# STRATEGIES *for* MONETARY POLICY

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CHAPTER TWELVE

# Improving Our Monetary Policy Strategy

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The Federal Open Market Committee (FOMC) currently uses what has been called a flexible inflation-targeting framework to set monetary policy. It is briefly described in the FOMC's statement on longer-run goals and monetary policy strategy.[1] In my view, this framework has served the FOMC well in effectively promoting our policy goals. A milestone was reached in January 2012 when the United States adopted an explicit numerical inflation goal. Careful analysis and discussions helped the FOMC reach a consensus on the explicit 2 percent goal and the statement that describes the FOMC's approach to setting policy to promote its congressionally mandated goals of price stability and maximum employment.

The FOMC is currently reviewing its policy framework. I am very supportive of this initiative. As a matter of good governance, a central bank should periodically review its assumptions, methods, and models, and to inform its evaluation, it should seek a wide range of perspectives, including those from experts in academia, the private sector, and other central banks. Another motivation to undertake the review now is that the postcrisis economic environment is expected to differ in some important ways from the precrisis world. Based on the aging of the population and the

1. See FOMC (2019b).

The views presented here are the author's own and are not necessarily shared by fellow panelists, other colleagues on the Federal Open Market Committee, or the Federal Reserve System.

expected slowdown in population growth, higher demand for safe assets, and other factors, many economists anticipate that the longer-term equilibrium real interest rate will remain lower than in past decades.[2] In fact, empirical estimates of the equilibrium real fed funds rate, so-called $r^*$, while highly uncertain, are generally lower than in the past.[3] This means there is a higher chance that the policy rate will be constrained by the zero lower bound and that nontraditional monetary policy tools will need to be used more often. To the extent that these tools are less effective than the traditional interest rate tool or are otherwise constrained, the potential is for longer recessions and longer bouts of inflation well below target.[4] In addition, fiscal policy's ability to buffer against macroeconomic shocks is likely to be constrained, given projected large fiscal deficits and high government debt-to-GDP ratios.[5] This raises the question of whether changes to our monetary policy framework would be helpful in maintaining macroeconomic stability in this environment.

A number of suggestions have been made for alternative monetary policy frameworks that potentially offer some benefits in a low-interest-rate environment. These include setting an inflation target that is higher than 2 percent (an option not being considered by the FOMC in its framework review), using price-level targeting or nominal GDP targeting instead of inflation targeting, targeting average inflation over the business cycle or some other time frame, or using what former chair Ben Bernanke has called temporary price-level targeting (which is essentially doing inflation targeting in normal times and price-level targeting once the policy rate is

2. See Mester (2018a).

3. For FOMC projections, see FOMC (2014) and FOMC (2019a). For a review of the literature on the equilibrium interest rate, see Hamilton et al. (2015).

4. Other government policies might also be brought to bear to increase the long-term growth rate and equilibrium interest rate, which would give monetary policy more room to act. Such policies would focus on increasing productivity growth and labor force growth.

5. See Peek, Rosengren, and Tootell (2018).

constrained by the zero lower bound). An idea that has received somewhat less attention is defining the inflation goal in terms of a range centered on 2 percent rather than a point target.[6] Although these alternative frameworks have theoretical appeal, none of them is without implementation challenges. For example, many of them work well in models of perfect credibility and commitment, where the public understands the framework and believes future committees will follow through, and the committee actually does follow through, implying that the committee has control of inflation expectations. Whether these assumptions would hold in practice is an open question. One needs to ask whether it is credible for policy makers to commit to keep interest rates low to make up for past shortfalls of inflation from target even when demand is growing strongly or to act to bring inflation down in the face of a supply shock by tightening policy even in the face of weak demand. It is not clear what actually would happen to inflation expectations in these scenarios despite what is assumed in the models. So the FOMC is going to have to evaluate the assumptions that drive the theoretical appeal of each framework and determine whether in practice the net benefits of any of the alternatives will outweigh those of the flexible inflation-targeting framework, and if not, what, if any, enhancements should be made to our current framework.

