Stanley Fischer: Financial sector reform – how far are we?

Text of the Martin Feldstein Lecture by Mr Stanley Fischer, Vice Chair of the Board of Governors of the Federal Reserve System, at the National Bureau of Economic Research, Cambridge, Massachusetts, 10 July 2014.

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Although the recession in the United States that started in December 2007 ended in June 2009, the impact of the Great Recession, which began when Lehman Brothers filed for bankruptcy on September 15, 2008, continues to be felt in the United States, Europe, and around the world.[1] After the bankruptcy of Lehman Brothers, policymakers, working through the G-20, quickly reached agreement on the macroeconomic policies needed to minimize the damage done by the crisis. For their part, central bankers and supervisors of financial systems, working through the newly established Financial Stability Board (FSB) and the newly enlarged Basel Committee, rapidly developed a program for reform of the financial sector and its supervision.

In this lecture I will ask how much has been achieved so far in implementing the ambitious financial sector reform program that was widely agreed at the early stages of the global financial crisis. From among the range of topics in which financial sector reforms have been instituted since 2008, I focus on three: capital and liquidity for banks and other financial institutions, macroprudential supervision, and the problem of too big to fail (TBTF).

What happened?

The 2007–09 crisis was both the worst economic crisis and the worst financial crisis since the 1930s. Following the collapse of Lehman Brothers, many thought that we were about to witness a second Great Depression. That did not happen, in large part because policymakers had learned some of the lessons of the Great Depression. Nonetheless, the advanced economies were put through severe economic and political tests. Fortunately, policymakers succeeded in dealing with the situation better than many had feared they would; unfortunately, we are still dealing with the consequences of the collapse and the steps necessary to deal with it.

Former Congressman Barney Frank has been heard to say that economists have a wonderful technique, that of the counterfactual, to analyze what has been achieved by preventing disasters, but that real people base their judgments more on the current state of the world than on disasters that have not happened. True as that may be, we should from time-to-time allow ourselves to recognize that as bad as the Great Recession has been, it would have been much worse had policymakers not undertaken the policies they did – many of them unorthodox and previously untried – to deal with the imminent crisis that confronted the United States and global economies after the fall of Lehman Brothers. And for that, we owe them our gratitude and our thanks.

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[1] I began work on this lecture when I was a resident Distinguished Fellow at the Council on Foreign Relations and completed it after I joined the Federal Reserve Board on May 28, 2014. I am grateful to Dinah Walker of the Council on Foreign Relations for research assistance and to Nellie Liang, Skander Van den Heuvel, Mark Van Der Weide, William Bassett, Beth Kiser, Barbara Hagenbaugh, and Stacey Tevlin at the Federal Reserve Board for discussions, advice, and assistance. Views expressed are my own and not necessarily those of the Board of Governors of the Federal Reserve System, the Federal Open Market Committee, or the Council on Foreign Relations.

The financial sector reform program

Several financial sector reform programs were prepared within a few months after the Lehman Brothers failure. These programs were supported by national policymakers, including the community of bank supervisors.

The programs – national and international – covered some or all of the following nine areas:[2] (1) to strengthen the stability and robustness of financial firms, "with particular emphasis on standards for governance, risk management, capital and liquidity"[3] (2) to strengthen the quality and effectiveness of prudential regulation and supervision; (3) to build the capacity for undertaking effective macroprudential regulation and supervision; (4) to develop suitable resolution regimes for financial institutions; (5) to strengthen the infrastructure of financial markets, including markets for derivative transactions; (6) to improve compensation practices in financial institutions; (7) to strengthen international coordination of regulation and supervision, particularly with regard to the regulation and resolution of global systemically important financial institutions, later known as G-SIFIs; (8) to find appropriate ways of dealing with the shadow banking system; and (9) to improve the performance of credit rating agencies, which were deeply involved in the collapse of markets for collateralized and securitized lending instruments, especially those based on mortgage finance.

Rather than seek to give a scorecard on progress on all the aspects of the reform programs suggested from 2007 to 2009, I want to focus on three topics of particular salience mentioned earlier: capital and liquidity, macroprudential supervision, and too big to fail.

