CHAPTER SIX

Panel on Independence, Accountability, and Transparency in Central Bank Governance

Charles I. Plosser, George P. Shultz, and John C. Williams

PART 1

Balancing Central Bank Independence and Accountability

Charles I. Plosser

It's been a fascinating day with very interesting discussions on a wide range of issues. In my remarks I'm going to take two things as given. The first is, the United States needs a central bank. It would be a very interesting discussion to consider alternative arrangements, but I'm not going to go there. And besides that, most countries today operate under fiat money regimes, and fiat money, of course, means that money has value because the government says it has value. Central banks for the most part are responsible for maintaining the purchasing power and value of a fiat currency. Of course in the United States, the way the Fed does that is by buying and selling securities in the open market to control the growth of money and credit. And that authority to buy and sell securities in the open market gives the central banks, and the Fed in particular, extraordinary powers to intervene in financial markets, not only through the quantity of things that they buy, but through the types of assets that they choose to buy.

Now the second premise that I'm going to take as given is that it is desirable to have a healthy degree of separation between

government officials who are in charge of spending and those who are in charge of printing the money. That is to say that a healthy degree of independence for a central bank is a valuable characteristic. And I think it's just good governance. History tells us that when central banks lack that political independence, outcomes are on average worse, often much worse. Printing money just becomes an easy substitute for tough fiscal choices, and that's not a good thing. So this healthy degree of separation between government expenditure decisions and the printing of fiat currency is just wise; I'm going to take that as given as well.

Now over the years, as we've heard listening to Michael [Bordo] and the others, unhappiness with the Fed comes and goes. We see episodes where the Fed is reviled or praised, and sometimes at the same time. But the recent criticisms, I think, largely stem from policy actions or choices of the Fed itself, as the Fed has pushed the envelope of traditional monetary policy. These include the obvious things we've talked about—bailouts of individual financial institutions, such as Bear Stearns and AIG; six years of essentially zero-policy interest rates; aggressive large-scale asset purchases that quadrupled the size of the Fed's balance sheet, and not just of Treasury securities but of mortgage-backed securities to support the housing market. Those decisions about the types of assets purchased, I believe, are a form of credit allocation by the central bank, and thus are more akin to fiscal policy than monetary policy. But regardless of the justification for any of these actions, what these actions have done is raise serious questions in many people's minds about the tremendous discretionary power that rests with the central bank. This has led to calls for reform of our central bank to enhance oversight and, perhaps, alter its governance.

So how, in a democratic society, do you design an institution that has considerable authority to do what it needs to do, including sufficient independence, but also is accountable and constrained in the use of its authority? Part of the problem in many of the pro-

posals put forward in Congress and elsewhere is that they seek accountability through greater political control and interference. And from my perspective, that risks robbing the central bank of much of its needed independence. For example, making Federal Reserve Bank presidents political appointees, or opening up monetary policy deliberations to real-time political or policy audits by the GAO (General Accountability Office) are, I think, potentially very damaging to the Fed's independence going forward.

So the way I look at this is, we should look at ways to limit the scope of authorities or responsibilities rather than impinge on the central bank's operational or political independence. So I'm going to highlight three ways I think of pursuing such restrictions on a central bank. First, narrowing the mandate for monetary policy. The broader the mandate, the more opportunity there is for discretion and, indeed, more discretion means there's more opportunity for more mischief. Discretion allows for the opportunity to make good decisions, but it also creates the opportunity for making really bad decisions. Indeed, broad mandates contribute to the view—and, in my view, the mistaken view—that central banks are capable of solving all manner of economic ills, and thus making it difficult to hold them accountable or measure their success. I'm reminded of the old saying: responsible for everything and accountable for nothing. The second way to restrict central bank actions is through the type of assets that can be purchased or sold, thus constraining the composition of its balance sheet and the range or scope of its market interventions. And the third way is to ensure appropriate discipline and accountability through more transparent communication of a monetary policy strategy, and this is where rules can play a vital role.

So let me talk first about goals and objectives of the Federal Reserve. The mandate from Congress has evolved over time. Its latest incarnation was set in 1977. The mandate, as Peter [Fisher] read to us earlier, says that the FOMC "shall maintain *long-run*

growth of monetary and credit aggregates commensurate with the economy's *long-run* potential to increase production so as to promote effectively the goals of maximum employment, stable prices, and moderate, long-term interest rates (italics mine)." Now Peter thought this mandate was actually very narrow. But he also noted that the interpretation of the mandate, whether it be by the Fed itself or by Congress, is actually quite vague and broad. It seems to have become the accepted wisdom that this mandate means the Fed should stabilize short-term fluctuations in employment while maintaining long-term price stability. I'm going to leave it to others to opine whether that's the only interpretation that this language could offer, or even if it's the best one. I think that's open for question. But I would suggest that it's in fact the vagueness of this mandate itself that's part of the problem.

The general interpretation of the mandate has allowed wide discretion for the Fed to pursue different objectives at different times, thus making communication of a coherent monetary policy strategy challenging at best. Indeed, the active pursuit of an employment mandate has been, and continues to be, problematic for the Fed. Many—or most—economists would at least be dubious of the ability of monetary policy to predictably manipulate employment with any precision in the short run. There is a strong consensus among economists that in the long run, monetary policy does not determine employment. And indeed, the FOMC's 2012 statement of longer-term goals and objectives acknowledges this. The statement explicitly says, "The maximum level of employment is largely determined by non-monetary factors that affect the structure and dynamics of the labor market." So the committee acknowledges that it does not know the maximum level of employment at any point in time and acknowledges that even conceptually it changes over time. So the committee for those reasons said it was inappropriate to quantify a numerical goal for the employment mandate. All that was great. Yet from my perspective, the committee seems

to act and talk as if it does have a target, and that monetary policy can always achieve it. The language that the Fed often uses tends to equate the long-term unemployment rate from the quarterly Summary of Economic Projections (SEP) of FOMC participants with maximum employment. And yet that's not the same thing as maximum employment attainable at any point in time. They are very different concepts. Indeed, the concept of maximum employment differs depending on the model one uses.

From my perspective, what's worse is there seems to be a view that not only is there an employment target, but other details of the labor market are also part of the mandate, and monetary policy can be used to determine those as well. Wage growth, participation rates, part-time versus full-time employment are some of the examples that come to mind. I know of no good economic theory or empirical evidence that explains the relationship between any of these labor market characteristics and monetary policy, although I'm sure somebody could come up with one. Now many people are advocating we have another mandate, financial stability, whatever that means, and that be added to the list of goals. That would further muddy the waters, and I'll have a little bit to say about that later.

So it's the vagueness of the mandate which has given wide latitude to the Fed to exercise great discretion over what it thinks is important, when it thinks it's important, and the instruments it uses to achieve a particular objective. For example, massive purchases of MBS (mortgage-backed securities) were undertaken in the hopes that significant subsidies to the housing sector relative to other industries would have beneficial results on aggregate employment, more so than just simply purchasing treasuries. Now you can debate whether this is an accurate empirical statement of what would actually be accomplished by such purchases. I don't think we have much evidence of that. But on the other hand, you could also debate whether such decisions to subsidize one industry

in favor of another should belong to the central bank in the first place. Now of course, one can argue that monetary policy can't avoid affecting relative prices and allocations. Even in the best of worlds that's probably true. But I think it's important to consider, in thinking about the institution, the limits to the interventions that should be allowed and the types of goals that should be assigned to an independent central bank.

