(bullardeabcn2009march31_ellisonsargent_finalpdf) the 10th EABCN Workshop on Uncertainty over the Business Cycle, European Central Bank, Frankfurt. Remarks by Thomas Sargent: "Truth and Probability." Martin Ellison's webpage.

- **March 31, 2009**. Presentation. "Panel Discussion: Dating Business Cycles" (bullardeabcn2009march31_dating_b_cycles_panel_finalpdf) with Lucrezia Reichlin and Bob Hall. Presented at the 10th EABCN Workshop on Uncertainty over the Business Cycle, European Central Bank, Frankfurt.
- **March 24, 2009**. Speech. "Effective Monetary Policy in a Low Interest Rate Environment," delivered at the The Henry Thornton Lecture, Cass Business School, London.
  Related news articles.

  Effective Monetary Policy in a Low Interest Rate Environment

  March 24, 2009

  The Henry Thornton Lecture, Cass Business School, London

  Last December, the Federal Reserve's Open Market Committee reduced its target for the federal funds rate to a range of 0 to .25 percent. The policy rates of some other central banks are also at historically low levels, leaving little or no room for further cuts: The benchmark rate of the European Central Bank stands at 1.5 percent, the Bank of England policy rate is 0.5 percent and the Bank of Japan policy rate is a mere 0.1 percent. (1) Very low policy rates create a challenge for the global central banking community. The challenge is to maintain an active and effective macroeconomic stabilization policy in the face of a global recession, even when policy rates are low and many are near zero.Very low policy rates create a challenge for the global central banking community. The challenge is to maintain an active and effective macroeconomic stabilization policy in the face of a global recession, even when policy rates are low and many are near zero.

  A conventional view has developed—especially over the past 15 years or so—that describes monetary policy in terms of a target for a short-term nominal interest rate, such as the overnight federal funds rate in the United States. Within this conventional view, the normal policy response to deteriorating

economic conditions and inflation below a target level is to lower the policy rate. This view is so conventional, in fact, that many participants in financial markets and in the broader central banking community can envision little else. Thus, with policy rates at or near zero, it would seem that the world's central banks have little or no scope for further policy response.

But there is scope for considerable policy response, every bit as effective as movements in short-term nominal interest rates. In my remarks this evening, I will discuss how the Fed and other central banks canprovide additional monetary stimulus as necessary. To keep stabilization policy active and aggressive in the current global recession requires a shift in thinking relative to that of the past 15 years. The shift in thinking is not unlike that brought to the Fed and the world in 1979 by Paul Volcker.scope for considerable policy response, every bit as effective as movements in short-term nominal interest rates. In my remarks this evening, I will discuss how the Fed and other central banks canprovide additional monetary stimulus as necessary. To keep stabilization policy active and aggressive in the current global recession requires a shift in thinking relative to that of the past 15 years. The shift in thinking is not unlike that brought to the Fed and the world in 1979 by Paul Volcker. (2) While the nature of our economic turmoil today is different from the 1970s in many respects, the shift away from a focus on short-term nominal interest rates is similar. The era of interest rate rules, inspired by the seminal paper of John Taylor in 1993While the nature of our economic turmoil today is different from the 1970s in many respects, the shift away from a focus on short-term nominal interest rates is similar. The era of interest rate rules, inspired by the seminal paper of John Taylor in 1993 (3) , is in abeyance, at least for now., is in abeyance, at least for now.

Let me say before I continue that the views expressed here are my own and do not necessarily reflect the views of other Federal Open Market Committee members.

Monetary Growth and Expected Inflation

At very low nominal interest rates, the expected rate of inflation plays a larger role. Declines in the expected rate of inflation, with nominal rates

fixed, show up as increases in the real rate of interest. The essence of stabilization policy is to lower the real rate of interest when macroeconomic conditions are weaker and raise it when macroeconomic conditions are stronger. One key to current stabilization policy is therefore to exert influence over the expected rate of inflation.

