

## William C Dudley: US experience with bank stress tests

Remarks by Mr William C Dudley, President and Chief Executive Officer of the Federal Reserve Bank of New York, at the Group of 30 plenary meeting, Bern, Switzerland, 28 May 2011.

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Today I would like to comment on the U.S. experience conducting bank stress tests. I thought this might be of interest both in light of the lessons we learned and the relevance of these lessons as the European banking regulators conduct another important round of bank stress tests this summer. As always, what I have to say reflects my own views and not necessarily those of the Federal Open Market Committee (FOMC) or the Federal Reserve System.

As way of background, the U.S. experience conducting stress tests across an array of large banks came out of earlier work doing horizontal supervisory evaluations of banks. We found these exercises useful in identifying best practices and to determine where particular banks were deficient.

In talking about stress tests in the United States, there are three distinct sets of stress tests to consider:

- Supervisory Capital Assessment Program (SCAP), completed in May 2009;
- stress tests conducted as part of the larger Comprehensive Capital Assessment Review (CCAR), completed in April 2011; and
- the Dodd-Frank Wall Street Reform and Consumer Protection Act mandated stress tests, which we have yet to implement.

SCAP was a supervisory stress test, meaning that regulators specified the adverse scenario and determined the resulting loss and revenue estimates on a standardized basis drawing on information submitted by each firm. The CCAR process centered on bank-run stress tests in which regulators specified the scenario but required each bank to model the stress event itself.

Dodd-Frank mandates both supervisory stress tests and bank-run stress tests. We are still working out how we will do each of these types, but I expect that the SCAP and CCAR exercises will serve as models.

Today I will focus on the SCAP and CCAR exercises. The first important point to make is that the purposes of the SCAP and CCAR are very different. Thus, these processes are conducted in very distinct ways. Turning first to the SCAP, its purpose was to restore confidence in large U.S. banks. The SCAP was designed to accomplish this mission by measuring how much capital these banks would need in a stress macroeconomic environment and then forcing these banks to either raise this capital from private sources or take mandatory convertible preferred equity from the U.S. Treasury.

The key attributes of the SCAP include:

- A common stress scenario was applied to each of 19 large bank holding companies (BHCs).
- This stress scenario was applied in a consistent manner across these banks. The test was applied at the detailed trading book and banking book level, with the expected loss experiences based upon the particular characteristics of the portfolio being examined. So, for example, evaluation of a residential mortgage portfolio might include detailed factors such as FICO scores and geographic distribution of the mortgages. This means that estimated potential losses under the stress scenario

vary across banks not just because of differences in overall portfolio composition, but also because of differences in asset quality within particular asset classes.

- A minimum capital standard was applied after two years of stress and with appropriate reserves at the end of the two-year period. The minimum capital standard was set at 4 percent of Tier I common and 6 percent of Tier I capital.
- Estimated potential losses were compared with the starting capital level and the estimated resources expected to be generated by the ongoing business – referred to as pre-provision net revenue (PPNR) – in order to determine the capital needed to meet the minimum capital standard.
- Details of the test were disclosed on a bank-by-bank basis using a template that the Federal Reserve established. This common template ensured comparability across the 19 BHCs and ensured that the Federal Reserve controlled the message, not the banks.

In contrast, while CCAR had an embedded stress test, the key attributes of the CCAR are quite different:

- The purpose was to assess the BHCs' capital planning processes to ensure that the BHCs have good capital plans in place.
- Stress tests were applied by individual banks as part of this exercise. We set the main scenario that the banks must use, and the banks were required to apply the stress test in the manner they deemed appropriate in assessing their capital adequacy. Supervisors used independent quantitative techniques both as a check on firm estimates and to assist in their evaluation of the firms' tools and processes. We evaluated their efforts in terms of: 1) how the stress test is applied, 2) what this implies in terms of capital adequacy, and 3) their capital plans and requests to pay dividends and/or conduct share repurchase programs.

Our evaluation of their capital planning processes and their requests to make capital disbursements was based mainly on three factors: 1) capital adequacy, 2) the quality of the capital planning process, and 3) the credibility of their plans to meet the Basel III capital requirements. Elements of a good planning process include: 1) description of risk appetite and capital targets, 2) robust internal controls, 3) incorporation of stress testing and stress-test results into the decision making process, 4) good governance with respect to the role of senior management and the board of directors, and 5) well-articulated capital distribution policies that describe how decisions are made relative to the expectations of future outcomes.

Some outside observers ask why supervisors would ever want to use bank-run stress tests rather than supervisory stress tests. The answer is that they serve different purposes. A bank-run stress test allows supervisors to evaluate how good each individual bank – and the banking system in general – is at assessing the risks it faces in a stress scenario and translating this into an appropriate amount of capital to set aside against these risks. Crucially, supervisors do not simply accept the results the banks produce in these tests – they evaluate both the adequacy of the numbers the banks produce and the processes they use to get there.

