

For release on delivery  
2:45 p.m. EDT (12:45 p.m. MDT)  
October 11, 2010

Macroprudential Supervision and Monetary Policy in the Post-crisis World

Remarks by

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at the

Annual Meeting of the National Association for Business Economics

Denver, Colorado

October 11, 2010

Thank you for that very kind introduction. When I look at the roster of previous recipients of the Adam Smith Award, it is very august company indeed. It's a tremendous honor to appear before you this year, and I am very grateful.<sup>1</sup>

I should stress that my remarks represent my own views and not necessarily those of my Federal Reserve colleagues. Today I would like to cover a subject that is of surpassing importance for economic policy: the implications of financial market excesses for the supervision of the financial system, and beyond that, for the formulation of monetary policy.

Just two years ago, we lived through an almost unimaginable catastrophe--the near collapse of a global financial system that many economists had come to believe was impervious to the sort of panic that could bring on a worldwide recession. The prevailing view was that modern economic policymaking, and central banking in particular, had mastered the management of the business cycle, and that the application of modern risk-management tools had greatly increased the stability of the financial system. Financial markets were not held to be perfect, of course. But they were viewed as self-correcting systems that tended to return to a stable equilibrium before they could inflict widespread damage on the real economy.

That view lies in tatters today as we look at tens of millions of unemployed and the trillions of dollars of lost output and lost wealth around the world. These events should have convinced any doubters that our financial system is vulnerable to the kinds of catastrophic breakdowns that can wreck the overall economy. An inescapable conclusion is that a first-order priority must be to engineer a stronger, more robust system

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<sup>1</sup> I would like to thank John Williams and Sam Zuckerman, both of the Federal Reserve Bank of San Francisco, for assistance in preparing these remarks.

of financial regulation and supervision--one capable of identifying and managing excesses before they lead to crises. We must find a way to contain these threats without putting a straitjacket on financial innovation and risk-taking. I don't claim this is an easy task, but it is an essential one.

### **Lessons from the Crisis**

It is now clear that our system of regulation and supervision was fatally flawed. Despite volumes of research on financial market metrics and weighty position papers on financial stability, the fact is that we simply didn't understand some of the most dangerous systemic threats. Looking back, I believe the regulatory community was lulled into complacency by a combination of a Panglossian worldview and benign experience. The notion that financial markets should be as free as possible from regulatory fetters had evolved into the conviction that those markets could, to a very considerable extent, police themselves. Meanwhile, things went along so well for so long that the common belief came to be that nothing *could* go disastrously wrong. Over a period of decades, the financial system was tested repeatedly--the Latin American debt crisis, the savings and loan crisis, the Asian crisis, the failure of Long-Term Capital Management, and the stock market crashes of the late 1980s and early 2000s. With each crisis, policymakers rolled up their sleeves and beat back the systemic threat. The levees held. Despite these financial market ups and downs, economies in the United States and other parts of the world performed very well. We appeared to have entered a new era of stability. We even gave it a name: the Great Moderation. We were left with the mirage of a system that we thought was invulnerable to shock, a financial Maginot Line that we believed couldn't be breached. We now know that this sense of invincibility was mere hubris.

To understand what went wrong, I refer you to Hyman Minsky's path-breaking work on speculative financial booms and busts.<sup>2</sup> As Minsky showed, success can lead to excess, and excess to ruin. The Great Moderation saw a progressive growth of credit and extension of risk, which came to a head in the mortgage market. Credit flowed freely and cheaply, and households and financial institutions alike took on greater risk, borrowing to the hilt. House prices soared off the charts. Financial innovators found increasingly exotic ways of packaging loans for investors. Securities became so opaque that few understood their risks. Originators sold mortgages to investors whose due diligence consisted of glancing at ratings. The financial system became increasingly complex, interconnected, and hyperleveraged.

When housing prices plunged, the value of real-estate-related assets on the balance sheets of financial institutions, both in the traditional and shadow banking sectors, collapsed. Not only were many of those institutions highly leveraged, they had also relied heavily on short-term borrowing to acquire those assets. The combination of leverage and short maturity funding left them perilously vulnerable to runs. The result was panic and market breakdowns on an unimaginable scale, bringing us frighteningly close to a meltdown of the global financial system and a second Great Depression.