Capital and Liquidity Ratios

At one level, the story on capital and liquidity ratios is very simple: From the viewpoint of the stability of the financial system, more of each is better.

This is the principle that lies behind the vigorous campaign waged by Anat Admati and Martin Hellwig to increase bank capital ratios, set out in their book, *The Bankers' New Clothes: What's Wrong with Banking and What to Do about It,* and in subsequent publications.[4]

But at what level should capital and liquidity ratios be set? In practice, the base from which countries work is agreement among the regulators and supervisors who belong to the Basel Committee on Banking Supervision (BCBS). At one time the membership consisted of the members of the G-10 plus Switzerland. It now includes the membership of the G-20 plus a few other countries.[5]

Following the global crisis, the BCBS moved to the Basel III agreement, which strengthens capital requirements, as opposed to Basel II, which tried to build primarily on measures of risk capital set by internal models developed by each individual bank. This approach did not work, partly because the agreed regulatory minimum capital ratios were too low, but also because any set of risk weights involves judgments, and human nature would rarely result in choices that made for higher risk weights. In the United States, the new regulations require

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[2] This is a combination of the areas of reform presented in the G-30 report, Group of Thirty (2009), Financial Reform: A Framework for Financial Stability (PDF), (Washington, D.C.: Group of Thirty, January); the FSB report, "Improving Financial Regulation: Report of the Financial Stability Board to G20 Leaders (PDF)," Financial Stability Board, September 2009; and some that I added.

[3] Group of Thirty (2009), p. 21. For an incisive account of measures to deal with the TBTF problem, see the 2009 speech by my Federal Reserve Board colleague, Daniel K. Tarullo (2009), "Confronting Too Big to Fail," speech delivered at the Exchequer Club, Washington, D.C., October 21.

[4] Anat Admati and Martin Hellwig (2013), The Bankers' New Clothes: What's Wrong with Banking and What to Do about It (Princeton, N.J.: Princeton University Press).

[5] A full list of jurisdictions and institutions represented on the Basel Committee on Banking Supervision can be found at www.bis.org/bcbs/membership.htm.

large bank holding companies (BHCs) to use risk-weighted assets (RWAs) that are the greater of those produced by firms' internal models or the standardized risk weights, some of which have been raised, thus mitigating the problem of the use of internal risk ratings.

What has been achieved? Globally

- The minimum tier 1 capital ratio has been raised from 4 percent to 6 percent of RWA.
- There is a minimum common equity tier 1 capital ratio of 4.5 percent of RWA.
- There is a capital conservation buffer of 2.5 percent of RWA, to ensure that banking organizations build capital when they are able to.
- A countercyclical capital buffer has been created that enables regulators to raise risk-based capital requirements when credit growth is judged to be excessive.
- A minimum international leverage ratio of 3 percent has been set for tier 1 capital relative to *total* (i.e., not risk-weighted) on-balance-sheet assets and off-balance-sheet exposures.
- There is a risk-based capital surcharge for global systemically important banks (G-SIBs) based on these firms' systemic risk.

In addition, in the United States

- The Federal Reserve is planning to propose risk-based capital surcharges for U.S. G-SIBs, based on the BCBS proposal for G-SIBs.[6]
- The relevant U.S. regulators (the Fed, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation (FDIC)) have raised the Basel III leverage ratio for U.S. G-SIBs to 5 percent; U.S. G-SIBs that do not achieve this ratio will face limits on their ability to distribute dividends and to pay discretionary employee bonuses.[7]
- Foreign banking organizations with U.S. nonbranch assets of $50 billion or more will have to form U.S. intermediate holding companies that will have to meet essentially the same capital requirements as U.S. BHCs with $50 billion or more of assets.

Many of these rules do not apply to community banks, in light of their different business models.

One more point on bank capital: The Swiss and Swedish regulators have already gone far in raising capital requirements, including by requiring bail-in-able secondary holdings of capital in the form of contingent convertible capital obligations (CoCos). The United States may be heading in a similar direction, but not by using CoCos, rather by requiring minimum amounts of "gone-concern" loss absorbency – in the form of long-term debt – that would be available for internal financing recapitalization through a new orderly liquidation mechanism created by the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act).