So when establishing the longer-term goals and objectives for any organization, whether it be the Fed, but particularly one that serves the public—I think Carl [Walsh] was making this point earlier—it's important that those goals be achievable. It's important that you assign an organization or institution goals that it can achieve. Assigning unachievable or unattainable goals to an organization is a recipe for failure, because it will fail at it. And for the Fed, and central banks more generally, failure contributes to a loss of confidence in the institution and thus its legitimacy.

My fear is that over the last quarter century or so, the public has come to expect way too much from central banks and way too much from monetary policy in particular. This has been quite evident around the world in the recent crisis, where the public and elected officials have relied on central banks to solve all manner of economic woes. I believe this is the wrong direction to take central banks, giving them more and more and more scope for both discretion and responsibility for our economic well-being. I'm reminded of Milton Friedman's admonishment in his presidential address to the AEA (American Economic Association) way back in 1967 when he said, "We are in danger of assigning to monetary policy a larger role than it can perform, in danger of asking it to accomplish tasks it cannot achieve and, as a result, in danger of preventing it from making the contribution that it is capable of making." Those are very wise words, I think, and we need to revisit them in the context of current monetary policy and institutions.

So as you can guess by now, I think the aggressive pursuit of broad and expansive objectives is quite risky. It could have undesirable repercussions down the road, including undermining the public's confidence in the institution, its legitimacy, and its independence. Indeed, I think the changes and reforms being discussed in Congress are the early salvos in just such a process. And it's worrisome, from my perspective. Expansive and vague mandates also make it difficult for the public to hold a central bank accountable, as it allows for policymakers to shift the goalposts, so to speak, to justify their policy choices. This aggravates the problem of accountability, because it muddles the metrics for success. Thus my earlier reference to "responsible for everything but accountable for nothing" is, I think, very apt.

So in order to narrow the focus of the Fed and create a more limited purpose central bank, I conclude that it would be appropriate to redefine the mandate to focus solely, or at least predominantly, on price stability. A single, primary mandate would help focus attention and reduce discretion to pursue other, perhaps unachievable goals and make it easier to hold the Fed accountable for its policies. It would also provide some protection for the Fed from demands arising from other interests outside the Fed or even inside the Fed that desire the Fed to pursue other objectives just because it can.

Another way of limiting the sorts of interventions a central bank can undertake is to more narrowly constrain the assets it can hold on its balance sheet, thus constraining the markets in which it can in fact intervene and purchase assets. This is not an uncommon restriction, and it's implemented in different ways in different countries. The ECB (European Central Bank) has a different set of restrictions than the Fed does. The Fed, of course, is already restricted in some degree by what it can do with its System Open Market Account (SOMA). The Fed is allowed to hold only US

government securities or agency obligations that are fully guaranteed by the government of the United States. This has permitted, however, the widespread, large-scale purchases of MBS. As we know, however, section 13(3) lending was used to circumvent even those restrictions, because it allowed the Fed to purchase many assets from Bear Stearns and JP Morgan and AIG, for example, "under unusual and exigent circumstances."

Now the FOMC has actually indicated in its so-called exit principles that it does desire to return the SOMA to an all-treasuries portfolio. I think that's an admirable goal. Unfortunately, given the size of the MBS portfolio and the inclination of the FOMC not to engage in outright sales of MBS, it may not happen in my lifetime. But we can get there. Now this recommendation to return SOMA to an all-treasuries portfolio does not necessarily impact the ability of the Fed to lend to depository institutions through the discount window, and thus to continue to play a role as the lender of last resort. What remains is the authority under section 13(3), which was used extensively during the crisis, to lend to JP Morgan, Bear Stearns, and AIG. Now those instances, in my view, were not true lender-of-last-resort activities. Lender of last resort is intended to provide, as we've talked a lot about today, liquidity to otherwise solvent or sustainable institutions based on strong collateral, not to prop up failing institutions by accepting poor collateral. Of course, in times of crisis, as we've talked about, the distinction between insolvency and illiquidity can be a difficult thing to determine.

I think there needs to be a new approach to emergency lending, and so in that regard, I go back to where Paul [Tucker] started us this morning about how do we define the rules of the game in emergencies. I worry a little bit that crisis management has now become the sine qua non of central banking. All of a sudden we now believe that if we can't solve the emergency lending problems, central banks aren't worth much to us. Crisis management and financial stability have taken on renewed importance, perhaps to

the detriment of other roles that central banks should play. This is an important topic and the trade-offs faced by central banks as they acquired ever broader mandates have yet to be fully understood.

I think a way to go about emergency lending or bailouts is not to fully integrate fiscal policy with monetary policy, because these are fiscal policy decisions. I have suggested that the way to go about it is to establish a new accord between the Treasury and the Fed. So what you could do is have an environment where, in an emergency, it is the Treasury that ends up taking the responsibility for saying, "We're going to bail out or rescue or buy some private assets in order to rescue institutions to promote financial stability," however they want to define that term. And that would be OK, as it is a fiscal policy action. Then the Treasury could turn around and tell the Fed, "We'd like you to execute this strategy for us." That's fine. But what needs to be decided, from my perspective, is the Treasury agrees *ex ante* that within some period of time—say six months, one year, or some predetermined window—the Treasury will swap those assets on the Fed's balance sheet that are private assets for treasuries. It would just be a swap. That frees the Fed to conduct monetary policy without the baggage of the credit allocations brought about through the acquisition of private assets. The Treasury would take over responsibility for the bailout and the credit exposure rather than the central bank. So I think that's one way to begin drawing some lines about how you could go about having the Fed play an operational role when needed but also, *ex ante*, protecting it on the flipside to return its portfolio to all treasuries.

Finally, I'll just briefly make my third point regarding transparency and systematic policy, because I made it already. Earlier we talked about a monetary policy report, about transparency and communication. I do feel that the Fed can and should be accountable and one way to do so is to describe its monetary policy strategy. I don't think discretion is a strategy. I think that using rules

and benchmarks to convey information about how the committee sets policy would be very useful. And doing that through a monetary policy report that used various rules as benchmarks and guidelines and then force the committee, force the FOMC, to explain its actions in the context of those benchmarks could be a very healthy step in the right direction.

I think the public has come to expect too much from central banks and has come to question the breadth of powers that they seem to possess. I think this is dangerous for the Fed and dangerous for the economy. And if the public loses confidence in the Fed, the central bank is at risk of losing its independence and legitimacy. So rather than micromanaging the governance, auditing policy decisions in real time, or undermining its independence, it would be better to establish, in my view, a more limited-purpose central bank, whose activities and responsibilities are more narrowly defined, whose scope for discretion is more limited, and yet whose independence is protected.

PART 2

Central Bank Transparency: Less is More

George P. Shultz

I've listened to what Charlie has to say, and all I can say is, "Amen." [Laughter.] I'd only add one little problem: I don't think the Treasury has the authority to do what you say. They would have to go and get that authority.

I sounded off this morning on some of the problems I think the Fed has had in conducting itself. Let me first touch on something akin to what you said. I think it's really important that the Fed show that it's competent. Right now in this country, there is an increasing feeling that the government can't do anything, can't even roll out a website. So it's important that it be competent, and

I think having a limited-purpose organization is the key to that competence. I think that's very important.