Thankfully, that depression never occurred. Governments and central banks around the world took extraordinary action to prevent complete collapse. But what we did get was bad enough--the deepest and most prolonged recession in generations. And the recovery has been agonizingly slow, held back, in part, by the ongoing efforts of overleveraged households and financial institutions to repair their balance sheets. These

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<sup>2</sup> See Hyman P. Minsky (1992), "The Financial Instability Hypothesis," Working Paper 74 (Annandale-on-Hudson, N.Y.: Jerome Levy Economics Institute of Bard College, May), available at [www.levyinstitute.org/pubs/wp74.pdf](http://www.levyinstitute.org/pubs/wp74.pdf).

events demonstrate both the natural tendency of the financial system to cycle through booms and busts and the potential, absent adequate supervision and regulation, for breakdowns in the financial system to threaten the global economy.

Financial market participants can be bipolar--prone to fads, manias, myopia, panics, and depression; driven by short-term gain; and easily caught up in the madness of crowds. One's belief about the beliefs of others is critical, like Keynes's example of a beauty contest.<sup>3</sup> In addition, the structure of compensation and incentives in the financial sector created strong motives for excessive risk-taking, especially during boom years. Methods of modern risk management may have intensified the cycle because of their reliance on metrics such as value at risk that are highly sensitive to recent performance, especially volatility. In good times, volatility declined, and value at risk along with it. This pattern generated a pro-cyclical willingness to take on risk and leverage, amplifying and propagating the boom and bust cycle. The vicious cycle of a collapse of confidence, asset fire sales, evaporation of liquidity, and a deleveraging free fall was the mirror image of the manic mortgage market that preceded it.

To avoid a repeat of these events, it is essential that we change the landscape of supervision and regulation. The landmark legislation recently passed by the Congress, the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act), is designed to do just that. It requires regulators to contain risks to the financial system before they erupt into crises. And it creates a structure to collect data, identify emerging threats to financial stability, and formulate policies to contain these risks.

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<sup>3</sup> See Franklin Allen, Stephen Morris, and Hyun Song Shin (2006), "Beauty Contests and Iterated Expectations in Asset Markets," *Review of Financial Studies*, vol. 19 (3), pp. 719-52.

Within this structure, the Federal Reserve will play an important role. We will supervise all systemically important institutions and, jointly with other regulators in the new Financial Stability Oversight Council, establish stricter prudential standards for such firms. We will help ensure the safety of financial market utilities that are critical to our payment, clearing, and settlement systems. And we will actively support the council's mission to identify and address emerging risks to financial stability. At the same time, though, we must take care to preserve incentives for innovation and reasonable risk-taking. We must remain prudent, while avoiding an overly strict approach that unduly impedes financial intermediation and stifles capital formation.

Vigilance to threats of systemic financial risk must also inform the conduct of monetary policy. We have seen that the eruption of a financial crisis can have severe economic consequences, compromising the ability of a central bank to attain its primary macroeconomic objectives. Monetary policymakers should also be aware that the decisions they make in pursuit of price stability and full employment could, in some circumstances, affect the development of systemic risk. For example, if compensation incentives in the financial sector are misaligned, low interest rates might heighten the ability and desire of financial market participants to reach for yield and take on risk.

Our goal should be to deploy an enhanced arsenal of regulatory tools to address systemic risk, making the financial system far more robust. That way, monetary policy can concentrate on its long-standing goals of price stability and maximum employment. Supervision and regulation *must* serve as the first and main line of defense in addressing systemic risk. We have at our disposal a tool kit of regulatory instruments that are well adapted for this purpose. Monetary policy cannot be a primary instrument for systemic

risk management. First, it has its own macroeconomic goals on which it must maintain a sharp focus. Second, it is too blunt an instrument for dealing with systemic risk. All the same, I cannot unequivocally rule out the possibility that situations could emerge in which monetary policy should play some role in reining in risk-taking behavior. I will return to this point later.

In the remainder of my remarks, I will discuss key issues that must be resolved before an effective policy regime for the containment of systemic risk can be established. First, we must understand the sources of systemic risk and design surveillance practices that enable us to detect threats to financial stability early on. Second, we must develop a tool kit of supervisory policy instruments--so-called macroprudential policies--and guidelines on how and when to deploy them. And third, we must strive to avoid situations in which macroprudential and monetary policies are working at cross-purposes, given that macroprudential policies affect macroeconomic performance and that monetary policy may affect risk-taking incentives.

All of these issues raise complex questions of design and implementation. Interesting parallels may be drawn, however, between the design issues we face in macroprudential policy and those we have grappled with in conducting monetary policy. These parallels include the appropriate roles of rules versus discretion, the need for policies that are robust in addressing uncertainty, and the assignment problem, all of which I will discuss later. The fertile field of monetary policy research may therefore offer lessons that can fruitfully be applied to managing systemic risk.

