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JUNE OVERSIGHT REPORT*

Stress Testing and Shoring Up Bank Capital

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Executive Summary*

Across the country, many American families have taken a hard look at their finances. They have considered how they would manage if the economy took a turn for the worse, if someone were laid off, if their homes plummeted in value, or if the retirement funds they had been counting on shrunk even more. If circumstances get worse, how would they make ends meet? These families have examined their resources to figure out if they could weather more difficult times – and what they could do now to be better prepared. In much the same spirit, federal banking regulators recently undertook “stress tests” to examine the ability of banks to ride out the financial storm, particularly if the economy gets worse.

Treasury recognized the importance of understanding banks’ ability to remain well capitalized if the recession proved worse than expected. Thus, Treasury and the Federal Reserve announced the Supervisory Capital Assessment Program (SCAP) to conduct reviews or “stress tests” of the nineteen largest BHCs. Together these nineteen companies hold two-thirds of domestic BHC assets. As described by Treasury, the program is intended to ensure the continued ability of U.S. financial institutions to lend to creditworthy borrowers in the event of a weaker-than-expected economic environment and larger-than-estimated losses.

The Emergency Economic Stabilization Act of 2008 (EESA)¹ specifically requires the Congressional Oversight Panel to examine the Secretary of the Treasury’s use of his authority, the impact of the Troubled Asset Relief Program (TARP) on the financial markets and financial institutions, and the extent to which the information made available on transactions under the TARP has contributed to market transparency. In this report, the Panel examines the steps Treasury has taken to assess the financial health of the nation’s largest banks, the impact of these steps on the financial markets, and the extent to which these steps have contributed to market transparency. Understanding the recently completed stress tests helps shed light on the assumptions Treasury makes as it uses its authority under EESA. As Treasury uses the results of these tests to determine what additional assistance it might provide to financial institutions, the tests also help determine the effectiveness of the TARP in minimizing long-term costs to the taxpayers and maximizing taxpayer benefits, thus responding to another key mandate of the Panel.

As part of their regular responsibilities, bank examiners determine whether the banks they supervise have adequate capital to see them through economic reversals. Typically, these bank supervisory examination results are kept strictly confidential. The stress tests built on the

* The Panel adopted this report with a unanimous 5-0 vote on June 8, 2009.

¹ Emergency Economic Stabilization Act of 2008 (EESA), Pub. L. No. 110-343 (hereinafter “EESA”).

existing regulatory capital requirements, but, because the stress tests were undertaken in order to restore confidence in the banking system, they included an unprecedented release of information.

The stress tests were conducted using two scenarios: one test based upon a consensus set of economic projections and another test using projections based on more adverse economic conditions. The only results that have been released are those based on the adverse scenario. These test results revealed that nine of the nineteen banks tested already hold sufficient capital to operate through 2010 under the projected adverse scenario; those banks will not be required to raise additional capital. Ten of the nineteen banks were found to need additional capital totaling nearly \$75 billion in order to weather a more adverse economic scenario. Those banks that need additional capital were required to present a plan to Treasury by June 8, 2009, outlining their plans to raise additional capital. All additional capital required under the stress tests must be raised by November 9, 2009, six months after the announcement of the stress test results. Some BHCs have already successfully raised billions in additional capital.

Like the case of the family conducting its own stress test of personal finances, the usefulness of the bank stress test results depends upon the methods used and the assumptions that went into conducting the examinations. To help assess the stress tests, the panel engaged two internationally renowned experts in risk analysis, Professor Eric Talley and Professor Johan Walden, to review the stress test methodology.

Based on the available information, the professors found that the Federal Reserve used a conservative and reasonable model to test the banks, and that the model provides helpful information about the possible risks faced by BHCs and a constructive way to address those risks. The criteria used for assessing risk, and the assumptions used in calibrating the more adverse case, have typically erred on the side of caution and avoided many of the more dangerous simplifications present in some risk modeling.

The professors also raised some serious concerns. They noted that there remain unanswered questions about the details of the stress tests. Without this information, it is not possible for anyone to replicate the tests to determine how robust they are or to vary the assumptions to see whether different projections might yield very different results. There are key questions surrounding how the calculations were tailored for each institution and questions about the quality of the self-reported data. It is also important to note that the stress test scenarios made projections only through 2010. While this time frame avoids the greater uncertainty associated with any projection further in the future, it may fail to capture substantial risks further out on the horizon. Based on the testimony by an analyst at Deutsche Bank at the Panel's May field hearing, the projected rise in the defaults of commercial real estate loans after 2010 raise concerns.

In evaluating the useful information provided by the stress tests, as well as the remaining questions, the Panel offers several recommendations for consideration moving forward:

- The unemployment rate climbed to 9.4 percent in May, bringing the average unemployment rate for 2009 to 8.5 percent. If the monthly rate continues to increase during the remainder of this year, it will likely exceed the 2009 average of 8.9 percent assumed under the more adverse scenario, suggesting that the stress tests should be repeated should that occur.
- Stress testing should also be repeated so long as banks continue to hold large amounts of toxic assets on their books.
- Between formal tests conducted by the regulators, banks should be required to run internal stress tests and should share the results with regulators.
- Regulators should have the ability to use stress tests in the future when they believe that doing so would help to promote a healthy banking system.

The Federal Reserve Board should be commended for releasing an unprecedented amount of bank supervisory information, but additional transparency would be helpful both to assess the strength of the banks and to restore confidence in the banking system. The Panel recommends that the Federal Reserve Board release more information on the results of the tests, including results under the baseline scenario. The Federal Reserve Board should also release more details about the test methodology so that analysts can replicate the tests under different economic assumptions or apply the tests to other financial institutions. Transparency will also be critical as financial institutions seek to repay their TARP loans, both to assess the strength of these institutions and to assure that the process by which these loans are repaid is fair.

Finally, the Panel cautions that banks should not be forced into counterproductive “fire sales” of assets that will ultimately require the investment of even more taxpayer money. The need for strengthening the banks through capital increases must be tempered by sufficient flexibility to permit the banks to realize full value for their assets.

Section One: Stress Testing and Shoring Up Bank Capital

A. Overview

The stress test is one of the two core parts of Treasury’s Capital Assistance Program (CAP). It lays the foundation for the second part of the CAP, the infusion of TARP funds to support some of the nation’s largest financial institutions “as a bridge to private capital in the future.”² The publication of the results of the stress tests involves a rare release of supervisory information by the Federal Reserve Board. EESA specifically requires the Panel to,

Examine [the] use by the Secretary [of the Treasury] of authority under this Act... [t]he impact of purchases made under the Act on the financial markets, and financial institutions, and [t]he extent to which the information made available on transactions under the [TARP] has contributed to market transparency.³

1. Introduction

A banking organization’s capital is its economic foundation. It serves as a cushion against losses and limits a bank’s ability to grow, including by limiting the degree to which a bank can lend, how many deposits it can take, and how it can otherwise raise funds in the capital markets. The strength of a bank’s capital is a barometer of its health, and decreases in the strength of its capital or uncertainty about that strength can affect the willingness of other financial institutions to deal with it. When an individual bank’s capital is seriously depleted, it can fail. Bank failures and uncertainty about the soundness of other banks can spread financial contagion across a national financial system, freezing lending, fostering uncertainty in the capital markets, and perhaps even threatening the deposits of ordinary citizens, although, in the United States, the deposit insurance system managed by the Federal Deposit Insurance Corporation (FDIC) protects against that threat.⁴ A bank’s ability to lend is directly related to its capital strength.⁵ While government intervention has the potential to stabilize the system by shoring up

² U.S. Department of the Treasury, *Treasury White Paper: The Capital Assistance Program and its Role in the Financial Stability Plan*, at 2 (online at www.treasury.gov/press/releases/reports/tg40_capwhitepaper.pdf) (accessed May 15, 2009) (hereinafter “CAP White Paper”).

³ EESA, *supra* note 1, at §125(1)(A)(i)-(iii).

⁴ Deposit insurance – currently set at \$250,000 per account – greatly reduces the risk of loss of deposits by individuals in banks operating in the United States.

⁵ Congressional Oversight Panel, Testimony of Vice-President of the Federal Reserve Bank of New York (FRBNY) Til Schuermann, *Hearing on the Impact of Economic Recovery Efforts on Corporate and Commercial Real Estate Lending*, at 2 (May 28, 2009) (online at cop.senate.gov/documents/testimony-052809-schuermann.pdf).

bank capital, it can also risk further scaring away private capital by creating new forms of risk and uncertainty.⁶

The danger of financial contagion surfaced early in the financial crisis. During 2008, two large banking institutions, IndyMac Bank (\$32.01 billion in assets)⁷ and Washington Mutual Savings and Loan (\$307 billion)⁸ were taken over by federal regulators, and three other banking institutions, Wachovia Bank (\$812.4 billion),⁹ the nation's fourth largest commercial bank, National City Corporation (\$143.7 billion),¹⁰ and Countrywide Financial Corporation (\$211 billion)¹¹ were in danger of failing when they were taken over by other institutions at the behest of the regulators.¹²

Within two weeks after the passage of EESA, Treasury began to make direct capital transfers "to stabilize the financial system by providing capital to viable financial institutions of all sizes throughout the nation." The transfers were made through various TARP programs created under the authority of the EESA. As of June 3, \$199.4 billion had been transferred to 436 banks under the TARP's Capital Purchase Program (CPP).¹³

⁶ Once the solvency of a bank is in question, private investors may fear that government interference will dilute private capital or that the government will pay below-market prices for assets. That, in turn, can have a chilling effect on a bank's ability to attract private capital. Perhaps in order to mitigate that chilling effect, Treasury has signaled its intention: (1) to divest itself of the ownership stakes it may acquire in any private firm as quickly as practical; and (2) to exert minimal influence on day-to-day operations even if in a position to do so. See U.S. Department of the Treasury, *Statement from Treasury Secretary Timothy Geithner Regarding the Treasury Capital Assistance Program and the Supervisory Capital Assessment Program* (May 7, 2009) (online at www.ustreas.gov/press/releases/tg123.htm).