There is a variety of practical policy tools that a central bank can employ when the zero bound on nominal interest rates precludes additional rate cuts. In particular, the zero bound does not prevent a central bank from taking actions that increase the growth of the monetary aggregates. It is well known and widely understood that, over the medium to long run, inflation reflects the growth rate of money. The current environment of exceptionally low short-term nominal interest rates does not prevent a central bank from increasing the money supply. In this sense, stabilization policy goals can be accomplished through influence on the expected rate of inflation.

The monetary base consists of currency in circulation and the deposits of banks and other depository institutions with the central bank. In the United States, the size of the monetary base doubled over a four-month period beginning in September 2008. This increase is astonishingly large. However, the increase in the base is in part a byproduct of Federal Reserve programs to assist credit markets and carry out its lender-of-last-resort function. The lender-of-last-resort programs—on the order of $1 trillion in the United States in recent months—should properly be viewed as implying temporary increases in the monetary base designed to improve market functioning. Temporary increases in the monetary base—here one day, gone the next—would not be expected to have an important influence on the rate of inflation. Therefore, we shall have to segregate the temporary increases in the monetary base associated with lender-of-last-resort programs from the more persistent increases in the monetary base associated with outright purchases of Treasury securities, agency mortgage-backed securities and agency debt. It is the persistent increases in the monetary base that should properly be expected to influence the rate of inflation and therefore have an influence on inflation expectations and real interest rates. Later in my remarks this evening, I will comment further on how one might gauge the monetary stimulus reflected in the extraordinary expansion of the Fed balance sheet and monetary base over the past six months.

I will also discuss the coupling of balance sheet expansion with the possibility of establishing an explicit inflation objective in the United States. In the current environment, a commitment to an explicit inflation objective coupled with a systematic approach to expanding the monetary base could help avoid further disinflation and a possible deflationary trap, such as the one experienced in Japan. Further, by anchoring inflation expectations, an explicit inflation objective could assist the transition back to conventional policy as normal conditions return and help ensure that Fed policy does not inadvertently cause a new round of high and volatile inflation once the current crisis passes. It is exactly because the current situation is so fluid that the announcement of an explicit numerical objective for inflation at this point may be particularly helpful.

Were it not for the global recession, I am certain that our discussions about monetary policy tonight would be within the context of the conventional paradigm of nominal interest rate targeting. The ongoing financial turmoil has changed that, and restoring stability to financial markets has been and will continue to be a primary focus of the Federal Reserve and the U.S. government. The crisis has revealed clear weaknesses in our financial infrastructure and regulatory system. Near the end of my remarks, I would like to share with you a few thoughts about the potential for regulatory reform in the United States.

Monetary Policy with an 'M'

Let me now turn to the question of how to conduct an effective monetary policy in a low interest rate environment. Conventional monetary policy has come to be defined as a central bank establishing an effective target for a short-term nominal interest rate. This has been incorporated in the recent practice of central banks and in textbook and academic discussions of monetary policy. In textbooks, the nominal interest rate target is derived from a relationship, or policy rule, involving the long-term inflation objective of the central bank, deviations of actual inflation—either observed or forecast—from that inflation objective, and deviations of actual economic activity from some measure of potential. This textbook description has been shown to be a reasonably accurate representation of the Fed's behavior at

least since the beginning of the Greenspan chairmanship. The public is now well-conditioned to think about U.S. monetary policy in terms of a target federal funds rate and predictable adjustments of the target in a rule-like fashion.

Under ordinary circumstances, nominal interest rate targeting can work quite well. However, with policy rates at or near zero, nominal interest rate targeting is no longer an option for combating low rates of actual and expected inflation and a global recession. With policy rates near zero, there is no ordinary policy rate move to make to react to output that is below potential and to inflation that is too low. Instead, central banks lose their ability to use interest rate movements to signal their policy moves to the public. This creates considerable uncertainty in the macroeconomy.

