**Systemic Risk Monitoring and Financial Stability**

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Like other central banks, the Federal Reserve traditionally has had responsibility for financial stability, primarily as the lender of last resort. In addition, the Federal Reserve has had regulatory and supervisory responsibilities for many large banking institutions. The Dodd-Frank Act (DFA)[[2]](#footnote-2) expands those responsibilities. It requires that the Fed be the primary supervisor for the largest BHCs and nonbank financial institutions designated as systemically important, and adopt a macroprudential approach to supervision and regulation. Such an approach would supplement the focus on the safety and soundness of an individual institution with explicit consideration of threats to the stability of the financial sector as a whole. DFA also imposes greater accountability for financial stability. The Chairman of the Federal Reserve Board is a voting member of the new Council, which has nine other voting members and is chaired by the Secretary of the Treasury. As a member of the Council, the Board is obligated to identify structural weaknesses and emerging risks in the financial system, and recommend financial regulatory and macroprudential policies to increase its resilience.

I briefly outline the key elements of a new systemic risk monitor and accompanying policy framework being developed at the Board to meet its new financial stability responsibilities. This work is ongoing and will require progress on new models, data, and organizational structures to implement effectively. Importantly, it will require a culture that promotes better communication across many groups, including supervisors, micro economists, and macro economists within the Fed, as well as across regulatory agencies. It builds on and complements traditional work related to bank holding company supervision and regulation, financial regulatory reforms, and monetary policy.

1. **Assessment of systemic risk**

The recent financial crisis demonstrates vividly that there are many channels through which seemingly small losses can become systemic and threaten financial stability. Systemic risk arises when shocks are amplified and inflict significant damage on the broader financial system and broader economy. The goal of a financial stability authority is to identify shocks and vulnerabilities—the potential amplification channels--and to preemptively address these vulnerabilities in order to reduce the frequency and severity of crises in the future. The financial system performs effectively, and is stable, when it is sufficiently resilient to absorb shocks and perform its function of allocating capital and credit, and facilitating payments.

Many researchers have looked at how losses in the relatively small subprime mortgage market could have triggered such a severe financial crisis and the Great Recession. Recent papers highlight multiple potential vulnerabilities, including weak financial firms, substantial interlinkages across these firms, complex financial products, and excessive leverage and maturity mismatch fueled by the shadow banking system (see e.g., Brunnermeier, 2009; Adrian and Shin, 2010; Gorton and Metrick, 2012; Acharya, Schnabl, and Suarez, 2011; Covitz, Liang, and Suarez, 2012). These vulnerabilities amplified the shock of subprime losses from a fall in house prices through direct counterparty losses, and indirect losses from fire sales, due to coordination failures in short-term funding markets and contagion, and deleveraging. A simple stylized narrative of the story illustrates some of the various amplification mechanisms (see Gorton and Metrick, 2012, for a more detailed narrative based on recent research papers, and Bernanke, 2010). Underwriting standards in the lead-up to the crisis were lax as the unregulated shadow banking system bid ever more aggressively for securitized subprime mortgage assets. As house prices fell, losses in the value of subprime mortgages were amplified because they were financed in short-term funding markets, like the asset-backed commercial paper market, which then were run by investors. Bank sponsors came under pressure to support some of these conduits, shrinking their capacity to provide other credit, and the decline in the value of mortgages and other assets from house price declines led to deleveraging. In addition, the securities also were used as collateral by broker-dealers and other market participants in repo markets; falling collateral values then sparked a run as investors ran on broker-dealers financed in the repo market. The failure of the GSEs, the failure of Lehman, and the “break the buck” event at the Primary Reserve Fund, led to further pullbacks in funding, actual or potential fire sales of subprime MBS which drove prices down further, and intensified deleveraging by financial intermediaries.

An effective systemic risk monitoring effort is based on identifying a range of possible shocks and assessing vulnerabilities--the channels that can amplify shocks. Vulnerabilities can be structural, present in all conditions, such as interconnections and common exposures, or it can be cyclical, which vary with financial and economic conditions, such as increasing leverage and maturity transformation. The main purpose of the monitoring effort is to then evaluate how possible shocks if amplified could disrupt financial intermediation and real economic activity. The success of this effort does not rest on unique foresight; instead, it explicitly builds on the view that it would be impossible to predict how any future crisis could fully play out.

While the approach is simple, the monitoring efforts are analytically intensive. They require more data and advanced techniques to develop better measures of systemic risks, based on interconnections among firms and markets that likely vary over time. They require a better understanding of linkages between the financial sector and the macroeconomy, and more focus on considering adverse outcomes that may not be the most likely, but certainly plausible.

