Overview

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Like everybody, I would like to thank the Kansas City Fed for inviting me to this wonderful conference. It's not only the environment that is wonderful, we've also had five very interesting papers, which together with the comments, have covered the topic of the impact of financial innovations on monetary policy very well indeed.

They all start from the changes in the structure of the financial system: the decline of banking, the rise of other financial intermediation, the growing internationalization of the system, and the invention of new instruments. And they all say that this is an unprecedented rate of technical change—the invention of high-speed computers, improved communications, and so on.

I think that's just wrong. The most important financial and technical innovation that relates to financial markets is the invention of the telegraph, which put international markets together in the late nineteenth century. There is very little evidence that interest rates move together more closely now than they did at the end of the nineteenth century. Similarly, the discussions we're having on the decline of banks were a central feature of the monetary economics literature of the early 1960s including the work of Gurley and Shaw and of Patinkin in the second edition of his classic work. And the things we are saying today on the theory of how monetary policy works were in fact being discussed then.

This is not to say that there is nothing new under the sun, but it is

to say that we're dealing with a process that has been going on for at least 150 years. If this integration of capital markets was for a time set back, and if there's been an accelerated pace of integration of capital markets in the post-World War II period, that has more to do with policy changes—with the introduction of capital controls in the 1930s, and their gradual removal—than with technology. We are now roughly where we were a century ago with regard to the international integration of the financial markets.

The papers fall into two groups. Those yesterday addressed what the changes in domestic financial systems mean for monetary policy. And then today's papers address what the growing integration of international capital markets means for monetary policy, where now exchange rate policy is explicitly recognized as part of monetary policy. I'd like to second the lament of the Governors, John Crow and Jacob Frenkel, who each had to point out that, at least in their countries, the exchange rate is a central element in monetary policy, and that the distinction even for the United States between what these innovations mean for domestic monetary policy and what they mean for exchange rate policy is an artificial one. Even in the United States, movements in the exchange rate that follow on changes in interest rates are a central part of the transmission mechanism of monetary policy. And of course that applies even more strongly to smaller, more open economies.

Rather than pursue the distinction between domestic and international implications, I'd like to organize my discussion around the three questions Alan Greenspan raised yesterday. But I'll take them up in a different order than he posed them.

The first question is, "What do these changes mean for the stability of the economy?' The answer is that we don't really know yet, except that so far, so good. In principle, these innovations —specially derivative securities—allow for a better allocation of risks than was possible before. This leads to welfare gains for economic agents. The magnitude of such gains is typically not as large as people in financial markets would have you believe, but they are no doubt a benefit.

We don't know yet how instruments will hold up under pressure.

We have had one scare, which was the **1987** worldwide stock market crash. That crash can in part be attributed to the innovations about which we are talking. But I think that scare and that shock did not affect the economy very much because of the immediate and appropriate response of monetary policy. Some people argue that the inflation of **1988** and **1989** was caused by central banks' overreaction to the stock market crash. But I think that the shock was handled correctly and that the system showed itself capable of dealing with what may have been a consequence of financial innovation in the stock markets.

We should recognize, though, that the final word is not in on the role of derivatives and on the very sophisticated hedging that is now possible. The mere fact that hedging becomes sophisticated means that we're also increasing the potential contagion effects of a mistake or a fraud somewhere in the system. We haven't seen it happen and we won't know that it will happen until it does. Yet, probably, one day it will. Then the question will be what mechanisms have central banks put in place for dealing with the potential panic that may happen as a result.

There is one point that should be borne in mind as we discuss stability. It is that as these innovations develop, and as markets learn to respond more rapidly to information, we may see ***greater*** fluctuations in the financial markets than we've seen before. It is not necessarily the case that because hedging is better, asset price fluctuations will be reduced. Once the capacity of asset prices to react to news has increased, the reactions may simply be faster and the fluctuations may be bigger. These innovations could even lead to more unstable production. If the economy reacts more rapidly to price signals, we may well see changes in production of different goods happening more rapidly than before. That would be good from the viewpoint of the allocation of resources. Thus it should not be ruled out that there may be more macroeconomic instability as a result of these innovations, but that macroeconomic instability would not be an economic problem.

The second question of Alan Greenspan's is "How does monetary policy affect the economy?" The answer to that is very simple. So

long as there is a demand for high-powered money and so long as the Fed controls the supply of high-powered money, the Fed can affect interest rates and thereby affect the economy. In the absence of credit effects, the pure interest rate mechanism operates as the Fed affects the federal funds rate, which then spreads through the system by affecting also the exchange rate, expectations, and ultimately economic activity and inflation. That is a textbook story about the transmission mechanism of monetary policy, which may be supplemented by a direct supply of bank credit effect that was analyzed in the paper by the Romers yesterday. There is nothing that has changed very much with regard to that story.