One danger of the current situation is that, because the interest rate signal mechanism has been turned off, the private sector's medium-term inflation expectations can begin to drift. Given the severity of the global macroeconomic shock, the possibility of a deflationary trap cannot be dismissed. Central banks therefore must adopt alternative policy approaches if they are to anchor inflation expectations, avoid sustained deflation, and maintain an active and effective stabilization policy.

One way of providing a credible nominal anchor for the economy is to set quantitative targets for monetary policy, beginning with the growth rate of the monetary base. This has several advantages. First and foremost, the monetary base is relatively easy to understand, fostering better communication about the thrust of policy. Second, we can be reasonably certain that sustained rapid expansion of the monetary base will be sufficient to head off any sustained deflation.

One important disadvantage is that the linkages between the growth rate of the monetary base, monetary aggregates and key macroeconomic variables are not statistically tight. This is in part because past data were produced under an interest-rate-targeting regime. The lack of precision can make it difficult to determine how rapidly to expand the base to achieve a specific inflation objective. We know this from long and exhaustive debates rooted in the 1980s concerning monetary instruments versus interest rate

instruments for monetary policy. This older debate is part of what set the stage for John Taylor's paper and the return of nominal interest rate rules. I am well aware of this intellectual history, and I stress that I would not advocate a monetary base control approach in normal times. But, I also stress that these are not normal times. We know that we face some risk of further disinflation and possible deflation globally. We have seen the example of Japan. We know that persistent monetary growth can prevent further disinflation and the accompanying counterproductive rise in real interest rates that would entail. A policy geared toward maintaining an elevated growth rate of the monetary base provides a clear, easily communicated strategy combating additional disinflation, even while further significant reductions in the nominal interest rate target are no longer possible.

Persistent versus Temporary Growth in the Monetary Base

The U.S. monetary base has expanded enormously over the past several months, reflecting an extraordinarily large expansion of the Federal Reserve balance sheet. But the meaning of this expansion is blurred because it is difficult to discern at a glance how much of it is associated with the temporary lender-of-last-resort role of policy and how much is associated with a persistent rise in the growth rate of the base that can be expected to feed into inflation outcomes.

As an example, in the aftermath of 9/11, the Fed doubled the level of reserves in the U.S. banking system for a period of several weeks. This temporary expansion was a classic response to stressed financial conditions. The inflationary consequences of this injection and subsequent removal were minimal or nonexistent. Something similar is going on during the current crisis, but on a grand scale and over a much longer time frame.

Since December 2007, the Federal Reserve has established several lending programs to provide liquidity and improve the functioning of key credit markets. The Term Auction Facility, Term Securities Lending Facility and the Primary Dealer Credit Facility, for example, help ensure that financial institutions have adequate access to short-term credit. The Commercial Paper Funding Facility provides a backstop for the market for high-quality

commercial paper. In addition, the Federal Reserve has entered into bilateral currency swap agreements with some foreign central banks to help ease conditions in dollar funding markets globally. Finally, over the past year, the Fed has provided loans to support specific financial institutions. The TAF, CPFF and swaps in particular have added about $1 trillion to the size of the Fed's balance sheet in recent months.

These programs belong to a family of policy responses associated with the lender-of-last-resort function of monetary policy. We should view them as temporary, as they are intended to be wound down as financial stress abates, and they are structured so that it is feasible to wind them down over a short period. As such, they are unlikely to have a meaningful impact on inflation or inflation expectations.

More recently, the Federal Reserve announced that it would purchase substantial quantities of debt and mortgage-backed securities issued by Fannie Mae and Freddie Mac. Within the past week, the Federal Reserve, in cooperation with the U.S. Treasury Department, has begun to operate its Term Asset-Backed Securities Loan Facility (TALF). Under the TALF, the Fed could purchase as much as $1 trillion of asset-backed securities collateralized by real estate and various other types of loans.

