

Five points about monetary policy and financial stability

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Since the 2008 global financial crisis and the Great Recession that followed, economists and policymakers have been evaluating the factors that led to the crisis, assessing what could have been done to prevent, or at least limit, the damage, and considering what can and should be done to reduce the probability and impact of future disruptions to financial stability. That this is a very broad topic can easily be seen by looking at the agendas of this and previous years' conferences organized by the Riksbank. Today I will focus my remarks on the nexus between monetary policy and financial stability, and I will arrange my comments around five main points. Before I continue, I should mention that these are my own views and not necessarily those of the Federal Reserve System or my colleagues on the Federal Open Market Committee.

1 Financial stability matters to central banks because the goals of monetary policy and financial stability are interconnected

Central banks care about financial stability. 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. In fact, the Federal Reserve was established in 1913 after a series of financial panics to help promote a more stable financial system and avoid costly bank runs.

In my view, a central bank should care about financial stability to the extent that it affects the health of the real economy. Volatility or minor disruptions in financial markets that represent the ebb and flow of a dynamic economy but do not threaten the health of the economy are not something the monetary policy authority should respond to. Indeed, to the extent that the word "stability" gives the impression that the financial system is static, we may want to adopt the language used in the United Kingdom and speak about financial system resiliency, that is, the ability of the financial system to continue to provide the core financial services of intermediation, risk management, and payments in the face of the inevitable shocks that will hit a dynamic economy.¹

Monetary policy mainly works through its ability to affect current and expected future interest rates; however, in certain circumstances, it also has the ability to affect risk-taking by investors and financial institutions, and thereby is linked to financial stability.² I believe that, in general, the goals of monetary policy and financial stability are complementary. For example, price stability helps businesses, households, and financial institutions make better

* I thank Stefan Ingves and Anders Vredin for inviting me to participate in this conference on the central bank's mandate. It seems very fitting that such a discussion should take place in Sweden, as the Riksbank is considered to be the oldest central bank in the world, only a couple of years shy of 350 years old. The Federal Reserve, which recently marked its 100th anniversary, is quite a youngster by comparison, although the Fed has endured considerably longer than the first two attempts at central banks in the United States, each of which lasted only 20 years.

1 See Tucker (2015).

2 See Adrian and Shin (2011) for a review of the literature on the risk-taking channel of monetary policy.

decisions, thereby fostering the stability of the financial system. And a stable financial system allows for more effective transmission of monetary policy throughout the economy. I view this complementarity as similar to the complementarity between the two monetary policy goals that the United States Congress has given to the Federal Open Market Committee (FOMC), namely, price stability and maximum employment.

But during the financial crisis we learned that financial imbalances can build up even in a low-inflation environment, so that while price stability may promote financial stability, it is not a sufficient condition. We also learned that financial instability can arise from nonbanks and from institutions that are solvent and not necessarily highly leveraged.³

A large body of research has aided our understanding about how systemic risk can build up and propagate through the economy. Well before the financial crisis, Kiyotaki and Moore (1997) did seminal work on the important role collateral plays in lending markets. 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.

Brunnermeier and Sannikov (2014) build on the Kiyotaki and Moore model. 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. Gorton and Ordoñez (2014) examine how private market activities generate endogenous accumulations of and subsequent collapses in leverage. These models illustrate that systemic risk is endogenous, determined by the choices of the model's decision makers, and varies across the cycle.

