What's Wrong with Prudential Bank Regulation and How to Fix It

By

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Chairman Hensarling, Ranking Member Waters, Members of the Financial Services Committee, it is a pleasure and an honor to be here today to share my thoughts with you about how to improve prudential banking regulation to address the too-big-to-fail problem, and more generally, to avoid instability and financial burdens on taxpayers that result from private risk taking at public expense. First, I identify what I take to be our desired destination: what should be our objectives? I then explain why the current mix of prudential regulations of banks developed over the past three decades is not designed well enough to get us there. The pillars of that system include Basel risk-based capital ratio requirements, leverage limits, liquidity regulations, stress tests, and "orderly resolution." As I will show, it is not just the particulars of these standards that are inadequate; they are misconceived and poorly designed. I propose regulatory reforms that would not only credibly limit private risk taking at public expense, but do so in a way that would improve the efficiency of our banking system. It is possible to credibly and substantially reduce (if not eliminate) bank bailouts, while also improving bank performance, and reducing the risks banks face from regulatory uncertainty.

What Destination?

What should be our destination? We want a regulatory system that credibly requires banks to risk their stockholders' investments, not taxpayers' wealth. And we want to avoid permitting losses to bank stockholders to cripple banks' abilities to make loans to viable borrowers in the wake of severe bank losses. These goals point to common regulatory objectives: requiring banks to maintain adequate amounts of equity capital and cash assets relative to the risks they undertake, and ensuring that the risks banks' bear are properly diversified across sectors so that a normal recessionary shock coming from one sector (e.g., real estate) does not lead to an economy-wide contraction of credit. Of course, avoiding bailouts and credit crunches isn't everything: we need to build a competitive banking system that is able to adapt to changing market conditions to provide a broad range of services to its customers at low cost. U.S. banks are still struggling to recover their competitive capabilities, partly owing to the new regulatory burdens that they are bearing in the wake of the Dodd-Frank Act of 2010.

There is great opportunity for improvement in regulation to meet these objectives of stability and efficiency. Our regulatory environment has not credibly ensured that banks will avoid bailouts and credit crunches, although we have imposed huge costs of regulatory compliance on banks. In particular, Title II of Dodd-Frank is supposed to ensure orderly liquidation of TBTF banks, but I see it as unlikely to deliver that result. It is more likely to institutionalize bailouts by establishing procedures under which they will occur, financed by "fees" that politicians like to pretend are not taxes. The new "single point of entry" approach, and the use of living wills, may make for good sound bites, but are not credible means for

avoiding bailouts. When a large bank fails, the potential disruptions and risks imagined by regulators and politicians will still make bailouts the political path of least resistance.

Rather than pretend that we will have the mechanisms and political will to liquidate TBTF institutions, we should focus our efforts on structuring prudential regulation to prevent large banks from becoming insolvent. That means focusing on the adequacy of bank capital and cash assets. My suggestions for reforming capital and liquidity standards are designed to improve both stability and efficiency by focusing on regulatory tools that are simpler and more reliable than our current regulatory toolkit.

Some would say that the only way to solve the bailout problem is to go back to a system of small banks, which would also necessarily mean local and narrowly focused banks. I believe that approach is wrong for two reasons. First, it is not possible to operate a global universal bank that is small because a small bank cannot cover the overhead costs of providing many services across many countries. If we were to prohibit global universal banks in the U.S. that would create a problem for global non-financial enterprises, which need a broad range of services and which find that they are served best by having those services available within a single banking relationship. Prohibiting large banks in the U.S. won't stop those global non-financial companies from choosing to work with global universal banks – it will just make them choose banks not headquartered in the U.S.

Second, reducing the size of our largest banks won't end bailouts; in fact, bailouts predate the establishment of global universal banks. Continental Illinois was small by current standards when it was bailed out in the early 1980s. And many other small banks and thrifts imposed huge bailout costs through government sponsored deposit insurance in the 1980s.