⁷ Federal Deposit Insurance Corporation, *FDIC Establishes IndyMac Federal Bank, FSB as Successor to IndyMac Bank, F.S.B., Pasadena, California* (July 11, 2008) (online at www.fdic.gov/news/news/press/2008/pr08056.html).

⁸ Federal Deposit Insurance Corporation, *JPMorgan Chase Acquires Banking Operations of Washington Mutual* (Sept. 25, 2008) (online at www.fdic.gov/news/news/press/2008/pr08085.html).

⁹ Wachovia Corporation, Form 8-K (Oct. 10, 2008) (online at www.sec.gov/Archives/edgar/data/36995/000119312508209190/d8k.htm).

¹⁰ PNC Financial Services Group, Inc., Form S-4 (Nov. 11, 2008) (online at www.sec.gov/Archives/edgar/data/713676/000095012308014864/y72384sv4.htm).

¹¹ Countrywide Financial Corporation, Form 10-K (Feb. 29, 2008) (online at www.sec.gov/Archives/edgar/data/25191/000104746908002104/a2182824z10-k.htm) (latest asset report available).

¹² This was in addition to the government-engineered takeover of the investment bank Bear Stearns by JPMorgan Chase & Co., the government-engineered takeover of Merrill Lynch by Bank of America, and the rescue of the American International Group (AIG) by the Federal Reserve Board and Treasury. PNC used \$7.7 billion in Capital Purchase Program (CPP) funds to aid in financing its acquisition of National City Corporation. PNC Financial Services Group, Inc., Form 8-K (Oct. 24, 2008) (online at www.pnc.com/webapp/unsec/Requester?resource=/wcm/resources/file/eb0fc043072db70/IR_8K_102408_NCC_Anounce.pdf).

¹³ U.S. Department of the Treasury, *Troubled Asset Relief Program Transactions Report for Period Ending June 3, 2009* (June 5, 2009) (online at www.financialstability.gov/docs/transaction-reports/transactions-report-

Two institutions, Citigroup and Bank of America, have received additional support outside of the CPP. Through the Targeted Investment Program (TIP), Treasury purchased from Citigroup \$20 billion in preferred shares, as well as a warrant to purchase common stock. Treasury and the FDIC also guaranteed a pool of \$306 billion of loans and securities.¹⁴ Bank of America also received capital and guarantees under the TIP. It received \$20 billion in capital in exchange for preferred stock and a warrant. Treasury and the FDIC agreed to guarantee a pool of \$118 billion in loans, in exchange for preferred stock.¹⁵

In early February, Treasury and the Federal Reserve Board announced an accelerated effort to conduct comprehensive and simultaneous reviews of the nation's 19 largest BHCs¹⁶ – those with more than \$100 billion in assets – to determine their ability to remain well capitalized if the recession led to deeper than expected losses in the face of the nation's increasing economic difficulties. The effort, formally called the SCAP, is referred to more informally as the “stress tests.” It is part of the broader CAP that is to be a primary mechanism for direct capital assistance to the nation's largest BHCs for the remainder of the financial crisis.

While federal bank supervisors enforce various capital requirements even in times of economic growth,¹⁷ SCAP represents a special supervisory exercise tailored to the current crisis. The term “stress test” itself sums up the government's objective – to create a set of economic and operating assumptions to see how much “stress” the assumptions would place on each BHC's capital position if they came to pass. The tests were designed to:

evaluat[e] expected losses and [whether the stress-tested BHCs have] the resources to absorb those losses if economic conditions were to be more adverse than generally expected [,] ... determine whether an additional capital buffer today, particularly one that strengthens the composition of capital, is needed for

060509.pdf) (hereinafter “June 5 TARP Transactions Report”). An additional \$69.8 billion was transferred under the TARP to rescue AIG.

¹⁴ U.S. Department of the Treasury, *Joint Statement by Treasury, Federal Reserve and the FDIC on Citigroup* (Nov. 23, 2008) (online at www.treas.gov/press/releases/hp1287.htm).

¹⁵ Board of Governors of the Federal Reserve System, *Treasury, Federal Reserve, and the FDIC Provide Assistance to Bank of America* (Jan. 16, 2009) (online at www.federalreserve.gov/newsevents/press/bcreg/20090116a.htm).

¹⁶ A BHC is essentially a corporation that owns one or more banks, but does not itself carry out the functions of a bank. The advantage of this type of structure is that it allows the BHC to raise capital more easily through, for instance, public offerings. Although Federal Reserve Board regulations refer formally to BHCs as “banking organizations,” the Federal Reserve Board uses the less formal designation in the document relating to the SCAP, as does this report. See 12 CFR Part 225, at Appendix A §1.

¹⁷ A corporation's capital consists simply of the amount by which the value of its assets exceeds the value of its obligations. See Annex to Section One of this report. Specific capital requirements for banks, insurance companies, securities broker-dealers, and other regulated industries fix a level of capital above that simple margin to create a level of safety to help ensure that the regulated companies can meet their obligations and avoid failures that spill over into the economic system.

the banking organization to comfortably absorb losses and continue lending even in a more adverse environment.¹⁸

BHCs in need of a buffer have six months to raise the necessary capital; the capital can in some cases come from additional TARP investments made under the CAP.

The results of the stress tests were released in early May. The Panel is devoting its June report to the details and results of the tests for several reasons. The first is the crucial one: the weaknesses of America's large banks, among other things, are at the core of the financial crisis and the breakdown in lending that was the immediate result of the crisis; while some believe that government policies contributed to the crisis, it is critical that government policies to deal with this weakness are soundly conceived and well-executed.

There are several additional reasons to examine the stress tests. These include the perspective they provide on the manner in which the government is dealing with the country's major lending institutions, as well as the information they have generated about the condition of the BHCs themselves at a time when economic conditions continue to deteriorate.

Thus, the report sets out the way the stress tests work and the assumptions on which they rest, evaluates those assumptions and the models used to conduct the tests, seeks to understand the stress test results, and makes recommendations about the future of the testing process.

2. Background

a. Capital Requirements

Capital requirements exist to protect against bank insolvency and to reduce systemic risk. By enforcing these requirements, regulators: (1) ensure that banks have adequate capital to weather unexpected losses; (2) counteract market pressures on banks to take excessive risks; (3) promote confidence among bank investors, creditors, and counterparties; and (4) minimize the scale and length of economic downturns. Capital requirements also protect against what is called "moral hazard," that is, the risk that a bank will take undue risks because it believes any benefits will go to the BHC executives and shareholders and any losses it suffers will be covered either by deposit insurance or by the notion that the institution will be supported with government funds rather than allowed to fail.¹⁹

¹⁸ CAP White Paper, *supra* note 2, at 2.

¹⁹ Minimum capital ratios are used by banking regulators to assign banks to one of five categories: (1) well capitalized; (2) adequately capitalized; (3) undercapitalized; (4) seriously undercapitalized; and (5) critically undercapitalized. Under banking regulations, insured depository institutions falling in the last three categories are subject to a variety of "prompt corrective actions." However, BHCs are not currently subject to the prompt corrective action regimen.

Because the stress tests focus on the adequacy of BHC capital, a short look at how BHC capital works is appropriate. A BHC's capital is generally measured as the ratio of specified core (tier 1) and supplementary (tier 2) capital elements on the firm's consolidated balance sheet to its total assets. To compute the tier 1 ratio, for instance, the firm's tier 1 capital elements are included in the numerator and the "risk-weighted" value of its assets are included in the denominator.

For this purpose, tier 1 (core) capital is the sum of the following capital elements: (1) common stockholders' equity; (2) perpetual preferred stock; (3) senior perpetual preferred stock issued by Treasury under the TARP; (4) certain minority interests in other banks; (5) qualifying trust preferred securities; and (6) a limited amount of other securities. Tier 2 (supplementary) capital is made up of the following capital elements: (1) the amount of certain reserves established against losses; (2) perpetual cumulative or non-cumulative preferred stock; (3) certain types of convertible securities; (4) certain types of long-, medium-, and short-term debt securities; and (5) a percentage of unrealized gains from certain investment assets.