Second, with all due respect to transparency, I think the Fed speaks with about a dozen voices right now. People sound off all the time, and it's a little hard to figure out just what is the policy. Let me give an example. Bill Martin worked at the Fed quite a while, and I happened to know him for unrelated reasons. He had a squeaky little voice and he didn't speak a lot, but when he spoke, people listened. When I was secretary of the treasury, we had a lot of problems with the exchange markets, so I had a little committee that I appointed and I persuaded Bill to be on it. After I left office, I was put on it. Bill Martin was chairman of the Fed, and we had a meeting where Bill was talking about our currency: "We've said this about the dollar, we've said that about the dollar, and what should we say about the dollar?" There was dead silence. Then this squeaky little voice of Bill Martin says, "You should say less." I think there's something to be said for saying less. Remember Ted Williams: "Why ain't ya talking, Ted?" "I let my bat do the talking." The Fed has a big bat. Let it do the talking.

Then I think it's always important to remember the context in which actions are taken. I'll give two examples. In the early 1970s we had a big debate about wage and price controls. I lost that fight. On the other side was Arthur Burns. We put this into effect and the first thing that happened was a freeze. It was really effective and it scared the hell out of everybody because you knew the economy has got to be able to adjust. But I think in Arthur's mind he felt that "these things really work." The result was that you wound up with a looser monetary policy. In an odd way, you'd have to say wage and price controls caused inflation later on.

Then there's a completely different kind of issue, and that came up in the Paul Volcker period that's been spoken about. I think it's fair to say that the first thing Paul got involved in was the credit restriction business. It exploded. It was only a little later that he

went to control the money supply. I remember the period very distinctly. Paul had been my under secretary when I was secretary of the treasury. I knew him very well and I knew Ronald Reagan very well. I organized his economic policies during the primaries and during the election campaign and afterwards. He was convinced, and we were all convinced—and Michael, I think you were a part of this—that we couldn't have a decent economy unless we got inflation under control. And the only way to do it was by what Paul was doing, so I made sure Paul knew that. Paul would tell you today that on quite a few occasions the press served up questions to the president, in essence inviting him to knock down Paul, but he never did, he never took the bait. People ran into the Oval Office all the time, saying, "Mr. President, Mr. President, it's going to cause a recession! We're going to lose seats in the midterm election!" Reagan basically took the view, "If not us, who? If not now, when?" So this period went on and it worked, but I don't think if Paul had been there as just chairman of the Fed that he could have handled it. You had to have a strong politician stand up to the reaction to the recession and the political implications.

I think I was reassured, Mary [Karr], by your comments about appointments and the idea that we don't need to be so concerned about regulatory capture, but I still worry. I think one of the answers is that we have this really complex Dodd-Frank, and all these banks have regulators by the dozens looking over their shoulders. It's a recipe for disaster. Why can't we have in place simpler, clearer regulations, like capital requirements and leverage? If you have them strongly in place, you don't need a million people. They will do the job, and you don't have potential for conflicts there.

I mentioned the incident this morning about calling banks in and making them take $25 billion when they didn't want it and basically threatening to regulate them out of existence if they didn't take it. That was a complete misuse of power. The Fed has a lot of power and it needs to be very careful how it uses it. Trust is the

coin of the realm, and people can't be trusted with power if they use it improperly. So that's part of the confidence business that you were talking about. Be sure you behave in a way that is consistent with the idea that trust is the coin of the realm.

Thank you.

PART 3

Monetary Policy and the Independence Dilemma

John C. Williams

Recently there has been a great deal of commentary arguing that the Federal Reserve needs more oversight and greater transparency. This has culminated in a number of legislative proposals designed to constrain the Fed's freedom of action in monetary policy and other spheres. One prominent example is the bill proposed in the House of Representatives entitled the Federal Reserve Accountability and Transparency Act of 2014, or the FRAT Act for short. Much of the debate surrounds the Federal Reserve's policy actions during and following the global financial crisis and recession. But the deeper issue of oversight and independence of central banks in democratic societies is not new; on the contrary, it has been a contentious one for the past century. In the broader historical context, recent proposals are not unique to the current situation but instead represent the latest chapter in a long-running debate in the United States and around the globe.

I will delve into the question of central bank oversight and independence, examine some of the solutions that have been tried in the past but ultimately failed, and then turn to approaches that have proven more successful. I'll conclude by considering how the lessons from the past apply to the current debate about how to enhance the oversight and transparency of the Federal Reserve. Throughout, I will focus on monetary policy and not address other

activities of central banks. Note that the views expressed here today are entirely my own, and do not necessarily reflect those of others in the Federal Reserve System.

The independence dilemma

Why has central bank oversight and transparency been so contentious? The independence dilemma stems from the enormous power central banks have to create money essentially out of thin air. Wielded judiciously, this power can foster economic prosperity and stability. However, it can also be misused as a short-term fix for governments to meet financing needs by printing money or to stimulate the economy before an election. Such misuse can undermine economic stability and fuel runaway inflation. The resulting longer-run damage may only be felt years or decades in the future, well outside usual political time frames.

To avoid the temptation of opportunistic money creation, modern governments have generally delegated the day-to-day operation of monetary policy to an independent central bank. This independence means that policymakers are free to focus on the technical aspects of their task, removed from direct political influence. This arrangement, however, creates a new problem: Who tells the central bank what to do, if not the government? Thus, the dilemma: successful monetary policy necessitates both an arm's-length relationship to the political process and oversight by elected officials. The search for balance at the horns of this predicament has been at the heart of central bank debates and reforms over the past century.

Two broad approaches have been taken to solve the quandary. In both cases, the overarching goal is the same: economic prosperity and stability. The difference is in the degree of operational latitude afforded the central bank. The first, more restrictive approach is to delegate an operational mandate stipulating that the central

bank achieve a specific intermediate goal. The second approach is to delegate an overall economic goal, such as low inflation, and let the central bank determine how to best achieve its goal with the tools at its disposal.

Operational mandates

In the past, central banks were typically given an operational mandate. This choice reflected a strong desire to limit the discretionary power of central banks and to provide a nominal anchor, that is, a stable value of money. Operational mandates were thought to be highly predictable, accountable, and transparent, and able to provide the basis for longer-term economic stability, at the cost of short-term flexibility and discretion. However, as I will discuss in more detail, operational mandates have been beset by a string of failures rooted in this very lack of flexibility to deal with changing economic conditions and crises. After each failure, a new operational mandate framework has been introduced that, while an improvement over the prior one, still proved prone to breakdown under economic and political stress.

The classic example of an operational mandate is the gold standard. Under the gold standard, monetary policy is completely subordinate to the fixed price of gold at a legislated level. Many countries followed the gold standard before World War I and in the period between the wars. The gold standard represents the most extreme form of an operational mandate. The central bank has little freedom of action or decision and is therefore unable to take potentially harmful actions on its own—or, for that matter, *any* actions on its own.

