



***Bank Capital: Lessons from the U.S.
Financial Crisis***

Eric S. Rosengren
President & Chief Executive Officer
Federal Reserve Bank of Boston

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The impact of the recent financial crisis has significantly changed the supervision and regulation of financial organizations.* Countries such as the U.K., Switzerland, and Sweden are not only planning on implementing the tougher Basel III capital standards, but are also considering whether they should require institutions to hold capital significantly *above* Basel III capital levels.

** Of course, I would like to note that the views I express today are my own, not necessarily those of my colleagues on the Federal Reserve's Board of Governors or the Federal Open Market Committee (the FOMC).*

In the United States, the financial crisis has caused reexamination of how we think about bank regulation, bank supervision, and financial stability. Bank regulation before the financial crisis had become focused on using risk weighting to determine appropriate regulatory levels of bank capital. However, the risk weights on certain assets did not perform as expected when mortgages with low risk weights became the epicenter of problems, when many securities that had high ratings and low capital charges fell dramatically in price, and when the originate-to-distribute (versus originate and hold) model¹ of lending was exposed as not distributing risk as widely as assumed.

Assets with high ratings received little supervisory attention, as risk-focused supervision focused on lower-quality assets. And off-balance-sheet exposures received insufficient supervisory scrutiny. Supervisors gained a false sense of comfort from models that aimed to look far out into the so-called tail of banks' potential loss distributions. But, these models failed to explicitly consider what would occur during times of severe macroeconomic stress.

Indeed it seems in hindsight that the very concept of financial stability was poorly understood before the financial crisis. Too little attention was devoted to the consequences of large institution failures, as the impact of such failures had not been fully considered in a way that adequately reflected a broader understanding of interconnected relationships. While liquidity had been receiving more attention at commercial banks, insufficient attention was given to the potential for runs on other financial institutions (for example broker-dealers) or products (such as money market mutual funds). Run risk was also badly underestimated in structured investment vehicles and asset-backed commercial paper (ABCP) conduits, which became difficult to finance during the crisis.

As a result of these important crisis lessons, dramatic changes have been made. The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (the DFA), in conjunction with Basel III capital standards, significantly increased the quantity and quality of capital expected to be held by banks. The introduction of stress tests, mandated by the DFA, increased attention on whether capital will be sufficient during stressful situations. While rules have not yet been finalized in the U.S., there will be additional capital charges for systemically important financial institutions. In addition, as required by the DFA, the largest banks have already submitted plans describing how they may be resolved should that be necessary.

Given the rapid changes occurring in supervision and regulation, some commenters have argued that the regulatory pendulum has already overcompensated, and that capital requirements are increasing too much and too fast. In particular, given the fragile state of the recovery that has occurred in most advanced economies, some argue that new capital requirements are overly conservative relative to historical experience and their imposition could stall the economic recovery.

Today, I will briefly examine the evidence for these arguments in the United States. I will first examine whether regulatory capital thresholds are too high, based on evidence from the financial crisis which will be more fully described in a forthcoming Federal Reserve Bank of Boston working paper. The results of that work will highlight that capital depletion during the financial crisis was extensive, and occurred relatively quickly, for many of the largest financial institutions in the United States – which is why it is critically important to examine whether large financial institutions are holding sufficient capital.

I will argue that the improvements in capital ratios that have occurred since the crisis are quite striking and have placed the U.S. economy in a better position to finance the recovery going forward. If, however, enhanced capital were the *only* regulatory response to the crisis, then our analysis would suggest that the size of the “SIFI surcharge” could be insufficient. But in conjunction with the SIFI surcharges, regulators have undertaken several other significant reforms – including liquidity standards, stress tests and resolution plans. Our results highlight the importance of taking this multi-pronged approach.

And contrary to arguments put forth by some commenters, our results suggest that even under the current multi-pronged approach, the current calibration of the SIFI surcharge does not appear excessive. Throughout I will argue that as we better understand systemically important financial institutions, we may want to better integrate lessons from stress testing and resolution procedures into capital requirements for the largest banks.

