The Supervisory Capital Assessment Program: Design and Implementation

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I. Introduction and Executive Summary

Most U.S. banking organizations currently have capital levels well in excess of the amounts required to be well capitalized. However, losses associated with the deepening recession and financial market turmoil have substantially reduced the capital of some banks. Lower overall levels of capital—especially common equity—along with the uncertain economic environment have eroded public confidence in the amount and quality of capital held by some firms, which is impairing the ability of the banking system overall to perform its critical role of credit intermediation. Given the heightened uncertainty around the future course of the U.S. economy and potential losses in the banking system, supervisors believe it prudent for large bank holding companies (BHCs) to hold additional capital to provide a buffer against higher losses than generally expected, and still remain sufficiently capitalized at over the next two years and able to lend to creditworthy borrowers should such losses materialize. The purpose of the Supervisory Capital Assessment Program (SCAP), which is being conducted by the supervisory agencies, is to assess the size of these capital needs.

The SCAP is a forward-looking exercise designed to estimate losses, revenues, and reserve needs for BHCs in 2009 and 2010 under two macroeconomic scenarios, including one that is more adverse than expected. Should the assessment indicate the need for a BHC to raise capital or improve the quality of its capital to better withstand losses that could occur under more stressful-than-expected conditions, supervisors will expect that firm to augment its capital to create a buffer. This buffer would be drawn down over time if losses were to occur. In evaluating the SCAP results, it is important to recognize that the assessment is a "what if" exercise intended to help supervisors gauge the extent of additional capital needs across a range of potential economic outcomes. A need for additional capital or a change in composition of capital to build a buffer under an economic scenario that is more adverse than expected is not a measure of the current solvency or viability of the firm.

This paper describes the SCAP process conducted by the federal bank regulatory agencies (the agencies) from Feb. 25, 2009 through late April of 2009.[1] All domestic BHCs with year-end 2008 assets exceeding $100 billion were required to participate in the SCAP as part of the ongoing supervisory process. These 19 firms collectively hold two-thirds of the assets and more than one-half of the loans in the U.S. banking system, and support a very significant portion of the credit intermediation done by the banking sector. The firms were asked to project their credit losses and revenues for the two years 2009 and 2010, including the level of reserves that would be needed at the end of 2010 to cover expected losses in 2011, under two alternative economic scenarios. The *baseline scenario* reflected the consensus expectation in February 2009 among professional forecasters on the depth and duration of the recession, while the *more adverse scenario* was designed to characterize a recession that is longer and more severe than the consensus expectation. The firms were also asked to provide supporting documentation for their projected losses and resources, including information on projected income and

[1] The federal bank regulatory agencies that participated in the SCAP are the Board of Governors of the Federal Reserve System, the Federal Reserve Banks, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency.

expenses by major category, domestic and international portfolio characteristics, forecast methods, and important assumptions.

The SCAP process was extensive. In early March, firms submitted their projections to the agencies, which included significant amounts of detailed data. Supervisory teams, organized by specific asset classes, revenues, and reserves, evaluated the substance and quality of the initial submissions and, where appropriate, requested additional data or evaluation of the sensitivity of projections to alternative assumptions. The supervisors also developed independent benchmarks based on firm-specific portfolio characteristics against which they evaluated the appropriateness of the firms' projections for losses and resources that would be available to absorb losses. Results for each firm also were evaluated to assess the sensitivity of the firm to changes in the economy based on projections under the baseline and the more adverse scenarios. The evaluations drew on the expertise of more than 150 senior supervisors, on-site examiners, analysts, and economists from the agencies. Senior supervisory officials made the determination of the necessary capital buffer for each BHC.

While the SCAP is conceptually similar to stress tests that firms undertake as part of their ongoing risk management, the objective of this program was to conduct a comprehensive and consistent assessment simultaneously across the 19 largest BHCs using a common set of macroeconomic scenarios, and a common forward-looking conceptual framework. This framework allowed supervisors to apply a consistent and systematic approach across the group to evaluate the projected loss and resource estimates submitted by the firms. The extensive information on the characteristics of loan, trading, and securities portfolios and modeling methods provided by these institutions allowed supervisors to conduct a cross-firm analysis and assess the projections. In addition, the SCAP is considerably more comprehensive than stress tests that focus on individual business lines, because it simultaneously incorporates all of the major assets and the revenue sources of each of the firms.

As discussed in the interagency statement released on February 10, the SCAP may result in a determination that a BHC may need to augment its capital base to establish a buffer. This capital buffer should position the largest BHCs to continue to play their critical role as intermediaries, even in a more challenging economic environment. The United States Treasury has committed to make capital available to eligible BHCs through the Capital Assistance Program as described in the Term Sheet released on February 25. In addition, BHCs can also apply to Treasury to exchange their existing Capital Purchase Program preferred stock to help meet their buffer requirement.

Section II describes the program design of the SCAP and Section III provides detail on how the assessment of losses and revenues were conducted, and how the capital need was calculated.

II. Program Design

This section provides a discussion of the SCAP framework, a general description of the process, the guidance given to BHCs, and the projections that the participating BHCs were asked to make.

II. A. Discussion of SCAP Analytical Framework

The SCAP process involves the projection of losses on loans, assets held in investment portfolios, and trading-related exposures, as well as the firm's capacity to absorb losses in order to determine a sufficient capital level to support lending under a worse-than-expected macroeconomic scenario. The

traditional role of capital, especially common equity, is to absorb unexpected losses and thus to protect depositors and other creditors. Given the heightened uncertainty about the economy and potential losses in the banking system, and the potential in the current environment for adverse economic outcomes to be magnified through the banking system, supervisors believe it prudent for large BHCs to hold substantial capital to absorb losses should the economic downturn be longer and deeper than now anticipated. The SCAP was designed to assess these capital needs as part of the ongoing supervisory process. The program is consistent with current regulatory capital guidelines, which require BHCs to hold capital commensurate with their risks, and to generally hold a dominant share of their regulatory capital in the form of common equity.