But we have to be worried about the demand for high-powered money in the United States. There is a fascinating recent Fed paper which has some estimates about how much high-powered money is held in one foreign country, Argentina. The number is $25 billion. If that is right, it means that about 10 percent of the United States' stock of high-powered money is held in one foreign country. There are probably several other countries that hold very large amounts. So in analyzing H, high-powered money demand, we're not necessarily dealing with the United States economy.

The question this raises—and it's raised explicitly in Hans Tietmeyer's paper—is whether, if the leverage of monetary policy comes through high-powered money, the central bank should take steps to maintain the demand for high-powered money. Tietmeyer leaves no doubt that the Bundesbank has done so. It has maintained that demand in a variety of ways and, Tietmeyer claims, at no cost to the efficient operation of the system. I doubt that taxing banks heavily does not produce distortions. But it is not necessary to produce distortions to generate a demand for high-powered money. Namely, provided interest is paid on reserves, the central bank can ensure a demand for H. It is not clear why central banks are so resistant to doing this-especially since they all run such tight budgets and don't really need the profits that they are now making. But if it is necessary to maintain a demand for high-powered money and if we want to extend reserve requirements to M2 in order to get control over M2, then we can do that without penalizing the banks unnecessarily.

Looking beyond **2020,** there are very intriguing questions about what happens in the limit as high-powered money or settlement balances vanish entirely from the system. How would monetary policy operate if we had a cashless society? What would happen if we got rid of reserve requirements and banks managed to do without them? These are interesting questions that needn't occupy us at this conference. They would become relevant for successive conferences somewhere **30** or **40** years down the road. There has been some discussion in the literature as to what a central bank would then do. It would presumably set standards by announcing what a dollar is, even if it doesn't control the supply. It could, for example, describe the dollar as being a right to purchase some bundle of goods. It would have a role as supervisor of the system. And it might turn out to be optimal to equip it with a large stock of whatever is operating as the medium of exchange in case it needs to intervene in markets, just as we equip our central banks and Treasuries with stocks of foreign exchange at present. But these are very speculative issues.

The last question posed was, "What do these changes mean for monetary policy?" And the short answer is that, domestically, central banks should use interest rates as their short-term policy guide. This is a big relief to me. I started learning monetary economics at the feet of Professor Richard Sayers, the intellectual force behind the Radcliffe Committee. He taught us that to tighten monetary policy, raise interest rates. I am glad to learn some 25 years later that the right answer to what you want to do if you want to tighten monetary policy is to raise interest rates.

The financial innovations that we've had recently have indeed made various money demands unstable. Such innovations mean that you cannot use monetary rules, except ones that become too complicated to understand. We were asked yesterday what the ultimate distinction is between a rule and discretion. I don't think that ultimately there is a distinction, in the following sense: in the eyes of someone who can understand everything, what the Fed is doing is just a rule. It's very hard for us to comprehend it, but the Fed behaves in predictable ways, responding to the data that come in. If you're smart enough you can figure out exactly what the rule is. But the existence of such a rule doesn't help very much. A useful rule has to be a simple, predictable

response to events.

The discussion that Allan Meltzer has been conducting with everybody here in the last few days on the distinction between rules and discretion fails to recognize the crucial distinction between the predictability of outcomes and the predictability of actions. It really doesn't help to have a predictable set of actions if those actions have no reasonable relation to anything that matters for the economy. So to keep M2 on track when the demand for M2 is unstable really wouldn't help. What the economy needs is a monetary policy where the public knows both that the monetary authority will do its best, and that its best is good, to produce outcomes in terms of inflation in particular and output on which they can rely. Namely, the public must believe that inflation will not be allowed to get out of hand and that in times of recession the Fed will not pursue its inflation target relentlessly. What really matters is the predictability of outcomes produced by the central bank.

There is then an argument which economists can conduct and can perhaps help central banks think through regarding the policies that are most likely to produce those outcomes. Those methods may involve money and they may involve interest rates. For long periods, the methods may involve money targets for MO, the monetary base, or M3. But it will not be the case, given the financial innovations that have been taking place for centuries, that any of those intermediate target rules will stay very useful.

It is important to note that the academic discussion of the 1970s and 1980s on rules versus discretion is being bypassed by the very interesting changes in monetary policy now being implemented in New Zealand and Canada. These are not rules in the sense of Milton Friedman. They are rules in the sense of Henry Sirnons, who in the first discussion of a monetary rule proposed the rule of stabilizing the price level. That is not a recognizable rule in the sense the notion was used in the 1970s and 1980s. But it is the rule that Canada and New Zealand and no doubt others, including perhaps the United Kingdom if Andrew Crockett's description is accurate, are moving toward. That is, there is an agreement in those countries—and it's a very subtle agreement—n what the inflation target will be. It is up to the central

bank to produce that result as well as it can, and there are incentives for the central bank to produce that result rather than to dodge the issue in a variety of ways.