Eliminating banking crises and bailouts is not everyone's primary objective. Some political leaders favor encouraging our banking system to provide directed credit to politically favored borrowers, even if that continues to require bailouts of banks and GSEs in the future. Although advocates of this approach don't explicitly connect the dots between their goals and the bailout problem, Stephen Haber and I show in our 2014 book, *Fragile By Design: The Political Foundations of Banking Crises and Scarce Credit*, that bailouts of banks and GSEs were a direct consequence of political bargains to subsidize risky real estate lending. Government policies relating to merger approvals, directed credits to low-income borrowers, and GSE mandates were coordinated purposefully to favor risky real estate lending and this was an important contributor to the banking system's, and GSEs', excesses in risky real estate finance leading up to the recent crisis. We explicitly chose as a country to tolerate an obviously

excessive exposure to real estate risk through lax prudential regulations of banks and GSEs in exchange for their making politically favored loans.

Large exposures to real estate risk by banks produce the worst systemic risks for the financial system because real estate risks are closely linked to the business cycle (hence highly correlated with one another), and because real estate investments are not easy to liquidate when they go sour. Although the United States is the most extreme case of this problem, we are not alone; a recent study by Jorda, Schularick and Taylor (2015) shows that the political impulse to subsidize real estate risk has expanded dramatically across many countries over the last several decades. If we are serious about solving the problem of systemic risk and bank bailouts, then we must also get serious about limiting the banking system's exposure to real estate risks. We cannot solve the problem of bank bailouts unless we do so.

What's Wrong with the Current Prudential Regulatory System?

Since the 2007-2009 banking crisis substantial progress has been made in strengthening the prudential regulatory system under which banks operate. Capital standards have been raised, and even higher capital requirements have been imposed on the largest and most systemically important financial institutions (so called SIFIs). In addition to capital requirements, SIFIs also must undergo stress tests annually which are intended to measure their resiliency under various shock scenarios. If done properly, stress tests could provide a useful check against underestimations of risk by bank models, which are almost assuredly occurring under the current approach to measuring bank asset risks as an input to the calculation of "risk-based assets." Furthermore, if done properly, stress tests could gauge the exposure of the banking system to systemic risk – especially risks related to correlated shocks such as real estate loan exposures. In addition to enhanced capital requirements and stress tests, new liquidity standards have been devised that are intended to further enhance bank resiliency and reduce banking system exposure to liquidity risk. As Florian Heider, Marie Hoerova and I (2015) show, it makes sense to require banks to hold cash, in addition to minimum capital requirements, because cash holdings can play a unique and cost-effective role in promoting bank stability.

Despite the progress in recognizing the importance of higher capital requirements, and the potential usefulness of stress tests and liquidity requirements, unfortunately, there is much room for improvement in the design of the prudential regulatory framework. The effectiveness of prudential regulations depends crucially on the details of their design. Unfortunately, capital requirements, stress tests and liquidity requirements are all deeply flawed, and these flaws are sufficient to undermine the reliability of our prudential regulatory system. At the same time, our regulatory system is imposing significant unintended costs on SIFIs and smaller banks, which are harming bank performance. That

reduced efficiency not only has adverse consequences for the costs of financial services, it threatens the resiliency of banks.

What's Wrong with Relying on Book Value Capital Requirements?

Capital requirements take the form of minimum ratios of the book value of equity (or broader measures of capital) relative to the book value of assets, or relative to the book value of risk-weighted assets (where asset risk is measured by banks' internal models or by formulaic risk categories that are applied to assets). Despite progress in requiring banks to employ asset valuations that track the economic value of tangible assets better, book equity remains a highly deficient means of measuring the true economic value of equity. This is true for two reasons. First, when banks suffer losses on tangible assets (such as loans) they typically delay recognition of those losses, and often supervisors have been complicit in permitting delayed recognition. Delayed recognition is convenient for banks, supervisors, and politicians alike because overstating capital can help banks to continue operating without curtailing lending or other risky activities. For example, recall that it wasn't until after the 1988 election was over that losses in U.S. savings and loans were recognized. The recent U.S. crisis also displayed some delayed recognition of bank losses (Huizinga and Laeven 2009). Second, and even more importantly, the book value of equity does not capture the value (or losses in value) of *intangible assets*, which reflect market perceptions of bank cash flows beyond the tangible value of net worth. As Doron Nissim and I have shown in our recent work (Calomiris and Nissim 2014), changes in intangible assets (servicing income, other fee income, the value of relationships with depositors or borrowers) have been among the primary drivers of loss in bank value since 2006, and banks are still in the process of recovering that lost value.