Regardless of the framework the FOMC ultimately decides on, the public's expectations about future monetary policy are an important part of the transmission mechanism of policy to the economy. This means effective communication will be an essential component of the framework. I believe there are ways we can enhance our communications about our policy approach that would make any framework more effective. Let me touch on three.

6. For further discussion of these monetary policy frameworks, see Mester (2018b) and Mester (2018c).

## 1. CLARIFY HOW MONETARY POLICY AFFECTS THE ECONOMY AND WHICH ASPECTS OF THE ECONOMY CAN BE INFLUENCED BY MONETARY POLICY AND WHICH ASPECTS CANNOT.

Monetary policy is more effective when the public's and market participants' policy expectations are aligned with our policy decisions. Before this alignment can occur, the public needs to have a basic understanding of our monetary policy goals and what monetary policy can achieve and what it cannot. My concern is that this understanding has diminished since the Great Recession. Regardless of the framework, the FOMC's strategy document should articulate the relationship between monetary policy and our two policy goals of price stability and maximum employment. We should clarify that over the longer run, monetary policy can affect only inflation and not the underlying real structural aspects of the economy such as the long-run natural rate of unemployment or maximum employment. Although this concept is touched on in our current monetary policy strategy document, I do not think that the public fully understands. Indeed, former chair Janet Yellen had to explain in one of her post–FOMC meeting press conferences that in an earlier speech, she did not mean to imply that she favored running a high-pressure economy as an experiment to affect longer-run growth and unemployment.[7]

I think we could do a better job of explaining how monetary policy promotes the economy's growing at potential and operating at maximum employment. In particular, we tend to move our policy rate up when resource utilization tightens and down when resource utilization eases in order to bring our policy rate into alignment with the economy's natural rate of interest, which changes over the business cycle as the economy adjusts to shocks. There doesn't need

7. See Yellen (2016, 9).

to be an exploitable Phillips curve trade-off between the unemployment rate and the inflation rate in order for policy makers to want to respond to changes in the unemployment rate, an indicator of resource utilization.[8] The response is not an attempt to actively use monetary policy to affect the longer-run growth rate of the economy or the longer-run unemployment rate. A benefit of explaining things in this way is that it makes it clear that the FOMC is not trying to rob the economy of jobs when it raises interest rates. Another benefit is that it should allay concerns that because the empirical Phillips curve has flattened, monetary policy has become anemic.

Improving the public's understanding of how monetary policy works and what it can achieve would help not only in normal times but also in bad times. The Great Recession was an enormous negative shock, some part of which was likely permanent or very persistent rather than transitory. Monetary policy should not have been expected to make up for that permanent loss. Fiscal policy should have taken on a larger part of the burden.

## 2. CLARIFY HOW UNCERTAINTY IS ACCOUNTED FOR IN MONETARY POLICY MAKING AND INCORPORATE THIS UNCERTAINTY INTO MONETARY POLICY STRATEGY TO AVOID GIVING A FALSE SENSE OF PRECISION.

According to Voltaire, "Uncertainty is an uncomfortable position, but certainty is an absurd one." In our context, this means it is important to convey that monetary policy makers have to deal with uncertainty in several forms. Monetary policy has to be forward looking because it affects the economy with a lag, but the economy is buffeted by shocks that can lead economic conditions to evolve

8. Brainard (2018) discusses the shorter-run neutral rate and longer-run equilibrium interest rate.

differently than anticipated. Moreover, our view of economic conditions in real time can be cloudy because the data come in with a lag and many economic data are revised over time. In addition, there is model uncertainty.

The public needs to understand that given the lags and revisions in the data, incoming information can alter not only the policy maker's view of the expected future evolution of the economy but also his or her understanding of current and past economic conditions. New information could alter the expected future path of policy and might even result in ex post regret of a recent action. Robert Hetzel says that policy making has a flavor of "guess and correct."[9] It is a normal part of monetary policy making that policy makers will always be learning about whether their policy settings are the appropriate ones to promote their goals.