The SCAP capital buffer includes a four percent tier 1 common capital ratio. Federal Reserve Board rules do not specifically define tier 1 common capital, but this is the element of tier 1 capital that is voting common stockholders' equity (i.e., it excludes qualifying trust and perpetual preferred stock, and qualifying minority interests). The supervisors have encouraged BHCs to hold as much of their tier 1 capital in the form of common shareholder equity as possible as this is the "most desirable capital element from a supervisory standpoint."²⁰

The risk-weighted assets of an institution, which form the denominator of the capital ratio, represent the value of the institution's assets, adjusted in some cases to reflect possibilities that the assets will lose value after the computation is made. For example, cash is assigned no risk "haircut," because its face value cannot vary. Similar adjustments are made for certain portions of an institution's capital elements.²¹

General regulatory rules require a BHC to have a tier 1 capital ratio of four percent, and a total (tier 1 plus tier 2) capital ratio of eight percent of the holding company's risk-weighted assets.²²

b. Efforts to Shore Up Bank Capital under the TARP

The initial method chosen by Treasury to shore up bank capital emphasized the direct transfer of TARP funds to BHCs in exchange for preferred stock. A special change in banking

²⁰ Board of Governors of the Federal Reserve System, *BHC Supervision Manual*, at §4060.3.2.1.1.3, 1281 (Jan. 2008) (online at www.federalreserve.gov/boarddocs/SupManual/bhc/200807/bhc0708.pdf).

²¹ See 12 CFR Part 225, at Appendix A §III.C, Appendix E, Appendix G.

²² See 12 CFR Part 225, at Appendix A §IV.A. BHCs are also required to maintain a leverage ratio of three percent of tier 1 capital to total capital.

regulations permits preferred stock purchased under the TARP to count as tier 1 capital.²³ It does not, however, count as tier 1 common capital, which the banking regulators are looking to bolster through the stress tests.²⁴

The first set of programs – the CPP, the Systemically Significant Failing Institutions (SSFI) program, and the TIP – followed that model. While the CPP was described as the “Healthy Banks Program,” it was in fact targeted at a broader range of banks. In contrast, the SSFI program and the TIP targeted institutions in financial distress.²⁵

In February 2009, Secretary of the Treasury Geithner introduced the CAP as a key component of the new Administration’s Financial Stability Plan.²⁶ The CAP has two fundamental components. The CAP introduces a new, additional mechanism for Treasury to make capital infusions. In exchange for capital injections through the CPP, Treasury generally receives preferred stock and warrants to purchase common stock. In exchange for capital injections through the CAP, Treasury will receive mandatory convertible preferred securities (i.e., securities that the recipient bank can convert into common equity), as well as warrants to

²³ Board of Governors of the Federal Reserve System, *Capital Adequacy Guidelines: Treatment of Perpetual Preferred Stock Issued to the United States Treasury Under the Emergency Economic Stabilization Act of 2008*, 74 Fed. Reg. 26081 (June 1, 2009) (final rule) (online at edocket.access.gpo.gov/2009/pdf/E9-12628.pdf).

²⁴ Board of Governors of the Federal Reserve System, *The Supervisory Capital Assessment Program: Overview of Results*, at 2 (May 7, 2009) (online at www.federalreserve.gov/newsevents/press/bcreg/bcreg20090507a1.pdf) (hereinafter “SCAP Results”).

²⁵ In addition to equity purchases, which are designed to shore up the capital position of troubled institutions, Treasury’s strategy includes programs that directly address the assets affecting bank balance sheets. One of the primary reasons banks are currently constrained in their ability to lend to creditworthy borrowers is that they have a number of assets on their books that have lost, or could lose, substantial value. In effect, they are conserving funds to cover these losses (and thereby limiting the availability of credit in the economy). The Public-Private Investment Program (PPIP) is basically designed to get these bad or “toxic” assets off the banks’ balance sheets. Under the program, a number of investment funds will be created with a combination of TARP funds and private capital; these funds will then buy existing, bad assets from banks. There will be two kinds of investment funds under PPIP: one backed by FDIC guarantees that will purchase legacy loans; another that will be able to borrow from the Federal Reserve Board in order to purchase legacy securities. The FDIC recently announced it would postpone the implementation of the legacy loans program, and it is not yet clear when this program will be put into effect. Federal Deposit Insurance Corporation, *FDIC Statement on the Status of the Legacy Loans Program* (June 3, 2009) (online at www.fdic.gov/news/news/press/2009/pr09084.html) (hereinafter “FDIC Loans Program Statement”). Another part of Treasury’s strategy is the Term Asset-Backed Securities Loan Facility (TALF), a joint program between Treasury and the Federal Reserve Board. Through the TALF, the Federal Reserve Board provides loans to investors that are secured by newly-issued, asset-backed securities (that are surrendered to the Federal Reserve Board if the borrower defaults). In case of default, Treasury buys the surrendered securities from the Federal Reserve Board, in effect guaranteeing a certain amount of losses the Federal Reserve Board potentially faces.

²⁶ U.S. Department of the Treasury, *Fact Sheet: Financial Stability Plan* (online at www.financialstability.gov/docs/fact-sheet.pdf) (accessed May 15, 2009) (hereinafter “Financial Stability Plan Fact Sheet”); U.S. Department of the Treasury, *U.S. Treasury Releases Terms of Capital Assistance Program* (Feb. 25, 2009) (online at www.ustreas.gov/press/releases/tg40.htm).

buy additional common stock of the institution receiving the infusion.²⁷ Through conversion, recipient banks will be able to increase their tier 1 common capital position as necessary if economic conditions deteriorate. The ability to convert preferred stock to common equity is intended to help institutions weather continued turbulence, but it also increases taxpayer risk without adding any new capital to the banks, since the conversion is essentially a reorganization of a BHC's capital structure moving the former preferred stockholders to a lower priority of payment in the event the BHC is liquidated.

The other component of the CAP, and the basis upon which decisions regarding the need for capital infusions will be made, is the stress tests under the SCAP. The stress tests are essential to the CAP because they allow regulators to determine which institutions may need additional capital over the next two year period and require the institutions that may need more capital to obtain that capital now. Equally important, they increase the level and composition of the capital required, building banks' capital buffers "to ensure the continued ability of U.S. financial institutions to lend to creditworthy borrowers in the face of a weaker than expected economic environment and larger than expected potential losses."²⁸

The stated purpose of CPP infusions is to build up the capital bases of BHCs so they can continue lending.²⁹ CAP infusions are specifically aimed at increasing capital buffers – in some cases beyond existing regulatory requirements – to safeguard against worse-than-expected economic conditions.³⁰ It is not yet clear, however, exactly how that more focused objective will affect Treasury's criteria for selecting recipients of infusions under the CAP.³¹ Nonetheless, what is clear is that Treasury is no longer applying the same approach toward all BHCs (or at least those not in danger of imminent collapse), as it did in its initial rounds of CPP infusions. Instead, Treasury is seeking to distinguish BHCs with weak capital positions from BHCs with strong capital positions so that it can tailor its actions accordingly.

The key to the CAP is the effort to measure bank capital, through the stress tests, and then to shore up that capital before more is needed. It is to the stress tests themselves that the report now turns.

²⁷ Financial Stability Plan Fact Sheet, *supra* note 26, at 3. The issuance of warrants to purchase common stock in any financial institution receiving assistance under the TARP is required by EESA, *supra* note 1, at §114(d).

²⁸ CAP White Paper, *supra* note 2, at 1.

²⁹ U.S. Department of the Treasury, *Treasury Releases March Monthly Bank Lending Survey* (May 15, 2009) (online at www.treas.gov/press/releases/tg135.htm).

³⁰ The bank supervisors will also require CAP applicants to submit a plan for how they intend to use taxpayer funds. This requirement did not exist for CPP infusions.

³¹ The Panel has called on Treasury to be clearer about its criteria for selecting TARP recipients since its first report in December 2008. See Congressional Oversight Panel, *Questions About the \$700 Billion Emergency Economic Stabilization Funds*, at 4-8 (Dec. 10, 2008) (online at cop.senate.gov/reports/library/report-121008-cop.cfm).

B. The Stress Tests

1. Purpose

According to the bank supervisors, and in some cases only after very large infusions of capital by the U.S. taxpayer, most U.S. banks now have capital levels in excess of the amounts required under banking rules, though in the case of Citigroup and Bank of America among others, only after large infusions of capital and even larger asset guarantees from the federal government through the TARP.³² Nonetheless, the realized and prospective losses created by the financial crisis and the impact of the country's economic condition on banks' revenues have substantially reduced, and are expected to further reduce, the capital of some major banks. Falling capital levels at major banks can lead to a broad loss of confidence in bank solvency, particularly if there is a lack of clear information as to the financial condition of the major banks. Loss of confidence can become a self-fulfilling prophecy, leading to the reluctance of banks to lend to one another (a key component of the banking system's operation), causing individual banks to tighten credit by cutting back on lending in general, and forcing regulators to pump funds into one bank or BHC after another on an ad hoc basis.

Treasury has described the stress testing program as a response to these threats. First, it looks ahead, to build up bank capital in advance to provide additional levels of protection against future potential losses. Second, by providing clear statements of the prospective condition of the BHCs tested – a departure from the past practice of keeping supervisory examination results strictly confidential – Treasury sought to restore confidence in the nation's largest banking organizations. Ultimately, stress testing has the potential to: (1) establish confidence that BHCs with weaker capital positions will be better equipped to weather future turbulence; and (2) signal to the capital markets that some BHCs have strong capital positions.

2. The Entities Tested

The SCAP applied exclusively to the 19 largest BHCs.³³ Treasury and the Federal Reserve Board state that they believe that those institutions, which the agencies estimate hold approximately two-thirds of domestic BHC assets and over one-half of the loans in the U.S. banking system, must be strong if the “banking system [is] to play its role in supporting a stronger, faster, and more sustainable economic recovery.”³⁴ (The regulators have announced

³² Board of Governors of the Federal Reserve System, *The Supervisory Capital Assessment: Design and Implementation*, at 3 (Apr. 24, 2009) (online at www.federalreserve.gov/newsevents/speech/bcreg20090424a1.pdf) (hereinafter “SCAP Design Report”). Views that major U.S. banks are not in fact well capitalized lie at the heart of disputes about the health of the nation's financial system. These disputes are discussed further in Part H of Section One of this report.

