

**The Nexus of Macroprudential Supervision, Monetary Policy, and Financial
Stability**



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Introduction

Good morning. I am very pleased to participate in this conference co-organized by the Federal Reserve Bank of Cleveland and the Office of Financial Research. I want to thank Stephen Ong and Joe Haubrich from the Cleveland Fed and Mark Flood and Greg Feldberg from the OFR for putting together such an interesting program. I also thank the editors of the *Journal of Financial Stability*, which will be publishing a special volume of the journal with some of the papers from the conference. This is the second in what I hope is a series of conferences co-sponsored by the Cleveland Fed and the OFR. I very much value the collaboration between our institutions, which share a similar mission of fostering financial stability in our nation. I believe avenues such as this conference, which bring together researchers, financial sector supervisors, and policymakers from around the globe, provide important ways for us to share different perspectives on the complex subject of financial stability. This dialogue can lead to a better understanding of what we know and what we still need to learn, a crucial step on the road to more effective policymaking.

This morning, I'd like to share my perspectives as a monetary policymaker on the important task of fostering financial stability in the post-crisis environment. It may seem strange that the nexus between monetary policy and financial stability is still an open question. The Federal Reserve itself was created a hundred years ago after the financial panics that beset the country in the late 1800s and early 1900s. After the severe 1907 banking panic, the idea that a central bank might contribute to a more stable financial system gained traction and the Federal Reserve Act was signed into law in 1913. Yet, today, after the severe financial crisis of 2008, we are again rethinking the role of central banks in promoting financial stability. In my remarks today, I will highlight some of the changes in the approach to bank supervision we have undertaken since the financial crisis and then discuss the relationship between monetary policy and financial stability in the post-crisis world. Of course, these will be my views and not necessarily those of the Federal Reserve System or my colleagues on the Federal Open Market Committee.

Macroprudential Supervision

Financial institutions are able to provide valuable credit, risk-management, and liquidity services to businesses and households because they are designed to take risks and are highly leveraged compared with nonfinancial businesses. But this risk-taking and leverage raise the possibility of systemic problems that could threaten the functioning of the financial system, hurt real economic activity, and impose significant economic costs. The pain inflicted by the 2008 financial crisis and deep recession that followed is still being felt by many in our economy. Financial sector supervisors and policymakers can learn many lessons from the crisis and its aftermath, and the country has taken a number of steps to help ensure we do not have a repeat occurrence. The Dodd-Frank Wall Street Reform and Consumer Protection Act, signed into law in 2010, includes a number of provisions to strengthen the supervisory framework, and financial institution regulators themselves are changing the way they go about monitoring risks. Wanting to promote financial stability is not new, but in addition to microprudential supervision, which promotes the safety and soundness of individual institutions, there is now more recognition of the importance of identifying and monitoring emerging risks to the stability of the financial system as a whole and taking appropriate steps to contain these systemic risks. In this macroprudential approach, examiners and supervisors are taking a more horizontal view in which a particular risk is evaluated across institutions rather than only at one institution at a time.

Under the Dodd-Frank Act, the Federal Reserve and other financial regulatory agencies were directed to augment the microprudential supervision of individual institutions with a macroprudential approach to supervision designed to address systemic risk. The Financial Stability Oversight Council, with representation from federal and state financial system regulators, was created to coordinate the government's efforts to identify and respond to systemic risks by establishing prudential standards for systemically important firms. The Office of Financial Research, also a product of the Dodd-Frank Act, has the important task of improving the quality of financial data, which are a crucial ingredient supporting policymakers' efforts to better understand the financial landscape and to spot systemic risks.