In addition to enhanced capital ratios and tougher measures of risk-based capital, the Basel III accord includes bank liquidity rules, another key element of global financial regulatory reform. The Basel Committee has agreed on the Liquidity Coverage Ratio (LCR), which is

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[6] As my colleagues Chair Yellen and Governor Tarullo have noted, it may be appropriate to go beyond the risk-based surcharges proposed by the BCBS. The goal would be to reach a point where any remaining TBTF subsidies have been offset and where other social costs of a potential failure by the firm have been internalized.

[7] In addition, the subsidiary banks of the U.S. G-SIBs will need to meet a 6 percent leverage ratio to be considered well capitalized from the viewpoint of prompt corrective action regulations.

designed to reduce the probability of a firm's liquidity insolvency over a 30-day horizon through a self-insurance regime of high-quality liquid assets (HQLA) to meet short-term stressed funding needs. The BCBS is also working to finalize the Net Stable Funding Ratio (NSFR), which helps to ensure a stable funding profile over a one-year horizon.

The bottom line to date: The capital ratios of the 25 largest banks in the United States have risen by as much as 50 percent since the beginning of 2005 to the start of this year, depending on which regulatory ratio you look at. For example, the tier 1 common equity ratio has gone up from 7 percent to 11 percent for these institutions. The increase in the ratios understates the increase in capital because it does not adjust for tougher risk weights in the denominator. In addition, the buffers of HQLAs held by the largest banking firms have more than doubled since the end of 2007, and their reliance on short-term wholesale funds has fallen considerably.

At the same time, the introduction of macroeconomic supervisory stress tests in the United States has added a forward-looking approach to assessing capital adequacy, as firms are required to hold a capital buffer sufficient to withstand a several-year period of severe economic and financial stress. The stress tests are a very important addition to the toolkit of supervisors, one that is likely to add significantly to the quality of financial sector supervision.

Macroprudential policy and supervision

In practice, there are two uses of the term "macroprudential supervision."[8] The first relates to the supervision of the financial system as a whole, with an emphasis on interactions among financial markets and institutions. The second relates to the use of regulatory or other non-interest-rate tools of policy to deal with problems arising from the behavior of asset prices.[9] For instance, when central bank governors are asked how they propose to deal with the problem of rising housing prices at a time when the central bank for macroeconomic reasons does not want to raise the interest rate, they generally reply that if the need arises, they will use macroprudential policies for that purpose. By that they mean policies that will reduce the supply of credit to the housing sector without changing the central bank interest rate.

Sector-specific regulatory and supervisory policies in the financial sector were used extensively and systematically in the United States in the period following World War II until the 1990s and are now being used in other advanced and developing countries. Elliott, Feldberg, and Lehnert review the use of such measures in the United States.[10] Frequently, these policies were aimed at encouraging or discouraging activity in particular sectors, for example agriculture, exports, manufacturing, or housing; sometimes broad, non-interest-rate measures were used to try to deal with inflation or asset-price increases, for instance, the use of credit controls.

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[8] The word "macroprudential" appears to have been invented in the late 1970s and was used by Andrew Crockett and others at the Bank for International Settlements (BIS) in the 1990s and later. It began to come into central banker usage in the first decade of this century. But it was the consequences of the failure of Lehman Brothers that made it a household word. See Piet Clement (2010) "The Term 'Macroprudential': Origins and Evolution (PDF)," B*IS Quarterly Review,* March, pp. 59–67.

[9] For an authoritative, recent statement by Chair Yellen, see Janet L. Yellen (2014), "Monetary Policy and Financial Stability," speech delivered at the 2014 Michel Camdessus Central Banking Lecture, International Monetary Fund, Washington, D.C., July 2.

[10] For a comprehensive review of the use of such policies, see Douglas J. Elliott, Greg Feldberg, and Andreas Lehnert (2013), "The History of Cyclical Macroprudential Policy in the United States," Finance and Economics Discussion Series 2013–29 (Washington: Board of Governors of the Federal Reserve System, May).