³³ *Id.* at 1.

³⁴ SCAP Results, *supra* note 24, at 5; SCAP Design Report, *supra* note 32, at 4 (“This capital buffer should position the largest BHCs to continue to play their critical role as intermediaries, even in a more challenging economic environment.”). Among the BHCs subject to the stress tests were several companies that had recently

that they do not intend to conduct stress tests for smaller BHCs, stating in joint comments on the results of the stress tests that “smaller financial institutions generally maintain capital levels, especially common equity, well above regulatory capital standards.” Regulators should nevertheless continue to closely monitor capital levels at the smaller institutions as part of the supervisory process, especially in light of the failures of small banks that have already occurred.³⁵⁾

While the majority of institutions to whom stress tests were applied are traditional BHCs, several others are not. Two of the largest ones, Goldman Sachs and Morgan Stanley, are investment banking organizations that became BHCs in September 2008, at the height of the financial crisis, in order to access the increased capital that BHCs can obtain from the Federal Reserve Banks. However, the primary activity of these companies remains investment rather than commercial banking.³⁶ The credit card company American Express and the former financial services arm of General Motors, GMAC, also converted to BHCs for similar reasons in November and December of 2008, respectively, and qualified for the stress tests based on their total assets at the end of 2008.³⁷ In addition, the insurance company MetLife qualified as one of the largest BHCs, having become a BHC in 2001.³⁸ Of course, by becoming BHCs, these institutions subjected themselves to the more stringent capital requirements that apply to banks and to which they were not previously subject.

The 19 BHCs taking part in the stress tests as part of the CAP have already been the recipients of \$217 billion in assistance through various TARP programs. These include the CPP, and, in the case of Citigroup and Bank of America, the TIP, and, in the case of GMAC, the

concluded significant mergers or acquisitions, including acquisitions of troubled institutions with the potential to impact the capital reserves of the BHCs participating in the stress tests. This group included: (1) Bank of America, which acquired Merrill Lynch in September 2008 and had purchased Countrywide Financial earlier last year; (2) JPMorgan Chase, which bought Bear Stearns and Washington Mutual; (3) Wells Fargo, which currently holds Wachovia; and (4) PNC, which acquired National City Bank.

³⁵ See Parts C and H of Section One of this report; Robert B. Albertson, *Stress Test Consequences*, Sandler O’Neill Partners (May 11, 2009) (online at www.sandleroneill.com/pdf/financials_051109.pdf) (hereinafter “Stress Test Consequences”). Fifty-one banks have failed since September 2008. Federal Deposit Insurance Corporation, *Failed Bank List* (June 4, 2009) (online at www.fdic.gov/bank/individual/failed/banklist.html).

³⁶ Board of Governors of the Federal Reserve System, *Press Release* (Sept. 21, 2008) (online at www.federalreserve.gov/newsevents/press/bcreg/20080921a.htm) (approving the applications of Goldman Sachs and Morgan Stanley to become BHCs).

³⁷ Board of Governors of the Federal Reserve System, *Press Release* (Nov. 10, 2008) (online at www.federalreserve.gov/newsevents/press/orders/20081110a.htm) (approving the application of American Express to become a BHC); Board of Governors of the Federal Reserve System, *Press Release* (Dec. 24, 2008) (online at www.federalreserve.gov/newsevents/press/orders/20081224a.htm) (approving the application of GMAC to become a BHC).

³⁸ Board of Governors of the Federal Reserve System, *Order Approving Formation of a Bank Holding Company and Determination on a Financial Holding Company Election*, at 7 (Feb. 12, 2001) (online at www.federalreserve.gov/boarddocs/press/BHC/2001/20010212/attachment.pdf).

Automotive Industry Financing Program,³⁹ although it should be noted that there are reports indicating that not all of them actively sought such funds.⁴⁰ (MetLife was the only BHC that participated in the stress test that has not received TARP aid.) In addition, Bank of America and Citigroup have received government guarantees on pools of their assets – totaling up to \$97.2 billion in the case of Bank of America and up to \$244.8 billion for Citigroup.⁴¹ A significant share of the preferred stock that Treasury purchased in Citigroup is expected to be converted to common equity in order to strengthen that company’s capital structure.⁴²

3. How the Stress Tests Worked

a. Overview

The stress tests first estimated the losses that the 19 BHCs would likely suffer between now and the end of 2010 based on specified economic assumptions, resulting from:

- debtors defaulting on loans the BHCs had made to them;
- decreases in value in the securities the BHCs held as investments;
- (for the BHCs with large securities trading businesses) losses on the trading of securities;⁴³ and
- the impact of revenues of falling transactional volume on a fixed cost base, such as in the credit card market.

The tests then projected how much capital each BHC would have after absorbing the estimated losses, at the end of 2010. It was at this point that the supervisors determined the need

³⁹ See June 5 TARP Transactions Report, *supra* note 13. See also Part J of Section Two of this report.

⁴⁰ See, e.g., Damian Paletta, et al., *At Moment of Truth, U.S. Forced Big Bankers to Blink*, Wall Street Journal (Oct. 15, 2008) (online at online.wsj.com/article/SB122402486344034247.html).

⁴¹ U.S. Department of the Treasury, *Summary of Terms: Eligible Asset Guarantee* (Jan. 15, 2009) (online at www.treas.gov/press/releases/reports/011508bofatermsheet.pdf) (hereinafter “Bank of America Asset Guarantee”) (granting a \$118 billion pool of Bank of America assets a 90 percent federal guarantee of all losses over \$10 billion, the first \$10 billion in federal liability to be split 75/25 between Treasury and the FDIC and the remaining federal liability to be borne by the Federal Reserve Board); U.S. Department of the Treasury, *Summary of Terms: Eligible Asset Guarantee* (Nov. 23, 2008) (online at www.treasury.gov/press/releases/reports/cititermsheet_112308.pdf) (hereinafter “Citigroup Asset Guarantee”) (granting a 90 percent federal guarantee on all losses over \$29 billion of a \$306 billion pool of Citigroup assets, with the first \$5 billion of the cost of the guarantee borne by Treasury, the next \$10 billion by FDIC, and the remainder by the Federal Reserve Board). See also U.S. Department of the Treasury, *U.S. Government Finalizes Terms of Citi Guarantee Announced in November* (Jan. 16, 2009) (online at www.treas.gov/press/releases/hp1358.htm) (hereinafter “Final Citi Guarantee Terms”) (reducing the size of the asset pool from \$306 billion to \$301 billion).

⁴² U.S. Department of the Treasury, *Treasury Announces Participation in Citigroup’s Exchange Offering* (Feb. 27, 2009) (online at www.financialstability.gov/latest/tg41.html).

⁴³ These calculations included (under accepted accounting rules) the results of other entities and businesses that the BHCs had recently acquired.

for a capital buffer. If the test resulted in tier 1 capital being less than six percent of risk-weighted assets, or tier 1 common capital being less than four percent for a particular institution, that institution was required to obtain additional capital by November 2009.⁴⁴

The process builds on existing regulatory and accounting requirements⁴⁵ and does not introduce new measures of risk or change the way banks' risk is measured. The tests were affected only to a limited extent by new accounting rules. Recent accounting guidance that allows more flexibility in calculating the value of securities portfolios⁴⁶ was not taken into account in estimating losses.⁴⁷ On the other hand, accounting rules not yet in effect that will require off-balance sheet assets (such as special-purpose vehicles formed to securitize banks' assets) to be brought onto banks' balance sheets were treated as already in effect, resulting in a more conservative calculation.⁴⁸

In estimating the losses, the banking supervisors took a "horizontal" approach, with specialized teams of personnel assessing losses with respect to the same asset classes across all institutions, in order to ensure that comparable assets were valued the same way (or that differences were consistently and rationally applied) for each BHC.⁴⁹

b. Economic Assumptions

The process used two sets of economic assumptions to create the scenarios against which BHCs were "stress tested." These were: a "baseline" scenario that assumed that economic

⁴⁴ U.S. Department of the Treasury, *Joint Statement by Secretary of the Treasury Timothy F. Geithner, Chairman of the Board of Governors of the Federal Reserve System Ben S. Bernanke, Chairman of the Federal Deposit Insurance Corporation Sheila Bair, and Comptroller of the Currency John C. Dugan: The Treasury Capital Assistance Program and the Supervisory Capital Assessment Program* (May 6, 2009) (online at www.ustreas.gov/press/releases/tg121.htm). The various general components of capital are described *supra*.

⁴⁵ This issue is discussed *supra* in Part A of Section One of this report. See also 12 CFR Part 225, at Appendix E §4(b)(3).

⁴⁶ Financial Accounting Standards Board, *Determining Fair Value When the Volume and Level of Activity for the Assets or Liability Have Significantly Decreased and Identifying Transactions That Are Not Orderly* (Apr. 9, 2009) (FSP FAS 157-4) (online at www.fasb.org/cs/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1175818748755&blobheader=application%2Fpdf) (hereinafter "FASB Fair Value Staff Position"); Financial Accounting Standards Board, *Recognition and Presentation of Other-Than-Temporary Impairments* (Apr. 9, 2009) (FSP FAS 115-2 and FAS 124-2) (online at www.fasb.org/cs/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1175818748856&blobheader=application%2Fpdf).

