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U.S. Implementation of the Basel Capital Regulatory Framework

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Summary

The Basel III international regulatory framework, which was produced in 2010 by the Basel Committee on Banking Supervision at the Bank for International Settlements, is the latest in a series of evolving agreements among central banks and bank supervisory authorities to standardize bank capital requirements, among other measures. Capital serves as a cushion against unanticipated financial shocks (such as a sudden, unusually high occurrence of loan defaults), which can otherwise lead to insolvency. The Basel III regulatory reform package revises the definition of regulatory capital and increases capital holding requirements for banking organizations. The quantitative requirements and phase-in schedules for Basel III were approved by the 27 member jurisdictions and 44 central banks and supervisory authorities on September 12, 2010, and endorsed by the G20 leaders on November 12, 2010. Basel III recommends that banks fully satisfy these enhanced requirements by 2019. The Basel agreements are not treaties; individual countries can make modifications to suit their specific needs and priorities when implementing national bank capital requirements.

In the United States, Congress mandated enhanced bank capital requirements as part of financial-sector reform in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act; P.L. 111-203, 124 Stat.1376). Specifically, the Collins Amendment to Dodd-Frank amends the definition of capital and establishes minimum capital and leverage requirements for banking subsidiaries, bank holding companies, and systemically important non-bank financial companies. In addition, Dodd-Frank removes a requirement that credit ratings be referenced when evaluating the creditworthiness of financial securities. Instead, the U.S. federal banking regulators (i.e., the Federal Reserve, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation) are required to find other appropriate standards by which to determine the financial risks of bank portfolio holdings when enforcing the mandatory capital requirements.

This report summarizes the higher capital requirements for U.S. banks regulated for safety and soundness. The U.S. federal banking regulators announced the final rules for implementation of Basel II.5 on June 7, 2012, and for the implementation of Basel III on July 9, 2013. On April 8, 2014, the federal banking regulators adopted the enhanced supplementary leverage ratio for bank holding companies with more than \$700 billion of consolidated assets or \$10 trillion in assets under custody as a covered bank holding company. Although higher capital requirements for most U.S. banking firms may reduce the insolvency risk of the deposit insurance fund, which is maintained by the Federal Deposit Insurance Corporation, they arguably could translate into more expensive or less available bank credit for borrowers. Whether higher capital requirements would result in a reduction of overall lending or systemic risk remains unclear. Prior to the financial crisis, banks maintained capital levels that exceeded the minimum regulatory requirements, yet the economy still saw widespread lending. Bank capital reserves also may have limited effectiveness as a systemic risk mitigation tool if a significant amount of lending occurs outside of the regulated banking system. For an introduction to some of the topics covered in this report, see CRS Report R43002, *Financial Condition of Depository Banks*, by (name redacted).

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Overview of Capital Adequacy Regulation

Lending is inherently risky. Banks face *default risk* because their assets consist primarily of loans made to borrowers who may not always repay all of the principal and interest owed. In addition, banks face *funding risk* because they must continuously borrow short-term to *fund* their assets (customer loans).¹ In other words, banks typically provide longer-term (illiquid) customer loans by borrowing the funds via sequences of shorter-term (liquid) loans at relatively lower rates.² Profits are generated from the spread between the long-term rates lenders charge their customers and the successive sequences of shorter-term rates they pay for liquidity until the longer-term loans are repaid in full. Hence, if borrowers default on their loans, then lenders might be unable to repay their shorter-term loan obligations (liabilities) to depositors and other creditors (e.g., financial institutions).

Lenders also face *systemic risk*. Although economists have not arrived at a consensus definition, systemic risk may be viewed as an increase in correlation among individual default and funding risks, largely due to a sudden loss of confidence (panic) of financial market participants following a liquidity disruption or decline in asset prices.³ In other words, systemic risk can be thought of as contagion, meaning that liquidity and payment problems affecting one or a few entities may spread and create disruptions in the rest of the market. For example, suppose an isolated default event prompts other financial market participants to re-evaluate their estimates of default risk for similar or related financial activities. If market participants suspect that an observed default event is relevant beyond the directly involved entities, then growing pessimism of creditors of investors can suddenly manifest itself in the form of a market retrenchment.⁴ Consequently, financial panics have historically been rooted in the uncertainty about future asset prices (e.g., real estate, stocks, financial securities) while such assets were serving as collateral for an innumerable amount of loans.⁵ Furthermore, the severity of a national recession depends upon the amount of lending activity prior to the bursting of an asset bubble, particularly if many of the outstanding loans suddenly became “underwater,” such that the balances owed were to exceed the current value of the underlying collateral.

U.S. lending institutions that accept federally insured deposits are collectively referred to as insured depository institutions, and they must comply with *safety and soundness* regulatory

¹ Bank assets, which tend to consist primarily of long-term customer loans, may also consist of cash and other financial securities.

² Such short-term borrowing may occur in the form of paying interest on customer deposits or repaying loans obtained in the short-term money markets. The short-term money markets consist of repurchase agreements, commercial paper, and the international short-term market known as the London Interbank Offering Rate (LIBOR) market. U.S. banks may also acquire short-term loans by going to the federal funds market or borrowing from the Federal Home Loan Bank System.

³ In economics and finance, a theoretical framework links confidence in financial markets with profitability; thus, a disruption in profitability may result in a sudden and widespread loss of confidence among market participants and possibly a financial crisis. For more information, see Lance Taylor and Stephen A. O’Connell, “A Minsky Crisis,” *Quarterly Journal of Economics*, vol. 100 (1985), pp. 871-885.

⁴ See Sanjiv R. Das, Laurence Freed, and Gary Geng et al., “Correlated Default Risk,” *Journal of Fixed Income*, vol. 16, no. 2 (September 2006), pp. 7-32.

⁵ See Gertrude Tumpel-Gugerell, Member of the Executive Board of the European Central Bank, “Asset Price Bubbles: How They Build Up and How to Prevent Them?” Speech at alumni event of the Faculty of Economics at University of Vienna, Vienna, May 3, 2011, <http://www.ecb.int/press/key/date/2011/html/sp110503.en.html>.

requirements.⁶ As part of safety and soundness regulation, banks are required to maintain sufficient capital reserves to buffer against losses associated with default (credit), funding (liquidity), and systemic risk events.⁷ A bank's capital is defined as the difference between its assets and liabilities. If a bank maintains sufficient capital, then defaults of a few assets (longer-term loans) are less likely to translate into a subsequent failure to repay its shorter-term obligations. A capital buffer, therefore, protects bank creditors from loan defaults by bank customers as well as other sudden unfavorable macroeconomic events. A bank is considered solvent as long as it maintains capital above a minimum threshold level, and it is considered undercapitalized and faces the prospect of being shut down by its regulator should its capitalization fall below the threshold. Hence, a bank's asset or lending portfolio normally grows proportionately with its capital reserves.

The Basel Capital Accords

The work by the Basel Committee on Banking Supervision (BCBS) on the first Basel Capital Accord,⁸ Basel I, provided an international consensus framework for bank safety and soundness regulation. The objective of the first Basel Capital Accord was to promote consistent safety and soundness standards while providing an equitable basis of competition for banking institutions in participating countries.⁹ In other words, international regulators were concerned that banks might prefer to domicile in countries with the most relaxed safety and soundness requirements. Unless capital reserve requirements are internationally harmonized, variation in standards may also lead to competitive disadvantages for some banks with competitors in other countries. Basel I established the amount of capital (relative to assets) that financial institutions needed to maintain. Although the BCBS has no authority to compel member governments to adopt any specific standards, the U.S. federal banking regulators generally adopt rules consistent with the Basel Accords. The first Basel Capital Accord was published in July 1988 and fully implemented in the United States by the end of 1992.

The safety and soundness regulatory framework for banking institutions that stems from the Basel Capital Accords includes

- a *Tier 1* capital component made up of mainly common shareholders' equity (issued and fully paid), disclosed reserves, most retained earnings, and perpetual non-cumulative preferred stock. *Tier 1 capital risk-weighted asset ratios* are generally defined as Tier 1 capital (e.g., common shareholder equity) in the numerator and bank assets (typically weighted according to their likelihood of default) in the denominator. Banks must hold enough capital reserves to maintain

⁶ See CRS Report R41718, *Federal Deposit Insurance for Banks and Credit Unions*, by (name redacted).

⁷ See Douglas J. Elliott, "A Primer on Bank Capital," The Brookings Institution, January 28, 2010, http://www.brookings.edu/~media/research/files/papers/2010/1/29%20capital%20elliott/0129_capital_primer_elliott.pdf.

⁸ The name, Basel Accord, comes from Basel, Switzerland, the home of the Bank for International Settlements (BIS). In 1974, the BIS established the Basel Committee on Banking Supervision (BCBS), made up of representatives from the monetary authorities of 13 countries—Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States—to determine and mitigate bank risk in light of different national systems of supervision and deposit insurance.

⁹ See Roger W. Ferguson, Jr., "Capital Standards for Banks: The Evolving Basel Accord," *Federal Reserve Bulletin*, September 2003, pp. 395-405.

the minimum required capital-asset ratios, which would reduce banks' vulnerability to *unanticipated* loan defaults.