During the financial crisis, we saw that when financial markets are not functioning well, the transmission of monetary policy to the economy can be disrupted. In those circumstances, the actions taken to implement monetary policy can also affect financial stability. The FOMC has acknowledged that nonconventional monetary policy, including large-scale asset purchases and the extended period of very low interest rates, could pose potential risks to financial stability by affecting market functioning and by spurring risk-taking in a search for yield.⁴ Empirical work is beginning to document this effect. For example, Jiménez, et al. (2014) use data on 23 million bank loans from the Spanish credit registry and find that a lower overnight policy rate induces low-capitalized banks to lend more to ex ante riskier firms and to require less collateral compared to high-capitalized banks, direct evidence of monetary policy's effect on risk-taking.⁵

Thus, while I believe that, in most circumstances, the goals of monetary policy and financial stability are complementary, we need to recognize that, at times, actions taken to foster financial stability and those taken to promote our monetary policy goals might be in conflict, at least in the short run. In the U.K., the Financial Services Act recognizes this potential tradeoff and explicitly says that the Financial Policy Committee is not authorized to act in a way that it feels is "likely to have a significant adverse effect on the capacity of the financial sector to contribute to the growth of the U.K. economy in the medium or long term".⁶

3 Feroli et al. (2014) focus on market "tantrums", which they define as periods in which risk premiums inherent in market interest rates fluctuate widely. Using data on inflows and outflows to open-end mutual funds, they conclude that market tantrums can arise independently of the degree of leverage in the system.

4 The Board of Governors discusses developments related to financial stability in its monetary policy report to Congress. For example, see Board of Governors (2016), p. 20.

5 Jiménez et al. (2014) separately identify how a change in the monetary policy rate affects the demand for credit and the volume and composition of credit supplied, in particular, the supply to riskier borrowers.

6 See Section 9c(4) of the U.K.'s Financial Stability Act 2012 (Bank of England, 2012).

In deciding whether to take 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. Too high a resilience standard will thwart risk-taking and innovation, which will undermine longer-run economic growth. In setting the standard, we need to come to some common understanding about the amount of growth and prosperity we are willing to give up in order to lower the risk to financial stability. In the United States, people who are 80 years old have lived through two major financial crises (the Great Depression and the 2008 crisis). Is that too many? Would we rather lower the probability of such an event to one every 1,000 years? What would we be willing to give up to do that?

That may be a premature question at this point. There are likely things that can be done and that are being done to lower the risk to financial stability without much cost in terms of longer-run growth. If we think of there being a risk-return frontier relating financial stability risk to the economic return that a well-functioning financial system can provide, then it is not hard to imagine that we were operating at a point well interior to that frontier in the run-up to the crisis, and that the improvements being made in our financial regulatory and supervisory regime are moving us toward the frontier without sacrificing growth. This brings me to my second point.

2 To foster the resiliency of the financial system, macroprudential tools are being developed to lower the probability that instability arises and to limit the damage when financial shocks arise

In the United States, the regulatory reforms engendered in the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act 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. Under Dodd-Frank, the Federal Reserve and other financial regulatory agencies in the United States were directed to augment their traditional microprudential approach, which promotes the safety and soundness of individual institutions, with a macroprudential approach in which examiners and supervisors take a horizontal view of risk across institutions rather than looking at only one institution at a time.

Although there is still more to be done, regulators continue to make progress in developing tools to implement the macroprudential approach and to monitor the risks over the business and financial cycles. Some tools focus on building up the structural resiliency of the financial system throughout the business cycle. In my view, these structural resiliency tools are the most promising. They include the Basel III risk-based capital requirements, minimum liquidity requirements, central clearing for derivatives, and bank stress tests. Living-will resolution plans and the Orderly Liquidation Authority, which is housed at the Federal Deposit Insurance Corporation (FDIC), are intended to make it easier for regulators and policymakers to allow large complex financial institutions to fail.

