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Remarks by

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On the Conceptual Basis of Monetary Policy

I want to talk tonight not about what monetary policy should do in the next week or month, but about a much broader issue: the conceptual basis for monetary policy in a world in which the monetary aggregates are all but meaningless. This is not a hypothetical world; it is the world in which we all live--now and for the foreseeable future. So my topic is of much more than theoretical interest. It is about as practical as you can get.

First an important disclaimer. While I believe that the Federal Reserve should talk with society much more, and much more openly, about the conceptual basis for our monetary policy, that is a tiny minority view within the Federal Open Market Committee at present. The dominant opinion is that silence is golden; and I have to respect that. So I want to make it absolutely clear that I am speaking only for myself. There is no official Fed view on these matters, and so there are no "secrets of the temple" to be revealed.

The Goals of Monetary Policy

To think seriously about how monetary policy should be conducted, it seems to me axiomatic that you must start with the objectives. Precisely what is it that monetary policy is trying to accomplish? This question is a relatively easy one because Congress has provided the answer in the Federal Reserve Act.

Although worded somewhat awkwardly, the Act gives us a dual mandate: to pursue both "stable prices" and "maximum employment."

This dual mandate is, as you may know, under attack these days. As you probably also know, I have defended it as entirely reasonable and appropriate. So let's consider some of the arguments against the status quo. Why might Congress want to replace our current dual mandate by new instructions that direct the Fed to focus exclusively on price stability?

First comes a very bad reason, but the one that is most often offered nonetheless. It is alleged that the Fed cannot pursue two goals simultaneously because we have only one instrument. Superficially, this sounds correct. One is less than two, isn't it? But as soon as you think seriously about the argument, it begins to crumble in your hands. Each of us, in our everyday lives, pursues multiple goals with a limited set of instruments. We understand intuitively that we must trade off one goal against the other; and we act this way in virtually everything we do.

For example, when I drive somewhere I have one instrument--driving speed--and two objectives: getting to my destination quickly, because driving time is unproductive and I wish to minimize it, and safety, which is, of course, maximized by driving slowly. Like all drivers, I select a driving speed that strikes some sort of reasonable balance between these two conflicting goals.

Or consider the response of an investment adviser to a client who expresses interest in both current income and price appreciation. Do you know any investment adviser who would reject the client on the grounds that she can pursue only one goal at a time? The claim that one instrument limits you to one target is simply logically fallacious. Real life is about tradeoffs, not purity.

So we can reject this first argument out of hand. But there are coherent reasons to favor an inflation-only mandate for the Fed. What are some?

One might be a belief that price stability is of such overriding importance for society, and recessions so inconsequential, that the central bank should be directed to ignore recessions and focus single-mindedly on bringing down inflation. There may be times and places where this view makes sense. But nothing can convince me that the contemporary United States is one of them.

A second reason could be a belief that monetary policy is powerless to influence real growth and employment--in the economist's jargon, that money is "neutral." In that case, the effects of monetary policy would pass directly through to prices without stopping off at real output along the way. As some of you know, this argument is a favorite intellectual plaything of academic economists. But the empirical evidence against it is overwhelming and, so far as I know, not a single person in the practical world believes it to be true.

A third possible argument could be that the Fed, while able to stabilize employment in principle, is so incompetent in practice that it should be enjoined from even trying. Each of you must judge the validity of this claim for yourself. But from where I sit, and even from where I used to sit, it sure looks like the Fed has done a much better job than that.

So I conclude that none of the arguments for a mono-goal has much merit. But to make the dual mandate operational, we must come to terms with the tradeoff between the two goals.

The Nature of the Inflation-Unemployment Tradeoff

Regarding that tradeoff, there is a widespread myth that the Phillips curve is dead. But what I like to call the "clean little secret of macroeconomics" is that exactly the opposite is true: The Phillips curve is actually among the most reliable of all the statistical relationships in empirical macroeconomics--at least for the United States.

What does this reliable empirical Phillips curve say? First of all, it says that the inflation process in the United States is highly inertial. Like one of Newton's bodies in motion, prices tend to keep rising at the same rate unless acted upon by an outside force. That is why the best single predictor of next year's inflation rate is this year's inflation rate.

Now, what are these "outside forces"? Leaving aside supply shocks, which occasionally change the inflation rate quite dramatically, the principal factor that moves inflation up or

down is the so-called GDP gap--the gap between potential and actual GDP. (Alternatively, you can measure the gap by the difference between the actual and natural rates of unemployment.) If GDP exceeds potential, inflation tends to rise. If GDP falls short of potential, inflation tends to fall. And, of course, if GDP is approximately at potential, inflation will remain at its current level, whether that is high or low.

