

Daniel K Tarullo: Developing tools for dynamic capital supervision

Speech by Mr Daniel K Tarullo, Member of the Board of Governors of the Federal Reserve System, at the Federal Reserve Bank of Chicago Annual Risk Conference, Chicago, Illinois (via videoconference), 10 April 2012.

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The importance of robust capital requirements for financial stability and the serious shortcomings of the pre-crisis capital regulatory regime have been well documented. In the last few years, domestic and international initiatives have strengthened standards for the quantity and quality of capital held by banking organizations. Implementation of these new standards should significantly increase the safety and soundness of the financial system.

But there are at least four reasons why simple compliance with the stricter standards will not achieve this goal. First, as has long been recognized, a capital ratio – even a much higher one – is essentially a snapshot of a bank’s balance sheet and, thus, often a lagging indicator of the bank’s actual condition. Second, the ability of a bank to remain a viable financial intermediary in times of stress depends not only on the losses likely to affect the value of current assets, but also the impact on revenues and, thus, the capacity to replenish capital during the stress period. Third, if capital requirements are set solely with reference to more ordinary economic circumstances, they will not capture the potential impact of a shock to the value of widely held assets to the financial system as a whole. Fourth, the capacity of both bank management and regulators to understand a firm’s capital position depends on its having good information and quantitative risk-management systems.

Thus, stronger capital standards must be complemented with supervisory tools that incorporate dynamic, macroprudential elements. Two important such tools that have been adopted by the Federal Reserve since the onset of the financial crisis are stress testing and firm-specific capital planning. Since we have just completed a second annual exercise using both supervisory tools, I thought this risk conference would be a good occasion for reviewing the rationale and features of these tools, describing the recent results, and identifying some issues we will be considering as we continue to develop these tools in the future.

Tools for dynamic capital supervision

The potential utility of comprehensive stress testing had been much discussed among academics, analysts, and regulators in the years preceding the financial crisis, but it was only during the crisis that this tool was used across large firms at the same time. In February 2009, the federal banking agencies – led by the Federal Reserve – created a stress test and required the nation’s 19 largest bank holding companies to apply it as part of our Supervisory Capital Assessment Program (SCAP). The test involved two scenarios – one based on the consensus forecast of professional forecasters, and the other based on a severe, but plausible, economic situation – with specified macroeconomic variables such as GDP growth, employment, and house prices. Each participating institution was asked to supply, in a standardized format, detailed information on portfolio risk factors and revenue drivers that supervisors could use to estimate losses and revenues over a two-year period. These data allowed supervisors to make consistent estimates across all 19 firms.

The immediate motivation for the 2009 stress test was to determine how much additional capital a bank holding company would need to ensure that it would remain a viable financial intermediary even in the adverse scenario. The Treasury Department stood ready to provide capital to any bank that could not raise the required amount from private sources. But the Federal Reserve’s decision to disclose the results of the test on a firm-specific basis served a second purpose – to provide investors, and markets more generally, with information that would help them form their own judgments on the condition of U.S. banking institutions. This

decision proved to be an important step in establishing market and public confidence that the U.S. financial system would weather the crisis.

Though conceived and developed in the midst of the financial crisis, SCAP will be remembered as a watershed for supervisory policies applicable to large institutions. Congress drew on the lessons of the 2009 exercise by including a requirement for stress testing in the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act). But well before Congress passed the Dodd-Frank Act, the SCAP experience had already profoundly affected attitudes toward supervision within the Federal Reserve. It demonstrated in practice, not just in theory, the value of a simultaneous, forward-looking projection of potential losses and revenue effects based on each bank's own portfolio and circumstances. The forward-looking feature overcame the limitations of static capital ratios. The simultaneity, along with stress test features such as an assumed instantaneous market shock, introduced a critical macroprudential dimension that offered insights into the condition of the entire financial system, including whether banks were sufficiently resilient to continue to provide their critical intermediation functions even under such adverse conditions.

Regular and rigorous stress testing thus provides regulators with knowledge that can be applied to both microprudential and macroprudential supervision efforts. Disclosure of the methodology and firm-specific results of our stress testing has additional regulatory benefits. First, the release of details about assumptions, methods, and conclusions exposes the supervisory approach to greater outside scrutiny and discussion. Such discussions will almost surely help us improve our assumptions and methodology over time. Second, because bank portfolios are difficult to value without a great deal of detailed information, the test results should be very useful to investors in and counterparties of the largest institutions. The market discipline promoted by means such as resolution mechanisms will be most effective if market participants have adequate information with which to make informed judgments about the banks.