The regulatory reforms aim to foster financial stability in two ways: first, by lowering the probability of a financial crisis, and second, by reducing the costs imposed on the rest of the economy when a shock hits the financial system. Falling mainly in the first category are the new higher standards for financial institution capital and leverage requirements, liquidity requirements, concentration limits, standards for corporate governance including executive compensation, and the stress tests. Falling mainly in the second category are Dodd-Frank's requirement that a systemically important financial institution provide a resolution plan or living will detailing how it would wind down the firm should it fail, and the act's Title II provisions establishing an orderly liquidation authority to resolve troubled nonbank financial companies. Developing a system to effectively resolve systemically important financial institutions in a way that avoids causing problems that cascade throughout the financial system is a key task on the agenda for promoting financial stability. Ironically, we will have a more stable financial system if we build a system that allows insolvent institutions to fail, and less regulatory intervention to prevent closure of these firms. An effective resolution method will give managers and creditors the incentive to monitor the risks their institution is taking to avoid losses.

Indeed, one of the lessons of the crisis was that incentives matter and regulation itself creates incentives. Sometimes these incentives work to promote financial stability. But sometimes regulations, no matter how well intentioned, can create counterproductive incentives – so-called unintended consequences. For example, at least some part of the strong growth in financial intermediation that occurred outside of the regulated banking system was driven by the desire to avoid regulation. Another example is suggested by the recent discussion surrounding the European Union's cap on bonuses paid to bankers. U.K. policymakers expressed concerns that the cap may not have the desired effect of limiting total compensation, and thereby limiting risk-taking, but instead may result merely in a shift to other types of uncapped compensation, such as fixed salaries, or may spur banks to move operations outside of the EU.

One guiding principle we should follow in any regulation is to pay attention to the incentives created by the regulatory system we have put into place. Explicit and implicit rules and the ways they are implemented create incentives. These incentives influence the behavior of all market participants: the financial intermediaries and their investors and customers, and the regulators. A second principle to follow in regulation is to avoid working against market forces. Instead, we should design a system that harnesses market discipline to work with improved regulation. I view Dodd-Frank's establishment of the OFR to collect financial firm data, as well the act's permission to compel more public disclosures, as encouraging the transparency needed for market discipline.

Although there is still more work to be done, regulators are making progress in developing tools to implement the macroprudential approach to promoting financial stability. In general, the macroprudential tools can be classified into two categories: structural tools and cyclical tools. The structural tools aim to build the resiliency of the financial system throughout the business cycle. These tools include the Basel III risk-based capital requirements, minimum liquidity requirements, central clearing for derivatives, and living will resolution plans.

In contrast, the cyclical tools are aimed at mitigating the systemic risk that can build up over the business cycle. The seminal model of Kiyotaki and Moore shows how these risks can be amplified and propagated.¹ In their model, because borrowers cannot be forced to repay, all lending is collateralized. When the economy is performing well, the value of the collateral increases, which supports further borrowing and higher output. But when a negative shock hits the economy and output declines, collateral values also fall, which means borrowing falls, which depresses output even further. Thus, the collateral constraint is a mechanism that amplifies and propagates the effects of temporary shocks on the economy.

¹ Nobu Kiyotaki and John Moore, "Credit Cycles," *Journal of Political Economy* 105, 1997, pp. 211-248.

Brunnermeier and Sannikov build on the Kiyotaki and Moore model.² In their model, an economic boom increases bank capital levels high enough so that credit is amply available to borrowers. This lowers the volatility of both output and asset prices. The lower volatility induces banks to increase their leverage and lend even more, so much so that the system is now vulnerable to a negative shock. These models illustrate that systemic risk is endogenous, determined by the choices of the model's decision makers, and that systemic risk varies across the cycle.

Macroprudential tools aimed at addressing these emerging risks include the countercyclical capital buffer, the capital conservation buffer, and stress test scenarios. The countercyclical capital buffer allows regulators to increase risk-based capital requirements when credit growth is judged to be excessive and leading to rising systemic risk. The capital conservation buffer ensures that banks raise capital above regulatory minimums in good times so that when they cover losses in bad times, their capital ratio will stay at or above the regulatory minimum. The stress tests can include scenarios that become more severe during strong economic expansions. Other possible cyclical tools, not yet established in the U.S. but used in other countries, include loan-to-value ratio limits and debt-to-income ratio limits that vary over the cycle. In some countries, these macroprudential tools have been targeted at particular sectors like housing credit or household credit. For example, Canada tightened loan-to-value and debt-to income limits on mortgage lending over the 2009 to 2012 period.³ Beginning in 2010, Israel also implemented a package of macroprudential tools to restrict the supply of housing credit.⁴ Spain introduced dynamic loan-loss

² Markus K. Brunnermeier and Yuliy Sannikov, "A Macroeconomic Model with a Financial Sector," *American Economic Review* 104, 2014, pp. 379-421.

