

**DEPARTMENT OF THE TREASURY**

**Office of the Comptroller of the Currency**

**Docket No. OCC-2011-0011**

**FEDERAL RESERVE SYSTEM**

**OP – 1421**

**FEDERAL DEPOSIT INSURANCE CORPORATION**

**Proposed Guidance on Stress Testing for Banking Organizations with more than \$10 Billion in Total Consolidated Assets.**

**AGENCIES:** Office of the Comptroller of the Currency, Treasury (“OCC”); Board of Governors of the Federal Reserve System (“Board” or “Federal Reserve”); Federal Deposit Insurance Corporation (“FDIC”).

**ACTION:** Proposed joint guidance with request for public comment.

**SUMMARY:** The OCC, Board, and the FDIC (collectively, the “agencies”) request comment on proposed guidance on stress testing (proposed guidance). The proposed joint guidance outlines high-level principles for stress testing practices, applicable to all Federal Reserve-supervised, FDIC-supervised, and OCC-supervised banking organizations with more than \$10 billion in total consolidated assets. The proposed guidance highlights the importance of stress testing as an ongoing risk management practice that supports a banking organization’s forward-looking assessment of its risks.

**DATES:** Comments must be submitted on or before July 29, 2011.

**ADDRESSES:**

OCC:

Please use the title “Proposed Guidance on Stress Testing” to facilitate the organization and distribution of the comments. You may submit comments by any of the following methods:

- **E-mail:** [regs.comments@occ.treas.gov](mailto:regs.comments@occ.treas.gov).

- **Mail:** Office of the Comptroller of the Currency, 250 E Street, S.W., Mail Stop 2-3, Washington, DC 20219.
- **Fax:** (202) 874-5274.
- **Hand Delivery/Courier:** 250 E Street, SW., Mail Stop 2-3, Washington, DC 20219.

*Instructions:* You must include “OCC” as the agency name and “Docket Number OCC-2011-0011” in your comment. In general, OCC will enter all comments received into the docket and publish them on the Regulations.gov Web site without change, including any business or personal information that you provide such as name and address information, e-mail addresses, or phone numbers. Comments received, including attachments and other supporting materials, are part of the public record and subject to public disclosure. Do not enclose any information in your comment or supporting materials that you consider confidential or inappropriate for public disclosure.

You may review comments and other related materials that pertain to this notice by any of the following methods:

- **Viewing Comments Personally:** You may personally inspect and photocopy comments at the OCC, 250 E Street, SW., Washington, DC. For security reasons, the OCC requires that visitors make an appointment to inspect comments. You may do so by calling (202) 874-4700. Upon arrival, visitors will be required to present valid government-issued photo identification and to submit to security screening in order to inspect and photocopy comments.
- **Docket:** You may also view or request available background documents and project summaries using the methods described above.

Board:

When submitting comments, please consider submitting your comments by e-mail or fax because paper mail in the Washington, DC area and at the Board may be subject to delay. You may submit comments, identified by Docket No. OP-1411, by any of the following methods:

- **Agency Web Site:** <http://www.federalreserve.gov>. Follow the instructions for submitting comments at <http://www.federalreserve.gov/generalinfo/foia/ProposedRegs.cfm>.
- **Federal eRulemaking Portal:** <http://www.regulations.gov>. Follow the instructions for submitting comments.
- **E-mail:** [regs.comments@federalreserve.gov](mailto:regs.comments@federalreserve.gov). Include docket number in the subject line of the message.

- **FAX:** (202) 452-3819 or (202) 452-3102.
- **Mail:** Jennifer J. Johnson, Secretary, Board of Governors of the Federal Reserve System, 20th Street and Constitution Avenue, N.W., Washington, DC 20551.

All public comments are available from the Board's website at <http://www.federalreserve.gov/generalinfo/foia/ProposedRegs.cfm> as submitted, unless modified for technical reasons. Accordingly, your comments will not be edited to remove any identifying or contact information. Public comments may also be viewed electronically or in paper form in Room MP-500 of the Board's Martin Building (20th and C Street, N.W., Washington, DC 20551) between 9:00 a.m. and 5:00 p.m. on weekdays.

**FDIC:** You may submit comments by any of the following methods:

- **Agency Web site:** <http://www.FDIC.gov/regulations/laws/federal/propose.html>  
Follow the instructions for submitting comments.
- **Federal eRulemaking Portal:** <http://www.regulations.gov>. Follow the instructions for submitting comments.
- **E-mail:** [comments@FDIC.gov](mailto:comments@FDIC.gov). Include "Stress Testing Guidance" in the subject line of the message. Comments received will be posted without change to <http://www.FDIC.gov/regulations/laws/federal/propose.html>, including any personal information provided.
- **Mail:** Robert E. Feldman, Executive Secretary, Attention: Comments/Legal ESS, Federal Deposit Insurance Corporation, 550 17th Street, N.W., Washington, DC 20429.
- **Hand Delivery/Courier:** Guard station at the rear of the 550 17th Street Building (located on F Street), on business days between 7:00 a.m. and 5:00 p.m. (EDT)

#### **FOR FURTHER INFORMATION CONTACT:**

**OCC:** Robert Scavotto, Lead International Expert, International Analysis and Banking Condition (202) 874-4943, Tanya Smith, NBE, Basel II Program Manager, Large Bank Supervision (202) 874-4464, Akhtarur Siddique, Deputy Director, Enterprise Risk Analysis Division (202) 874-4665, or Jeanette Quick, Attorney, Legislative and Regulatory Activities Division (202) 874-5090, Office of the Comptroller of the Currency, 250 E Street, SW., Washington, DC 20219.

**Board:** Anna Lee Hewko, Assistant Director, Capital and Regulatory Policy (202) 530-6260, or Constance M. Horsley, Manager, Capital and Regulatory Policy (202) 452-5239, David Palmer, Senior Supervisory Analyst, Risk Section, (202) 452-2904, Sviatlana Phelan, Financial Analyst, Capital and Regulatory Policy (202) 912-4306, Division of Banking Supervision and Regulation; or Benjamin W. McDonough, Counsel, (202) 452-

2036, or Dominic A. Labitzky, Senior Attorney, (202) 452-3428, Legal Division, Board of Governors of the Federal Reserve System, 20th and C Streets, NW., Washington, DC 20551.

FDIC: George French, Deputy Director, Policy, (202) 898-3929; Robert Burns, Chief, Exam Support & Analysis Section, (704) 333-3132 x4215; Karl Reitz, Senior Capital Markets Specialist, (202) 898-6775, Division of Risk Management Supervision; or Mark Flanigan, Counsel, (202) 898-7426; Ryan Clougherty, Senior Attorney, (202) 898-3843, Supervision Branch, Legal Division.

## **SUPPLEMENTARY INFORMATION:**

### **I. Background**

All banking organizations should have the capacity to understand their risks and the potential impact of stressful events and circumstances on their financial condition.<sup>1</sup> The U.S. federal banking agencies have previously highlighted the use of stress testing as a means to better understand the range of a banking organization's potential risk exposures.<sup>2</sup> The 2007-2009 financial crisis further underscored the need for banking organizations to incorporate stress testing into their risk management, as banking organizations unprepared for stressful events and circumstances can suffer acute threats to their financial condition and viability. The proposed guidance is intended to be consistent with industry practices and with international supervisory standards.<sup>3</sup>

Building upon previously issued supervisory guidance that discusses the uses and merits of stress testing in specific areas of risk management, the proposed guidance provides an overview of how a banking organization should structure its stress testing

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<sup>1</sup> For purposes of this guidance, the term "banking organization" means national banks and Federal branches and agencies supervised by the OCC; state member banks, bank holding companies, and all other institutions for which the Federal Reserve is the primary federal supervisor; and state nonmember insured banks and other institutions supervised by the FDIC.

<sup>2</sup> See, for example, Supervision and Regulation (SR) letter 10-6 or OCC Bulletin 2010-13 or FDIC FIL-13-2010, "Interagency Policy Statement on Funding and Liquidity Risk Management"; SR 10-1 or OCC Bulletin 2010-1 or FDIC Financial Institution Letter (FIL-2-2010), "Interagency Advisory on Interest Rate Risk"; SR letter 09-04, "Applying Supervisory Guidance and Regulations on the Payment of Dividends, Stock Redemptions, and Stock Repurchases at Bank Holding Companies"; SR letter 07-1, "Interagency Guidance on Concentrations in Commercial Real Estate" or OCC Bulletin 2006-46 or FDIC FIL-104-2006, "Interagency Guidance on CRE Concentration Risk Management"; SR letter 99-18, "Assessing Capital Adequacy in Relation to Risk at Large Banking Organizations and Others with Complex Risk Profiles"; OCC Bulletin 2008-20 or FDIC FIL-71-2008 "Supervisory Guidance: Supervisory Review Process of Capital Adequacy (Pillar 2) Related to the Implementation of the Basel II Advanced Capital Framework"; the Supervisory Capital Assessment Program (see <http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20080715a1.pdf>); and Comprehensive Capital Analysis and Review: Objectives and Overview (see [www.federalreserve.gov/newsevents/press/bcreg/20110318a.htm](http://www.federalreserve.gov/newsevents/press/bcreg/20110318a.htm)).

