

## Frederic S Mishkin: The Federal Reserve's enhanced communication strategy and the science of monetary policy

Speech by Mr Frederic S Mishkin, Member of the Board of Governors of the US Federal Reserve System, to the Undergraduate Economics Association, Massachusetts Institute of Technology, Cambridge, Massachusetts, 29 November 2007.

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A key element of the macroeconomics revolution in recent decades has been the recognition that the dynamic structure of the economy is not purely mechanistic but instead reflects the fundamental role of expectations in the economic decisions of households and firms.<sup>1</sup> That insight inevitably put a spotlight on the expectations of the monetary authorities themselves and has led central banks around the world to refine their communications about policy objectives and the macroeconomic outlook. Indeed, to give the public more information regarding its plan for conducting monetary policy in accordance with its congressional mandate, the Federal Reserve on November 14 announced several important enhancements to its communication strategy. And the Federal Reserve's first "Summary of Economic Projections" was published last week in conjunction with the minutes of the October meeting of the Federal Open Market Committee (FOMC). Here is a brief overview of the main elements of the enhanced communication strategy:

- FOMC participants now provide projections for four key macroeconomic variables that together reflect our dual mandate of promoting price stability and maximum sustainable employment: the growth of real gross domestic product (GDP); the unemployment rate; overall consumer inflation, as measured by the price index for personal consumption expenditures (PCE); and core consumer inflation, which excludes food and energy prices.<sup>2</sup> As I discussed in a recent speech, both inflation measures are important: Core inflation is a useful indicator of the underlying near-term trend of inflation, and overall inflation is what households and businesses ultimately care about (Mishkin, 2007c). Therefore, a significant aspect of the enhanced communication strategy is that the FOMC has added the overall inflation rate to its announced projections.
- The forecast horizon for projections has been extended from two calendar years to three. For example, the projections released last week extend to 2010.
- The quantitative projections indicate participants' assessments of the most likely (that is, modal) outcomes for economic activity and inflation. But the actual course of the macroeconomy could well turn out to be different, as the economy is constantly influenced by shocks that are intrinsically unpredictable, such as shifts in geopolitical factors. In the "Summary of Economic Projections," therefore, the FOMC augments the quantitative forecasts with a narrative that describes participants' views of the principal forces shaping the outlook and the sources of risk to that outlook.
- The "Summary of Economic Projections" also provides information about the range of views among FOMC participants and about the central tendency of their projections (which excludes the three highest and lowest observations). In particular,

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<sup>1</sup> Note that my remarks reflect my own views and not necessarily those of others on the Board of Governors or the Federal Open Market Committee. I appreciate the very helpful comments and assistance of Spencer Dale, William English, Andrew Levin, and Jonathan Wright.

<sup>2</sup> Also specified in the Federal Reserve's legislative mandate is the goal of moderate long-term interest rates, but this goal is generally viewed as consistent with the dual mandate because long-term interest rates can remain low only in a stable macroeconomic environment; further discussion of this topic is in Mishkin (2007a,d).

each participant makes an independent projection based on his or her own assessment of the "appropriate" path of monetary policy; that is, the path seen as most likely to foster outcomes for economic activity and inflation that are consistent with the Federal Reserve's dual mandate.

- Finally, the "Summary of Economic Projections" is published four times a year, whereas FOMC projections were previously published only twice a year.

In the remainder of this speech, I will discuss how the modern science of monetary policy provides a strong rationale for the Federal Reserve's new communication policy, and then I'll describe how a number of key principles of monetary policy making are evident in the latest set of FOMC projections, which were released last week.

### **The rationale for the Federal Reserve's enhanced communication strategy**

The modern approach to the formulation of monetary policy is generally characterized by an optimization problem in which policymakers maximize a specific objective function subject to a set of constraints. At first glance, this problem looks a lot like the typical optimal control problem that MIT undergraduates might study in an engineering course--say that of directing a rocket ship to the moon. However, there is a crucial difference: A rocket ship responds only to forces currently acting on it and does not try to anticipate how its controllers will change their settings. In contrast, expectations about future monetary policy and economic conditions play a key role in economic agents' decisions and thus are important in both the objective function and the constraints of the optimal monetary policy problem. This role of expectations is crucial in understanding why central bank communication is so important for achieving good macroeconomic outcomes.<sup>3</sup>

#### ***Objective function***

The modern science of monetary policy proceeds under the assumption that the central bank's purpose is to maximize the well-being of households in the economy; the objective function specifies exactly what should be maximized. Broadly speaking, the objective function has two components, each expressed as a deviation from a goal and each with a negative sign: one component is the deviation of inflation from its optimal level, and the other is the deviation of output (or employment) from its so-called natural level, the level that would be attained if prices and wages were completely flexible. Those components of the objective function capture the essence of the Federal Reserve's dual mandate to promote price stability and maximum employment, a mandate established by the Congress for the ultimate good of the public.