The public has to hold the FOMC accountable for its performance, but it should not hold monetary policy makers to an unrealistic standard. The FOMC took an important step in communicating uncertainty when it began showing 70 percent uncertainty bands around the median projections of FOMC participants, but these are not emphasized. I think they deserve more attention and should be released at the time of the post-FOMC press conference. They are a good illustration of the reasonable amount of deviation to expect between the projections and the outcomes. Some have argued that the FOMC's projections of appropriate monetary policy, the so-called dot plot, should be dropped because actual policy can differ from the projections. I think that would be a mistake. The dots can change over time because of economic developments, but that's a design feature, not a flaw. Omitting the dot plot would not eliminate the uncertainty around the projections, the divergence in views across FOMC participants, or the fact that policy making always entails learning and recalibration, but it would be a significant step back in transparency.

9. See Hetzel (2019).

We need to recognize uncertainty in our broader monetary policy strategy as well. Consider the FOMC's inflation target. After much deliberation, the committee chose a point target instead of a range and a total inflation measure rather than a core measure. Although there were arguments on both sides, the committee was persuaded that a point target would better anchor inflation expectations. Implicit in the choice was that the committee would tolerate small deviations from target given the precision with which we can measure inflation, the precision with which we can guide the economy, and the typical revisions to the personal consumption expenditures (PCE) inflation measures, which tend to be revised up over time.[10] It is interesting to think through whether our policy choices or communications since 2012 might have differed had the committee opted for a range rather than a point target, as some other central banks do, and for a core measure rather than a total measure of inflation. These data revisions and measurement issues, as well as potential difficulties in maintaining anchored inflation expectations during the periods of higher inflation meant to make up for periods of lower inflation, and vice versa, would seem to be amplified in price-level targeting and nominal GDP targeting frameworks.

## 3. CLARIFY OUR MONETARY POLICY STRATEGY BY TAKING A MORE SYSTEMATIC APPROACH TO OUR POLICY DECISIONS AND IN HOW WE COMMUNICATE THOSE DECISIONS.

Households, businesses, and investors make economic and financial decisions based on their expectations of the future, including the future course of monetary policy, and the FOMC strives to avoid surprising the public with its policy decisions. The communications

10. Croushore (2019) finds that the average revision from initial release to first annual benchmark revision to four-quarter PCE inflation over the period 1965Q3 to 2015Q4 was 0.10 percentage point and the average revision to four-quarter core PCE inflation over the period 1995Q3 to 2015Q4 was 0.14 percentage point.

challenge for the FOMC is to give the public a good sense of how policy is likely to respond *conditional* on how the economy evolves without implying that policy is precommitted to a particular policy path *regardless* of how the economy evolves. Essentially, the FOMC needs to convey the strategy it uses to determine its policy actions over time to promote achievement of its policy goals, that is, its reaction function. And this will be true regardless of which monetary policy framework the FOMC ultimately adopts. Ironically, the FOMC's strategy document does not offer much in the way of strategy, and this can lead to a misunderstanding that our policy decisions are discretionary. The term "data-dependent" has been used to explain the FOMC's policy-making strategy, but this term could be potentially misinterpreted as suggesting that policy will react to every short-run change in the data rather than the accumulation of changes that affect the medium-run outlook.

A more systematic approach to setting monetary policy can better align the public's policy expectations with policy decisions and help to reduce some of the uncertainty around how we conduct monetary policy. It can help insulate monetary policy from short-run political considerations, and it can also offer more policy continuity over time as committee members change. In a time of rising public skepticism about "experts," which can undermine public trust in institutions, being systematic will help the public understand how our decisions are actually made, which can enhance the Fed's credibility.

The question is how to ensure that we are setting policy systematically and how to convey this to the public. I have three suggestions. First, although judgment will likely always be a part of policy making, simple monetary policy rules can play a more prominent role in our policy deliberations and communications.[11] The FOMC

11. The Cleveland Fed provides updates for a set of monetary policy rules and their outcomes across several forecasts on the Cleveland Fed's website, and the Federal Reserve Board's *Monetary Policy Report* now includes a section on policy rules. See Federal Reserve Bank of Cleveland (March 22, 2019).

has been reluctant to relinquish policy making to following a simple rule, because no one rule works well enough across a variety of economic models and circumstances. But the Board of Governors has begun to include a discussion of rules as benchmarks in the *Monetary Policy Report,*[12] and frameworks that try to build in some commitments and constraints on future policy actions, such as price-level targeting, average inflation targeting, and nominal GDP targeting, are being discussed. This suggests that systematic policy making is garnering more support. As a first step, selecting a few benchmark rules that have been shown to yield good economic outcomes and using these as reference points to aid policy discussions and communicating why our policy may or may not differ from the rules' policy descriptions could go some way in ensuring that our decisions are derived in a systematic way and could help us explain our own policy reaction function to the public.

