Overview

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The theme of this conference—monetary policy and uncertainty—was tackled head-on in Alan Greenspan's opening address yesterday, but after that it was more central in today's paper by Carl Walsh and in this morning's panel than it was in yesterday's discussion.

Two key points about monetary policy and uncertainty were made in Chairman Greenspan's speech. First, that uncertainty is the defining characteristic of the monetary policy landscape. Monetary policy would be much different and much simpler if that were not so. And second, the conduct of monetary policy at its core involves crucial elements of risk management. I will return to that point near the end of these remarks.

We have had several expositions of what the key uncertainties are. Since the lists differ a bit, let me give mine. First, there is model uncertainty. At the broadest level, there is model uncertainty in the generic sense that we never fully understand the world in which we operate—we all carry around incorrect models in our heads. In the econometric sense, there are two sets of model uncertainty issues. First, if we were the modeler, we wouldn't be certain about the model to write down. Secondly, if we were model users, we wouldn't know which of the

many models that are out there to use. Model uncertainty is present in both of those cases.

Any specific model will be misspecified due to wrong theories that went into its construction, due to structural changes that take place over the course of time, and due to imperfect information about the current state of the economy. Not only is there imperfect information about current economic data, such as GDP, but more important is a topic that was discussed at length yesterday: our inability to identify the shocks impacting the economy and the degree of their permanence.

Yesterday's discussion brought out a key problem, which was described in terms of net versus gross shocks. The net shock is the shock impacting the economy net of any automatic or policy responses that take place that are not explicitly captured in the structure of the model. These would be particularly relevant if the structure of the economy, or the nature of policy responses, has changed since the model was constructed. An example given yesterday was the response of the Fed to the uncertainties pervading the economy in the fall of 1998, following the Russian default. That response offset what would have been the impact of the Russian shock on the economy and could, therefore, have led to an underestimate of the stabilizing role of monetary policy in that episode. More generally, when there is an endogenous policy response to variables that are not explicitly modeled, then it is very hard to identify both the policy reaction function and the nature of the shocks.

Discussion of the policy response to uncertainty usually starts from the Brainard model, whose implication is often expressed as "policy should be more cautious the more uncertainty there is." This has typically been described as a principle of policy conservatism in the face of uncertainty; more accurately, in this conference it has been said that the policy response to shocks should be attenuated in the presence of uncertainty. The difficulty with that advice is that it is not always valid. A clear example was provided in the discussion of the Russian default-LTCM episode, where decisive action was the better course of action in light of the asymmetry of the potential consequences of the shocks.

One cannot get very far on the basis of the ambiguous general guidance that theory provides in this area. To be sure, some theoretical advice can be extremely useful. For instance, the theoretical demonstration that the long-run Phillips curve is vertical above a certain low level of inflation is enormously useful in formulating policy. So is the advice that derives from the important theoretical work on the role of expectations in policymaking, even though central bankers had been talking about credibility at great length well before economists formalized the notion.

There has been a major change in the type of advice that academic economics offers to monetary policymakers. There used to be a desire—and Marty Feldstein just mentioned Milton Friedman's constant growth rate rule for money—by academics to specify precisely what a policy should be in a way that ensured that the bureaucrats and the policymakers wouldn't have anything to do.

If, indeed, the constant growth rate rule for money were the best monetary policy, we could have reduced all the 12 Federal Reserve Banks to one small office (and we would probably have destroyed this conference in the process). The inflation-targeting literature provides a more subtle analysis of the role of the central bank by distinguishing between the desirability of clearly specifying the targets of policy, while recognizing that the attainment of those targets should be left to the discretionary operations of the central bank. That, of course, gives the central bank a more vital role.

I should note that I do not think that this flexible inflation targeting result—a rule in specifying the targets of policy, combined with discretion for the central bank in attaining the target—actually comes out that clearly from the theory. It is a pragmatic conclusion drawn from the way the model is set up and from thinking about its application. I share that conclusion, but it does not follow directly from the logic of the model.

Thus, flexible inflation targeting is very far from a mechanistic rule for monetary policy, although some of the discussion yesterday seemed to assume that it is. We should also note that the inflation-targeting policy

frameworks being applied around the world, for instance, in the United Kingdom, Australia, South Africa, Brazil, do *not* say that inflation should be the only target of the monetary policymakers. Rather, the frameworks require that monetary policy provide a nominal anchor by targeting inflation—for instance in the United Kingdom inflation about two years in the future. But the path between the present and the targeted rates of inflation can be chosen—and is chosen—with regard to its implications for output. Flexible inflation targeting is surely not the last word on monetary policy, but it does go a long way toward resolving some of the critical problems—particularly that in the short run monetary policy can affect output, while in the long run it affects inflation—in the conduct of monetary policy.

Where does one see the academic work going now? It would be very, very useful, and we are beginning to see it, for research to try to get inside the discretionary part of monetary policy. That is happening to some extent—for that is what the Taylor rule is about.

