FEDERAL RESERVE SYSTEM

[Docket No. OP-1651]

Enhanced Disclosure of the Models Used in the Federal Reserve's Supervisory Stress Test

AGENCY: Board of Governors of the Federal Reserve System (Board).

ACTION: Final notification.

SUMMARY: The Board is finalizing an enhanced disclosure of the models used in the Federal Reserve's supervisory stress test conducted under the Board's Regulation YY pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act and the Board's capital plan rule.

DATES: **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].**

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SUPPLEMENTARY INFORMATION:

Background

Each year the Federal Reserve publicly discloses the results of the supervisory stress test.[1] The disclosures include revenues, expenses, losses, pre-tax net income, and capital ratios that would result under two sets of adverse economic and financial conditions. As part of the disclosures, the Federal Reserve also describes the broad framework and methodology used in the supervisory stress test, including information about the models used to estimate components of pre-tax net income and post-stress capital ratios in the stress test. The annual disclosures of both the stress test results and supervisory model framework and methodology represent a significant increase in the public transparency of large bank supervision in the U.S. since the 2007-2009 financial crisis.[2] Indeed, prior to the first supervisory stress test in 2009, many analysts and institutions cautioned against these disclosures, arguing that releasing bank-specific loss estimates to the public would be destabilizing. However, experience to date has shown the opposite to be true – disclosing these details to the public has garnered public and market confidence in the process.

[1] See, for example, *Dodd-Frank Act Stress Test 2018: Supervisory Stress Test Methodology and Results*, June 2018, and *Comprehensive Capital Analysis and Review 2018: Assessment Framework and Results*, June 2018.

[2] In addition to those public disclosures, the Federal Reserve has published detailed information about its scenario design framework and annual letters detailing material model changes. The Federal Reserve also hosts an annual symposium in which supervisors and financial industry practitioners share best practices in modeling, model risk management, and governance.

The Federal Reserve routinely reviews its stress testing and capital planning programs, and during those reviews, the Federal Reserve has received feedback regarding the transparency of the supervisory stress test models.[3] Some of those providing feedback requested more detail on modeling methodologies with a focus on year-over-year changes in the supervisory models.[4] Others, however, cautioned against disclosing too much information about the supervisory models because doing so could permit firms to reverse-engineer the stress test.

The Federal Reserve recognizes that disclosing additional information about supervisory models and methodologies has significant public benefits, and is committed to finding ways to further increase the transparency of the supervisory stress test. More detailed disclosures could further enhance the credibility of the stress test by providing the public with information on the fundamental soundness of the models and their alignment with best modeling practices. These disclosures would also facilitate comments on the models from the public, including academic experts. These comments could lead to improvements, particularly in the data most useful to understanding the risks of particular loan types. More detailed disclosures could also

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[3] During a review that began in 2015, the Federal Reserve received feedback from senior management at firms subject to the Board's capital plan rule, debt and equity market analysts, representatives from public interest groups, and academics in the fields of economics and finance. That review also included an internal assessment.

[4] Some of the comments in favor of additional disclosure included requests that the Federal Reserve provide additional information to firms only, without making the additional disclosures public. Doing so would be contrary to the Federal Reserve's established practice of not disclosing information related to the stress test to firms if that information is not also publicly disclosed.

help the public understand and interpret the results of the stress test, furthering the goal of maintaining market and public confidence in the U.S. financial system. Finally, more detailed disclosures of how the Federal Reserve's models assign losses to particular positions could help those financial institutions that are subject to the stress test understand the capital implications of changes to their business activities, such as acquiring or selling a portfolio of assets.

The Federal Reserve also believes there are material risks associated with fully disclosing the models to the firms subject to the supervisory stress test. One implication of releasing all details of the models is that firms could conceivably use them to make modifications to their businesses that change the results of the stress test without actually changing the risks they face. In the presence of such behavior, the stress test could give a misleading picture of the actual vulnerabilities faced by firms. Further, such behavior could increase correlations in asset holdings among the largest banks, making the financial system more vulnerable to adverse financial shocks.[5] Another implication is that full model disclosure could incent banks to simply use models similar to the Federal Reserve's, rather than build their own capacity to identify, measure, and manage risk. That convergence to the Federal Reserve's model would create a "model monoculture" in which all firms have similar internal stress

[5] For example, if firms were to deem a specific asset as more advantageous to hold based on the particulars of the supervisory models, and an exogenous shock were to occur to that specific asset class, the firms' losses would be magnified because they held correlated assets.

