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## DISCLOSURE OF BANKS' STRESS-TEST RESULTS

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One of the main lessons of the recent financial crisis is that large banks need to have sufficient capital to absorb losses resulting from adverse economic conditions.

This is especially important for preventing the negative spillovers that these losses can have on the rest of the economy via contagion across financial institutions and the reduction in loans to the real economy. Consequently, the United States Congress enacted the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act), which requires the Federal Reserve to conduct an annual stress test of large bank holding companies (BHCs) to evaluate whether they indeed have sufficient capital.

Examinations of large banks by regulators are not new. Large banks in the United States have been subject to continuous on-site examinations for many years, and these on-site examinations have been a key input into a bank's CAMELS rating, which is a score between 1 and 5 used to classify a bank's overall condition. The newly required stress tests are different in that they focus

on the ability of banks to withstand severely adverse macroeconomic scenarios. Moreover, their results are intended to be disclosed publicly.

The results of the most recent stress tests were disclosed publicly in March 2013.<sup>1</sup> The disclosure of the results is an important part of the newly required stress tests in the eyes of the Federal Reserve, as emphasized in the press release announcing the results: "The Federal Reserve believes that disclosure of stress test results provides valuable information to market participants and the public, enhances transparency, and promotes market discipline."<sup>2</sup> At the same time, this disclosure policy is quite controversial and has generated strong concerns in the financial industry. For example, in a *Wall Street Journal* article from March 5, 2012, the Clearing House Association expressed the view that making all this information public "could have unanticipated and

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Itay Goldstein is a Professor of Finance at the Wharton School of the University of Pennsylvania. He is also the coordinator of the PhD program in Finance. Professor Goldstein earned his BA (Economics and Accounting, 1994), MA (Economics, 1998), and PhD (Economics, 2001) from Tel Aviv University. He is an expert in the areas of corporate finance, financial institutions, and financial markets, focusing on financial fragility and crises and on the feedback effects between firms and financial markets. His research has been published in major academic journals, including the *Review of Economic Studies*, the *Journal of Finance*, the *Journal of Financial Economics*, the *Review of Financial Studies*, and the *Journal of Economic Theory*. His research has also been featured in the popular press in the *Financial Times*, *Bloomberg*, *Forbes*, *National Public Radio*, and others. Professor Goldstein is an editor of the *Review of Financial Studies*. He has been an editor of the Finance Department at *Management Science* and an editor of the *Journal of Financial Intermediation*. He has served as an academic consultant of the Federal Reserve Bank of New York, the Federal Reserve Bank of Philadelphia, and the Committee for Capital Markets Regulation. Prior to joining Wharton, Professor Goldstein was on the faculty of Duke University's Fuqua School of Business. He also worked in the research department of the Bank of Israel.

potentially unwarranted and negative consequences to covered companies and U.S. financial markets.” In this policy brief, I will outline some of these potentially unwarranted and negative consequences, which I believe are indeed important to consider when designing disclosure policy.

The structure of this policy brief is as follows: First, I provide a short overview of the nature of the newly required stress tests and the meaning of their results. Then, I discuss the tradeoffs involved in setting the level of disclosure, emphasizing some of the disadvantages of a policy of greater disclosure, which are often not well understood. Finally, I conclude with a few suggestions on how to revise the disclosure policy to alleviate some of the identified problems. As I explain below, understanding the implications of the disclosure policy is crucial for alleviating financial fragility, for providing proper incentives to banks, and for enabling efficient production and aggregation of information about financial institutions.

## STRESS TESTS FOLLOWING THE DODD-FRANK ACT

The Dodd-Frank Act requires the Federal Reserve to conduct an annual stress test on large BHCs and all nonbank financial companies designated by the Financial Stability Oversight Council (FSOC) for Federal Reserve supervision. The Federal Reserve adopted rules implementing these requirements in October 2012. Under the rules, 18 BHCs were part of the Dodd-Frank Act supervisory stress tests this year (DFAST 2013). They are: Ally Financial Inc.; American Express Company; Bank of America Corporation; The Bank of New York Mellon Corporation; BB&T Corporation; Capital One Financial Corporation; Citigroup, Inc.; Fifth Third Bancorp; The Goldman Sachs Group, Inc.; JPMorgan Chase & Co.; KeyCorp; Morgan Stanley; The PNC Financial Services Group, Inc.; Regions Financial Corporation; State Street Corporation; SunTrust Banks, Inc.; U.S.