The intertemporal nature of these objectives is crucial, as the well-being of households depends not only on their consumption and leisure at the present moment but also on their expectations about how that standard of living will evolve over time. Thus, policies that are intended to maximize the well-being of households must reflect both the present state of the economy and its expected path in future periods.

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<sup>3</sup> A clear formulation of the New Keynesian approach to the science of monetary policy can be found in Clarida, Gali, and Gertler (1999) and in Woodford (2003), both of which build on the pioneering work of Goodfriend and King (1997) and of Rotemberg and Woodford (1997). Academic economists and central-bank researchers have followed this approach in numerous subsequent studies; some examples include King and Wolman (1999); Erceg, Henderson, and Levin (2000); Giannoni and Woodford (2005); Benigno and Woodford (2003); Levin and others (2005); and Schmitt-Grohé and Uribe (2005).

## **Constraints**

In a market-oriented economy like ours, the science of monetary policy explicitly reflects the extent to which households and firms have the freedom to make their own economic decisions. The overall level of expenditures in the economy--which macroeconomists refer to as aggregate demand--is the sum of all the spending decisions of individual households and firms. Aggregate demand exhibits a strong forward-looking component because, as noted, the spending decisions of households include their expectations regarding the future path of the economy. Similarly, the overall inflation rate of the economy ultimately reflects the price-setting decisions of individual firms, and expectations have a crucial influence on those decisions as well. As a result, the evolution of aggregate supply also exhibits a significant forward-looking component.

However, both aggregate supply and aggregate demand tend to exhibit a substantial degree of inertia, which reflects the significant costs incurred by households and firms in making sudden large adjustments in their consumption, staffing levels, and so forth. Largely because of those inertial elements, monetary policy actions have little or no instantaneous effect on the economy; in fact, the peak effect on aggregate demand may not appear for at least a year, and the peak effect on inflation is subject to even longer lags. Therefore, because the variables the central bank wants to influence have a forward-looking component, and because the effects of policy actions are unlikely to appear for at least a year, macroeconomic projections should have a central role in the monetary policy plan and should appear in the public description of that plan.

The critical role of expectations in the evolution of the economy elevates the importance of central-bank communication and suggests that it should encompass some discussion of views beyond that of the quantitative projections. Broadening the scope of communication by including a description of policymakers' expectations helps households and businesses to make more-informed decisions and can help anchor the private sector's inflation expectations more firmly by clarifying and underscoring the central bank's intention to keep inflation low and stable over the long run. Increased communication also enhances the performance of financial markets by providing investors with greater information about policymakers' intentions. In all of these ways, central-bank communication that more fully portrays policy considerations facilitates the effectiveness of monetary policy and contributes to the overall stability and growth of the economy.

The enhancements to our communication strategy were developed through a comprehensive process over the past year or so, but they have turned out to be particularly timely in light of recent economic and financial developments. As you are well aware, the U.S. economy has been experiencing a bout of financial instability over the past few months. Heightened uncertainty in the credit markets impedes the ability of the financial markets to channel funds to households and businesses that have productive investment opportunities.

As I discussed in a speech in early November, the heightened uncertainty flows from an increase in risk, which can be broken down into two components: *valuation risk*, which arises when the market realizes that the complexity of a security or the opaqueness of its underlying creditworthiness prevents it from accurately assessing the value of the security; and *macroeconomic risk*--that is, the risk that a financial disruption will cause significant deterioration in the real economy, which can, in turn, worsen the financial disruption (Mishkin, 2007d). The Federal Reserve's recent policy actions are intended to help lower macroeconomic risk and thereby improve the functioning of financial markets. In addition, our enhanced communications will help reduce macroeconomic risk by providing additional information regarding our policy strategy and our assessment of the economic outlook.

## **The science of monetary policy and the longer-term outlook**

I would now like to consider the important information conveyed about the FOMC's longer-term policy strategy in the Federal Reserve's newly released set of macroeconomic projections. In that context, I will also highlight how our longer-term strategy fulfills the dual mandate and embeds some of the key implications of the modern science of monetary policy.