⁴⁷ The accounting guidance did affect the reduction in estimated capital required for those BHCs whose first quarter performance exceeded original estimates, but the aggregate impact of the accounting change appears to be limited. See further discussion later in this report, *infra* note 79.

⁴⁸ Financial Accounting Standards Board, *Briefing Document: FASB Statement 140 and FIN 46* (May 18, 2009) (online at www.fasb.org/news/051809_fas140_and_fin46r.shtml); SCAP Results, *supra* note 24, at 16.

⁴⁹ *Id.* at 4.

conditions during 2009 and 2010 would follow the February 2009 “consensus estimate” of those conditions and a “more adverse” scenario that assumed that those conditions would be worse.

The two scenarios used different assumptions for the following macroeconomic metrics: real Gross Domestic Product (GDP) growth, unemployment rate, and housing price changes.

Figure 1: Economic Scenarios: Baseline and More Adverse Alternatives⁵⁰

	2009	2010
<u>Real GDP Growth</u>		
Average baseline ⁵¹	-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
<u>Civilian unemployment rate</u> ⁵²		
Average baseline	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
<u>House Prices</u> ⁵³		
Baseline	-14	-4
Alternative more adverse	-22	-7

As noted above, the baseline scenario was based on consensus economic forecasts available in February 2009, and the adverse scenario was projected from that baseline. As further discussed below, there was some criticism that both sets of assumptions were too optimistic at the time, and there was additional criticism when the economy deteriorated further after the SCAP exercise began.⁵⁴ The final SCAP results were primarily reported on the basis of

⁵⁰ SCAP Design Report, *supra* note 32, at 6.

⁵¹ Baseline forecasts for real GDP growth and the unemployment rate equal the average of the projections released by Consensus Forecasts, Blue Chip, and Survey of Professional Forecasters in February.

⁵² Unemployment data is collected monthly; the rates used here are projected averages for the year.

⁵³ Percent change in the Case-Shiller 10-City Composite index from the fourth quarter of the previous year to the fourth quarter of the year indicated.

⁵⁴ See, e.g., Ari Levy. ‘Stress Testing’ for U.S. Banking Industry May Not Live Up to Name, Bloomberg (Feb. 26, 2009) (online at www.bloomberg.com/apps/news?pid=20601110&sid=a.DoUvyCa0cE); John W. Schoen, Bank ‘Stress Test’ Draws Fire From Critics, MSNBC (Apr. 24, 2009) (online at

the “more adverse” scenario. While the Federal Reserve Board’s paper on the methodology of the SCAP states that “[p]rojections under two alternative scenarios allow for analysis of the sensitivity of a firm’s business to changes in economic conditions,”⁵⁵ it is not clear whether, with only one set of data, there is sufficient information for analysts to run their own models based on alternative macroeconomic assumptions.

While the stress tests assumed stronger BHC future earnings than the International Monetary Fund (IMF) has projected, the tests adopted loan loss assumptions that were more conservative than those used in the IMF model.⁵⁶ The differences between various projections are summarized in Figure 2.

Figure 2: Alternative Economic Assumptions

Metric	Baseline		More Adverse		IMF Projections ⁵⁷		Current Data ⁵⁸
	2009	2010	2009	2010	2009	2010	(Most Recent)
GDP Growth	-2.0	2.1	-3.3	0.5	-2.8	0.0	-5.7 ⁵⁹
Unemployment	8.4	8.8	8.9	10.3	8.9	10.1	9.4 ⁶⁰

The stress-tested BHCs were told to adapt the scenarios’ macroeconomic assumptions to their specific business activities when projecting their own losses and resources over 2009 and

www.msnbc.msn.com/id/30368110); Nouriel Roubini, *Stress Testing the Stress Test Scenarios: Actual Macro Data Are Already Worse than the More Adverse Scenario for 2009 in the Stress Tests. So the Stress Tests Fail the Basic Criterion of Reality Check Even Before They Are Concluded* (Apr. 13, 2009) (online at www.rgemonitor.com/roubini-monitor/256382/stress_testing_the_stress_test_scenarios_actual_macro_data_are_already_worse_than_the_more_adverse_scenario_for_2009_in_the_stress_tests_so_the_stress_tests_fail_the_basic_criterion_of_reality_check_even_before_they_are_concluded). See also Part H of Section One of this report.

⁵⁵ SCAP Design Report, *supra* note 32, at 5.

⁵⁶ See generally Douglas J. Elliot, *Implications of the Bank Stress Tests*, Brookings Institution, at 8-9 (May 11, 2009) (online at brookings.edu/~media/Files/rc/papers/2009/0511_bank_stress_tests_elliott/0511_bank_stress_tests_elliott.pdf).

⁵⁷ International Monetary Fund, *World Economic Outlook: Crisis and Recovery*, at 65 (Apr. 2009) (online at www.imf.org/external/pubs/ft/weo/2009/01/pdf/text.pdf).

⁵⁸ Because the baseline and adverse scenarios are projected as annual averages, they are not directly comparable to monthly or quarterly data.

⁵⁹ First quarter 2009, percent change from preceding quarter in chained 2000 dollars (preliminary figure). U.S. Department of Commerce, Bureau of Economic Analysis, *Gross Domestic Product, 1st quarter 2009 (preliminary)* (May 29, 2009) (online at www.bea.gov/newsreleases/national/gdp/2009/gdp109p.htm) (hereinafter “Gross Domestic Product”). This figure is up from the 6.3 percent decline in the fourth quarter of 2008. *Id.*

⁶⁰ U.S. Department of Labor, Bureau of Labor Statistics, *The Employment Situation: May 2009* (June 5, 2009) (USDL 09-0588) (online at www.bls.gov/news.release/pdf/empst.pdf) (hereinafter “Employment Situation”). This figure is the unemployment rate through April 2009, the last month for which data is available. The year-to-date average unemployment rate stands at 8.5 percent. See *id.* at 10.

2010. This process included adapting assumptions for housing price changes to account for local conditions, and, where the BHCs had international operations, adjusting the assumption that international conditions would be as bad as those assumed for the United States. In making these adaptations, the institutions were encouraged to make additional appropriate assumptions of macroeconomic conditions based on the three governing metrics, and several BHCs developed their own assumptions as to interest rates, yield curves, etc.

c. Loan loss projections

The BHCs were instructed by the supervisors to estimate losses from failure to pay obligations through the end of 2012 for 12 separate loan categories,⁶¹ based on the value of the loans shown on the BHCs' books at the end of 2008. Accounting and banking rules require that banks carry loans on their books at their unpaid principal amount, reduced by a percentage reflecting the credit history of the borrower and the general risk of nonpayment for loans of the particular type. The remaining principal amount, less these provisions, is the amount that a BHC shows as assets on its balance sheet. Loans are not "marked-to-market," that is, they are not revalued by estimating what a BHC could receive for those loans if it sold them. Thus, the losses the BHCs were required to estimate were losses arising from borrowers' failure to pay their obligations, not losses arising from a drop in market value of existing loans, and the use of a different valuation method for these loans might have resulted in a rather different estimate of the required capital buffer.⁶²

With respect to this method of valuation of loans, see commentary in the Panel's April Oversight Report:

Treasury has not explained its assumption that the proper values for these assets are their book values – in the case, for example, of land or whole mortgages – and more than their "mark-to-market" value in the case of ABSs, CDOs, and like securities; if values fall below those floors, the banks involved may be insolvent in any event.⁶³

In assessing their loan losses, the BHCs were told to add to their loan inventory potential additional loans that could result from the drawing down of existing credit lines by borrowers, and to add to their balance sheets liabilities held in "special purpose vehicles" (SPVs) that had previously been excluded from capital calculations and that might have to be taken back onto the

⁶¹ These categories were: first lien (1) prime, (2) Alt-A, and (3) subprime mortgages; (4) closed-end junior liens; (5) home equity lines of credit; (6) commercial & industrial loans; commercial real estate (7) construction, (8) multifamily, and (9) non-farm, non residential loans; (10) credit card loans; (11) other consumer loans; and (12) other loans. SCAP Design Report, *supra* note 32, at 18.

⁶² See Part H of Section One of this report.

⁶³ Congressional Oversight Panel, *April Oversight Report: Assessing Treasury's Strategy: Six Months of TARP*, at 75 (Apr. 7, 2009) (online at cop.senate.gov/reports/library/report-040709-cop.cfm) (hereinafter "Panel April Oversight Report").

balance sheets in a stressed economic environment or due to accounting changes.⁶⁴ It should be noted that the unanticipated on-boarding of off-balance sheet assets played a significant role in the current financial crisis,⁶⁵ and with consumer defaults rising, on-boarding SPVs might be expected to account for a large proportion of estimated losses. The proportion of estimated losses due to on-boarding SPVs was not disclosed by the supervisors.