## **Systemic Risk: Sources and Surveillance**

At its most basic level, systemic risk stems from the possibility that some event or sequence of events could result in severe impairment of the financial sector's ability to provide credit in the economy. At their most extreme, such events can trigger panicky attempts to withdraw credit, creating runs that lead to failures of important financial institutions and, ultimately, systemic collapse.

If policymakers are to detect emerging threats to the financial system, we must understand the determinants of systemic risk and develop appropriate metrics for measuring it. Economists have long studied these issues, and the recent crisis has intensified research on the subject. This work points to several key elements in the buildup of risks in the financial system. Let me mention three factors that current research suggests are critical.

One factor is the accumulation in the financial sector of very high levels of risk and leverage, along with excessive reliance on unstable short-term funding. The emergence of such behavior among the largest and most interconnected financial institutions is particularly dangerous, since these institutions are linchpins in our financial system and their failure could cause significant damage to large numbers of counterparties and the system as a whole, as the examples of Lehman Brothers and American International Group demonstrate. However, a buildup of leverage and growing maturity mismatches are also worrisome when they occur more broadly in the financial system.

A second element is a high positive correlation of risk exposures across institutions. A wide array of commercial banks, investment banks, and other financial



institutions held mortgages, mortgage-backed securities, or positions in mortgage-related derivatives. The result was the massive vulnerability of the financial system to a collapse of housing prices. What seemed like moderate risks taken by individual institutions ultimately led to an enormous risk to the system as a whole.

A third element is the extraordinary interconnectedness and complexity within the financial system. The intricate and opaque web of connections among financial players multiplies the dangers of contagion in the form of lost confidence, frozen liquidity, fire sales, and domino effects.<sup>4</sup> A key factor in this channel of systemic risk is the institutional arrangements in payment, clearing, and settlement systems. For example, weaknesses in the market infrastructure for repurchase agreements, or repos, and over-the-counter derivatives intensified the crisis.<sup>5</sup>

Systemic risk reflects the confluence of factors that may grow slowly over years. Therefore, surveillance must look at a variety of indicators and be forward looking, considering the paths of factors that influence such risk for years to come. To facilitate timely recognition of the emergence of systemic risk, we should design quantifiable indicators related to the three elements I just outlined: risk buildup at systemically important institutions and within the financial sector more broadly, positive correlations of risk among financial market participants, and interconnectedness among those participants.

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<sup>4</sup> See Hyun Shin (2009), “Financial Intermediation and the Post-Crisis Financial System,” paper presented at the 8th BIS Annual Conference, June 25-26.

<sup>5</sup> See Payments Risk Committee (2010), *Task Force on Tri-Party Repo Infrastructure* (New York: PRC, May), available at [www.newyorkfed.org/prc/report\\_100517.pdf](http://www.newyorkfed.org/prc/report_100517.pdf); and Darrell Duffie, Ada Li, and Theo Lubke (2010), “Policy Perspectives on OTC Derivatives Market Infrastructure,” Staff Report 424 (New York: Federal Reserve Bank of New York, January (revised March)), available at [www.newyorkfed.org/research/staff\\_reports/sr424.html](http://www.newyorkfed.org/research/staff_reports/sr424.html).

Systemic risk surveillance will demand Herculean efforts by the regulatory agencies and the Office of Financial Research created by the new legislation. I see parallels between the way we take the pulse of the economy when considering monetary policy decisions and the way we should monitor and evaluate systemic risk when formulating macroprudential policies. In assessing the economy, we collect and analyze a myriad of data. In practice, though, we regard certain metrics as most critical, such as gross domestic product, employment and unemployment, and inflation. Similarly, in risk surveillance, we will gather an array of data on risk spreads, credit flows and volumes, asset prices, debt and leverage, markets, and institutions, including detailed, often proprietary, microdata on balance sheets and data from such markets as those for over-the-counter derivatives and repos. Nonetheless, surveillance is likely to concentrate on key factors in the buildup of systemic risk such as the ones I identified: the accumulation of credit and funding risk on the balance sheets of systemically important institutions and throughout the financial system, the correlation of risk among financial market participants, and the extent of counterparty exposures.

Of course, we must also keep a close eye on broad credit and asset market conditions. One strand of surveillance will involve watching variations of risk and term spreads of bonds and other securities relative to historical norms. Narrow risk spreads and risk premiums may be a harbinger of excessive risk-taking by investors. Another strand will focus more directly on measuring credit flows and exposures to credit risk. If overall credit growth is extraordinarily rapid, it may be a sign that financial institutions are taking greater risks onto their balance sheets. Because of financial system complexity, leverage is impossible to measure perfectly. Still, real-time indicators of the

leverage of financial intermediaries would help identify where we are in a credit cycle. For example, we can look at the marginal leverage of new borrowing by examining data on collateral haircuts. We may also monitor data on repo market activity and haircuts to spot vulnerabilities relating to maturity mismatches. This information can be crosschecked against firm- and sector-level data on credit risk exposure.