I. Capital Depletion at Systemically Important Institutions During the Financial Crisis

A paper that will soon be released by the Federal Reserve Bank of Boston uses a panel of large, systemically important banks to examine the magnitude of capital erosion that occurred during the financial crisis. The panel includes banks that failed, banks that were merged into other institutions, and banks that survived the crisis intact. The analysis uses a variety of adjustments to make the accounting measures of capital consistent across institutions – including removing sources of direct government capital support, adjusting for structural changes to the firm, and making accounting adjustments for firms that were not bank holding companies throughout the period.²

The paper examines how much Tier 1 common equity ratios deteriorated (the “capital erosion”) during each institution’s crisis period – defined as the period during the financial crisis when the institution suffered its largest capital erosion.³

The results are shown in Figure 1. Not surprisingly, those institutions with the largest capital erosion tended to be institutions that merged or failed during the crisis. These institutions tended to have a heavy exposure to residential real estate, like Washington Mutual and Countrywide, or tended to have a business model particularly susceptible to runs because of dependence on wholesale funding – such as the investment banks Lehman Brothers and Merrill Lynch. The loss of capital during this period is striking, and underscores how much capital can be depleted during an unusually severe financial crisis.

Figure 2 shows the erosion of Tier 1 common equity relative to buffers being used in the Basel III framework. During the stress test exercises associated with the Federal Reserve’s annual Comprehensive Capital Adequacy Review (CCAR) program we have required that bank capital exceed 5 percent Tier 1 common equity over the forecast horizon, based on the premise that such a buffer would be required for financial firms to fully operate and maintain investor and counterparty confidence during stressful periods. Basel III sets the minimum Tier 1 common equity plus the conservation buffer at 7 percent. Furthermore, under Basel III, systemically important financial institutions are expected to maintain additional buffers of 1 to 2.5 percentage points. This heightened standard provides capital buffers of 200 basis points, 300 basis points, and 450 basis points above the Tier 1 common equity benchmark used during the stress tests.

For the 26 large banks examined in the Boston Reserve Bank’s study, half had losses below the 200 basis point buffer. That is, given the losses experienced during the financial

crisis, which was quite severe, *half* of the largest banks – *if* they held at least 7 percent Tier 1 common equity – would have remained above the 5 percent Tier 1 common ratio during their period of most severe capital erosion during the crisis. On the other hand, this also highlights that for some banks, such a buffer would not have been sufficient.

Turning to those financial institutions with the largest capital erosion, eight of the 26 banks would have had losses that exceeded 450 basis points. Such losses would have exceeded the buffers provided by the currently proposed maximum "SIFI surcharge" (for systemically important financial institutions)⁴ and conservation buffer, and would have caused capital to fall below the 5 percent tier 1 common equity floor that has been used in the CCAR stress tests unless banks were holding capital above the regulatory required minimum. This highlights that while the capital buffers should provide significantly greater capital than was held prior to the crisis, the capital buffers do *not* seem excessive given the losses experienced during the financial crisis at some of our largest institutions.

While such results arguably substantiate the need for relatively large SIFI surcharges, high capital levels alone are not enough. Our results highlight the need for a multi-pronged approach that employs newly-developed supervisory tools – including stress tests, liquidity standards, and resolution plans – in conjunction with capital charges.

II. Improvements in the quality and quantity of capital

Figure 3 shows how dramatic the improvement in capital ratios has been at large U.S. financial institutions. For example, the Tier 1 common capital ratio aggregated across 15 large U.S. banking organizations fell to close to 5 percent in late 2008.⁵ However, during the economic recovery these institutions have significantly improved their Tier 1 common capital

ratio, to above 10 percent. The broader definitions of capital show similar strong improvement relative to pre-crisis norms.