<sup>3</sup> See "Principles for Sound Stress Testing Practices and Supervision," Basel Committee on Banking Supervision, May 2009.

activities and ensure they fit into overall risk management. The purpose of this guidance is to outline broad principles for a satisfactory stress testing framework and describe the manner in which stress testing should be employed as an integral component of risk management that is applicable at various levels of aggregation within a banking organization, as well as for contributing to capital and liquidity planning. While the guidance is not intended to provide detailed instructions for conducting stress testing for any particular risk or business area, the proposed guidance aims to describe several types of stress testing activities and how they may be most appropriately used by banking organizations. The guidance does not explicitly address the stress testing requirements imposed upon certain companies by section 165(i) of the Dodd-Frank Wall Street Reform and Consumer Protection Act.<sup>4</sup> The Board, FDIC, and OCC expect to implement that provision in a future rulemaking that would be consistent with the principles in the proposed guidance.

## **II. Principal Elements of the Proposed Guidance**

The agencies are issuing this proposed guidance to emphasize the importance of stress testing as an ongoing risk management practice that supports banking organizations' forward-looking assessment of risks and better equips them to address a range of adverse outcomes. The proposed joint guidance is applicable to all banking organizations supervised by the agencies with more than \$10 billion in total consolidated assets. Specifically, with respect to the OCC, these banking organizations would include national banking associations and Federal branches and agencies; with respect to the Board, these banking organizations would include state member banks, bank holding companies, and all other institutions for which the Federal Reserve is the primary federal supervisor; with respect to the FDIC, these banking organizations would include state nonmember insured banks or insured branches of foreign banks. A banking organization should develop and implement its stress testing framework in a manner commensurate with its size, complexity, business activities, and overall risk profile.

The uses of a banking organization's stress testing framework should include, but are not limited to, augmenting risk identification and measurement; estimating business line revenues and losses and informing business line strategies; identifying vulnerabilities and assessing their potential impact; assessing capital adequacy and enhancing capital planning; assessing liquidity adequacy and informing contingency funding plans; contributing to strategic planning; enabling senior management to better integrate strategy, risk management, and capital and liquidity planning decisions; and assisting with recovery planning.

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<sup>4</sup> Pub. L. No. 111-203, 124 Stat. 1376. Section 165(i) of the Dodd-Frank Act is codified at 12 U.S.C. 5365(i).

### *A. Stress Testing Principles*

Principle 1: A banking organization's stress testing framework should include activities and exercises that are tailored to and sufficiently capture the banking organization's exposures, activities, and risks.

An effective stress testing framework covers a banking organization's full set of material activities, exposures, and risks, whether on or off the balance sheet. An effective stress testing framework should be applied at various levels in the banking organization, such as business line, portfolio, and risk type, as well as on an enterprise-wide basis. Each stress test should be tailored to the relevant level of aggregation, capturing critical risk drivers, internal and external influences, and other key considerations at the relevant level. Stress testing should capture the interplay among different exposures, activities, and risks and their combined effects. Scenarios used in a banking organization's stress tests should be relevant to the direction and strategy set by its board of directors.

Principle 2: An effective stress testing framework employs multiple conceptually sound stress testing activities and approaches.

Banking organizations should use multiple stress testing activities and approaches and ensure that each is conceptually sound. Stress tests usually vary in design and complexity, including the number of factors employed and the degree of stress applied. Effective stress testing relies on high-quality input data and information to produce credible outcomes. A banking organization should document the assumptions used in its stress tests and note the degree of uncertainty that may be incorporated into the tools used for stress testing. Furthermore, almost all stress tests, including well-developed quantitative tests supported by high-quality data, employ a certain amount of expert or business judgment that should be made transparent to users of stress test results.

Principle 3: An effective stress testing framework is forward-looking and flexible.

A stress testing framework should be sufficiently dynamic and flexible to incorporate changes in a banking organization's on- and off-balance-sheet activities, portfolio composition, asset quality, operating environment, business strategy, and other risks that may arise. While stress testing should utilize available historical information, a banking organization should look beyond assumptions based only on historical data and challenge conventional assumptions. A banking organization should carefully consider the incremental and cumulative effects of stress conditions. In addition to conducting formal, routine stress tests, a banking organization should have the flexibility to conduct new or ad hoc stress tests in a timely manner to address rapidly emerging risks. A banking organization should continue updating and maintaining its stress testing framework in light of new risks, better understanding of the banking organization's exposures and activities, and any changes in its operating structure and environment.

Principle 4: Stress test results should be clear, actionable, well supported, and inform decision-making.

Stress testing should incorporate measures that adequately and effectively convey the results of its tests. In addition, all stress test results should be accompanied by descriptive and qualitative information (such as key assumptions and limitations) to allow users to interpret the exercises in context. A banking organization should regularly communicate stress test results to appropriate levels within the banking organization to foster dialogue around stress testing, keep management and staff apprised, and to inform stress testing approaches, results, and decisions in other areas of the banking organization. In addition, management should review stress testing activities on a regular basis to determine, among other things, the validity of the assumptions, the severity of scenarios and sensitivity tests, the robustness of the estimates, the performance of any underlying models, and the stability and reasonableness of the results. Finally, stress test results should inform a banking organization's analysis and decision-making.

### *B. Stress Testing Approaches and Applications*

The proposed guidance describes certain stress testing approaches and applications – scenario analysis, sensitivity analysis, enterprise-wide testing, and reverse stress testing – that a banking organization should strongly consider using within its stress testing framework, as appropriate. Each banking organization should apply these approaches and applications commensurate with its size, complexity, and business profile, and may not need to incorporate all of the details described in the proposed guidance.

#### Scenario analysis

Scenario analysis refers to a type of stress testing in which a banking organization applies historical or hypothetical scenarios to assess the impact of various events and circumstances, including extreme ones. Scenarios usually involve some kind of coherent, logical narrative or “story” as to why certain events and circumstances are occurring and in which combination and order they occur, such as a severe recession, failure of a major counterparty, loss of major clients, natural or man-made disaster, localized economic downturn, or a sudden change in interest rates brought about by unfavorable inflation developments. Stress scenarios should reflect a banking organization's unique vulnerabilities to factors that affect its exposures, activities, and risks.

#### Sensitivity analysis

Sensitivity analysis refers to a banking organization's assessment of its exposures, activities, and risks when certain variables, parameters, and inputs are “stressed” or “shocked.” Generally, sensitivity analysis differs from scenario analysis in that it involves changing variables, parameters, or inputs without an explicit underlying reason or narrative, in order to explore what occurs under a range of inputs and at extreme or highly adverse levels. Sensitivity analysis can also help to assess the combined impact on a banking organization of several variables, parameters, factors, or drivers.

#### Enterprise-wide stress testing

Enterprise-wide stress testing involves assessing the impact of certain specified scenarios on the banking organization as a whole, particularly on capital and liquidity. As is the case with scenario analysis more generally, enterprise-wide stress testing involves robust scenario design and effective translation of scenarios into measures of impact. Enterprise-wide stress tests can help a banking organization in its efforts to assess the impact of its full set of risks under adverse events and circumstances, but should be supplemented with other stress tests and other risk measurement tools given inherent limitations in capturing all risks and all adverse outcomes. Selection of scenario variables is important for enterprise-wide tests, because they generally serve as the link between the overall narrative of the scenario and tangible impact on the banking organization as a whole. For an enterprise-wide test, assumptions across business lines and risk areas should remain constant for the chosen scenario, since the objective is to see how the banking organization as a whole responds to a common outcome.

### Reverse stress testing

Reverse stress testing is a tool that allows a banking organization to assume a known adverse outcome, such as suffering a credit loss that breaches regulatory capital ratios or suffering severe liquidity constraints making it unable to meet its obligations, and then deduce the types of events that could lead to such an outcome. This type of stress testing may help a banking organization to consider scenarios beyond its normal business expectations and see the impact of severe systemic effects on the banking organization. It also allows a banking organization to challenge common assumptions about its performance and expected mitigation strategies. Reverse stress testing helps a banking organization evaluate the combined effect of several types of extreme events and circumstances that might threaten the survival of the banking organization, even if in isolation each of the effects might be manageable.