One aspect of systemic risk surveillance that has garnered a great deal of attention is the identification of asset price bubbles. Bubbles present systemic danger when major financial institutions use leverage to finance investment in risky assets that they hold on their balance sheets. The systemic risk is multiplied when the asset bubble is accompanied by a credit bubble that fuels highly leveraged investment.<sup>6</sup> So a top priority of systemic risk surveillance must be to assess whether asset price movements suggest the presence of a bubble and identify at an early stage those that might be particularly dangerous. In practice, of course, we will have highly uncertain notions of when excesses evolve into bubbles. Near the end of a bubble, it's pretty clear that something is amiss. But by then it's too late to do much about it.

We will also need to monitor the cross-sectional correlations of firms' risk exposures.<sup>7</sup> In addition, we need information on counterparty exposures through derivatives and other financial instruments. Finally, further development of financial

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<sup>6</sup> See Tobias Adrian and Hyun Song Shin (2008), "Financial Intermediaries, Financial Stability, and Monetary Policy," paper presented at "Maintaining Stability in a Changing Financial System," a symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo., August 21-23, [www.kansascityfed.org/publicat/sympos/2008/Shin.03.12.09.pdf](http://www.kansascityfed.org/publicat/sympos/2008/Shin.03.12.09.pdf).

<sup>7</sup> A number of promising measures of measuring systemic risk that take into account the correlations of firms' strategies have recently been developed. For example, the CoVaR approach aims to measure the marginal contribution of a financial institution to systemic risk, where systemic risk is measured by the value at risk of all firms together; see Tobias Adrian and Markus K. Brunnermeier (2009), "CoVaR," Staff Report 348 (New York: Federal Reserve Bank of New York, August), available at [www.newyorkfed.org/research/staff\\_reports/sr348.pdf](http://www.newyorkfed.org/research/staff_reports/sr348.pdf). See also the risk topography approach discussed in Markus K. Brunnermeier, Gary Gorton, and Arvind Krishnamurthy (2010), "Risk Topography," unpublished paper, July, [www.princeton.edu/~markus/research/papers/risk\\_topography.pdf](http://www.princeton.edu/~markus/research/papers/risk_topography.pdf).

sector stress testing, building on the tests carried out in the United States in 2009 and in Europe this year, will provide valuable information about the ability of the financial system to weather significant economic or financial shocks. We should refine the stress-testing methodology as we develop a more sophisticated understanding of institution-level systemic risk factors. These enhancements can be carried out by the quantitative surveillance unit that we have already established in our supervision of the largest financial institutions to better integrate macroprudential considerations with regular supervisory practice.

Qualitative information on credit will complement the quantitative evidence. The Fed recently introduced the Senior Credit Officer Opinion Survey on Dealer Financing Terms, adding to the information collected from the existing commercial bank Senior Loan Officer Opinion Survey on Bank Lending Practices, a survey on credit supply and demand.<sup>8</sup>

Systemic risk surveillance is both a science and an art: science in that we will analyze closely a wide range of data that research shows to be diagnostic, and art in that we will have to exercise judgment about when excesses become so dangerous that action is required. The Fed and other regulators in the United States and abroad have made important progress in developing systemic risk indicators. Still, we must recognize the inherent difficulty in forecasting crises and acknowledge the failure of past risk-monitoring efforts. Moreover, we must be mindful of the inadequacy of indicators that focus too specifically on the markets and channels that transmitted the crisis of 2007 and 2008. Like Tolstoy's unhappy families, every financial crisis is a crisis in its own way.

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<sup>8</sup> These surveys are available on the Federal Reserve Board's website at [www.federalreserve.gov/econresdata/releases/surveysreports.htm](http://www.federalreserve.gov/econresdata/releases/surveysreports.htm).

For that reason, we need a flexible approach that combines science and art, and judgmentally weighs information from all indicators.

### **Macroprudential Policy Implementation**

Refining our ability to identify systemic threats is well and good. But when we detect a threat, what will we do about it? This question brings me to the tools and implementation of macroprudential policies. The first tool is information to help focus attention in policy circles, and among investors and the public, on looming systemic risks. The detailed financial stability reports published by the International Monetary Fund and a number of central banks are intended to serve this purpose.<sup>9</sup> And the Financial Stability Oversight Council created under the Dodd-Frank Act is charged with preparing such a report once a year.