Starting with the large and complex financial firms, we want to monitor the expected financial conditions and tail risks of these financial firms. Researchers have developed a number of systemic risk measures for firms based on their stock prices and CDS premiums. These measures are based on the insight that firms with high covariance with the broader markets in bad states of the world will be more systemically risky. For example, one measure, CoVaR, estimates the increase in the value at risk of the financial system conditional on a firm’s distress.[[3]](#footnote-3) Two others look at a firm’s returns conditional on weak returns for the broader markets.[[4]](#footnote-4),[[5]](#footnote-5) Some have criticized these market-based measures on the grounds that investors might not really know much about the interconnections of the firms and the sensitivity to strains in broader markets. Nonetheless, these types of measures capture how markets perceive how specific firms would perform in bad states of the world. Moreover, even without full information, investors’ perceptions can raise funding and capital costs for these firms, and thus have important implications for their viability.

A promising measure of the systemic risk of the largest institutions is based on regular supervisory stress tests, such as the type originated in the Supervisory Capital Assessment Program in 2009. These measures will be based on firm-specific detailed asset information collected by supervisors, and will be a forward-looking assessment of firms’ exposures to a scenario with adverse macroeconomic or financial risks. The firms’ assessments will be evaluated jointly and so reflect losses when multiple firms are stressed at the same time. This rigorous summary measure of the vulnerability of firms to stressed economic and financial conditions are an improvement over market-based indicators to the extent that supervisors have better insight than outside market participants.

Network analysis built from data on direct interconnections between firms is potentially quite valuable to evaluate the potential for systemic risk. It would allow regulators to estimate how the distress of a given firm would directly affect the other firms in the network, and also to simulate follow-on effects, which can be very significant. Because good data on connections among firms are quite limited, however, only a few countries’ banking systems, such as those in Austria and Canada, have been mapped, though some researchers have usefully applied network analysis to cross-country banking data, and document a significant increase in interconnections since the late 1980s.[[6]](#footnote-6)

Imbalances in financial markets are another way risks can become systemic. Thus, systemic risk monitor reports need to encompass more than institutions. Financial imbalances could be reflected in narrow risk premiums, fueled by high leverage and short-term funding, and the proliferation of new products and innovations that operate in the shadows beyond regulatory boundaries.

On this front, we want to assess risk premiums for major asset classes. Some aggregate financial conditions indexes, based on principal components of various risk spreads, may also capture the extent to which low discount rates are common to many asset classes. Options on asset prices can also reveal a skew in investors’ views about downside risks and a rapid unwind that could cause markets to become dysfunctional. High and increasing leverage, and maturity mismatch in the financial and nonfinancial sectors of the economy can also pose risks. A new survey of major dealers was initiated by the Fed about a year ago to gain insight into the availability and terms of credit for securities financing and OTC derivatives.[[7]](#footnote-7) At the same time, the Fed is better utilizing its existing data collection efforts, such as the Flow of Funds accounts, to measure the reliance of the debt of the nonfinancial sector on unstable short-term funding sources.

In addition, as the central bank, we are especially interested in evaluating how possible risks could disrupt the availability and terms of credit, and thus have adverse effects on the real economy. We also draw on structural macro models of the U.S. economy and foreign economies, such as FRB-US, and DSGE models to better understand the interaction of the financial system and real activity, to simulate plausible adverse scenarios, and to help evaluate potential policy tools. Much work is ongoing at the Fed and in the academic community to enrich the financial sectors in these models.

1. **Macroprudential policies**

In considering macroprudential policies, one has to recognize that systemic risk is inherently a negative externality, arising from fire sales or coordination failures, for example. Macroprudential policies are justified because firms lack private incentives to mitigate this externality. As research indicates, the recent crisis had multiple causes, and reflected interactions between built-up cyclical imbalances and structural risks. Macroprudential policies can address both types of systemic risks. Policies can be aimed at vulnerabilities that build with extended periods of favorable economic and financial conditions. Such policies are designed to “lean against the wind” to prevent, for example, credit-fueled asset bubbles that could unwind in destabilizing ways, but perhaps more importantly to bolster the resilience of financial institutions when the bubble inevitably bursts. Policies also can be aimed at reducing structural vulnerabilities, such as those arising from regulatory gaps or weak business models, to increase the resilience of the financial system. Key examples of structural risks are complex linkages across firms, the perception of too-big-to-fail institutions, and the unstable business model of money market mutual funds.