### *C. Stress Testing for Assessing Adequacy of Capital and Liquidity*

Given the importance of capital and liquidity to a banking organization's viability, stress testing should be applied to these two areas on a regular basis. Stress testing for capital and liquidity adequacy should be conducted in coordination with a banking organization's overall strategy and annual and planning cycles. Results should be refreshed in the event of major strategic decisions, or other decisions that can materially impact capital or liquidity. Banking organizations should conduct stress testing for capital and liquidity adequacy periodically.

Capital stress testing supplements a banking organization's regulatory capital analysis by providing a forward-looking assessment of capital adequacy, usually with a forecast horizon of at least two years, and highlighting the potential adverse effects on capital levels and ratios of risks not fully captured in regulatory capital requirements.<sup>5</sup> Stress testing can aid capital contingency planning by helping management identify exposures or risks that would need to be reduced and actions that could be taken to

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<sup>5</sup> The portions of the proposed guidance that discuss stress testing for capital adequacy do not apply to U.S. branches and agencies of foreign banking organizations.



bolster capital levels or otherwise maintain capital adequacy, as well as actions that in times of stress might not be possible – such as raising capital.

Using liquidity stress testing, a banking organization can work to identify vulnerabilities related to liquidity adequacy in light of both firm-specific and market-wide stress events and circumstances.<sup>6</sup> Effective stress testing helps a banking organization identify and quantify the depth, source, and degree of potential liquidity strain and to analyze possible impacts on its cash flows, liquidity position, profitability, and other aspects of its financial condition over various time horizons. These tests also help determine whether the banking organization has a sufficient liquidity buffer to meet various types of future liquidity demands. In this regard, liquidity stress testing should be an integral part of the development and maintenance of a banking organization's contingency funding planning.

An effective stress testing framework should explore the potential for capital and liquidity problems to arise at the same time or exacerbate one another. A banking organization's liquidity stress analysis should explore situations in which the banking organization may be operating with a capital position that exceeds regulatory minimums, but is nonetheless viewed within the financial markets or by its counterparties as being of questionable viability. For its capital and liquidity stress tests, a banking organization should articulate clearly its objectives for a post-stress outcome, for instance to remain a viable financial market participant that is able to meet its existing and prospective obligations and commitments.

#### *D. Governance over the Stress Testing Framework*

Similar to other aspects of its risk management, a banking organization's stress testing framework will be effective only if it is subject to strong governance and controls to ensure that the framework is functioning as intended. Strong governance and controls also help ensure that the framework contains core elements, from clearly defined stress testing objectives to recommended actions. Importantly, strong governance provides critical review of elements of the stress testing framework, especially regarding key assumptions, uncertainties, and limitations. A banking organization should ensure that the stress testing framework is not isolated within a banking organization's risk management function, but is firmly integrated into business lines, capital and asset-liability committees, and other decision-making bodies.

The results of stress testing analyses should facilitate decision-making by the board and senior management. Stress testing results should be used to inform the board about alignment of the banking organization's risk profile with the board's chosen risk appetite, as well as inform operating and strategic decisions. Stress testing results should be considered directly by the board and senior management for decisions relating to capital and liquidity adequacy. The board and senior management should ensure that the stress testing framework includes a sufficient range of stress testing activities applied at

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<sup>6</sup> See SR letter 10-6, SR letter 10-1; OCC Bulletin 2010-13, OCC Bulletin 2010-1; FDIC FIL 13-2010 and FIL 2-2010.

the appropriate levels of the banking organization (i.e., not just one enterprise-wide stress test).

### **III. Request for Comment**

The agencies invite comment on all aspects of the proposed guidance. More specifically, what, if any, additional elements or aspects of an effective stress testing framework should the agencies consider including in this guidance? What additional approaches and applications of stress testing have been found to be particularly useful aside from those included in the proposed guidance? What challenges, if any, exist in applying this guidance generally or at particular banking organizations and why? Are there any terms described by the proposed guidance that require further clarification and how should they be defined?

### **IV. Administrative Law Matters**

#### *A. Paperwork Reduction Act Analysis*

In accordance with the Paperwork Reduction Act (“PRA”) of 1995 (44 U.S.C. 3506; 5 CFR Part 1320 Appendix A.1), the agencies reviewed the proposed guidance. The agencies may not conduct or sponsor, and an organization is not required to respond to, an information collection unless the information collection displays a currently valid OMB control number. The agencies have determined that certain aspects of the proposed guidance may constitute a collection of information. In particular, these aspects are the provisions that state a banking organization should (i) have a stress testing framework that includes clearly defined objectives, well-designed scenarios tailored to the banking organization’s business and risks, well-documented assumptions, conceptually sound methodologies to assess potential impact on the banking organization’s financial condition, informative management reports, and recommended actions based on stress test results and (ii) have policies and procedures for a stress testing framework. The agencies estimate that the above-described information collections included in the proposed guidance would take respondents, on average, 260 hours each year. The frequency of information collection is estimated to be annual. Respondents are banking organizations with more than \$10 billion in total consolidated assets, as defined in the guidance

OCC:

Respondents: 50.

Estimated annual burden: 13,000 hours.

Board:

Respondents: 120.

Estimated annual burden: 31,200 hours.

FDIC:

Respondents: 22.

Estimated annual burden: 5,060 hours.

**OCC:** For purposes of the PRA, this information collection will be titled Recordkeeping and Disclosure Provisions Associated with Stress Testing Guidance.

This information collection is authorized pursuant to the National Bank Act, (12 U.S.C. 1 *et seq.*; 12 U.S.C. 161) and the International Banking Act (12 U.S.C. 3101 *et seq.*). The OCC expects to review the policies and procedures for stress testing as part of its supervisory process. To the extent the OCC collects information during an examination of a banking organization, confidential treatment may be afforded to the records under exemption 8 of the Freedom of Information Act (“FOIA”), 5 U.S.C. 552(b)(8).

Comments should also be sent to the Communications Division, Office of the Comptroller of the Currency, Mailstop 2-3, Attention: 1557-NEW, 250 E Street, S.W., Washington, DC 20219. In addition, comments may be sent by fax to (202) 874-5274 or by electronic mail to [regs.comments@occ.treas.gov](mailto:regs.comments@occ.treas.gov). You may personally inspect and photocopy comments at the OCC, 250 E Street, S.W., Washington, DC 20219. For security reasons, the OCC requires that visitors make an appointment to inspect comments. You may do so by calling (202) 874-4700. Upon arrival, visitors will be required to present valid government-issued photo identification and to submit to security screening in order to inspect and photocopy comments. Additionally, please send a copy of your comments by mail to: OCC Desk Officer, 1557-NEW, U.S. Office of Management and Budget, 725 17th Street, N.W., #10235, Washington, DC 20503, or by fax to (202) 395-6974. For further information or to request a copy of the OCC’s collection, please contact Mary H. Gottlieb, OCC Clearance Officer, (202) 874-5090, Legislative and Regulatory Activities Division, OCC, 250 E Street, S.W., Washington, DC 20219.

**Board:** For purposes of the PRA, this information collection will be titled Recordkeeping and Disclosure Provisions Associated with Stress Testing Guidance. The agency form number for the collection is FR 4202. The agency control number for this new collection will be assigned by OMB.

This information collection is authorized pursuant to sections 11(a), 11(i), 25, and 25A of the Federal Reserve Act (12 U.S.C. 248(a), 248(i), 602, and 611), section 5 of the Bank Holding Company Act (12 U.S.C. 1844), and section 7(c) of the International Banking Act (12 U.S.C. 3105(c)). The Board expects to review the policies and procedures for stress testing as part of the Board’s supervisory process. To the extent the

Board collects information during an examination of a banking organization, confidential treatment may be afforded to the records under exemption 8 of the Freedom of Information Act (“FOIA”), 5 U.S.C. 552(b)(8).

Comments on the collection of information should be sent to Cynthia Ayouch, Acting Federal Reserve Board Clearance Officer, Division of Research and Statistics, Mail Stop 95–A, Board of Governors of the Federal Reserve System, Washington, DC 20551, with copies of such comments sent to the Office of Management and Budget, Paperwork Reduction Project (Docket No. OP-1374), Washington, DC 20503.

Comments are invited on:

(1) Whether the proposed collection of information is necessary for the proper performance of the Federal Reserve’s functions; including whether the information has practical utility;

(2) The accuracy of the Federal Reserve’s estimate of the burden of the proposed information collection, including the cost of compliance;

(3) Ways to enhance the quality, utility, and clarity of the information to be collected; and

(4) Ways to minimize the burden of information collection on respondents, including through the use of automated collection techniques or other forms of information technology.