In addition to structural tools, there are countercyclical tools that aim to mitigate the systemic risk that can build up over the business cycle. These include the countercyclical capital buffer and the capital conservation buffer.⁷ Other possible cyclical tools, not yet established in the United States but used in other countries, include loan-to-value ratio limits

7 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.

and debt-to-income ratio limits that vary over the cycle and which have been targeted to particular sectors like housing credit or household credit.⁸

The performance of the set of macroprudential tools is largely untested. Cross-country studies find mixed results, with the effectiveness of the tools varying with economic circumstances and the types of shocks hitting the financial sector.⁹

In the United States, the application of these countercyclical tools is complicated by the complexity of the regulatory structure. There are multiple financial regulators in the United States, including the Federal Reserve, the FDIC, the Office of the Comptroller of the Currency, the National Credit Union Association, the United States Treasury, the Securities and Exchange Commission, the Commodity Futures Trading Commission, the Consumer Financial Protection Bureau, and the Federal Housing Finance Agency. In many cases, the regulatory authority of these agencies is defined by type of institution rather than by instrument. While the Financial Stability Oversight Council (FSOC), created by the Dodd-Frank Act, promotes coordination and information sharing across these financial system regulators, the need to coordinate countercyclical macroprudential policy actions across multiple regulators in the United States adds a complication to effectively using such tools in a timely way.

The complex financial system also makes monitoring risks more complicated. The Office of Financial Research, established under Dodd-Frank, is collecting data to aid in this task. The Federal Reserve has also developed a framework for systematically tracking risks, and financial stability surveillance is receiving regular attention in FOMC meetings.¹⁰ This regular and systematic analysis is helping us to better identify changes in conditions over time. This brings me to my next point: the importance of taking a systematic approach to financial stability.

3 To the extent possible, policymakers should take a systematic approach in applying financial stability policy rather than relying on discretion

The financial crisis underscored the important role of incentives in financial markets – not only the incentives of financial institutions but also those of regulators and policymakers. Time-inconsistency problems and moral hazard issues are important factors that need to be considered when designing a framework for implementing financial stability policy. These types of problems argue for taking a systematic approach in applying financial stability policy rather than relying on discretion.

The benefits of systematic monetary policy are well established. When monetary policymakers respond in a systematic fashion to incoming information, the public will have a better sense of how policymakers are likely to react to economic developments – whether those developments are anticipated or unanticipated – so their policy expectations will better align with those of policymakers. This alignment helps the public make better financial and economic decisions, thereby making monetary policy more effective.

8 For example, Canada tightened loan-to-value and debt-to-income limits on mortgage lending over the 2009 to 2012 period (Krznar and Morsink, 2014). Beginning in 2010, Israel also implemented a package of macroprudential tools to restrict the supply of housing credit (Fischer, 2014). Spain introduced dynamic loan-loss provisioning in 2000. 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 (Balla and McKenna, 2009).

9 For example, a study by economists at the International Monetary Fund (IMF) examined the effectiveness of macroprudential tools in reducing systemic risk in 49 countries. The authors concluded that many of the most frequently used tools were effective in reducing the pro-cyclicality of credit and leverage, but the effectiveness depended on the type of shock hitting the financial sector (see Lim et al., 2011). Another study published by the Bank for International Settlements (BIS) examined 57 countries over a span of up to three decades and found that imposing maximum debt-service-to-income ratios can limit the buildup of credit in housing markets, but maximum loan-to-value ratios were less effective, and instruments like reserve and liquidity requirements focused on the supply of credit had little impact on housing markets (see Kuttner and Shim, 2016).

10 This framework is described in Adrian, Covitz, and Liang (2013), and involves tracking a standard set of financial system vulnerabilities, including the pricing of risk, leverage, maturity and liquidity transformation, and interconnectedness and complexity. Recognizing the complex nature of the United States financial system, Federal Reserve staff track these risks across four broad areas of the financial system: asset markets, the banking sector, shadow banks, and the nonfinancial sector.

An additional benefit of a systematic approach is that it provides a mechanism through which policymakers can commit to policies aimed at promoting policy goals over the longer run. Being systematic can help alleviate time-inconsistency problems in monetary policy, whereby policymakers may favor the short run over the long run. Note that by systematic policy I do not mean that monetary policy will be set mechanically by a policy rule or that policymakers need to be prescient about the types of shocks that will hit the economy. Rather, I mean that policy will react in a systematic fashion to economic developments that change the economic outlook.