History has shown that this inflexibility and the subservience of monetary policy to fluctuations in gold supply and demand contributed to economic crises and depressions. The gold standard's inability to cope with economic stress is reflected by its frequent

curtailment during times of war and crisis. In fact, so often was it suspended that deviations from the gold standard routinely became the norm, rather than the exception. The inherent lack of flexibility in the money supply was blamed for contributing to the depth of the downturns experienced by many countries during the 1930s.[1]

The failure of the gold standard led to a new type of operational mandate, the fixed exchange rate regime. Under this system, the central bank is required to maintain the value of the domestic currency in relation to that of a foreign currency. As with the gold standard, predictability, accountability, and transparency were considered paramount virtues. The most famous example was the Bretton Woods system, in which foreign currencies were pegged to the US dollar. A fixed exchange rate system is somewhat less rigid than a gold standard and is far less subject to the particularities of gold supply and demand. Nonetheless, it puts a straitjacket on a central bank's ability to set monetary policy attuned to domestic economic conditions, since policy is beholden to the exchange-rate peg. As a result, monetary policy is less able to counter cyclical swings in the economy.

History has shown that fixed exchange rate systems at times perform poorly and are often abandoned during periods of severe economic stress or crisis. Although some economies have successfully operated with exchange-rate pegs, other regimes have not stood the test of time. For example, the Bretton Woods system collapsed in the early 1970s and the European Exchange Rate Mechanism faltered in the early 1990s.

The string of failures associated with the gold standard and fixed exchange rates led to other proposed operational mandates, including monetary targets. Monetary targeting is most often

1. Eichengreen 1992.

associated with Milton Friedman's proposal to have the money stock grow at a constant rate irrespective of economic conditions.[2] In theory, monetary targeting has the benefit of being predictable, accountable, and transparent, while providing a stronger automatic stabilizer for the economy than earlier, more rigid regimes. For example, if the economy heats up, demand for money balances rises, driving interest rates up, which slows the economy and reduces inflation pressures.

However, in practice, monetary targeting has proved an unreliable and overly restrictive framework. In particular, changes in the financial system have caused the relationship between money demand and the economy to shift in unexpected ways. As a result, a fixed growth rate of the money stock can have unpredictable implications for economic growth and inflation. Following on the theoretical insight of William Poole, in a world where money demand is hard to predict, it is preferable to use the interest rate as the primary policy instrument rather than money supply.[3] This is exactly what central banks around the world have done, leaving monetary targeting by the wayside.

Goal mandates

In light of the string of past failures of various forms of operational mandates, many countries have settled on a very different approach to deal with the issues of oversight and independence. Instead of stipulating an operational target, they set high-level economic goals and delegate to the central bank the authority to decide how to best achieve them. Under such a goal mandate, the central bank is held responsible for achieving its objectives and is typically required to regularly report on its progress and the steps

2. Friedman 1960.
3. Poole 1970.

it is taking. This framework stresses the predictability, accountability, and transparency of the main economic goals of policy, rather than operational actions.

An early entry in this category is the mandate under which the Federal Reserve has operated for the past thirty-eight years. The Federal Reserve Reform Act of 1977 states: "The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates." Somewhat confusingly, this sentence combines elements of both operational and goal mandates. The operational mandate aspect is captured by the reference to long run growth of monetary and credit aggregates, hearkening to a monetary targeting regime. The goal mandate is specified as the ultimate objective of monetary policy. Later in this paragraph, the tension between the two approaches is resolved clearly in favor of the goal mandate: "Nothing in this Act shall be interpreted to require that such ranges of growth or diminution be achieved if the Board of Governors and the Federal Open Market Committee determine that they cannot or should not be achieved because of changing conditions." Although the description of the goals is left somewhat vague, the Federal Reserve filled in this gap by issuing a statement describing the longer-run goals and policy strategy in greater detail.[4]

The Act of 1977 also demanded a greater level of oversight and transparency regarding monetary policy. It stipulated that the Fed would consult with congressional committees at semiannual meetings concerning "objectives and plans with respect to the ranges of growth or diminution of monetary and credit aggregates for the

4. Board of Governors 2015.

upcoming twelve months, taking account of past and prospective developments in production, employment, and prices."[5] The Full Employment and Balanced Growth Act of 1978 added a requirement that the Fed issue semiannual reports to Congress in conjunction with these meetings. The semiannual meetings and reports continue to this day.

Other countries have taken the goal mandate framework considerably further. Some twenty-five years ago the Reserve Bank of New Zealand introduced a new goal mandate framework called inflation targeting.[6] Since then, dozens of countries have adopted some form of inflation targeting. The cornerstone of this approach is that the central bank—often in consultation and in formal agreement with the government—assumes responsibility for inflation being, on average, near a numerical target. It is important to note that, although the inflation goal is front and center, inflation-targeting central banks also recognize a role for stabilizing economic activity—what is often referred to as "flexible inflation targeting."

The inflation-targeting framework also features clear communication of the central bank's policy strategy and the rationale for its decisions, with the goal of enhancing the predictability of the central bank's actions and its accountability to the public. This is generally done in regular public reports with detailed analysis of the economic outlook and policy strategy and decisions.[7] Indeed, some governments require the head of the central bank to issue a public letter when the inflation goal is missed, explaining why the target was not achieved and what is being done to rectify the situation.[8]

5. Federal Reserve Reform Act of 1977.

6. Leiderman and Svensson 1995, Bernanke and Mishkin 1997, Bernanke et al. 1999, Kuttner 2004.

7. See, for example, Norges Bank 2014.

8. See, for example, Bank of England 2015.

As a testament to the effectiveness of this framework, countries with inflation goal mandates have generally kept inflation low and stable over the past few decades, even in the aftermath of the global financial crisis.[9]

Back to the future: Monetary policy rules as an operational mandate?

Although many countries have found that a goal mandate coupled with strong oversight and transparency works much better than past operational mandates, some commentators argue that the problem has not been with the notion of an operational mandate per se, but with how it has been implemented. They accept that the gold standard, fixed exchange rate, and monetary targeting are flawed, and argue that a more sophisticated operational mandate is needed—one that is more flexible at dealing with changing economic conditions but still puts a meaningful constraint on the central bank.

The latest proposed operational mandate is that the central bank should, under most circumstances, follow a fixed monetary policy rule such as the Taylor rule.[10] This is the basic idea underlying the FRAT Act. According to many standard monetary policy rules, the real (inflation-adjusted) federal funds rate depends on a few macroeconomic variables: specifically, the utilization gap—the difference between the level of economic activity and its normal, full-employment level; the inflation gap—the difference between the inflation rate and its target level; and the normal, or "natural," rate of interest. Like other operational mandates, this proposal places a high value on predictability, accountability, and transparency and aims to limit the discretionary decision-making of the central bank.