- a *Tier 2* capital component, which includes allowances for loan and lease losses (ALLL), set aside for *anticipated* (or estimated) loan losses. Loan loss provisioning refers to increasing the amount of ALLL when loan default risks increase; decreases are referred to as “charge-offs” that occur when it becomes apparent that loan(s) will not be repaid. ALLL is adjusted quarterly, and these loan loss reserve proceeds must come from current income earnings (as opposed to total assets).¹⁰ When the ALLL of a bank exceeds 1.25% of its (risk weighted) assets, the excess is not counted as part of its Tier 2 capital.
- *stress testing*, which is conducted to determine whether a bank can withstand losses arising from a severe recession or systemic risk event and still remain adequately capitalized. Stress testing requirements vary by bank size and type of lending activities, but federal regulators require all U.S. banking institutions to analyze the potential impact of adverse economic conditions on their financial conditions or viability.

The second Basel Accord, Basel II, was developed in response to perceived shortcomings, in particular with the asset risk weighting system, discussed in more detail in **Appendix A**.¹¹ In the United States, Basel II was initially applied to only the 19 largest banking institutions.¹² On December 7, 2007, the federal banking regulators published the final rule to implement Basel II, which became effective on April 1, 2008.¹³ The date of expected compliance with some Basel II rules, however, was delayed or waived after the financial turmoil that began in 2007.¹⁴

In response to the 2007-2009 global financial crisis, the BCBS issued what is referred to as Basel II.5 as an amendment to Basel II.¹⁵ Basel II.5 is designed to better capture credit risk in the “trading book” of a bank. The trading book refers to securities that a bank would *not* hold to maturity and would also be accounted for at current market value. A security held to maturity is accounted for in the “banking book” at its original book value, unless the bank decides to sell it;

¹⁰ Tier 2 capital may also include items such as subordinated debt, limited-life preferred stock, and goodwill.

¹¹ See Secretariat of the Basel Committee on Banking Supervision, *The New Basel Capital Accord: An Explanatory Note*, Bank for International Settlements, Basel, Switzerland, January 2001, <http://www.bis.org/publ/bcbsca01.pdf>.

¹² The U.S. federal banking regulatory agencies placed banking organizations with at least \$250 billion of consolidated total assets or at least \$10 billion of on-balance-sheet risk associated with foreign asset holdings under Basel II; these institutions were required to use the most advanced approaches of the Basel II framework to determine their credit risks. See U.S. Department of the Treasury, Office of the Comptroller of the Currency; Board of Governors of the Federal Reserve System; Federal Deposit Insurance Corporation; and U.S. Department of the Treasury, Office of Thrift Supervision, “Risk-Based Capital Standard: Advanced Capital Adequacy Framework—Basel II,” 71 *Federal Register* 185, September 26, 2006.

¹³ U.S. Department of the Treasury, Office of the Comptroller of the Currency; Board of Governors of the Federal Reserve System; Federal Deposit Insurance Corporation; and U.S. Department of the Treasury, Office of Thrift Supervision, “Risk-Based Capital Standard: Advanced Capital Adequacy Framework—Basel II,” 72 *Federal Register* 235, December 7, 2007.

¹⁴ See CRS Report R40007, *Financial Market Turmoil and U.S. Macroeconomic Performance*, by (name redacted). While providing guidance for Basel II adoption, the Federal Regulators explained that banks could request compliance waivers. See the *Interagency Statement—U.S. Implementation of Basel II Advanced Approaches Framework* at <http://www.federalreserve.gov/boarddocs/srletters/2008/SR0804a1.pdf>.

¹⁵ See *Revisions to the Basel II Market Risk Framework*, March 2009, <http://www.bis.org/publ/bcbs148.pdf> and Basel Committee on Bank Supervision, *Guidelines for Computing Capital for Incremental Risk in the Trading Book*, <http://www.bis.org/publ/bcbs149.pdf>.

if so, it then moves over to the trading book where it is given fair market value accounting treatment. Distinguishing between assets that should be held in the trading and banking books is not always easy, thus making it difficult to determine the proper accounting and risk weighting treatment.¹⁶ Nonetheless, Basel II.5 is intended to prevent strategic but inappropriate placement of securities in the book that would provide the most favorable accounting treatment at a particular point in time, potentially resulting in a bank having an insufficient capital buffer to mitigate lending risks. The U.S. federal banking regulators issued proposed rules on the adoption of Basel II.5 revisions in the United States on January 11, 2011;¹⁷ these were amended and re-proposed on December 7, 2011.¹⁸ The final rule on the adoption of Basel II.5, also known as the market capital risk rule, was issued by the U.S. federal banking regulators on June 7, 2012.¹⁹

In a further response to the financial crisis, the Basel III regulatory framework reforms Basel II by revising the definition of regulatory capital and increasing the amounts banks must hold, among other requirements. The requirements and phase-in schedules for Basel III were approved by the 27 member jurisdictions and 44 central banks and supervisory authorities on September 12, 2010. Basel III compliance requires banks to satisfy the enhanced requirements by 2019. The federal banking regulators issued a proposed rule on June 7, 2012;²⁰ the final rule to implement most of the Basel III recommendations in the United States was approved by July 9, 2013.²¹

Enhanced Safety and Soundness Requirements Under Dodd-Frank

The Basel III final rule adopted by the U.S. federal banking regulators also implements some provisions from the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act; P.L. 111-203), which also addressed capital reserve requirements for banks. Some of the key statutory requirements are summarized below.

¹⁶ See Basel Committee on Banking Supervision, *Trading Book Survey: A Summary of Responses*, April 2005, <http://www.bis.org/publ/bcbs112.pdf>.

¹⁷ See Office of the Comptroller of the Currency, Treasury; Board of Governors of the Federal Reserve; and Federal Deposit Insurance Corporation, "Risk-Based Capital Guidelines: Market Risk," 76 *Federal Register*, January 11, 2011 at <http://www.gpo.gov/fdsys/pkg/FR-2011-01-11/pdf/2010-32189.pdf>.

¹⁸ See Office of the Comptroller of the Currency, Treasury; Board of Governors of the Federal Reserve; Federal Deposit Insurance Corporation, "Risk-Based Capital Guidelines: Market Risk; Alternatives to Credit Ratings for Debt and Securitization Positions," December 7, 2011 at <http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20111207a1.pdf>.

¹⁹ See announcement at <http://www.federalreserve.gov/newsevents/press/bcreg/20120607b.htm>. The final market capital rule that implements Basel II.5 applies to the trading books of banks with aggregated trading assets and trading liabilities equal to 10% or more of quarter-end total assets or \$1 billion or more.

²⁰ See announcement at <http://www.federalreserve.gov/newsevents/press/bcreg/20120607a.htm>. The comment period was extended from September 7, 2012 to October 22, 2012. See <http://www.occ.gov/news-issuances/news-releases/2012/nr-occ-2012-118.html>.

²¹ The Board of Governors of the Federal Reserve System and the Office of the Comptroller of the Currency adopted the final rule implementing Basel III on July 2, 2013; the Federal Deposit Insurance Company adopted the final rule on July 9, 2013. See "Regulatory Capital Rules: Regulatory Capital, Implementation of Basel III, Capital Adequacy, Transition Provisions, Prompt Corrective Action, Standardized Approach for Risk-weighted Assets, Market Discipline and Disclosure Requirements, Advanced Approaches Risk-Based Capital Rule, and Market Risk Capital Rule," <http://www.federalreserve.gov/bcreg/20130702a.pdf>.

Removal of References to Credit Ratings

Section 939 of Dodd-Frank requires the removal of any regulatory references to credit ratings in light of the viewpoint that flawed credit ratings may have contributed to the housing bubble.²² Section 939A required each federal agency to review regulations that would require the use of an assessment of the creditworthiness of a security or money market instrument, and any references to, or requirements in, those regulations regarding credit ratings. Afterwards, the agencies had to modify all regulations such that any reference to or requirement for reliance on credit ratings had to be removed. Regulators were required to find other appropriate standards by which to determine the financial risks of bank portfolio holdings while enforcing the mandatory capital requirements, and they must also transmit reports to Congress that contain descriptions of all regulatory modifications made pursuant to the section.²³

Section 171: The Collins Amendment

The Collins Amendment of Dodd-Frank provides for the development of consistent capital requirements for all insured depository institutions, depository institution holding companies, and systemically important non-bank financial companies.²⁴ Small bank holding companies with less than \$500 million in assets are exempt from the Collins Amendment. In addition, the amendment would not apply to foreign parents of bank and thrift holding companies; Federal Home Loan Banks would also be exempt from these requirements.

Section 171(b) of the Collins Amendment requires federal banking regulators to apply to U.S. bank holding companies and other systemically significant nonbank financial companies the same capital requirements that apply to federally insured depository institutions. Specifically, Section 171(b)(2) says,

The appropriate Federal banking agencies shall establish minimum risk-based capital requirements on a consolidated basis for insured depository institutions, depository institution holding companies, and nonbank financial companies supervised by the Board of Governors. The minimum risk-based capital requirements established under this paragraph shall not be less than the generally applicable risk-based capital requirements, which shall serve as a floor for any capital requirements that the agency may require, nor quantitatively lower than the generally applicable risk-based capital requirements that were in effect for insured depository institutions as of the date of enactment of this Act.