A systematic approach to financial stability policy is perhaps even more important than in the case of monetary policy because of the important role played by incentives. The crisis shone a bright light on significant moral hazard problems that exist in financial markets. A financial stability policymaker that is systematic in how it applies its tools to promote stability will likely help tame some of the moral hazard problems and also some of the time-inconsistency problems to which the regulators themselves are subject.

An important tool in this regard is the resolution of insolvent financial institutions. Without a credible resolution method, during the crisis in the face of serious distress at a large financial firm, governments faced a dilemma: either rescue the firm and create future moral hazard problems or let the firm fail and risk causing a cascade of other failures. The fact that policymakers had to make these decisions in the heat of the moment using their best judgment based on limited information did not help. Without a credible resolution method, it is reasonable to expect that even well-intentioned policymakers will be biased toward bailouts. A resolution method that can be applied systematically can help alleviate this problem. The living-will resolution plans and Orderly Liquidation Authority in the United States are promising, but still untested, tools in a process that will allow large firms to fail. This, in turn, provides incentives for these large, systemically important institutions to reorganize themselves in a way that reduces the risk they pose to the financial system.

As I mentioned, the Federal Reserve has become more systematic in monitoring risks across the financial system. Coupling that monitoring with the application of a resiliency standard across the entire financial services landscape, including the so-called shadow banking system that was less-heavily regulated in the past, would limit regulatory arbitrage. As the financial crisis made clear, taking an action that pushes risk from one set of institutions to another does not eliminate the risk, it just moves it around, potentially to a part of the financial system where the risk is more difficult to monitor and control.¹¹

I acknowledge that this broad application of the resiliency standard across the financial system may be particularly difficult in the United States with its complex regulatory structure. Still, we can devise ways to make the macroprudential tools more systematic and less discretionary. Regulators could agree in advance on the contingencies under which the cyclical macroprudential tools would be invoked, rather than waiting until the risks escalated before starting the process to coordinate action. For example, we can write down a formula for a countercyclical buffer, and we can define an explicit trigger for contingent convertible bonds. Knowing that such policies will be systematically applied and what will trigger them may induce financial market participants to limit the buildup of risks in the first place. This underscores the importance of communication, my fourth point.

¹¹ Application of a resiliency standard would allow the type of supervision to vary appropriately by the nature of the systemic risk associated with each part of the financial system. As discussed in Mester (2015), this is a component of the regime for financial stability advocated by Paul Tucker (2015). Several of the macroprudential tools are focused on those institutions that have been deemed systemically important, including the capital surcharge for global systemically important banks (G-SIBs) and the United States stress tests for banks with more than \$50 billion in assets.

4 Macprudential policy actions must be communicated in a clear way to avoid creating a conflict with or causing confusion over actions taken to foster monetary policy goals

Transparency and clear communication are hallmarks of best-practice monetary policymaking and the same should be true for financial stability policymaking. Clear communication helps align the public's policy expectations, which makes monetary policy more effective. Transparency is necessary so that the public and elected officials have the ability to hold monetary policymakers accountable for their decisions. The Federal Reserve has been given independence in setting monetary policy, which has been well documented as yielding more effective policy and better economic outcomes. Accountability must however go hand-in-hand with independence, so the Federal Reserve regularly communicates the basis for its policy decisions.

A parallel can be drawn with financial stability policy. Although, in some cases, prudential supervisory information should be kept private, as a general principle, I think financial stability policymakers should strive for greater transparency and more disclosure. Similarly, they should require more disclosure from financial firms so that creditors and other market participants can exert market discipline.