In addition, Figure 4 highlights that the quality of capital has also significantly improved. Tier 1 common capital accounts for a larger share of total risk-based capital, as shown in the top chart. Tangible common equity, a narrow definition of capital shown in the bottom chart, has improved significantly since the fourth quarter of 2008. While total capital has improved, the particularly large increase in narrowly defined tangible capital highlights a significant improvement in loss absorption capacity.

Relative to the 7 percent minimum for Tier 1 common equity plus the capital conservation buffer, banks that are reporting pro forma Basel III capital ratios for the end of 2012 have already reached this minimum standard, as seen in Figure 5.⁶ Furthermore, many of these large banks are now holding more than 8 percent Tier 1 common equity on a pro forma basis.

Figure 6 compares the pro forma Basel III Tier 1 common equity standard relative to the Tier 1 common equity under Basel I. It shows that the Basel III standard results in a much lower – and thus more stringent – capital ratio than the Basel I standard, although the difference can vary greatly depending on the business activities of the financial institution and the quality of assets held. Overall, for those banks disclosing pro forma Basel III capital ratios, the difference between the Basel III pro forma Tier 1 common equity ratio and the Basel I Tier 1 common equity ratio averages more than 2 percent. It is encouraging that many large U.S. financial institutions have already reached the minimum Basel III Tier 1 common equity standard – which is more restrictive than under Basel I, and is set at higher thresholds.

III. Capital and Other Regulatory Tools

In the United States the new supervisory tools being employed are far more extensive than just raising minimum capital standards. In conjunction with the SIFI surcharges, regulators have undertaken several other significant reforms – including liquidity standards, stress tests and resolution plans. Examining capital under stress situations, improved liquidity standards, and resolution plans (the so-called “living wills”) are some of the more important innovations that complement the higher capital standards.

Our results highlight the importance of taking this multi-pronged approach. None of these tools were used before the crisis, and they are likely to be increasingly important tools as regulators and financial institutions gain more experience with them. Thus any historical examination of capital erosion may not fully reflect the many changes that have occurred at financial institutions and in supervision and regulation in recent years.

It is also worthwhile considering how the various new supervisory tools could be combined for enhanced impact. For example, one possibility is to make the trade-off between higher capital and the ability to easily resolve large institutions more explicit. One reason for imposing a SIFI surcharge is that large, complicated banks are likely to cause problems that spill over throughout the financial system (and by extension the economy) if they need to be resolved. Smaller banks are usually resolved over a weekend, with most of the assets and liabilities transferred to an acquiring bank. However, such a process is not always feasible for large institutions – as we saw in the case of Lehman Brothers. The failure of Lehman Brothers disrupted other financial intermediaries, seriously impaired functioning of a number of markets, precipitated runs on other financial intermediaries, and highlighted the need for better resolution of large institutions.⁷ To address this risk, difficult-to-resolve large

institutions could receive a higher SIFI surcharge than those large institutions that are more easily resolvable.⁸ Such an approach would both encourage large firms to enhance their resolvability and would further reduce the probability of failure for remaining difficult-to-resolve institutions.

Thus, the cost to society of disruptive failures of systemically important institutions warrants that these institutions hold more capital – and indeed the Basel III accord is already imposing capital surcharges for large and difficult-to-resolve institutions. At this point the resolution process is new and untried. However, presumably SIFI surcharges should reflect in part how successful resolution plans are likely to be.

Contrary to arguments put forth by some commenters, our results suggest that even under the current multi-pronged approach, the current calibration of the SIFI surcharge does not appear excessive. Given the losses in excess of 450 basis points at a number of large institutions during the last financial crisis, minimum standards for large institutions may be too low.

Concluding Observations

The changes to supervision and regulation since the financial crisis have been extensive. Many of those changes are not yet fully implemented, and many of the regulatory tools remain untried during times of stress. Nonetheless, U.S. financial institutions are now well placed to finance the economic recovery, as many of the institutions have already recapitalized.