³ See Ivo Krznar and James Morsink, "With Great Power Comes Great Responsibility: Macroprudential Tools at Work in Canada," IMF Working Paper WP/14/83, May 2014.

⁴ See Stanley Fischer, "Macroprudential Policy in Action: Israel," in George A. Akerlof, Olivier J. Blanchard, David Romer, and Joseph E. Stiglitz, eds., *What Have We Learned? Macroeconomic Policy after the Crisis* (Cambridge, Mass: The MIT Press), 2014, pp. 87-98.

provisioning in 2000.⁵ This method builds up reserves during good economic times according to the historical losses experienced by the asset classes held in the bank's portfolio. This buffer is then available to absorb losses in bad times.

Assessing the performance of these macroprudential tools is an area of ongoing research. It is complicated by the fact that there is relatively little experience with the use of these tools, and econometrically, it is difficult to isolate the effects of the macroprudential tools from the effects of changes in monetary policy and fiscal policy that occurred at the same time. For example, according to Federal Reserve Vice Chairman Stanley Fischer, the Bank of Israel did not have good empirical estimates of the effectiveness of the different macroprudential measures.⁶ Moreover, gauging success may depend on your metric. While the Spanish banking system had the highest ratio of loan-loss reserves to nonperforming assets in western Europe in 2006,⁷ and so was in a better position to handle losses, the provisioning did not prevent a housing bubble in Spain. A study by economists at the IMF examining the effectiveness of macroprudential tools in reducing systemic risk in 49 countries found mixed results.⁸ The authors concluded that many of the most frequently used tools were effective in reducing the procyclicality of credit and leverage, but the effectiveness depended on the type of shock hitting the financial sector.

This study and others suggest that the macroprudential approach has promise, but that the jury is still out on just how effective the tools will be. To me, this underscores the importance of our continued vigilance

⁵ See Eliana Balla and Andrew McKenna, "Dynamic Provisioning: A Countercyclical Tool for Loan Loss Reserves," Federal Reserve Bank of Richmond *Economic Quarterly*, 95, Fall 2009, pp. 383-418.

⁶ See Stanley Fischer, "Financial Sector Reform: How Far Are We?" Martin Feldstein Lecture, National Bureau of Economic Research, Cambridge, MA, July 10, 2014.

⁷ See Balla and McKenna, p. 403.

⁸ See C. Lim, F. Columba, A. Costa, P. Kongsamut, A. Otani, M. Saiyid, T. Wezel, and X. Wu, "Macroprudential Policy: What Instruments and How to Use Them? Lessons from Country Experiences," IMF Working Paper WP/11/238, October 2011.

in monitoring the buildup of risks in the financial system. Better monitoring of these risks will be aided by the data being collected by the OFR and the metrics being developed in the Federal Reserve System and elsewhere, such as the Cleveland Fed's financial stress index,⁹ which summarizes movements in a number of financial variables associated with stress. It is important to remember, however, that many of these metrics quantify correlations in the data rather than telling us something about the structure of the underlying financial markets or what has caused the movement in the metric and whether it requires a policy response.

For this, one needs structural general equilibrium economic models that seriously incorporate financial markets and the possibility of financial stress, borrower defaults, and financial institution failures. These models need to be fairly complex. Before the financial crisis we may have convinced ourselves that we could rely on representative agent models, linearized around a steady state, with one interest rate. But the nature of the financial crisis pointed out the inadequacies of these models for understanding the impact of severe financial stress on the real economy. By their nature, financial crises involve nonlinearities, potentially multiple equilibria, and financial frictions that limit arbitrage. So our models need to include these features. Macroprudential tools focus on the allocation of credit in the economy and work through redistribution. To study the effects of such tools, our models need to include heterogeneous agents – entities with different rates of risk tolerance and time preference – and multiple interest rates.¹⁰ Of course, monetary policy also entails some redistributions of income and wealth, and understanding the dynamics of the effects of monetary policy also requires the use of more complex models.¹¹ There is an ongoing research effort at central banks around the world in developing models that can be used to

⁹ The Cleveland Financial Stress Index is updated daily at http://www.clevelandfed.org/research/data/financial_stress_index/.