Admittedly, most such reports failed to identify the mechanisms behind the recent crisis. And even when vulnerabilities were identified and warning bells sounded, they were often greeted with yawns, as anyone who remembers the phrase “irrational exuberance” can testify. Those who sounded the alarms were seen as killjoys who refused to join the party. Words are important, but clearly they are not enough. We need strong policies to back them up. We need macroprudential policymakers ready to take away the punch bowl when the party is getting out of hand. We know that market participants won’t take kindly when limits are set precisely in those markets that are most exuberant, the ones in which they are making big money. During the late stages of the

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<sup>9</sup> See International Monetary Fund (2010), *Global Financial Stability Report: Meeting New Challenges to Stability and Building a Safer System* (Washington: IMF), available at [www.imf.org/external/pubs/ft/gfsr/2010/01/pdf/text.pdf](http://www.imf.org/external/pubs/ft/gfsr/2010/01/pdf/text.pdf).

For example, see Bank of England (2010), *Financial Stability Report* (London: BOE), available at [www.bankofengland.co.uk/publications/fsr/2010/fsr27.htm](http://www.bankofengland.co.uk/publications/fsr/2010/fsr27.htm).

housing boom, more than a few financial institution chief executive officers dismissed the warnings of their own risk managers with a wave of the hand.

So what should be the main tools of macroprudential supervision? Many of them are similar to those of microprudential policy. They take the form of restrictions or incentives related to financial firms' balance sheets. Still, macroprudential policies differ from purely microprudential approaches in that they are intended to protect the financial system as a whole and, by extension, the broader economy. Macroprudential policies will be aimed at countering the pro-cyclical nature of credit and leverage, leaning against the wind when systemic risk is accumulating. In addition, they will seek to stem risks related to interconnections and spillovers in the financial system.

The Basel Committee on Banking Supervision is playing a key role in designing this new regulatory regime as part of the Basel III initiative. And, under Federal Reserve leadership, initiatives to implement macroprudential supervision are well under way in the United States. Policymakers here and abroad agree that macroprudential policy must include requirements to hold more and higher-quality capital. And capital requirements must be reformulated to reduce the pro-cyclicality of credit and leverage. Financial institutions may be required to build capital buffers in good times, which they can run down in bad times, thereby limiting credit growth during booms and mitigating credit contraction in downturns. Banks may also be required to have, in addition to their standard equity buffers, contingent capital in the form of debt that is convertible to equity if they experience significant losses. This additional capital would protect them from insolvency during busts while allowing them to benefit from debt finance in boom times. U.S. regulators have also been charged with developing heightened prudential standards

for systemically important institutions to constrain risk-taking by those firms whose failures would pose the greatest systemic risk. One approach could involve imposing penalties or restrictions on financial firms based on factors such as the correlation of their strategies with those of other firms or by limiting risk exposure to individual counterparties.

Policies are on the drawing board to ensure that institutions avoid undue reliance on short-term debt and have adequate liquidity in market downturns. Such requirements would diminish the risk of the shortfalls and hoarding that could fuel a credit market meltdown. Policymakers might additionally put in place policies to discourage overreliance on short-term debt among investors more broadly through, for example, regulations on repo haircuts. To address unsustainable real estate price run-ups, some countries have chosen to cap maximum loan-to-value ratios on home loans. Such an approach deserves serious consideration. My expectation is that policies such as these will restrict dangerous pro-cyclical movements in debt and leverage, diminish the extent of maturity mismatches and the potential for runs, and discourage unsustainable asset price appreciation. Importantly, the Federal Reserve and other U.S. regulators have also taken steps to ensure that the financial institutions we supervise enforce compensation policies that control incentives for excessive pro-cyclical risk-taking.

Macroprudential supervision must be particularly attentive to risks that could impair the plumbing of the financial system--that is, the payments, clearing, and settlements systems--where breakdowns would relay and amplify systemic risk. Importantly, the Dodd-Frank Act significantly increases the trading of derivatives on

exchanges and their clearing through central counterparties.<sup>10</sup> Because clearinghouses are themselves subject to risk from counterparties and are important linchpins in the financial system, they must be regulated to ensure that they operate safely.

