"Prudential Stress Testing in Theory and Practice:
Comments on 'Stressed Out: Macroprudential Principles for Stress Testing'"

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I am pleased to have this opportunity to be with you today to discuss stress testing. In the wake of the housing bust and subsequent financial turmoil, the regulation and supervision of financial institutions and markets has been the subject of intense scrutiny. The 2009 U.S. stress tests appeared to play a critical role in the resolution of the crisis, which has led to recommendations that such tests, with appropriate refinements, be made a routine component of the supervisory regime for large financial institutions. Indeed, as the authors note, the Dodd-Frank Act mandates annual stress tests for bank holding companies and nonbank financial firms supervised by the Federal Reserve. Analysis of the motivation for and design of supervisory stress tests is therefore well worthwhile.

In this paper the authors draw a sharp distinction between microprudential and macroprudential approaches to regulation, and they use this distinction as the main lens through which they assess the current conduct of stress tests. They distinguish between the different theoretical motivations for microprudential and macroprudential regulation, and contrast what they view as distinct practices associated with the two approaches. They go on to sketch out a method of evaluating the overall strength of a banking system based on correlations between equity prices and CDS spreads. On the basis of their analysis, they argue that the stress tests conducted in the U.S. in 2009 and Europe in 2010 have brought about insufficient improvements in financial conditions. And they conclude with a set of recommendations for regulators as to how their stress tests should be improved.

The Distinction Between Microprudential and Macroprudential Regulation in Theory

I will begin with their discussion of the motivation for prudential regulation and what that implies about stress tests. Microprudential regulation, according to the authors, aims to offset the moral hazard distortions associated with deposit insurance, in which case the purpose of stress tests is to ensure that bank capital buffers are large enough to keep incentives well aligned. In contrast, macroprudential regulation aims to "control the social costs associated with excessive balance-sheet shrinkage on the part of multiple financial institutions hit with a common shock." The authors cite the burgeoning theoretical literature on fire sales, margin spirals and other financial market spillovers, where the flaws inherent in modern financial markets also distort financial institution decisions, beyond distortions due to government guarantees.

I want to make two comments here. First, the formal economic modeling of financial fragility is still in its infancy, and in my view models of financial market spillovers do not yet provide a persuasive foundation for policy making. What we have so far is a collection of "possibility theorems" showing that under a particular collection of assumptions the prices and quantities of some financial instruments could fall dramatically. Of course, since the fundamentals are unobserved, there is usually an alternative theory with

equivalent price and quantity predictions under which observed arrangements are reasonably efficient. One strategy for distinguishing between alternative theories is to assess the plausibility of shifts in fundamentals large enough to rationalize observed price changes. To my knowledge, such head-to-head contests between alternative theories of financial strains are relatively rare.

Another strategy for distinguishing between alternative theories of financial fragility is to compare a broad range of *qualitative* model characteristics against real world observations. Models of financial market spillovers generally rely on frictions that lead to some form of market segmentation and "cash-in-the-market pricing" under which assets can sell for less than their fundamental value. I have a hard time reconciling the apparent fluidity of modern financial markets with the notion that market segmentation is pervasive enough to warrant frequent and widespread interventions. Indeed, one stylized fact about this crisis is that from mid-2007 onward a substantial amount of investable wealth was reported to be "on the sidelines" awaiting more attractive asset prices.

I get the sense, though, that the popularity of policy prescriptions derived from models of financial spillovers owes less to hardnosed evaluation of microeconomic foundations, than to the attraction of a popular class of narratives about the crisis we've just been through.[1] In these accounts, regulators did not fully appreciate the extent to which (under regulated) financial markets are inherently prone to excessive risk-taking, and did not have the full set of tools to cope with the resulting financial fragilities. These accounts imply, consistent with our authors' recommendations that stress tests ought to focus on mitigating the distortionary effects of the spillovers that run rampant in financial markets.

