange requires money. He discusses the difficulty of conducting exchange efficiently because metallic money needs to be weighed and assayed. Smith discusses the practice of princes and sovereign states in debasing the currency. He notes that “[s]uch operations, therefore, have always proved favourable to the debtor and ruinous to the creditor, and have sometimes produced a greater and more universal revolution in the fortunes of private persons, than could have been occasioned by a very great public calamity.”

Monetary policymakers are acutely aware of the potential for monetary policy to create “a very great public calamity” and they feel deeply their responsibility not to permit such an outcome.

Our most fundamental challenges are basically the same ones Smith noted. Uncertainty over the value of money is one; another is the incentive of sovereign states to debase the value of money. My aim in this lecture is to provide a skeletal picture of how I view the Federal Reserve's task.

Before proceeding, I want to emphasize that the views I express here are mine and do not necessarily reflect official positions of the Federal Reserve System. I thank my colleagues at the Federal Reserve Bank of St. Louis for their comments, but I retain full responsibility for errors.

## RATIONAL EXPECTATIONS MACROECONOMIC EQUILIBRIUM

Most macroeconomists today adhere to a model based on the idea of a rational expectations equilibrium. All aspects of government policy enter the rational expectations model—the “RE model” for short—but I'll confine my remarks to monetary policy. Policymakers are assumed to have a set of goals and a conception of how the economy works. The private sector understands, to the extent possible, policymakers' views. An equilibrium is characterized by a situation in which the private sector has a clear understanding of policy goals and the policymakers' model of the economy, and the policy model of the economy is as accurate as possible. If the policymakers and private market participants do not have views that converge, no stable equilibrium is possible because expectations as to the behavior of others will be constantly changing.

In this setting, market behavior depends centrally on expectations concerning monetary policy

and the effects of monetary policy on the economy, including effects on inflation, employment, and financial stability. A stable equilibrium requires that markets behave as policymakers expect and that policymakers behave as markets expect.

It is easiest to describe the rational expectations equilibrium in a context of certainty. But, of course, all the really interesting questions arise in a context of uncertainty. One form of uncertainty concerns future states of the world. In principle, we can think about a model in which market responses and policy responses to new information reflect maximizing behavior. In the private sector, in response to new information, households change consumption plans to maximize utility and firms make operating and investment decisions to maximize profits. Similarly, policymakers revise the stance of monetary policy in an attempt to pursue policy goals as efficiently as possible. The continuous flow of new information includes everything that happens—weather disturbances, technological developments, routine economic data reports and the like. Thus, we can think of the economy as evolving efficiently in response to stochastic disturbances of all sorts. Of course, in practice, there is also uncertainty about market and policy responses to new information, and there are improvements over time in knowledge about how the economy works. Nevertheless, the RE model provides the core insights that shape my views as to how to make routine policy decisions and how to design a longer-run program to improve policy.

## MONETARY POLICY IMPERATIVES IN THE MODEL

We can think of the actual, observed equilibrium as a full rational expectations equilibrium under current policy. There may well be an alternative policy that would induce a new rational expectations equilibrium that would have more desirable properties than the current equilibrium. Thinking of the model this way provides an agenda for long-run improvement in monetary policy.

### *Clarity of Goals*

For the private sector to form accurate expectations about future monetary policy and outcomes of key economic variables, policymakers need to state their goals clearly. The literature on inflation targeting emphasizes this point, and I have long believed that the FOMC could improve the clarity with which it conveys its objectives to the general public. In the past, I have stated my own personal inflation objective as “zero inflation, properly measured” but have also said that FOMC agreement on an inflation objective, which some might express as a “comfort zone of 1 to 2 percent inflation,” is more important than which precise specification is selected. There are practical difficulties that can and should be addressed, such as what price index to use, over what period to measure price changes, and what degree of tolerance to adopt if inflation runs outside the range. I do not believe that uncertainty about the Fed’s inflation objective is a large issue at present but do believe that there is an opportunity to improve clarity.

### *Maintaining Credibility*

To maintain credibility, the monetary authorities must deliver what they said they would deliver. Credibility is essential to the stability of longer-term inflation expectations. Central banks around the world emphasize the importance of achieving low and stable inflation. In the United States, the Federal Reserve lost considerable credibility in the 1970s because the inflation rate rose to unacceptable levels. With impaired credibility, the FOMC under Paul Volcker had to pursue a sustained anti-inflationary policy even in the face of the most severe recession since the Great Depression. The cost of restoring credibility makes clear the reason for not losing it.

Credibility is not, however, one-dimensional. Sustained low inflation is desired for its own sake but even more for the contribution it makes to high employment and economic growth. Thus, while inflation damages credibility, so also can high unemployment. There is a fine balance here. We know that monetary policy cannot affect

employment in the long run, but we also know that monetary policy mistakes can create unemployment over an uncomfortably long short run. When unemployment rises, policymakers need to be able to explain in credible fashion why the problem is not a consequence of a monetary policy mistake, for that perception is always present among some observers in such circumstances. There is, after all, some historical justification for such a perception given that almost all economists agree that monetary policy mistakes contributed to the severity of the Great Depression. Given the importance of high employment, a period of sustained excessive unemployment may create doubts about future policy, and this uncertainty is a manifestation of impaired credibility.