A second suggestion is to enhance our own FOMC projections by asking the participants to provide a set of economic projections conditioned on a common policy path, in addition to the current projections, which are conditioned on each individual participant's view of appropriate policy. This common path might come from a policy rule. This would be a step toward achieving a coherent consensus FOMC forecast, which has been a challenge but which could serve as the benchmark for understanding the FOMC's policy actions and post-meeting statements, a recommendation I have made in the past.[13]

My third suggestion to help communicate systematic policy making is to make our post-meeting FOMC statement consistent from meeting to meeting and less focused on short-term changes

12. See Board of Governors (2019, 36–39).

13. See Mester (2016). Hetzel (2019) also proposes a method to determine an FOMC consensus forecast that would entail the committee's agreeing to its preferred reaction function at the start of each year, and then using an iterative process among FOMC members based on that rule and the board staff's economic model.

in the data released between FOMC meetings and more focused on the medium-run outlook and a consistent set of indicators on inflation, inflation expectations, the unemployment rate, employment growth, output growth, and financial conditions. Each statement could provide the rationale for the policy decision in terms of how accumulated changes in this consistent set of economic and financial conditions have or have not influenced the committee's assessment of the factors relevant for policy, that is, the arguments in our reaction function. The statement would also consistently articulate the committee's assessment of risks to the outlook and other considerations that the committee is taking into account in determining current and future policy. This assessment would be informed by the analysis of alternative forecast scenarios, which are discussed at each FOMC meeting. If we provided more consistency about the conditions we systematically assess in calibrating the stance of policy, the public and market participants would get a better sense of the FOMC's reaction function over time, and their policy expectations would better align with those of policy makers.

I note that all of the suggestions I have made today are relevant regardless of the framework the FOMC ultimately decides to use for setting monetary policy.

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## GENERAL DISCUSSION

ANDY LEVIN: Wow. It's a really awesome panel. Thank you, all of you, for your comments and explanations. Two quick comments. First, about earning credibility. Mike Bordo and Chris Erceg and I have a paper that we wrote a long time ago about this. We were looking at the Volcker disinflation and other disinflations, and our conclusion was that the central bank needs to be tough up front to prove it's serious about bringing down inflation, and then it gradually gains credibility. What I worry about is that these makeup strategies rely solely on promises about future policy actions, and there is no way to gain credibility up front, because you're stuck at the zero bound and you can't gain credibility until much later. And I was thinking about this quote: He who hesitates is lost. If the public doesn't believe the commitment while you're at the zero bound, then you don't want to carry it through later, because it was pointless. You didn't get any gain. Why would you do that? And so there's an equilibrium here where they know that, you know they know that, and so the whole thing kind of seems very fragile. And I think Mary mentioned earlier that she's a bit worried or concerned. And I would definitely lose sleep at night worrying that this fragile strategy is the one that the US economy would depend on in a severe adverse scenario.

Of course, that was a statement, but I'd really like to hear your responses to it. Now let me ask a real question. This morning, when we were talking about negative interest rates, Mike made the point that usually what happens is small central banks try things first. For example, in the case of inflation targeting, it was a long, long time before the FOMC [Federal Open Market Committee] was comfortable doing it. And we think, oh, maybe that's what'll happen with digital cash. By contrast, nominal GDP targeting and average-inflation targeting are totally untried and untested strategies, particularly at the zero bound. And so, given that the FOMC is usually so cautious, I honestly don't understand why the FOMC seems so much more willing to take a totally untried and untested strategy, where other innovative approaches seem to be completely off the table?