The SCAP was designed under the assumption that the institutions continue to operate under the regulatory and accounting frameworks existing as of December 31, 2008 and considering the effect of significant changes that have or are expected to occur during the next two years.[2] Loans held in portfolio subject to accrual accounting are carried at amortized cost, net of an allowance for loan losses. The use of accrual accounting for these assets is based on BHCs' intent and ability to hold these loans to maturity, which reflects, in part, a combination of more stable deposit funding and information advantages about the quality of the loans they underwrite. The economic value of loans in the accrual book is reduced through the loan loss reserving process when repayment becomes doubtful, but is not reduced for fluctuations in market prices, which may be driven by market liquidity considerations, if those factors do not affect the ultimate likelihood of repayment. The adherence of SCAP to current practices is important because the majority of assets at most of the BHCs participating in the SCAP are loans that are booked on an accrual basis. As a result of the loss recognition framework for assets in the accrual loan book, the results of this exercise are not comparable with those that would evaluate such assets on a mark-to-market basis.

The SCAP analysis is forward looking, but over a limited time horizon. Losses and resources are projected over a two-year period (2009 to 2010) and include an assessment of the sufficiency of loan loss reserves expected at the end of 2010, which captures expected losses in 2011. This choice of horizon reflects a tradeoff between capturing the full extent of losses that might be incurred on assets that were originated when underwriting standards were more lax in 2006 and 2007 and a reasonable ability to project with some degree of confidence the losses and resources at more distant future points. Given the profile of the consensus baseline outlook for the macro economy and the alternative more adverse scenario that includes a return to positive real GDP growth within the two years, this horizon seems likely to capture a large portion of losses from positions held as of the end of 2008.

While this approach likely captures the bulk of the losses that might be realized on these assets, it is important to note that it does not include the substantial losses that have already been taken. That is, forward-looking losses in the SCAP are not "lifetime" losses which occur from origination to the life-end of the assets, but they do represent a substantial addition to those losses that have already been realized and, as noted above, when combined with losses already taken, are likely to represent a substantial share of the losses associated with loans originated from 2005 to 2007. Losses taken in the 6 quarters through the end of 2008 by these firms and firms they acquired are substantial, estimated at approximately $400 billion for the 19 BHCs participating in the SCAP. They include charge-offs, write-

[2] Significant changes in accounting considered included the recently issued Financial Accounting Standards Boards Financial Staff Position FAS 115-2 and FAS 124-2, *Recognition and Presentation of Other-Than-Temporary Impairments* that is effective in 2009 and expected changes to consolidation accounting that will be effective in 2010.

downs on securities held in the trading and in the investment accounts, and discounts on assets acquired in acquisitions of distressed or failed financial institutions.

II.B. General Description of the Exercise

The BHCs were asked to estimate their potential losses on loans, securities, and trading positions, as well as pre-provision net revenue (PPNR) and the resources available from the allowance for loan and lease losses (ALLL) under two alternative macroeconomic scenarios. Each participating firm was instructed to project potential losses on its loan, investment, and trading securities portfolios, including off-balance sheet commitments and contingent liabilities and exposures over the two-year horizon beginning with year-end 2008 financial statement data. Firms were provided with a common set of indicative loss rate ranges for specific loan categories under conditions of the baseline and the more adverse economic scenarios. Firms were allowed to diverge from the indicative loss rates where they could provide evidence that their estimated loss rates were appropriate. In addition, firms with trading assets of $100 billion or more were asked to estimate potential trading-related market and counter-party credit losses under a market stress scenario provided by the supervisors, based on market shocks that occurred in the second half of 2008.

The BHCs also were asked to project the resources they would have available to absorb losses over the two-year horizon under both scenarios. These resources consist of PPNR – net interest income, fees and other non-interest income, net of non-credit-related expenses – and reserves already established for probable incurred losses at December 31, 2008. PPNR and the ALLL, combined with existing capital above the amount sufficient to exceed minimum regulatory capital standards, are resources that the firm would have available to absorb some of their estimated losses under the scenarios.

Teams of supervisors and analysts composed of members from each of the agencies reviewed and assessed the firms' submissions. Some teams had special expertise in particular asset classes, or in revenues, reserves, and capital, and other teams had special expertise in the specific participating firms. At the outset of the process, teams dedicated to evaluating particular categories of assets, revenues, and reserves evaluated the firms' submissions and actively engaged with the firms for several weeks to obtain additional information necessary to support the firms' estimates. Some firms were asked to provide additional information on the risk characteristics of their portfolios to supplement their initial submission. Examiners also reviewed and evaluated the quantitative methods that firms used to project losses and resources, and support for key assumptions. The supervisory analyses of losses built on individual firm-specific information about the risk characteristics of the portfolio, underwriting practices, and risk management practices.

These teams applied across-firm, comparative analysis to support their assessments. To facilitate this horizontal comparison, supervisors applied independent quantitative methods using firm-specific data to estimate losses and loss absorption resources. The quantitative methods were applied to all the firms to provide consistency in evaluating firms' estimates. The results of these analyses were then evaluated in the context of previous examination work and in the context of the indicative loss rates and macroeconomic scenarios provided by the supervisors to the BHCs at the beginning of the exercise.

To conclude the process, projected losses, revenues, and changes in reserves were combined to evaluate the amount and quality of capital that each firm should have at the end of 2010. Calculations were done on a post-purchase accounting basis and considered taxes, including deferred tax assets, and dividends on preferred stock. Under the more adverse scenario, if any firm is found to have less capital than the need projected by the SCAP assessment, supervisors will request those firms to take deliberate actions to augment their capital so that they will remain in an appropriately strong financial position and be able to lend and support financial intermediation. Thus the capital needs determined by this supervisory exercise should be viewed as a capital buffer designed to be drawn down as losses materialize should the economy be weaker than expected, and still be substantial enough at the end of 2010 for firms to be considered sufficiently capitalized. If the economy recovers more quickly than specified in the more adverse scenario, firms could find their capital buffers at the end of 2010 more than sufficient to support their critical intermediation role and could take actions to reverse their capital build-up.

II.C. Initial Guidance on Macroeconomic Scenarios

For implementation of the SCAP, the supervisors provided assumptions for two alternative macroeconomic scenarios. BHCs were encouraged to consider the broader macroeconomic conditions and adapt the assumptions to reflect their specific business activities when projecting their own losses and resources over 2009 and 2010. For example, local residential house prices would be expected to be a significant determinant in projected loan loss rates given their prominent role in mortgage and consumer lending in recent years. Projections under two alternative scenarios also allow for analysis of the sensitivity of a firm's business to changes in economic conditions.