Bancorp; and Wells Fargo & Company. Their total assets range from \$89 billion (KeyCorp) to \$2.4 trillion (JPMorgan Chase & Co) as of March 2013.

In conducting the stress tests, the Federal Reserve considered three macroeconomic scenarios – baseline, adverse, and severely adverse – and examined the implications they would have on each individual BHC. The published results are for the severely adverse economic scenario.

The severely adverse scenario includes trajectories for 26 variables: 14 variables that capture economic activity, asset prices, and interest rates in the U.S. economy and financial markets, plus three variables (real GDP growth, inflation, and the U.S./foreign currency exchange rate) in each of four countries or country blocs (the euro area, the United Kingdom, developing Asia, and Japan). This scenario is not meant to be a projection for the future, but rather a reflection of a very bad possible economic shock of the kind that was experienced in the recent financial and economic crisis. In this scenario, real GDP in the United States declines nearly 5 percent between the third quarter of 2012 and the end of 2013; the unemployment rate rises to 12 percent; the four-quarter percent change in the consumer price index (CPI) decelerates to 1 percent; equity prices fall more than 50 percent; the equity market volatility index increases from 21 to 70; real estate prices decline by more than 20 percent; and the euro area, the United Kingdom, and Japan fall into recession, while developing Asia experiences below-trend growth.

For each BHC, the stress test examines the effect of the severely adverse economic shock on net income and losses, taking into account the exposures of the BHC and its business. In order to conduct this analysis, the Federal Reserve relies on input from the BHCs and on analytical models that determine the effect of the shock on the income and losses of the bank. Combining the results on income and losses with assumptions on capital distribution policy, the test

generates the final output, which is the effect of the severely adverse shock on the bank’s capital ratios, based on different definitions of capital ratios. The four different ratios are the ratio of the common equity component of tier 1 capital to risk-weighted assets (the tier 1 common ratio), the ratio of tier 1 capital to risk-weighted assets (the tier 1 capital ratio), the ratio of total regulatory capital to risk-weighted assets (the total risk-based capital ratio), and the ratio of tier 1 capital to average assets (the tier 1 leverage ratio).

Generally speaking, when a bank’s capital ratios are projected to drop below a certain threshold following the severely adverse economic shock, that bank is considered to have not “passed” the stress test. Such a bank is expected to limit capital distributions or raise more capital to be better prepared for adverse economic shocks. In general, banks differ from each other in the type of loans they make and the exposures of these loans to the assumed macroeconomic scenarios. Also, they differ in their capital buffers and how these buffers are maintained in light of planned capital distributions. Hence, some banks may fail while others may pass depending on these different business practices and capital structures.

Overall, the newly required stress tests are an important part of the post-crisis regulatory effort to maintain a sound financial system that is less prone to the fragility experienced in 2008. Constantly thinking of adverse economic shocks and examining whether large financial institutions have sufficient capital to endure such shocks is a very useful exercise to prevent the negative spillovers from financial institutions’ losses in bad times to the rest of the economy via contagion across financial institutions and the reduction in loans to the real economy.

While the current framework for the stress tests is a very good first step, it has its weaknesses. One major difficulty is that the stress tests only consider three scenarios (focusing on the most adverse one).

1 They are available at: <http://www.federalreserve.gov/newsevents/press/bcreg/20130307a.htm>.

summary.htm.

3 “Should Banks’ Stress Test Results Be Disclosed? An Analysis of the Costs and Benefits” (2012). Available at <http://finance.wharton.upenn.edu/~itayg/Files/stresstests.pdf>.

edu/~itayg/Files/stresstests.pdf.

4 For example, the Office of Financial Research at the U.S. Department of the Treasury is coordinating efforts to analyze and improve stress

tests. Some work in this direction can be found in the OFR’s working paper series: <http://www.treasury.gov/initiatives/ofr/research/Pages/working-paper-series.aspx>.

2 <http://www.federalreserve.gov/bankinforeg/stress-tests/executive->

These scenarios are heavily influenced by past events, but as we know, future events can take a wholly different form; there is room to analyze many more scenarios than just the three that are examined currently. Considering a wider array of scenarios that could emerge from recent economic developments would improve the ability of the tests to identify weak spots in the financial system. Another difficulty is related to the ability to capture systemic risks and general-equilibrium effects in the current framework. As we saw in the recent crisis, problems are aggravated by equilibrium forces, as the shocks to some institutions might bring down other institutions. Developing a framework that captures the combined effects on all banks, taking into account their relations with each other and with the rest of the economy, is a major challenge that academics and policymakers need to address in the years to come.