Since the implementation of macroprudential supervision is a work in progress, I want to highlight several important design considerations. The first relates to the appropriate balance between fixed rules and discretion--a question familiar from monetary and fiscal policy. In both cases, we have learned that fixed rules offer distinct advantages. In fiscal policy, automatic stabilizers have proven helpful in mitigating the amplitude of cyclical fluctuations. They trigger fiscal support when needed in a timely and predictable way. In the realm of monetary policy, the Fed and other central banks commonly vary policy in a manner that researchers and market participants find predictable and systematic. Indeed, guidance from policy rules is increasingly used in actual decisionmaking since rule-based recommendations create a sensible starting point for deliberations. Rule-like behavior also aligns the expectations of markets and policymakers so that policy is transmitted quickly and effectively to the economy.

Nevertheless, neither fiscal nor monetary policymakers rely on fixed rules alone. Discretionary fiscal policy has been helpful, even essential, in some instances in responding to economic fluctuations resulting from large shocks. Similarly, in the realm of monetary policy, the Fed and other central banks certainly don't slavishly follow prescriptions from any rule. They retain discretion to deviate from such prescriptions when responding to severe shocks, unusually strong headwinds, or significant asymmetric risks.

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<sup>10</sup> See Duffie and others, "Policy Perspectives," in note 5, for a discussion of these issues.



In the implementation of macroprudential supervision, I believe it will be similarly advantageous to put in place a system of controls in which fixed rules play an important role while a place is preserved for the discretionary judgments of regulators. Fixed rules will diminish the need for policymakers to make the difficult decision to take away the punch bowl. Moreover, if discretionary macroprudential policy interventions are deferred until a boom is well under way, the macroeconomic spillovers could prove difficult for monetary policy to offset.

For these reasons, a stronger system of prudential controls designed to mitigate the buildup of systemic risk must be put into place, a system that will incorporate mechanisms to automatically counter pro-cyclical behavior. All the same, discretionary interventions will inevitably play a part in macroprudential supervision. For one thing, it's important to keep in mind that financial institutions have been very adept at gaming rule-based systems. And, over time, there is always an incentive for risky financial activities to migrate outside the perimeter of supervision and regulation, even if that perimeter is moving. That's precisely what happened prior to the mortgage crisis, when leverage ballooned in the shadow banking system and investment banks and some nonbanks became principal participants in credit derivatives markets. Furthermore, the financial system will evolve in ways that preclude any wholly rule-based system from countering all emerging systemic threats. Discretionary macroprudential interventions are certain to be needed to address dangerous developments, and judgment must play a role.

A second consideration in macroprudential supervision relates to the need for robust policies. This concern derives from the observation that we still have a lot to learn

about the behavior of financial institutions and their effects on systemic risk and the real economy. Our ability to model the channels by which disruptions in credit and finance affect the real economy and the ways these effects feed back into the banking and financial systems is getting more sophisticated.<sup>11</sup> But our understanding of the key channels, their quantitative importance, and the effects of our policies remain incomplete at best. It is therefore important that we implement policies that are likely to succeed in mitigating systemic risk in a future crisis regardless of the precise triggers and transmission channels. A rich monetary policy literature demonstrates that simple rules result in good, even excellent, performance when policymakers face uncertainty about the structure of the economy and the source of economic shocks.<sup>12</sup> This conclusion may apply to macroprudential supervision as well.

A third consideration in the design of the macroprudential supervision relates to the need for extensive international cooperation. If the United States were to go it alone with tough policies, we could see our financial institutions flee in a race to the bottom. But I'm convinced that won't happen. We are working closely with our international counterparts to develop coherent and comprehensive approaches, aided by the Basel

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<sup>11</sup> See, for example, Markus K. Brunnermeier and Yuliy Sannikov (2010), "A Macroeconomic Model with a Financial Sector," unpublished paper, May, [www.princeton.edu/~markus/research/papers/macro\\_finance.pdf](http://www.princeton.edu/~markus/research/papers/macro_finance.pdf); Vasco Curdia and Michael Woodford (2009), "Credit Spreads and Monetary Policy," Staff Report 385 (New York: Federal Reserve Bank of New York, August), available at [www.newyorkfed.org/research/staff\\_reports/sr385.html](http://www.newyorkfed.org/research/staff_reports/sr385.html); Mark Gertler and Peter Karadi (2009), "A Model of Unconventional Monetary Policy," manuscript, New York University, April; and the references therein.

<sup>12</sup> See, for example, John B. Taylor and John C. Williams (forthcoming), "Simple and Robust Rules for Monetary Policy," in Benjamin Friedman and Michael Woodford, eds., *Handbook of Monetary Economics* (Amsterdam: North-Holland).