The issue of how monetary policy should relate to asset-price inflation had been on the agenda of central bankers for many years before the Lehman Brothers' failure.[11] The issue became more prominent in the United States in the 1990s and the first few years of this century, and temporarily culminated in the Fed's "mopping-up" approach, namely that monetary policy – meaning interest rate policy – should not react to rising asset prices or suspected bubbles except to the extent that they affect either employment and/or price stability. Operationally, this approach was much more likely to lead to action after the bubble had burst than as it was forming.[12] The policy was tested in the bursting of the tech bubble in 2001 and appeared to be successful as the economy recovered from 2002 onward.[13] However, the mopping-up doctrine did not include the second element of the macroprudential approach – the use of regulatory and supervisory measures to deal with undesired asset-price movements when the central bank interest rate was judged not to be available for that purpose.

At present, the word macroprudential is used primarily in the second sense – of the use of regulatory and supervisory noncentral bank interest rate tools to affect asset prices. In this sense, the use of the word takes us back to a world that central bankers thought they had left by the 1990s.[14]

Now, from etymology to economics: I want to review my experience with macroprudential policies – in the second sense of noninterest regulatory and supervisory policies – as Governor of the Bank of Israel to draw a few key lessons about the use of these policies. To set the background: There was no financial crisis in Israel during the Great Recession. As domestic interest rates declined along with global rates, housing prices began to rise.[15] This is a normal part of the textbook adjustment mechanism and is expected to encourage an increase in the rate of homebuilding. The rate of building increased, but not sufficiently to meet the demand for housing, and prices continued to rise.[16]

The banks are the largest financial institutions in Israel and dominate housing finance. The supervisor of banks reports to the governor of the central bank. Starting in 2010, the supervisor began to implement a series of measures to reduce the supply of housing finance by the banks. Among the measures used were increasing capital requirements and

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[11] Among the suggested solutions was the proposal that the consumer price index should include the prices of assets as representing the costs of future consumption. See Armen A. Alchian and Benjamin Klein (1973), "On a Correct Measure of Inflation," *Journal of Money, Credit, and Banking*, vol. 5 (1), part 1, pp. 173–91.

[12] As is well known, support for the mopping-up approach was not unanimous, with, for example, researchers at the BIS, notably Claudio Borio and Bill White, presenting the view that monetary policy should be used to deal with asset-price inflation. See Claudio Borio and William R. White (2003), "Whither Monetary and Financial Stability? The Implications of Evolving Policy Regimes (PDF)," paper presented at "Monetary Policy and Uncertainty: Adapting to a Changing Economy," a symposium sponsored by the Federal Reserve Bank of Kansas City, held in the Jackson Hole, Wyo., August 28–30. See also Raghuram Rajan (2005), "Has Financial Development Made the World Riskier? (PDF)" paper presented at "The Greenspan Era: Lessons for the Future," a symposium sponsored by the Federal Reserve Bank of Kansas City, held in the Jackson Hole, Wyo., August 25–27.

[13] It could be argued that the low interest rates of the 2003–06 period were the result of the mopping-up approach. I do not see any necessary connection between the mopping-up doctrine and monetary policy in the period following the mopping up of the hi-tech boom.

[14] According to the ProQuest database, of the roughly 1,600 articles referring to the term "macroprudential" after the start of the Great Recession, almost all refer to regulatory and supervisory interventions.

[15] House prices tended to increase more rapidly in countries that did not experience a financial sector crisis during the Great Recession. For a more detailed account, see Stanley Fischer (2014), "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), pp. 87–98.

[16] The supply of land to the market in Israel is fundamentally controlled by the government, which owns more than 90 percent of the land.

provisioning against mortgages; limiting the share of any housing financing package indexed to the short-term (central bank) interest rate to one-third of the total loan, with the remainder of the package having to be linked to either the five-year real or five-year nominal interest rate; and, on different occasions, limiting the loan-to-value (LTV) and payment-to-income (PTI) ratios.[17] Additional precautionary measures were implemented in the supervision of banks.[18]

The most successful of these measures was the limit of one-third imposed in May 2011 on the share of any housing loan indexed in effect to the Bank of Israel interest rate. Competition among the banks had driven the spread on floating rate mortgages indexed to the Bank of Israel rate down to 60 basis points, which meant that mortgage financing was available at an extremely low interest rate. The term-structure was relatively steep, so that the requirement that the remaining two-thirds of any financing package had to be indexed to a five-year rate – whether real or nominal – made a substantial difference to the cost of housing finance. In addition, increases in both LTV and PTI ratios were moderately effective. However, increasing capital charges had very little impact in practice.