Of course, clear communication is easier said than done. Three aspects make this even harder for financial stability policy than for monetary policy. First, the framework and tools of financial stability policy are new. It will take considerable effort on the part of the financial stability policymakers to explain the tools they are using and the rationale for their policy decisions. However, such communication is necessary so that the public understands when an action is being taken because of concerns about financial stability rather than concerns about monetary policy goals. This would be particularly true when the monetary policy authority is also responsible for taking financial stability actions, and if monetary policy were the tool used to address the financial stability concerns. It is worth considering whether separating decisions about financial stability from decisions about monetary policy within the central bank, perhaps by having separate committees as in the U.K., could aid communication and decision-making.¹²

A second complication for effective communication of financial stability policy is timing. If effective monetary policy means taking away the punch bowl just as the party gets going, then effective financial stability policy might mean taking away the punch bowl before the guests have even arrived because the seeds of financial instability are sown much earlier and action must be taken earlier as well. If the need for monetary policy to be forward looking is a difficult concept for the public to grasp, the need for financial stability policy to act well before there are clear signs of instability may be even more difficult to explain.

Yet a third complication to effective communication is the complexity of the financial regulatory regime itself.¹³ In my view, a sometimes overlooked lesson from the crisis is that regulatory complexity can complicate supervision, risk monitoring, compliance, and enforcement. Given the scope and ever-changing nature of the financial system, regulatory complexity is, to a certain extent, unavoidable. But the tradeoffs should be recognized. For example, it is reasonable to require banks to hold higher levels of capital against higher-risk assets, but a system of risk weights that is overly granular and complex would be counterproductive. In practice, too much complexity would make it harder for regulators to assess compliance and to determine whether institutions were engaging in some practices

¹² Kohn (2015) discusses the benefits of such separation.

¹³ Haldane and Madouros (2012) discuss the benefits of a less complex financial regulatory structure and argue that the complexity of the financial landscape does not call for a complex financial regulatory structure, but just the opposite.

merely as a way to hide risk and lower their capital requirements. If regulators have made the rules such complex that they cannot assess compliance, then, in practice, there are no consequences for firms that fail to meet the standards. Complexity also makes it difficult to monitor the monitors. It might be worth exploring whether we would be better off with a much simpler macro- and micro-prudential supervisory structure, one that is easier to implement and simpler to govern and that is approximately right across various economic models and states of the world even if it is never optimal in any particular model or state.

Of course, we are not in that simpler regime. The question thus is, given our current financial structure, how should policy respond to emerging financial stability risks and what role should monetary policy play? This question is the focus of my final point.

5 Financial stability should not be added as another goal for monetary policy, but monetary policymakers need to remain cognizant of the linkages between financial stability and monetary policy goals

In my view, the first line of defense against financial instability involves the tools that will make the structure of the financial system less prone to crisis. These structural resiliency tools include higher capital standards (including a minimum non-risk-based leverage ratio, as well as risk-based capital standards), liquidity standards, stress tests, living wills, and effective resolution methods for systemically important bank and nonbank financial institutions. Much work has been done to develop these structural resiliency tools, and I believe the system is in a better position to handle shocks now than it was before the financial crisis.

Countercyclical macroprudential tools, such as limits on loan-to-value ratios in particular markets, are worth further study, but at this point, I am not convinced that we have enough knowledge and experience with them to use them effectively in the United States. That consideration leads me to think that we should set standards for the structural resiliency tools somewhat higher than they would be if we had more confidence in the countercyclical tools.

What about using monetary policy? As I have discussed, monetary policy and financial stability goals and actions are interrelated. Very loose monetary policy increases the likelihood that financial instabilities will develop, thereby increasing the likelihood that macroprudential policy tools will be needed. Tight macroprudential policy can tighten financial conditions more generally, thereby increasing the likelihood that a monetary policy response will be needed.

In my view, monetary policy should remain focused on promoting price stability and maximum employment; financial stability should not be added as a third objective for monetary policy. First, it is not clear that monetary policy would be very effective against emerging financial stability risks. While interest rates affect the fundamental value of assets, it is not clear that they affect the speculative or bubble portion; the impact may depend on the underlying nature of the financial imbalance.¹⁴ Second, monetary policy tends to be a blunt instrument, any benefits of using it to stem financial imbalances, mispricing of assets, or excessive leverage need to be weighed against the economic costs in terms of price stability and employment. Svensson (2016) brings some metrics to the question and concludes that the costs outweigh the benefits.¹⁵

¹⁴ For example, in the Gali (2014) model, raising interest rates to combat a bubble can actually inflate it.