FDIC: You may submit comments by any of the following methods:

- **Agency Web site:** <http://www.FDIC.gov/regulations/laws/federal/propose.html>  
Follow the instructions for submitting comments.
- **Federal eRulemaking Portal:** <http://www.regulations.gov>. Follow the instructions for submitting comments.
- **E-mail:** [comments@FDIC.gov](mailto:comments@FDIC.gov). Include “Stress Testing Guidance” in the subject line of the message. Comments received will be posted without change to <http://www.FDIC.gov/regulations/laws/federal/propose.html>, including any personal information provided.
- **Mail:** Robert E. Feldman, Executive Secretary, Attention: Comments/Legal ESS, Federal Deposit Insurance Corporation, 550 17th Street, N.W., Washington, DC 20429.
- **Hand Delivery/Courier:** Guard station at the rear of the 550 17th Street Building (located on F Street), on business days between 7:00 a.m. and 5:00 p.m. (EDT)

Comments are invited on:

(1) Whether the proposed collection of information is necessary for the proper performance of the Federal Reserve's functions; including whether the information has practical utility;

(2) The accuracy of the agencies' estimate of the burden of the proposed information collection, including the cost of compliance;

(3) Ways to enhance the quality, utility, and clarity of the information to be collected; and

(4) Ways to minimize the burden of information collection on respondents, including through the use of automated collection techniques or other forms of information technology.

### *B. Regulatory Flexibility Act Analysis*

#### Board:

While the guidance is not being adopted as a rule, the Board has considered the potential impact of the proposed guidance on small banking organizations in accordance with the Regulatory Flexibility Act (5 U.S.C. 603(b)). For the reason discussed in the Supplementary Information above, the Board is issuing the proposed guidance to emphasize the importance of stress testing as an ongoing risk management practice to support a banking organization's forward-looking assessment of risks in order to better equip such organization to address a range of adverse outcomes. The guidance provides an overview of how a banking organization should structure its stress testing activities to ensure they fit into the organization's overall risk management program. The guidance outlines broad principles for a satisfactory stress testing framework, and describes the manner in which a banking organization should employ stress testing as an integral component of risk management. Based on its analysis and for the reasons stated below, the Board believes that the proposed guidance will not have a significant economic impact on a substantial number of small entities. Nevertheless, the Board is publishing an initial regulatory flexibility analysis, and seeking comment on whether the proposed guidance would impose undue burdens on, or have unintended consequences for, small organizations.

Under regulations issued by the Small Business Administration ("SBA"), a small banking organization is defined as a banking organization with total assets of \$175 million or less. See 13 CFR 121.201. The guidance being proposed by the Board is intended for banking organizations supervised by the agencies with more than \$10 billion in total assets, including state member banks, bank holding companies, and U.S. branches and agencies of foreign banking organizations. Banking organizations that are subject to the proposed guidance therefore substantially exceed the \$175 million total asset threshold at which a banking organization is considered a small banking organization under SBA regulations.

In light of the foregoing, the Board does not believe that the proposed guidance, if adopted in final form, would have a significant economic impact on a substantial number

of small entities. As noted above, the Board specifically seeks comment on whether the proposed guidance would impose undue burdens on, or have unintended consequences for, small organizations and whether there are ways such potential burdens or consequences could be addressed in a manner consistent with the guidance.

#### **V. Proposed guidance**

The text of the proposed guidance is as follows:

Office of the Comptroller of the Currency

Federal Reserve System

Federal Deposit Insurance Corporation

Guidance on Stress Testing for Banking Organizations  
With Total Consolidated Assets of more than \$10 Billion

*I. Introduction*

All banking organizations should have the capacity to understand fully their risks and the potential impact of stressful events and circumstances on their financial condition. The U.S. federal banking agencies have previously highlighted the use of stress testing as a means to better understand the range of a banking organization's potential risk exposures.<sup>1</sup> The 2007-2009 financial crisis further underscored the need for banking organizations to incorporate stress testing into their risk management practices, demonstrating that banking organizations unprepared for stressful events and circumstances can suffer acute threats to their financial condition and viability.<sup>2</sup> The Federal Reserve, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation (collectively, the "agencies") are issuing this guidance to emphasize the importance of stress testing as an ongoing risk management practice that supports banking organizations' forward-looking assessment of risks and better equips them to address a range of adverse outcomes. This proposed joint guidance is applicable to all institutions supervised by the agencies with more than \$10 billion in total consolidated assets. Specifically, with respect to the OCC, these banking organizations would include national banking associations and Federal branches and agencies; with respect to the Board, these banking organizations would include state member banks, bank holding companies, and all other institutions for which the Federal Reserve is the primary federal supervisor; with respect to the FDIC, these banking organizations would include state nonmember insured banks or insured branches of foreign banks.

Building upon previously issued supervisory guidance that discusses the uses and merits of stress testing in specific areas of risk management, this guidance provides an overview of how

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<sup>1</sup> See, for example, Supervision and Regulation (SR) letter 10-6 or OCC Bulletin 2010-13 or FDIC FIL-13-2010, "Interagency Policy Statement on Funding and Liquidity Risk Management"; SR 10-1 or OCC Bulletin 2010-1 or FDIC FIL-2-2010, "Interagency Advisory on Interest Rate Risk"; SR letter 09-04, "Applying Supervisory Guidance and Regulations on the Payment of Dividends, Stock Redemptions, and Stock Repurchases at Bank Holding Companies"; SR letter 07-1, "Interagency Guidance on Concentrations in Commercial Real Estate" or OCC Bulletin 2006-46 or FDIC FIL-104-2006, "Interagency Guidance on CRE Concentration Risk Management"; SR letter 99-18, "Assessing Capital Adequacy in Relation to Risk at Large Banking Organizations and Others with Complex Risk Profiles"; OCC Bulletin 2008-20 or FDIC FIL-71-2008 "Supervisory Guidance: Supervisory Review Process of Capital Adequacy (Pillar 2) Related to the Implementation of the Basel II Advanced Capital Framework"; the Supervisory Capital Assessment Program (see <http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20080715a1.pdf>) ; and Comprehensive Capital Analysis and Review: Objectives and Overview (see [www.federalreserve.gov/newsevents/press/bcreg/20110318a.htm](http://www.federalreserve.gov/newsevents/press/bcreg/20110318a.htm)).

<sup>2</sup> Moreover, the Dodd-Frank Wall Street Reform and Consumer Protection Act (Pub. L. No. 111-203, 124 Stat. 1376) requires financial organizations with more than \$10 billion in total consolidated assets to conduct a stress test at least annually. See generally 12 U.S.C. 5365(i)(2).

a banking organization should structure its stress testing activities and ensure they fit into overall risk management. The guidance outlines broad principles for a satisfactory stress testing framework and describes the manner in which stress testing should be employed as an integral component of risk management that is applicable at various levels of aggregation within a banking organization, as well as for contributing to capital and liquidity planning. While the guidance is not intended to provide detailed instructions for conducting stress testing for any particular risk or business area, the document describes several types of stress testing activities and how they may be most appropriately used by banking organizations.

## *II. Overview of stress testing framework*

For purposes of this guidance, stress testing refers to exercises used to conduct a forward-looking assessment of the potential impact of various adverse events and circumstances on a banking organization. Stress testing occurs at various levels of aggregation, including on an enterprise-wide basis. As outlined in section IV, there are several approaches and applications for stress testing and a banking organization should consider the use of each in its stress testing framework.

An effective stress testing framework provides a comprehensive, integrated, and forward-looking set of activities for a banking organization to employ along with other practices in order to assist in the identification and measurement of its material risks and vulnerabilities, including those that may only manifest themselves during stressful economic or financial environments, or arise from firm-specific adverse events. Such a framework should supplement other quantitative risk management practices, such as those that rely primarily on statistical estimates of risk or loss estimates based on historical data, as well as qualitative practices. In this manner, stress testing can assist in highlighting unidentified or under-assessed risk concentrations and interrelationships and their potential impact on the banking organization during times of stress.<sup>3</sup>

A banking organization should develop and implement its stress testing framework in a manner commensurate with its size, complexity, business activities, and overall risk profile. Its stress testing framework should include clearly defined objectives, well-designed scenarios tailored to the banking organization's business and risks, well-documented assumptions, sound methodologies to assess potential impact on the banking organization's financial condition, informative management reports, ongoing and effective review of stress testing processes, and recommended actions based on stress test results. Stress testing should incorporate the use of high-quality data to ensure that the outputs are sufficiently credible to support decision-making. Importantly, a banking organization should have a sound governance and control infrastructure with objective, critical review to ensure the stress testing framework is functioning as intended.