Thus the Phillips curve says, roughly, that the change in the inflation rate depends on the GDP gap. Since the natural rate of unemployment (sometimes called the NAIRU) is the unemployment rate that corresponds to a GDP gap of zero, we can rephrase this empirical finding as a statement that inflation will rise or fall as unemployment is below or above the natural rate.

So far, I have two ingredients of the story: the dual mandate that Congress has given the Fed, and an empirical finding about how the U.S. economy works. Putting them together leads to a simple two-part conclusion about the tradeoff between inflation and unemployment:

First, there is no tradeoff between inflation and unemployment in the long run, since any inflation rate can be maintained indefinitely if unemployment remains around its natural rate. Furthermore, monetary policy cannot keep unemployment below the natural rate forever. Hence, the pursuit of price stability is the appropriate long-run goal for the Fed.

Second, however, there is a short-run tradeoff between inflation and unemployment, and monetary policy affects both variables. Hence the Federal Reserve Act's concern with "maximum employment" should be interpreted as assigning us a short-run objective: the stabilization of output and employment growth; that is, the mitigation of business cycles. While inherently short-run, this goal is, in my judgment, crucially important.

How Monetary Policy Affects the GDP Gap

What I have said so far about how the economy works puts the GDP gap at center stage. It is, first, an indirect measure of employment and, second, the best indicator of whether inflation is likely to rise or fall. So when I think about monetary policy, I ask three principal questions:

1. Where is the GDP gap today? This involves estimating potential GDP or, alternatively, the natural rate of unemployment.

2. Where is the GDP gap likely to be a year or two from now under unchanged monetary policy? (The 1-2 year horizon reflects the lags in monetary policy.) Answers to this question, of course, require forecasts of economic activity.

3. How would a change in monetary policy affect the likely GDP gap a year or two from now?

Each of these questions is terribly important and involves many technical issues and difficult judgment calls.

But, for tonight, I want to skip over the first two and deal only with the last: How does monetary policy affect the gap between potential and actual GDP?

The growth rate of potential GDP is, as a matter of arithmetic, the sum of two things: the growth rate of labor input and the growth rate of labor productivity (GDP per hour of work). In recent years, conventional estimates have been roughly 1% annual growth for labor input and 1.5% for productivity, leading to the widely cited 2.5% growth rate for potential GDP measured in 1987 prices. I don't want to discuss the validity of those estimates today. I only want to point out that the Fed has rather little influence on either number. To a first approximation, we can do nothing about labor force growth and nothing about trend productivity. So monetary policy has practically no influence on potential GDP.

But, by moving interest rates, monetary policy exerts a great deal of influence over actual GDP. Some types of spending--especially housing, but also business fixed investment and consumer durables--are directly sensitive to interest rates. Other types of spending are indirectly sensitive. For example, interest rates affect the stock market and exchange rates which, in turn, influence consumer spending and foreign trade. Now, for the most part, spending reacts to real interest rates while the Fed controls only nominal interest rates--a point to which I will return in a moment. But since inflationary expectations are

pretty stable in the short-run, most changes in nominal interest rates are probably changes in real interest rates.

The Concept of "Neutral" Monetary Policy

This point leads naturally to a concept that is elusive but, in my view, is nonetheless extremely useful: the concept of "neutral" monetary policy. You may recall that this issue was discussed extensively in the financial press while the Fed was tightening in 1994; but it has barely surfaced since. However, it is fundamental to the way I think about monetary policy.

Here is my suggested definition of what "neutral monetary policy" means. At any moment in time, both the current level of potential GDP and its likely evolution through time are essentially independent of monetary policy. But the evolution of actual GDP is heavily influenced by monetary policy. A neutral monetary policy would set real interest rates at the level that matches actual GDP to potential GDP, once all the lags are worked out and in the absence of random shocks. Notice several critical aspects of this definition.

First, it is entirely oriented toward inflation, as is appropriate in view of the Fed's long-term goal of price stability. According to my definition, a neutral monetary policy would be consistent with constant inflation in the medium run. Continuing what seems to me natural nomenclature, any real interest rate higher than neutral should be called "tight" money, because it will lead eventually to a GDP gap and to lower

inflation. Similarly, any interest rate lower than neutral constitutes "easy" money, for it will, if maintained, eventually produce a negative GDP gap and rising inflation.