The focus of this policy brief, however, is not on these general weaknesses in the framework under which stress tests are conducted, but on the important angle of the disclosure of the results. I now turn to discuss this issue.

## THE TRADEOFFS INVOLVED IN DESIGNING THE DISCLOSURE POLICY

The last round of stress tests described above involved a high level of disclosure on each individual BHC. For each BHC, the four projected capital ratios under the severely adverse scenario were disclosed publicly, alongside details on projected net income and projected loan losses by type of loan (First-lien mortgages, domestic; Junior liens and HELOCs, domestic; Commercial and industrial; Commercial real estate, domestic; Credit cards; Other consumer; Other loans). Overall, the results suggest that all BHCs, with the exception of Ally Financial – the former finance affiliate of General Motors, owned by the U.S. government since the financial crisis – have sufficient capital to endure the severely adverse shock that served as the basis for the test.

The benefit of disclosure is very well understood. Providing more information

to market participants enables the market to prepare for the consequences of large economic shocks, and this, in turn, disciplines financial institutions. For example, if a financial institution is found to be unprepared for a large economic shock, then market participants will limit their exposure to this financial institution. This will force the financial institution to take actions to improve its capital positions in order to regain the confidence of market participants. The basic idea is that more information is always beneficial, as it allows market participants to take more efficient decisions in their interactions with financial institutions, and thus encourages greater discipline among financial institutions.

**“Disclosure has undeniable benefits in promoting informativeness and market discipline. However, one should be mindful of the unintended consequences.”**

However, recent academic literature has pointed out that disclosure has some significant disadvantages. These can be particularly relevant in the case of banks’ stress tests results. Such disadvantages are often not fully understood and appreciated in the debate on disclosure, and so it is important to highlight and explain them. In a recent paper that I co-authored with Haresh Sapra, we review this literature, describing in detail the disadvantages of disclosure and their implications for the question of stress test disclosure.<sup>3</sup> Here, I draw on this review to describe the main policy insights. The interested reader can refer to this paper for fuller analysis and a list of references.

Broadly speaking, the disadvantages of disclosure can be classified into three groups:

### I. ADVERSE EFFECTS ON THE EX-POST BEHAVIOR OF MARKET PARTICIPANTS

If an individual market participant needs to

make a decision, this decision will be more efficient when there is access to more information. This, however, is not necessarily the case in the presence of many market participants that exert externalities on each other. Market participants might put excessive weight on public information, even if it is less precise than their own private information, just because they know that the public information is available to all of them. Specifically, in the context of banks, a piece of bad news that is made public via the disclosure of stress test results might trigger an inefficient run on a bank that does not pass the test. Market participants, knowing that the negative results were observed by all, will rush to withdraw money from the bank, even if their own private information is not so negative. Hence, the results of stress tests that are made public might get more than their fair weight in market participants’ decisions, generating adverse economic outcomes. This problem is particularly severe if the stress test results are noisy, e.g., if the data used in the stress test are not sufficiently rich to determine precisely the risk faced by the bank, thus generating predictions that are not perfect.

### II. ADVERSE EFFECTS ON THE EX-ANTE BEHAVIOR OF MARKET PARTICIPANTS

Stress tests conducted by the Federal Reserve provide one source of information about banks. There are many other sources of information that find their way into financial markets. Generally speaking, speculators in financial markets produce and trade on information on banks; this information finds its way into market prices. This is why regulators are known to rely on market prices of bank securities when deciding on various policy steps. The problem is that when regulators disclose their own information *ex post* by publishing stress test results, they crowd out other sources of information. This is because speculators’ incentives to produce information on individual banks and trade on it might be weakened when they know that some of this information already is slated to find its way to the markets via the disclosure made by the Federal Reserve.