9. Williams 2014a.
10. Taylor 1993.

This approach has several advantages over previous operational mandate frameworks in terms of macroeconomic performance. First, a monetary policy rule makes clear the central bank's longer-term inflation goal, which is an integral part of the rule itself. This clarifies the communication of policy goals and actions. Second, a properly specified policy rule incorporates the fundamental principle ("Taylor principle") of monetary policy that the nominal interest rate needs to rise more than one-for-one with an increase in inflation as a necessary condition to achieve the desired level of inflation in the long run. Third, a policy rule incorporates systematic and predictable counter-cyclical responses to economic conditions consistent with economic theory and a wide range of economic models.[11]

Research has shown that a policy rule is likely to be superior to other operational mandates like the gold standard, fixed exchange rates, and monetary targeting.[12] In model simulations of typical economic fluctuations, an optimally designed monetary policy rule can come very close to the first-best achievable outcomes.[13] As a result, central banks around the world consult monetary policy rules in preparing forecasts, analyzing risk scenarios, and studying alternative policy strategies. At the Federal Reserve, monetary policy rules have been a regular feature of monetary policy analysis, briefings, and discussions for the past two decades.[14]

There is no question that monetary policy rules provide an invaluable tool for research and practical policy considerations at central banks. Nonetheless, before one rushes to institute a policy rule operational mandate, there are substantive issues and open questions that need to be addressed. Three are particularly relevant: the treatment of unobserved variables such as the natural

11. Taylor and Williams 2011.
12. Bryant, Hooper, and Mann 1993.
13. Levin, Wieland, and Williams 1999, 2003; Levin et al. 2006.
14. Williams 2014c.

rates of economic activity and interest; the zero lower bound on interest rates; and the specification of the rule itself.

An important element of most monetary policy rules is the dependence on unobservable measures of the normal, or "natural," levels of economic activity—such as real gross domestic product or the unemployment rate—and interest rates. In principle, these natural rates change over time in unpredictable ways and are therefore subject to considerable uncertainty.[15] Under a policy rule mandate, would the estimates of the natural rates be set by statute or by the central bank? Would they change over time as economic circumstances change or would they be fixed? These are not purely academic questions. Following the most recent recession, estimates of both the natural rate of output and interest have been subject to dramatic shifts, which would have sizable effects on the appropriate setting of policy according to standard monetary policy rules.[16] If the mandated policy rule uses outdated or inappropriate measures of natural rates, economic performance will suffer. On the other hand, allowing the central bank to freely choose natural rate measures would significantly loosen the constraint on policymaking. In the extreme, any deviation from the mandated rule could be defined away by a shift in the estimated natural rate.

A second issue is the zero lower bound on nominal interest rates that limits the ability to lower interest rates during periods of economic downturn or very low inflation relative to the prescription of a monetary policy rule. During the recent US recession, standard monetary policy rules prescribed negative nominal interest rates, but this was unattainable.[17] The Federal Reserve and other central banks turned to unconventional means to provide the missing monetary stimulus. These measures, including asset pur-

15. Orphanides and Williams 2002, Laubach and Williams 2003.
16. Williams 2014b, 2015.
17. Board of Governors 2009, Rudebusch 2009, Williams 2009.

chases and explicit forward policy guidance, are outside the realm of standard monetary policy rules. In such circumstances, which are very likely to occur again in the future, a policy rule mandate is silent. Moreover, research shows that the very presence of the zero lower bound argues for deviating from a standard policy rule around times when the constraint binds, as the central bank aims to make up for lost monetary stimulus.[18]

Third, although there has been a great deal of research about the properties of well-performing monetary policy rules, there is, as yet, no consensus about the best specification of such a rule. Different models imply different best rules. In addition, in the presence of the zero lower bound or uncertainty about natural rates, the best performing rules can be very different from those designed absent these features.[19] In those circumstances, mechanically following one policy rule designed to work well under one set of assumptions can yield very poor economic outcomes when those assumptions are violated.

Where do we go from here?

I have argued that the independence dilemma has been with us for a very long time. Despite the best intentions, attempts to solve it through an operational mandate have proven fruitless in the past. Although a policy rule operational mandate is unquestionably superior to past operational mandates, such an approach is subject to a number of issues and questions. First and foremost, what rule should the central bank follow? One lesson from the history of operational mandates is that what looks good in theory often fails to deliver when circumstances change in unpredictable ways. Particularly in situations of economic stress or crisis,

18. Reifschneider and Williams 2000.
19. Orphanides and Williams 2002, 2006, Reifschneider and Williams 2000.

operational mandates have proven to be ineffective and have often been abandoned.

Given the challenges for an operational mandate to succeed, a potentially more promising approach to address the independence dilemma may be to look to the experiences of inflation-targeting countries, where the principle of enhancing accountability and transparency within a goal mandate framework has proven to be very successful.

GENERAL DISCUSSION

JOHN WILLIAMS (ADDITIONAL COMMENT): Can I make one quick rejoinder? I think I have one minute left. I just want to explain, because I think I can hear Peter saying, "Well, here we go again, nineteen different policymakers and nineteen views." I don't think, and I was hoping that Arvind Krishnamurthy would be here, but I don't think the only argument for buying MBS was to affect credit to housing. I think that actually his research, a lot of other research has shown that the purchases of MBS actually did have bigger effects on other credit market rates than buying Treasury securities. And that's a legitimate debate among research economists. But I don't think it's fair, at least from my own perspective, to say, "We are buying MBS in order to boost housing." It's partly—at least my own view was—that MBS was shown to have a bigger effect on more general financial conditions and treasuries.

KEVIN WARSH: So, John Williams, you talked about the benefits of an inflation targeting regime. When Peter and I and many of us were at the Fed, before the more recent periods, we thought that there was a comfort zone for inflation, which we would broadly define between 1 and 2 percent. Would the inflation targeting regime, which we've now taken more precisely, because our ability presumably to measure inflation is to the tenth of the percent—our inflation target is now 2 percent. As best as I can recall from recent data, the core inflation rates, at least as measured by the Fed, are in the 1.5 or 1.6 percent range. Is it your judgment that there would be a material difference, the real economy, if the actual underlying core inflation were to converge with our target as opposed to being somewhere in the middle of our old-fashioned comfort zone?

WILLIAMS: I do feel that this is testimony . . . [Laughter.] So I think that the decision here is just really about being consistent over

time. So what you were talking about is there was an unwritten consensus. So once a committee agreed to a 2 percent objective, and that's the middle of the objective, not a maximum, then I think that given that commitment and goal, I think that the view is on average we want to get 2 percent, but that doesn't mean any given year or other. But I do think we've learned from other countries, and I don't want to pick on them, but we've learned a lot from the experience in Japan over the last twenty-five years. When you communicate that, "Well, inflation, it's been really hard to get inflation higher, so let's just accept where it is," then inflation expectations can drift downwards. Of course, on the upside too, I agree, I make exactly the same point. If inflation were running high, I would argue we need to get it back down to the number we committed to. And I think that this issue about range versus number, I think numbers are important, I think that's what most countries have done. That said, we go through great pains in our one-pager—which, you know, Charlie really should be given a lot of credit for what he accomplished on getting the statement of long-run goals and strategy—in there, we go through great pains to emphasize that this is not month-to-month, quarter-to-quarter, even year-to-year, but it's a medium-run constant.

CHARLES PLOSSER: As John said, I was very involved in the effort to create the committee's statement on its long-term goals and objectives. Yet from a historical perspective, I can attest to the fact that there was considerable debate among us whether the inflation objective should be a point target or range. John was there and an active contributor on many points. I felt at the time that the number was better. But in retrospect, I think one of the things I didn't anticipate with the number, which I think turned out to be the case, is the precision with which both the public and the markets think we can control or even measure inflation. I think the point estimate has perhaps given a false degree

of certainty and precision by which this can happen. So I think that you read the headlines: *Fed Significantly Below Its Target Yet Again!* And it's 1.5 or 2.5 instead of 2. The truth of the matter is: given our uncertainties and measurement challenges it is hard to consider such deviations as significant. So in retrospect, I think we should have given a little more thought to the issues, perhaps conveying more about the uncertainties and measurement challenges that actually exist. The way the ECB does it, which is 2 percent or just below, might be a better way. But it's an interesting conversation to have.

