Panel discussion for the Federal Reserve Board/*Journal of Money, Credit, and Banking* (JMCB) conference on "Financial Markets and Monetary Policy"
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Closing Panel Presentation

I'm delighted to have this opportunity to help wrap up what has been a fascinating and timely macro-finance research conference. Cataclysmic events, like the current economic and financial crisis, often fundamentally alter the focus—and even the paradigm—for economic research and for monetary policymaking. The Keynesian paradigm, with its activist policy prescriptions, grew out of the pain and suffering of the Great Depression, which dealt a blow to the classical view that markets readily equilibrate. The Great Inflation of the 1970s, in turn, exposed inadequacies in the substance and methodology of Keynesian macroeconometric modeling, and helped usher in the real business cycle research program with its prescription that monetary policy should leave the economy to its own devices and focus mainly on keeping inflation low and stable. Just a decade later, the Great Disinflation of the early 1980s reminded us that monetary policy has real consequences, and a New Keynesian synthesis focused policy on both full employment and price stability, as approximately described by a Taylor rule. During the relatively stable Great Moderation, the quintessence of that synthesis—namely, the DSGE model with nominal rigidities—ascended to the position of reigning macroeconomic orthodoxy. But few things are permanent in our world. The current financial crisis raises questions about the relevance and usefulness of this paradigm too. I'd like to focus today on three of these questions.

The monetary policy transmission mechanism

The first has to do with the transmission mechanism of monetary policy. In most models used for monetary policy analysis today, "optimal" policies can be designed for pursuing full employment, and low and stable inflation. While these models allow for various real and nominal rigidities, they treat

financial markets as frictionless and efficient. As a consequence, monetary policy affects the economy through a single tool—a short-term interest rate—that transmits itself across credit, equity, derivatives, and foreign exchange markets through arbitrage.

But, the hand we have been dealt today doesn't look anything like the textbook ideal that I just described. Instead, we are experiencing pervasive financial market failures with devastating macroeconomic effects. The normal monetary transmission mechanism has been hobbled by dysfunctional money and credit markets. Risk spreads have ballooned on supposedly safe assets like agency debt and mortgage-backed securities (MBS). What does optimal monetary policy look like in this situation? How do we gauge the effectiveness of policy actions, and how can we implement and communicate systematic policy responses under these conditions?

This question of how to conduct monetary policy when financial markets aren't working well is illustrated by our large-scale asset purchase program. With the funds rate pinned near zero and spreads on mortgages over Treasuries very elevated, the Federal Open Market Committee (FOMC) embarked on a program of purchases of agency-insured MBS, agency debt, and longer-term Treasury debt totaling $1.75 trillion. This program's goal is to bring down private borrowing rates and thereby stimulate the economy. In the ideal world of frictionless financial markets, such actions would be ineffective because private investors would simply readjust their portfolios to accommodate changes in the Fed's portfolio. But, in a world where financial markets are impaired, such balance sheet policies may influence asset prices and the economy.

A market test of these policies came on March 18 when the FOMC's announcement of an expansion of these purchases was met with an immediate and sharp decline in interest rates on both Treasury securities and agency-backed MBS. Rates on corporate bonds and mortgages came down as well. Similar effects on interest rates were felt in the United Kingdom after the Bank of England announced a program to buy long-term government debt there. Despite these initial successes, there is

still a lot we don't know about the magnitude and duration of the effects of these policies. Our standard monetary policy models do not incorporate financial frictions that lead to asset purchases having real effects. We lack both the data and theory to provide strong guidance on these policies. Truly, we are sailing in uncharted waters, marking our maps with every bit of information along the way.

Asset price bubbles and monetary policy

My second point concerns asset prices. The role of the house price bubble in precipitating the current financial crisis places new urgency on a long-standing question: Should central banks attempt to deflate asset price bubbles before they grow large enough to cause big problems? Until recently, most central bankers would have said monetary policy should respond to an asset price only to the extent that it will affect the future path of output and inflation. In essence, if you believe that financial markets work well most of the time, then you would be highly reluctant to target asset prices, let alone pop asset price bubbles. But, as I have discussed, we have vivid proof that markets sometimes don't work, and that the unwinding of a bubble can dramatically harm economic performance and threaten financial stability.

Four main issues define this debate, and the current crisis bears on each of them.[1] First, some question whether bubbles even exist. They argue that asset prices reflect the collective wisdom of traders in organized markets who best understand the fundamental factors underlying asset prices. It seems to me that this argument is difficult to defend in light of the poor decisions and widespread dysfunction we have seen in many markets during the current turmoil.