In other words, the capital requirements of a bank holding company can be no less stringent than the requirements applied to its depository subsidiary. In addition, the minimum requirements cannot be quantitatively lower than the capital requirements that were in effect when Dodd-Frank

²² A credit rating is a third-party assessment of the future credit risk of a firm that typically has issued financial securities. See U.S. Congress, Senate Committee on Banking, Housing, and Urban Affairs, *Dodd-Frank Wall Street Reform: Conference Report Summary*, 111th Cong., 2nd sess., July 1, 2010, http://banking.senate.gov/public/_files/070110_Dodd_Frank_Wall_Street_Reform_comprehensive_summary_Final.pdf and <http://www.sec.gov/news/press/2011/2011-59.htm>.

²³ For example, the Office of the Comptroller of the Currency (OCC) asked for comments in November 2011 for alternative frameworks that could be applied to the securities purchased by national banks and federal savings associations. See “Alternatives to the Use of External Credit Ratings in the Regulations of the OCC,” *Federal Register*, November 29, 2011, p. 73527, available at <http://www.gpo.gov/fdsys/pkg/FR-2011-11-29/html/2011-30428.htm>.

²⁴ For more information on the regulation of systemically important firms, see CRS Report R42083, *Financial Stability Oversight Council: A Framework to Mitigate Systemic Risk*, by (name redacted).

was enacted (July 2010). Hence, only the features of Basel I and Basel II that were implemented in the United States at that time, along with other requirements consistent with Section 38 of the Federal Deposit Insurance Act, became a floor for future regulatory ratios.²⁵ Regulators may set higher (but never lower) ratio requirements than those established for insured depositories that were in effect at that time. The U.S. federal banking regulators announced the final rule implementing this requirement on July 28, 2011.²⁶

The Collins Amendment also had the effect of excluding a class of securities from the definition of eligible Tier 1 capital for large bank holding companies and systemically important nonbanks. *Trust preferred securities* are hybrid instruments possessing characteristics typically associated with debt obligations; issuers, however, may have an incentive to redeem at some future date.²⁷ Given that trust preferred securities were excluded from Tier 1 capital for insured depositories at the time of passage, the Collins Amendment effectively made this a requirement for bank holding companies, specifically those with \$15 billion or more in total consolidated assets as of December 31, 2009.²⁸ Bank holding companies with \$15 billion or more in consolidated assets have a three-year phase-out period that began on January 1, 2013; institutions with less than \$15 billion in assets have a 10-year phase-out period that began on January 1, 2013.²⁹

Highlights of the Final Rule Implementing Basel III and Various Dodd-Frank Requirements

The capital requirements adopted in the Basel III final rule include most but not all of the BCBS recommendations; they also include many, but not all, of the related safety and soundness provisions required by Dodd-Frank. For example, Title 1 of Dodd-Frank created enhanced safety and soundness requirements for banks with \$50 billion or more in assets as well as systemically important financial institutions (SIFIs) that the Financial Stability Oversight Council (FSOC) determines could pose a threat to financial stability.³⁰ In addition, additional capital requirements not implemented in the Basel III final rule may still be implemented at some future date.³¹

²⁵ For more information on the Federal Deposit Insurance Act of 1950 (P.L. 81-797, 64 Stat. 873), see <http://www.fdic.gov/regulations/laws/important/>. See Julie L. Stackhouse, *Prompt Corrective Action: What Does It Mean for a Bank's Liquidity*, Federal Reserve Bank of St. Louis, Central Banker, fall 2008, <http://www.stlouisfed.org/publications/cb/articles/?id=792>.

²⁶ See <http://www.gpo.gov/fdsys/pkg/FR-2011-06-28/pdf/2011-15669.pdf>.

²⁷ See <http://www.fdic.gov/news/news/inactivefinancial/2002/fil0229a.html>. For a discussion of trust preferred securities, see http://www.philadelphiafed.org/bank-resources/publications/src-insights/2009/first-quarter/q1si4_09.cfm and <http://www.fdic.gov/regulations/examinations/supervisory/insights/siwin10/trust.html>. Examples of trust preferred securities may be directly issued preferred stocks with the tax advantages of debt.

²⁸ The original provision was modified in the Conference Committee. The revised provision is now included as Section 171 of Dodd-Frank. This provision exempted organizations that were mutual holding companies on May 19, 2010, and it also adjusted the compliance dates for covered institutions. See H.Rept. 111-517 to accompany H.R. 4137.

²⁹ The U.S. Federal Regulators will allow institutions to temporarily include existing trust preferred securities in Tier 2 capital until such instruments are replaced with new capital instruments that satisfy the eligibility criteria of the Basel III final rule.

³⁰ For more information on the safety and soundness provisions of Dodd-Frank that apply specifically to SIFIs, such as a systemic risk tax, see CRS Report R42150, *Systemically Important or "Too Big to Fail" Financial Institutions*, by (name redacted).

³¹ See <http://www.federalreserve.gov/bcreg20130702a.pdf>.

The Basel III final rule provides guidance on the required risk-weighting methodology and capital ratio levels, and it also incorporates the enhanced capital and liquidity requirements mandated by Dodd-Frank. The Basel III final rule applies to all banks and bank holding companies domiciled in the United States, with some exceptions.³² Banking institutions with less than \$500 million in total consolidated assets will not have to comply with the same prompt corrective action ratio requirements (discussed below), but they will have to comply with the revised system of risk weights.³³ The Basel III final rule does not apply to all top-tier savings and loan holding companies domiciled in the United States, particularly those substantially engaged in insurance underwriting or non-financial activities.³⁴ Some banking institutions covered by the Basel III final rule will face even more stringent requirements. For example, *advanced approaches* banks, defined as institutions with at least \$250 billion in consolidated assets or on-balance sheet foreign exposures of at least \$10 billion, must comply with additional safety and soundness requirements, particularly in the form of a countercyclical capital buffer and a supplementary leverage ratio discussed below. Furthermore, advanced approaches banks that get designated as SIFIs can expect to see additional requirements in the future.

This section discusses changes to the definition of eligible capital and highlights some of the new risk-weighting and prompt corrective action ratio requirements stemming from the Basel III final rule. **Appendix C** discusses the increase in stress testing requirements for all U.S. banks, which are likely to result in banks holding levels of required capital that exceed the minimum ratio compliance thresholds.

Stricter Definition of Capital

The U.S. federal banking regulators closely followed the definition of Tier 1 capital established by the BCBS, which now will be defined more narrowly. To raise the quality, consistency, and transparency of regulatory capital, the committee determined that Tier 1 capital must consist predominantly of common equity and retained earnings. The financial crisis demonstrated that the resources to cushion against credit losses and write-downs came out of retained earnings, which is a part of a bank's tangible equity base. Hence, the definitions of Tier 1 capital ratio and tangible common equity ratio are now more closely defined.³⁵ Mortgage servicing rights, deferred tax assets, and holdings in other financial institutions may also be included in Tier 1 because they are considered very liquid and can be sold to offset unexpected losses; but these assets may not collectively exceed more than 15% of a bank's Tier 1 capital. This requirement limits dilution of the amount of common tangible equity in Tier 1 capital.

The final rule requires most elements of accumulated other comprehensive income (AOCI) to be included in Tier 1 regulatory capital. AOCI refers to gains or losses not yet realized (on assets available for sale), but the rationale to include these elements in Tier 1 capital is to capture a more

³² Subsidiaries of foreign banking firms operating in the United States must comply by July 15, 2015.

³³ These banks are subject to the Federal Reserve's Small Bank Holding Company Policy Statement, which may be found at <http://www.federalreserve.gov/newsevents/press/bcreg/20060227a.htm>.

³⁴ A multi-tiered Savings & Loan Holding Company is composed of multiple companies or affiliates, and the top-tier refers to the parent or holding company that owns a savings bank or association. Savings and Loan Holding Companies that have more than 25% of consolidated assets derived from insurance underwriting activities, are subject to state insurance regulation, or have 50% or more of their revenues derived from non-financial activities are temporarily exempted while the Fed further evaluates the appropriateness of this regulatory capital framework for these institutions.

³⁵ The tangible common equity ratio is defined as the ratio of a bank's common equity divided by its tangible assets.

accurate assessment of a bank's loss absorption capacity if its assets had to be sold.³⁶ For example, temporary movements in interest rates may cause the market value of securities to fluctuate. When interest rates fall, loans become more valuable especially if borrowers choose not to refinance into ones with lower interest rates; conversely, the market values of existing loans fall when interest rates increase. Given that interest rate fluctuations translate into fluctuations of bank assets (securities) values, inclusion of unrealized gains and losses in Tier 1 capital would likely add volatility to bank capital ratios, arguably reflecting more frequent movements in market interest rates rather than changes in borrowers' default risks. Such volatility could increase the difficulty to gauge how much to lend and remain in compliance during periods of interest rate uncertainty, which may be particularly problematic for small banks with limited ability to use derivative instruments to hedge interest rate risks. Consequently, the U.S. federal banking regulators will allow banks that are *not* subject to the advanced approaches rules a one-time opportunity to opt out of the AOCI requirement. Banks may opt out of this requirement by the first quarterly financial report filed and submitted after January 1, 2015.³⁷

Default (Credit) Risk Ratio Requirements

Before discussing some of the ratio requirements, it may be useful to review the two-step process for determining the proper capitalization levels. First, the asset (loan) is multiplied by a *risk weight* that is designed to capture the riskiness of the borrower. Next, the risk-weighted asset (or the product of the original asset multiplied by the risk weight) is multiplied by the *prompt corrective action ratio* or required capital ratio charge, which is designed to ensure that lending institutions have a capital reserve to buffer against the credit risk of the borrower.³⁸ For example, suppose a borrower receives a \$100,000 mortgage loan. According to the Basel III final rule, if the mortgage meets certain requirements, then it would be assigned a 50% risk weight, and the value of the risk-weighted asset would be \$50,000. For the bank to be *adequately capitalized*, it would need to hold total risk-based capital in the amount of \$4,000 (8% prompt corrective action capital charge *\$50,000) on this loan; to be *well-capitalized*, it would need to hold total risk-based capital in the amount of \$5,000 (10% prompt corrective action capital charge *\$50,000). This example has only one loan, but the entire asset side of a bank's balance sheet is typically risk weighted and then summed prior to applying the prompt corrective capital charges.