Committee on Banking Supervision, the Financial Stability Board, the International Monetary Fund, and other institutions.<sup>13</sup>

Finally, we must not forget that macroprudential policies will entail some costs as well as benefits. The magnitude of these costs remains a subject of debate. But, as with all forms of regulation, we must find the right balance between overly strict supervision and laissez faire. I don't know exactly where on the continuum that balance lies. But I do know that, before the crisis, we had veered disastrously too far in the direction of laissez faire, with consequences we know too well.

### **Interaction with Monetary Policy**

One of the most challenging issues relating to systemic risk management is the appropriate interactions between macroprudential and monetary policy. To what extent, if at all, should monetary policy be used to mitigate systemic risk? And to what extent, if at all, should monetary policy be coordinated with macroprudential supervision? These issues are the subject of intense debate among policymakers across the globe. Of course, the question of whether monetary policy should lean against asset price bubbles is hardly new.<sup>14</sup> What has changed is the sense of urgency surrounding this and related questions.

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<sup>13</sup> See John Lipsky (2010), "Reconsidering the International Monetary System," panel presentation at the "Macroeconomic Challenges: The Decade Ahead," a symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo., August 26-28.

<sup>14</sup> See, for example, Ben S. Bernanke and Mark Gertler (1999), "Monetary Policy and Asset Price Volatility," paper presented at "New Challenges for Monetary Policy," a symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo., August 26-28, [www.kansascityfed.org/publicat/sympos/1999/S99gert.pdf](http://www.kansascityfed.org/publicat/sympos/1999/S99gert.pdf); Stephen G. Cecchetti, Hans Genburg, John Lipsky, and Sushil B. Wadhvani (2000), *Geneva Reports on the World Economy 2: Asset Prices and Central Bank Policy* (London: Centre for Economic Policy Research); and Donald L. Kohn (2006), "Monetary Policy and Asset Prices," speech delivered at "Monetary Policy: A Journey from Theory to Practice," a European Central Bank colloquium held in honor of Otmar Issing, Frankfurt, Germany, March 16, [www.federalreserve.gov/newsevents/speech/kohn20060316a.htm](http://www.federalreserve.gov/newsevents/speech/kohn20060316a.htm).

I noted previously--and it is now commonly accepted--that monetary policy can affect systemic risk through a number of channels.<sup>15</sup> First, monetary policy has a direct effect on asset prices for the obvious reason that interest rates represent the opportunity costs of holding assets. Indeed, an important element of the monetary transmission mechanism works through the asset price channel. In theory, an increase in asset prices induced by a decline in interest rates should not cause asset prices to keep escalating in bubble-like fashion. But if bubbles do develop, perhaps because of an onset of excessive optimism, and especially if the bubble is financed by debt, the result may be a buildup of systemic risk. Second, recent research has identified possible linkages between monetary policy and leverage among financial intermediaries.<sup>16</sup> It is conceivable that accommodative monetary policy could provide tinder for a buildup of leverage and excessive risk-taking in the financial system.

Macroprudential interventions may also have macroeconomic spillovers. For example, research suggests that rigorous enforcement of supervisory standards for capital following the real estate-related loan losses of the early 1990s may have slowed the economy's recovery from the recession. Today, we all understand the need for more stringent bank capital and liquidity requirements to stem systemic risk. But, with high unemployment in so many economies, the new Basel III agreement recognizes the desirability of a phase in period for these standards. The implementation of tighter standards over a multi-year period should mitigate the concern that the macroprudential

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<sup>15</sup> See Janet L. Yellen (2009), "Linkages between Monetary and Regulatory Policy: Lessons from the Crisis," presentation to the Institute of Regulation and Risk, North Asia, held in Hong Kong, November 17; and Charles Bean, Matthias Paustian, Adrian Penalver, and Tim Taylor (2010), "Monetary Policy after the Fall," paper presented at "Macroeconomic Challenges: The Decade Ahead," a symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo., August 26-28, [www.kansascityfed.org/publicat/sympos/2010/bean-paper.pdf](http://www.kansascityfed.org/publicat/sympos/2010/bean-paper.pdf).

<sup>16</sup> See Tobias Adrian and Hyun Song Shin (2009), "Money, Liquidity, and Monetary Policy," *American Economic Review*, vol. 99 (May), pp. 600-05.

policies we are putting in place to control systemic risk will unduly restrict the availability of credit, thereby retarding economic recovery. In this case, as it should, the implementation of macroprudential policy is taking account of spillovers that monetary policy, at least now, cannot easily offset.