Second, it's an open question whether policymakers can identify bubbles in time to act effectively given that our models of underlying fundamentals are imprecise. For example, fundamental values of

[1] Glenn D. Rudebusch, "Monetary Policy and Asset Price Bubbles," *FRBSF Economic Letter* 2005-18, August 5, 2005. http://www.frbsf.org/publications/economics/letter/2005/el2005-18.html

housing often are estimated by comparing the ratio of house prices to rents with a long-run average.[2] This is a rather crude method, and some experts doubted that a bubble existed even when this ratio reached record highs in 2006. That said, by 2005 I think most people understood that—at a minimum—there was a substantial risk that houses were overvalued, although few anticipated that house prices would fall as sharply as they have.[3]

Third, even if we can identify bubbles as they happen, using monetary policy to address them will reduce our ability to attain other goals, so it makes sense for monetary policy to intervene only if the fallout is likely to be quite severe and difficult to deal with after the fact. For example, fluctuations in equity prices generally affect wealth and consumer demand quite gradually. A central bank may prefer to adjust short-term interest rates after the bubble bursts to counter the depressing effects on demand. The tech stock bubble seems to fit this mold. Still, some bursting bubbles are more virulent than others. It may be that credit booms, such as the one that spurred recent house price and bond price increases, hold more dangerous systemic risks than other asset bubbles. By their nature, credit booms are especially prone to generating powerful adverse feedback loops between financial markets and real economic activity.[4] If all asset bubbles are not created equal, policymakers could decide to intervene in those cases that seem especially dangerous.

Fourth, if a dangerous asset price bubble is detected and action to rein it in is warranted, is conventional monetary policy the best tool to use? Going forward, I am hopeful that capital standards and other tools of macroprudential supervision will be deployed to modulate destructive boom-bust cycles,

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[2] Joshua Gallin, "The Long-Run Relationship between House Prices and Rents," Finance and Economics Discussion Series 2004-50, Board of Governors of the Federal Reserve System, Washington, D.C. (forthcoming in *Real Estate Economics*). http://www.federalreserve.gov/pubs/feds/2004/200450/200450abs.html

[3] Kristopher Gerardi, Andreas Lehnert, Shane M. Sherlund, and Paul Willen, "Making Sense of the Subprime Crisis," *Brookings Papers on Economic Activity*, Fall 2008, pp. 69–160.

[4] Frederic S. Mishkin, "How Should We Respond to Asset Price Bubbles?" speech at the Wharton Financial Institutions Center and Oliver Wyman Institute's Annual Financial Risk Roundtable, Philadelphia, PA, May 15, 2008. http://www.federalreserve.gov/newsevents/speech/mishkin20080515a.htm

thereby easing the burden on monetary policy.[5] However, I now think that, in certain circumstances, the answer as to whether monetary policy should play a role may be a qualified yes. In the current episode, higher short-term interest rates probably would have restrained the demand for housing by raising mortgage interest rates, and this might have slowed the pace of house price increases. In addition, tighter monetary policy may be associated with reduced leverage and slower credit growth, especially in securitized markets.[6] Thus, monetary policy that leans against bubble expansion may also enhance financial stability by slowing credit booms and lowering overall leverage.

Certainly there are pitfalls to trying to deflate bubbles. At the same time, policymakers often must act on the basis of incomplete knowledge, and it is now patently obvious that not dealing with some bubbles can have grave consequences. I would not advocate making it a regular practice to lean against asset price bubbles. But, in my view, recent painful experience strengthens the case for using such policies, especially when a credit boom is the driving factor.

The inflation objective and the zero bound

Finally, I will turn to the question of the appropriate long-run inflation objective—that is, the rate that best promotes the dual goals of maximum sustainable employment and price stability. This is a topic

[5] There is now widespread agreement among policymakers and in Congress on the need to overhaul our supervisory and regulatory system, and broad agreement on the basic elements of reform. See, for example, Timothy Geithner, testimony before the House Financial Services Committee, March 26, 2009 (http://treasury.gov/press/releases/tg71.htm); Ben S. Bernanke, "Financial Reform to Address Systemic Risk," speech at the Council on Foreign Relations, March 10, 2009 (http://www.federalreserve.gov/newsevents/speech/bernanke20090310a.htm); Daniel K. Tarullo, "Modernizing Bank Supervision and Regulation," testimony before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, March 19, 2009 (http://www.federalreserve.gov/newsevents/testimony/tarullo20090319a.htm); Group of Thirty, "Financial Reform: A Framework for Financial Stability," January 2009 (http://www.group30.org/pubs/pub_1460.htm); Markus Brunnermeier, Andrew Crockett, Charles Goodhart, Avinash D. Persaud, and Hyun Shin, "The Fundamental Principles of Financial Regulation" *Geneva Reports on the World Economy* 11, January 2009 (http://www.voxeu.org/reports/Geneva11.pdf); Congressional Oversight Panel, "Special Report on Regulatory Reform," January 2009 (http://cop.senate.gov/documents/cop-012909-report-regulatoryreform.pdf).

[6] Tobias Adrian and Hyun Song Shin, "Money, Liquidity, and Monetary Policy," *American Economic Review* 99(2), May 2009, pp. 600–605.

that the FOMC has discussed on numerous occasions during my tenure as a governor and as president of the San Francisco Fed. In the past, I had spoken in favor of a 1½ percent rate of PCE price inflation. In my view, though, recent events provide reason to reexamine this critical subject.