### ***The longer-term projections for inflation***

The projections for both overall and core inflation at the three-year horizon (which is currently 2010) fall in the range of 1.5 percent to 2.0 percent; the central tendency of these projections is 1.6 percent to 1.9 percent. As I noted earlier, each FOMC participant's projection is made under the assumption of "appropriate" monetary policy--that is, the path of policy calibrated to achieve outcomes for economic activity and inflation that are most consistent with our dual objectives of price stability and maximum employment. For that reason, the longer-run inflation projections provide information about each FOMC participant's assessment of the inflation rate that best promotes those dual objectives--a rate that I will refer to as the "mandate-consistent inflation rate."

When the underlying level of inflation is reasonably close to its mandate-consistent rate, monetary policy should be able to achieve that rate of inflation in coming years while keeping economic activity near its maximum sustainable level. Although overall inflation is currently above the mandate-consistent rate, reflecting the effects of energy price increases, core inflation has been well-behaved. Thus, I believe this description essentially characterizes the current macroeconomic environment, and my own projection of inflation at a three-year horizon is equal to my assessment of the mandate-consistent inflation rate.

The range of projections for inflation in 2010--1.5 percent to 2.0 percent--is consistent with a fundamental implication of the modern science of monetary policy--namely, that the well-being of the economy is maximized by maintaining a low and stable inflation rate over time.<sup>4</sup> Low inflation promotes social welfare by simplifying the savings and retirement planning of individual households and by facilitating firms' production and investment decisions, all of which helps promote higher productivity growth. Furthermore, an environment of overall price stability contributes to economic efficiency by reducing the variability of relative prices and by minimizing the distortions that arise because the tax system is not completely indexed to inflation. Finally, and importantly, low and stable inflation promotes equity and reduces poverty, as the poorest members of society typically do not have access to the sorts of financial instruments that would help protect them against inflation.

At the same time, recent research on the science of monetary policy (as well as the analysis of several historical episodes) has underscored the pitfalls that can result from maintaining a zero or negative inflation rate over time. First, such a strategy tends to raise the likelihood of episodes in which short-term nominal interest rates reach the zero lower bound and thereby hinder the conduct of monetary policy. Second, an economy with a zero average inflation rate will almost inevitably experience some episodes of deflation, which may adversely affect financial markets and thereby hamper the performance of the macroeconomy. Third, if inflation is at or below zero, downward rigidities in nominal wage adjustment might induce some distortions in labor market efficiency, with unfavorable consequences for the level of employment. In light of these considerations, as Chairman Bernanke (2007) recently noted,

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<sup>4</sup> There is no perfect indicator of the "true" inflation rate; for example, the PCE price deflator exhibits some upward bias that corresponds to unmeasured improvements in the quality of goods and services that consumers purchase. Thus, given PCE inflation of about 1-1/2 percent to 2 percent, the "true" inflation rate faced by consumers might well be less than 1 percent.

"the (properly measured) long-run inflation rate that best promotes the dual mandate is likely to be low but not zero."

The science of monetary policy has also emphasized the importance of establishing the central bank's strong and credible commitment to keeping inflation low and stable over the long run because that commitment helps to stabilize inflation expectations; in turn, stable expectations aid the functioning of the economy and the efficacy of policy. The increased information that these projections convey regarding FOMC participants' views of the mandate-consistent inflation rate, combined with the FOMC's continuing commitment to keeping inflation low and stable, should help anchor inflation expectations even more firmly.

Better information on FOMC participants' views on the mandate-consistent inflation rate is also essential for achieving the other element of the dual mandate--maximum employment. By increasing the likelihood of achieving a low and predictable inflation rate, providing information on the mandate-consistent inflation rate plays a crucial role in facilitating long-term growth in employment and labor productivity. Furthermore, although the economy will inevitably be buffeted by various shocks, the knowledge that the monetary authority will take steps to move inflation gradually toward its mandate-consistent rate over time also helps minimize the deviations of employment and output from maximum sustainable levels.

### **The longer-term projections for growth and unemployment**

For 2010, the central tendency of the range of projections for the growth of real GDP is 2.5 percent to 2.6 percent, and the projections for the unemployment rate have a central tendency of 4.7 percent to 4.9 percent. The full range of FOMC participants' projections is 2.2 percent to 2.7 percent for real GDP growth and 4.6 percent to 5.0 percent for the unemployment rate.