There are three key lessons from this experience. First, the Bank of Israel did not have good empirical estimates of the effectiveness of the different macroprudential measures.[19] This problem is likely to be relevant in many countries in large part because we have relatively little experience of the use of such measures in recent years.[20] Policymakers may thus be especially cautious in the use of measures of this type.

Second, measures aimed at reducing the demand for housing are likely to be politically sensitive.[21] Their use requires either very cautious and well-aimed measures by the regulatory authorities, and/or the use by the government of subsidies to compensate some of those who end up facing more difficulty in buying housing as a result of the imposition of macroprudential measures. Indeed, it often appears that there is a conflict between cautious risk management by the lenders and the desire of society to house its people decently.

Third, there is generally a need for coordination among several regulators and authorities in dealing with macroprudential problems of both types.

There are many models of regulatory coordination, but I shall focus on only two: the British and the American. As is well known, the United Kingdom has reformed financial sector regulation and supervision by setting up a Financial Policy Committee (FPC), located in the Bank of England; the major reforms in the United States were introduced through the Dodd-Frank Act, which set up a coordinating committee among the major regulators, the Financial Stability Oversight Council (FSOC).

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[17] For more details, see Fischer (2014).

[18] Mortgages in Israel are *not* nonrecourse loans; in the event of nonpayment, the lender can seek to attach other assets of the borrower in addition to the house itself.

[19] Typically the impact was calculated based on an estimate of how much a measure would increase the effective interest rate paid by the borrower, but this calculation generally resulted in an overestimate of the impact of the policy change.

[20] Elliott, Feldberg, and Lehnert (2013) present empirical results on the use of macroprudential (sense 2) measures in the United States, but their results are at too high a level of aggregation to be useful in making decisions on the deployment of specific supervisory or regulatory measures. The literature is growing. For example, Kuttner and Shim examine the effects of actions in 57 countries since the 1980s on house prices and housing credit growth. See Kenneth N. Kuttner and Ilhyock Shim (2013), "Can Non-Interest Rate Policies Stabilise Housing Markets? Evidence from a Panel of 57 Economies," Bank for International Settlements working paper no. 433 (Basel: BIS, November).

[21] This is a general problem but is particularly the case in the Israeli context where the bulk of the male population is conscripted into the armed forces for three years at a relatively low salary, and there is a general view that young couples deserve to be able to buy an apartment when they marry.

In discussing these two approaches, I draw on a recent speech by the person best able to speak about the two systems from close-up, Don Kohn.[22] Kohn sets out the following requirements for successful macroprudential supervision: to be able to identify risks to financial stability, to be willing and able to act on these risks in a timely fashion, to be able to interact productively with the microprudential and monetary policy authorities, and to weigh the costs and benefits of proposed actions appropriately. Kohn's cautiously stated bottom line is that the FPC is well structured to meet these requirements, and that the FSOC is not. In particular, the FPC has the legal power to impose policy changes on regulators, and the FSOC does not, for it is mostly a coordinating body.

After reviewing the structure of the FSOC, Kohn presents a series of suggestions to strengthen its powers and its independence. The first is that every regulatory institution represented in the FSOC should have the goal of financial stability added to its mandate. His final suggestion is, "Give the more independent FSOC tools it can use more expeditiously to address systemic risks."[23] He does not go so far as to suggest the FSOC be empowered to instruct regulators to implement measures somehow decided upon by the FSOC, but he does want to extend its ability to make recommendations on a regular basis, perhaps on an expedited "comply-or-explain" basis.

Kohn remarks that he does not hold up the U.K. structure of macroprudential supervision as ideal for all countries at all times and further notes that the U.K. system vests a great deal of authority in a single institution, the Bank of England. This element is not consistent with the U.S. approach of dispersing power among competing institutions.

These are important, and difficult, issues. Kohn's proposals clearly warrant serious examination. It may well be that adding a financial stability mandate to the overall mandates of all financial regulatory bodies, and perhaps other changes that would give more authority to a reformed FSOC, would contribute to increasing financial and economic stability.