JIM BULLARD: I agree that you'd be a world leader. You'd be taking the world's top economy and experimenting with a new strategy. You'd want to be really careful about doing that. That was also my argument earlier about why I really don't want the United States to be the first country to move off the 2 percent international standard on inflation targeting. It took decades to get that consensus and you would unleash chaos in global foreign exchange markets, I think, if you did this. I totally agree with you. We should show the same willingness to think about electronic cash. I think there's more going on in the Fed maybe than you appreciate. People are thinking about this. But like nominal GDP targeting, they're not ready to commit to it.

MARY DALY: I'll just add one thing. John Williams, Jim, and I and many others are thinking about these things. That's what we should be doing. That's very different from choosing to change the operating framework. And that's why the bar is high. I don't think all those things are contradictory. Discussing and debating is what we should be doing.

JOHN COCHRANE: Thanks. So, all of these strategies are ways of implementing forward guidance. They rely on the idea that expectations far in the future have stimulative effects today. But that seems quite unbelievable. If you promise lower for longer, then a Fed chair has to go to Congress and say, "Look, I know that the short-term rate should be *5%* today, looking at the economy today, but I'm going to keep it at zero for the next year, because I promised three years ago that's what I was going to do in order to stimulate demand back then. So, I'm making good on my promises, even though it's not the right thing for the economy today and will lead to too much inflation." That would be tough. Would anyone believe the Fed would do such a thing? And if not, what good are lower-for-longer promises and speeches?

The Fed had a chance, in fact. There was a long period of talking about lower for longer and forward guidance. And then, starting a couple years ago, the Fed was quite slow to raise rates and got a lot of heat for that. Nobody went to Congress and said, "We're deliberately holding rates lower than they should be, because we want to make good on those forward guidance projects." The chance to build some credibility was lost.

Now let me turn that positive. I think, in response to Andy, there is a way to do it, which is to gain your reputation on the other side—by sticking to a price-level target in the face of too much inflation, not just too little. If inflation goes above target, the Fed can get some reputation by saying it will not just bring inflation back to where it was, but it will run too low inflation for a while to bring the price level back. Getting people to believe one-sided promises is twice as hard.

In that regard, I think Loretta's idea that we're going to make these ideas into a strategy with lots of judgment is not going to work. To tie yourself to the mast this way, you're going to really have to tie yourself to the mast and be much more tied to the rule than you would otherwise want to be. If you use a lot of judgment, fine, but nobody will believe promises that in the future you will deviate from, well, using lots of judgment. It's the only way ex-post to go before Congress and say, "We're holding rates deliberately low even though inflation's increasing," and therefore to get people to believe you'll do that ex-ante. You have to kind of make this policy much more mechanical than you otherwise would. If you don't want to do that for lots of good reasons, then forward guidance is never going to be effective.

MICHAEL BORDO: This comment is for Mary and Robert. About fifteen years ago I wrote some papers on deflation. I did one with

Andy Filardo and some other people. We distinguished between good versus bad deflation. Good meant productivity driven and bad meant collapses in aggregate demand. What we found was that over one hundred fifty years and twenty countries, there were a lot of episodes of good deflation, and they lasted for a really long time. And so, if that's the case, we may be going into one of those situations now. In that case, how does this affect your strategy? It seems like inflation targeting, as we are using right now, really isn't going to work. Maybe we should be following a price-level target, and this just seems like it is not something that should be forgotten.

ROBERT KAPLAN: The reason I've stubbornly raised this third possibility now for more than three years is that I think something structural is going on in the economy. The problem is, it doesn't easily lend itself to academic research. But I can tell, having been in business for a long time and having talked to companies, the economy is going through fundamental, structural change involving technology, technology-enabled disruption, and, to a lesser extent, globalization. And so I don't have the answer to your question, but I want to raise it because it's a third explanation that we have to think about and it will affect how we think about the framework.

And to your last comment—so, then, why aren't we seeing more productivity improvement as a result of these structural changes? That's one of the questions. Why aren't we seeing more productivity improvement? It's one of the questions we've been doing a lot of work on at the Dallas Fed. We don't have all of the answers, but we're trying to think through these questions. We're having a conference, by the way, on this in May—our second one—just to invite the community to consider these questions.