If all we ever did was run supervisory stress tests in which we instruct banks in detail how to perform the test, we would be in the position of a parent who shows his child how to solve each problem in her homework – and never discovers whether the child can do the work on her own or not.

The CCAR process differs from the SCAP in several key respects. First, in the CCAR there was no disclosure by the Fed of the stress test results. In CCAR, the focus was on assessing the sensitivity of the firms' own projections of capital under the baseline and stress scenarios to alternate assumptions and estimates. The results do not lend themselves to direct,

apples-to-apples comparisons like the results in the SCAP. Second, the emphasis was on the capital planning process, not forcing the banks to raise capital to withstand a stress environment. Third, the CCAR was conducted at a different stage of the economic cycle. The issue was not capital raising as in the SCAP, but instead how fast should they continue to build their capital. What's prudent? This translated into an evaluation about the amount of capital that they could prudently pay out via dividends and/or share buybacks.

Fourth, with respect to the distribution requests, we were not calculating the amount of capital that the banks can distribute. Instead, we were making an "up" or "down" decision per their requests. Either we "objected" or we "did not object." We want banks to have good capital planning processes and make intelligent decisions with respect to capital. We don't want to determine their capital actions or what their distributions should be. They need to be able to do this. Fifth, with respect to disclosure, this decision was left to individual firms. In some cases, banks disclosed whether we objected or not to their plans for distributions, while in other cases they simply announced their intention with regard to future capital distributions.

So what have been the lessons from our stress test exercises?

One key issue during the financial crisis was the unwillingness of banks to proactively raise capital so they would be better prepared to withstand a "bad state of the world" scenario should that transpire. Banks didn't want to do this for two reasons. First, capital raises might signal that they were, in fact, weak. Second, the capital raises would be dilutive. In particular, in many cases the expected share price would be higher without dilution even admitting the possibility of a "bad state of the world" scenario. The problem with this approach was that each individual bank's decision not to raise capital to protect against the "bad state of the world" scenario increased the likelihood of the "bad state of the world" scenario. There was an important externality. If a bank raises additional capital, it doesn't just make its own bank stronger, it also makes the entire banking system more stable. Yet it reaps only a portion of these benefits. This was the collective action problem that the SCAP was designed to remedy.

Perhaps, I can best illustrate the problem via two figures. In **Figure 1**, banks have sufficient capital. The mean value of capital is well above zero, the distribution is narrow, and none of the distribution falls below zero – everyone believes the bank is solvent. In **Figure 2**, losses push the distribution of capital to the left and uncertainty about the value of the assets widens the distribution. Thus, unlike the case in Figure 1, a portion of the distribution falls below zero. The bank may be insolvent. Thus, the bank is likely to encounter funding difficulties.

The point of the SCAP was to push the probability distribution back to the right by adding capital – and to narrow it by creating more certainty about how much capital the banks need. By moving the banking industry collectively back to Figure 1 from Figure 2, the "bad state of the world" becomes less likely.

In the SCAP, we had to make a number of important decisions. These included:

- The appropriate capital target. We focused on the Tier I common ratio because we believed that this was the most credible form of capital. This put much greater emphasis on common equity than previously.
- The severity of the stress test. We assumed a stress scenario with an unemployment rate 1.5 percentage points higher than the baseline scenario, and further home price declines of about 29 percent compared with 18 percent in the base case. We were aiming for a stress test scenario that had about a 5 percent to 10 percent probability of being realized.
- The capital target at the end of 2010 and the stress test severity were both important in terms of the credibility of the SCAP. Going in, we were worried that with our capital goal, the BHCs' needs might turn out to be higher than the available

resources from the private sector and the U.S. Treasury. We decided not to compromise the credibility of the stress test to save on needed capital resources. We were fortunate that the need turned out to not be that great: \$185 billion of capital needed prior to capital actions already implemented and revenue generated during the first quarter of 2010; \$75 billion of capital needed after these first quarter actions.

- We decided to apply the stress scenario on a consistent basis across all 19 banks. This entailed economists and bank supervisors working together to do analysis on both a top-down and bottom-up basis. This allowed us to generate aggregate estimates that made sense on an economywide basis. If we had just used the initial estimates supplied by the banks – we would have had a Lake Wobegon outcome – the banks would all have said that they were above average.
- We specified the capital need in terms of dollars rather than in terms of a capital ratio. In other words, we did not allow banks the option of shrinking their risk-weighted assets in order to push up their capital ratios. We didn't want banks to shrink to minimize the amount of capital needed because such behavior might have damaged the macroeconomy. I think this was an important macroprudential element of the SCAP.
- Disclosure. This was hotly debated. There was no precedent for the disclosure of supervisory information. However, senior policymakers – including myself – thought disclosure was essential for the SCAP to be credible and we resolved to disclose extensive information.