Revised Risk-Weighting Requirements

All banks regardless of size are required to follow the same risk-weighting guidelines. Federal regulators have implemented a system that assigns risk weights, some that appear below, to all types of asset holdings (or exposures) based upon various categories of loans, issuers (of financial securities), and borrower underwriting requirements. All bank assets (loans) would be multiplied by the assigned risk weight, and the sum of the risk-weighted assets would then be multiplied by a minimum capital percentage to determine how much capital a bank must hold.

³⁶ The Financial Accounting Standard Board (FASB) has also issued new accounting rules on the reporting of AOCI, which includes gains and losses excluded from net income, to increase transparency. See http://www.fasb.org/cs/ContentServer?pagename=FASB%2FFASBContent_C%2FNewsPage&cid=1176160678750.

³⁷ See http://www.fdic.gov/regulations/capital/Community_Bank_Guide.pdf. For more information about Call Reports and financial reporting requirements of thrifts, see http://www2.fdic.gov/Call_TFR_Rpts/index.asp.

³⁸ If a bank fails to maintain capital levels consistent with the required regulatory capital ratios, then its regulator can take prompt corrective action, which may include penalties or additional requirements until its balance sheet is brought back into compliance.

Notable Asset Risk Weighting Requirements Under Basel III Final Rule

- Exposures to the U.S. government, including securities issued by the Federal Reserve and federal government agencies, will continue to be assigned a 0% risk weight.
- In light of the Qualified Mortgage Rule, the treatment of residential mortgage exposures did not change.³⁹ These exposures will continue to be assigned a 20% risk weight if they are insured by the Federal Housing Administration or the Veterans' Administration; a 50% risk weight for prudently underwritten first-liens; and a 100% risk weight for all other exposures, including when a borrower has both first and second liens.
- Exposures to the direct obligations of the government-sponsored enterprises (e.g., Fannie Mae, Freddie Mac, Federal Home Loan Banks, Farmer Mac) will continue to receive a 20% risk weight; a risk weight of 100% will be assigned to holdings of their preferred stock.
- Consumer loans (e.g., credit cards, automobile loans) continue to receive a risk weight of 100%.
- A Public Sector Entity (PSE) is defined as a state, local authority, or other government subdivision below the level of a sovereign, which would include U.S. states and municipalities. Two risk weights are assigned to the issuances of these PSEs. For a general obligation, which is defined as a bond backed by the full, faith, and credit of a PSE, the assigned risk weight is 20%. For a revenue exposure, which the PSE has committed to repay with revenues from a project rather than general tax funds, the assigned risk weight is 50%.
- Exposures to foreign sovereigns and banks will be assigned risk weights depending upon whether the entity (1) is a member of the Organization for Economic Co-operation and Development (OECD) and (2) has a country risk classification (CRC) assigned by the OECD. The weights range from 0% to 150% for issuances by foreign sovereigns and from 20% to 150% for issuances by foreign banks. (A weight of 150% will immediately be assigned to a foreign exposure upon the occurrence of a sovereign default during the previous 5 years.)
- Exposures to the Bank for International Settlements, the European Central Bank, the European Commission, the International Monetary Fund, and a broad range of multilateral development banks receive a risk weight of 0%.
- Generally speaking, the risk weights for commercial real estate (CRE) exposures remain at 100%. A particular subset of CRE, however, known as high-volatility commercial real estate (HVCRE) will be assigned a risk weight of 150%. HVCRE is defined as the acquisition, development, or construction of real property with the following exemptions: one- to four-family residential properties, certain community development projects, the purchase or development of agricultural land, or CRE projects in which the borrower satisfies additional qualifying requirements.
- A 100% risk weight must be applied to various off-balance sheet exposures that are not securitization exposures (e.g., loan guarantees, repurchase agreements, securities lending and borrowing transactions).
- Banks must apply a 150% risk weight to the outstanding balance of non-performing loans (except for non-performing 1-4 family residential mortgage loans).
- In light of Section 939A of Dodd-Frank, U.S. implementation of Basel II.5 and Basel III do not depend on credit ratings. The ratings-based approach to securitization exposures (that was allowed under Basel I) has been replaced with the *simplified supervisory formula approach* (SSFA). Under SSFA, the risk weight is determined by the applicable credit risk as well as the hierarchy position of the securitization exposure in the payment structure.⁴⁰

Revisions to Prompt Corrective Action Ratio Requirements

After the assets are risk weighted, banks must apply prompt corrective action capital ratio charges to determine how much capital to hold. Generally speaking, a bank in compliance with the capital charges (see **Appendix B, Table B-1**) would be considered *adequately capitalized* or has satisfied the minimum levels of capitalization. A bank must exceed those capitalization standards to be

³⁹ For information on the Qualified Mortgage Rule, see CRS Report R43081, *The Ability-to-Repay Rule: Possible Effects of the Qualified Mortgage Definition on Credit Availability and Other Selected Issues*, by (name redacted).

⁴⁰ For example, some junior securitization risk exposures may be assigned a risk weight of 1,250%.

considered *well-capitalized*, and the U.S. federal banking regulators have defined the criteria necessary to achieve that designation.⁴¹ A bank failing to satisfy the minimum capitalization requirements would receive a *prompt corrective action* notice from its primary regulator that may include penalties and other restrictions. An overview of the ratios as applied to banks of different sizes is presented below; a more detailed discussion appears in **Appendix B**.

Risk-Weighted Capital Ratio Requirements

The total risk-weighted capital requirements, which is defined as total (Tier 1 and Tier 2) capital divided by total risk-weighted assets, must now use the following new risk weights below.

Total Risk-Weighted Capital Ratio Requirements Under Basel III Final Rule

- 8% minimum total risk-based capital ratio by January 1, 2014.
- 10.5% with inclusion of a *capital conservation buffer* of 2.5% by the end of 2019 for banks. This buffer is designed to build capital outside of financial distress, and banks must maintain a conservation buffer *greater than 2.5%* to avoid restrictions on dividends and discretionary bonus payments.
- Up to 13.0% for the advanced approaches banks with the inclusion of both the capital conservation buffer of 2.5% by the end of 2019 and the *countercyclical buffer*, which has initially been set at 0%, could be set as high as 2.5% by the end of 2019. Section 616(c) of Dodd-Frank requires U.S. banks to maintain a countercyclical buffer (defined and discussed in **Appendix B**). The advanced approaches banks would, therefore, need to maintain a combined (conservation and countercyclical) buffer *greater than 5%* to avoid restrictions on dividends and discretionary bonus payments.⁴²

In the earlier risk weighting example, a \$100,000 mortgage loan was assigned a 50% risk weight, and the risk-weighted asset was equal to \$50,000. Thus, the minimum prompt corrective action total risk-weighted capital charges under the final rule are as follows: banks with assets under \$500 million would hold a capital buffer of \$4,000; banks with more than \$500 million in assets would hold \$5,250; and advanced approaches banks would hold \$5,250 if the countercyclical buffer is set at 0% or \$6,500 if the countercyclical buffer is set at 2.5% during times of rapid credit growth.

Unweighted Leverage Ratio Requirements

In contrast to the risk-weighted capital ratio requirements, the leverage ratio is defined as Tier 1 capital divided by the average total on-balance sheet assets. An unweighted ratio requirement may be important at times when financial risks suddenly rise above what the assigned risk weight can feasibly capture. The leverage ratio requirements for U.S. banks appear below.

Unweighted Leverage Ratio Requirements

- 4% minimum leverage ratio by January 2014.
- An additional supplementary leverage ratio of 3% for the advanced approaches banks. The supplementary

⁴¹ See <http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20120607a1.pdf>, Table 6—Proposed PCA (Prompt Corrective Action) Levels for Insured Depository Institutions not Subject to the Advanced Approaches Rule for determining whether a bank is adequately capitalized or undercapitalized.

⁴² Under separate rulemaking, an additional 0-2.5% could be required for Global Systemically Important Banks (G-SIBs), which are financial institutions whose distress or disorderly failure would cause significant disruption to global financial markets. See <http://www.bis.org/publ/bcb201.pdf>.

leverage ratio incorporates leverage exposures that are both on and off the bank's balance sheet.

- An additional 2% added to the supplementary leverage ratio of 3%, for a supplementary leverage ratio of 5%, for banks with more than \$700 billion in total consolidated assets or more than \$10 trillion in assets as a bank holding company.