A stress testing framework should allow a banking organization to conduct consistent, repeatable exercises that focus on its material risks, exposures, activities, and strategies, and also conduct ad hoc scenarios as needed. The framework should consider the impact of both firm-specific and systemic stress events and circumstances that are based on historical experience as well as on hypothetical occurrences that could have an adverse impact on a banking

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<sup>3</sup> For purposes of this guidance, the term "concentrations" refers to groups of exposures and/or activities that have the potential to produce losses large enough to bring about a material change in a banking organization's risk profile or financial condition.



organization's operations and financial condition. Banking organizations subject to this guidance should formally review and assess the effectiveness of their stress testing frameworks at least once per year.

### *III. General stress testing principles*

A banking organization should develop and implement an effective stress testing framework as part of its broader risk management and governance processes. The framework should include several activities and exercises, and not just rely on any single test or type of test, since every stress test has limitations and relies on certain assumptions.

The uses of a banking organization's stress testing framework should include, but are not limited to, augmenting risk identification and measurement; estimating business line revenues and losses and informing business line strategies; identifying vulnerabilities and assessing their potential impact; assessing capital adequacy and enhancing capital planning; assessing liquidity adequacy and informing contingency funding plans; contributing to strategic planning; enabling senior management to better integrate strategy, risk management, and capital and liquidity planning decisions; and assisting with recovery planning. This section describes general principles that a banking organization should apply in implementing such a framework.

Principle 1: A banking organization's stress testing framework should include activities and exercises that are tailored to and sufficiently capture the banking organization's exposures, activities, and risks.

An effective stress testing framework covers a banking organization's full set of material activities, exposures, and risks, whether on or off the balance sheet. The framework should also address non-contractual sources of risks, such as those related to a banking organization's reputation. Appropriate coverage is important as stress test results could give a false sense of comfort if certain portfolios, exposures, or business line activities are not captured. Stress testing exercises should be part of a banking organization's regular risk identification and measurement activities. For example, in assessing credit risk a banking organization should evaluate the potential impact of adverse outcomes, such as an economic downturn or declining asset values, on the condition of its borrowers and counterparties, and on the value of any supporting collateral. As another example, in assessing interest-rate risk, banking organizations should analyze the effects of significant interest rate shocks or other yield-curve movements.

An effective stress testing framework should be applied at various levels in the banking organization, such as business line, portfolio, and risk type, as well as on an enterprise-wide basis. In many cases, stress testing may be more effective at business line and portfolio levels, as a higher level of aggregation may cloud or underestimate the potential impact of adverse outcomes on a banking organization's financial condition. In some cases, stress testing can also be applied to individual exposures or instruments. Each stress test should be tailored to the relevant level of aggregation, capturing critical risk drivers, internal and external influences, and other key considerations at the relevant level.

Stress testing should capture the interplay among different exposures, activities, and risks and their combined effects. While stress testing several types of risks or business lines

simultaneously may prove operationally challenging, a banking organization should aim to identify common risk drivers across risk types and business lines that can adversely affect its financial condition. Accordingly, stress tests should provide a banking organization with the ability to identify potential concentrations – including those that may not be readily observable during benign periods and whose sensitivity to a common set of factors is apparent only during times of stress – and to assess the impact of identified concentrations of exposures, activities, and risks within and across portfolios and business lines.

Stress testing should be tailored to the banking organization’s idiosyncrasies and specific business mix and include all major business lines and significant individual counterparties. For example, a banking organization that is geographically concentrated may determine that a certain segment of its business may be more adversely affected by shocks to economic activity at the state or local level than by a severe national recession. On the other hand, if the banking organization has significant global operations, it should consider scenarios that have an international component and stress conditions that could affect the different aspects of its operations in different ways, as well as conditions that could adversely affect all of its operations at the same time.

A banking organization should use its stress testing framework to determine whether exposures, activities, and risks are aligned with the banking organization’s risk appetite.<sup>4</sup> A banking organization can use stress testing to help inform decisions about its strategic direction and/or risk appetite by better understanding the risks of its exposures or of engaging in certain business practices. For example, if a banking organization pursues a business strategy for a new or modified product, and the banking organization does not have long-standing experience with that product or lacks extensive data, the banking organization can use stress testing to identify the product’s potential downsides and unanticipated risks. Scenarios used in a banking organization’s stress tests should be relevant to the direction and strategy set by its board of directors, as well as sufficiently severe to be credible to internal and external stakeholders.

Principle 2: An effective stress testing framework employs multiple conceptually sound stress testing activities and approaches.

All estimates of risk, including stress tests, have an element of uncertainty due to assumptions, limitations, and other factors associated with using past performance measures and forward-looking estimates. Banking organizations should, therefore, use multiple stress testing activities and approaches (consistent with section IV), and ensure that each is conceptually sound. Stress tests usually vary in design and complexity, including the number of factors employed and the degree of stress applied. A banking organization should ensure that the complexity of any given test does not undermine its integrity, usefulness, or clarity. In many cases, relatively simple tests can be very useful and informative.

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<sup>4</sup> For purposes of this guidance, risk appetite is defined as the level and type of risk an organization is able and willing to assume in its exposures and business activities, given its business objectives and obligations to stakeholders. See Senior Supervisors Group report, “Observations on Developments in Risk Appetite Frameworks and IT Infrastructure,” December 2010 (see <http://www.newyorkfed.org/newsevents/news/banking/2010/an101223.pdf>).

Additionally, effective stress testing relies on high-quality input data and information to produce credible outcomes. A banking organization should ensure that it has readily available data and other information for the types of stress tests it uses, including key variables that drive performance. In addition, a banking organization should have appropriate management information systems (MIS) and data processes that enable it to collect, sort, aggregate, and update data and other information efficiently and reliably within business lines and across the banking organization for use in stress testing. If certain data and information are not current or not available, a banking organization should analyze the stress test outputs with an understanding of those data limitations.

A banking organization should also document the assumptions used in its stress tests and note the degree of uncertainty that may be incorporated into the tools used for stress testing. In some cases, it may be appropriate to present and analyze test results not just in terms of point estimates, but also including the potential margin of error or statistical uncertainty around the estimates. Furthermore, almost all stress tests, including well-developed quantitative tests supported by high-quality data, employ a certain amount of expert or business judgment; the role and impact of such judgment should be clearly documented. In some cases, when credible data are lacking and more quantitative tests are operationally challenging or in the early stages of development, a banking organization may choose to employ more qualitatively based tests, provided that the tests are properly documented and their assumptions are transparent. Regardless of the type of stress tests used, a banking organization should understand and clearly document all assumptions, uncertainties, and limitations, and provide that information to users of the stress testing results.

Principle 3: An effective stress testing framework is forward-looking and flexible.

A stress testing framework should be sufficiently dynamic and flexible to incorporate changes in a banking organization's on- and off-balance-sheet activities, portfolio composition, asset quality, operating environment, business strategy, and other risks that may arise over time from firm-specific events, macroeconomic and financial market developments, or some combination of these events. A banking organization should also ensure that its MIS are capable of incorporating relatively rapid changes in exposures, activities, and risks.

While stress testing should utilize available historical information, a banking organization should look beyond assumptions based only on historical data and challenge conventional assumptions. A banking organization should ensure that it is not constrained by past experience and that it considers a multiple scenarios, even scenarios that have not occurred in the recent past or during the banking organization's history. For example, a banking organization should not assume that if it has suffered no or minimal losses in a certain business line or product that such a pattern will continue. Structural changes in customer, product, and financial markets can present unprecedented situations for a banking organization. A banking organization with any type of significant concentration can be particularly vulnerable to rapid changes in economic and financial conditions and should try to identify and better understand the impact of those vulnerabilities in advance. For example, the risks related to residential mortgages were underestimated for a number of years by a large number of banking organizations, and those risks eventually affected the banking organizations in a variety of ways. Effective stress testing

can help a banking organization identify any such concentrations and help understand the potential impact of several key aspects of the business being exposed to common drivers.

Stress testing should be conducted over various relevant time horizons to adequately capture both conditions that may materialize in the near term and adverse situations that take longer to develop. For example, when a banking organization stress tests a portfolio for market and credit risks simultaneously, it should consider that certain credit risk losses may take longer to materialize than market risk losses, and also that the severity and speed of mark-to-market losses may create significant vulnerabilities for the firm, even if a more fundamental analysis of how realized losses may play out over time seems to show less threatening results. A banking organization should carefully consider the incremental and cumulative effects of stress conditions, particularly with respect to potential interactions among exposures, activities, and risks and possible second-order or “knock-on” effects.