The Federal Reserve's credibility is also affected by other matters. Sound performance in dealing with financial crises and regulatory responsibilities enhances credibility. Reputational risk applies to the institution as a whole. Poor performance of responsibilities outside the monetary policy realm can affect the public's confidence in the central bank's leadership.

Monetary policy success depends on high credibility, but it is important to recognize that credibility adheres to the entire institution that conducts monetary policy and not just to the department within the institution responsible for monetary policy.

## SOME IMPLICATIONS OF THE MODEL

The model I've sketched provides a way of thinking about current policy decisions. At least, the model provides a way for you to think about my thinking about current policy decisions. The model also provides a framework for analyzing potential policy improvements over time.

The model clearly calls for improved clarity of central bank goals, a topic I've already discussed. Clearly, also, the model supports continuing macroeconomics research to improve understanding of how the economy works. Because a full rational expectations equilibrium requires com-

plete knowledge on the part of the private sector of central bank thinking and analysis, Federal Reserve research findings should be distributed widely. More generally, the model points to the importance of reducing asymmetries of knowledge through central bank transparency.

A finding of the optimal control literature is that when a policy authority uses all available information as efficiently as possible in pursuing its goals, simple correlations between observable variables and goal variables may go to zero. Although the exact result will be model dependent, we should not expect correlations such as between money growth and nominal GDP growth or between unit labor costs and inflation to be independent of the policy regime. This is a familiar proposition in the securities markets, where it is stated as the efficient markets hypothesis. Observable information should be quickly reflected in securities prices, leaving no risk-adjusted profit opportunities from trading on publicly available information. There is, of course, an opportunity to exploit nonpublic information.

In the monetary policy context, research suggests that inflation-forecasting models have not worked very well in recent years. The reason, I believe, is that the Federal Reserve has been pretty successful in exploiting all available public information in its monetary policy decisions aimed at maintaining low and stable inflation. However, there is an opportunity to exploit non-public information. The Federal Reserve has an extensive process of gathering anecdotal information from business contacts. Much of this information is published in the Beige Book two weeks before every FOMC meeting. The policy model I'm sketching certainly leaves room for greater and more systematic effort to gather and exploit anecdotal information.

What does the model imply about the value of financial-market information to policymakers? Consider the fed funds futures market. Does that market's response to, say, the employment report help policymakers to assess the significance of the new data? In the RE model the clear answer is "no." The behavior of the fed funds futures market tells us what the market believes will be the Fed's response to the news. That is useful

information for the Fed, but does not help in understanding what the new information itself means for the evolution of the economy. The same argument holds for other financial prices, which reflect a mixture of direct effects from new information and indirect effects from anticipated policy responses to the new information. The implication for policymakers is that we need to provide our own analysis of the implications of new information and cannot rely on financial markets to do that job for us.

The model also contains a surprising implication for central bank communication. Consider the most extreme version of the model, in which there are no information asymmetries. The central bank and the private markets have the same information. The economy evolves as stochastic shocks occur. When shocks are observed, the central bank and the markets get the new information at the same time and both understand the implications of the new information for each others' actions. Moreover, and this is the surprising result, the central bank does not need to say anything about the policy implication of any particular shock. The markets already know the implications because there is full knowledge and no information asymmetry.

The practical import of this implication for central bank communication policy is that communications should focus on policy fundamentals of goals and the model of how the economy works. The economy works best when policymakers disclose the systematic part of policy and minimize the random part. That is, policy should not itself be a source of random disturbance. In the extreme, austere version of the model I am now discussing, central bank communication about policy responses to individual shocks is unnecessary and more likely to create market disturbances than enlightenment. Only when the central bank believes that the market is misinterpreting the policy significance of a shock is comment on the particular shock desirable. We can think of such communication as being designed to reduce an information asymmetry.

You may believe that my argument from an extreme, austere model is far-fetched. However,

as one who routinely talks with the press after every speech, I can tell you that imparting the correct interpretation of the policy significance of recent data is not a simple matter. It is all too easy to create an unintended market disturbance. Thus, I personally really do take seriously the practical relevance of the extreme model.

I have discussed the implication of the RE model for central bank communication because it seems to me that there are many opportunities for improving communication, and many possible communications pits into which it is easy to fall. Central bank communications are not just "PR" issues, which I put in quotes to indicate how some might dismiss their importance, but essential to the monetary policy process. Expectations are critical to how markets perform and expectations are affected both by what the central bank says and by what it does.

## CONCLUDING REMARKS

The economics profession has converged to a basic conception of how the economy works based on a rational expectations view of the world. That core idea is at the heart of every model today and at the heart of monetary policy practice. Nevertheless, there is ample room for disagreement and further development. Some—and I include myself in this group—think about policy in a way that is pretty close to an austere version of the model in which information asymmetries play a minimal role, while others see a much larger role for imperfections in the market's information set. In any event, the RE model provides an organizing framework and common language for analyzing monetary policy issues. Adam Smith posed fundamental issues well, but in the context of the gold standard. Since Smith's day, we've come a long way. Indeed, we've come a long way since the 1960s and 1970s when fundamental differences between Keynesians and monetarists, as the split was then described, left monetary policy in a state that could only be described as incoherent. Fundamental advances in economics really have made a difference.