All of these facilities and programs affect the size and composition of the Fed balance sheet. However, before September 2008, the Fed offset increases in its lending to financial institutions by selling Treasury securities in the open market. Doing so largely kept these facilities from affecting the overall size of the Fed balance sheet and growth rate of the monetary base. The base increased by a mere $20 billion, or about 2.2 percent, between Aug. 1, 2007 and Aug. 27, 2008. (4)

A key question for understanding the thrust of monetary policy going forward is how much of the enormous increase in the Fed balance sheet since last September is likely to be temporary and how much is likely to be persistent. The temporary components, which mainly reflect the liquidity injected by the Fed in carrying out its lender-of-last-resort function, remain very large. The more persistent components, which to date reflect mainly open market purchases of agency debt and mortgage-backed securities, are

smaller, but growing rapidly. The persistent components are likely to have greater inflationary consequences going forward because these components are unlikely to shrink as much or as quickly as the less-persistent components of the balance sheet. Put differently, the growth in the persistent components of the balance sheet will have more impact on the medium- to long-term growth of the monetary base and hence the outlook for inflation than does the growth of the less-persistent components.

A Clear Inflation Objective

Uncertainty concerning the path of policy and the implications for inflation could be reduced with the announcement of a specific inflation objective. A clearly articulated inflation objective would help anchor inflation expectations and reduce uncertainty about the long-run goals of policy. Right now, inflation expectations are unusually diffuse. The ballooning of the Fed balance sheet and large government fiscal deficit have created worries about higher inflation in the future, while at the same time the weak economy, disinflation and the recent history of the Japanese economy are raising the specter of deflation. By making its long-run inflation objective explicit, the Fed could help provide a credible commitment that the growth of the monetary base will slow as deflation risks recede. Further, by reducing inflation uncertainty, the announcement of an explicit inflation objective would reduce inflation risk premiums in interest rates and promote efficient resource allocation.

The Future of Financial Intermediation

Maintaining price stability is surely one of the most important ways that a central bank can promote the stability of the financial system. A credible commitment to long-run price stability enables a central bank to respond aggressively to financial crises without unmooring inflation expectations. The ongoing financial crisis demonstrates, however, that price stability alone will not guarantee financial stability. The crisis has revealed important problems in our system of financial regulation and oversight, and I would like to spend my remaining time discussing some lessons suggested by the recent financial turmoil.

One obvious lesson is that our present system of financial oversight and regulation is not up to the challenges posed by the size and complexity of the modern global financial system. Some very large, complex international financial firms are at the epicenter of the financial crisis. Comprehensive regulatory reform must better address the regulation and oversight of firms with global operations. This will require continued close cooperation among financial regulators of all countries where large international financial firms do business. International cooperation may be especially critical to the success of any attempt at improved oversight and regulation.

One reason for enhanced regulation and oversight of large complex financial organizations is that governments are unlikely to permit such firms to fail; or, if they do fail, the government will substantially protect many of the firm's creditors from loss. As stressed by Gary Stern and Ron Feldman, (5) it is simply not credible in most times and places that a government will allow a large financial failure to occur. This creates a "too-big-to-fail" problem. Any new regulation has to be soberly designed with this problem in mind. It is not sufficient for policymakers to simply announce that they will "get tough next time."it is simply not credible in most times and places that a government will allow a large financial failure to occur. This creates a "too-big-to-fail" problem. Any new regulation has to be soberly designed with this problem in mind. It is not sufficient for policymakers to simply announce that they will "get tough next time."