In addition to conducting formal, routine stress tests, a banking organization should have the flexibility to conduct new or ad hoc stress tests in a timely manner to address rapidly emerging risks. These less routine tests usually can be conducted in a short amount of time and may be simpler and less extensive than a banking organization’s more formal, regular tests. However, for its ad hoc tests, a banking organization should still have the capacity to bring together approximated information on risks, exposures, and activities and assess their impact.

More broadly, a banking organization should continue updating and maintaining its stress testing framework in light of new risks, better understanding of the banking organization’s exposures and activities, new stress testing techniques, and any changes in its operating structure and environment. A banking organization’s stress testing development should be iterative, with ongoing adjustments and refinements to better calibrate the tests to provide current and relevant information. Banking organizations should document the ongoing development of their stress testing practices.

Principle 4: Stress test results should be clear, actionable, well supported, and inform decision-making.

Stress testing should incorporate measures that adequately and effectively convey results of the impact of adverse outcomes. Such measures may include, for example, changes to asset values, accounting and economic profit and loss, revenue streams, liquidity levels, cash flows, regulatory capital, risk-weighted assets, loan loss provisions, internal capital estimates, levels of problem assets, breaches in covenants or key trigger levels, or other relevant measures. Stress test measures should be tailored to the type of test and the particular level at which the test is applied (for example, at the business line or risk level). Some stress tests may require using a range of measures to evaluate the full impact of certain events, such as a severe systemic event. In addition, all stress test results should be accompanied by descriptive and qualitative information (such as key assumptions and limitations) to allow users to interpret the exercises in context. The analysis and the process should be well documented so that stress testing processes can be replicated if need be.

A banking organization should regularly communicate stress test results to appropriate levels within the banking organization to foster dialogue around stress testing, to keep the board

of directors, management, and staff apprised, and to inform stress testing approaches, results, and decisions in other areas of the banking organization. A banking organization should maintain an internal summary of test results to document at a high level the range of its stress testing activities and outcomes, as well as proposed follow-up actions. In addition, management should review stress testing activities on a regular basis to determine, among other things, the validity of the assumptions, the severity of tests, the robustness of the estimates, the performance of any underlying models, and the stability and reasonableness of the results.

Stress test results should inform analysis and decision-making related to business strategies, limits, risk profile, and other aspects of risk management, consistent with the banking organization's established risk appetite. A banking organization should review the results of its various stress tests with the strengths and limitations of each test in mind (consistent with Principle 2), determine which results should be given greater or lesser weight, analyze the combined impact of its tests, and then evaluate potential courses of action based on that analysis. A banking organization may decide to maintain its current course based on test results; indeed, the results of highly severe stress tests need not always indicate that immediate action has to be taken. Wherever possible, tools such as benchmarking or other comparative analysis should be used to evaluate the stress testing results relative to other tools and measures, both internal and external to the banking organization, to provide proper context and a check on results.

#### *IV. Stress testing approaches and applications*

This section discusses some general types of stress testing approaches and applications. For any type of stress test, banking organizations should indicate the specific purpose and the focus of the test. Defining the scope of a given stress test is also important, whether it applies at the portfolio, business line, risk type, or enterprise-wide level, or even just for an individual exposure. Based on the purpose and scope of the test, different stress testing techniques are most useful. Thus, a banking organization should employ several stress testing approaches and applications, as needed. Among them should be approaches or applications such as scenario analysis, sensitivity analysis, enterprise-wide stress testing, and reverse stress testing. Consistent with Principle 1, banking organizations should apply these commensurate with their size, complexity, and business profile, and may not need to incorporate all of the details described below. Consistent with Principle 3, banking organizations should also recognize that stress testing approaches will evolve over time and they should update their practices as needed.

##### Scenario analysis

Scenario analysis refers to a type of stress testing in which a banking organization applies historical or hypothetical scenarios to assess the impact of various events and circumstances, including extreme ones. Scenarios usually involve some kind of coherent, logical narrative or "story" as to why certain events and circumstances are occurring and in which combination and order, such as a severe recession, failure of a major counterparty, loss of major clients, natural or man-made disaster, localized economic downturn, or a sudden change in interest rates brought about by unfavorable inflation developments. Scenario analysis can be applied at various levels of the banking organization, such as within individual business lines to help identify factors that could harm those business lines most.

Stress scenarios should reflect a banking organization's unique vulnerabilities to factors that affect its exposures, activities, and risks. For example, if a banking organization is concentrated in a particular line of business, such as commercial real estate or residential mortgage lending, it would be appropriate to explore the impact of a downturn in those particular market segments. Similarly, a banking organization with lending concentrations to oil and gas companies should include scenarios related to the energy sector. Other relevant factors to be considered in scenario analysis relate to reputational and legal risks to a banking organization, such as an existing major lawsuit, potential litigation, or a situation when a banking organization feels compelled to provide support to an affiliate or provide other types of non-contractual support to avoid reputational damage. Scenarios should be internally consistent and portray realistic outcomes based on underlying relationships among variables, and should include only those mitigating developments that are consistent with the scenario. Additionally, a banking organization should consider the best manner to try to capture combinations of stressful events and circumstances, including second-order and "knock-on" effects. Ultimately, a banking organization should select and design multiple scenarios that are relevant to its profile and make intuitive sense, use enough scenarios to explore the range of potential outcomes, and ensure that the scenarios continue to be timely.

A banking organization may apply scenario analysis within the context of its existing risk measurement tools (e.g., the impact of a severe decline in market prices on a banking organization's value-at-risk (VaR) measure) or use it as an alternative, supplemental measure. For instance, a banking organization may use scenario analysis to measure the impact of a severe financial market disturbance and compare those results to what is produced by its VaR or other measures. This type of scenario analysis should account for known shortcomings of other risk measurement frameworks. For example, market risk VaR models generally assume liquid markets with known prices. Scenario analysis could shed light on the effects of a breakdown in liquidity and valuation difficulties.

One of the key challenges with scenario analysis is to translate a scenario into balance sheet impact, changes in risk measures, potential losses, or other measures of adverse financial impact, which would vary depending on the test design and the type of scenario used. For some aspects of scenario analysis, banking organizations may use econometric or similar types of analysis to estimate a relationship between some underlying factors or drivers and risk estimates or loss projections based on a given data set, and then extrapolate to see the impact of more severe inputs. Care should be taken not to make assumptions that relationships from benign or mildly adverse times will hold during more severe times or that estimating such relationships is relatively straightforward. For example, linear relationships between risk drivers and losses may become nonlinear during times of stress.

### Sensitivity analysis

Sensitivity analysis refers to a banking organization's assessment of its exposures, activities, and risks when certain variables, parameters, and inputs are "stressed" or "shocked." A key goal of sensitivity analysis is to test the impact of assumptions on outcomes. Generally, sensitivity analysis differs from scenario analysis in that it involves changing variables, parameters, or inputs without an explicit underlying reason or narrative, in order to explore what occurs under a range of inputs and at extreme or highly adverse levels. In this type of analysis a

banking organization may realize, for example, that a given relationship is much more difficult to estimate at extreme levels.

A banking organization may apply sensitivity analysis at various levels of aggregation to estimate the impact from a change in one or more key variables. The results may help a banking organization better understand the range of outcomes from some of its models, such as developing a distribution of output based on a variety of extreme inputs. For example, a banking organization may choose to calculate a range of changes to a structured security's overall value using a range of different assumptions about the performance and linkage of underlying cash flows. Sensitivity analysis should be conducted periodically due to potential changes in a banking organization's exposures, activities, operating environment, or the relationship of variables to one another.

Sensitivity analysis can also help to assess a combined impact on a banking organization of several variables, parameters, factors, or drivers. For example, a banking organization could better understand the impact on its credit losses from a combined increase in default rates and a decrease in collateral values. A banking organization could also explore the impact of highly adverse capitalization rates, declines in net operating income, and reductions in collateral when evaluating its risks from commercial real estate exposures. Sensitivity analysis can be especially useful because it is not necessarily accompanied by a particular narrative or scenario; that is, sensitivity analysis can provide banking organizations more flexibility to explore the impact of potential stresses that they may not be able to capture in designed scenarios. Furthermore, banking organizations may decide to conduct sensitivity analysis of their scenarios, i.e., choosing different levels or paths of variables to understand the sensitivities of choices made during scenario design. For instance, banking organizations may decide to apply a few different interest-rate paths for a given scenario.

#### Enterprise-wide stress testing

Enterprise-wide stress testing is an application of stress testing that involves assessing the impact of certain specified scenarios on the banking organization as a whole, particularly on capital and liquidity. As is the case with scenario analysis more generally, enterprise-wide stress testing involves robust scenario design and effective translation of scenarios into measures of impact. Enterprise-wide stress tests can help a banking organization in its efforts to assess the impact of its full set of risks under adverse events and circumstances, but should be supplemented with other stress tests and other risk measurement tools given inherent limitations in capturing all risks and all adverse outcomes in one test.