testing models, and this could cause firms to miss key idiosyncratic risks that they face.[6]

I. Proposed Enhanced Model Disclosure

On December 15, 2017, the Board invited comment on a proposal to enhance the disclosures of those models.[7] The proposed enhancements were designed to balance the costs and benefits of model disclosure in a way that would further enhance the public's understanding of the supervisory stress test models without undermining the effectiveness of the stress test as a supervisory tool. The proposed enhanced disclosures contained three components: (1) enhanced descriptions of supervisory models, including key variables; (2) modeled loss rates on loans grouped by important risk characteristics and summary statistics associated with the loans in each group; and (3) portfolios of hypothetical loans and the estimated loss rates associated with the loans in each portfolio.[8]

The proposed enhanced descriptions of the models would have expanded the existing model descriptions in two ways. First, they would have provided more detailed information about the structure of the models by including certain important equations that characterize aspects of the model. Second, they would have included a table that contains a list of the key variables that influence the results of a given model,

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6 *See* Til Schuermann, "The Fed's Stress Tests Add Risk to the Financial System," *Wall Street Journal,* March 19, 2013.

7 82 FR 59547 (December 15, 2017).

8 The second and third components would have been provided for the models used to project losses on the most material loan portfolios.

and the table would show the relevant variables for each component of the model (e.g., PD, LGD, EAD), along with information about the source of the variables.

The proposed enhanced disclosure would have included estimated loss rates for groups of loans with distinct characteristics, which would allow the public to directly see how supervisory models treat specific assets under stress. To shed more light on the degree of heterogeneity of loans within a given group, the proposed enhanced disclosure would also have included summary statistics associated with the loans in each group.

The proposed enhanced disclosure would have included the publication of portfolios of hypothetical loans, along with supervisory projected loss rates on the portfolios. The portfolios of hypothetical loans would have been designed to mimic the characteristics of the actual loans reported by firms participating in the stress test, but would not have contained any individual firm's actual loan portfolio or any actual loans reported by firms. The set of variables included for each portfolio would have been designed such that the public could independently estimate loss rates for these portfolios, although the set would not necessarily have included every variable that might be included in a loss model for the relevant loan type.

Under the proposal, the Board would have provided enhanced versions of the supervisory model descriptions that are currently published in the model description appendix of the Board's annual disclosures of supervisory stress test results, and the Board would also have provided modeled loss rates on groups of loans and the loss rates associated with portfolios of hypothetical loans for the most material loan portfolios. The Board would have expected to publish its enhanced disclosure in the first quarter of each calendar year, and the annual disclosure in any given year would reflect updates to supervisory models for that stress test cycle, but would be based on data and scenarios from the prior stress test cycle.

II. Summary of Comments

The Board received twelve comment letters in response to the proposal. Commenters included public interest groups, academics, individual banking organizations, and trade and industry groups. Commenters generally expressed support for the proposal, and provided suggestions regarding future model disclosures.

A. Fully disclosing models for notice and comment

Commenters were divided in their views on the appropriate level of transparency. Some commenters recommended full disclosure of supervisory models published by the Board through the public notice and comment process, suggesting that this would result in more accurate models. Other commenters expressed the view that the Federal Reserve should fully disclose material aspects of the models such as underlying formulas, equations, model backtesting, validation outcomes, and limitations, to enable the public to evaluate the reliability of the Federal Reserve's results. However, other commenters opposed full transparency of supervisory models, indicating that it is important for the stress test to remain flexible and for it not to be perfectly predictable by the companies subject to it. One commenter cited a historical study of the Office of Federal Housing Enterprise Oversight (OFHEO) stress test, noting that the full disclosure of the OFHEO stress test model rendered that stress test ineffective.

As discussed above, the proposed enhancements were designed to balance the costs and benefits of disclosure in a way that would further facilitate the public's understanding of the supervisory stress test models without undermining the effectiveness of the stress test as a supervisory tool. More detailed disclosures can enhance the credibility of the stress test and lead to its improvement, but full disclosure of all details related to supervisory models could make the financial system at large more vulnerable by allowing firms to make modifications to their businesses that would change their supervisory stress test results without materially changing their risk profile. The Board views the proposal as striking an appropriate balance between enhancing model transparency and maintaining the efficacy of the stress test, and is therefore adopting the enhancements as proposed, with modifications as described below. The Board intends to continue to improve its disclosures and to consider ways to further increase the transparency of the stress test.