Some would argue that the conduct of macroprudential and monetary policy should be closely coordinated, even integrated, because of the spillovers I described.<sup>17</sup> Indeed, the logic of this argument has led some observers to conclude that both macroprudential and monetary policy should be assigned to the central bank.<sup>18</sup> As I noted, the Dodd-Frank Act assigned the Federal Reserve an important role in the conduct of macroprudential supervision, and for good reasons. We have long experience in supervision, broad knowledge of financial markets, and an understanding of the linkages between financial markets and the economy. In addition, the insights derived from our supervisory role benefit the conduct of monetary policy. But the pursuit of macroprudential supervision under the new legislation involves other regulatory agencies beside the Fed, and the new Financial Stability Oversight Council will play an important role. And, of course, the Fed will keep sole responsibility for the conduct of monetary policy, retaining its independence. There are important reasons for this approach. One is that systemic risk surveillance will benefit from the perspectives of regulators with different windows on the financial system, all participating in the oversight council.

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<sup>17</sup> See Bean and others, “Monetary Policy after the Fall,” in note 15, for a discussion of the interaction of monetary and macroprudential policies.

<sup>18</sup> See Kenneth R. French, Martin N. Baily, John Y. Campbell, John H. Cochrane, Douglas W. Diamond, Darrell Duffie, Anil K Kashyap, Frederic S. Mishkin, Raghuram G. Rajan, David S. Scharfstein, Robert J. Shiller, Hyun Song Shin, Matthew J. Slaughter, Jeremy C. Stein, and René M. Stulz (2010), *The Squam Lake Report: Fixing the Financial System* (Princeton: Princeton University Press).

Second, the principle of central bank independence in the conduct of monetary policy is widely accepted as vital to achieving maximum employment and price stability.

Fortunately, it is perfectly possible to attain good outcomes even if monetary policy and macroprudential policy are carried out separately and independently, and the goals of each are pursued using entirely separate tool kits. This conclusion is an application of the assignment problem made familiar by Robert Mundell and others who analyzed monetary and fiscal policy.<sup>19</sup> A key insight from that literature is that satisfactory results can be attained without policy coordination, even though fully optimal policy generally calls for coordination when spillovers occur. Of course, it is necessary for monetary policy to take into account any macroeconomic effects resulting from macroprudential policy and vice versa.

This separate-assignments approach to formulating macroprudential and monetary policy has merit both in theory and practice. But I want to be careful not to push the argument for separation too far. I noted, for example, that situations may arise in which the Federal Reserve, in its conduct of monetary policy, might not be able to fully offset the macroeconomic effects of macroprudential interventions. This scenario could happen because of the zero bound on interest rates or monetary policy lags. In such circumstances, it makes sense for macroprudential policy to take macroeconomic effects into account. By the same token, I would not want to argue that it is *never* appropriate for monetary policy to take into account its potential effect on financial stability. Regulation is imperfect. Financial imbalances may emerge even if we strengthen macroprudential oversight and control. Some day in the future, it is possible that

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<sup>19</sup> See Robert A. Mundell (1962), "Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability," in *International Monetary Fund Staff Papers*, vol. 9 (1) (Basingstoke, England: Palgrave Macmillan), pp. 70-79.

macroprudential regulators might let down their guard. In such situations, if emerging threats to financial stability become evident, monetary policy could be faced with difficult tradeoffs. My hope is that such situations will remain largely theoretical and, in practice, be exceedingly rare.

Overall, I am encouraged by the progress we are making in developing the new regulatory framework. Still, macroprudential supervision is a work in progress, and we must humbly recognize that we have a lot to learn.

### **Challenges**

It's important to be realistic about the challenges that lie ahead. By its nature, policy designed to manage systemic risk fights dangers that may never lead to crises. We may sometimes be like the boy who cried, "Wolf!"--and the villagers may not be pleased about being roused from their beds. Right now, we are still suffering from the shock of an epic financial disaster. The climate for macroprudential policymaking is relatively favorable. But memories will fade, as they always have before, and future policymakers may face harsh criticism. They will need to make difficult and potentially costly judgment calls, relying on imperfect real-time information. In this regard, it's worth recalling Paul Samuelson's quip that the stock market has predicted nine of the past five recessions. Will future regulators and monetary policymakers be accused of bursting 10 of the past 2 asset bubbles?

These dangers are real. But the events we've recently lived through make it clear that we have no choice but to embark on this road. We've all been asked, "Didn't you see this mortgage disaster coming? Why didn't you do anything about it?" Our task now is to implement intelligent policies to contain future bubbles and credit binges, and to

make sure that those that do occur inflict a lot less damage on the economy. Next time I hope we can say, "We did see it coming, and we did something about it."

Thank you very much.