On April 8, 2014, the U.S. federal banking regulators issued a final rule that would add an additional capital buffer of at least 2% to the current supplementary leverage ratio of 3% for banks with more than \$700 billion in total consolidated assets or \$10 trillion in total assets, thus raising the total supplementary leverage ratio requirement to a 5% minimum.⁴³ The enhanced supplementary leverage ratio would function similar to the capital conservation buffer such that the eight largest SIFIs must maintain a 6% ratio (which would exceed the 5% minimum) to avoid restrictions on bonuses. The proposal would take effect on January 1, 2018.⁴⁴

Liquidity Risk Ratio Requirements (Proposed)

One definition of liquidity is the ability to sell an asset immediately for its original face or book value without incurring losses or significant transaction fees.⁴⁵ Bank portfolios generally consist of illiquid assets (longer-term loans) that are funded by liabilities (shorter-term borrowings) that must be renewed continuously until the longer-term customer loans are fully repaid. Episodes of uncertainty, however, can cause increases in short-term rates relative to long-term rates, which can translate into distress for financial institutions. For example, institutions holding large amounts of illiquid assets may suddenly find themselves competing with other financial institutions to borrow shorter-term liquid assets, which drives up short-term rates and increases funding risks. During a period of uncertainty, another option for a bank might be to liquidate some of its asset security holdings; but if other banks simultaneously make similar financial decisions, the market for such securities may consist of many sellers and few willing buyers. In both cases, even if banks have sufficient capital reserves to still be considered solvent, the scarcity of liquid funds would result in problems repaying short-term funding obligations. Hence, in addition to having sufficient capital to absorb some loan defaults (credit risk), banks need sufficient amounts of liquidity to buffer against unanticipated reversals in cash flow that could result in asset “fire sales,” a phenomenon that occurred in 2007 and into 2008.⁴⁶ The BCBS, therefore, introduced two new liquidity risk ratio requirements (discussed in **Appendix B**) to improve resilience to liquidity stress.⁴⁷

⁴³ See <http://www.federalreserve.gov/newsevents/press/bcreg/20140408a.htm>.

⁴⁴ Section 165 of Dodd-Frank has a leverage buffer requirement, but this requirement differs from the leverage ratio requirement discussed in this section. Dodd-Frank requires bank holding companies with \$50 billion or more in assets and nonbank financial companies supervised by the Federal Reserve designated as SIFIs to maintain a debt-to-equity ratio of no more than 15-to-1.

⁴⁵ Economists have various definitions of liquidity rather than a single consensus definition.

⁴⁶ See Greenlaw, Hatzius, and Kashyap et al., “Leveraged Losses: Lessons from the Mortgage Market Meltdown,” Proceedings of the U.S. Monetary Policy Forum, 2008, http://research.chicagobooth.edu/igm/docs/USMPF_FINAL_Print.pdf.

⁴⁷ This regulatory action may also be considered *macroprudential* in nature given that it would act to alleviate funding pressures that could affect the entire financial system and result in a systemic risk event. See CRS Report R40417, *Macroprudential Oversight: Monitoring Systemic Risk in the Financial System*, by (name redacted).

The liquidity risk ratio requirements proposed by the BCBS were not implemented in the Basel III final rule.⁴⁸ On October 24, 2013, however, the federal banking agencies announced a proposed rule to strengthen liquidity requirements (or implement the BCBS's *liquidity coverage ratio*), which would be applied to depository institutions with \$10 billion or more in total consolidated assets.⁴⁹ The liquidity risk ratio requirements have come under scrutiny, particularly because banks would have to substitute away from higher-yielding, illiquid loans and hold more lower-yielding, liquid assets.⁵⁰ If banks are required to hold more liquid assets, then they may not be taking on a sufficient amount of risk (i.e., providing credit in the form of illiquid loans) necessary to spur economic growth. In addition, the banking system may not need to hold large amounts of liquid assets given that the Federal Reserve was established to function as the lender of last resort when liquidity shortages arise.⁵¹ Furthermore, if the banking system held enough highly liquid U.S. Treasury securities to satisfy the liquidity risk ratio requirements, other financial and non-financial entities may experience a shortage of liquid securities. Consequently, the entire banking system could become *more* susceptible to a systemic risk crisis should its large concentration of liquid (U.S. Treasury) securities suddenly experience an increase in credit risk. Hence, while the U.S. federal banking regulators recognize that liquidity risk management is a practical tool for banking system stability, a substantial increase in risk-free asset holdings by the banking system could introduce new challenges to financial stability.⁵²

Do Higher Capital Requirements Curb Lending, (Systemic) Risks, or Both?

In theory, increasing safety and soundness requirements in the form of holding more capital should increase the capacity of the banking system to absorb losses associated with its various financial risks. Higher capital requirements can reduce vulnerability of banking institutions to insolvency (failure). Furthermore, under circumstances when a bank failure is unavoidable, higher capital may reduce the size of claims or perhaps the need to draw from the deposit insurance fund that is maintained by the Federal Deposit Insurance Corporation, thus avoiding possible taxpayer losses.⁵³

Banks, however, are reluctant to hold larger amounts of capital than necessary given that funding loans via the short-term interbank loan markets is typically cheaper than funding them with shareholder equity. A bank typically must pay its shareholders a greater return than it would to

⁴⁸ On November 4, 2011, Federal Reserve Governor Daniel K. Tarullo indicated that the banking regulatory agencies were making recommendations for changes to the liquidity coverage ratio initially proposed by the BSBC and mentioned other liquidity alternatives. See Governor Daniel K. Tarullo, *The International Agenda for Financial Regulation*, Board of Governors of the Federal Reserve System, Speech Delivered at the American Bar Association Banking Law Committee Fall Meeting, Washington, DC, November 4, 2011, <http://www.federalreserve.gov/newsevents/speech/tarullo20111104a.htm>.

⁴⁹ See <http://www.federalreserve.gov/newsevents/press/bcreg/20131024a.htm>.

⁵⁰ See <http://www.bis.org/publ/bcbs188.pdf>.

⁵¹ See Governor Jeremy C. Stein, "Liquidity Regulation and Central Banking," At the "Finding the Right Balance" 2013 Credit Markets Symposium sponsored by the Federal Reserve Bank of Richmond, Charlotte, NC, April 19, 2013, <http://www.federalreserve.gov/newsevents/speech/stein20130419a.htm>.

⁵² See http://www.americanbanker.com/issues/178_153/wave-of-new-regulations-stokes-fears-of-treasuries-shortage-1061210-1.html.

⁵³ See CRS Report R41718, *Federal Deposit Insurance for Banks and Credit Unions*, by (name redacted).

short-term creditors because (1) its return on equity must be competitive with that of other publicly-traded firms; and (2) shareholders require greater compensation for their willingness to shoulder greater default risk. During periods of economic uncertainty, investors could possibly interpret a bank's decision to raise capital as a sign that its default or funding risks may be increasing.⁵⁴ If investors subsequently react negatively to a bank's efforts to raise capital (by seeking higher investment returns elsewhere), then the bank's share price might fall and the risk of bank failure, ironically, could increase.

A bank may attempt to meet increased capital requirements by placing the higher cost burdens on its customers (borrowers) rather than on existing shareholders. For example, to avoid raising new capital and diluting shareholder equity by reducing portfolio assets (loans), a bank may decide to sell some existing assets or reduce future lending.⁵⁵ A bank could also pass its higher funding costs on to borrowers by increasing lending rates. Hence, a bank must decide how to distribute the costs of higher capital requirements between its shareholders and customers. The distribution of those costs may dampen credit expansion and slow the pace of economic recovery.

Although higher capital and stress testing (discussed in **Appendix C**) requirements may result in a larger cushion to absorb unexpected losses, the extent to which a systemic risk event can be mitigated is unclear. Prior to the recent financial crisis, many banks held more than enough capital to be considered well capitalized by regulatory standards; yet holding precautionary capital did not necessarily restrain lending by the covered institutions.⁵⁶ According to the "paradox of financial instability," the financial system appears at its most robust when it is actually most at risk.⁵⁷ The evidence for the paradox is linked to the observation that bank capital is *procyclical*, meaning that it rises during healthy economic periods, when there are fewer defaults, and declines during financial downturns when defaults increase.⁵⁸ Procyclical implies that bank capital levels may be a lagging indicator of distress rather than a predictor of a systemic event.⁵⁹ Ironically, excessive lending activity may arise when banking institutions grow

⁵⁴ See William C. Dudley, "U.S. Experience with Bank Stress Testing," Speech at the Group of 30 Plenary Meeting, Bern, Switzerland, May 28, 2011, <http://www.newyorkfed.org/newsevents/speeches/2011/dud110627.html>.

⁵⁵ If a bank decides to curtail lending to remain in or move toward compliance, it may also discourage (new) depositors to maintain proper balance sheet ratios. See Eric Dash and Nelson D. Schwartz, "In Cautious Times, Banks Flooded With Cash," *New York Times*, October 24, 2011, <http://www.nytimes.com/2011/10/25/business/banks-flooded-with-cash-they-cant-profitably-use.html?pagewanted=all>; Paul Davis, "In Cash Glut, Banks Try to Discourage New Deposits," *American Banker*, July 2010, <http://www.americanbanker.com/bulletins/-1023018-1.html>.

⁵⁶ See <http://www.imf.org/external/pubs/ft/wp/2010/wp10286.pdf>. Large U.S. banking firms held significantly more equity capital than the minimum required by bank regulators under the Basel I requirements over the 1992 through 2006 period. See Allen N. Berger, Robert DeYoung, and Mark Flannery, *How Do Large Banking Organizations Manage Their Capital Ratio?*, The Federal Reserve Bank of Kansas City Economic Research Department, Research Working Paper 08-01, April 2008, <http://www.kc.frb.org/Publicat/RESWKPPAP/PDF/RWP08-01.pdf>.