To mitigate threats posed by the too-big-to-fail problem, the Fed is developing a package of enhanced prudential standards, including higher capital and leverage requirements, liquidity standards, stress testing, and resolution plans for large complex financial institutions. We also are working with the Council to designate systemically important nonbank financial institutions and financial market utilities that would become subject to enhanced prudential oversight by the Fed and other agencies, to reduce the systemic risks were such a firm to fail. In addition, we have proposed rules to set margin requirements for over-the-counter derivatives, with more stringent requirements for contracts between certain parties whose default would have greater risk of triggering a cascade.

We have publicly urged the SEC to take additional steps to mitigate the risk of runs on money market funds. In the annual report, the Council recommended that the SEC continue to pursue reform alternatives, such as mandatory floating net asset value, capital buffers to absorb fund losses, or deterrents to redemptions. We also, through an inter-agency task force, are working to increase the stability of the tri-party repo market by limiting intraday credit exposures and strengthening collateral management practices.

At times when build-ups appear on track to becoming excessive, policy makers may want to take pre-emptive actions to mitigate costs of a possible disorderly unwind. In addition to public statements about possible excesses or heightened supervisory attention and guidance, there are other targeted macroprudential tools designed to lean against the wind. One proposal is the countercyclical capital buffer in Basel III should aggregate credit grow “too quickly.” Others include countercyclical margin requirements, or higher LTVs or DTIs when borrowers begin to get too levered. Evidence to date on the efficacy of such tools is limited, and there are many implementation hurdles, such as when to act, with what force, and how to coordinate globally. While advocates recognize the limited evidence of benefits for such targeted tools—much based on lessons gleaned from experiences in other countries—they view the alternative of no action as too costly.

1. **Challenges**

There are many significant challenges to identifying threats to financial stability and appropriate policy actions. I’ve discussed some of those associated with developing a robust systemic risk monitoring effort. The information needs are immense. Research on how risks are propagated is still in early stages, both because of insufficient data and complexity of linkages. In addition, in considering potential policies to address building vulnerabilities, we would be, almost by definition, taking away the punch bowl just as the party’s getting fun. While this stance may not be unusual for a central banker, we have less experience than for monetary policy, where over time, tools and targets have become well-defined and policy formulation quite sophisticated.

A final challenge is to create a culture of more effective communication across many groups, including supervisors, micro economists, and macro economists within the Fed, and across regulatory agencies that do not regularly share information. In addition, it is important to engage actively with the outside community of researchers and analysts. To that end, we will need more standardized and more timely data, and greater disclosure to encourage interactions. The analysis and data disclosure in the Financial Stability Oversight Council’s annual report is a step in the right direction.[[8]](#footnote-8) There is a long and successful history of engagement between academics and policymakers in setting monetary policy, and I hope that promoting such engagement for financial stability will produce a similar successful payoff.

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1. Director, Office of Financial Stability Policy and Research, Federal Reserve Board. The views presented here are my own and do not necessarily reflect those of the Board of Governors or its staff. [↑](#footnote-ref-1)
2. “Dodd-Frank Wall Street Reform and Consumer Protection Act,” HR 4173, 111th Congress, 2nd Session, Passed by the House in December 2009 and by the Senate in May 2010. [↑](#footnote-ref-2)
3. One measure, Conditional Value-at-Risk (CoVaR), reflects losses of the financial system conditional on the stress of a particular firm. Specifically, it measures the increase in the value at risk of the financial system conditional on a firm becoming distressed, e.g., a 5th percentile bad event (Adrian and Brunnermeier, 2009). [↑](#footnote-ref-3)
4. The Systemic Expected Shortfall (SES) reflects losses born by equity holders conditional on a large tail return for the broader equity markets (Acharya, et al, 2010). [↑](#footnote-ref-4)
5. The Distressed Insurance premium (DIP) measures a hypothetical insurance premium against catastrophic losses in a portfolio of financial institutions. The systemic importance of an institution is measured by its marginal contribution to the aggregate insurance premium (Huang, Zhou, and Zhu, 2009). [↑](#footnote-ref-5)
6. See, for example, Elsinger, H., A. Lehar, and M. Summer (2006), “Risk Assessment for Banking Systems,” *Management Science*; Gauthier, C., A. Lehar, and M. Souissi (2010), “Macroprudential Regulation and Systemic Capital Requirements,” Bank of Canada Working Paper 2010-4; and Garratt, R., L. Mahadeva, and K. Svirydzenka, “Measuring Systemic Risk in the International Banking Network (2011), Bank of England working paper, no. 413. [↑](#footnote-ref-6)
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8. Financial Stability Oversight Council 2012 Annual Report, http://www.treasury.gov/initiatives/fsoc/Documents/2012%20Annual%20Report.pdf [↑](#footnote-ref-8)