Second, the neutral real interest rate is not a fixed number. Many factors other than interest rates influence aggregate demand, so the real rate needed to match actual GDP to potential necessarily changes whenever these other factors do. Among these factors, of course, are fiscal policy and net exports. For example, smaller fiscal deficits will, other things equal, lower the neutral real interest rate. However, if it is to serve as a guide to monetary policy, the operational definition of neutrality rate ought to filter out most of the quarter-to-quarter fluctuations and focus on longer-run factors. Finally, and implicit in what I have just said, the neutral real rate of interest is difficult to estimate and impossible to estimate precisely. It is most usefully thought of as a concept rather than as a number, as a way of thinking about monetary policy rather than as a mechanical rule.

Nominal versus Real Interest Rates

Let me now come back to two points that I finessed rather glibly before: the distinction between nominal and real interest rates, and the distinction between short rates and long rates (starting with the first).

Unfortunately for the monetary authority, we control only the nominal interest rate, while it is mostly the real rate

that matters for spending. As I noted earlier, this distinction is normally not critical in the very short run because inflationary expectations are quite sluggish, so that changes in nominal interest rates are most likely changes in real interest rates. But, in the longer run, the two rates can diverge quite sharply.

What happens if the central bank chooses a nominal interest rate that mistakenly sets the real interest rate too high? Since GDP falls below potential, a gap opens up and, with a lag, inflation begins to fall. If the central bank fails to adjust the nominal interest rate down, the real rate goes even higher. This spells trouble. The GDP gap grows larger, inflation falls faster,and real rates rise even more. The economy is put into a disinflationary tailspin.

The opposite happens if the nominal interest rate is accidentally pegged at a level that makes the real rate too low. In that case, loose monetary policy leads to an overshoot of potential GDP and, eventually, to a rise in inflation. If the central bank holds the nominal interest rate fixed, the real rate falls even lower, meaning that monetary policy gets even looser. We are off to the inflationary races.

The moral of this story is simple: Holding the nominal interest rate fixed while the inflation rate is changing (in either direction) is likely to be hazardous to your economy's health. Before too long, the central bank must adjust its nominal rate so as to guide the real rate back toward its neutral

setting. That's more or less what we have been doing since July 1995. But since (a) no one knows the neutral rate for sure and (b) that rate changes over time, this is no easy task!

Short Rates versus Long Rates

The second important distinction is between long rates and short rates-- which is really shorthand for the distinction between the Federal funds rate, which we control, and financial market prices that really matter for spending decisions--such as long bond rates, stock prices, and exchange rates. The problem, of course, is that the funds rate is of direct interest only to a few banks. It has macroeconomic effects only to the extent that it influences other rates.

The standard theory of the term structure of interest rates is supposed to rescue us from this dilemma. It holds that long rates are the appropriate weighted average of expected future short rates, plus a risk premium. So, for example, the one-year rate should depend on the next 365 expected overnight rates.

But there are two severe practical problems with this theory. First, it does not work very well statistically; for example, tests assuming rational expectations routinely reject the theory. Second, and presumably related to the first, expectations about future short rates are not very well anchored in reality. You will note, of course, that it is the market's

expectations of future Fed actions that govern long rates, not the Fed's.

It is this second problem to which I want to call to your attention. Because expectations of future Federal Reserve behavior are not anchored by any underlying reality at present, the reaction of long rates to a change in Fed policy may deviate quite far from what we at the Fed see as "the fundamentals." Let me cite two recent examples. Although I was not at the Fed in late 1993 and early 1994, I am fairly certain that the Fed's expectation of future Fed funds rates was quite a bit higher than the market's. A year later, I was at the Fed, and I know that the market's expectations of where the funds rate was headed were well above my own. In the first case, long rates were "too low;" in the second case, they were "too high"--both relative to the likely future path of short rates. In each case, the faulty estimate was attributable to misapprehensions about where the Fed was headed.

The Fed and the Markets

When the response of long rates (and stock prices and exchange rates) to changes in the funds rate is unpredictable, monetary policy has a severe practical problem to cope with, for our ability to predict the effects of our own actions hinges on our ability to predict how those actions will move market prices. Curing this problem is one reason--though not the only reason--why I favor greater openness at the Fed.

If the Fed would give markets a wider window on our goals, our worldview, and our general strategy, the market's medium- and long-term expectations would be better anchored in reality. Market participants would then be able to make better guesses about future Federal Reserve decisions. And that, in turn, might make it easier for the Fed to predict how long rates would react to changes in the funds rate. If that were true--and I admit it is just a hypothesis--we at the Fed would be better able to predict the effects of our own policy actions on financial markets and therefore on the real economy. In a word, you would be better at predicting us and we would be better at predicting you.