An alternative narrative that I find more compelling builds on the moral hazard associated with explicit government guarantees and the time consistency dilemma associated with ambiguous implicit guarantees.[2] This narrative acknowledges the potential fragility associated with maturity transformation, both inside and outside of the banking sector, but emphasizes the extent to which such fragility is a matter of choice by financial intermediaries, particularly the extent to which inefficient runs can be prevented through partial suspension provisions or avoided altogether through longer-term funding. Constructive ambiguity biases policy towards rescues and dampens creditors' incentives to avoid vulnerability. Maturity transformation proliferates and the implicit safety net expands.[3]

This alternative narrative illuminates the critical role of the 2009 U.S. stress tests – the so-called Supervisory Capital Assessment Program (SCAP). By the time the Capital Assistance Program was announced on February 23, 2009, several large banks already had received equity-diluting government capital injections as part of the Troubled Asset Relief Program. Rumors circulated that the administration was considering the outright nationalization of many large financial institutions. The acceleration in the economic contraction in the fourth quarter of 2008 implied a broad deterioration in the outlook for business and consumer lending portfolios. Financial statements were an inadequate guide to the magnitude of future losses, however, because Securities and Exchange Commission (SEC) regulations prevented reserving for expected future loan losses more than four quarters ahead, even if they were reasonably forecastable. So uncertainty about future loan losses and government rescue policy, combined with limitations in financial reporting, made new equity issuance nearly impossible.

In this context, the SCAP tests served two critical purposes. First, the test results provided more reliable estimates of current and potential future capital positions than would otherwise have been available to investors. By projecting losses over a three-year horizon, instead of being limited to a one-year horizon under SEC reporting rules, it provided more complete estimates of current equity.[4] Projections also were validated collectively by supervisory teams to assure consistency across participating financial firms and provide investors with credibly verified reports.

Second, and perhaps most importantly, the Program provided a clear statement of the government's intentions for capital injections. If additional capital was required, and institutions could not raise enough new equity privately, the government would provide a buffer in the form of mandatory convertible preferred shares. If the hole could be filled with private equity, further dilution by government capital injections would be unlikely barring a much more adverse scenario. The U.S. stress tests therefore clarified the intended boundaries around future government interventions.

That clarity came at the cost, however, of establishing precedents that expanded the implicit government safety net for financial firms. According to a recent estimate by Richmond Fed staff, 40 percent of bank and savings institution liabilities were explicitly guaranteed at the end of 2009, while an additional 45 percent could reasonably be viewed, on the basis of official actions and statements, as implicitly guaranteed.[5] Back in 1999, only 13 percent of bank and savings institution liabilities were implicitly guaranteed by this criterion, while 50 percent were explicitly guaranteed.[6] Overall, government guarantees thus expanded from 63 percent of banking liabilities to 85 percent.

The Distinction Between Microprudential and Macroprudential Regulation in Practice

I have been discussing the *theoretical* distinctions between macroprudential and microprudential approaches to stress tests. I would also like to comment on the *practical* distinctions the authors draw between macroprudential and microprudential approaches to stress tests. Here, I think the authors overstate the differences.

The authors emphasize the goal of ensuring that the banking system has sufficient capacity to continue lending. On that basis they argue that evaluating bank solvency based on capital *ratios* rather than the *dollar value* of capital allows banks to remedy capital deficiencies by reducing lending, potentially exacerbating the effect of banking system deleveraging on credit supply. "Supervisors should mandate," the authors state, "dollar amounts for capital additions rather than focusing on restoration of capital ratios." This is what we actually did. Financial firms participating in the SCAP were asked to estimate expected losses on their year-end 2008 portfolios under the two macroeconomic scenarios and compare them to current capital, plus current allowance for loan and lease losses plus resources available from pre-provision net revenue over the two-year horizon. Firms generally were *not* allowed to meet their capital need by planning to shrink their balance sheets.

I also think the authors are a bit off-base in criticizing current stress tests for neglecting wholesale funding. It's true that runs by short-term creditors would pose risks to financial institutions. But the central premise of the Capital Assistance Program was that participating banks would receive government funds to ensure they remained amply capitalized. That implied a commitment to support those firms' deposit and non-deposit liabilities – in essence, to do "whatever it takes" in the event of a run. SCAP was designed to reduce uncertainty about how much government capital was needed to prevent runs. To the extent that broad banking system support by Europeans governments was a presumption at the end of 2009, I think the same argument applies to their stress tests as well.