### III. ADVERSE EFFECTS ON THE EX-ANTE BEHAVIOR OF FINANCIAL INSTITUTIONS

Banks that know that their performance in a stress test will become public information might adjust their behavior *ex ante* in an inefficient way. Such inefficiencies may come in different forms. For example, banks may be reluctant to provide information to the Federal Reserve if they know that this information will become public. Since the Federal Reserve depends on banks' information for the stress tests, this could reduce the precision and effectiveness of stress tests. Banks also might try to 'game' the system by adjusting their exposures in a way that will enable them to pass the stress test but will not necessarily make them less risky or more efficient. This is related to the fact that stress tests identify only a limited number of scenarios, so banks can learn how to appear healthy in particular scenarios while not minimizing overall risk or maximizing overall value.

### IMPLICATIONS FOR THE DISCLOSURE OF STRESS TESTS RESULTS

Should we conclude from the above discussion that disclosure of banks' stress test results is undesirable? The answer to this question is simple: No. Disclosure has undeniable benefits in promoting informativeness and market discipline. However, one should be mindful of the unintended consequences of disclosure, and perhaps limit the extent of disclosure to mitigate these unintended consequences.

For example, instead of disclosing BHC-specific information, as described above, another possibility is to disclose only aggregate information—say, total expected losses by loan type for a group of banks, or average expected capital ratios for a group of banks. Disclosing aggregate information can help avoid the unintended consequences highlighted in the previous section. Aggregate results are more precise and therefore are less likely to trigger inefficient runs on individual banks. The disclosure of aggregate results will not crowd out the incentives of speculators to produce and trade

on bank-specific information. And the fact that aggregate results are disclosed will not lead banks to restrict the information they provide or to try to game the system. Of course, disclosing only aggregate information has a cost, as it does not allow for the benefits of microprudential regulation. Yet, it allows the Federal Reserve to create benefits for macroprudential regulation, i.e., regulation aimed to promote the stability of the financial system as a whole—which, after all, is the main motivation for having stress tests in the first place.

But, there are also ways to disclose bank-specific information and alleviate the unintended consequences. To address the possibility of runs following a bad result for an individual bank, it is important to identify the banks that are particularly susceptible to runs – those with a severe mismatch between liquid liabilities and illiquid assets – and to be particularly cautious in disclosing information about them. Moreover, accompanying the disclosure of a bad performance on a stress test with a clear plan on how to fix the problem and improve the capital positions of the bank will alleviate the concerns of the market and make a run less likely. To avoid crowding out information production by market participants, the Federal Reserve can identify the dimensions on which the market is likely to provide information of higher quality than the regulatory stress tests and avoid disclosing information on these dimensions. To prevent incentive problems at the banks, and to make sure that they don't game the system and adjust their balance sheets just to pass the test, it is important that banks don't know *ex ante* what are the parameters and assumptions on which the stress test will focus. In particular, running multiple scenarios will make it more difficult for banks to do 'window dressing' in preparation for a stress test.

Above all, improving the quality and precision of the stress test will go a long way in mitigating the unintended consequences of disclosure. When very precise information is being disclosed, those problems are less worrying. As mentioned above, two ways to improve the quality and precision of stress tests results would be to consider a

larger variety of economic scenarios and to account for systemic risk and general-equilibrium effects. Current research conducted in academia and in policy institutions is aimed at improving stress tests analysis in these dimensions and others.<sup>4</sup> For example, considering systemic risk and general-equilibrium effects requires understanding the interconnections across banks and how they are affected in times of crisis. This is a task that is now on the agenda of many researchers. In addition, researchers are thinking of ways to come up with coherent scenarios and incorporating them into stress tests to improve the ability of these tests to spot problems in the financial system. In the interim, however, revising the disclosure policy in the ways described above can help mitigate the potential negative consequences of publicly divulging the stress test results of individual bank holding companies.

### BRIEF IN BRIEF

- The Dodd-Frank Act requires that the Federal Reserve conduct an annual stress test on large bank holding companies (BHCs) to ensure they have sufficient capital to withstand losses from adverse economic conditions. Eighteen BHCs were subjected to a stress test this year.
- The stress tests consider three economic scenarios—baseline, adverse, and severely adverse—and the results for the severely adverse scenario are disclosed publicly by the Federal Reserve, on the assumption that providing more information will help impose more discipline on financial institutions.
- However, the policy of disclosure has some significant disadvantages. It can increase the likelihood of a run on any bank that does not pass the test. It can crowd out other sources of information on banks. And it can motivate banks to "game" the system by fixing their balance sheets to appear financially sound without actually being so.
- While disclosure is still a beneficial policy, it should be revised to address these disadvantages, while the quality and precision of the tests themselves also should be improved.



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