The baseline assumptions for real GDP growth and the unemployment rate for 2009 and 2010 were assumed to be equal to the average of the projections published by Consensus Forecasts, the Blue Chip survey, and the Survey of Professional Forecasters. The projections were based on forecasts available in February 2009 just before the commencement of the SCAP. The baseline scenario was intended to represent a consensus view about the depth and duration of the recession. The supervisors developed an alternative "more adverse" scenario to reflect the possibility that the economy could turn out to be appreciably weaker than expected under the baseline outlook. By design, the path of the U.S. economy in this alternative more adverse scenario reflects a deeper and longer recession than in the baseline. However, the more adverse alternative is not, and is not intended to be a "worst case" scenario. To be most useful, stress tests should reflect conditions that are severe but plausible.[3]

The assumptions for house prices in the baseline economic outlook are consistent with the path that was implied by futures prices for the Case-Shiller 10-City Composite index in late February and the average response to a special question on house prices in the Blue Chip survey. For the more adverse scenario, house prices are assumed to be about 10 percent lower at the end of 2010 relative to their

[3] The "more adverse" scenario was constructed from the historical track record of private forecasters as well as their current assessments of uncertainty. In particular, based on the historical accuracy of Blue Chip forecasts made since the late 1970s, the likelihood that the average unemployment rate in 2010 could be at least as high as in the alternative more adverse scenario is roughly 10 percent. In addition, the subjective probability assessments provided by participants in the January Consensus Forecasts survey and the February Survey of Professional Forecasters imply a roughly 15 percent chance that real GDP growth could be at least as low, and unemployment at least as high, as assumed in the more adverse scenario.

level in the baseline scenario.[4]

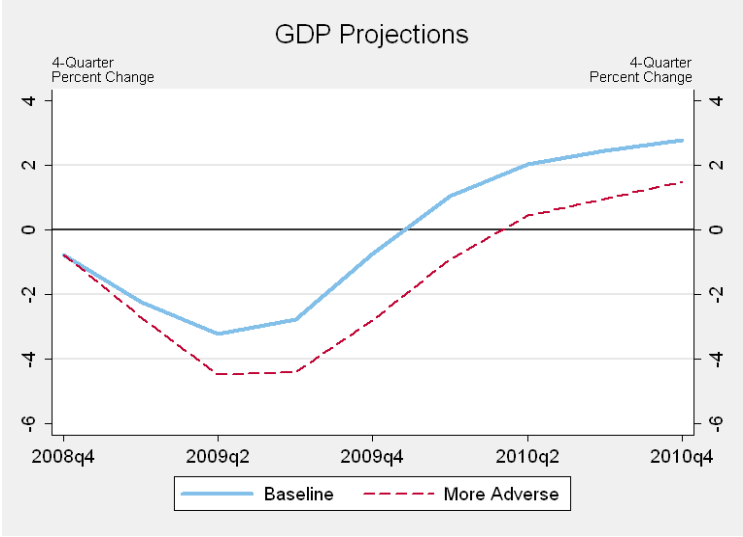
Since the announcement of the SCAP in late February, the economy has deteriorated somewhat and professional forecasters have revised their outlooks for GDP growth and the unemployment rate in 2009 and 2010. New information on house prices suggests that the market's expectation for house price declines is similar to what was anticipated in February. A large share of projected losses at banks are expected to be related to house prices, and the specified path for house prices in the more adverse scenario still represents a severe level of stress. Although the likelihood that unemployment could average 10.3 percent in 2010 is now higher than had been anticipated when the scenarios were specified, that outcome still exceeds a more recent consensus projection by professional forecasters for an average unemployment rate of 9.3 percent in 2010.

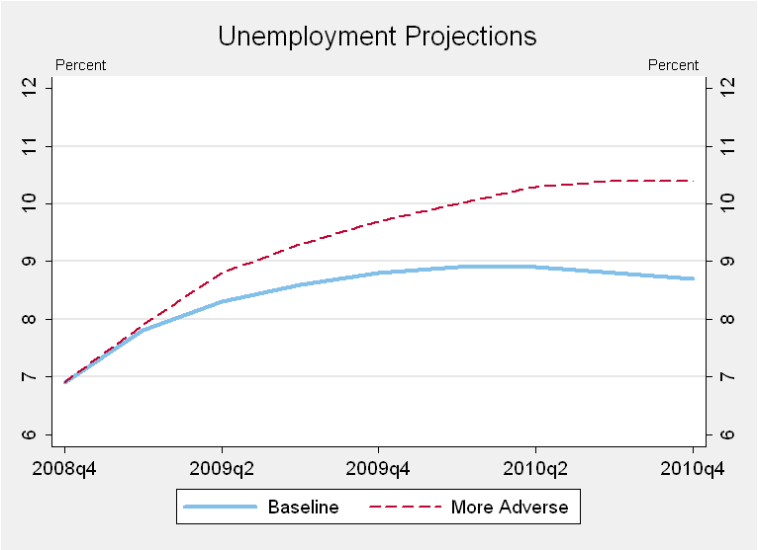
Table 1
Economic Scenarios: Baseline and More Adverse Alternatives
(Minus signs indicate negative values)