WILLIAMS: One thing I learned from reporters and other people is that if you give a range, they figure out very quickly on their iPhones what the midpoint of that range is.

PAUL TUCKER: An issue with the ECB's casting of its target is that it isn't clear whether the target is symmetric. The language suggests not, and I would say that this caused them difficulties, including political difficulties because: Why should unelected people decide whether the policy framework should be symmetric or asymmetric? There is a more general and deeper difficulty with a range rather than a point target, which is that in the deliberative discussion that Kevin wants to characterize monetary policy one cannot tell whether differences of view reflect different views on the outlook for the economy or different *personal* preferences about the steady-state rate of inflation. One can imagine circumstances where, in the dreadful expression, *the hawks* all appear to be in favor of 1 percent and *the doves* are all in favor of 2 percent, but none of them is actually revealing that. When the UK regime of central bank independence was being framed in 1997–98, we just wanted to take the objective off the table to avoid that kind of problem, as well as for the kind of democracy reasons that I was talking about earlier.

DAVID PAPELL: I want to expand a little bit on the Taylor rule and inflation targeting, maybe in the opposite direction. Suppose we

have inflation targeting. And then inflation goes up. It will happen sometime. We may have forgotten about that. But what happens when inflation goes up? If the Fed doesn't raise the nominal interest rate more than point-for-point, inflation is going to stay up. So to have inflation targeting, you have adopted the first Taylor principle. Now what happens if you have a higher output gap, or unemployment goes up, or unemployment goes down, and you think there's some relation there with inflation? Well, now you have the second part of the Taylor rule. And you have the inflation target, so you have the third part of the Taylor rule. So what you have left is how you want to define the equilibrium real interest rate. So what I'm suggesting is that operationally, there may not be much difference between serious inflation targeting and some variant of the Taylor rule. I think the difference is that, if the Fed picks the coefficients and says what it's going to focus on, then it's really a question of the reporting. It's really a question of how it's explaining what it's doing more than a huge dichotomy between inflation targeting and a Taylor rule. And I think part of it is, using the buzzword for the day, the clarity rather than the transparency.

MICHAEL BOSKIN: I wanted to just add a few things to those that have been raised, in the parts that I've been able to attend, on the border of monetary and fiscal economics. In the case of tax reform, you wind up basically with three laws. Some people are operating under the old one, some under the new ones, and some under transition rules. You've got to pay attention to how quickly all that can happen.

But I think there's some interesting follow-up on what Charlie had to say about a new accord between the Treasury and the Fed, and the time limits, and what you can buy, and all that. I think it's really important—I'll just give you an example. When we did the savings and loans and third world money bank center bailouts in the early 1990s, in the end, they turned out to be

good enough for government work. They weren't what we'd call necessarily textbook. But there were some principles embedded in them. The RTC (Resolution Trust Corporation) was set up to self-immolate. I was concerned about the risk it wouldn't, and so for that I got to co-lead the administration group that oversaw it. When we finally got them to sell the stuff in large blocks, rather than one at a time, it actually went quite smoothly. So I think the lesson there is there's at least an example of limited-time, orderly, rapid transition to private markets, etc. And I think you monetary economists might want to think a little bit about that, because these issues don't just arise in the monetary sphere.

On Brady bonds, we were getting a totally illiquid, in any sense of mark-to-market any time in the foreseeable future, close to worthless debt, because the Mexicans repudiated their debt and some of the other Latin American nations were about to. We created a liquid market in an alternative zero security, etc., and brokered agreements. So there were specific purposes. The reason I go into this is that in September of 2007, at a breakfast with Hank Paulson just before our corporate tax reform conference at the Treasury, I asked him what he was doing to get ready, if he needed to do any bailouts. And he just looked at me like it wasn't in his thinking. Then he asked me to go talk to Bob Steel, who was under secretary, and he at least took some notes, and I never heard from him again.

So I go through this because George mentioned the Treasury needs some authority, but the Treasury's going to need some expertise and some institutional procedure to be thinking about this across administrations. The treasury secretary comes and goes, and key officials come and go, more rapidly than they do at the Fed, by the way. You can argue whether the staffs change, too. You ought to think about actually how, if we did that, human beings would operate in this context. George has raised

an important point that you wouldn't think of in this context, which has moved to a very odd form of government, which [is that] we don't have a cabinet system much anymore. We have czars in the White House, people can't get confirmed, therefore we don't always get good people, and George, I don't want to put words in your mouth, but I've often heard you say, "There are actually good people in the agencies who have that system, but everybody's just reporting to some twenty-eight-year-old czar in the White House, and that can't work." So I would just ask you to think some more about that, because I would worry that we could do that, and in the next crisis, the Treasury would be unprepared.

So I just think there's precedent for it. We've had a successful time with a limited self-immolation strategy in the previous financial crisis. People tend to downplay it, but sized to today's economy, it was over a trillion dollars. So I think that's important.

I can't resist just saying, not only would you want to change it slowly, you'd also want to change it when we're measuring inflation differently, and have an understanding of what true inflation is. And a larger and larger fraction of the economy is becoming harder and harder to separate between nominal and real expenditures. On some of the biases that the commission I chaired pointed out, the BLS (Bureau of Labor Statistics) has changed some of its procedures, and its measured inflation is going up by half a percentage point slower than it would have otherwise. There's a lot of pressure to make some of the other recommendations. The PCE (personal consumption expenditure index) uses a Fisher Index, so you get some of the substitution bias reduced at the upper levels. But all the stuff on quality change and new products really is a perplexing problem, and 2 percent inflation as we measure it today is very unlike what

was being measured ten years ago. Over a quarter to a year, sure, but over years or a decade, probably not.

JOHN TAYLOR: A couple points on John Williams's thoughtful remarks. First, it's not inflation targeting versus rules-based strategy. As David was saying, you can find examples of inflation targeting countries which have a strategy to get there. And it works pretty well. You can find examples where there's an inflation target, or at least an implicit one, and the performance has not been so good, and I actually have to say, unfortunately that's the United States in recent years. Our performance over the last ten years is nothing to write home about: crisis, slow recovery, boom-bust. By way of comparison, both Greenspan and Volcker had a vaguer inflation target as Kevin was referring to. I think of it as about 1.5 percent, but they were not explicit numerically. But they also had kind of a strategy they were using. And you can document it with data and policy reaction functions, as best we can. And then somewhere around 2003 that strategy disappeared, or was changed, or something different happened, and the results have not been good. So I look at this experience and conclude that it's not just an inflation target. It's a strategy that goes with the inflation target. And even now it's worrisome that some of the very successful inflation targeting countries in emerging markets are, in effect, under a lot of pressure to do other things—macroprudential policy, even capital controls—going back to the bad old days before inflation targeting, when they were thinking about a million other things besides their inflation target. So that's worrisome.

Second, relating to the zero lower bound, it is very important, and—I thought our work showed this—that the interest rate instrument needs to be supplemented with a money growth instrument when you run into deflationary or hyper-inflationary situations—and in particular when you hit the zero bound.