Title II of the Dodd-Frank Act is aimed at altering the presumption of full government support for the liabilities of large financial institutions. The failure of a large "systemically important" institution is to be handled under the Federal Deposit Insurance Corporation's Orderly Liquidation Authority. The FDIC can borrow from the U.S. Treasury to fund the continued operations of the seized institution, but creditors are to receive no more than they would under a straight liquidation. The FDIC has the authority, however, to make exceptions to that requirement. Retaining broad discretion to rescue creditors would perpetuate the "constructive ambiguity" that led to the dramatic expansion of the government safety net in recent decades. So it is not clear whether the presumption of full creditors support is behind us.

I have not yet commented on the empirical work that the authors use to support their hypothesis that the stress tests have not significantly improved financial market conditions. The authors recognize that news about shocks that are common across financial institutions, including changes in expectations regarding government rescue policy, could swamp the idiosyncratic news about individual institutions, in which case correlations among equity prices and CDS spreads are all positive and one cannot distinguish between their different cases. Because risk exposures have been so similar across large institutions, it seems quite plausible to me that a large portion of the variation in their equity prices and CDS spreads reflect common shocks, including common movements in expectations about government support.

One prominent thread in the authors' discussion is the importance of ensuring that healthy banks are capable of rescuing problem banks in a crisis. But U.S. banking institutions raised substantial amounts of equity in public markets or through direct placements between the beginning of the crisis in 2007 and the fall of 2008 when events raised uncertainty about government dilution and made such investments problematic.[7] My sense is that outside equity deserves supervisors' attention as well.

Conclusion

So while I applaud the authors' attention to the theory and practice of supervisory stress tests, I part company regarding the distinction between macroprudential and microprudential perspectives. Most of their practical recommendations for the actual conduct of stress tests strike me as useful, but I think of them as "prudential stress tests done right" rather than as a sharp break from past practice.

I would like to close with some general comments on the use of stress tests. As I have said, they have proven their usefulness in the crisis. Quantifying the risks at large financial institutions is a complex and costly process that is vulnerable to manipulation. A disciplined and well-organized supervisory process for validating those assessments strikes me as well worth the costs. Stress tests are not a panacea, however. In a sense they are only as good as the imagination of the scenario designers, who need to resist the temptation to dismiss extreme scenarios as too far-fetched or focus too much attention on preparing for the last war.

One critical question about stress tests is whether or not to disclose the results, and if so, at what level of detail. A good case can be made for transparency; stress tests provide quantitative assessments that are forward-looking, independently certified and methodologically comparable across institutions. On the other hand, there can be good reasons to restrict the release of bank-specific supervisory information.[8] As is often the case in financial regulation, the answer is not as obvious as it might seem.

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[1] Vincent Reinhart, "A Year of Living Dangerously: The Management of the Financial Crisis in 2008," *Journal of Economic Perspectives,* Winter 2011, vol. 25, no. 1, pp. 71-90.

[2] See Jeffrey M. Lacker, "Reflections on Economics, Policy and the Financial Crisis," Speech to the Kentucky Economic Association, Frankfort, Ky., September 24, 2010.

[3] Marvin Goodfriend and Jeffrey M. Lacker, "Limited Commitment and Central Bank Lending," *Federal Reserve Bank of Richmond Economic Quarterly*, Fall 1999, vol. 85, no. 4, pp. 1-27.

[4] The Supervisory Capital Assessment Program projected losses and capital over a two year horizon, through the end of 2010. Because the capital position at the end of 2010 reflected loan loss reserves at that time, expected losses for 2011 were required as well. See Board of Governors of the Federal Reserve System, "Supervisory Capital Assessment Program: Design and Implementation," April 24, 2009.

[5] John R. Walter and Nadezhda Malysheva, "How Large Has the Federal Financial Safety Net Become?" Federal Reserve Bank of Richmond *Working Paper* No. 2010-03, March 2010.

[6] John R. Walter and John A. Weinberg, "How Large is the Federal Financial Safety Net?" *Cato Journal*, Winter 2002, vol. 21, no. 3, pp. 369-99.

[7] Viral V. Acharya, Irvind Gujral, and Hyun Song Shin, "Dividends and bank Capital in the Financial Crisis of 2007-2009," March 2009.
[8] Edward Simpson Prescott, "Should Bank Supervisors Disclose Information About Their Banks?" *Federal Reserve Bank of Richmond Economic Quarterly*, Winter 2008, vol. 94, no. 1, pp. 1-16.