But stress testing is no more a panacea for the supervision of large financial institutions than capital requirements themselves, or any other regulatory device. By design, the stress tests to date have not covered other sources of stress, such as funding and interest rate risks, which are the subjects of other supervisory exercises. But just as strengthened capital requirements remain at the center of a better financial regulatory system, so stress testing is now recognized as a critical, forward-looking tool for ensuring that minimum capital requirements can be maintained. Indeed, stress testing has already come to epitomize the horizontal, interdisciplinary approach to supervising our largest bank holding companies that the Federal Reserve System has instituted over the past few years.

Firm-specific capital planning has also become an important supervisory tool. In November 2011, the Federal Reserve issued a new regulation requiring large banking organizations to submit an annual capital plan.¹ This tool serves multiple purposes. First, it provides a regular, structured, and comparative way to promote and assess the capacity of large bank holding companies to understand and manage their capital positions, with particular emphasis on risk-measurement practices. Second, it provides supervisors with an opportunity to evaluate any capital distribution plans against the backdrop of the firm's overall capital position, a matter of considerable importance given the significant distributions that some firms made in 2007 even as the financial crisis gathered momentum. Third, at least for the next few years, it will provide a regular assessment of whether large holding companies will readily and comfortably meet the new capital requirements related to various Basel agreements as they take effect in the United States.

¹ Board of Governors of the Federal Reserve System (2011), "Federal Reserve Board Issues Final Rule on Annual Capital Plans, Launches 2012 Review", press release, November 22, www.federalreserve.gov/newsevents/press/bcreg/20111122a.htm.

A stress test is a critical part of the annual capital review. But, as these different purposes indicate, the capital review is about more than using a stress test to determine whether a firm's capital distribution plans are consistent with remaining a viable financial intermediary even in an adverse scenario. As indicated during our capital reviews in both 2011 and 2012, the Federal Reserve may object to a capital plan because of significant deficiencies in the capital planning process, as well as because one or more relevant capital ratios would fall below required levels under the assumptions of stress and planned capital distributions. Likewise, the stress test is relevant not only for its role in the capital planning process. As noted earlier, it also serves other important purposes, not least of which is increased transparency of both bank holding company balance sheets and the supervisory process of the Federal Reserve.

Results of the 2012 stress test and capital review

The stress test that the Federal Reserve developed in the fall of 2011 and administered over the succeeding months was based on a quite adverse scenario. It hypothesized a deep recession in the United States, with GDP contracting sharply, unemployment reaching a peak of more than 13 percent, equity prices falling by half, and house prices declining by an additional 20 percent from their 2011 levels. In addition, given the potential for financial stress in Europe, the scenario included a global recession and a global financial market shock. The latter, applied to the trading, derivatives, and private equity positions of the six firms with the highest volumes of trading, included a dramatic widening of credit default spreads for both European sovereigns and financial institutions, as well as sharp increases in spreads for European sovereign bonds.

When we announced the scenario in November, a number of observers questioned whether a scenario of this severity was realistic. In this regard, it is important to reemphasize that the stress scenario is not a forecast of what will happen. It reflects, instead, an unlikely but not implausible outcome in which the U.S. economy experiences a serious recession simultaneously with a significant contraction of global economic activity and a global financial shock. Thus, the assumed increase in unemployment is similar to that experienced in the three deep post-World War II recessions. It is because current unemployment stands so much higher today than it did at the outset of those recessions that it is assumed to rise to a postwar high.

More fundamentally, the severity of the recession reflects two considerations. First, as I have already suggested, a core rationale for stress testing is the macroprudential goal of ensuring that the nation's financial system could continue to operate even in the face of severely adverse developments. It is precisely an outcome fairly far out on the tail at which a stress test should be directed. A more probable scenario, with a milder downturn, would not serve that purpose. Second, presumably reflecting this logic, the Dodd-Frank Act requires that we include a "severely adverse" scenario. Accordingly, as we fully implement the Dodd-Frank requirement beginning next year, this level of severity will in any case be required by law.