Financial reform and TBTF

Diagnoses of what went wrong with the financial system at the start of the Great Recession in the United States generally placed heavy emphasis on the problem of too big to fail. The TBTF problem derives from the typical response of governments confronted by the potential failure of a large bank, which is to intervene to save the bank and some of its noninsured creditors.[24] In the words of Governor Tarullo, "...no matter what its general economic policy principles, a government faced with the possibility of a cascading financial crisis that could bring down its national economy tends to err on the side of intervention."[25]

I will start by discussing some of the main steps in the links between TBTF and the crisis, and between the financial sector reform program and TBTF. We begin with the link between TBTF and government intervention: Once investors believe that governments will intervene to prevent large banks from becoming bankrupt, they become willing to lend to these banks at lower rates than they would lend without the implicit guarantee. This could lead to such

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[22] Donald Kohn (2014), "Institutions for Macroprudential Regulation: the UK and the U.S." speech delivered at the Kennedy School of Government, Harvard University, Cambridge, Mass., April 17.

[23] The FSOC would become more independent as a result of implementing Kohn's suggestions.

[24] In describing the TBTF diagnosis, I draw on Tarullo (2009). In addition, see Gary H. Stern and Ron J. Feldman (2004), *Too Big to Fail: The Hazards of Bank Bailouts* (Washington, D.C.: Brookings Institution Press); Charles W. Calomiris and Stephen H. Haber (2014), *Fragile by Design: The Political Origins of Banking Crises and Scarce Credit* (Princeton: Princeton University Press); and Financial Stability Board (2010), "Reducing the Moral Hazard Posed by Systemically Important Financial Institutions (PDF)," FSB report (Basel: BIS, October). For a very readable account, see chapter 11 of Alan S. Blinder (2013), *After the Music Stopped: The Financial Crisis, the Response, and the Work Ahead* (New York: Penguin Books).

[25] Tarullo (2009), p.2.

banks becoming larger than optimal and to encouraging them to take more risks than they would absent expected government intervention to reduce the likelihood of their becoming bankrupt.

A great deal of empirical work has attempted to measure the premium – in terms of a lower cost of financing – that the large banks typically receive. The results vary, but a representative set of estimates – that of the International Monetary Fund in its April 2014 issue of the *Global Financial Stability Report* – reports that in 2013 their estimates of the premium were approximately 15 basis points in the United States, 25–60 basis points in Japan, 20–60 basis points in the United Kingdom, and 60–90 basis points in the euro area.[26] The estimated premium in the United States was higher at the height of the financial crisis, and has been declining since then in response to the significant steps made in the regulatory reform agenda.

Do large banks, with lower costs of financing, take bigger risks? The empirical relationship between bank size and their risk-taking has been examined by Laeven, Ratnovski, and Tong, who find that "large banks tend to have lower capital ratios, less stable funding, more market-based activities, and (to) be more organizationally complex than small banks."[27] From this they conclude that "[l]arge banks are riskier, and create more systemic risk, when they have lower capital and less-stable funding. [They] create more systemic risk (but are not individually riskier) when they engage more in market-based activities or are more organizationally complex."[28]

The key to these results is the recognition that banks have several sources of financing, and that the more they rely on market interest rate-sensitive short-term funding, the less stable they are likely to be. Organizational complexity is certainly an issue: Maintaining managerial control, especially risk control, in a multi-activity bank, where individual rewards may be massive, is extremely difficult – think for instance of Baring's in the late 1990s, or Societe Generale, or the so-called London Whale at JPMorgan Chase. Strong risk management is essential but faces the hurdle of the structural incentives for risk-taking implied by limited liability for individuals and by what may be a human proclivity to take risks.[29] But of course, banks that are heavily consumer deposit financed also fail from time to time, as a result of bad lending decisions.

It could be that large banks can finance themselves more cheaply because they are more efficient, that is, that there are economies of scale in banking. For some time, the received wisdom was that there was no evidence of such economies beyond relatively modest-sized banks, with balance sheets of approximately $100 billion. More recently, several papers have found that economies of scale may continue beyond that level. For example, the title of a paper by Joseph Hughes and Loretta Mester, "Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return Driven Cost Function"[30] suggests that large institutions may be better able to manage risk more efficiently because of "technological advantages, such as diversification and the spreading of information...and other costs that do

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[26] International Monetary Fund (2014), Global Financial Stability Report (Washington, D.C.: IMF, April), chapter 3.