Despite the dramatic improvement in bank capital positions, examination of capital erosion during the financial crisis highlights *how large and quick* the capital erosion was at

some of the largest financial institutions. While the SIFI surcharges have the potential for providing even more of a capital buffer for the largest institutions, it will be critically important to determine how other tools such as stress tests, tougher liquidity requirements, and resolution plans supplement the higher and more stringent capital standards.

The high levels of government support during the financial crisis were problematic. Government authorities don't want to be in a position of having to provide support again, and in fact, might not be able to so. And it is certainly in the industry's best interest not to need government support. That makes the enactment of effective capital regimes all the more important.

Thank you.

¹ For a discussion of originate-to-distribute see Board and Santos of the New York Fed at <http://www.newyorkfed.org/research/epr/12v18n2/1207bord.pdf>

² Generally speaking, the study took starting capital ratio levels which were adjusted to reflect Basel III estimates and measured the impact to capital during the financial institution's crisis period resulting from net losses and changes in major regulatory capital accounts, including: goodwill, deferred tax assets, gains/losses resulting from own credit risk, and changes in the value of "available for sale" securities.

³ Note that these crisis periods may differ across institutions given differences in business activities and accounting treatment of losses.

⁴ For background see: http://www.financialstabilityboard.org/publications/r_111104bb.pdf, notably "iii) Requirements for banks determined to be globally systemically important to have additional loss absorption capacity tailored to the impact of their default, rising from 1% to 2.5% of risk-weighted assets (with an empty bucket of 3.5% to discourage further systeminess), to be met with common equity;..."

⁵ Four measures of capital are referenced in Figures 3 and 4, total risk-based capital, Tier 1 risk-based capital, Tier 1 common capital, and tangible common equity:

Total risk-based capital includes core capital elements (Tier 1 capital) plus supplementary capital elements (Tier 2 capital).

Tier 1 risk-based capital is defined in the Capital Adequacy Guidelines for Bank Holding Companies: Risk-Based Measures (12 CFR part 225, Appendix A) as the sum of core capital elements less any amounts of goodwill, other intangible assets, interest-only strips receivables, deferred tax assets, nonfinancial equity investments, and other items that are required to be deducted in accordance with section II.B. of this appendix. Tier 1 capital must represent at least 50 percent of qualifying total capital." The specific elements included in Tier 1 capital and their various limits, restrictions, and deductions are discussed in detail in 12 CFR part 225, Appendix A.

Tier 2 capital includes supplementary items such as qualifying subordinated debt and a portion of the allowance for loan and lease losses. See 12 CFR part 225, Appendix A for a full discussion of the items included in Tier 2 capital and the associated limits, restrictions and deductions.

Tier 1 common capital as defined for the Supervisory Capital Assessment Program is the portion of Tier 1 capital that is common equity, or Tier 1 capital less perpetual preferred stock, minority interests and trust preferred securities that qualified as Tier 1 capital.

Tangible common equity is defined as total equity capital less perpetual preferred stock and related surplus (net of related treasury stock), goodwill and other intangible assets.

Four capital ratios are also calculated. The denominator for three ratios -- the Tier 1 risk-based capital ratio, the total risk-based capital ratio and the Tier 1 common capital ratio -- is risk-weighted assets. The denominator for the tangible common equity ratio is tangible assets, defined as total assets less goodwill and other intangible assets.

⁶ The Basel III Tier 1 common capital ratios are estimates provided by the banking organizations in their recent earnings press releases. They are based on Notices of Proposed Rulemaking (NPRs) released in June 2012. As these are subject to interpretation, the ratios may not be directly comparable until the rules are finalized.

⁷ Additionally, during the crisis a few large banks did acquire other challenged, large financial institutions which likely mitigated some systemic risk. However, given the recognition that banks have grown extremely large and increasingly complex, it is less likely that future acquisitions will be as forthcoming.

⁸ Admittedly, implementation challenges remain in this matter.