For both of those reasons, the book value of equity as a fraction of assets, or a fraction of risk-weighted assets, doesn't accurately measure bank health. For example, after Citigroup had become arguably insolvent by September 2008, it and many other distressed banks found themselves unable to roll over their short-term uninsured debts, prompting a systemic banking crisis. In December 2008, however, Citigroup reported an overall risk-based capital ratio as high as 11.98%. Clearly, book equity as a fraction of assets or risk-weighted assets did not measure Citigroup's health, or its ability to continue to access short-term debt markets (Calomiris and Herring 2013). And yet, the reforms envisioned under Basel III continue to focus on book equity ratios. Strangely, it seems as if the goal of Basel III capital standard reforms has been to make all financial institutions just as healthy as Citigroup was in December 2008!

I support raising equity capital ratio requirements to an even higher level than current requirements – to be specific, I suggest raising the minimum equity-to-assets ratio to 10%, and raising the

minimum equity-to-risk-weighted assets ratio to 15%. But raising capital ratio requirements even higher would not be a cost-effective solution to the problems of delayed loss recognition or the non-recognition of changes in the value of intangibles. Higher book equity requirements would not address those fundamental problems. And requiring unreasonably high equity requirements raises the cost of lending and other bank services.1

The right way to ensure the adequacy of bank equity capital is to measure its *economic value* rather than its book value, and then put in place reliable regulatory requirements that ensure banks will maintain an adequate amount of meaningfully measured equity capital. For publicly traded banks (which includes all SIFIs) the measure of the economic value of bank equity is its market value. Market value is the right measure to use to capture economic value not only because it has proven to be accurate over reasonable time horizons (which it has) but also because it is the measure that captures the opinions of the market place, and thus provides a uniquely valuable measure of market perceptions of banks' counterparty risks. When banks lose market confidence in the sufficiency of their equity's economic value, that results in their losing access to markets for their uninsured short-term debt. For this reason it is essential to employ market values to gauge economic value: even if the market were wrong in its measures of economic value, market opinions are the ones that matter for the risks of spreading financial crises through counterparties' unwillingness to roll over short-term debts, as we saw in September 2008.

How can we best connect regulatory equity requirements to market information about the value of bank equity? One way to do so is simply to require that banks maintain a minimum "market equity ratio," defined by using a moving average of the market value of equity relative to the market value of assets (where the market value of assets equals the face value of debt plus the market value of equity). I am not in favor of that approach because, in a recession, there would be a temptation for regulators to "forbear" and relax those regulations to spur lending and to protect banks from having to raise new capital in an unfriendly environment. We have to be realistic and recognize that the enforcement of regulations cannot be taken for granted; democracies often choose predictably and myopically to forebear from enforcing regulations at the time when we most need to enforce them.

A better approach for ensuring that banks maintain adequate economic equity ratios – one which Richard Herring and I have been advocating for some time (Calomiris and Herring 2013) – is to require, alongside a standard minimum book equity requirement, that (large) banks maintain another similar

1 Recently, Admati and Hellwig (2013) have argued that higher book equity requirements do not have social costs. As shown in Calomiris (2013) and Aiyar et al. (2014a, 2014b, 2014c, 2015), that argument is not correct as a matter of theory and it is contradicted by a large body of empirical evidence.

proportion of assets in contingent convertible debt (CoCos) that converts to equity on a dilutive basis when the (say, 120-day) moving average of the market value of equity relative to the market value of assets falls below some threshold. For example banks could be required to maintain a 10% book equity to asset ratio, and another 10% of assets financed by CoCos that convert to equity when the moving average of the market value of equity relative to the market value of assets falls below 10%. By a "dilutive basis" I mean that CoCos would convert into equity worth more than their face value at the moment of conversion. Crucially, dilution ensures that bank managers face strong incentives to replace lost equity in a timely manner, to avoid a dilutive conversion of a massive amount of CoCos.