B. Content of disclosures of models

Commenters were generally supportive of the proposed enhancements to the model disclosures. Several commenters asserted that the portfolios of hypothetical loans in particular would help the public understand the models. Consistent with the proposal, commenters requested that the Board provide detailed descriptions of modeling assumptions and equations.

Some commenters expressed the view that the Board should publish a more detailed model disclosure than the one provided in the proposal. These commenters requested decompositions that explain the proportion of changes from scenarios, portfolio composition, model changes, and additional details about model backtesting and assumptions. One commenter stated that the Board should provide a comprehensive explanation of the cost and benefit analysis used to determine the content of its proposed enhanced model disclosure.

The Board intends to publish enhanced versions of the supervisory model descriptions that are currently published in the model description appendix of the Board's annual disclosures of supervisory stress test results, and to publish the loss rates on groups of loans and portfolios of hypothetical loans and associated loss rates for the most material loan portfolios. In prior stress test results disclosures, the Board has discussed the key drivers of the supervisory stress test results, such as changes in firms' portfolio composition, and the Board intends to continue to consider ways to provide additional information on key drivers of aggregate results as appropriate.

One commenter outlined proposed variables on which to group loan loss rates in the enhanced disclosure. The segments the commenter suggested for corporate loans were generally consistent with those segments the Board provided in the example of disclosure for the corporate loan loss model in the proposal.

C. Disclosure of specific models

Commenters requested more detail on the models used to project pre-provision net revenue (PPNR) and operational-risk losses in the supervisory stress test. Several commenters specifically requested enhanced disclosure of the components of PPNR (i.e., net interest income, noninterest income, and noninterest expense), including additional detail on the structure, characteristics, and variables used to model each component of PPNR. One commenter requested forecasted PPNR metrics by scenario for hypothetical firms.

Commenters also requested that enhanced disclosure be provided for a number of other models, including the models used to project other-than-temporary losses on securities, other comprehensive income, losses associated with the global market shock and associated losses, deferred tax assets, loan loss provisions, the purchase accounting treatment for material business plan changes, and transfer pricing revenues. One commenter requested that the Board release supervisory models used to project losses for previous stress tests.

The Board intends to include in its enhanced model disclosure detailed descriptions of the supervisory models that are currently addressed in the model description appendix of the Board's annual disclosure of supervisory stress test results, including the models used to project PPNR and operational-risk losses. These descriptions would contain the structural form of key model equations and key input variables. Further, the Board intends to publish projections of certain components of PPNR, including net interest income, noninterest income, and noninterest expense, for each covered company in its annual results disclosure.

The detailed disclosure of modeled loss rates similar to the example provided in the proposal requires loan- or security-level data reported to the Board on a regular basis; therefore, such disclosures are not feasible for certain types of models or calculations, such as the calculation of deferred tax assets. The Board intends to publish enhanced modeled loss rate disclosures for the most material loan portfolios over the next several years, starting with two of the most material loan portfolios in 2019. Over time, the Federal Reserve will extend enhanced modeled loss rate disclosures to non-loan portfolios, such as securities. The specific portfolios and the level of detail provided for each portfolio will depend on constraints such as those related to vendor data contracts, where applicable.

Models used in previous years are described in the Board's annual disclosure of supervisory stress test results.

D. Timing of enhanced model disclosure

Some commenters requested that enhanced disclosure be provided in early January of each calendar year. Another commenter asserted that the benefits of a stress test model disclosure are maximized and costs are minimized when disclosure takes place after the stress tests are completed.

Consistent with the proposal, the Board expects to publish details about the models in the first quarter of each calendar year. Specifically, the Board expects to publish enhanced model descriptions for all models and enhanced modeled loss rate disclosures for two of the most material loan models in the first quarter of 2019. In

2020, the Board intends to revise enhanced model descriptions, as appropriate, and to publish enhanced modeled loss rate disclosures for two additional models.

Publication of the supervisory model disclosure prior to the release of the supervisory stress test results will help firms and the public anticipate the extent to which changes in supervisory results may result from changes in the models. In recent years, the Board has increased the information it provides to the public about supervisory models, and has detailed material model changes in an annual letter published in advance of the stress test. The Board believes that the benefits of providing that information in advance of the stress test outweigh the costs of doing so.

By order of the Board of Governors of the Federal Reserve System, February 22, 2019.

Ann Misback,
Secretary of the Board.

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