Recall that early simulations with models were done with the zero bound in mind, usually setting the interest rate to 1 percent when the mathematical interest rate formula went below 1 percent. And it is certainly not inconsistent with an interest rate rule to use the "meta-rule" approach suggested by David Reifschneider and John Williams in their 1999 paper "Three Lessons for Monetary Policy in a Low Inflation Era," which seems to me very significant. So I think there are lots of ways to deal with this. It doesn't mean you throw out the whole ideas of rules or strategies for the instruments of monetary policy.

Also, there is now a debate about whether the zero bound is binding at all now. Why is the Fed still at zero, or between zero and 0.25 percent? There are lots of reasons why it already should be higher. It's a matter of choice of the central bank to be at that level. It's not necessarily a binding thing.

WILLIAMS: Can I respond briefly? I think, John, you're absolutely right, David's right, that in theory—this goes back to, I can't remember who made this point, maybe Mike made this point—that in rational expectations, where there's complete certainty, these all become, first of all, Mike Woodford and Ben McCallum and many people have shown these are all equivalent. Now we're just into semantics. So I think that this goes back to a question I raised with Carl's paper. It came up with a number of comments. What's the problem we're trying to solve? And that's what Carl's paper was really about. Let me try to specify what's the problem we're really dealing with. Is it a problem that the central bank has the wrong objective function? Is the problem that the central bank is not pursuing its own goals? Is the problem that the central bank is overly confident in its own ability to predict the future? So I think that we do have this problem that under the standard assumptions of our textbook models, none of these issues arise and this is a pointless conversation. We should go straight to the reception, because it's all the same

rationalization expectations equilibrium. [Laughter.] Now that may well be optimal! But when I was thinking about this and reading everybody's reviews, what is the problem? Not just specifically today, but what was the problem that inflation targeting central banks of Canada, New Zealand, the United Kingdom, what were they trying to solve? And I think that in some of these cases, it was a very different problem, and they came to different solutions. And when I talk to my friends at the Bank of England over the years—I'll just mention Spencer Dale, because he was the one I used to have the lengthiest discussions with, and he said, "The main goal of monetary policy is to stabilize inflation and thereby create a solid nominal anchor, and the way you do that is you talk constantly, every day, 24/7, about inflation. You never talk about anything else. God forbid," he said, "you don't talk about your interest rate paths, or anything like that, you just focus on inflation. And once you've solved that kind of communication uncertainty/imperfect knowledge problem, you basically accomplish what a central bank can do." I'm not saying that he's necessarily right. But it is a different view of what the problem is, and what the right solution is, and I just think it's something to keep in mind when we have these discussions. And I agree 100 percent that being at a lower bound is a decision. You can't just say, "We're at the zero lower bound, therefore, the zero lower bound is a problem," because then we'll always be at the zero lower bound. [Laughter.]

PETER FISHER: John Taylor zeroed in on the idea that something changed in 2003. Having been in the asset management business for most years since then and, in my view, that's when the Federal Open Market Committee started targeting asset prices . . . no, they didn't say it as clearly then, although there was some verbiage in the early period. But Ben Bernanke's speeches, when he became chairman, are littered with asset prices, asset prices, asset prices. I think that's the conundrum the committee

is in now: When do you stop targeting asset prices? The exit isn't about engineering the Fed funds market. That's a trivial issue. The effort is, once you've been targeting asset prices for seven years or longer, how do you stop? I think that's what is changing.

Now, to change gears a little bit, I wrote the legal brief that defended the constitutionality of the Federal Open Market Committee in the 1980s, when we actually got to Judge Harold Greene to uphold the constitutionality of the Reserve Bank presidents' seats on the FOMC. So, I've defended the constitutionality of Reserve Bank presidents. That's a different question from whether it's a wise thing to continue to defend. And there are plenty of central banks around the world that are independent of government, in which all the officials are appointed by the government. And I think that this is just something that has outlived its utility. The presidents of the Reserve Banks being appointed by their regional boards is something that's causing much more trouble than it's worth. That's a conclusion I've come to reluctantly.

I think they can be appointed by the US president. There's different ways to be appointed by government. I was appointed by the chancellor of the exchequer to the board of the FSA (Financial Services Authority); I never met the chancellor. I think I was pretty independent of the government. Technically, I was appointed by her majesty's government. But there's regulatory capture happening all over the regulatory apparatus in America that has nothing to do with the Reserve Bank presidents and it's time we removed this distraction.

TUCKER: Can I ask a question about this? There are two stages to this argument about the position of the regional Fed presidents. One is whether or not they should be appointed by elected representatives of the people. That's the debate we had earlier. If the national consensus on that question were to be "yes," then the

second issue is whether the appointments should be made by a federal elected official, the president, subject to confirmation by the federal-level Senate or whether, alternatively, the appointments should be made by state-level elected representatives. I have been a bit surprised that that doesn't come up, given attitudes around the US to Washington government and politics and given the regional base of the various Fed presidents. In a nutshell, and truly without taking a substantive position, I'm struck that you're saying, "Make this all a Washington thing."

PETER FISHER: I'll be open-minded over whether we can come up with some other construct. But I think the days of having Reserve Bank presidents appointed by the boards of directors are over. The political cost of holding onto this vestige of independence is not worth the candle. The United States Senate is a pretty good representative of the country as a whole. And having the Senate confirm Reserve Bank presidents would be better than where we are.

ROBERT HODRICK: Monetary policy, as we've talked about it today, works through the interest rate and perhaps asset prices, and one of the chief asset prices that we haven't mentioned very much is the exchange rate. I was wondering to what extent we need to think about international coordination of monetary policy, and the fact that if we're following a Taylor rule that is just focusing on domestic inflation and the output gap, and other countries are running massive inflation, our currency is going to be massively appreciating and that's going to disadvantage our exporters and be good for the consumers and importers. Is that something we should be concerned about in designing appropriate monetary policy rules?

ANDREW LEVIN: I really like the speech that John Williams gave recently about policy rules. But as John Taylor has emphasized, there can't just be longer-run goals. There has to be a coherent policy strategy. And monetary policy is fundamentally a

quantitative problem, which means that a strategy actually translates into what we would call a reaction function. That's all there is. We can use a model for the US economy, similar to the Totem model in Canada or the N.E.M.O. model in Norway; those models all seem to have fancy names. [Laughter.] And you can formulate a specific strategy using a model like that. Most inflation targeting central banks are effectively doing inflation forecast targeting, where they use a model with some judgmental adjustments and say, "With this policy path, we will get this trajectory for inflation and economic activity." But those models are essentially black boxes that are very difficult to explain to the public. Furthermore, the models oftentimes are simply wrong. In fact, you saw that in the charts that I showed earlier. Year after year for the past few years, those models—not just of the Fed, but professional forecasters' models—have been consistently wrong. And so my plea would be to say, we can do better in monetary policy by not just relying on models but also looking at benchmark rules. And I hope that's the spirit of this workshop: that it would be beneficial to bring benchmark rules into monetary policy discussions and into the FOMC's deliberations and communications, and not just rely on black boxes.