This CoCos requirement would give bank CEOs a strong incentive to maintain the economic value of their equity capital at a sufficiently high level. Doing so would virtually preclude bank bailouts – no bailouts can occur if banks remain distant from the insolvency point. Maintaining a high ratio of market equity to assets also would substantially reduce the risk of a systemic banking crises (well-capitalized banks don't lose access to the short-term debt market). Indeed, bank CEOs would have an incentive to maintain a significant buffer of equity value in excess of the trigger ratio (10% in the above example), That buffer would voluntarily rise with the riskiness of banks' assets, resulting in a self-enforcing risk-based equity requirement based on credible self measurement of risk, in contrast to the current system of risk measurement gaming by banks.[2]

This proposed CoCos requirement would forestall any counterproductive regulatory "forebearance" because it would be unlawful for government regulators or legislators to prevent CoCos conversion at the expense of CoCos holders.

What's Wrong with Stress Tests?

In concert with reformed capital ratios, stress tests could be a promising means of encouraging bankers to think ahead – leading them to consider prospective risks that could cause sudden losses of value, and prodding them to increase as necessary their capital buffers and improve their risk management practices. As they are currently structured, however, stress tests are a Kafkaesque Kabuki drama in which

2 Under current arrangements that permit banks to measure their own risks for regulatory purposes banks have strong incentives to construct models that underestimate their risks. Calomiris (2009, 2011) discusses other policy actions that would reduce the gaming by banks of the measurement of risk, including the use of contractual interest rates for measuring loan risk and the reform of ratings provided by NRSROs that would create incentives for rating agencies not to underestimate risk. The latter proposal inspired a proposed amendment to Dodd-Frank, sponsored by Senator Barbara Boxer, which unfortunately was defeated.

regulators punish banks for failing to meet standards that are never stated (either in advance or after the fact). This makes stress tests a source of uncertainty rather than a helpful guide against unanticipated risks. Moreover, the mystery standards currently being applied by the Fed are probably not very meaningful. On balance, the regulatory risk from stress tests may be doing significant harm to bank values (Calomiris and Nissim 2014).

In addition to their economic costs and questionable contributions, current stress tests are also objectionable on grounds of basic adherence to the rule of law and respect for property rights. Regulators not only impose unstated quantitative standards for meeting certain stressed scenarios, they also retain the option of simply deciding that banks fail on the basis of a qualitative judgment unrelated even to their own model's criteria. It is hard to believe that the current structure of stress tests could occur in a country like the United States, which prizes the rule of law, the protection of property rights, and adherence to due process.

The penalties imposed as a consequence of failing a stress test are also objectionable. Failing a stress test does not just result in a bank's having to raise additional equity capital in the marketplace (which I believe would be the proper punishment for a bank's failing a well-designed stress test); regulators now control the dividend or repurchase decisions of SIFIs and limit their dividend payments based on the outcomes of the stress test. Of course, regulatory actions that limit dividends make sense for a capital impaired bank, but imposing such limits on a healthy bank that is in compliance with all its regulatory requirements is an inappropriate incursion into the decision making of the board of directors, and a dangerous source of damage to a bank's economic value. Banks must be able to operate their businesses flexibly and respond to market conditions in doing so. Dividend decisions are a fundamental aspect of corporate policy that should be left to the determination of the board of directors.