⁵⁷ For a discussion of the paradox of financial stability, see Herve Hannon, "Towards a Global Financial Stability Framework," Speech at the 45th SEACEN Governors' Conference, Siem Reap province, Cambodia, February 2010, <http://www.bis.org/speeches/sp100303.pdf?noframes=1>.

⁵⁸ Countercyclical capital buffers may increase the capacity of banks to absorb losses associated with an unexpected rise in defaults or encourage them to increase the cost of credit, which may dampen the demand for credit during economic boom periods. In 2008, however, Spain experienced a property bubble and subsequent banking crisis despite the requirement of countercyclical capital buffers for Spanish banks. For more information, see Gabriel Jimenez, Steven Ongena, and Jose-Luis Peydro, et al., *Macprudential Policy, Countercyclical Bank Capital Buffers and Credit Supply: Evidence from the Spanish Dynamic Provisioning Experiments*, Barcelona Graduate School of Economics, Working Paper 628, Barcelona, Spain, April 2012, http://research.barcelonagse.eu/tmp/working_papers/628.pdf; and CRS Report R42377, *The Eurozone Crisis: Overview and Issues for Congress*, coordinated by (name redacted).

⁵⁹ For a discussion of the limitations of stress testing as early warning devices, see Claudio Borio, Mathias Drehmann, (continued...)

overconfident (1) as a result of being well-capitalized and (2) as optimism grows with the exceptional performance of an asset used as collateral for loans.⁶⁰ Given that many banking crises arguably may be attributed to the bursting of asset bubbles, which have proven difficult for the Federal Reserve to identify and counteract, a rise in the pace of aggregate lending activity (especially as lenders' credit risk exposures grow more correlated with the performance of a particular financial market) may arguably serve as a better indicator of vulnerability to a systemic risk event than higher capital requirements.⁶¹

Bank capital levels may also become more misleading or less effective at mitigating financial risks when a significant amount of lending occurs outside the regulated banking system. Prior to the recent financial crisis, many loans were originated by nonbank (nondepository) institutions and nonbank subsidiaries of bank holding companies; some nonbanks and securitizers that held mortgage loans were not subject to safety and soundness capital requirements. Furthermore, large complex financial institutions sponsored financial conduits that allowed mortgages to be financed off the balance sheets of supervised banks.⁶² When large amounts of lending activity occur in parts of the financial system that are not regulated for safety and soundness, raising capital requirements for depository institutions would not necessarily address the rise in the various types of financial risks in the economy.⁶³ Conversely, if non-bank lending activities substantially decline, then the influence of higher bank capital requirements on overall lending activity may increase, causing credit availability in the economy to become more contingent on (or sensitive to) changes in bank capitalization levels.⁶⁴

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and Kostas Tsatsaronis, *Stress-Testing Macro Stress-Testing: Does It Live Up to Expectations*, Bank for International Settlements, Working Papers 369, Basel, Switzerland, January 2012, <http://www.bis.org/publ/work369.htm>.

⁶⁰ See Franklin Allen and Douglas Gale, "Bubbles, Crisis, and Policy," *Oxford Review of Economic Policy*, vol. 15, no. 3 (1999) at <http://finance.wharton.upenn.edu/~allenf/download/Vita/bubbles.pdf>. For a discussion about overconfidence in the performance of mortgage assets stemming from overconfidence in rising house values, see Christopher L. Foote and Paul S. Willen, "The Subprime Mortgage Crisis," in *The New Palgrave Dictionary of Economics Online*, eds. Steven N. Durlauf and Lawrence E. Blume, Online Edition ed. (Palgrave Macmillan, 2011). In the recent banking crisis, institutions that experience large losses held high concentrations or were exposure to mortgage securities prior to the downturn in the housing market. See David Greenlaw, Jan Hatzius, and Anil K. Kashyap, et al., "Leveraged Losses: Lessons from the Mortgage Market Meltdown," Proceedings of the U.S. Monetary Policy Forum, 2008, http://research.chicagobooth.edu/igm/docs/USMPF_FINAL_Print.pdf.

⁶¹ See Governor Ben S. Bernanke, "Asset-Price "Bubbles" and Monetary Policy," Remarks before the New York Chapter of the National Association of Business Economics, New York, NY, October 15, 2002, <http://www.federalreserve.gov/boarddocs/speeches/2002/20021015/default.htm>; and U.S. Department of the Treasury, Office of the Comptroller of the Currency, "Concentrations of Credit, Comptroller's Handbook," December 2011, <http://www.occ.gov/publications/publications-by-type/comptrollers-handbook/Concentration-HB-Final.pdf>.

⁶² See Peter J. Elmer, "Conduits: Their Structure and Risk," *FDIC Banking Review*, vol. 12, no. 3 (December 1999), pp. 27-40. The proliferation of off-balance-sheet activities arguably could have been used as an indicator that credit availability was growing at a rate faster than the capital buffers of the banking firms that sponsored such conduits. See Thomas M. Hoenig and Charles S. Morris, *Restructuring the Banking System to Improve Safety and Soundness*, Federal Reserve Bank of Kansas City, May 2011, <http://www.kansascityfed.org/publicat/speeches/Restructuring-the-Banking-System-05-24-11.pdf>. For more information on the supervision of Large Complex Banking Organizations, see Lisa M. DeFerrari and David E. Palmer, "Supervision of Large Complex Banking Organizations," *Federal Reserve Bulletin*, February 2001, pp. 47-57, at <http://www.federalreserve.gov/pubs/bulletin/2001/0201lead.pdf>.

⁶³ See CRS Report RS22722, *Securitization and Federal Regulation of Mortgages for Safety and Soundness*, by (name redacted).

⁶⁴ The Federal Reserve attributes an observed tightening of credit to the disappearance of private-label mortgage securitizations, which may have been able to fund creditworthy borrowers that did not satisfy underwriting criteria set by Fannie Mae, Freddie Mac, or the Federal Housing Administration. See Chairman Ben S. Bernanke, "Housing Markets in Transition," Speech at the 2012 National Association of Homebuilders International Builders' Show, (continued...)

Appendix A. Asset Risk Weighting

Capital adequacy regulation requires banks to hold enough reserves to maintain minimum capital-asset ratios, which are generally defined as bank capital (e.g., common shareholder equity) in the numerator and bank assets in the denominator. Basel I introduced a risk weighting system that weights (multiplies) the assets in the denominator of the capital-asset ratio by a factor that attempts to capture the relative credit or default risk of bank assets.⁶⁵ The risk weighting system arguably correlates lower credit risk with liquidity, as it typically assigns lower weights to more liquid assets and higher weights to less liquid assets. For example, cash and U.S. Treasury securities, which are liquid and considered to have zero default risk, receive a risk weight of 0%. These asset holdings would have no effect on a bank's portfolio capital-asset ratio. On the other hand, loans with higher risk weights reduce the overall portfolio capital-asset ratio by increasing the size of the denominator. A bank holding a loan that is assigned 100% risk weight would be required to hold 8% of the value of that asset as capital. Should a bank decide to hold less cash and increase its holdings of higher yielding, less liquid loans, then its capital reserves must also increase for its capital-asset ratio to remain intact. Conversely, when capital-asset ratios are low, academic research has found that some banks will substitute toward low risk-weighted asset categories to restore the ratio.⁶⁶ The composition of a bank's asset portfolio, therefore, may be influenced by the fixed risk weights assigned to the various assets.

The Basel I weighting system arguably did not sufficiently differentiate among the degrees of risk. To illustrate, Basel I places the same capital charge on all commercial loans regardless of the differences in credit (default) risk. In other words, a bank would be required to hold the same percentage of capital against two commercial loans regardless if one were of relatively higher credit quality. Furthermore, the weighting system is unable to capture offsetting risk exposures. The capital surcharge is the same even though holding the loan with lower default risk may compensate for holding the higher risk loan. Hence, banks arguably have an incentive to make higher risk loans with potentially higher yields as opposed to lower risk loans with lower yields.

Another concern regarding the Basel I weighting system is that banks would be incentivized to hold government securities (e.g., U.S. Treasuries) rather than extend loans where credit shortages may exist, particularly during economic downturns. The government securities of nations that are members of the Organization for Economic Co-operation and Development (OECD) receive a risk weight of 0%. Suppose capital-asset ratios fall below regulatory threshold levels during recessions after an increase in borrower loan defaults. If banks, as discussed earlier, previously had the incentive to hold lower quality loans during an expansionary economic period, they may

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Orlando, FL, February 10, 2012, <http://www.federalreserve.gov/newsevents/speech/bernanke20110210a.htm>. Section 171 of Dodd-Frank, which requires the same minimum-leverage and risk-based capital requirements that apply to federally insured depository institutions to apply to bank holding companies and systemically significant nonbank financial companies, may reduce the funding advantages previously enjoyed by some non-banks relative to the banking sector, thus increasing the sensitivity of credit availability to changes in capital requirements.

⁶⁵ See "Minimum Capital Requirements" at <http://www.bis.org/publ/bcbs128b.pdf>; "Risk Weighting Assets" at http://www.fdic.gov/regulations/resources/directors_college/sfcb/capital.pdf or http://www.ots.treas.gov/_files/422020.pdf.

