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Introduction

N. Gregory Mankiw

Monetary policy is not easy. Central bankers have multiple objectives and, over time, must confront a variety of economic circumstances. They know their actions have powerful effects on the economy, but the timing, magnitude, and channels of those effects are not fully understood. Their job is made all the more difficult by widespread disagreements among economists. Some economists view monetary policy as a potential cure for economic fluctuations. Others would be satisfied if monetary policy could avoid being a cause of fluctuations.

Just as there are many facets to the making of monetary policy, there are many facets to research on the topic. In January 1993, the National Bureau of Economic Research and I brought together a group of prominent macroeconomists in Islamorada, Florida, to present and discuss new research on monetary policy. This volume is the result.

Many topics are addressed in the papers that follow. As readers of this volume will learn, these authors do not always agree with one another. What binds these authors together is a conviction that monetary policy is important, and that it can be improved by serious, practical research. The papers collected here offer a sampling of that research.

The first three papers discuss alternative ways of conducting monetary policy. Martin Feldstein and James Stock study how the Fed could use the broad monetary aggregate M2. Robert Hall and I discuss the role of rules in the making of monetary policy, especially rules aimed at targeting nominal income. Michael Woodford examines the theoretical question of how one should judge alternative indicators for monetary policy.

A longstanding question in monetary economics is how much information is

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contained in monetary aggregates and how the Fed might use that information. Feldstein and Stock argue that the Fed could use M2 to reduce both the average rate of inflation and the volatility of growth in nominal gross domestic product (GDP). They reach this conclusion by deriving an optimal M2 rule from a vector autoregression. This rule would, they conclude, reduce the standard deviation of annual GDP growth by over 20 percent. In addition, they consider a simpler policy based on a single equation linking M2 and GDP. They show that this policy is almost as successful in reducing nominal GDP volatility.

Feldstein and Stock also address the question of whether the link between monetary aggregates and economic activity is sufficiently reliable to form the basis of policy. They apply a battery of recently developed statistical tests for parameter stability. These tests do not detect any evidence of instability in the link between nominal GDP and M2. By contrast, the links between nominal GDP and more narrow monetary aggregates are found to be highly unstable. Feldstein and Stock interpret this evidence as contradicting those who have argued that the M2-GDP link is so unstable that it cannot be used to improve monetary policy.

Hall and I begin by discussing the desirability of a rule for monetary policy and the characteristics a good rule should have. We emphasize, in particular, three types of nominal income targets, which differ in how they respond to past shocks to prices and real economic activity. A key question is how any of these rules might be implemented in practice. We suggest that the consensus forecast of future nominal income could play a role in ensuring that the central bank does not deviate from its announced target. To show how economic performance might have differed historically if the Fed had been committed to some type of nominal income target, we offer simulations of a simple model of the economy. According to the simulations, the primary benefit of nominal income targeting would have been reduced volatility in the price level and the inflation rate. Whether real economic activity would have been less volatile is unclear.

Woodford's paper considers how one might judge the usefulness of various indicators for monetary policy, especially indicators other than measures of the money supply. Several policymakers and commentators have, in recent years, suggested that commodity prices, exchange rates, and interest-rate yield spreads could be useful in conducting monetary policy. Advocates of using such indicators often point to the historical forecasting performance of these indicators. In the spirit of Lucas's famous critique of econometric policy evaluation, Woodford argues that reduced-form forecasting regressions are of little value. Evaluating indicators for monetary policy, he argues, requires the use of structural econometric models.

The next three papers in the volume analyze the behavior of prices. Monetary policymakers monitor inflation closely, for inflation is a key measure of economic performance and, in the long run, is determined primarily by monetary policy. The short-run behavior of prices, however, is less well understood.

The papers by Alan Blinder, Laurence Ball, and Michael Bryan and Stephen Cecchetti take three quite different approaches to raise our understanding of prices and inflation.

Blinder's paper offers a new way of judging alternative theories of price adjustment. Blinder reports on a survey in which he asks firms about their behavior. He confirms that prices are indeed quite sticky: the typical price in the U.S. economy is changed once a year. Breaking with standard methodology in economics, Blinder also asks firms about which theories best describe their behavior. He finds, for example, that firms are highly concerned about coordination issues when considering price changes. This survey evidence should help us distinguish among alternative theories for the stickiness of prices.