Finally, although the precise content of the Fed's stress testing framework remains unknown (and thus unaccountable) from what I have been able to gather I would describe it as a poor gauge of the risk of loss. A key problem is that regulators seem to suffer from "balance sheet fetishism" – scenarios' effects are measured primarily through their impact on the values of tangible assets, but as noted above, the loss of value in banks tends to often occur through lost intangibles, which the recent crisis showed are just as damaging to banks' health and their ability to continue to access markets.

Addressing these deficiencies has three parts: (1) making the stress tester (the Fed) accountable by requiring it to provide appropriate guidance about how the risk of value loss will be estimated and what the consequences will be of stress test failure, (2) using stress tests as an input into capital requirements and removing the stress tester from controlling dividend decisions of healthy banks, and (3)

improving stress tests so that they are more realistically focused on the true loss of economic value, by focusing on bank cash flows, divided by line of business, using detailed bank managerial accounts (which supervisors have but currently make little use of) rather than the current practice of gauging risks using aggregated and imprecise information from financial accounts. This can be accomplished without the Fed's having to provide its own detailed models of banks' cash flows under the various stressed scenarios, which it properly fears would encourage gaming of stress tests. To make stress tests more meaningful, the Fed should make use of banks' managerial accounting information, and present its stress tests models confidentially to a panel of financial experts and defend its conclusions. This will ensure that the guidelines issued by the Fed are both an accurate description of its models and substantively appropriate for gauging value loss of banks under stressed scenarios.

What's Wrong with Liquidity Requirements?

Liquidity requirements are another good idea that is being implemented poorly. After the recent crisis, the Fed and other countries' bank regulators came to the conclusion that it would be useful to establish liquidity standards alongside capital standards in order to mitigate bank liquidity risk. It is noteworthy that neither the Fed nor the Basel Committee has bothered to explain the economic framework that they believe justifies these new liquidity requirements. I think the reason they have avoided doing so is that the requirements are indefensible either on the basis of logic or empirical evidence. The regulations that have emerged (specifically, the two distinct liquidity requirements that are about to be imposed) are improperly designed in three fundamental respects (Calomiris, Heider and Hoerova 2015).

(1) The standards implicitly assume that liquidity risk is independent of insolvency risk, and thus structuring liquidity requirements independently of capital requirements. In fact, to my knowledge, there has never been a significant liquidity risk problem (the possibility of being unable to roll over one's debts) that did not result from an increase in insolvency risk. (2) The standards assume that liquidity regulation should focus on a complex measure of net liquidity risk (which attaches weights to different assets and liabilities and equates a dollar less of short-term debt with a dollar more of cash). That equivalence assumption has been discredited both in theory and in practice (Acharya, Almeida and Campello 2007, Calomiris 2012, Calomiris, Heider and Hoerova 2015); contrary to the Basel and Fed focus on net liquidity risk, banks that hold more cash and more uninsured debt in equal amount generally will suffer less liquidity risk than other banks. (3) The standards assume that the appropriate definition of liquid assets should be much broader than cash.

The Basel/Fed approach to liquidity regulation runs afoul of theories of liquidity requirements that emphasize the special role of bank reserves at the central bank, which results from (a) their riskless character, (b) the fact that their risk cannot be increased by the bank, and (c) the fact that they are observably held on a continuous basis (unlike book capital, which is based on questionable accounting). Those attributes permit reserves to play a unique role in reducing insolvency and liquidity risks by maintaining depositor confidence through the effects of reserves on incentivizing proper risk management by banks. That interpretation of the special role of cash reserves is also consistent with centuries of practice in many countries, where reserves in the central bank were required in proportion to bank debts.

I am not saying that there is only one correct theory of liquidity requirements. I am saying that the liquidity requirements being imposed on banks today are theoretically incoherent and deeply inconsistent with the history of liquidity requirements, as well as with other theoretical analysis and empirical evidence.