⁶⁶ See Patricia Jackson, coordinator, *Capital Requirements and Bank Behaviour: The Impact of the Basle Accord*, Bank for International Settlements, Basle Committee on Banking Supervision Working Papers, Basle, Switzerland, April 1999, pp. 1-59, http://www.bis.org/publ/bcbs_wp1.pdf.

decide to hold more OECD country sovereign debt rather than make new loans during recessionary periods to keep capital-asset ratios in compliance. These actions may further curtail lending to segments where more severe credit shortages may exist, such as in non-OECD emerging market economies or in the private sector when entering the recovery phase of a business cycle.⁶⁷ Hence, the Basel I weighting system that relies on fixed weights results in “procyclical” capital requirements, which means they may incentivize excessive risk taking during expansions and discourage credit availability during economic downturns.⁶⁸ A bank’s risk exposure may also be *understated* should the default risk of OECD country sovereign (debt) securities increase.⁶⁹

Basel II revised the weighting system to allow for more risk differentiation, specifically by adding more risk weight categories. Given that fixed weights do not vary when financial risks change, Basel II also proposed the use of external credit assessments or ratings to support the determination of the appropriate risk weight assignment.⁷⁰ For example, suppose a Nationally Recognized Statistical Rating Organization (NRSRO) gave its highest investment grade rating to a security that still receives a 100% risk weight under Basel I. The highly rated security could receive a 20% risk weight under Basel II, which arguably better reflects the high credit quality. Given that Dodd-Frank removes the use of NRSRO credit ratings, the Basel III final rule incorporated a more extensive risk weighting system that allows for more risk differentiation than Basel I.⁷¹ Despite the greater array of risk weights to differentiate among the degrees of risk, the risk weighting system would still provide procyclical lending incentives for the banking system (in terms of the types of assets to hold in portfolio during different phases of the business cycle as previously discussed).

⁶⁷ See Bryan J. Balin, *Basel I, Basel II, and Emerging Markets: A Nontechnical Analysis*, The Johns Hopkins University School of Advanced International Studies, Washington, DC, May 2008, <http://www.policyarchive.org/handle/10207/bitstreams/11484.pdf>. For more information about OECD, see http://www.oecd.org/home/0,2987,en_2649_201185_1_1_1_1_1,00.html.

⁶⁸ Jose L. Fillat and Judit Montoriol-Garriga, *Addressing the Pro-cyclicality of Capital Requirements with a Dynamic Loan Loss Provision System*, Federal Reserve Bank of Boston, Working Paper No. QAU10-4, September 15, 2010, <http://www.bostonfed.org/bankinfo/qau/wp/2010/qau1004.pdf>.

⁶⁹ See CRS Report R41167, *Greece’s Debt Crisis: Overview, Policy Responses, and Implications*, coordinated by (name redacted).

⁷⁰ See *Part 2: The First Pillar—Minimum Capital Requirements*, Bank for International Settlements, <http://www.bis.org/publ/bcbs128b.pdf>.

⁷¹ For an example of Basel I risk weighting and total capital charges of an entire sample bank balance sheet, see Appendix of CRS Report R42574, *Credit Union Commercial Business Lending: Key Issues for Legislation in the 112th Congress*, by (name redacted).

Appendix B. Capital Charges and Regulatory Ratios

The purpose of this appendix is to show the capital requirements arising from the Basel III Capital Accord (as opposed to the Basel III final rule) before the federal regulators included additional elements, such as some of the required Dodd-Frank provisions. Basel III, Pillar 1⁷² modifies the regulatory capital and liquidity requirements established in Basel I and Basel II, requiring more and higher quality capital.⁷³ As previously discussed, Basel III, Pillar I revises the definition of Tier 1 capital to increase the amount of common tangible equity that must be held as minimum regulatory capital. In addition, the minimum common equity capital requirement increases to 4.5% by January 1, 2015, up from the Basel II level of 2%. By January 1, 2019, the total minimum total capital requirement (Tier 1 and Tier 2) increases from 8.0% to 10.5%, which reflects the 2.5% capital conservation buffer (discussed below). Basel III also establishes a countercyclical capital buffer, a leverage ratio, and two new liquidity ratios. These regulatory ratios, sometimes referred to as capital charges, are discussed in more detail in this appendix. **Table B-1** summarizes the Basel III minimum capital requirements and phase-in arrangements.

Capital Conservation Buffer

The BCBS established a capital conservation buffer to encourage banks to build capital buffers outside periods of financial stress that can be drawn down should their assets deteriorate, thus improving their resiliency to unanticipated losses. On September 12, 2010, the BCBS agreed to set the capital conservation buffer at 2.5% of risk-weighted assets. This buffer must consist mostly of common tangible equity. According to Basel III, regulators should forbid banks from distributing earnings, dividend payments, and salary bonus payments when banks have depleted their capital buffers. The conservation buffer would increase in increments of 0.625% annually. On January 1, 2016, the conservation buffer must be 0.625, rising to 2.5% by January 1, 2019.

Countercyclical Capital Buffer

Lending can grow disproportionately when economic activity is expanding and contract when economic activity is contracting, thus feeding and exacerbating the business cycle. On September 12, 2010, the BCBS established a countercyclical buffer that would equal between 0 and 2.5% of a bank's total risk-weighted assets and consist of common equity or other fully loss absorbing capital. The buffer would grow during economic expansions and decrease during contractions. National regulatory authorities will be allowed to determine when lending growth poses a risk to

⁷² Basel II introduced the concept of three regulatory pillars. Pillar 1 contains the methodology for calculating the minimum capital requirements for banks, among other requirements. Pillars 2 and 3 of Basel II were added to monitor the rise of unintended outcomes. The second pillar requires banks to maintain management mechanisms to conduct ongoing internal self-evaluation of their risk exposures and compliance with the minimum regulatory capital requirement. The third pillar facilitates market discipline and reporting. Specifically, pillar 3 addresses problems with operational risks, which include internal operation failures, such as poor accounting, legal and compliance failures, poor and fraudulent managers and traders, and security failures.

⁷³ See Basel Committee on Banking Supervision, *Strengthening the Resilience of the Banking Sector*, December 2009, <http://www.bis.org/publ/bcbs164.pdf>. This document was an expanded and updated version of an earlier document entitled Basel Committee on Banking Supervision, *Enhancements to the Basel II Framework*, July 2009, <http://www.bis.org/publ/bcbs157.pdf>.

the stability of the financial system and when a countercyclical capital buffer requirement would be necessary.⁷⁴

Leverage Ratio

The leverage ratio is defined as gross capital divided by the average total consolidated on-balance sheet assets. Unlike the Tier 1 and Tier 2 capital ratios, the leverage ratio does not depend upon risk weights. The logic behind this ratio is to illuminate financial risks that could be assigned lower weights and still translate into substantial losses. Hence, the leverage ratio assigns the same level of credit risk to all assets (e.g., loans held in portfolio, asset-backed securities, credit-risk guarantees) and serves as a capital backstop to ensure that a bank's capital buffer does not fall below a minimum threshold. The BCBS is currently testing a minimum requirement of 3% for the leverage ratio, which it plans to implement as a requirement by January 1, 2018.⁷⁵

Liquidity Risk Measures: Liquidity Coverage Ratio, Net Stable Funding Ratio

On September 12, 2010, the BCBS established the 30-day liquidity coverage ratio requirement to promote resilience to sudden temporary disruptions in liquidity. The numerator of the liquidity coverage ratio consists of the total amount of a bank's stock of *high-quality* (generally government securities and cash) liquid assets, and the denominator measures net cash outflows over a 30-day time period. By 2019, a bank must hold an equal (or greater) amount of high-quality liquid assets relative to its amount of net cash outflow over a 30-day period.⁷⁶ The BCBS also established the net stable funding ratio (NSFR) to encourage banks to rely upon medium- and longer-term funding of its longer-term loans as opposed to relying primarily upon short-term funding.⁷⁷ The NSFR will not be introduced as a minimum requirement in Basel III until 2018.⁷⁸

⁷⁴ The committee also supports the International Accounting Standard Board plans to issue a set of high level guiding principles that would promote an expected loss approach, which is also less procyclical than the current incurred loss approach. See <http://www.bis.org/publ/bcbs164.pdf>, p. 8.

⁷⁵ For more discussion of the leverage ratio, see <http://www.bis.org/publ/bcbs165/splr.pdf> and <http://www.bis.org/publ/bcbs251.pdf>.

⁷⁶ See <http://www.bis.org/publ/bcbs238.pdf>.

⁷⁷ The numerator of the NSFR would be computed using banks' "available stable funding sources" (ASF) in the numerator divided by assets that "require stable funding" (RSF) in the denominator. The ASF in the numerator would be calculated as the sum of a bank's liabilities and capital using ASF weights. Bank capital would receive a 100% ASF weight; consumer deposits liabilities would receive 70% ASF weight; and shorter-term liabilities would receive lower or 0% ASF weights. In other words, available stable funding sources with longer maturities would be assigned higher weights than those with shorter maturities. The RSF in the denominator would be calculated as the sum of the bank's assets using RSF weights. Cash assets do not require funding and would receive a 0% RSF weight. Loans that mature in less than a year require funding and would receive an 85% RSF; loans that take a year or longer to mature would receive a 100% RSF. In other words, assets that require stable funding receive higher weights the longer they must be funded. The NSFR cannot be lower than 100%. Hence, a bank must either increase its capital reserves if it chooses to fund longer-term consumer loans with sequences of shorter-term loans, or it must diversify the maturities of its own shorter-term borrowings to maintain a NSFR of 100%.