¹⁵ The benefit of “leaning against the wind”, that is, running monetary policy tighter than it otherwise would be in order to stem emerging financial instabilities, is a reduction in the probability of entering into a financial crisis. The cost is worse economic conditions today and higher economic costs should the economy enter into a crisis. By Svensson’s (2016) metrics, these costs outweigh the small reduction in the probability of a crisis. One caveat about Svensson’s analysis is that it is based on a log-linear model, but we know that financial crises involve extreme states and non-linearities.

While I do not believe financial stability should be part of the monetary policy mandate, I do think that when we are making monetary policy decisions, we need to be cognizant of the linkages between our monetary policy actions and financial stability. In the case of the housing market, which precipitated the last crisis, policymakers underestimated the breadth and depth of the negative impact this would have on the rest of the economy and financial system. To the extent that we misjudged the impact, there is a larger potential gain to carefully monitoring financial market conditions, implementing the structural macroprudential tools, and being open to taking offsetting action should imbalances develop.¹⁶

If our macroprudential tools proved to be inadequate and financial stability risks continued to grow, I believe monetary policy should be on the table as a possible defense. However, 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 monetary policy goals would also be in jeopardy. Which brings me back to my original point: in most cases, the goals of price stability, maximum employment, and financial stability are complementary.

6 Conclusion

Let me conclude by noting that in his 2015 presidential address to the American Finance Association, Luigi Zingales (2015) posed the question, “Does Finance Benefit Society?” While academics, and, I believe, central bankers, typically say “yes”, a recent survey indicates that the average American is much less certain.¹⁷ I am hopeful that the considerable efforts underway across the globe will change that. I believe it is our responsibility to ensure that we create and maintain a financial system that is seen by the public as being beneficial, and one that truly is.

¹⁶ Peek, Rosengren, and Tootell's (2015) textual analysis of the transcripts of FOMC meetings from 1982 through 2009 suggests that the FOMC does consider financial stability when setting monetary policy.

¹⁷ Zingales (2015) cites the Chicago Booth-Kellogg School Financial Trust Index survey of a representative sample of about 1,000 American households, conducted by Social Science Research Solutions. Forty-eight percent of respondents to the December 2014 survey said that the United States financial system hurts the United States economy, while only 34 percent said that it benefits the United States economy.