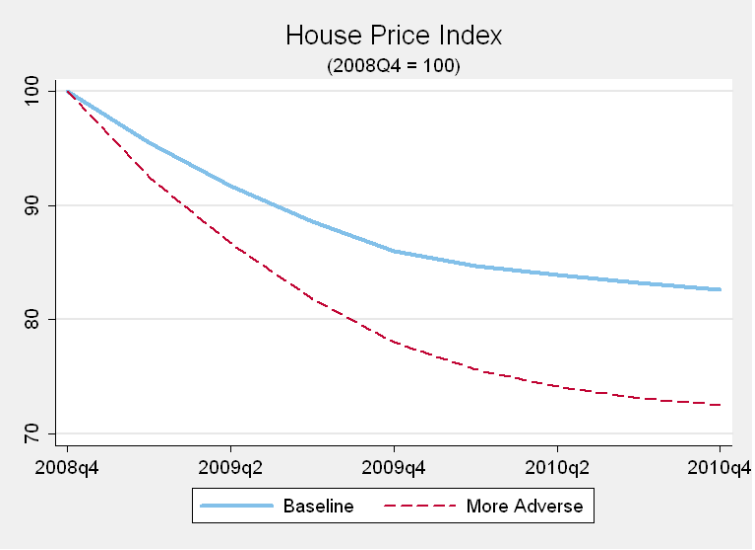
	2009	2010
Real GDP[1]		
Average Baseline[2]	-2.0	2.1
Consensus Forecasts	-2.1	2.0
Blue Chip	-1.9	2.1
Survey of Professional Forecasters	-2.0	2.2
Alternative More Adverse	-3.3	0.5
Civilian unemployment rate[3]		
Average Baseline[2]	8.4	8.8
Consensus Forecasts	8.4	9.0
Blue Chip	8.3	8.7
Survey of Professional Forecasters	8.4	8.8
Alternative More Adverse	8.9	10.3
House prices[4]		
Baseline	-14	-4
Alternative More Adverse	-22	-7

[1] Percent change in annual average.
[2] Baseline forecasts for real GDP and the unemployment rate equal the average of projections released by Consensus Forecasts, Blue Chip, and Survey of Professional Forecasters in February.
[3] Annual average.
[4] Case-Shiller 10-City Composite, percent change, fourth quarter of the previous year to fourth quarter of the year indicated.

[4] Based on the year-to-year variability in house prices since 1900, and controlling for macroeconomic factors, there is roughly a 10 percent probability that house prices will be 10 percent lower than in the baseline by 2010.


GDP Projections
4-Quarter
Percent Change
4-Quarter
Percent Change
4
2
0
-2
-4
-6
2008q4
2009q2
2009q4
2010q2
2010q4
Baseline
More Adverse


Unemployment Projections
Percent
Percent
12
11
10
9
8
7
6
2008q4
2009q2
2009q4
2010q2
2010q4
Baseline
More Adverse


House Price Index
(2008Q4 = 100)
100
90
80
70
2008q4
2009q2
2009q4
2010q2
2010q4
Baseline
More Adverse

II. D. Initial Guidance on Loss and Resource Calculations

Loss Projections

The participating BHCs were asked to project estimated losses on loans, securities, and trading-related exposures (for those firms with trading assets exceeding $100 billion), including potential losses stemming from off-balance sheet positions, for 2009 and 2010 that would be consistent with the economic outlooks in the baseline and more adverse scenarios. They were instructed to project losses for 12 separate categories of loans held in the accrual book, for loans and securities held in the available-for-sale and held-to-maturity (AFS/HTM) portfolios, and in some cases for positions held in the trading account. The BHCs were asked to make adjustments to reported balance sheet values of assets to reflect expectations of customer drawdowns on unused credit commitments, and other assets or exposures that might be taken back on the balance sheet in a stressed economic environment and due to pending accounting changes.

The specific categories of loans and securities included in the exercise are listed in the attached template. For the most part, these categories are based on regulatory report classifications to facilitate comparison across BHCs and with information reported by the BHCs in their regulatory filings. However, the BHCs were encouraged to provide more granular loss projections – that is, loss projections for sub-categories of the loan types specified in the template – to the extent that their internal calculations were built up from such information. In addition, the BHCs were instructed to report projections of losses that would be material deriving from other positions, businesses, or risk exposures that were not included in the template.

For loans, the BHCs were instructed to estimate forward-looking, undiscounted credit losses, that is, losses due to failure to pay obligations ("cash flow losses") rather than discounts related to mark-to-market values. To guide estimation, the BHCs were provided with a range of indicative two-year cumulative loss rates for each of the 12 loan categories for the baseline and more adverse scenarios. BHCs were permitted to submit loss rates outside of the ranges, but were required to provide strong supporting evidence, especially if they fell below the range minimum. The indicative loss rate ranges were derived using a variety of methods for predicting loan losses, including analysis of historical loss experience at large BHCs and quantitative models relating the performance of individual loans and groups of loans to macroeconomic variables. These loan-level models were particularly important for residential mortgages, since historical loss experience at BHCs may not be a reliable guide to future performance under the baseline or more adverse scenario, given the path of home prices in recent years.

The BHCs were asked to provide loss estimates based on outstanding balances of loans and securities on a global consolidated basis as of December 31, 2008 as reported in their FR Y-9C reports, adjusted to reflect any significant mergers, acquisitions, or divestitures that an institution completed after that date.[5] The BHCs also were asked to project losses on loans that could be drawn down from unused credit commitments in place as of year-end 2008 and on securitized assets that could be brought back onto the balance sheet under stressed market conditions.

For securities held in the available-for-sale and held-to-maturity portfolios, institutions were instructed to estimate possible impairment relative to net unrealized losses at year-end 2008 (as

[5] The FR Y-9C reports contain balance sheet and income statement information for bank holding companies.

reported in the Q4 2008 FR Y-9C). Firms were asked to address potential other-than-temporary-impairment charges that may be required under both scenarios.

As noted above, BHCs with trading account assets exceeding $100 billion as of December 31, 2008 were asked to provide projections of trading-related losses for the more adverse scenario, including losses from counterparty credit risk exposures, including potential counterparty defaults, and credit valuation adjustments taken against exposures to counterparties whose probability of default would be expected to increase in the adverse scenario.[6] To calculate these losses, the firms conducted a stress test of their trading book positions and counterparty exposures as of market close on February 20, 2009, based on an instantaneous re-pricing of trading positions equal to the changes in market pricing variables that occurred over the period of June 30, 2008 to December 31, 2008. Aside from the dollar loss estimates, BHCs were asked to disclose the positions that were included in this analysis as well as the risk factors that were stressed and the changes in variables employed (for example, changes in rates and spreads, and percentage changes in equities, foreign exchange, and commodities). Firms were also asked to provide the results of the stress tests conducted in the usual course of business from January 2009 or the most recent dates available.

Resources to Absorb Losses

Institutions were also instructed to provide projections of resources available to absorb losses under the two scenarios, including pre-provision net revenue, and the allowance for loan losses, over the two-year horizon.