As one might expect from the severity of the adverse scenario, the losses projected by our models for the 19 firms were quite high. Total losses amounted to about \$650 billion, of which \$535 billion was due directly to declines in balance sheet asset values. The remaining \$115 billion was accounted for by additional items run directly through net revenue estimates, such as expenses from mortgage putbacks. The portfolio losses would be very high by historical standards. For example, the \$340 billion in loan losses included in the total loss figure translates into a loss rate of about 7.2 percent, which compares to about a 5.4 percent loss rate in the peak eight quarters of losses during the financial crisis and is a higher rate than has been experienced at any point in the last century except during the Great Depression. Similarly, pre-provision net revenue was projected to be equal to only about 2.5 percent of average assets, an historically low rate that compares to about

3.5 percent during the nine-quarter period from the fourth quarter of 2007 through the fourth quarter of 2009 that spanned the financial crisis.

Notwithstanding the stringency of the stress test, only four of the nineteen firms fell below the 5 percent Tier 1 common ratio standard, or one of the other applicable ratios, even assuming that all proposed capital actions went forward during the stress period. In passing, I might observe that we would expect that firms would, in fact, pare their distributions in the face of a severely deteriorating operating environment, but the fact that some firms failed to do so in 2007 and 2008 has led our supervisors to make the conservative assumption that distributions would continue. If proposed future capital distributions are not assumed – that is, if the approach in the 2009 SCAP is taken – only one firm falls below the required post-stress minimum capital ratios.

Indeed, a comparison with the original 2009 stress test shows the degree to which the 19 firms have improved their capital positions. The actual aggregate Tier 1 common ratio of the 19 firms at the end of the third quarter of 2011 (the beginning of the stress period) was about 10.1 percent, nearly double the 5.3 percent aggregate ratio for the firms at the end of 2008 (the start of the stress period for SCAP). Moreover, at 6.3 percent, the *post-stress* aggregate ratio under the 2012 test would be higher than that *actual* aggregate capital ratio at the end of 2008, even assuming all proposed capital actions go forward during the stress period.

As to qualitative conclusions from this year's Comprehensive Capital Analysis and Review (CCAR), most of the 19 bank holding companies have made considerable progress in their internal capital planning processes. However, there appears to be room for improvement at virtually every firm, and at some firms the amount of work needed is still significant.² This will remain a major focus of supervisory efforts, in next year's capital review, and more generally.

The 2012 experience in retrospect

The 2012 exercise extended our supervisory emphasis on forward-looking, data-driven, horizontal assessments of the largest bank holding companies. It built upon, and incorporated, lessons learned from prior exercises. But these supervisory tools are still relatively new. Just as capital planning and internal stress testing capacities could be improved at every firm, so we intend to consider both substantive and procedural improvements in our use of these tools. To this end, over the coming months we will be consulting extensively with academics, other analysts, and the banks themselves.

Substantively, the Federal Reserve will be focusing on potential refinements to supervisory models, such as modifying them to use more granular data. We will continue to pay considerable attention to model validation. Among other things, we are forming an advisory group of academics and other experts to advise our internal model-validation team on an ongoing basis. Then, later in the year, we intend to convene a modeling symposium to bring a broader array of voices into the discussion.

We are, of course, mindful of the statements by some of the 19 participating bank holding companies that certain loss rates produced by the Federal Reserve's model for the 2012 stress test significantly exceeded their own estimates. We may gain greater insight into the source of these differences as we proceed with the review of our modeling. However, our experience during the stress test has already suggested some possible reasons. First, not surprisingly, the supervisory perspective on stress test modeling tends to be somewhat more conservatively inclined than that of the firms. Second, Federal Reserve modeling generally avoids the assumption that loss experience during a period of high stress can be

² The full 2012 report, including methodology and results, is available at www.federalreserve.gov/newsevents/press/bcreg/bcreg20120313a1.pdf.

extrapolated from experience in more normal times, whereas at least some firm modeling uses roll rates and other such extrapolations that may not be as useful for measuring losses in tail events. A third, and related point, is that for some loan types the Federal Reserve model incorporates nonlinear effects of the macroeconomic scenario. For example, a 20 percent decline in national house prices would mean that prices would decline substantially more in some markets and less in others, and losses in areas where house prices decline more would be disproportionately greater than losses in areas where house prices decline by less. The result would be higher overall losses than if prices had declined by a uniform 20 percent everywhere. Fourth, supervisors had the advantage of seeing the modeling practices of all 19 of the firms and were able in some instances to identify outliers in terms of assumptions and practices.