A better and much simpler approach – which is also consistent with economic theory and with centuries of practice around the world – would be to require banks (especially SIFIs) to maintain reserves at the Fed as a proportion of their total debt (say 25%) at the central bank. To avoid turning that prudential requirement into a tax, those reserves should bear interest at something like the Fed funds rate less 10 basis points. In essence, this would require banks to hold a significant proportion of their assets in riskless debt. Given that U.S. banks historically held cash assets (cash, reserves and Treasury securities) far in excess of 25%, this requirement would be conservative. It would also have little binding effect on banks today, given the huge excess reserve holdings maintained by banks at present.

It is worth noting that, although such a requirement would not be binding on large U.S. banks today, it would have been very binding on those banks, and other banks, in the years leading up to the recent crisis. Large weekly reporting U.S. banks held 25.8% of their assets in cash plus treasuries plus agency securities in January 1994. That percentage fell to 17.2% in 2001, and to 13.5% in 2008. The insolvency and liquidity risk of the banking system would have been substantially mitigated if banks had been forced to maintain a minimum of 25% of assets in remunerative cash reserves at the Fed in the years leading up to the crisis.

Limiting Real Estate Risk

If a combination of properly designed book equity capital requirements, CoCo requirements, stress testing and reserve requirements were applied to bank SIFIs, we would effectively eliminate the risk of failure by those SIFIs, and therefore, also effectively eliminate too-big-to-fail bailouts. As I

pointed out at the outset, however, that would not necessarily eliminate banking crises or costs to taxpayers from protecting banks. Small banks and Savings and Loans failed in droves during the 1980s, resulting in a disruptive and costly credit crunch and in hundreds of billions of dollars in bailout costs from deposit insurance protection.

The most important source of systemic risk for small banks – one that was visible both in the 1980s and in the 2000s – is excessive exposure to real estate lending. Real estate risks track the business cycle and thus tend to be highly correlated. Banks that suffer delinquencies on real estate loans tend to find it hard to liquidate those positions, owing both to the fact that they happen during general economic downturns, and to the fact that real estate assets are non-homogeneous and thus inherently harder to liquidate.

Depository institutions' large exposures to real estate risk are not inevitable or desirable as a matter of economics. The current high exposure of depository institutions to real estate risk does not reflect any natural link between real estate finance and deposit funding, but rather government policies that have subsidized risky real estate lending (including GSE, FHA, and FHLB credit subsidies), combined with policies that have encouraged depository institutions to play a leading role in real estate lending (such as CRA agreements to facilitate bank mergers, and providing federal deposit insurance to thrift institutions).

Prior to the 1930s, it was considered unwise to fund real estate assets with short-term depository debt.3 Building and loan associations and insurance companies were the primary funding sources for mortgages prior to the 1930s, and they relied on long-term debt and equity to fund mortgage investments (Fleitas, Fishback and Snowden 2015). National Banks historically were prohibited from any real estate lending (Calomiris and Carlson 2015). It was generally understood that real estate and short-term debt funding did not mix well, owing to the pressures on liquidating loans that short-term debt can entail and the high costs of liquidating real estate loans. Beginning in the 1930s, the federal government changed course and began to subsidize mortgage risks funded by short-term debt.

It is well known that the recent subprime banking crisis reflected the deep exposures of large depository institutions and GSEs to mortgage-backed securities. But the concentration of risk in lending was not just a big-bank problem. As the crisis wore on, other real estate loan exposures by all banks

3 The theoretical literature explaining why commercial banks would fund loans with short-term deposits (e.g., Calomiris and Kahn 1991) suggests that they would do so primarily for commercial and industrial loans, not mortgages or real estate development.

became an additional source of strain. As of January 2008, roughly three-quarters of the loan portfolios of banks other than the large weekly reporting banks were real estate loans of one kind or another. Even the large weekly reporting banks held real estate loans on their balance sheets equal to 32.6% of their total assets. That figure includes none of their MBS exposures, on and off their balance sheets.