For purposes of this exercise, PPNR is defined as net interest income plus non-interest income minus non-interest expense. It is therefore the income after non-credit-related expenses that would flow into the firms before they take provisions or other write-downs or losses. The participating BHCs were instructed to project the main components of PPNR under each of the macroeconomic scenarios. The firms were instructed to explain clearly the assumptions underlying these projections, especially those regarding business or market share growth. Especially in the more adverse scenario, pre-provision net revenue projections materially exceeding their 2008 values would require strong supporting evidence in the absence of documentation of nonrecurring events that negatively affected 2008 net revenue.

Institutions were also instructed to estimate the portion of the year-end 2008 allowance for loan and lease losses available to absorb credit losses on the loan portfolio under each scenario, while maintaining an adequate allowance at the end of the scenario horizon. This calculation could either result in a drawdown of the year-end 2008 ALLL or indicate a need to build reserves over the scenario horizon. The adequacy of loan loss reserves was assessed against the likely size, composition, and risk characteristics of the loan portfolio at the end of the scenario in 4Q 2010.

[6] Under the baseline scenario, BHCs were instructed to assume no further losses beyond current marks.

Assessing Capital Needs in an Uncertain World

Projecting estimated losses and revenues for BHCs is an inherently uncertain exercise, and this difficulty has been amplified in the current period of increased macroeconomic uncertainty. The future path of GDP growth, unemployment, and home prices, for example, are unknown, with a wide range of plausible outcomes. Indeed, this increased uncertainty was a key motivation for the SCAP, as policymakers are interested in restoring confidence that BHCs have sufficient resources to continue to lend to creditworthy borrowers across a wide range of macroeconomic outcomes.

Forward-looking assessments across a range of possible outcomes including more adverse environments, commonly referred to as "stress tests," are regularly used by both institutions and supervisors and are regularly integrated in traditional risk-management practices. This approach provides additional information to firms and supervisors about the vulnerability of a BHC by examining how it might fare under different economic scenarios. This type of analysis, however, is itself subject to considerable uncertainty, including uncertainty about the range of potential macroeconomic outcomes to consider, the relationship between BHC results and macroeconomic scenarios, the degree to which historical relationships will continue to be relevant in a more stressed environment, and the potential changes to consumer behavior in response to both macroeconomic and institutional changes.

Nevertheless, this type of exercise can be extremely useful in helping supervisors and analysts broadly understand a BHC's risk, especially in periods of high uncertainty. Moreover, a stress test provides a systematic, disciplined framework for gauging the magnitude of capital buffers that might be needed by different firms to absorb losses under plausible "what if" scenarios.

III. Supervisory Reviews and Assessments

III.A. Supervisory Review of the Submissions and Benchmark Assessments

The supervisory review and assessment of the loss and resource estimates submitted by the participating BHCs were critical parts of the SCAP exercise. This review involved the work of more than 150 people from the supervisory agencies, including senior examiners, economists, and financial analysts. Staff was organized into teams, each of which focused on examining a distinct aspect of the loss and resource projections across all 19 participating BHCs. In particular, there were teams charged with examining loss projections for consumer portfolios, commercial and industrial (C&I) and commercial real estate loan (CRE) portfolios, AFS and HTM securities portfolios, trading account assets, and counterparty credit risk, and teams examining projections of PPNR and ALLL coverage. There were also advisory groups composed of specialists in accounting, regulatory capital, and financial and macroeconomic modeling.

These teams were charged with evaluating the quality of the firm submissions so that each submission had sufficient information on data, methods, and assumptions to be analyzed. The teams were responsible for analyzing the loss and resources projections from a cross-firm perspective, using

supporting information supplied by the firms as part of the SCAP exercise. This work was informed by supervisory information and knowledge of the on-site examination teams at each of the participating BHCs. The objective was to evaluate the projections submitted by the firms and the approaches used to generate those numbers. A key aspect of this analysis was to understand the particular parameters and assumptions employed and their consistency with the macroeconomic scenarios provided, as well as the models and methodologies used to generate the loss and resource estimates.

Aside from a direct review of the assumptions and models used in loss and resource projections submitted by the participating BHCs, the agencies developed independent benchmarks against which to evaluate the submissions. One set of benchmarks was the indicative loan loss rate ranges provided to firms prior to their preparing assessments of potential losses in their accrual loan portfolios under each macroeconomic scenario for the categories of loans on the SCAP template. The ranges are based on loss rate estimates calculated by the different supervisory agencies participating in the SCAP, using methodologies both currently in use by the agencies and some especially designed for this assessment. All the ranges are estimates, reflecting the uncertainty inherent in the likely loss experience of large banking companies in stressful economic environments.

The agencies used a variety of approaches to calculate indicative loss rates across the different types of loans. These approaches for residential mortgages included "micro" models of default and loss-given-default built on information about individual loans, models based on the performance of regional mortgage loan portfolios, and analysis of mortgages held by failing banks. For other consumer loans and for commercial lending (including various types of commercial real estate lending), the agencies estimated loss rates using techniques such as regressions of historical charge-off or default data against macroeconomic variables such as home price appreciation and the unemployment rate and analysis of loan-level data derived from supervisory sources. A variety of other statistical analyses were applied to the historical experience at large BHCs to estimate loss rates and resource availability.

These indicative loss rate ranges, although useful as general guides to aggregate banking sector losses, do not reflect important differences across firms that could affect performance and losses in significant ways. Thus, the agencies also developed more detailed benchmarks for losses and resources incorporating granular, firm-specific information on factors such as past performance, portfolio composition, origination vintage, borrower characteristics, geographic distribution, international operations, and business mix. These benchmarks were intended to provide a common background in discussions with the firms about their analysis and as additional information to help supervisors determine where results should be adjusted.

As with the indicative loss rate ranges, these benchmarks also made use of models and approaches already in use to monitor risk and firm condition as part of the on-going supervisory oversight process, as well as methods developed specifically for the SCAP exercise. These estimates drew on much of the same data provided by the participating BHCs as part of their SCAP submissions and were provided in response to specific requests from the supervisory teams. These supervisory benchmarks provided important information to the teams evaluating the BHC submissions, since the benchmarks were calculated using consistent methodologies across firms, while still incorporating detailed firm-specific information about the BHCs.