[27] Luc Laeven, Lev Ratnovski, and Hui Tong (2014), "Bank Size and Systemic Risk (PDF)," International Monetary Fund Staff Discussion Note 1404, May.

[28] Large banks also hold less capital than small banks because they are more diversified – for example, small U.S. banks have larger geographical concentrations and larger single-name concentrations than larger banks.

[29] In this regard one cannot fail to be impressed by the fact that in countries with a death penalty for corruption, some people appear nonetheless to be willing to take the chance of becoming rich illegally.

[30] See Joseph P. Hughes and Loretta J. Mester (2011), "Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return-Driven Cost Function (PDF)," working paper 11–27 (Philadelphia: Federal Reserve Bank of Philadelphia, July).

not increase proportionately with size." That said, these authors conclude that "[W]e do not know if the benefits of large size outweigh the potential costs in terms of systemic risk that large scale may impose on the financial system." They add that their results suggest that "strict size limits to control such costs will likely not be effective, since they work against market forces..."

The TBTF theory of why large banks are a problem has to contend with the history of the Canadian and Australian banking systems. Both these systems have several very large banks, but both systems have been very stable – in the Canadian case, for 150 years.[31] Beck, Demirguc-Kunt, and Levine (2003) examined the impact of bank concentration, bank regulation, and national institutions on the likelihood of a country suffering a financial crisis and concluded that countries are less likely to suffer a financial crisis if they have (1) a more concentrated banking system, (2) fewer entry barriers and activity restrictions on bank activity, and (3) better-developed institutions that encourage competition throughout the economy.[32] The combination of the first finding with the other two appears paradoxical, but the key barrier to competition that was absent in Canada was the prohibition of nationwide branch banking, a factor emphasized by Calomiris and Haber in their discussion of the Canadian case.[33] In addition, I put serious weight on another explanation offered in private conversation by a veteran of the international central banking community, "Those Canadian banks aren't very adventurous," which I take to be a compliment.[34]

Why is the TBTF phenomenon so central to the debate on reform of the financial system? It cannot be because financial institutions never fail. Some do, for example, Lehman Brothers and the Washington Mutual failed in the Great Recession. Other banks were merged out of existence, often at very low prices, with the FDIC managing the resolution process. Banks in the United Kingdom and in Europe failed during the Great Recession. It cannot be because equity-holders never lose in bank crises. It could be because until now, bond holders in large banks rarely have lost significantly in crises – rather, for fear of contagion, they ended up being protected by the government.

Almost certainly, TBTF is central to the debate about financial crises because financial crises are so destructive of the real economy. It is also because the amounts of money involved when the central bank or the government intervenes in a financial crisis are extremely large, even though the final costs to the government, including the central bank, are typically much smaller. In some cases, governments and central banks even come out slightly ahead after the crisis is over and the banks have been sold back to the private sector. Another factor may be that the departing heads of some banks that failed or needed massive government assistance to survive nonetheless received very large retirement packages.

One can regard the entire regulatory reform program, which aims to strengthen the resilience of banks and the banking system to shocks, as dealing with the TBTF problem by reducing the probability that any bank will get into trouble. There are, however, some aspects of the financial reform program that deal specifically with large banks. The most important such measure is the work on resolution mechanisms for SIFIs, including the very difficult case of

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[31] If this lecture had been delivered in 2005, I would have added the British banking system to the above list. This is evidence that the regulatory structure also matters.

[32] Thorsten Beck, Asli Demirguc-Kunt, and Ross Levine (2003), "Bank Concentration and Crises (PDF)," National Bureau of Economic Research working paper no. 9921 (Cambridge, Mass.: NBER, August).

[33] Calomiris and Haber (2014), pp. 305–11.

