

Taking the Stress Out of Stress Testing

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Let's start by recalling the harm this country suffered from the financial crisis. A precise dollar estimate of the costs to GDP is impossible, because such a calculation depends on one's estimate of sustainable pre-crisis growth potential. But wherever you land on the continuum of loss estimates, the cumulative impact is in the trillions of dollars of lost output from the initial effects and the subsequent reduction in growth potential.

Let's also recall how the effects of the crisis were distributed. With a few exceptions, large financial institutions were supported by the government, some directly with injections of government capital, all indirectly through interest rate reductions and massive injections of liquidity as the Fed lent against a wide range of assets. This will always be the case. Once a crisis hits, any government, no matter what its ideology, will do everything it can to stop the financial system – and with it, the country's economy – from imploding.

The story is different for households and smaller businesses, who bore the brunt of the worst recession in three quarters of a century. As a country we should have done a better job keeping people in their homes. But we should be honest with ourselves that financial crises and major recessions will almost always hit those of lesser means especially hard. So the combination of reduced economy-wide growth potential and disproportionate effects mean that it's a really good idea to reduce the incidence and severity of financial crises.

One might have hoped that, barely a decade removed from a major, global financial crisis, and the worst recession in three quarters of a century, it would not be necessary to make these points. Unfortunately, it is.

To begin, let me review three imperatives for regulatory reform that emerged from the crisis.

First, regulatory capital throughout the banking system needed to be considerably higher. Second, the largest banking organizations needed to be regulated more stringently. This is because of the greater harm they can inflict on the economy when they cease functioning as viable intermediaries and, obviously, the even greater harm they can cause by failing. Third, the risks to financial stability from firms and activities outside the perimeter of regulated banking organizations needed to be addressed. The subject of this conference is on the second – the state of big bank regulation, and that’s where I’ll focus. But, on the third imperative, let me note in passing the important letter sent by Janet Yellen, Ben Bernanke, Tim Geithner and Jack Lew last week criticizing the FSOC’s proposals for revising its approach to identifying non-banks that could pose a risk to the financial system.

As we saw in the crisis, systemically important banks are not the only source of risk to financial stability. But the incapacitation of one of those banks can have grave consequences for the financial system as a whole. Conversely, if those banks remain strong during periods of financial stress induced by asset price shocks or other events, then the financial system and the economy will remain more resilient. The law now incorporates these realities in the requirement that more systemically important banks be more stringently regulated.

I don’t at all think the state of regulation when I left the Fed in April 2017 was the best it could be. Capital requirements and stress testing needed more work. I don’t think we got

liquidity regulation quite right. And there were surely sensible changes to be made in other regulatory areas based on experience with the innovative regulations called for in Dodd-Frank. But we *had* made considerable progress enhancing the resiliency of these largest banks and of at least putting a sizeable dent in too-big-to-fail concerns. Those very banks are prospering today, having taken market share from some of their international rivals. The large U.S. banks are also starting to enjoy new advantages because so many advances in financial technologies reward scale.

Unfortunately, I fear that a good bit of that progress to which I referred a moment ago could be endangered by a kind of low-intensity deregulation, consisting of an accumulation of non-headline-grabbing changes and an opaque relaxation of supervisory rigor. There are things to be concerned about in many of the individual proposals on such matters as the leverage ratio, resolution planning, and foreign banking organizations. It's the cumulative effect, though, that is truly worrisome. Again, I would have no quarrel with efforts to improve regulatory efficiency while maintaining (or even increasing) resiliency for the big banks. But that's not the apparent direction of change.

Rather than say a little about a lot of these proposals, I want to concentrate on stress testing and the CCAR regime, because capital requirements remain the single most important element of the post-crisis prudential regulatory regime, and CCAR has been the binding capital constraint for the largest banks. Adequate capital requirements provide a buffer against losses arising from any assets and activities, regardless of whether bankers and regulators correctly anticipated the greatest sources of risk. To at least some extent, they can disincentivize excessive risk-taking. Among the clearest lessons from the crisis was that prevailing capital requirements had been woefully inadequate, both in conception and in enforcement. This, by the

way, is a view that could be found across the ideological spectrum before and after the crisis. Back in 2005, before I was on the Fed, I testified before the Senate Banking Committee on alongside a conservative scholar with whom I found myself in vigorous agreement on the risks of inadequate capitalization. The Chair and Ranking Member of that Committee subsequently joined in a letter to regulators warning of the need for adequate capital levels. Later, when I foreshadowed the higher capital requirements being contemplated by the Fed, an editorial advocating even higher ones came from the *Wall Street Journal*.

Stress testing is undoubtedly a complicated way to set capital requirements – that’s one reason why it is peculiarly susceptible to being weakened without much fanfare. In thinking about changes, it is important to get back to the basics of what stress testing is, and where its value lies.