The intent of the overall process was to bring together as much information as possible about the specific firm and empirical evidence on loss rates and resource availability in order to provide the best judgment on potential losses and revenues in economic conditions that are weaker than expected.

Loss and revenue projections submitted by the firms were adjusted to ensure consistency across institutions and consistency with the macroeconomic scenarios defined for the exercise. These adjustments reflect a combination of the analysis of the supervisory teams, benchmarks developed by the teams and by economists and analysts working at the agencies, and supervisory judgment and knowledge of the individual firms in the exercise. A synopsis of the assessment process by category is described below.

III. B. Supervisory Review and Benchmark Assessments by Category

First and Second Lien Mortgages

Supervisory teams for the residential mortgage portfolios evaluated the firms' submissions, which described the portfolios, methods used to project losses, and important assumptions in those methods. As part of a special request for this exercise, the participating BHCs provided detailed and uniform descriptions of their residential mortgage portfolio risk characteristics. In particular, firms provided information on type of product, loan-to-value (LTV) ratio, FICO score, geography, level of documentation, year of origination, and other features. First mortgages, home equity lines of credit (HELOCs), and closed-end second-mortgage products were each evaluated separately. Each firm's models, assumptions, and circumstances were evaluated independently and relative to those of peer firms to determine adjustments to the firm's submission. Assumptions about prepayments and new originations were normalized to be generally consistent across firms. Portfolios were then analyzed using firm-specific portfolio attributes and common loss estimation methodologies calibrated to industry-wide data. Certain attributes, in particular FICO, LTV bands, vintage, product type, and geography, were found to be strongly predictive of default. These attributes were used to further evaluate submissions by the firms, and where necessary, loss estimates were adjusted to better reflect portfolio characteristics in a consistent way across firms.

Credit Cards and Other Consumer Loans

For credit cards, the supervisory teams evaluated methods used to project losses and benchmarked each firm's results against historical trends in these portfolios (for example, loss, paydown / runoff, roll rates, utilization) in the context of the two macroeconomic scenarios. Firms submitted detailed information on their credit card portfolios. Data included FICO scores, payment rates, utilization rates, and geographic concentrations. The teams developed specific portfolio risk profiles in order to make cross-firm comparisons to gauge the reasonableness of the loss estimates submitted by the firms. Once normalized for assumptions, adjustments to loss rates were made where necessary, but in general the supervisory results were relatively close to the BHCs' estimates.

For other consumer loans, which are composed mainly of auto loans, personal loans, and student loans, firms provided information on FICO scores, LTV, term, vehicle age, and geographic concentration. This detailed data were evaluated along with the analysis of the underlying components of each firm's portfolio, including historical loss experience. Supervisors also examined various performance measures to assess the relative riskiness of the portfolios across firms to arrive at projected loss rates.

Commercial and Industrial Loans

Analysis of C&I loan loss projections was based on the distribution of exposures by industry and by internal rating provided by the firms. In many cases, these ratings were mapped to default probabilities by the firm; in other cases, this association was established by supervisory analysts. This information was confirmed and supplemented by external measures of risk, such as expected default frequencies from third party vendors. Supervisors evaluated firm loss estimates using a Monte Carlo simulation that projected a distribution of losses by examining potential dispersion around central probabilities of default. The approach produced a consistently-prepared set of loss estimations across all the BHCs by combining firm-specific exposure and rating information with standardized assumptions of the performance of similar exposures. The results of this analysis were compared to the firms' submissions and adjustments made to ensure consistency across BHCs.

Commercial Real Estate Loans

For commercial real estate (CRE) loans, firms were asked to submit detailed portfolio information on property type, loan to value (LTV) ratios, debt service coverage ratios (DSCR), geography, and loan maturities. The supervisors analyzed loans for construction and land development, multi-family property, and non-farm non-residential projects separately. The supervisors employed common industry vendor models, and developed proprietary models, to generate independent loss estimates for each portfolio. Specifically, for loans maturing in 2009 to 2010, the supervisors constructed a model that compared current LTV ratios to benchmark LTVs in order to assess the probability that borrowers would be able to refinance their exposure. For loans maturing beyond 2010, the team used vendor models that incorporate factors such as property type, LTV, DSCR, and geographic market factors. For construction loans, the geography and nature of the project received special attention. The resulting loss estimates were compared with the firms' submissions.

Other Loans

This category is highly heterogeneous, including farmland lending, loans to depository institutions, loans to governments, and other categories. For most categories of other loans, a firm's loss record over the past five years was used to provide a relative ranking, and to assess the firm's submission.

Securities in AFS and HTM Portfolios

The majority of securities in the AFS and HTM portfolios are Treasury securities, government agency securities, sovereign debt, and high-grade municipal securities. Private-sector securities include corporate bonds, equities, asset-backed securities, commercial mortgage-backed securities (CMBS), and non-agency residential mortgage backed securities (RMBS). About 15 percent of the portfolio is non-agency RMBS or CMBS. Supervisors focused their efforts on evaluating the private-sector securities portfolio for possible impairment, obtaining details of each security, such as collateral type, vintage, metropolitan area, and property type, as well as elements of each security's structure, such as credit ratings, current credit support, and carrying and market values. Each security was tested to determine if the security would become impaired during its lifetime. Loss estimates were based on an examination of more than 100,000 securities identified by the Committee on Uniform Security Identification Procedures, or CUSIP. For each securitized asset, credit loss rates on underlying collateral, consistent with those loss rates used for unsecuritized accrual loan portfolios, were weighed against current credit

support levels for the securities. If the current level of credit support was considered insufficient to cover projected losses, the security was written down to fair value with a corresponding "other than temporary impairment" charge, in accordance with accounting guidelines, equal to the difference between book and market value. Each corporate and municipal bond was evaluated for future OTTI potential based on indicators of downgrade likelihood, including information from market credit spreads. For each equity security, OTTI was determined when the stressed market value was below the carrying value. Supervisors evaluated the position marks based on portfolio characteristics and ratings to identify anomalies and to identify conservative or aggressive practices and methodological outliers among the BHCs. Special attention was paid to institutions that had greater concentrations of accumulated other comprehensive income (AOCI) relative to tangible common equity, as AOCI forms the basis of potential recognizable losses in earnings, and hence core capital, in a given period.[7]

New FASB guidance on fair value measurements and impairments was issued on April 9, 2009, after the commencement of the SCAP. For the baseline scenario supervisors considered firms' resubmissions that incorporated the new guidance. However, for the more adverse scenario, in order to reflect greater uncertainty about realizable losses in stressful conditions, supervisors did not incorporate the new FASB guidance.