At the Dallas Fed, we believe that productivity is connected to the issue of the adaptability of our human capital. This issue of human capital and adaptability of human capital—it's not the first time in our history we've dealt with it. We believe that workers with a high school education or less are on the receiving end of the effects of these structural changes, as opposed to benefiting from them. I think that is crucial. We believe that the benefits of these trends are being unevenly shared, which may be why you're seeing more uneven productivity results as a consequence of technology. It may also explain the issue of greater income inequality. But we don't have all of the answers. We're asking the questions. And we plan to continue to dig in, and we want to invite the rest of the research community to help us and see if others have good ideas on how to understand and think about these issues.

BILL NELSON: I think this question is for President Daly, but I'd be interested in anyone's views. So, I look out there and I see two-sided risks. I also worry about the fact that, you know, inflation could get anchored on the bad side of two, and the zero lower bound looks kind of close. But at the same time, I worry that historical relationships could reassert themselves. Inflation could start moving up. The Fed could find itself on the accommodative side of $r^*$, and a flat yield curve, and a flat Phillips curve. Isn't there a risk if the Fed is responding to an average of inflation that it gets behind the curve? I mean, so, it's moving up slowly, because it's responding to average inflation. Meanwhile, real interest rates move down, because expected inflation has gone up, pushing the unemployment rate the wrong way on a Phillips curve whose intercept has also moved up, because expected inflation is higher. I am concerned that adopting an averaging mechanism will put us back in the old days of the Fed getting behind the curve, overreacting, and adding to business cycle variability.

DALY: That's a great question. Let me start by saying that the discussion I had today is in the context of a broader set of work that many here have done. We just had a monetary policy forum in New York where we talked about this. Is the Phillips curve dead or just hibernating? That was the title of the paper. But I think the even deeper work is, does it have these nonlinearities that surprise us? Or can we see them coming? So if you have a gradual increase in inflation, that's a very different problem than if you're going steadily along at your target and then suddenly have sharp increases, which is when you would worry that you're going to get behind the curve. In average-inflation targeting, if you're using six quarters or three years, you don't have the potential problems associated with averaging over ten years, where you could really get behind the curve and have volatile cyclical swings that we don't offset because we are committed to this long average. It's more heartening that the window length can be short. That you don't have to go to something like full price-level targeting, where you have a full makeup strategy, because then those things do become more prominent. I guess the main thing I want to say is you can't adopt any framework without assessing both sides of the risks. Right now, the prominent risk I focused on is the one we've been talking about a lot. We've got low $r^*$, slow growth, and low inflation. That's something we're not used to. But we also have to keep studying what happens in our economy when it really heats up. And we just don't have a lot of evidence that charts nonlinearities either in the aggregate data or even in the MSA data, where we have many more experiences of super-hot economies.

ANDY FILARDO: So, I agree that it's really great that the Fed is now regularly reviewing its monetary policy framework. And I appreciate the efforts to try to squeeze a little more performance out of a flexible inflation-targeting regime. However, I'm not sure, based on what I saw today, that there's a clear, urgent case for change. In other words, I don't see compelling evidence of having cleared the high bar that Mary talked about.

My question is about whether the strategies being discussed today are the most urgent now that the shadow of the great financial crisis has largely faded. When many of us heard that the Fed was going to do a strategic review, we thought that it would reflect on some lessons from the past decade about how monetary policy could better address big problems, such as financial crises. I don't think that any of the strategies discussed today would help to prevent a future crisis.

So that leads me to dig into the motivation of the review and the issue of crises. Do you think that monetary policy played a role in the run-up to the global financial crisis? One possibility is that the crisis represented a big one-off shock that came out of nowhere. If so, there is a logic to just focusing on refining the flexible inflation-targeting strategy. Another possibility is that the role of monetary policy in the crisis is still too difficult and early to deal with, and this monetary policy question about how to address crises will be saved for a later date. I also wonder how the Fed's review might fit into the current discussions happening in other venues about moving on to other types of monetary policy frameworks that look at flexible inflation targeting, macro-prudential policies, and the external environment, such as the IMF's [International Monetary Fund's] new focus on integrated monetary policy frameworks.