As I’m sure most of you have heard many times before, stress testing is a dynamic, forward-looking approach to setting minimum capital levels that helps avoid some of the traditional limitations of static capital requirements. Stress tests model what could happen to bank balance sheets under severely adverse conditions. By testing all large bank balance sheets simultaneously, stress testing gives a more accurate picture of the risks to the financial system as a whole.

For these reasons, stress testing has been widely acknowledged as an important regulatory innovation in building the resiliency of large banking organizations. I think it fair to say that the Fed has been at the forefront of developing and refining stress testing as a key element of prudential regulation. But it is important to understand the limitations, as well as the strengths, of the current approach. Here are two important ones.

First, neither regulators nor bankers can count on anticipating correctly what the next source of severe stress will be. Just think of the origins of the recent financial crisis. If regulators had used only one scenario from year to year, and that scenario didn't correctly anticipate the decline in housing prices and shock to mortgage-backed securities, the banks might still have been badly undercapitalized when the crisis hit.

Second, the current supervisory model at the Fed calculates only the losses that would occur directly because of the anticipated shock. It doesn't project second-order effects, such as the impact of fire sales or liquidity squeezes which, as we saw during the crisis, amplified the losses associated with the shock to real estate prices.

For both these reasons, the "results" of any single stress test may underestimate, perhaps significantly, the losses that may occur under actual stress conditions. There are, at least in theory, ways of dealing with these limitations. You might run dozens, perhaps hundreds, of scenarios to try to capture a much greater proportion of unanticipated risks. And you might try to incorporate second-order effects into your supervisory stress testing model. Unfortunately, the former idea seems impractical, though perhaps someday information systems would make it feasible. As to including second-order effects – that's a significant modeling challenge. Back in 2016, the Fed's Board of Governors asked the staff to tackle this challenge, but I don't think we've heard anything suggesting progress, or even that it's still a priority.

At least for the foreseeable future, then, regulators will have to rely on second-best solutions to current limitations on stress testing. If you can't simultaneously stress a hundred scenarios, at least you should vary the scenario materially from year to year to give yourself a better chance of capturing different kinds of risks. And if you know you're not capturing all the

significant risks that may be lurking out there, you should incorporate features into the CCAR regime to compensate for that fact.

With this explanation of stress testing in mind, let's think about the suggestions that have been made to change it. We should start with the formal proposal issued by the Fed last year to integrate CCAR with point-in-time capital requirements by using the stress test to create something called a "stress capital buffer," which would constrain banks from paying out dividends that breached that buffer.

This idea was actually developed in 2016 as a way to make capital regulation more efficient. Although it had not been translated into a formal regulatory proposal by the time of the election, it had been described publicly as increasing effective capital requirements for the eight systemically important banks, since the G-SIB capital surcharges would be included in the post-stress buffer, even as some of the assumptions in the supervisory stress model would be relaxed. As proposed by the Fed last year, however, it could lead to reductions in capital requirements for some G-SIBs. The reason is that, buried in a footnote of the Fed's explanation of its proposal was the information that the Fed intended to exclude the enhanced supplemental leverage ratio from what was supposed to be a fully integrated set of capital requirements. This was important, because the binding capital constraint on several G-SIBs has been the post-stress leverage ratio. With the intended relaxation of assumptions on balance sheet growth and capital distributions, the amount of required capital – as projected by the model – would go down. But, unlike the case with risk-based capital, where the G-SIB surcharges would more than offset this impact, the failure to include the enhanced supplemental leverage ratio could result in effectively lowered capital requirements for some of the biggest banks. Unfortunately, while the Fed gave estimates of the impact of the changes on risk-weighted requirements, it did not provide an

analysis of how the change would affect leverage ratio requirements, and thus actual capital levels. So we just don't know.

Furthermore, at least one Fed board member has suggested a willingness to consider removing even the simple, 3% leverage ratio as a post-stress requirement, on the grounds that the stress test is intended to be risk sensitive, and a leverage ratio is intended to be a back-up to risk sensitive measures. It's of course true that leverage ratios are not risk-based measures. But recall what I said just a moment ago about the limitations of stress testing. The results of any one stress test cannot be read as assurance that the banks tested are reasonably secure from plausible stress scenarios, because that test is based only on one scenario. The post-stress leverage ratio is one way to take account of this uncertainty. Another would be to raise G-SIB surcharges. But eliminating the post-stress leverage ratio without a compensatory adjustment elsewhere would be a backdoor way of reducing current regulatory capital requirements at some of the largest, most systemically important banks.