Because prices are slow to adjust to changes in monetary policy, reducing inflation usually involves the temporary cost of high unemployment and low output. This cost is often summarized in a number called the sacrifice ratio: the ratio of the loss in output to the fall in inflation. Ball's paper investigates the determinants of the sacrifice ratio. He develops a method for estimating the sacrifice ratio in individual disinflation episodes, and applies it to sixty-five episodes in moderate-inflation countries in the Organization for Economic Co-operation and Development (OECD). Ball finds that the sacrifice ratio is usually smaller in more rapid disinflations. That is, when reducing inflation, cold turkey is less costly than gradualism. In addition, the sacrifice ratio is smaller in countries with more flexible wage-setting institutions, such as shorter labor contracts. Ball also examines whether the initial level of inflation, the openness of the economy, or incomes policies influence the sacrifice ratio, but the results are not decisive.

Inflation watchers, both inside and outside central banks, are always on the lookout for increases in inflation. Whenever a report on inflation is released, they face the difficult job of disentangling short-term noise from longer-term trends. Bryan and Cecchetti address this problem by considering alternative measures of core inflation, which they define as the persistent component of inflation. Although standard measures of inflation are the *average* over many goods, they suggest that the *median* rate of inflation may provide a superior measure of core inflation. They reach this conclusion using a model of asymmetric supply shocks with costly price adjustment. In this model, skewness in the cross-sectional distribution of inflation can cause short-term noise in the aggregate price index. This short-term noise affects median inflation less than it affects average inflation.

Bryan and Cecchetti document the statistical properties of core inflation as measured by the median. They find that median inflation is more correlated with past money growth and delivers better forecasts of future inflation than does average inflation. Moreover, unlike average inflation, median inflation does not forecast future money growth. Bryan and Cecchetti interpret this finding as suggesting that monetary policy has often accommodated supply shocks, which they measure as the difference between average and median

inflation. They also compare alternative measures of core inflation: the consumer price index excluding food and energy, the 15 percent trimmed mean, and the median. They find that the median has the strongest relationship with past money growth and provides the best forecast of future inflation.

The next two papers examine the monetary transmission mechanism—the channel through which the central bank's actions affect spending on goods and services. The traditional view of the transmission mechanism, called the "money view," holds that contractionary monetary policy reduces spending by raising interest rates. Recently, attention has centered on an additional channel of monetary policy—the reduction in bank lending that must accompany a reduction in reserves. The papers by Anil Kashyap and Jeremy Stein and by Jeffrey Miron, Christina Romer, and David Weil offer alternative perspectives on the importance of this new "lending view."

Kashyap and Stein survey the recent literature—both theoretical and empirical—on the lending view of monetary policy. The traditional money view assumes that there is one important distinction among types of assets: assets used for transactions (money) and those held only as a store of value (bonds). By contrast, under the lending view, there are three types of assets: money, bonds, and bank loans. Like bonds, bank loans earn interest, but they are not perfectly substitutable with bonds. Banks make loans presumably because loans offer a higher return than bonds, while borrowers need these loans because they do not have access to bond markets. According to the lending view, when the central bank reduces reserves, it not only raises the interest rate on bonds, but it also reduces the supply of bank loans. Kashyap and Stein's paper offers a brief history of thought on the lending view, examines its theoretical foundations, and reviews the empirical evidence.

Miron, Romer, and Weil examine changes over time in the importance of the lending channel. They begin by using a simple theoretical model to isolate the observable factors that affect this channel's strength. They then show that several changes in the economy—the composition of bank assets, the composition of external firm finance, and reserve requirements—should have made the lending channel stronger before 1929 than during the period immediately after World War II. Yet, they show that conventional indicators of the importance of the lending channel, such as the spread between the loan rate and the bond rate and the correlation between loans and output, do not exhibit the predicted decline in the importance of the lending channel. They suggest two possible interpretations of these results. Either the traditional indicators are not good measures of the strength of the lending channel, or the lending channel has not been quantitatively important in any era.

The final paper in this volume, by Matthew Shapiro, builds on the path-breaking work of Christina Romer and David Romer. Romer and Romer identified dates when the Fed appears to have shifted its policy toward reducing the rate of inflation. Shapiro's paper examines the causes and effects of this decision. He constructs variables measuring expected unemployment and inflation

and then uses these variables in a model to explain the Fed's actions. He reports that the model does a good job of explaining the Fed's decisions to disinflate. Moreover, as one might have expected, the Fed appears to weigh the outlook for unemployment as well as that for inflation in making its decision about disinflation. Surprisingly, Shapiro finds little evidence that inflation in fact falls after the Romer dates. The Volcker disinflation is found to be the only disinflation to have reduced inflation permanently. The disinflation after the 1973 OPEC price increases was effective, but only temporarily. Other "disinflations" had negligible impacts on the rate of inflation.

The nine papers in this volume contain many intriguing results. Yet, surely, there is more work to be done. Many of the new empirical findings reported here deserve greater scrutiny using data from other time periods and other countries. I hope that readers will both learn from the papers in this volume and be inspired to undertake further work on these important and exciting topics.