Against this expanded loan inventory, BHCs were required to estimate their losses in each of the 12 loan categories under both scenarios. The banking supervisors provided the BHCs with a range of indicative two-year cumulative loss rates for each category and each scenario to guide their projections. For example, the supervisors provided an indicative loan loss rate of 7-8.5 percent for first lien mortgages in the more adverse scenario. The BHCs adapted this guidance to their particular situations to estimate the loan losses they would suffer in each category of loans under each scenario. These estimates were provided to supervisors. In addition, the BHCs were required to provide granular data about the particular characteristics of their portfolios (such as underwriting practices, FICO scores and refreshed LTV information) so that the supervisors could assess the reasonableness of the BHCs' loan loss estimates. BHCs were permitted to predict loss rates outside the indicative ranges if they could provide strong supporting evidence for the deviation, especially if their loan loss estimate fell below the range minimum. Therefore, in certain categories and scenarios some BHCs estimated that their loan loss rates would be above the indicative range, while others ended up making estimates that fell below the range.

Using the data presented by the BHCs, the supervisors made their own estimates of loan losses on an asset-class-by-asset-class basis, comparing loss projections for similar asset classes across institutions so that, for example, losses with respect to subprime loans in a particular area originated in a particular period would be estimated at the same rate for different BHCs, even if those BHCs' own estimates differed. Therefore, a divergence in loss rates between BHCs in a given category of loans should indicate differences in portfolios, not differences in the BHCs' own estimates. Each BHC's loss estimates ultimately relied on portfolio-specific data regarding past performance, origination year, borrower characteristics and geographic distribution. These differences led to significant variation between BHCs in the ultimate loan loss estimates used by supervisors. For example, Capital One's estimated loss rate for first lien mortgages was 10.7 percent and BB&T Corporation's rate was 4.5 percent.⁶⁶

d. Projections of losses on securities

⁶⁴ SCAP Results, *supra* note 24.

⁶⁵ See, e.g. Citigroup Inc., *Citigroup's 2008 Annual Report on Form 10-K*, at 6-18 (online at www.citigroup.com/citi/fin/data/k08c.pdf?ieNocache=677).

⁶⁶ SCAP Results, *supra* note 24, at 21, 23.

The BHCs were also required to estimate the losses that their securities portfolios would suffer through 2010 under both economic scenarios.

The way securities are valued on a BHC's balance sheet differs from the way loans are treated and depends on what the BHC intends to do with those securities. Securities may be categorized as: (1) "held to maturity" (HTM); (2) trading, that is, held for sale in the near future; or (3) "available for sale" (AFS). Securities held to maturity are carried on the BHC's balance sheet at "amortized" cost (roughly, principal minus repayments), with that value further reduced if the value of the security is considered subject to "other than temporary impairment" (OTTI). Securities available for sale or in the trading portfolio are carried at "fair value," which means market value if there is a trading market for them, or at a value estimated by the BHC if there is not.⁶⁷

All 19 BHCs were instructed to estimate possible impairment with respect to net unrealized losses on securities that they categorized as held to maturity and securities that they classified as available for sale under both scenarios. For this analysis, securities carried at fair value were marked to market as of December 31, 2008. Since a loss from impairment when a security is marked down is recorded on the BHC's income statement as a charge to income, the BHCs were also told to estimate the decrease in income that would result from these devaluations.⁶⁸

The recent FASB guidance on establishing "fair value" in illiquid markets, which gave BHCs greater flexibility in valuing securities, was not taken into account in estimating losses under the more adverse scenario in order to reflect greater uncertainty about realizable losses in

⁶⁷ "Fair value" is established in accordance with accounting rules. Where there is a market for the securities, that market value is used. Where the market is illiquid, the rules permit the owner to use other inputs to establish a price for its securities, taking into account current market pricing and conditions. In the recent market turmoil, the need to take market conditions into account in creating valuation models for their securities meant that some institutions had to realize significant losses on their portfolios of securities such as mortgage-backed ABSs, even though those securities were still continuing to generate cash flow. In response to this situation, the accounting authorities released guidance in April 2009, that permitted more flexibility in the valuation of securities for which there was no liquid market. FASB Fair Value Staff Position, *supra* note 46. This guidance applied to financial statements for periods after June 15, 2009, with an early-adoption provision for periods ending no earlier than March 15, 2009. Thus, the BHCs' financial statements for the year ending December 31, 2008, were not affected by the April FASB guidance.

⁶⁸ SCAP Design Report, *supra* note 32, at 8. In deciding which securities should be treated as having suffered an OTTI and thus need to be revalued at fair value as of December 31, 2008, the supervisors took a conservative approach in the more adverse scenario, in that BHCs were required to take into account the possibility that in adverse economic conditions they might not be able to hold all their HTM securities until they matured, and may need to sell them before recovery of their cost basis. The total impact of this requirement was small, as most HTM securities in the BHCs' portfolios were low-risk Treasury securities and the like, but this approach illustrates the conservative approach taken by the supervisors.

stressful conditions.⁶⁹ (The FASB guidance was taken into account in estimating losses in the baseline scenario, but the baseline scenario results were not published.)⁷⁰

BHCs with trading securities of \$100 billion or more – Bank of America, Citigroup, Goldman Sachs, JP Morgan Chase, and Morgan Stanley – were asked to provide projections of trading-related losses for the more adverse scenario, including losses from their “counterparty” exposure risk with regard to credit default swap and similar transactions. To calculate these losses, the BHCs conducted a stress test of their trading book positions and counterparty exposures as of market close on February 20, 2009. BHCs were told to disclose the positions that they included in this analysis, the risk factors that were stressed, and the changes in variables that they used (such as changes in interest rates, spreads, exchange rates, etc.).⁷¹

As with estimates of loan losses, the supervisors made their ultimate estimates of losses from securities portfolios using the estimates provided by the BHCs and applying “horizontal testing” across asset classes to ensure consistency.

e. Resources available to absorb losses

In addition to drawing on their capital, banks can absorb losses with offsetting income and loss reserves set up precisely for that purpose. The tests “stressed” both items.

The BHCs were instructed to project the main components of their “pre-provision net revenue” (PPNR), which is net interest income plus non-interest income minus non-interest expense, under both economic scenarios. The stress test review required BHCs to explain in detail the assumptions they made in computing PPNR, especially if those assumptions included an increase in business, and any projections in excess of 2008 levels required strong supporting evidence.

A bank sets aside reserves in a current period to absorb anticipated future loan losses so that those losses do not affect overall capital in the future period. The BHCs were instructed to estimate the resources they would have available to absorb projected losses. This would include

⁶⁹ Critics have argued that the principal effect of the FASB rule change would be to allow BHCs to simply avoid recording decreases in the value of their assets, undermining investor confidence and perhaps prolonging the crisis. *See, e.g.*, House Committee on Financial Services, Subcommittee on Capital Markets, Insurance and Government Sponsored Enterprises, Testimony of Executive Director of the Center for Audit Quality Cynthia Fornelli, *Mark-to-Market Accounting: Problems and Implications*, 111th Cong. (Mar. 12, 2009) (online at www.house.gov/apps/list/hearing/financialsvcs_dem/fornelli031209.pdf). In other words, the rule change may allow BHCs that are actually insolvent to continue operating, a situation analogous to Japan’s elimination of mark-to-market accounting early in its so-called “Lost Decade.” *Id.* However, this debate largely turns on the question of whether the fundamental problem facing the financial system is one of liquidity or valuation.

⁷⁰ SCAP Design Report, *supra* note 32, at 14.

⁷¹ The estimates of losses took into account the severe market stresses that occurred between June 30, 2008 and December 31, 2008. This process goes beyond usual mark-to-market rules and, in requiring the use of data from the most stressed markets in recent decades, might be termed “mark to mayhem.”

the revenue that they earned in 2009 and 2010, the reserves that they had set aside for losses at the end of 2008, and any additions to those reserves projected to be made during 2009 and 2010. They were then asked to estimate the portion of the year-end 2008 reserves that they would need to absorb credit losses on their loan portfolio under each scenario while still ending up on December 31, 2010, with sufficient reserves in light of their loan portfolio on that date to absorb future losses at an elevated (that is, stressed) rate. To the extent additional reserves would likely be needed, income available to absorb losses (i.e., PPNR) was reduced accordingly.

f. Adjustments

At the end of the first stage of the stress testing, the supervisors translated the gains and losses they projected for each BHC into changes in that BHC's projected capital levels.

These amounts were first calculated on the basis of the BHCs' results to December 31, 2008. As discussed in more detail below, the initial results suggested that the aggregate capital needed for the 19 BHCs to reach capital buffer targets in the more adverse scenario would be \$185 billion, "much of which" would have to be in the form of tier 1 common capital.⁷²

The final calculation of the capital buffers reflected the effects of acquisitions, new capital raised, and operating performance in the first three months of 2009. These adjustments were substantial, and reflected actions taken by some BHCs prior to the conclusion of the stress tests to raise capital by selling subsidiaries or businesses, converting preferred stock into common stock or issuing common shares, and, to a lesser extent, strong operating results generated by some BHCs during the first quarter.⁷³ Where a BHC's first quarter performance exceeded the supervisors' estimate of PPNR for that period, the amount by which it exceeded estimates was added to the estimate of resources available to absorb losses, thus decreasing the required capital buffer.⁷⁴ The impact of "Capital Actions and Effects of Q1 Results" is presented on a net basis for each BHC, so it is not possible to see the specific effect of each of these actions or results on a BHC's capital or even whether a particular BHC experienced an adjustment because of its operating results.⁷⁵ For the 19 BHCs, the total impact of Q1 2009 adjustments was

⁷² The summary of SCAP results does not specify the amounts of tier 1 common and other tier 1 capital that comprise each holding company's required buffer. The release says simply that:

[c]apital needs are mainly in the form of tier 1 common capital, which reflects the fact that while many institutions have a sufficient amount of capital, they need to take steps to improve the quality of that capital... For ten of the participating BHCs, supervisors expect these firms to raise additional capital or change the composition of their capital. As noted above, much of this need is for additional tier 1 common. For all of these firms, a raise of new common equity of the amount indicated would be sufficient to ensure they will also have at least a six percent tier 1 ratio at the end of 2010.