Our disclosures – both of our methodology and of the results – seem to have struck about the right balance between providing useful information to investors, counterparties, and the public, on the one hand, and protecting proprietary information whose release might result in competitive harm to firms, on the other. However, as with all aspects of the stress test and CCAR, we welcome any suggestions for improvement here as well.

As to procedure, we have already decided on several changes for next year. First, the timing of the CCAR will change, so that the decisions on objection or non-objection will apply to capital actions beginning in the second quarter of 2013. That is a shift from the first two CCARs, in which the supervisory responses covered first quarter capital plans, but those responses were not delivered until late in that quarter. Second, now that the regulatory reporting mechanisms for data collection are in place, we will be able to begin the analysis earlier, thereby providing more time to both firms and supervisors to run the stress tests. Incidentally, because these reports will be filed quarterly, our supervisors will be able to monitor more effectively how firms are performing relative to their projected baselines. This, in turn, will enable us to require resubmissions of capital plans in a more timely way, should conditions change materially at an individual firm or more broadly in the industry.

One issue that we will be considering at some length is the nature of communications between supervisors and firms during the duration of the stress test and CCAR. Some of the practical concerns about communication can be fairly easily addressed, such as by continuing to improve the timeliness of answering technical questions and generally having more coordinated communication with the firms throughout the process.

Other concerns will require more extensive thought. I think it fair to say, for example, that many firms were frustrated by the limitations on how much supervisors would communicate about modeling assumptions and other information relevant to capital planning decisions. Here, there is some tension between the desirability of providing more information to firms and the importance of not turning capital planning into a mechanical compliance exercise, in which firms simply run the Federal Reserve model, instead of developing and enhancing their own risk-management and capital planning capacities. We do not want to encourage a world in which everyone simply applies the same risk-management model, rather than engages in the important and multidimensional process of evaluating and modeling risk. But there should be ways to provide some further explanation of our modeling approach without leading to this outcome, particularly in the aftermath – rather than in the middle – of the supervisory exercise itself.

As a first step along these lines, we hope the symposium and other channels for discussing good modeling practices will reduce the “black box” feeling of some of the firms. Of course, good modeling – whether at a firm or at the Federal Reserve – should be adapted to take advantage of improved data and advances in risk management. It would not be desirable to fix upon a model and continue to use it even as it becomes stale and, thus, potentially misleading.

In this regard, I note that the Dodd-Frank stress testing regime that we will implement requires that the bank holding companies themselves disclose the results of their own stress

tests. This will be a valuable augmentation of the transparency around stress testing, providing markets and stakeholders with more information about the risk-management practices of bank holding companies and creating points of comparison with the Federal Reserve's stress testing. More generally, there will be a good deal of continuity as we implement the stress testing requirements of the Dodd-Frank Act. But the statute requires some additional elements, such as using three, rather than two, scenarios. We are currently accepting public comment on our proposed regulation implementing this part of Dodd-Frank.

Conclusion

Stress testing and regular capital review exercises have already become key components of our supervisory program for large bank holding companies. Indeed, as I suggested earlier, they are critical for ensuring that the increased resilience of the financial system envisioned in the post-crisis strengthening of capital requirements is realized. Furthermore, just as these supervisory instruments aim for dynamic assessment of capital needs, so they will remain dynamic, adapting in response to our experience, economic and financial conditions, and advancements in risk measurement.

Having offered an encomium to these tools, let me end by making clear that a one-size-fits-all approach is no more appropriate here than in most other areas of prudential supervision. While forward-looking assessment is important for capital planning in all banking organizations, the specific, sophisticated character of the kind of stress test we ran this year is surely neither necessary nor suitable for smaller banking organizations. For firms with more than \$10 billion but less than \$50 billion in total consolidated assets, the nature of any stress testing requirements will be quite different from that used in the CCAR. For banks with assets of \$10 billion or less, I would not expect any kind of supervisory stress testing requirements.