Don't get me wrong, I am no polyanna on this score. Markets have minds of their own and often move dramatically for reasons having nothing to do with Fed policy. They exhibit herd behavior and seem to overreact to almost everything. Bond traders trading 30-year bonds are thinking somewhat less than 30 years ahead; indeed, many of them have not even lived 30 years! And there were speculative bubbles before there was a Fed to speculate about. So I don't believe that keeping the markets better informed about monetary policy would render them either stable or predictable. But I do believe that we could at least reduce the speculative bubbles that are rooted in bad guesses about the Fed's behavior.

So far as I can tell, however, this remains a minority view both at the Federal Reserve and on Wall Street, where the

prevailing view is that mystery is an integral part of sound monetary policy. But I remain unconvinced and know of no good reason to think that markets work better when they are less well informed.

Illustration: The Taylor Rule

One way to illustrate how the concepts I have been talking about can be applied in practice is to refer to a monetary policy rule suggested by Professor John Taylor of Stanford University. I hasten to add that the Taylor rule is certainly not the official policy of the FOMC. However, the reason it has garnered so much publicity of late is that it tracks Fed behavior since 1987 extremely well.

The Taylor rule is an equation that predicts where the FOMC will set the federal funds rate. It starts with an estimate of the real federal funds rate that corresponds to neutral monetary policy; Taylor uses 2 percent. Add the current inflation rate, say 3 percent, and you have an estimate of the neutral nominal funds rate--in this case, 5 percent.

According to Taylor, the FOMC will deviate from this neutral interest rate if the GDP gap differs from zero or if inflation differs from our long-run target--which the FOMC has never enunciated, but which Taylor pegs at 2 percent. Specifically, when inflation is above the presumed 2 percent target or GDP is above potential, the Committee will raise the nominal federal funds rate to put the real funds rate above 2

percent. On the other hand, inflation below 2 percent or GDP below potential will lead the FOMC to set the real funds rate below 2 percent.

Now I could quarrel with many of the details of Taylor's rule. Were it being used in practice as a monetary policy rule, these details would be important and well worth arguing about.But that is not my purpose here. I bring up Taylor's rule only to illustrate how the four concepts I have discussed tonight--the Fed's dual mandate, the tradeoff between inflation and unemployment, the effect of interest rates on the GDP gap, and the concept of neutral monetary policy--can be brought together to create a way to <u>think about</u> monetary policy.

Notice four crucial aspects of the Taylor rule:

1. It uses an estimate of the neutral real federal funds rate as a central concept in the formulation of monetary policy.
2. It assumes that the Fed has two objectives: driving inflation down to 2 percent and driving the GDP gap to zero. I argued earlier that such a dual objective is both required by law and entirely appropriate.
3. Its coefficients embody a presumed attitude toward the tradeoff between inflation and unemployment, which I argued the Fed must have.
4. It assumes, as I did earlier, that the Fed regulates aggregate demand by changing the nominal

interest rate, but that it is the real interest rate that matters.

Conclusion

To wrap us, let me tie this discussion back to the question I raised at the outset: How do you conduct monetary policy when the monetary aggregates are essentially useless?

Let's first remember the good old days. Monetarists used to think of the "neutral" money growth rate--Friedman's k percent--as the one that set the growth rate of nominal GDP equal to the sum of the target inflation rate plus the trend growth rate of real GDP. Faster money growth than that would be expansionary in the short run and inflationary in the long run; slower money growth would be contractionary and disinflationary. But no one can operationalize such a policy nowadays because the relationship between money and nominal GDP has broken down.

Today, the real short-term interest rate is the logical replacement for the money growth rate. Its "neutral" value can be estimated from history and/or from econometric models, although it can never be known with certainty. "Tight" monetary policy can then be defined as keeping the real interest rate higher than neutral. Such a policy can be expected to contract the economy, after a lag, and reduce inflation, after an even longer lag. Conversely, "easy" money means holding the real short rate below the

neutral setting to stimulate the economy. Just how tight or loose monetary policy should be depends on the goals of the Fed, its attitudes toward the tradeoff between inflation and unemployment, and the sensitivity of the economy to interest rate changes.

There has been much talk in recent years of the problem posed by the loss of the so-called nominal anchor for monetary policy when monetary aggregates are abandoned in favor of interest rates. The new "anchor" I am tacitly proposing has three pieces:

1. the central bank's long-run inflation target;
2. its commitment to keep real interest rates higher than neutral when inflation is above target, other things equal;
3. understanding that nominal interest rates must not be held fixed, but must be adjusted for inflation because it is real interest rates that matter.

Yes, I know this all requires a certain amount of trust in your central bank. But can you think of an institution you trust more?