[34] This comment pushes one in the direction of supporting the Volcker rule and other restrictions on commercial banks undertaking capital market activities. One criticism of the Volcker rule is that two of the key failed institutions in the recent financial crisis – Bear-Stearns and Lehman Brothers – were not banks. It is hard to see why this fact suggests that permitting commercial banks to combine their activities with those of investment banks would be a stabilizing factor for the banking system.

G-SIFIs. In the United States, the Dodd-Frank Act has provided the FDIC with the Orderly Liquidation Authority (OLA) – a regime to conduct an orderly resolution of a financial firm if the bankruptcy of the firm would threaten financial stability. And the FDIC's single-point-of-entry approach for effecting a resolution under the new regime is a sensible proposed implementation path for the OLA.

Closely associated with the work on resolution mechanisms is the living will exercise for SIFIs. In addition, there are the proposed G-SIB capital surcharges and macro stress tests applied to the largest BHCs ($50 billion or more). Countercyclical capital requirements are also likely to be applied primarily to large banks. Similarly the Volcker rule, or the Vickers rules in the United Kingdom or the Liikanen rules in the euro zone, which seek to limit the scope of a bank's activities, are directed at TBTF, and I believe appropriately so.

What about simply breaking up the largest financial institutions? Well, there is no "simply" in this area. At the analytical level, there is the question of what the optimal structure of the financial sector should be. Would a financial system that consisted of a large number of medium-sized and small firms be more stable and more efficient than one with a smaller number of very large firms? That depends on whether there are economies of scale in the financial sector and up to what size of firm they apply – that is to say it depends in part on why there is a financing premium for large firms. If it is economies of scale, the market premium for large firms may be sending the right signals with respect to size. If it is the existence of TBTF, that is not an optimal market incentive, but rather a distortion. What would happen if it was possible precisely to calculate the extent of the subsidy or distortion and require the bank to pay the social cost of the expansion of its activity?[35] This could be done either by varying the deposit insurance rate for the bank or by varying the required capital ratios for SIFIs to fit each bank's risk profile and structure. This, along with measures to strengthen large banks, would reduce the likelihood of SIFI failure – but could not be relied upon to prevent all failures.

Would breaking up the largest banks end the need for future bailouts? That is not clear, for Lehman Brothers, although a large financial institution, was not one of the giants – except that it was connected with a very large number of other banks and financial institutions. Similarly, the savings and loan crisis of the 1980s and 1990s was not a TBTF crisis but rather a failure involving many small firms that were behaving unwisely, and in some cases illegally. This case is consistent with the phrase, "too many to fail." Financial panics can be caused by herding and by contagion, as well as by big banks getting into trouble.

In short, actively breaking up the largest banks would be a very complex task, with uncertain payoff.

The bottom lines

The United States is making significant progress in strengthening the financial system and reducing the probability of future financial crises. In particular

- By raising capital and liquidity ratios for SIFIs, and through the active use of stress tests, regulators and supervisors have strengthened bank holding companies and thus reduced the probability of future bank failures.
- Work on the use of the resolution mechanisms set out in the Dodd-Frank Act, based on the principle of a single point of entry, holds out the promise of making it possible to resolve banks in difficulty at no direct cost to the taxpayer – and in any event at a lower cost than was hitherto possible. However, work in this area is less advanced than the work on raising capital and liquidity ratios.

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[35] See footnote 6 above.

- Although the BCBS and the FSB reached impressively rapid agreement on needed changes in regulation and supervision, progress in agreeing on the resolution of G-SIFIs and some other aspects of international coordination has been slow.
- Regulators almost everywhere need to do more research on the effectiveness of microprudential and other tools that could be used to deal with macroprudential problems.
- It will be important to ensure that coordination among different regulators of the financial system is effective and, in particular, will be effective in the event of a crisis.
- A great deal of progress has been made in dealing with the TBTF problem. While we must continue to work toward ending TBTF or the need for government financial intervention in crises, we should never allow ourselves the complacency to believe that we have put an end to TBTF.
- We should recognize that despite some imperfections, the Dodd-Frank Act is a major achievement.
- At the same time, we need always be aware that the next crisis – and there will be one – will not be identical to the last one, and that we need to be vigilant in both trying to foresee it and seeking to prevent it.

And if, despite all our efforts, a crisis happens, we need to be willing and prepared to deal with it.