The Fed has also recently given a lot more information on the supervisory model to the banks. While the code itself has not been released, I suspect that the smart people who work on such things for the big banks now have most of what they need to reverse engineer the model's loss functions. This disclosure has been made in the name of transparency and fairness, two norms that are hard to argue with in the abstract. After all, why shouldn't banks know how the Fed assesses the riskiness of an asset subject to the stress test? The answer lies in the phenomenon of regulatory arbitrage, which has always been a problem for regulatory capital requirements. Once they know with precision the characteristics of an asset that place it in a particular risk category, they will find clever ways to reshape their assets so as to reduce capital requirements without reducing risk. If banks know the model code, they'll have a roadmap for

doing this. A reported post-stress capital ratio of say, 6% will in fact reflect a lower level of resiliency than a 6% ratio under the original stress testing regime. So, to maintain the same level of resiliency that was provided by the undisclosed test, the Fed should be increasing the post-stress capital requirement to take account of the regulatory arbitrage.

Some bank supporters have also argued that the scenarios should be subject to notice and comment rulemaking each year. If the Fed were to do so, the banks would not only have the opportunity to argue for less severe scenarios. They would also have more time to adjust their balance sheets so as to reduce the post-stress capital requirement for that particular test. But there is a deeper problem with this kind of proposal, which seems related to the general complaint of some banks that there is excessive volatility in their capital requirements, because some elements of the stress scenarios change from year to year. As I explained a moment ago, this so-called volatility is a necessary feature of a stress testing regime, not a bug to be corrected.

Stress testing needs continually to shift to take account of varied risks, even as it changes to become more administratively efficient. If the stress test becomes predictable, it ceases to have value. Worse, the stress test results could become affirmatively misleading – giving false assurance that the largest banks would be able to endure a severe scenario and remain viable financial intermediaries. If banks really want more continuity in the amount of capital they can distribute from year to year, the system could give it to them by using point-in-time capital requirements. But in order to provide the same level of protection afforded by the more dynamic stress test, those static capital requirements would need to be a good bit higher than they are today. Indeed, if the choices are to make the stress test predictable and comfortable, on the one hand, or to have higher point-in-time capital requirements on the other, it might be at least more honest – and considerably less expensive – to choose the second option.

Analogies to stress testing are, I have found, generally imperfect. But I do think it's instructive to analogize to an exam intended to evaluate students' knowledge of a subject area. If you give them the test in advance, you can be sure that most – if not all – of them will do very well on the exam. But since the exam can only have covered a small proportion of the material covered in the course, you will have no idea of how much they actually know about all the subject matter of the whole course. Similarly, if you give banks the model and the scenario in advance, you can be sure that most – if not all – of them will produce balance sheets suggesting they will be comfortably capitalized should the scenario occur. But you will have a very misleading picture of their actual resiliency.

There are other low-profile ways that the integrity of stress testing can be compromised, such as by giving exceptions to particular banks or groups of banks so that the impact of the model's loss functions or revenue projections on a bank's capital requirements is reduced. For example, I heard a number of times from banks that their underwriting in a particular asset class was so good that the objective loss characteristics that they inferred were being applied in the model should be overridden. This, or other kinds of opaque exceptions, need to be avoided.

Capital requirements for the largest banks should be going up, not down. The limitations of the stress test, the realization that there may be less government support in a future crisis, and the prospect of longer, deeper recessions because of the zero lower bound on monetary policy all argue as much. Sound risk management principles argue in the same direction. Even if higher capital requirements for the G-SIBs were to inhibit some otherwise sound lending, regional banks could take up at least some of this slack, whereas the failure of one of the G-SIBs would be extremely difficult to handle without major harm to the economy. While quantitative cost-benefit analysis is generally much harder to do sensibly in prudential financial regulation than in

most areas, the history of capital regulation provides more of a basis for such an analysis. And independent academic efforts overwhelmingly conclude that regulatory capital levels should be higher than present requirements.

I am not so cheery-eyed as to see a prospect that the current leadership of the banking agencies will consider raising capital requirements. But I had hoped they would not lower them for the biggest banks. Yet a few steps down this road have, regrettably, already been taken. If more follow, I believe those concerned with the risks posed to the financial system by the largest banks will need to rethink the utility of stress testing, which necessarily involves so much regulatory discretion. When that discretion is exercised stringently, the banks are best positioned to know it, and they are not shy about bringing their complaints to the attention of senior Fed officials or members of Congress. But if that discretion is exercised in a lax manner, the banks will not be complaining, and the public will have a very difficult time seeing what has happened.

Stronger, blunter, more transparent capital regulation – as has periodically been proposed from both the left and right – is a less efficient way to protect the financial system. But, depending on what happens in the next few years, it could end up being the better of two unattractive choices.

Looser bank regulation is always a great temptation. More lending today produces higher growth in the short-term, even if that additional lending is not sustainable. Unlike deregulation in many other areas, the harm that may be done cannot be observed, since it takes time to become manifest. There's no certainty as to when improvidently lax regulation will come home to roost in the form of a financial crisis or recession that becomes worse than it need have been. The eventual damage may well come after those who loosened up on the regulation have moved

on. But somewhere down the line, someone else will suffer that damage. In all likelihood, it will once again be the most vulnerable of households and businesses.