The present, disorderly too-big-to-fail regime creates a moral hazard: Firms whose liabilities are guaranteed have an incentive to take greater risks than firms without such guarantees. In the United States, the perception that the government would guarantee the liabilities of Fannie Mae and Freddie Mac enabled those firms to borrow heavily in debt markets at relatively low interest rates and to maintain much lower capital ratios than other financial firms. Ultimately, financial losses eroded the thin capital cushions of Fannie and Freddie and pushed both firms into the hands of a government conservator. Without the perception of government backing—which turned out to be a reality—markets surely would have forced Fannie and Freddie to hold more capital, which would have made the firms less vulnerable to losses on their mortgage portfolios. (6) The experience with Fannie and Freddie shows how expectations of what will happen in the failure regime

really influence all pricing and behavior during normal times. It is a serious distortion, and it suggests that the nature of the policy in the event of failure needs to be clearly delineated and understood both by the private sector and the government.The experience with Fannie and Freddie shows how expectations of what will happen in the failure regime really influence all pricing and behavior during normal times. It is a serious distortion, and it suggests that the nature of the policy in the event of failure needs to be clearly delineated and understood both by the private sector and the government.

The present too-big-to-fail regime also creates tremendous uncertainty because it is inherently disorderly. When firms are failing, they simply have to be broken apart, liquidated or reorganized in some way. Unspecified government intervention in the event of failure leaves this process open, making stakeholders wonder what will happen next. Also unspecified is which firms are considered too big to fail. If the top five firms are in this category, how is a crisis at the number six firm to be handled? Or, is the government to extend the unspecified protection to all firms in the industry? Leaving the nature of the intervention in the event of failure unspecified, and in addition leaving the list of too-big-to-fail firms unspecified, creates substantial uncertainty that could be avoided with a well-designed reform.

These two aspects of the too-big-to-fail problem clearly point toward the need for improvement in the current system. The improvement would be to design a resolution regime for large, insolvent financial institutions considered too big to fail. The resolution regime should have several features. First, it should be explicit and well understood by all players. Second, while it would likely involve some level of government assistance, the nature of that assistance (even if state-contingent) should be clear. Third, it should be credible, in the sense that when the crisis arrives, the government will have incentives to follow through on the plan without deviation. And fourth, it should be made clear which firms would use this alternative resolution regime and which firms would use bankruptcy court.

The resolution regime now in place for commercial banks in the United States works reasonably well and could serve as a model for resolving failures of other types of financial institutions. Bank failures are generally

resolved quickly with little disruption to the broader financial system. The Federal Deposit Insurance Corporation (FDIC) takes control once a bank's primary regulator determines that a bank is insolvent. The FDIC either liquidates the failed bank or, frequently, arranges a merger with another bank. Insured deposits are either transferred to the new bank or, in the case of liquidation, paid out quickly. The process is transparent and relatively painless for most depositors and borrowers of the failed bank.

An improved resolution regime might require bringing all too-big-to-fail financial organizations under an umbrella regulator. The regulator would continuously supervise those organizations and enforce rules to minimize the chance of financial system disruption. Rules that limit the size of financial organizations or discourage excessive risk taking might also be necessary. A macroprudential regulator of this sort would take into account broad economic trends and consider the impact of a firm's actions on the entire financial system, not just on the firm's own creditors. To some extent, the Federal Reserve and other regulators already consider broad economic trends and effects. However, our present system was not designed to control broad macroeconomic risks posed by complex financial organizations with far-flung operations. The success of any macroprudential regulation would likely rest not with the allocation of the responsibility, but with the tools given to implement the mandate.

Many other changes in regulation have been suggested to better manage risks in the financial system, and there isn't time today to discuss all of them. The issues are complex, and though reforms are necessary, they should be well thought out. Any changes to the regulatory environment will spur innovation in the private sector to legally circumvent restrictions. Reform has to be undertaken with this in mind.

Let me now turn to some brief conclusions.