References

- Adrian, Tobias, Daniel Covitz, and Nellie Liang (2013), "Financial Stability Monitoring", *Discussion Paper No. 21*, Federal Reserve Board, Washington, DC.
- Adrian, Tobias, and Hyun Song Shin (2011), "Financial Intermediaries and Monetary Economics", In *Handbook of Monetary Economics*, Vol. 3a, Ed. by Friedman B. M. and M. Woodford, Elsevier: New York, NY.
- Balla, Eliana, and Andrew McKenna (2009), "Dynamic Provisioning: A Countercyclical Tool for Loan Loss Reserves", *FRB Richmond Economic Quarterly*, Vol. 96, No. 4, pp. 383-418.
- Bank of England (2012), "Financial Services Act", Chapter 21, Bank of England: London.
- Board of Governors of the Federal Reserve System (2016), "Developments Related to Financial Stability", In the Monetary Policy Report, February 10, The Federal Reserve System: Washington, D.C.
- Brunnermeier, Markus K., and Yuliy Sannikov (2014), "A Macroeconomic Model with a Financial Sector", *American Economic Review*, Vol. 104, No. 2, pp. 379-421.
- Feroli, Michael, Anil K. Kashyap, Kermit Schoenholtz, and Hyun Song Shin (2014), "Market Tantrums and Monetary Policy", Paper prepared for the U.S. Monetary Policy Forum, New York, NY, and *Chicago Booth Research Paper No. 9*.
- Fischer, Stanley (2014), "Macroprudential Policy in Action: Israel", in *What Have We Learned? Macroeconomic Policy after the Crisis*, Ed. By Akerlof, George A., Olivier J. Blanchard, David Romer, and Joseph E. Stiglitz: MIT Press: Cambridge, MA.
- Gali, Jordi (2014), "Monetary Policy and Rational Asset Price Bubbles", *American Economic Review*, Vol. 104, No. 3, pp. 721-752.
- Gorton, Gary and Guillermo Ordoñez (2014), "Collateral Crises", *American Economic Review*, Vol. 104, No. 2, pp. 343-378.
- Haldane, Andrew G. and Vasileios Madouros (2012), "The Dog and the Frisbee", speech at the Economic Policy Symposium "The Changing Policy Landscape", August 31st, Federal Reserve Bank of Kansas City: Jackson Hole, WY.
- Jiménez, Gabriel, Steven Ongena, José L. Peydró, and Jesus Saurina (2014), "Hazardous Times for Monetary Policy: What Do Twenty-Three Million Bank Loans Say About the Effects of Monetary Policy on Credit Risk-Taking?", *Econometrica*, Vol. 82, No. 2, pp. 463-505.
- Kiyotaki, Nobu, and John Moore (1997), "Credit Cycles", *Journal of Political Economy*, Vol. 105, No. 2, pp. 211-248.
- Kohn, Donald (2015), "Implementing Macroprudential and Monetary Policies: The Case for Two Committees", Presented at the 59th Economic Conference "Macroprudential Monetary Policy", October 2nd-3rd, Federal Reserve Bank of Boston: Boston, MA.
- Krznar, Ivo, and James Morsink (2014), "With Great Power Comes Great Responsibility: Macroprudential Tools at Work in Canada", *Working Paper No. 83*, International Monetary Fund.
- Kuttner, Kenneth N. and Ilhyock Shim (2016), "Can Non-Interest Rate Policies Stabilize Housing Markets? Evidence from a Panel of 57 Economies", *Working Paper, No. 19723*, National Bureau of Economic Research, December 2013, Revised March 17.
- Lim, Cheng H., Fransesco Columba, Alejo Costa, P. Kongsamut, Akira Otani, M. Saiyid, Torsten Wezel, and Xiaoyong Wu (2011), "Macroprudential Policy: What Instruments and How to Use Them? Lessons from Country Experiences", *Working Paper No. 238*, International Monetary Fund.
- Mester, Loretta J. (2015), "Comments on 'Microprudential Versus Macroprudential Supervision: Functions That Make Sense Only as Part of An Overall Regime for Financial Stability'", Presented at the 59th Economic Conference "Macroprudential Monetary Policy", October 2nd-3rd, Federal Reserve Bank of Boston: Boston, MA.

Peek, Joe, Eric S. Rosengren, and Geoffrey M.B. Tootell (2015), "Should U.S. Monetary Policy Have a Ternary Mandate?", Presented at the 59th Economic Conference "Macroprudential Monetary Policy", October 2nd–3rd, Federal Reserve Bank of Boston: Boston, MA.

Svensson, Lars E.O. (2016), "Cost-Benefit Analysis of Leaning against the Wind: Are Costs Larger Also with Less Effective Macroprudential Policy?", *Working Paper No. 3*, international Monetary Fund.

Tucker, Paul (2015), "Microprudential Versus Macroprudential Supervision: Functions That Make Sense Only as Part of an Overall Regime for Financial Stability", Presented at the 59th Economic Conference "Macroprudential Monetary Policy", October 2nd–3rd, Federal Reserve Bank of Boston: Boston, MA.

Zingales, Luigi (2015), "Does Finance Benefit Society?", *Journal of Finance*, Vol. 70, No. 4, pp. 1327-1363.