As indicated in the forecast narrative, these longer-run projections were heavily influenced by participants' assessments of the sustainable rates of output growth and employment. However, assessments of potential output growth and the sustainable unemployment rate are fundamentally different from assessments of the mandate-consistent inflation rate. In particular, as I emphasized in a speech last spring, the Federal Reserve can determine and achieve the long-run average rate of inflation in keeping with its dual mandate, but the Federal Reserve *most emphatically* cannot choose the level of maximum sustainable economic activity--no central bank can control the level of real economic activity or employment over the longer run (Mishkin, 2007a).

In addition, the maximum sustainable levels of output and employment cannot be known with any assurance (Mishkin, 2007b). The relatively narrow range of participants' longer-term projections for real GDP growth and the rate of unemployment must not be confused with the uncertainty attending those projections. As is explained in the special section on forecast uncertainty that was published last week with the FOMC's "Summary of Economic Projections," the uncertainty attending each participant's projections is distinct from the diversity of views about the most likely outcomes. Forecast uncertainty is concerned with the risks associated with a particular projection rather than with divergences across a number of different projections.

In that regard, macroeconometric analysis indicates that the sustainable unemployment rate and the growth rate of potential output have varied quite substantially over recent decades, thereby exacerbating the challenges of constructing estimates of these characteristics at any given point in time. For example, Staiger, Stock, and Watson (1997a,b) obtained 95 percent confidence intervals for a measure of the sustainable unemployment rate that are at least 2 percentage points wide. Thus, although FOMC participants' projections for the unemployment rate in 2010 provide information about their assessments of the sustainable unemployment rate, the analysis of Staiger, Stock, and Watson highlights the degree of uncertainty about these assessments--namely, the true value of that rate might well be as

low as 3-3/4 percent or as high as 5-3/4 percent. Such calculations help illustrate the fundamental point that the FOMC projections--just like any forecast--should be interpreted with considerable caution; they can be highly uncertain and may vary considerably over time in response to incoming information about the structure of the economy and the macroeconomic outlook.

### **The science of monetary policy and the shorter-term projections**

Now let us take a brief look at the Federal Reserve's macroeconomic projections for 2007 through 2009. These projections are useful for understanding the Federal Reserve's near-term policy strategy, and again, I would like to highlight how this strategy fulfills the dual mandate and embeds key implications of the modern science of monetary policy.

The science emphasizes that monetary policy makers need to think in terms of a plan for the appropriate paths for inflation and economic activity that best promotes the dual mandate of price stability and maximum sustainable employment. If economic activity is well below its maximum sustainable level, then monetary policy should aim at increasing output and employment toward sustainable levels. If inflation is above the mandate-consistent rate, monetary policy should aim at reducing inflation to that rate. Providing projections for the short run as well as for the longer run encourages FOMC participants to think in terms of desirable paths for inflation and output, a discipline that the science suggests will produce better policy outcomes. In addition, the projections provide households and businesses with information that can help them understand what the monetary authority is trying to achieve, thereby increasing the likelihood of good economic outcomes.

### **The inflation outlook**

In the projections of FOMC participants, core inflation edges down slightly and then remains fairly stable at about 1-3/4 percent toward the end of the decade. Meanwhile, given an anticipated flattening out of energy prices, overall consumer inflation in these projections declines toward the core inflation rate; it drops from about 3 percent this year to about 2 percent in 2008 and then drops a bit further near the end of the decade.

These projections are consistent with a point I made in an earlier speech--namely, in recent decades core inflation has tended to be a good predictor of overall inflation further ahead (Mishkin, 2007c). Furthermore, these projections demonstrate that FOMC participants do not think that the Federal Reserve should, or even could, achieve an immediate reduction of overall inflation to its mandate-consistent rate. The recent high level of overall inflation reflects rapidly rising energy prices that the Federal Reserve obviously cannot control. For this reason, any attempt to bring overall inflation down too quickly would entail large losses of output and employment, and hence such an approach would be inconsistent with the Federal Reserve's dual mandate, which places a balanced emphasis on both price stability and maximum employment.

### **The outlook for economic activity**

The midpoint of the range of projections for real GDP growth declines noticeably from about 2-1/2 percent for 2007 to roughly 2 percent in 2008; then it returns to about 2-1/2 percent in 2009 and 2010. The projection narrative indicates that the near-term weakness in the economy importantly reflects the sharp contraction in the housing market and the recent strains in the credit markets. As I have already noted, monetary policy works only with a lag and hence cannot offset these near-term effects; rather, the recent cuts in the federal funds rate are intended to help bring economic activity back to maximum sustainable levels over time, and such an outcome can be seen in the broad contours of the FOMC projections.