Trading Portfolio Losses

Losses in the trading portfolio were evaluated by applying market stress factors to the trading exposures for the five firms with trading assets exceeding $100 billion, based on the actual market movements that occurred over the stress horizon (June 30 to December 31, 2008). The supervisors used information on trading book positions from the firms' internal risk-management reports to project loss amounts under the defined scenario. Supervisors then compared each firm's submission to its own scenario and investigated areas where the loss estimates or gains were significantly different from the supervisors' estimates. Supervisors reviewed all of the firm's assumptions, such as the shocks to prices and spreads, the methodology used by the firm to value the assets, and whether material exposures and assets were included in the stress test. Areas where the BHCs' and supervisors' estimates diverged were identified and investigated, and final loss estimates were revised accordingly. In addition, the SCAP included an incremental default risk (IDR) estimate for firms' trading book positions.

Counterparty Credit Risk

Analysis focused on assessing the reasonableness of counterparty credit risk (CCR) loss estimates stemming from exposure growth and credit valuation adjustments associated with the market shocks applied to the assets in the trading books. Specifically, the supervisors reviewed the firms' loss estimates for mark-to-market losses stemming from credit valuation adjustments (CVA) consistent with the trading shock scenario.[8] During the assessment process, supervisors developed a view of the quality of each firm's loss estimate, and made adjustments to the firm's loss estimates where appropriate to reflect factors such as consistency in the application of the trading asset shock; the comprehensiveness

[7] AOCI is a measure of accumulated unrealized gains and losses on AFS securities, based on current carrying and market values.

[8] A credit valuation adjustment taken against a given trading counterparty reflects the decline in the value of the obligation owed by that counterparty due to deterioration in the counterparty's creditworthiness, and directly impacts a firm's earnings and the value of the its assets.

of coverage of counterparties and products; the prudent treatments of legal netting, collateral and margin; and soundness in the stress methodology employed.

Supervisors also requested that firms calculate an IDR loss estimate reflecting counterparty credit losses from default. The methodologies and the quality of firm submission varied. In some cases, supervisors developed independent estimates of the potential losses from counterparty defaults under the more adverse scenario.

Pre-Provision Net Revenue

Analysis of firm submissions for PPNR started with a critical assessment of the business projections that were included in the BHCs' submissions. In particular, the submissions and their underlying assumptions were assessed for consistency with the overall macroeconomic scenarios. To help in its work, the supervisors also reviewed copies of the firms' internal management and financial reports. For example, "ALCO packages," including information about the yield curve assumptions, net interest income projections, and economic value of equity assessments made by the firms as part of their business planning processes, were reviewed and compared with the assumptions used in firms' SCAP projections.[9] The supervisors also examined historical trends in the main components of PPNR--net interest income, noninterest income, and noninterest expense--for each firm using data from regulatory reports and from public financial statements. This evaluation involved a critical assessment of the firms' estimates based on supervisory knowledge of each firm's revenue drivers and the risks to those drivers. This analysis was then used to modify key assumptions in firms' forecasts (for example, projected growth rates and stock price indexes) to make them more consistent with the scenarios provided in the stress test. Peer analysis was also developed during the process and used to identify trends and outliers.

Supervisors also examined the historical relationship between PPNR and its main components to measures of macroeconomic activity, and examined firm-specific differences in the composition of PPNR, assessing which components have been more volatile in the past, and thus less likely to be sustainable in strained economic conditions.

Supervisors weighted the estimates arrived at through these techniques and compared them with firm submissions. Where supervisors' analysis produced lower estimates of PPNR than those provided by the firm, the supervisory estimate was applied.

Allowance for Loan and Lease Losses

The supervisors developed benchmarks based on projections of the required level of reserves at the end of the scenario. The goal was to determine the level of reserves needed at year-end 2010 for two distinct portfolios, the "vintage" loans remaining from year-end 2008 and the newly extended credits over the scenario horizon. To arrive at the vintage loan total, supervisors began with the year-end 2008 loan book balance, by loan segment, and reduced these balances based on the estimated losses calculated for this exercise. New loans were estimated based on information provided by the firms as part of this exercise or, if no loan growth information was provided, by assuming that any new

[9] The ALCO package is information generated by a bank holding company's "Asset-Liability Committee," containing historical information, analysis, and projections of the evolution of the firm's assets and liabilities, associated funding costs, and liquidity risk exposure and management.

loan growth represented the replacement of estimated loan losses between 2009 and 2010. Reserve needs for the vintage and new loan portfolios were determined by assessing potential losses on these portfolios in 2011 and assuming reserves sufficient to cover these losses. Loss rates for vintage loans were calculated as each firm's 2010 loss rate by loan category, reduced by the anticipated average percentage reduction in loan losses in 2011 as calculated from firms that reported this information. For newly extended credits, which would likely be underwritten under more prudent lending standards, loss rates by loan category from 2007 were used to represent the expected losses in 2011.

III. C. Accounting Adjustments

The supervisory team assessing consumer credit losses worked closely with accounting specialists in the agencies to ensure that the firms' projections were consistent with accounting standards. Additionally, supervisors evaluated the potential impact of the proposed changes to FAS 140 which are expected to be implemented in January 2010. Based on information provided by the BHCs, implementation of the proposed changes to FAS 140 could result in approximately $900 billion in assets being brought onto the balance sheets of these institutions. Risk-weighted assets were increased by about $700 billion to reflect this projected consolidation. The on-boarding of assets also factored into our assessment of ALLL needs, and those assets were treated as new loans.

A second critical set of adjustments were made to recognize the impact of discounts taken by institutions on purchased impaired loan portfolios acquired during mergers, as governed by SOP 03-03. Several of the participating BHCs acquired loans at significant discounts as part of mergers. Based on the information provided by the BHCs, these discounts totaled more than $90 billion.[10] These discounts were considered in assessing possible future losses for these firms under the two scenarios, since such discounts make up a large portion, and possibly all, of projected future losses on impaired acquired loans in the two scenarios. The approach used in the SCAP was to project losses on the original balances of the impaired acquired loans (that is, balances with the discounts added back to bring the impaired loan balances back to their contractual principal at the date of acquisition) and then to net these losses against the discount that the BHCs took at the time they acquired the loans.