¹⁰ For an informative discussion of the nature of the models, see Eric M. Leeper and James M. Nason, “Bringing Financial Stability into Monetary Policy,” November 11, 2014.

¹¹ Yves Mersch, member of the Executive Board of the European Central Bank, discusses some of this research in “Monetary Policy and Economic Inequality,” keynote speech, Corporate Credit Conference, Zurich, October 17, 2014.

evaluate how policymakers should incorporate financial stability concerns into monetary policymaking, the subject to which I now turn.

Monetary Policy and Financial Stability

The severity of the financial crisis and ensuing recession renewed the discussion of how central banks should respond to developing systemic risk. During this episode, we saw that financial imbalances can build up even in a low-inflation environment. While price stability may promote financial stability, it is not a sufficient condition. We also saw that when financial markets are not functioning well, the transmission of monetary policy to the economy can be disrupted, and this can undermine its effectiveness in achieving the goals of price stability and maximum employment. In addition, the FOMC has recognized that nonconventional monetary policy, including large-scale asset purchases and the extended period of essentially zero interest rates, could pose potential risks to financial stability by affecting market functioning and spurring risk-taking in a search for yield, and the Committee continues to monitor these potential risks.¹² Thus, our recent experience has shined a bright light on the interactions between monetary policy and financial stability and has led to some reassessment of the proper relationship between the two.

Before the crisis, the conventional approach generally taken by the Fed was to use monetary policy to respond to asset price movements – whether driven by fundamentals or not – only to the extent that those movements contained information about inflation and output growth. Monetary policy would not try to limit the size of imbalances as they developed, but would opt to mop up the consequences of a correction after the fact.

¹² See “Developments Related to Financial Stability,” in the *Monetary Policy Report*, Board of Governors of the Federal Reserve System, July 15, 2014, pp. 22-23.

But others argued for a more activist approach, with monetary policy being used to try to stem developing imbalances *before* they caused harm to the real economy. BIS and OECD economist William White characterized these approaches as “clean” or “lean.”¹³ That is, should monetary policy clean up the mess after a bubble bursts, or should it lean against a bubble that appears to be forming? Former Federal Reserve Governor Randy Kroszner used another colorful metaphor: should monetary policy act as a fire extinguisher or a smoke detector?¹⁴

In my view, the divisions between these two views are sometimes overstated. Both sides recognize that central banks have a responsibility to promote financial stability, acting as the lender of last resort to solvent financial institutions with good collateral. Both sides agree that monetary policy should take financial conditions into account as part of the economic environment and that asset prices play an important role in the monetary policy transmission mechanism, potentially affecting both aggregate demand and inflation, but that monetary policy should not target asset prices. Neither side argues that monetary policy should respond to small misalignments of financial conditions and economic fundamentals, but both would support a monetary policy response to the extent that imbalances in credit and financial markets pose risks to price stability over the medium and longer run. Looked at in this way, the differences between the two viewpoints are perhaps more a matter of degree and nuance.

Rather than frame the discussion in terms of whether or not the central bank should attempt to pop an asset price or credit bubble, I would prefer that we frame the discussion in terms of the risks to macroeconomic and financial system stability. Financial crises can arise from high levels of optimism about the economy, which can lead to a rapid expansion in credit, which feeds into higher asset prices and a lower cost of capital, which then leads to further credit and economic expansion. Eventually, if the

¹³ See William R. White, “Should Monetary Policy ‘Lean or Clean’?,” Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute Working Paper No. 34, August 2009.