JOHN COCHRANE: I sense it's time to close. I want to close this conference with a short, cheery comment. Interest rates are zero, which Milton Friedman taught us was the optimal quantity of money. [Laughter.] Why are you laughing? He was exactly right.

Inflation is 1.5 percent and trending down, despite the Fed's best efforts. Congress asked for "price stability," and looks like we're getting it. What's to complain about that? Unemployment is back to normal. Growth is too slow, and employment is too low, but everyone concedes that the Fed can't do anything about long-term growth and structural problems.

Things could be a lot worse. Our benign situation doesn't mean what we've done today is useless. It means we have a little breathing space, time to get monetary policy right before the next crisis.

GEORGE SHULTZ: Welcome to California.

[Laughter.]

REFERENCES

Bank of England. 2015. "Letter from the Governor of the Bank of England to the Chancellor of the Exchequer, February 12, 2015," https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/403346/Letter_from_the_Chancellor_to_the_Governor_12022015.pdf.

Bernanke, Ben S., Thomas Laubach, Frederic S. Mishkin, and Adam S. Posen. 1999. *Inflation Targeting: Lessons from the International Experience.* Princeton, NJ: Princeton University Press.

Bernanke, Ben S., and Frederic S. Mishkin. 1997. "Inflation Targeting: A New Framework for Monetary Policy?" *Journal of Economic Perspectives* 11, no. 2 (Spring): 97–116.

Board of Governors of the Federal Reserve System. 2009. "Monetary Policy Alternatives," June 18: 37, http://www.federalreserve.gov/monetarypolicy/files/FOMC20090624bluebook20090618.pdf.

Board of Governors of the Federal Reserve System. 2015. "Statement on Longer-Run Goals and Monetary Policy Strategy." Adopted January 24, 2012, amended January 27, 2015, http://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf.

Bryant, Ralph C., Peter Hooper, and Catherine L. Mann. 1993. *Evaluating Policy Regimes: New Research in Empirical Macroeconomics.* Washington, DC: Brookings Institution.

Eichengreen, Barry. 1992. *Golden Fetters: The Gold Standard and the Great Depression, 1919–1939*. New York: Oxford University Press.

Federal Reserve Accountability and Transparency Act of 2014, H.R. 5018, 113th Cong., https://www.congress.gov/bill/113th-congress/house-bill/5018.

Federal Reserve Reform Act of 1977. Pub. L. No. 95–188, 91 Stat. 1387, http://www.gpo.gov/fdsys/pkg/STATUTE-91/pdf/STATUTE-91-Pg1387.pdf.

Friedman, Milton. 1960. *A Program for Monetary Stability.* New York: Fordham University Press.

Full Employment and Balanced Growth Act of 1978, Pub. L. No. 95–523, 92 Stat. 1887, http://www.gpo.gov/fdsys/pkg/STATUTE-92/pdf/STATUTE-92-Pg1887.pdf.

Kuttner, Kenneth N. 2004. "A Snapshot of Inflation Targeting in its Adolescence." In *The Future of Inflation Targeting.* Edited by Christopher Kent and Simon Guttmann. Sydney: Reserve Bank of Australia: 6–42, http://www.rba.gov.au/publications/confs/2004/pdf/kuttner.pdf.

Laubach, Thomas, and John C. Williams. 2003. "Measuring the Natural Rate of Interest." *Review of Economics and Statistics* 85, no. 4: 1063–1070, http://www.mitpressjournals.org/doi/pdf/10.1162/003465303772815934.

Leiderman, Leonardo, and Lars E.O. Svensson, eds. 1995. *Inflation Targets.* London: Centre for Economic Policy Research.

Levin, Andrew T., Alexei Onatski, John C. Williams, and Noah Williams. 2006. "Monetary Policy under Uncertainty in Micro-founded Macroeconomic Models." *NBER Macroeconomics Annual 2005, vol. 20.* Cambridge, MA: MIT Press: 229–287.

Levin, Andrew T., Volker Wieland, and John C. Williams. 1999. "Robustness of Simple Monetary Policy Rules under Model Uncertainty." In *Monetary Policy Rules.* Edited by John Taylor. Chicago: University of Chicago Press: 263–299.

Levin, Andrew T., Volker Wieland, and John C. Williams. 2003. "The Performance of Forecast-Based Monetary Policy Rules under Model Uncertainty." *American Economic Review* 93, no. 3 (June): 622–645.

Norges Bank. 2014. *Monetary Policy Report with Financial Stability Assessment*. Oslo, September, http://static.norges-bank.no/pages/101366/monetary_policy_report_3_14.pdf.

Orphanides, Athanasios, and John C. Williams. 2002. "Robust Monetary Policy Rules with Unknown Natural Rates." *Brookings Papers on Economic Activity* 33, no. 2: 63–145.

Orphanides, Athanasios, and John C. Williams. 2006. "Monetary Policy with Imperfect Knowledge." *Journal of the European Economic Association* 4, no. 2–3 (April/May): 366–375.

Poole, William. 1970. "Optimal Choice of Monetary Policy Instruments in a Simple Stochastic Macro Model." *The Quarterly Journal of Economics* 84, no. 2 (May): 197–216.

Reifschneider, David, and John C. Williams. 2000. "Three Lessons for Monetary Policy in a Low-Inflation Era." *Journal of Money, Credit, & Banking* 32, no. 4: 936–966.

Rudebusch, Glenn D. 2009. "The Fed's Monetary Policy Response to the Current Crisis." *FRBSF Economic Letter* 2009–17 (May 22), http://www.frbsf.org/economic-research/publications/economic-letter/2009/may/fed-monetary-policy-crisis/.

Taylor, John B. 1993. "Discretion versus Policy Rules in Practice." *Carnegie-Rochester Conference Series on Public Policy* 39, no. 1 (December): 195–214.

Taylor, John B., and John C. Williams. 2011. "Simple and Robust Rules for Monetary Policy." In *Handbook of Monetary Economics,* vol. 3B. Edited by Benjamin Friedman and Michael Woodford. Amsterdam: North-Holland: 829–860.

Williams, John C. 2009. "Heeding Daedalus: Optimal Inflation and the Zero Lower Bound." *Brookings Papers on Economic Activity*, Fall: 1–37.

Williams, John C. 2014a. "Inflation Targeting and the Global Financial Crisis: Successes and Challenges." Presentation to the South African Reserve Bank Conference on "Fourteen Years of Inflation Targeting in South Africa and the Challenge of a Changing Mandate." Pretoria, South Africa, October 31, http://www.frbsf.org/our-district/press/presidents-speeches/williams-speeches/2014/october/inflation-targeting-global-financial-crisis/.

Williams, John C. 2014b. "Monetary Policy at the Zero Lower Bound: Putting Theory into Practice." Working paper, Hutchins Center on Fiscal & Monetary Policy, Brookings Institution, January 16, http://www

.brookings.edu/~/media/research/files/papers/2014/01/16-monetary-policy-zero-lower-bound/16-monetary-policy-zero-lower-bound-williams.

Williams, John C. 2014c. "Policy Rules in Practice." *Journal of Economic Dynamics and Control* 49 (December): 151–153.

Williams, John C. 2015. "The Decline in the Natural Rate of Interest." Manuscript. March 2. http://www.frbsf.org/economic-research/economists/jwilliams/Williams_NABE_2015_natural_rate_FRBSF.pdf.