Conclusion

The financial crisis has challenged our thinking about both monetary policy and financial regulation. In the present environment, it is not useful to think about monetary policy in the conventional way. We need a shift in thinking,

similar to the one adopted by the Volcker Fed under different circumstances in October 1979. A shift away from interest rate rules and toward quantitative approaches is appropriate in the current environment, even if interest rate rules are more appropriate in normal times. As we make this shift, all of the important lessons of the past two decades concerning the nature of good monetary policy must be kept in mind. In particular, we need a clearly articulated, credible policy that stretches out for several years and indicates how the central bank plans to respond to macroeconomic events going forward. The Fed can accomplish this by continuing to expand the persistent components of its balance sheet so as to keep the monetary base growing at an elevated rate to avoid further disinflation and the rise in real interest rates that would entail. A credible plan would also name an explicit inflation objective to help control the currently very diffuse expectations of medium-term inflation. And, a credible plan would also specify more explicitly how the central bank intends to keep base growth under sufficient control for the medium and longer term to meet the inflation target.

Over the near term, monetary policy will continue to focus on containing the fallout from the ongoing financial crisis. The crisis has clearly exposed faults in the structure of financial regulation and supervision, especially of large, complex financial organizations considered too big to fail. Above all, the current crisis has demonstrated that "too big to fail" is not good public policy. One of the key remedies is to put in place a resolution regime for firms considered too big to fail, one that is clearly articulated, credible and well understood by all players.

I appreciate the opportunity to speak here tonight and I welcome your questions.

Footnotes
1. These rates were current as of March 23, 2009.
2. See "Reflections on Monetary Policy: 25 Years after October 1979," Federal Reserve Bank of St. Louis Review March/April2005, for a compilation of the conference proceedings as well as personal reflections commemorating Oct. 6, 1979.March/April2005, for a compilation of the conference proceedings as well as personal reflections commemorating Oct. 6, 1979. [http://research.stlouisfed.org/publications/review/05/03/part2/MarchApril2

005Part2.pdf](http://research.stlouisfed.org/publications/review/05/03/part2/MarchApril2005Part2.pdf)
3. Taylor, John B. Discretion versus Policy Rules in Practice . Carnegie-Rochester Conference Series on Public Policy 39: (1993), pp. 195-214.. Carnegie-Rochester Conference Series on Public Policy 39: (1993), pp. 195-214.
4. The Federal Reserve Bank of St. Louis Adjusted Monetary Base (seasonally adjusted) increased from $856 billion on Aug. 1, 2007 to $876 billion on Aug. 27, 2009.
5. See Gary H. Stern and Ron J. Feldman, (2004), Too Big to Fail: The Hazards of Bank Bailouts , Brookings Institution Press, Washington, D.C., Brookings Institution Press, Washington, D.C.
6. William Poole, former president of the Federal Reserve Bank of St. Louis, noted the inherent risks posed by Fannie Mae and Freddie Mac in a series of speeches: "Financial Stability." Remarks at the Southern Legislative Conference Annual Meeting, New Orleans, Louisiana, Aug. 4, 2002; "Housing in the Macroeconomy." Remarks at the Office of Federal Housing Enterprise Oversight Symposium, Washington, DC, March 10, 2003; and "Reputation and the Non-Prime Mortgage Market." Remarks at the St. Louis Association of Real Estate Professionals. July 20, 2007.

- **March 20, 2009**. Speech. "Monetary Policy in a Global Recession," (bullardbankoffrance2009march15keynotepdf) delivered at the Monetary Policy in the Current Crisis International Workshop, organized by the Banque de France, Aix-Marseille University, and Toulouse School of Economics.
  Related news articles.
- **February 27, 2009**. Presentation. "Discussion of Harris, Kasman, Shapiro, and West: Oil and the Macroeconomy—Lessons for Monetary Policy," (bullard_usmonetarypolicyforum_27_feb_2009_1pmpdf) 2009 U.S. Monetary Policy Forum, sponsored by the Initiative on Global Markets, University of Chicago Graduate School of Business.
- **February 17, 2009**. Speech. "Dial 'M' for Monetary Policy," delivered at the New York Association for Business Economics, Harvard Club of New York, New York.
  Related news articles.
  Jacob Frankel asks Alan Greenspan about the balance sheet, Economic Club