SCAP Results, *supra* note 24, at 16, 17.

⁷³ Federal Reserve Board officials have informed Panel staff that the aggregate impact of all first quarter 2009 PPNR on the required capital buffer was only \$20 billion.

⁷⁴ *Id.*

⁷⁵ See Part H of Section One of this report.

to reduce the capital buffer needed by \$110 billion, \$87.1 billion of which was attributable to Citigroup, Inc.⁷⁶

The adjustments for the additional three months reflects certain accounting changes adopted in April 2009, to provide flexibility as to the “fair value” that must be assigned to securities for which no liquid market exists (for example, asset-backed securities for which there is no market, or over-the-counter credit default swaps). Seven BHCs adopted these accounting changes for their first quarter financial statements.⁷⁷ Some securities that those BHCs had been carrying on their books at “fair value” were revalued at a higher price in light of the accounting changes, and the increase in these values was recognized as income. On the other hand, some liabilities of those BHCs were also revalued as a result of the accounting change, and the increase in these liabilities decreased the BHCs’ income. Where a BHC’s income for the first quarter of 2009 exceeded the supervisors’ original estimates for its revenues, as discussed above,⁷⁸ these revaluation-related increases (or decreases) would have decreased (or increased) the amount of the capital buffer required. It is not possible to quantify the impact of these changes on the basis of the information published, however. Because adjustments to the required capital buffer resulting from first quarter performance are presented on a net basis, reflecting both revenues and capital actions, it is not possible to identify which BHCs had their buffer requirement reduced due to first quarter performance, and thus whether any members of that group of BHCs adopted the accounting guidance. It appears that the maximum possible impact of the accounting changes on required capital buffers would have been approximately \$5.6 billion.⁷⁹

While several BHCs published income statements for the first quarter of 2009 that included as revenue credit value adjustments (CVA) resulting from the revaluation of their own

⁷⁶ This issue is discussed *infra* in Part B of Section One of this report.

⁷⁷ These BHCs are: Bank of America, Bank of New York Mellon, Citigroup, JPMorgan Chase, PNC, U.S. Bancorp, and Wells Fargo. The 19 BHCs tested report to the Securities and Exchange Commission (SEC) and thus their financial statements are publicly available.

⁷⁸ This issue is discussed *infra* in Part B of Section One of this report.

⁷⁹ Based on SEC filings by the BHCs, which do not present such data in a standardized form, the possible aggregate impact on required capital buffer ranges from an *increase* of approximately \$240 million (if only the BHCs that recognized losses resulting from the accounting change were allowed adjustments due to first quarter performance) to a decrease of approximately \$5.6 billion (if only the BHCs that recognized income from accounting changes were allowed such adjustments. Of the latter figure, approximately \$5 billion relates to Wells Fargo alone. It should be noted that because the FASB guidance was not taken into account in estimating losses under the more adverse scenario (which was the only scenario for which results were reported), the impact of the FASB guidance is limited to this measure alone (the increased resources available to absorb losses) and only to the BHCs whose PPNR for the first quarter of 2009 exceeded the supervisors’ estimates.

debt, this ephemeral “revenue” was not included in the calculation of the PPNR available to absorb losses.⁸⁰

g. Calculation of the SCAP buffer

After making the adjustments just described, the supervisors computed the additional amount, if any, required so that the BHCs would reach the capital buffer ratio of six percent tier 1 capital and four percent tier 1 common capital. The computation began with measures of these capital elements at December 31, 2008, calculated in accordance with Federal Reserve Board rules.⁸¹ Using the loss and revenue estimates discussed above, the supervisors calculated the necessary capital buffer. In doing so, they examined a range of capital metrics and factors, including tier 1 common and overall capital, and including the composition of capital. The initial assessment of capital need (relating to the BHCs’ capital position as of December 31, 2008) was communicated to the BHCs in late April.

As discussed below, Treasury released the results of the stress tests on May 7, 2009. The reason for the time lag between communication to the banks and release of the results publicly may have been due to the need to check for errors, omissions, and double counting, but the Panel has not had access to documents that would establish this fact. Nor is it possible to tell whether, or to what extent, the numbers communicated to the banks in late April differed from those released publicly.

4. Results of the Stress Tests

On May 7, 2009, Treasury released the results of the stress tests.⁸² (The results released dealt only with the impact of the “more adverse” economic scenario, not the baseline scenario.) Those results showed that ten of the 19 BHCs required additional capital to weather a “more adverse” economic scenario and that nine of the 19 BHCs already held a sufficient capital buffer and would not be required to raise additional capital as a result of the stress test.⁸³

The results estimated that in aggregate the 19 BHCs included in the SCAP would incur approximately \$600 billion of additional losses by the end of 2010.⁸⁴ Residential mortgage and consumer loans accounted for \$322 billion, or 53.7 percent, of this \$600 billion.⁸⁵

⁸⁰ Revenue from such CVAs is routinely excluded from the calculation of tier 1 capital. *See generally* 12 CFR part 225, at Appendix A § II.

⁸¹ This calculation starts with shareholders’ capital adjusted to remove certain accounting adjustments that may obscure the true value of shareholder equity. *See* 12 CFR part 225, Appendix A §II.

⁸² SCAP Results, *supra* note 24.

⁸³ These nine banks are American Express, BB&T, Bank of New York Mellon, Capital One, Goldman Sachs, J.P. Morgan Chase, MetLife, State Street, and USB.

⁸⁴ SCAP Results, *supra* note 24, at 3. This \$600 billion is in addition to losses recorded on the banks’ balance sheets in the six quarters ending December 31, 2008.

The ten BHCs requiring capital are: Bank of America (\$33.9 billion), Citigroup (\$5.5 billion), Fifth Third Bancorp (\$1.1 billion), GMAC (\$11.5 billion), KeyCorp (\$1.8 billion), Morgan Stanley (\$1.8 billion), PNC (\$600 million), Regions Financial Corporation (\$2.5 billion), SunTrust (\$2.2 billion), and Wells Fargo & Company (\$13.7 billion).⁸⁶ These BHCs must raise the capital by November 9, 2009, six months after the announcement of the test results, and they must submit a capital plan to their supervisors in early June outlining how they will do so.

The supervisors broke BHCs' assets into categories, or "buckets," and disclosed the BHCs' estimated losses for each bucket. Besides first lien mortgages, the other buckets were second/junior lien mortgages, commercial and industrial loans, commercial real estate loans, credit card loans, securities (AFS and HTM), trading and counterparty, and other, which included "other consumer and non-consumer loans and miscellaneous commitments and obligations."⁸⁷

Loss estimates within each bucket varied significantly between the BHCs. For example, as noted above, BB&T's estimated loss rate on first lien mortgages through the end of 2010 was 4.5 percent, while Capital One was estimated to have a 10.7 percent loss rate. This translated into an estimated loss for BB&T on first lien mortgages of \$1.1 billion, while Capital One was estimated to have a \$1.8 billion loss on its first lien book.⁸⁸ The median loss rate on first lien mortgages for all 19 participants was eight percent.⁸⁹ The Federal Reserve Board explained that such variations reflected "substantial differences in the portfolios across the BHCs, by borrower characteristics such as FICO scores, and loan characteristics such as loan-to-value ratio, year of origination, and geography."⁹⁰ An element of judgment was necessary in determining these loss rates. It allowed the testing, for example, to reflect local conditions with greater accuracy. However, because of the judgment involved, the calculations cannot be reviewed or replicated. This diminishes the reliability of the tests and the confidence that the public is able to place in them.

The original testing measured capital levels as of the end of 2008. Since that time, a number of BHCs have taken steps that have increased their capital, and thus, as discussed above, decreased the amount of capital buffer that they must raise. As of the end of 2008, the 19 BHCs would have had to have raised a total of \$185 billion in capital. As a result of capital actions and

⁸⁵ SCAP Results, *supra* note 24, at 6.

⁸⁶ SCAP Results, *supra* note 24, at 9.

⁸⁷ SCAP Results, *supra* note 24, at 10. The BHCs expected losses were actually calculated more granularly. The supervisors estimated BHC loan losses for 12 categories of loans and multiple categories of securities. The eight buckets that were disclosed were netted figures for some of these smaller categories.

⁸⁸ SCAP Results, *supra* note 24, at 9.

⁸⁹ SCAP Results, *supra* note 24, at 10.