III. D. Determination of Capital Needs

As part of the submission process, each BHC reported projections of Tier 1 capital and common stockholders' equity for the end of 2009 and 2010. The BHCs' projected evolution of capital over the scenarios reflects a combination of credit losses, PPNR to absorb losses, and the need to generate appropriate ALLL at the end of the assessment horizon. These estimates served as a useful benchmark for the SCAP, but were not necessarily consistent with the final projections of losses and revenue the supervisors made for the BHC.

As a result, supervisors projected pro forma capital for 2010 for each BHC using the revised estimates of credit losses and revenue. The basic algorithm began with 2008 Q4 measures of equity capital and regulatory capital from Y-9C reports. Pro forma equity capital was estimated by rolling tax-

[10] The reduction in projected losses relating to purchase accounting adjustment for the two scenarios is less than this amount. Some portion of the credit losses reflected in this discount may take place after the end of the scenario or may reflect market loss assumptions at the time of acquisition that are more severe than those assumed by the BHCs and supervisors in the supervisory loss projections. Some of the discount not related to credit losses is captured by the BHC in "accretable yield", which is part of pre-provision net revenue (such amounts are amortized into income over the estimated life of the loan in accordance with GAAP).

adjusted net income (PPNR less credit losses less reserve builds reflected on a net of tax basis) for the two-year horizon through equity capital. The estimated losses were on a post-purchase accounting basis.[11] This effectively treats losses and provisions as an instantaneous event that is offset by revenue earned over the period. Projected reserve increases over the assessment horizon imply a net need to provision for future losses, which reduced resources available to absorb legacy losses and increased capital needs. Finally, supervisors estimated the impact of payments of preferred dividends and incorporated the impact of regulatory capital rules such as limits on the inclusion of deferred tax assets in Tier 1 Capital. This generated projections of pro forma capital levels absent any further changes in capital participation by private investors or the U.S. Treasury.

To determine the necessary capital buffer, supervisors did not rely on a single indicator of capital, but examined a range of indicators of capital adequacy including but not limited to pro forma equity capital and Tier 1 capital, including the composition of capital. Tier 1 capital, as defined in the Board's Risk-Based Capital Adequacy Guidelines, is composed of common and non-common equity elements, some of which are subject to limits on their inclusion in Tier 1 capital.[12] These elements include common stockholders' equity, qualifying perpetual preferred stock, certain minority interests, and trust preferred securities. Certain intangible assets, including goodwill and deferred tax assets, are deducted from Tier 1 capital or are included subject to limits.[13]

Supervisors have long indicated that common equity should be the dominant component of Tier 1 capital, so a measure of voting common stockholders' equity (essentially Tier 1 capital less preferred stock, less qualifying trust preferred securities, and less minority interests in subsidiaries) was also examined. The Board's capital adequacy guidelines currently state that voting common stockholders' equity generally should be the dominant element within Tier 1 capital, so the approach is consistent with existing capital guidelines and does not imply a new capital standard. This analytical work provided an initial estimate of capital needs for each BHC to remain appropriately capitalized even if the more adverse scenario materializes.

The initial assessment of the capital need was conveyed to the BHCs in late April. The final capital assessment will include actual results year-to-date, including 2009 Q1 operating performance and corporate activities, such as sales of specific assets or business or capital events, such as a new issuance of equity securities. Supervisors evaluated this information considering the safety and soundness of individual BHCs and the stability of the broader financial system.

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[11] For purchased impaired loans, the projected Tier 1 Capital and Common Stockholder's Equity incorporated credit losses and provisions that reflect consideration of the discounts on purchased impaired loans and any adjustments made by the SCAP if the estimated credit losses exceeded the credit loss portion of the discounts on the purchased impaired loans as of the acquisition date.

[12] See 12 CFR part 225, Appendix A, § II.A.1.

[13] See 12 CFR part 225, Appendix A, § II.B.

Appendix:
The SCAP Templates

Loan and Security Categories to be included in the Loss Estimates*
(Loss Amounts in Billions of Dollars)

	Outstanding Balance Q4 2008	Loss Estimates		
		2009	2010	TOTAL
LOANS				
First Lien Mortgages				
Prime				
Alt-A				
Subprime				
Second/Junior Lien Mortgages				
Closed-end Junior Liens				
HELOCs				
C&I Loans				
CRE Loans				
Construction				
Multifamily				
Nonfarm, Non-residential				
Credit Cards				
Other Consumer				
Other Loans				
COMMITMENTS AND CONTINGENT OBLIGATIONS				
List by type the amount and assumed losses related to commitment draw-downs and other contingent obligations				
SECURITIES				
Available for Sale				
Held to Maturity				
TRADING ACCOUNT (including traded loans)				
	For the more adverse scenario only: report total dollar loss amount, table identifying positions captured and those not captured in the stress tests, risk factors stressed, and size of risk factor changes assumed.			

* Form to be completed once for the baseline scenario and once for the more adverse scenario. If there are positions, businesses or risk exposures not captured on this template that would materially affect losses under the baseline or more adverse scenario, please include estimates of those losses in addition to the losses associated with the positions included on this template.

Resources to Absorb Losses*

(Amounts in Billions of Dollars)

	2009	2010	TOTAL
PRE-PROVISION NET REVENUE			
Net Interest Income			
Non-interest Income			
Non-interest Expense			
ALLOWANCE FOR LOAN LOSSES			
(1) ALLL at end of previous year			
(2) ALLL at end of year			
ALLL Resources: (1) – (2)			

* Form to be completed once for the baseline scenario and once for the more adverse scenario.

Post-Scenario Tier 1 Capital*

(Amounts in Billions of Dollars, end of period)

	Q4 2008	2009	2010
Tier 1 Capital			
Sum of Tier 1 Elements			
Common Stockholders' Equity			
Risk-Weighted Assets			

* Form to be completed once for the baseline scenario and once for the more adverse scenario.