⁷⁸ See <http://www.bis.org/publ/bcbs231.pdf>.

Table B-I. Basel III Pillar I Requirements and Phase-in Arrangements

(all dates as of January 1; in percentages)

Pillar I Requirements	Years								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Minimum Common Equity Capital Ratio			3.5	4.0	4.5	4.5	4.5	4.5	4.5
Minimum Tier I Capital			4.5	5.5	6.0	6.0	6.0	6.0	6.0
Minimum Total (Tier I + Tier 2) Capital (row 3)			8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Conservation Buffer (row 4)						.0625	1.25	1.875	2.5
Minimum Total Capital + Conservation Buffer (sum of rows 3 & 4)			8.0	8.0	8.0	8.625	9.25	9.875	10.5
Optional: Minimum Countercyclical Buffer (row 6)						.0625	1.25	1.875	2.5
Minimum Total Capital + Conservation + Countercyclical Buffers (sum of rows 3, 4, & 6)			8.0	8.0	8.0	8.6875	10.5	11.75	13.0
Leverage Ratio	Mon.		3%	3%	3%	3%	3%	Req.	
Liquidity Coverage Ratio					60%	70%	80%	90%	100%
Net Stable Funding Ratio		Mon.						Req.	

Source: Basel Committee on Banking Supervision, Group of Governors and Heads of supervision announces higher global minimum Standard, September 12, 2010, p. 7.

Notes: Monitor "Mon." = observation or testing period begins, Require "Req." = introduction of minimum standard.

Additional Capital Requirements for G-SIBs

Globally systemically important banks (G-SIBs) will have additional loss absorbency or capital requirements.⁷⁹ G-SIBs are financial institutions, typically with significantly large amounts of assets that engage in financial activities such that their distress or failure would cause significant disruption to global financial activity. The BCBS recommends that an institution determined to be systemically important would be required to hold an additional 1% to 2.5% of capital in the form of common equity against their risk-weighted assets. These loss requirements would also be phased in and become fully effective by 2019.

⁷⁹ See <http://www.bis.org/publ/bcbs255.pdf>.

Appendix C. Stress Testing and Systemic Risk

A bank stress test is a diagnostic tool used to judge the ability of banks and financial institutions to weather adverse macroeconomic and financial conditions.⁸⁰ Stress tests are conducted to determine whether banks and financial institutions remain adequately capitalized and solvent under specific adverse economic scenarios. A stress test may include events such as heightened rates of unemployment, an economic slowdown or a recession, or failure of a large complex banking organization.⁸¹ Such events could result in widespread borrower defaults, the inability to obtain short-term funding, and ultimately, depletion of a bank's Tier 1 capital. Thus, stress tests may alert a bank's management and regulators to potential balance sheet weaknesses during an unfavorable economic or financial scenario. In addition, passing a stress test often requires banking institutions to hold capital levels that would exceed the capital ratios discussed earlier in this report.

Dodd-Frank requires bank holding companies and non-bank financial corporations with consolidated assets of more than \$10 billion to conduct and report on self-imposed semi-annual stress tests. On October 9, 2012, the Office of the Comptroller of the Currency and the Federal Deposit Insurance Corporation separately announced final rules requiring national banks and federal savings associations with total consolidated assets of \$10 billion or more to conduct annual stress tests; the Federal Reserve released its final rule on October 12, 2012.⁸² The final rules were issued directly to banking institutions from their primary federal banking regulator. Federal banking regulators, however, currently require all banking institutions to analyze the potential impact of adverse economic conditions on their financial conditions or viability. Federal regulators do allow stress tests to be customized for banks of different sizes.

A Stress Testing Example for Small Institutions

Although community banks are less likely to face the same stress testing requirements as banks with \$10 billion or more in assets,⁸³ they are required to assess their ability to withstand an adverse macroeconomic scenario. For example, U.S. federal banking regulators, concerned about relaxed underwriting standards in commercial real estate (CRE), increased supervisory guidance for banks with significant concentrations in CRE.⁸⁴ Community banks, which typically engage in CRE lending, are generally considered vulnerable to loan defaults and possible failure if CRE prices suddenly collapse.⁸⁵ Given that CRE losses can be substantial and federal regulators may

⁸⁰ Stress testing is also a practice used in medicine, nuclear diagnostics, pharmacology, and computer and network systems among others.

⁸¹ For the definition of a large complex banking organization, see Lisa M. DeFerrari and David E. Palmer, "Supervision of Large Complex Banking Organizations," *Federal Reserve Bulletin*, February 2001, pp. 47-57, <http://www.federalreserve.gov/pubs/bulletin/2001/0201lead.pdf>.

⁸² For the Office of the Comptroller of the Currency, see <https://www.federalregister.gov/articles/2012/10/09/2012-24608/annual-stress-test>; for the Federal Deposit Insurance Corporation, see <http://www.fdic.gov/news/news/press/2012/pr12116.html>; for the Federal Reserve, see <http://www.gpo.gov/fdsys/pkg/FR-2012-10-12/pdf/2012-24988.pdf>.

⁸³ See <http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20120514b1.pdf>.

⁸⁴ See the announcement of the Interagency Guidance on Concentrations in Commercial Real Estate Lending, Sound Risk Management Practices at <http://www.federalreserve.gov/newsevents/press/bcreg/20061206a.htm> and the regulatory guidance at <http://edocket.access.gpo.gov/2006/pdf/06-9630.pdf>.

⁸⁵ Community banks are generally small banks that generally have assets of \$1 billion, meet the lending needs of a circumscribed geographic area. See <http://www.fdic.gov/news/conferences/communitybanking/> (continued...)

not be familiar with the default and funding risks unique to a particular geographic area,⁸⁶ the guidance required a bank to submit a plan to its regulator regarding its risk management practices if any of the following conditions hold:

- total construction and land development loans was equal to or more than 100% of its total capital reserve;
- total construction, land development, other land and loans secured by multifamily and nonfarm nonresidential property was equal to or greater than 300% of its total capital; or
- the CRE loan portfolio had increased by 50% or more in the span of 36 months.

The risk management plan must outline the bank's plan to reduce or manage its high level of commercial real estate concentrations. The guidance states its intent to encourage institutions to develop risk management practices and levels of capital levels "commensurate with the level and nature of their commercial real estate concentrations" rather than limit CRE lending by banks. Nevertheless, the U.S. federal banking regulators are likely to require banks with unacceptable risk management plans to raise additional capital.

Stress Testing of Midsize Banking Organizations

On March 5, 2014, the federal banking regulators issued final guidance on stress testing for firms with assets between \$10 billion and \$50 billion.⁸⁷ Generally speaking, the final rules include, for institutions with \$10 billion to \$50 billion in consolidated assets, stress testing requirements (e.g., economic scenarios) as well as deadlines for reporting (to the primary regulator) and making financial disclosures (to the public).

Stress Testing of Large and Large Complex Banking Organizations

Sections 165 and 166 of Dodd-Frank require enhanced prudential standards on bank holding companies with total consolidated assets of \$50 billion or more and non-bank financial companies determined by the Financial Stability Oversight Council to be systemically important.⁸⁸

In February 2009, the Federal Reserve announced the Supervisory Capital Allocation Program (SCAP) for bank holding companies with assets exceeding \$100 billion. Under the SCAP, the Federal Reserve conducted a stress test for the 19 largest U.S. bank holding companies, which included an estimation of their revenues, losses, and reserve requirements under two adverse economic scenarios.⁸⁹ The SCAP program conducted stress tests for 2009 and 2010. In November

(...continued)

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⁸⁶ See Jose A. Lopez, *Concentrations in Commercial Real Estate Lending*, Federal Reserve Bank of San Francisco, Economic Letter 2007-01, San Francisco, CA, January 5, 2007, <http://www.frbsf.org/publications/economics/letter/2007/el2007-01.html>.

⁸⁷ See <http://www.federalreserve.gov/newsevents/press/bcreg/20140305a.htm>.

⁸⁸ See <http://www.gpo.gov/fdsys/pkg/FR-2011-12-01/pdf/2011-30665.pdf>. See CRS Report R42083, *Financial Stability Oversight Council: A Framework to Mitigate Systemic Risk*, by (name redacted).

⁸⁹ See <http://www.federalreserve.gov/bankinforeg/bcreg20090424a1.pdf>.

2011, the Federal Reserve introduced the Comprehensive Capital Assessment Review (CCAR) program that annually evaluates the capital planning process of institutions with over \$500 billion in assets.⁹⁰ The SCAP stress testing now continues under the CCAR program.⁹¹

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⁹⁰ See <http://www.federalreserve.gov/newsevents/press/bcreg/20111122a.htm> and <http://www.federalreserve.gov/bankinforeg/ccar.htm>. The bank holding companies that would be subject to annual stress testing by the Federal Reserve are listed at <http://www.ffiec.gov/nicpubweb/nicweb/Top50Form.aspx>.

⁹¹ The SCAP and CCAR stress testing exercises may serve as the general framework for implementing the Dodd-Frank Act requirements throughout the banking system, particularly for the institutions with \$10 billion to \$50 billion in assets. See William C. Dudley, "U.S. Experience with Bank Stress Testing," Speech at the Group of 30 Plenary Meeting, Bern, Switzerland, May 28, 2011, <http://www.newyorkfed.org/newsevents/speeches/2011/dud110627.html>.

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