The obvious answer to the systemic risk created by real estate exposures is to limit the percentage of each bank's lending to real estate. If we did so, real estate financing would migrate to REITs, insurance companies, and other sources of funds that are more natural providers of real estate finance. Banks would also become more focused on lending to small and medium-sized enterprises. The banking system likely would shrink a bit, but that should not be a cause of concern from a public policy perspective.

It also makes sense to eliminate existing FHA and GSE subsidies for mortgage risk in favor of other approaches to promoting affordable housing. Subsidizing affordable housing through mortgage risk subsidies is ineffective, destabilizing and potentially cruel, as we saw during the recent subprime debacle, in which many people favored by affordable housing policies were not able to keep their homes. A better approach, which I have been advocating for two decades, is for the federal government to provide means-tested downpayment matching for low-income first-time home buyers. This would reduce leverage, reward thrift, and make homes more affordable for the poor.

Conclusion

For SIFIs, I suggest regulatory reforms that combine a simple 10% book equity-to-assets minimum requirement (alongside a 15% book equity-to-risk-weighted assets requirement), a 10% CoCos issuance requirement with a market-informed conversion trigger (as described above), a 25% remunerative cash reserves-to-debt requirement, and a stress testing regime that is more transparent, disciplined and focused on bank cash flows. In addition, for all banks, I propose limits on the maximum proportion of real estate lending. The proposed reforms to the prudential regulation of SIFIs would work to virtually eliminate the too-big-to-fail problem. In concert with limits on real estate exposure for all depository institutions, these reforms would go a long way toward solving the broader problem of costly banking crises and government bailouts.

These proposed reforms would rely on the incentives of SIFI bankers to proactively raise capital and manage risk, and use the opinions of markets to gauge the adequacy of SIFI bank capital rather than flawed accounting rules and bank-concocted risk measures.

These reforms not only would stabilize the banking system and protect taxpayers, they would also reduce regulatory uncertainty, improve the performance of banks, and appropriately reward banks that are

better able to manage their risks. By reducing reliance on discretionary supervisory decisions when gauging the capital adequacy of SIFIs, we would avoid counterproductive forebearance and bank gaming of risk measurement, which now occur. For all those reasons, I believe that my proposed reforms would result in a more stable and efficient banking system.

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Visiting Associate Professor of Finance, Wharton School, August 1991-July 1992.

Assistant Professor of Economics, Northwestern University, September 1984-July 1991.

Visiting Assistant Professor of Economics, Stanford University, January 1989-June 1989.

OTHER PAST AND PRESENT AFFILIATIONS

President, International Atlantic Economic Society, 2014-2015.

Vice President, International Atlantic Economic Society, 2013-2014.

Member, Financial Reform Project, Pew Charitable Trusts, May-December, 2009.

Program Chair, Banking and the Economy, FDIC Center for Financial Research, May-Dec. 2008.

Center for Global Development Task Force on Access to Financial Services, 2008-2010.

Consultant, Banco Central do Brasil, January 2009.

Consultant, Comision Bancaria y de Valores, Mexico, May 1999-2000.

Consultant, Federal Reserve Bank of New York, July 1996-1999. Visiting Scholar, Federal Reserve Bank of New York, June 1995.

Consultant, Banco Central de la Republica Argentina, September 1996-1998.

Consultant, Banco Central de la Reserva, El Salvador, October 1996-1998.

Consultant, World Bank mission on Argentine financial sector, February 1998.

Consultant, Comparative Study of Term Finance, World Bank, 1995-May 1996.

Federation of American Scientists Committee on Systemic Risk, 1995-1996.

Consultant, World Bank mission on Mexican banking reform, November 1995.

Consultant, Federal Reserve Bank of St. Louis, May 1993-June 1995.

Consultant, Board of Governors, Federal Reserve, Research and Statistics, Nov 1993.

Consultant, Project to Evaluate Japan's Industrial Credit Programs, The World Bank, November 1991-February 1995.

Consultant, Federal Reserve Bank of Chicago, July 1989-July 1991;Visiting Economist, Federal Reserve Bank of Chicago, June 1988-December 1988.