There is considerable diversity in the views of participants about the outlook for near-term growth. The range of forecasts for the growth of real GDP in 2008 is from 1.6 percent to 2.6 percent--twice as wide as in the previous set of FOMC projections, which were published last June.

As part of the enhanced projections process, FOMC participants provide a qualitative assessment of the magnitude of uncertainty surrounding their projections relative to average levels of uncertainty. As a benchmark for these qualitative assessments, the forecast narrative provides information about the average magnitude of projection errors of private and government forecasters over the past twenty years. These averages of projection errors indicate that the degree of uncertainty about the growth outlook is even wider than the range of the participants' forecasts. For example, at a one-year forecast horizon, the root mean squared prediction error is 1.3 percentage points for the growth of real GDP and 0.6 percentage points for the unemployment rate, as compared to 1.0 percentage points and 0.4 percentage points respectively for participants' forecasts of real GDP growth and unemployment. Furthermore, in the latest report, FOMC participants indicated that the current degree of uncertainty about GDP growth is even higher than the typical level of uncertainty over the past two decades.

Although the current projections involve relatively stable trajectories for economic activity and inflation, the regular communication of Federal Reserve projections would become particularly useful in a setting in which the economy started from a position further away from its long-run balanced-growth path. In such circumstances, the task of monetary policy is to help guide the economy back toward the balanced-growth path, and the appropriate speed of that convergence will depend on the nature of the shocks that have affected the economy.

### **The enhanced communication strategy and Federal Reserve accountability**

I have argued that the Federal Reserve's enhanced communication strategy will improve the public's understanding of our objectives and policy strategies and thereby enable households and businesses to make better decisions. In addition, enhanced communication can help anchor the public's inflation expectations, which promotes both price stability and higher economic growth. As we have seen, the new communication strategy is consistent with what the modern science of monetary policy suggests is needed to achieve good monetary policy outcomes.

Beyond that, however, I would like to emphasize another crucial reason for the Federal Reserve to enhance its communication strategy. We at the Federal Reserve have the task, delegated by the Congress, of conducting monetary policy to enhance the welfare of our citizens. In a democratic society, that assignment requires that we, as public servants, be accountable to the public and the Congress

Of course, given the myriad unforeseen events and disturbances that can affect the economy, a central bank cannot be held accountable solely in terms of actual economic outcomes. For this reason, accountability can be enhanced by having the central bank explain the broad outcomes that its policy strategy is aimed at fostering, and then, to the extent that the economy deviates from those outcomes--as it surely will--the central bank should explain the factors that caused the deviation and how it plans to achieve the desired outcomes in the future.

In that regard, the Federal Reserve's enhanced communication strategy will be useful in enabling the FOMC to explain its policy decisions and strategies more fully in the context of its medium-term objectives for economic activity and inflation and the risks to those objectives. As a result, the public and the Congress can better assess whether our forecasts of the economy are reasonable and whether we are pursuing a policy strategy that is consistent with achieving the dual mandate of price stability and maximum sustainable

employment. The result should be increased accountability that is consistent with basic democratic principles.

I also hope that the increased prominence given to participants' economic projections will, on the one hand, help focus greater attention on our medium-term objectives and on our progress toward meeting these objectives and, on the other hand, remove some attention from the question of whether the FOMC will change its target for the federal funds rate at its next meeting. The near-term path of interest rates is highly uncertain and depends on the implications of the incoming data, which in some cases are evolving right up to the time of the meeting. What is more certain--and far more important--is the commitment of the FOMC to move interest rates as needed to foster outcomes consistent with our dual mandate of maximum sustainable employment and price stability.

## Conclusion

As I have outlined here, I believe that the recent enhancements to the Federal Reserve's communication strategy are a major advance in achieving greater transparency. Moreover, the approach we have taken is consistent with what the science of monetary policy tells us will result in better outcomes for price stability and maximum employment. In addition, this communication strategy can help improve the performance of financial markets and increases the Federal Reserve's accountability to the public and the Congress.

Over the years, the Federal Reserve has striven to improve its communication strategy, and our recent enhancements should be seen as an important further step in this direction. We have learned from our earlier experiences with increasing the transparency of our communications, and we expect to continue learning. We will also continue to examine how we can improve our communication with the public and the markets so that we can better achieve our congressionally mandated goals.

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