Disclosure allowed private-sector analysts to kick the tires and this was important. The day after the results were published, I remember that Bridgewater Associates – which had said the banks needed considerably more resources – published a paper evaluating the SCAP results. The banner headline was: “We Agree.” So this was important. However, I would note that it is important not to draw too strong a conclusion from just one episode. In the SCAP process, I also think it is important that we had some good luck. First, the banks' needs were not that great. What people didn't appreciate going in was that U.S. banks have strong revenue-generation capabilities: the banks had already set aside a large amount of reserves and taken large mark-to-market losses, and the banks had already bolstered their capital resources via capital raises and the sale of ancillary businesses. Second, the economy started to look a bit better in May at the time the SCAP results were released. This made the stress scenario more credible. Third, the capital markets were open to the banks. This was important because, as we saw, private capital was viewed as very much superior to Treasury mandatory convertible preferred shares. Fourth, although we made the correct decision to disclose, this was a difficult and close call. The fact that the loss experiences for the different asset classes varied across the banks helped to bolster the credibility of the results.

Going into the spring of 2009, there was a prevailing view that several of the largest banks would have to be nationalized. The problem was that on a mark-to-market basis, some of these banks were viewed as potentially insolvent. But the mark-to-market price declines overstated the problem because a significant portion of the decline in prices did not reflect expected losses but instead was due to a huge increase in the illiquidity premium. This was due to the fact that risky assets could no longer be financed easily on a leveraged basis. As long as banks could hold onto the assets, losses would shrink once the illiquidity premium narrowed back to a more typical level.

To sum up, I believe that the SCAP was an important turning point in the financial crisis. Confidence improved as banks raised capital mainly in the private markets.

So what were the lessons from the CCAR?

I think here the lessons were mostly for the banks. There were negative consequences for banks that had inadequate capital planning capabilities or asked to make distributions that were too large relative to expected capital resources.

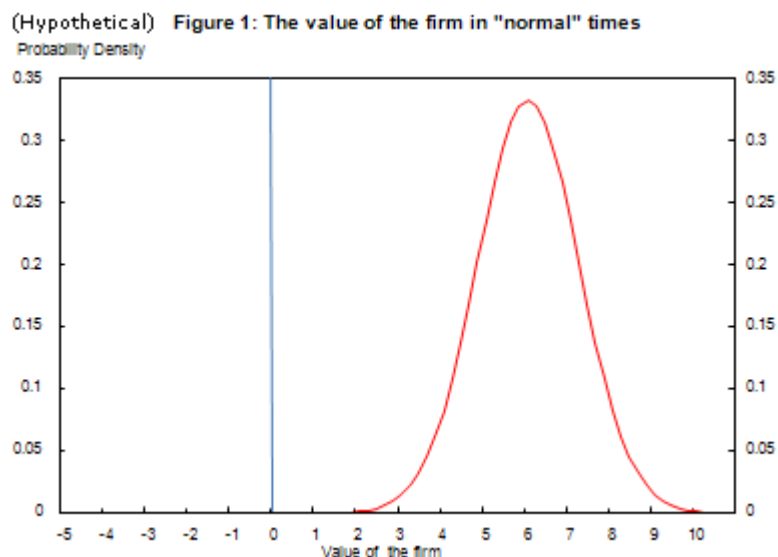
From the CCAR, we concluded that all banks could and should be required to improve their capital planning processes, even those that received a decision of “no objection” to their proposed distributions. A detailed letter went to each firm outlining areas for improvement and we will be tracking the banks progress.

CCAR is not a one-off event. It will be an ongoing process. It is designed to push banks to continue to upgrade their risk management and capital assessment processes.

So what are the implications of the U.S. experience? The context and purpose of any stress test should dictate the form it takes. Both the SCAP and CCAR models likely have some lessons for other such exercises, but in circumstances of market stress, the SCAP model is more relevant than the CCAR model. In such episodes, our experience suggests:

- First, the stress scenario needs to be severe to be credible.
- Second, disclosure of the results is needed at a sufficiently granular level so that private analysts can make their own independent assessment.
- Third, the results need to be credible in terms of expected losses.
- Fourth, there needs to be a credible capital backstop so that market participants can be sure banks will be able to raise the capital that they need under a stress environment, one way or another.

One tricky issue is how to treat sovereign debt exposures. This was not an issue in the U.S. SCAP exercise. This is difficult because there is a complex interaction between fiscal soundness and bank soundness, which is very hard to model. This illustrates a wider point – that all situations are importantly distinct and that while we can all learn from each others’ experiences in this field, there is no one-size-fits-all approach.



(Hypothetical) Figure 2: The value of the firm in times of market stress