The choice of an appropriate inflation objective depends on an evaluation of the costs and benefits of very low inflation. The financial crisis and global recession have not qualitatively changed these costs and benefits, but they may affect their quantitative evaluation, which in turn might influence how policymakers view their inflation objectives. The benefits of low and stable inflation are abundantly clear to this audience and have not changed in any material way because of the recession. On the cost side, the zero lower bound on nominal interest rates is a critical concern. Japan's experience with deflation starting in the 1990s generated a large body of research on monetary policy strategy that takes account of the zero lower bound.[7] Researchers emphasize the benefits of aggressively cutting rates when the prospect of reaching the zero bound emerges, and of using clear communication about the central bank's future policy intentions and its long-run inflation goals. The FOMC took this research to heart during the deflation scare of the early 2000s and the current crisis.

One conclusion of the research is that, even if monetary policy acts appropriately, an inflation objective of 1 percent or lower entails some costs in terms of stabilizing output, but the impact on average macroeconomic performance at higher inflation objectives is minimal.[8] However, I have not found the experience of the past several years at all reassuring on this point. We have had two deflation scares and a severe global recession in a span of seven years, with several major central banks now confronting the zero bound. Of course, this may simply reflect very bad luck that is unlikely to be repeated. But, a number of considerations make me hesitant to endorse this view. Indeed, concern about the ability of the

[7] For example, see the special conference volume, "Monetary Policy in a Low-Inflation Environment," in the *Journal of Money, Credit, and Banking* 32(4, part 2), November 2000.

[8] See David Reifschneider and John C. Williams, "Three Lessons for Monetary Policy in a Low Inflation Era," *Journal of Money, Credit, and Banking*, November 2000, and Guenter Coenen, Athanasios Orphanides, and Volker Wieland, "Price Stability and Monetary Policy Effectiveness when Nominal Interest Rates are Bounded at Zero," *Advances in Macroeconomics* 4(1) 2004. http://www.bepress.com/bejm/advances/vol4/iss1/art1/

Fed to support employment following large negative shocks may explain why most FOMC members now judge a PCE inflation rate of 2 percent to be most consistent with the Committee's dual mandate.

Calculations of the effects of the zero bound depend crucially on assumptions regarding the magnitude of disturbances that hit the economy, the level of the natural rate of interest, and the behavior of the rest of the global economy. Recent experience raises the possibility that the Great Moderation is behind us, so we must be prepared for substantial shocks. Thus, an analysis of the zero bound needs to incorporate greater volatility than experienced over the past quarter century. With respect to the equilibrium real interest rate, the global savings glut that helped restrain real interest rates may persist or even intensify after the recession is over, leaving us with only a small cushion against reaching the zero bound. And, the theory that the global economy was decoupled did not hold up in the current recession. This has weakened the transmission of monetary policy by short-circuiting the exchange rate channel in any one country. When all other countries are in recession and cutting rates, it is harder to stabilize the economy and avoid deflation.

Finally, the Fed's experience with nontraditional monetary policy tools cuts two ways in analyzing the effectiveness of monetary policy near the zero bound. On the one hand, the apparent success of the Fed's longer-term asset purchases and broader credit easing programs in lowering borrowing costs and stimulating spending suggests that the zero bound problem may not be as costly as previously thought. On the other hand, the deployment of these new policy tools comes with its own set of risks and costs. In particular, we do not yet have good estimates of the quantitative impact of such interventions. In addition, the use of nonstandard monetary policy instruments necessarily brings with it the uncertainty and risks of unintended consequences. For example, some observers worry that the ballooning of the Fed's balance sheet may raise inflation because the Fed may face political and technical challenges when it tries to unwind these policies—especially if the recession ends before the need for

support of the financial markets fades.[9] While I have not found these arguments convincing so far, the recent rise in Treasury rates, if it is reflective of such concerns, is disconcerting.

Clearly, the events and monetary policy dilemmas of the past two years have laid before us an urgent and compelling research agenda. We simply must understand better—and ultimately develop reliable models of—the extraordinary financial and macro linkages that produced the current crisis. In addition, we need to more fully evaluate the costs and benefits of nonstandard monetary policy actions. I'll close with an encouraging note. As the papers at this conference attest, researchers in the academic and policy worlds are rising to the occasion. These are vitally important tasks and I'm glad to see so many of my colleagues rolling up their sleeves.

[9] See Jeffrey Lacker, "Government Lending and Monetary Policy," remarks to the National Association for Business Economics, 2009 Washington Economic Policy Conference, Alexandria, VA, March 2, 2009 (http://www.richmondfed.org/press_room/speeches/president_jeff_lacker/2009/lacker_speech_20090302.cfm); and Charles I. Plosser, "Ensuring Sound Monetary Policy in the Aftermath of Crisis," speech to the U.S. Monetary Policy Forum, The Initiative on Global Markets, University of Chicago Booth School of Business, February 27, 2009 (http://www.philadelphiafed.org/publications/speeches/plosser/2009/02-27-09_us-monetary-policy-forum.pdf)