¹⁴ See Randall S. Kroszner, “What Should Central Banks Do? Comments on Charles Goodhart’s ‘The Changing Role of Central Banks,’” remarks at the BIS Annual Research Conference, Lucerne, June 2010.

expectations turn out to be overly optimistic, investments won't pay off, confidence will collapse, credit supply will fall, and there can be a rapid decline in prices and a pullback in credit.¹⁵ This need not be a bubble: the optimistic expectations formulated may have been based on the information available at the time. But the rapid rise in prices can lead to a bubble by generating behavior that is consistent only with continuing rises in prices. For example, as asset prices rise, lenders may begin to lower credit standards and rely on further appreciation of asset prices to cover any potential credit losses rather than on borrowers' ability to repay. This can continue until losses start to overtake asset price appreciation. Whether the original rapid rise in asset prices was generated by a bubble or not is less important than the observation that asset price dynamics can yield undesirable outcomes for the economy. The central bank needs to assess whether the risk of macroeconomic and financial system instability has risen, not whether there's a bubble.

In deciding whether or not to intervene by taking an action against a growing imbalance, policymakers need to balance the expected improvement in future economic conditions against the potential cost of unduly limiting credit extension. In the case of the recent collapse in the housing market, policymakers underestimated the breadth and depth of the negative impact this would have on the rest of the economy and the financial system. To the extent that we misjudged the impact, there is a larger potential gain to more carefully monitoring financial market conditions, implementing structural macroprudential tools aimed at lowering systemic risk, and being open to taking offsetting action should imbalances develop.

But what tool should policymakers use? There is ongoing discussion on this issue. At this point, given the state of our knowledge, I would opt to use the macroprudential tools as the first line of defense, since they can be more targeted to the markets and institutions where the risks are emerging. Whether monetary policy would be as effective is debatable. While interest rates affect the fundamental value of

¹⁵ See 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, May 15, 2008.

assets, it is not clear they affect the speculative or bubble portion. The impact may depend on the underlying nature of the financial imbalance. Indeed, in the Gali model, raising interest rates to combat a bubble can actually further inflate it.¹⁶ In addition, monetary policy tends to be a blunt instrument. Of course, depending upon the nature and breadth of the financial shock, this might be a desirable attribute. As former Federal Reserve Governor Jeremy Stein said, one benefit of using monetary policy is that “it gets in all the cracks,” meaning that a change in interest rates would affect all financial institutions and markets, whether regulated or not.¹⁷

In a situation in which the macroprudential tools proved to be inadequate and risks to financial stability continued to grow, monetary policy should be on the table as a possible defense. I note, however, that in this case, the blurring between financial stability goals and monetary policy goals would be high: if we assessed the risks to financial stability to be sufficiently great, achieving our dual mandate goals would be in jeopardy as well. This is an illustration that, in most cases, the goals of price stability, maximum employment, and financial stability are complementary.

Conclusion

In summary, well-functioning financial markets and institutions are valuable assets to our economy. The painful experience of the global financial crisis and ensuing severe recession underscores the importance of doing all we can to keep the financial system healthy. Policymakers and regulators are expanding their data-collection efforts and developing metrics to better monitor financial market conditions and to assess emerging financial market stress and systemic risks. We are augmenting microprudential supervision with new macroprudential tools aimed at making the financial system more resilient. And we are

¹⁶ See Jordi Gali, “Monetary Policy and Rational Asset Price Bubbles,” *American Economic Review* 104, 2014, pp. 721-752.

¹⁷ See Jeremy C. Stein, “Overheating in Credit Markets: Origins, Measurement, and Policy Responses,” remarks at “Restoring Household Financial Stability after the Great Recession: Why Household Balance Sheets Matter,” Federal Reserve Bank of St. Louis Research Symposium, St. Louis, February 7, 2013.

developing the types of macroeconomic models that will allow us to evaluate different policies to promote financial stability. Progress is being made, but there is more work to do. Efforts like this conference, which bring together the best and the brightest in the field to share their expertise, play an essential role in furthering this agenda. I urge you to continue your important work on this front so that we can improve our policymaking to promote economic and financial stability.