Scenario design for enterprise-wide stress testing involves developing scenarios that affect the banking organization as a whole that stem from macroeconomic, market-wide, and firm-specific events. These scenarios should incorporate the potential simultaneous occurrence of both firm-specific and macroeconomic and market-wide events, considering system-wide interactions and feedback effects. For example, price shocks may lead to significant portfolio losses, rising funding gaps, a ratings downgrade, and diminished access to funding. In general, it is a good practice to consult with a large set of individuals within the banking organization – in various business lines, research and risk areas – to gain a wide perspective on how enterprise-wide scenarios should be designed and to ensure that the scenarios capture the relevant aspects of

the banking organization's business and risks. Banking organizations should also conduct scenarios of varying severity to gauge the relative impact. At least some scenarios should be of sufficient severity to challenge the viability of the banking organization, and should include instant market shocks and stressful periods of extensive duration (e.g., not just a one or two-quarter shock after which conditions return to normal).

Selection of scenario variables is important for enterprise-wide tests, because they generally serve as the link between the overall narrative of the scenario and tangible impact on the banking organization as a whole. For instance, in aiming to capture the combined impact of a severe recession and a financial market downturn, a banking organization may choose a set of variables such as changes in GDP, unemployment rate, interest rates, stock market levels, or home price levels. However, particularly when assessing the impact on the whole banking organization, using a large number of variables can make a test more cumbersome and complicated – so a banking organization may also benefit from simpler scenarios or from those with fewer variables. Banking organizations should balance the comprehensiveness of contributing variables and tractability of the exercise.

As with scenario analysis generally, translating scenarios into tangible effects on the banking organization as a whole presents certain challenges. An institution should identify appropriate and meaningful mechanisms for translating scenarios into relevant internal risk parameters that provide a banking organization-wide view of risks and understanding of how the risks are translated into loss estimates. Not all business areas are equally affected by a given scenario, and problems in one business area can have effects on other units. However, for an enterprise-wide test, assumptions across business lines and risk areas should remain constant for the chosen scenario, since the objective is to see how the banking organization as a whole responds to a common outcome.

### Reverse stress testing

Reverse stress testing is a tool that allows a banking organization to assume a known adverse outcome, such as suffering a credit loss that breaches regulatory capital ratios or suffering severe liquidity constraints making it unable to meet its obligations, and then deduce the types of events that could lead to such an outcome. This type of stress testing may help a banking organization to consider scenarios beyond its normal business expectations and see the impact of severe systemic effects on the banking organization. It also allows a banking organization to challenge common assumptions about its performance and expected mitigation strategies.

Reverse stress testing helps to explore so-called “break the bank” situations, allowing a banking organization to set aside the issue of estimating the likelihood of severe events and to focus more on what kinds of events could threaten the viability of the banking organization. Reverse stress testing helps a banking organization evaluate the combined effect of several types of extreme events and circumstances that might threaten the survival of the banking organization,



even if in isolation each of the effects might be manageable. For instance, reverse stress testing may help a banking organization recognize that a certain level of unemployment would have a severe impact on credit losses, that a market disturbance could create additional losses and result in rising funding costs, and that a firm-specific case of fraud would cause even further losses and reputational impact that could threaten a banking organization's viability. In some cases, reverse stress tests could reveal to a banking organization that "breaking the bank" is not as remote an outcome as originally thought.

Given the numerous potential threats to a banking organization's viability, the organization should ensure that it focuses first on those scenarios that have the largest firm-wide impact, such as insolvency or illiquidity, but also on those that seem most imminent given the current environment. Focusing on the most prominent vulnerabilities helps a banking organization prioritize its choice of scenarios for reverse stress testing. However, a banking organization should also consider a wider range of possible scenarios that could jeopardize the viability of the banking organization, exploring what could represent potential blind spots.

#### *V. Stress testing for assessing the adequacy of capital and liquidity*

There are many uses of stress testing within banking organizations. Prominent among these are stress tests designed to assess the adequacy of capital and liquidity. Given the importance of capital and liquidity to a banking organization's viability, stress testing should be applied in these two areas in particular, including an evaluation of the interaction between capital and liquidity and the potential for both to become impaired at the same time. Depletions and shortages of capital or liquidity can cause a banking organization to no longer perform effectively as a financial intermediary, be viewed by its counterparties as no longer viable, become insolvent, or diminish its capacity to meet legal and financial obligations. A banking organization's capital and liquidity stress testing should consider how earnings, capital, and liquidity would be affected in an environment in which multiple risks manifest themselves at the same time, for example, an increase in credit losses during an adverse interest-rate environment. Additionally, banking organizations should recognize that at the end of the time horizon considered by a given stress test, the banking organization may still have substantial residual risks or problem exposures that may continue to pressure capital and liquidity resources.

Stress testing for capital and liquidity adequacy should be conducted in coordination with a banking organization's overall strategy and annual planning cycles. Results should be refreshed in the event of major strategic decisions, or other decisions that can materially impact capital or liquidity. Banking organizations should conduct stress testing for capital and liquidity adequacy periodically.

#### Capital stress testing<sup>5</sup>

Capital stress testing results can serve as a useful tool to support a banking organization's capital planning and corporate governance.<sup>6</sup> They may help a banking organization better

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<sup>5</sup> The portions of this guidance related to capital stress testing do not apply to U.S. branches and agencies of foreign banking organizations.

understand its risks and evaluate the impact of adverse outcomes on its capital position and ensure that the banking organization holds adequate capital given its business model, including the complexity of its activities and its risk profile. Capital stress testing supplements a banking organization's regulatory capital analysis by providing a forward-looking assessment of capital adequacy, usually with a forecast horizon of at least two years, and highlighting the potential adverse effects on capital levels and ratios of risks not fully captured in regulatory capital requirements. It should also be used to help a banking organization assess the quality and composition of capital and its ability to absorb losses. Stress testing can aid capital contingency planning by helping management identify exposures or risks that would need to be reduced and actions that could be taken to bolster capital levels or otherwise maintain capital adequacy, as well as actions that in times of stress might not be possible – such as raising capital.

A capital stress testing framework should include exercises that analyze the potential for changes in earnings, losses, reserves, and other potential effects on capital under a variety of stressful circumstances. The framework should also capture any potential change in risk-weighted assets, the ability of capital to absorb losses, and any resulting impact on the banking organization's capital ratios. The framework should include all relevant risk types that have a potential to affect capital adequacy, whether directly or indirectly. A banking organization should also explore the potential for possible balance sheet expansion to put pressure on capital ratios and consider mitigation options, other than simply shrinking the balance sheet. Capital stress testing should assess the potential impact of a banking organization's material subsidiaries suffering capital problems on their own, even if the consolidated banking organization is not encountering problems.<sup>7</sup>

Enterprise-wide stress testing, as described section IV, should be an integral part of a banking organization's capital stress testing. Such enterprise-wide testing should include pro-forma estimates of not only potential losses and resources available to absorb losses, but also potential planned capital actions (such as dividends or share repurchases) that would affect the banking organization's capital position, including regulatory and other capital ratios. There should also be consideration of the impact on the banking organization's provision for loan and lease losses and other relevant financial metrics. Even with very effective enterprise-wide tests, banking organizations should use capital stress testing in conjunction with other internal approaches (in addition to regulatory measures) for assessing capital adequacy, such as those that rely primarily on statistical estimates of risk or loss estimates based on historical data.

#### Liquidity stress testing

A banking organization should also conduct stress testing for liquidity adequacy.<sup>8</sup> Through such stress testing a banking organization can work to identify vulnerabilities related to liquidity adequacy in light of both firm-specific and market-wide stress events and

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<sup>6</sup> In this manner, stress testing can form an integral part of an organization's internal capital adequacy process, consistent with supervisory standards outlined in SR letter 09-04, SR letter 99-18, OCC Bulletin 2008-20 or FDIC FIL-71-2008 "Supervisory Guidance: Supervisory Review Process of Capital Adequacy (Pillar 2) Related to the Implementation of the Basel II Advanced Capital Framework."

<sup>7</sup> For regulated subsidiaries, stress testing activities should be fully consistent with the regulations and guidance of the relevant primary federal supervisor.