There has been some reaction in this conference to the Taylor rule as being too simple. That is right, but the point is also recognized by those who use the Taylor rule. A Taylor rule, or any simple policy rule, provides a baseline against which it is useful to judge policies. Such policy rules will never be more than baselines, and we should not expect them to be more than that. (I say "never" in the sense of a couple hundred years.)

One element that is lacking in the academic discussion is study and modeling of the interactions that take place inside central banks between decisionmakers and the econometric models. The interaction is a complex one. The models are used (it is not one model; it is several models) to develop estimates of economic responses to alternative policies. Examination of these alternative outcomes then allows the policies to be modified by the policymakers' judgments, leading to refined estimates of the economy's responses to the policies. I am describing here what I believe is done in the Fed, and no doubt in other central banks as well. The models are used in interaction with

the judgment of policymakers. As that process goes on, conclusions are drawn and policy decisions get made. This decisionmaking process would benefit from close examination by academics.

There is a disconnect between the sort of models used in presentations at this conference in trying to draw general lessons for policy, and the type of models that are more generally used in central banks, which have to be a good deal more detailed. It has for a long time been difficult to get researchers operating at the econometric frontiers to take the bigger models generally used in policy formulation seriously. But these models very likely have a major impact on decisionmaking, and it would be useful indeed if some way could be found to enable the great expertise that is present at this conference to be applied to models that are used in actual policy decisions rather than the greatly simplified models that have been presented in some of the papers here.

Chris Sims has a paper in the second volume of the Brookings Papers in 2002 that says two things. One, the way models are used now by policymakers is not optimal. Secondly, and this is the part that I pick up on, that the academics could be doing a good deal more to make this a more useful exercise.

I would like to go back to Alan Greenspan's view of monetary policy as risk management before the end of my presentation. Let me start by recalling something I learned at the World Bank about 15 years ago. The bank used to have a commodity price forecasting division. The team was excellent and very sophisticated, and what it did mattered a lot because the World Bank's members were more commodity dependent then than they are now. The only problem was that despite the best efforts of the excellent staff, the forecasts were very poor and a lot of money was being spent to produce them. Eventually, someone figured out that rather than continue trying to improve the forecasts, it was better to recognize that the forecasts were likely to remain poor and that the bank should switch its efforts toward thinking about how to help countries hedge the risks from the price uncertainty. I am not sure how far this effort has gotten,

because what was being advocated at the time—commodity price index bonds issued by developing countries—has not really taken off in a major way. But the lesson to take away is the idea of adjusting optimally to the presence of risk rather than trying to forecast precisely what is going to happen.

I am not absolutely sure what the monetary policy analogy is, but let me suggest a few things. It is clear that developments in financial markets have made a very big difference to the way risks are shared and, accordingly, to the way shocks impact the economy. For instance, the invention of credit default derivatives makes a big difference to the stability of the financial system—though we need to recognize that the risk does not go away, it is just reallocated within the economy.

A related possibility is the suggestion by Bob Shiller that some means should be found of developing macroeconomic hedging tools—for instance GDP-indexed bonds—that could help individuals and the economy deal better with risks. If such instruments existed, the impact of shocks on the economy and on consumer welfare would be moderated, and that would likely change the way in which monetary policy changes would affect the economy.

Another way in which the notion of policy as risk management is important was evident in the discussion we had yesterday on structural changes that have increased the flexibility of the economy, for instance the well-known view that flexibility of the exchange rate strengthens an economy's ability to absorb shocks. More generally, changes in economic structure that increase the economy's flexibility improve its capacity to deal with shocks and the risks that their impacts produce.

Let me conclude by discussing two issues that were on yesterday's agenda. The first was the interesting discussion on the contribution, if any, that improved monetary management may have made to more stable economic performance around the globe in the last 20 years. In the very elegant paper by Jim Stock and Mark Watson, we were told

that although there is a contribution from improved monetary management, it is not the main factor. Rather, the magnitude of the shocks has declined. That elicited some concern among the monetary policymakers here. I thought yesterday's discussion, particularly about the potential crises we have dodged in the last 15 years—for instance the 1987 stock market crash, or the LTCM-Russia crisis, or September 11—helped make a strong case that monetary policy had improved in important respects.

The last point relates to Ken Rogoff's very interesting paper on what accounts for the global decline in inflation. It is, of course, dangerous—an example of moral hazard—for academics or former academics to claim that the intellectual climate has real effects. Nonetheless, I do believe that academic work on the costs of inflation and the growing understanding of the tradeoffs between inflation and growth, along with other elements mentioned in the discussion, namely, that people discovered that the benefits of inflation were illusory, made a big difference to the political importance of fighting inflation and to the way monetary policy has been conducted. We are all very fortunate that is so. I say "all" but it is not all, because there are still populist governments out there trying to undermine the independence of their central banks, trying to get more inflationary policies that are not going to work, and trying to finance fiscal deficits that are too large.

So, the progress that has been made in fighting inflation is not engraved in stone. We have to keep seeking to improve monetary policy and to continue the fight against inflation and deflation. We have to make sure that the benefits of the improved policies of the last 20 years are maintained.