Now why is it subtle? It's subtle because the inflation target is not an absolute. The Bank of Canada can recontract with the government if conditions change. So in the face of a supply shock, the Bank of Canada and the government may sit down to modify the inflation target, to raise it a bit. Therefore the inflation target is not an absolute. The rule leaves no doubt that the ultimate focus is on inflation. But it is not so rigid as to tie the hands of the central bank inappropriately.

I would also like to second Mike Mussa's comment on the Bundesbank, by quoting from Helmut Schlesinger: "Pragmatic monetarism as accepted in the Federal Republic must not be confused with rigid adherence to scholarly doctrine." The Bundesbank does not follow a monetarist rule. The Bundesbank undertakes tradeoffs like everybody else. Germany has 4 1/2 percent inflation as a result of German unification. It could have had zero; or it could have had 7. The Bundesbank had to face the tradeoff as to how much recession they wanted. They made that tradeoff just as everybody does. And that's what central banks are paid to do.

Third, the discussions in this morning's papers focused on the exchange rate issue. They were concerned, rightly so, with what the enormous extent of short-term international capital mobility means for exchange rate management. Even here, we shouldn't exaggerate the changes. On one day in March 1973, not March 1993, the Bundesbank bought 10 billion deutsche marks worth of dollars. And the system was much smaller then. Very big flows took place in the 1970s as Bretton Woods was breaking up; it was possible to mobilize those flows because a sufficient number of large countries already at that stage had no capital controls. So we're in an environment and with questions similar to those that arose at the breakup of the Bretton Woods system.

The question is, What exchange rate system(s) should we use? I like the logic of Andrew Crockett's paper, and in Mussa and Goldstein's paper, that there really are only two extremes. A floating rate system,

a genuine floating rate system, will work well with capital mobility; or a genuine fixed rate system with irrevocably fixed exchange rates would work well with the capital mobility that we have. I was a little taken aback by Andrew's claim that the shock of German unification is unique. I am sure that the particular shock is unique, that there won't be another German unification shock. But there will be many more shocks. Within Europe itself, a big change in the oil price will put an enormous strain on relative exchange rates. And no doubt, there are other shocks that we are not smart enough to think about yet that will come along and require changes in exchange rates unless the system has gotten itself to the point where it's willing to deal with them other than through exchange rates. So, I wouldn't think that the future is much easier with regard to the possibility of shocks than the past.

Moreover, the Europeans stress the impossibility of running a floating rate system when countries trade a lot. I don't know why the Canadian-U.S. experience gets so little attention in this regard. The United States and Canada have had floating exchange rates without a great deal of noise coming out of either country on the difficulties that this float causes for trade. And there hasn't been much pressure to move to a fixed rate system as the free trade arrangement has developed. In a private discussion with André Icard a while ago, he argued that in fact the single market project is far more far-reaching than the free trade area. But up to this point, the single market hasn't happened. And it would have been possible for trade in Europe to continue integrating with floating rates.

Much as I like its logic, I don't think that the Crockett scenario is a realistic one. I doubt that Europe will go to the European Monetary Union (EMU) in the way that he says, namely, by going from 15 percent bands to fixed rates. I even doubt that it will happen with the 15 percent bands being available, but unused. Rather, it will happen through a tightening of bands.

Now why do you need EMU? The economic case is not very strong, despite the argument that the single market needs it. EMU is a political statement, a very important political statement. Monetary union is justified on political grounds, namely the imperative of European political integration: Europe will end up moving toward EMU, which

I regard as ***politically*** beneficial and as ***economically*** mildly costly. But I think monetary union will happen by a gradual tightening of bands from where they are now—after some time in which there's been convergence of inflation performance and some period of stability of exchange rates. It's far from certain that the move will take place with all countries joining at once. Rather the two-speed or multi-speed EMU is still the most likely outcome.

One last question. If EMU is going to happen, what about the big three whose exchange rates float—Europe, the United States, and Japan? Why does everyone accept that it's good for these rates to float when it's not good for other rates to float? Andrew's argument is basically that there's nothing you can do about fluctuations in these rates, so you'd better settle that problem through international policy coordination.

I don't any longer take the view that international policy coordination is useless. I think that when countries beat up on each other regularly at meetings, it has some small impact. I'm sure for instance that keeping the U.S. budget deficit in full view over the 1980s, as everybody kept complaining about it, had some impact on what Secretary of Treasury Baker wanted to do about the deficit. Such pressures are constructive. But we will not get very much out of the policy coordination business because the major countries have not yet seen it as being in their interests to change their domestic policies in accord with international considerations. That is why rates will continue to float among these countries for a very long time. Most likely, these will be genuinely floating rates, not ones with target zones. That would be the one extreme of the Crockett scenario.

What about in the year 2020? So long as we look far enough ahead, we can look forward to the eventual advantages of operating with a single world money. But that's a very long way off.