<sup>8</sup> See SR letter 10-6, OCC Bulletin 2010-13, OCC Bulletin 2010-1, and SR letter 10-1.

circumstances. Effective stress testing helps a banking organization identify and quantify the depth, source, and degree of potential liquidity strain and to analyze possible impacts on its cash flows, liquidity position, profitability, and other aspects of its financial condition over various time horizons. For example, stress testing can be used to explore potential funding shortfalls, shortages in liquid assets, the inability to issue debt, exposure to possible deposit outflows, volatility in short-term brokered deposits, and the impact of reduced collateral values on borrowing capacity at the Federal Home Loan Banks, the Federal Reserve discount window, or other secured wholesale funding sources.

Liquidity stress testing should explore the potential impact of adverse developments that may affect market and asset liquidity, including the freezing up of credit and funding markets, and the corresponding impact on the banking organization. Such tests can also help identify the conditions under which balance sheets might expand, thus creating additional funding needs (e.g., through accelerated drawdowns on unfunded commitments). These tests also help determine whether the banking organization has a sufficient liquidity buffer to meet various types of future liquidity demands. In this regard, liquidity stress testing should be an integral part of the development and maintenance of a banking organization's contingency funding planning. Liquidity stress testing should include enterprise-wide tests as discussed in section IV, but should also be applied, as appropriate, at lower levels of the banking organization, particularly for entities that might face regulatory restrictions or limitations on receiving or providing funds. As with capital stress testing, banking organizations may need to conduct liquidity stress tests at both the consolidated and subsidiary level. In undertaking enterprise-wide liquidity tests banking organizations should make realistic assumptions as to the implications of liquidity stresses in one part of the banking organization on other parts.

An effective stress testing framework should explore the potential for capital and liquidity problems to arise at the same time or exacerbate one another. For example, a banking organization in a stressed liquidity position is often required to take actions that have a negative direct or indirect capital impact (e.g., selling assets at a loss or incurring funding costs at above market rates to meet funding needs). A banking organization's liquidity stress analysis should explore situations in which the banking organization may be operating with a capital position that exceeds regulatory minimums, but is nonetheless viewed within the financial markets or by its counterparties as being of questionable viability. As with other applications of stress testing, for its capital and liquidity stress tests, it is beneficial for a banking organization to articulate clearly its objectives for a post-stress outcome, for instance to remain a viable financial market participant that is able to meet its existing and prospective obligations and commitments.

## *VI. Governance*

Similar to other aspects of its risk management, a banking organization's stress testing framework will be effective only if it is subject to strong governance and controls to ensure the framework is functioning as intended. Strong governance and controls help ensure that the framework contains core elements, from clearly defined stress testing objectives to recommended actions. Importantly, strong governance provides critical review of elements of the stress testing framework, especially regarding key assumptions, uncertainties, and limitations. A banking organization should ensure that the stress testing framework is not

isolated within a banking organization's risk management function, but is firmly integrated into business lines, capital and asset-liability committees, and other decision-making bodies. The extent and sophistication of a banking organization's governance over its stress testing framework should align with the extent and sophistication of that framework.

Governance over a banking organization's stress testing framework rests with the banking organization's board of directors and senior management. As part of their overall responsibilities, a banking organization's board and senior management should establish a comprehensive, integrated and effective stress testing framework that fits into the broader risk management of the banking organization. While the board is ultimately responsible for ensuring that the banking organization has an effective stress testing framework, senior management generally has responsibility for implementing that framework. Senior management duties should include establishing adequate policies and procedures and ensuring compliance with those policies and procedures, assigning competent staff, overseeing stress test development and implementation, evaluating stress test results, reviewing any findings related to the functioning of stress test processes, and taking prompt remedial action where necessary. Senior management, directly and through relevant committees, also should be responsible for regularly reporting to the board on stress testing developments and results from individual and collective stress tests as well as on compliance with stress testing policy. Board members should actively evaluate and discuss these reports, ensuring that the stress testing framework is in line with the banking organization's risk appetite, overall strategy and business plans, and directing changes where appropriate.

A banking organization should have written policies, approved and annually reviewed by the board, that direct and govern the implementation of the stress testing framework in a comprehensive manner. Policies, along with procedures to implement them, should:

- Describe the overall purpose of stress testing activities;
- Articulate consistent and sufficiently rigorous stress testing practices across the entire banking organization;
- Indicate stress testing roles and responsibilities, including controls over external resources used for any part of stress testing (such as vendors and data providers);
- Describe the frequency and priority with which stress testing activities should be conducted;
- Indicate how stress test results are used and by whom;
- Be reviewed and updated as necessary to ensure that stress testing practices remain appropriate and keep up to date with changes in market conditions, banking organization products and strategies, banking organization exposures and activities, the banking organization's established risk appetite, and industry stress testing practices.

A stress testing framework should incorporate validation or other type of independent review to ensure the integrity of stress testing processes and results, consistent with existing supervisory expectations.<sup>9</sup> If a banking organization engages a third party vendor to support some or all of its stress testing activities, there should be appropriate controls in place to ensure that those externally-developed systems and processes are sound, applied correctly, and

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<sup>9</sup> For validation of models and other quantitative tools used for stress testing, see OCC Bulletin 2011-12 "Supervisory Guidance on Model Risk Management", or SR letter 11-7, "Guidance on Model Risk Management."

appropriate for the banking organization's risks, activities, and exposures. Additionally, senior management should be mindful of any potential inconsistencies, contradictions, or gaps among its stress tests and assess what actions should be taken as a result. Internal audit should also play a role focused on ensuring the ongoing performance, integrity, and reliability of the stress testing framework. A banking organization should ensure that its stress tests are documented appropriately, including a description of the types of stress tests and methodologies used, key assumptions, results, and suggested actions. The board and senior management should review stress testing activities and results with an appropriately critical eye and ensure that there is objective review of all stress testing processes.

The results of stress testing analyses should facilitate decision-making by the board and senior management. Stress testing results should be used to inform the board about alignment of the banking organization's risk profile with the board's chosen risk appetite, as well as inform operating and strategic decisions. Stress testing results should be considered directly by the board and senior management for decisions relating to capital and liquidity adequacy, including capital contingency plans and contingency funding plans. The board and senior management should ensure that the stress testing framework includes a sufficient range of stress testing activities applied at the appropriate levels of the banking organization (i.e., not just one enterprise-wide stress test). Sound governance also includes using stress testing to consider the effectiveness of a banking organization's risk mitigation techniques for various risk types over their respective time horizons, such as to explore what could occur if expected mitigation techniques break down during stressful periods.

## *VII. Conclusion*

A banking organization should use the principles laid out in this guidance to develop, implement, and maintain an effective stress testing framework. Such a framework should be adequately tailored to the banking organization's size, complexity, risks, exposures, and activities. A key purpose of stress testing is to explore various types of possible outcomes, including rare and extreme events and circumstances, assess their impact on the banking organization, and then evaluate the boundaries up to which the banking organization plans to be able to withstand such outcomes.

While stress testing can provide valuable information regarding potential future outcomes, similar to any other risk management tool it has limitations and cannot provide absolute certainty regarding the implications of assumed events and impacts. Furthermore, management should ensure that stress testing activities are not constrained to reflect past experiences, but instead consider a broad range of possibilities. No single stress test can accurately estimate the impact of all stressful events and circumstances; therefore, a banking organization should understand and account for stress testing limitations and uncertainties, and use stress tests in combination with other risk management tools to make informed risk management and business decisions.

This concludes the text of the proposed guidance.

**[THIS SIGNATURE PAGE RELATES TO THE DOCUMENT ENTITLED “PROPOSED GUIDANCE ON STRESS TESTING FOR BANKING ORGANIZATIONS WITH TOTAL CONSOLIDATED ASSETS OF MORE THAN \$10 BILLION”.]**

**DATED:** 6-2-11

John Walsh (signed)

John Walsh,  
Acting Comptroller of the Currency

**[THIS SIGNATURE PAGE RELATES TO THE DOCUMENT ENTITLED “PROPOSED GUIDANCE ON STRESS TESTING FOR BANKING ORGANIZATIONS WITH TOTAL CONSOLIDATED ASSETS OF MORE THAN \$10 BILLION”.]**

By order of the Board of Governors of the Federal Reserve System, June 8, 2011.

Jennifer J. Johnson (signed)

Jennifer J. Johnson,  
Secretary of the Board.

**[THIS SIGNATURE PAGE RELATES TO THE DOCUMENT ENTITLED “PROPOSED GUIDANCE ON STRESS TESTING FOR BANKING ORGANIZATIONS WITH TOTAL CONSOLIDATED ASSETS OF MORE THAN \$10 BILLION”.]**

Dated at Washington, D.C., this 7<sup>th</sup> of June 2011.  
By order of the Board of Directors.  
Federal Deposit Insurance Corporation.

Valerie J. Best (signed)

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Valerie J. Best,  
Assistant Executive Secretary.