BULLARD: I can talk about that. I think the "company line" is that in the United States we passed the Dodd-Frank Act, we increased capital requirements a lot for banks, and we put on other types of regulation. That was appropriate, because you don't want to try to react to that with monetary policy. I think there's a fundamental problem on the horizon, or maybe with us today, which is the potential collapse of inflation expectations down to zero. I think that has happened in Japan, and it's been very hard to get off that. It looks like it's happening in Europe and it looks like it's going to be very difficult for them as well. So, I see this discussion as being very relevant to not allowing inflation expectations in the United States to follow in the path of Japan or Europe, and I see that as very much related to the framework discussion.

MESTER: Let me just add that at the upcoming conference at the Federal Reserve Bank of Chicago, there will be a discussion of financial stability and how that relates to the monetary policy part of the framework. So, it is something that we've struggled with in terms of the strategy document. And I can't remember the year that financial stability became part of that strategy document. But it's very terse. So there is going to be a discussion of that at the upcoming conference.

BRIAN SACK: So, one issue I thought would come up today, as part of systematic monetary policy with these threats, would be having the policy rule react directly to inflation expectations. This is related to the question I asked the vice chair this morning. I think that the thing to consider is, in the model that has been used, expectations have been formed consistent with the model. So essentially, expectations are helping you, as you're operating on the path of inflation out in the future. But maybe expectations are also a source of risk themselves, and we don't fully understand how they evolve. They may change because people don't believe the model or see other factors or so on. So, isn't there a case for actually having the policy rule react directly and forcefully to changes in inflation expectations, particularly longer-run inflation expectations?

BULLARD: Yeah. I don't know. In my other work, where I depart from rational expectations, then the expectations become a state variable of the system and you definitely would want to look at that. Some of the literature there does say that you should respond directly to inflation expectations. But I'm also recalling that John's equation one, if I'm not mistaken, actually had inflation expectations as one of the arguments in the policy rule. So, there was a little bit of that today. But I think this is very much an interesting issue. The literature has also talked about the circularity in this and multiple equilibria and stuff like that. But I'm very sympathetic in actual policy making that the state of expectations is a state of the system. It's not the same as the rational expectations that we see in the model.

DALY: I'll just add one thing, recalling something the vice chair mentioned earlier this morning. We have various different measures of inflation expectations right now. But I wouldn't consider any of them perfect. And so, you have to think about how you'd bundle them. If you're going to respond to a variable that you don't measure very well and you really don't understand its formation, that lends itself to more uncertainty. I think it's a very intriguing idea. In fact, when you said it earlier, I wrote it down in my research book. But I think we might not be there yet in terms of understanding how they're formed and how to measure them.

CHARLES PLOSSER: It's been a fascinating panel, as always, and a fascinating day. We've had four presidents plus John Williams talk earlier and the vice chair. I just want to make one comment, and that is, I think listening to the people who've spoken at this conference, particularly the policy makers—and I don't want to exclude Rich [Clarida]—but when you listen to the presidents, we had five of them participating in these comments, you begin to realize, I think, the importance of the Federal Reserve system and the role the presidents in the banks play. They are an important source of new ideas. Their banks are important sources of research in contributing to the formulation of monetary policy and its execution.

I think the other piece I would add is their independence is an important stalwart in part of preserving the independence of the Federal Reserve system and their protection from the politization that can often be pressures. And in this heightened political atmosphere, they are a critical wall, if you will, or support system for preserving the independence of the Fed from either political party, any political influence. So, I think you get a flavor of the contributions that they can make, the ideas that their banks can contribute, as I said. And not taking anything away from the board or from Rich, I think this illustrates how important the Federal Reserve system governance structure is, and its independence is preserved from the bank system, the Federal Reserve bank system.

So, I want to thank all of them for participating, making their contributions—not only their own contributions but the contributions from their research staff. I think it's really important. And a day like today illustrates that importance, I think, and I'm really proud of them and proud of the system for those contributions.