⁹⁰ SCAP Results, *supra* note 24, at 10.

the results of Q1 2009 results, this figure decreased by \$110.4 billion, to a total of \$74.6 billion.⁹¹ By far the largest portion of this decrease is attributable to Citigroup, whose required capital buffer was reduced from \$92.6 billion to \$5.5 billion.⁹² The most important factor in the abrupt change in Citigroup's adjustment was a \$58.1 billion preferred stock exchange offer announced on February 27, 2009. This exchange offer involves conversion of up to \$27.5 billion in Citigroup preferred stock held by Treasury into Citigroup common stock⁹³ (increasing Treasury's ownership in Citigroup to 36 percent).⁹⁴ It also includes two pending sales of operating subsidiaries of Citigroup. In addition, Citigroup has sold a Japanese subsidiary⁹⁵ and announced a brokerage venture for Salomon Smith Barney, for which Citigroup will book a gain.⁹⁶

This unprecedented exercise reported that nine of the top 19 BHCs were adequately capitalized to withstand a serious downturn in the economy over the next two years. It further reported to the remaining banks a quantifiable amount of capital that they needed to raise to remain well capitalized during this potential downturn.

C. Immediate Impact of the Stress Tests

The stress tests appeared to have an immediate impact on financial markets and public confidence.⁹⁷

⁹¹ SCAP Results, *supra* note 24, at 9.

⁹² SCAP Results, *supra* note 24, at 9.

⁹³ SCAP Results, *supra* note 24, at 9; Citigroup Inc., Form 8-K (Feb. 27, 2009) (online at www.sec.gov/Archives/edgar/data/831001/000095010309000421/dp12698_8k.htm).

⁹⁴ Citigroup Inc., *Citi To Exchange Preferred Securities for Common, Increasing Tangible Common Equity to as Much as \$81 Billion* (Feb. 27, 2009) (online at www.sec.gov/Archives/edgar/data/831001/000095010309000421/dp12698_ex9901.htm). Citigroup did not receive any additional government funds as the result of the conversion.

⁹⁵ Citigroup Inc., Form 8-K (May 1, 2009) (online at www.sec.gov/Archives/edgar/data/831001/000095014209000583/form8k_050109.htm).

⁹⁶ Citigroup Inc., *Morgan Stanley and Citi To Form Industry-Leading Wealth Management Business Through Joint Venture* (Jan. 13, 2009) (online at www.sec.gov/Archives/edgar/data/831001/000095010309000089/dp12289_ex9901.htm).

⁹⁷ Various measures show the impact of the tests on the markets. CDS prices show that the price of protecting against default in the large banks fell after the results of the tests were released. Alistair Barr and Ronald D. Orol, *B. of A., Citi are Stress-Test Winners, CDS Prices Suggest*, MarketWatch (May 8, 2009) (online at www.marketwatch.com/story/b-of-a-citi-are-stress-test-winners-group-says?dist=TQP_Mod_mktwN) ("The cost of protecting against a default by Citigroup and Bank of America dropped by more than a third this week, as news of the stress-test results leaked out, according to Credit Derivatives Research. The cost of default protection on other banks and investment banks, including Morgan Stanley and Goldman Sachs has also fallen a lot this week, the research firm said."). Short interest in the 19 banks fell by 20 percent from May 7, 2009 through May 29, 2009. DataExplorers, *Update: Stress Test for US Financials* (May 29, 2009) (online at dataexplorers.com/sites/default/files/Sector%20Focus%20Bank%20Stress%20Test%20-%20Update%20May%2029%202009.pdf).

As soon as the results of the stress tests were announced, the BHCs began raising capital to meet shortfalls. The 19 BHCs have raised or publicly announced plans for raising \$48.2 billion in new debt and equity. Treasury has claimed that, in total, \$56 billion in capital-raising was planned as of May 20.⁹⁸ Debt and equity issuances reported for each BHC so far are set out in part K of Section One of this report.

Though the official results were released on Thursday, May 7, 2009, the results for many of the BHCs were reported in the press prior to that date. By early that week, the public knew that ten of the 19 BHCs would be required to raise additional capital.⁹⁹ It also knew the amount of capital required to be raised for some of the BHCs. However, there appears to have been some confusion surrounding the reported numbers. Federal Reserve Board officials have told the Panel that some of the reports revealed only the preliminary required capital, before it was adjusted for the effect of capital actions and 2009 first quarter results. The officials further suggested that, as a result of changes in the figures when the official results were released, many commentators mistakenly believed that the delay in the release was the result of negotiations with the BHCs.¹⁰⁰ To gain a better understanding of the stress tests, on March 30, the Panel requested that Treasury provide the Panel with documents related to Treasury's work on the stress tests. On May 11, the Panel made a similar request of the Federal Reserve Board. The Panel followed up with Treasury to reiterate its need for access to the documents on May 26. On June 5, Treasury made available to Panel staff a number of documents related to the stress tests. On June 8, the Federal Reserve made additional documents available. Panel staff is reviewing the documents and expects to see more documents; the meaning of the documents reviewed to date remains unclear. The Panel expects to include information resulting from that review in a future report or update where appropriate.

Although the SCAP involved only the nation's 19 largest BHCs, it spurred the private evaluation of smaller institutions. An analysis performed for the Financial Times showed that 7,900 U.S. small and medium sized banks would need to raise \$24 billion in capital to achieve

Media reports reflect that many felt a general sense of relief on seeing the results. *See e.g., After the Financial Stress Tests: Relief But Still Some Uncertainty*, CNBC (May 8, 2009) (online at www.cnbc.com/id/30640189); Jim Puzzanghera and E. Scott Reckard, *Bank 'Stress Test' Results Hint at Economic Recovery*, Los Angeles Times (May 8, 2009) (online at www.latimes.com/business/la-fi-stress-tests8-2009may08,0,6880257.story).

⁹⁸ Senate Committee on Banking, Housing, and Urban Affairs, Testimony of Secretary Geithner, *Oversight of the Troubled Asset Relief Program*, 111th Cong. (May 20, 2009) (online at banking.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=64feeb1d-f2c3-4f11-a298-800be9bd360d&Witness_ID=ae7c9f56-f16f-4b3c-b4e7-b5919e3ccd7c) (hereinafter "Geithner Testimony"). The \$8 billion difference is the result of Treasury using a more lenient standard to decide whether a fund has been "planned" yet.

⁹⁹ Damian Paletta and Deborah Solomon, *More Banks Will Need Capital*, Wall Street Journal (May 5, 2009) (online at online.wsj.com/article/SB124148189109785317.html).

¹⁰⁰ Arianna Huffington, *The Stress Tests Fail the Smell Test*, Huffington Post (May 5, 2009) (online at www.huffingtonpost.com/arianna-huffington/the-stress-tests-fail-the_b_196350.html).

the capital buffer levels required of large BHCs in the SCAP.¹⁰¹ The firm that conducted this analysis stated that it expects that the stress test's methodology and capital adequacy focus will migrate to the broader U.S. banking system.¹⁰²

D. A Comment on the Supervisory Process

The stress tests involved the submission of material by the 19 BHCs estimating their loss, income, and resource figures for the test period. The banking supervisors evaluated the quality of the BHCs' submissions and made their own estimates of losses and resources to absorb those losses. As part of that process, supervisors used supporting information provided by the BHCs, as well as the supervisors' own knowledge and supervisory information. Supervisors also included their own independent benchmarks, such as the indicative loan loss rates discussed above.

The supervisory teams performing the tests involved more than 150 examiners from the Federal Reserve Board, the Federal Reserve Banks, the Office of the Comptroller of the Currency (OCC), and the FDIC. Additionally, specialist teams were assigned to examine loss projections for specific asset classes across all the BHCs. This ensured that the same or similar assets would be valued the same way in the projections for each institution, and that counterparty risk, revenue projections, and loan loss would be treated consistently across institutions. The BHCs had several thousand people working to produce the raw data that informed the stress tests. Additional advisory groups provided assistance with accounting, regulatory capital, and financial and macroeconomic modeling.

The supervisory process, by its nature, always involves constant interaction between the supervisor and the regulated entity, and the SCAP process was no exception. The supervisors presented the BHCs with indicative guidelines for loan loss rates, but the BHCs were able to use alternative measures if they could prove to the supervisors (with adequate documentation) that the alternative was more appropriate. The supervisors alone, however, decided whether the loan loss rates used were appropriate. (The supervisors found some BHCs' submissions to be of a higher quality than others, and, after the supervisors had presented the BHCs with their initial estimates, some BHCs presented the supervisors with more detailed information in order to correct errors and double-counting that had been reflected in their results.)

While SCAP in some ways represents a new and tougher approach by federal regulators, it does not constitute a genuine break from past supervision methods and tactics, and was not

¹⁰¹ Saskia Scholtes, et al., *Smaller US Banks Need Additional \$24bn*, Financial Times (May 17, 2009) (online at www.ft.com/cms/s/0/79c47ffa-4306-11de-b793-00144feabdc0,dwp_uuid=ffa475a0-f3ff-11dc-aaad-0000779fd2ac.html) (hereinafter "Financial Times Study") (The Financial Times-commissioned study used metrics that differed from the SCAP in two ways: (1) it did not adjust for first quarter performance; and (2) it was not able to estimate loss rates with the same degree of individualized precision as the regulators).

¹⁰² Stress Test Consequences, *supra* note 35.

intended to be. The fact that regulators did not identify emerging systemic risks prior to the crisis underscores the importance of scrutiny toward the supervisory role generally and the recent round of stress testing.

E. Specific Limitations of the Stress Tests

Any evaluation of the stress tests must start with both what the tests are and what they are not. Supervisors have always regarded regulatory capital as a baseline measure and have required additional capital (or changes in capital composition) for particular institutions when the situation warranted. The stress tests operate under this premise but they are also a unique, cross-institution exercise. They are not a regulatory examination of the 19 BHCs, focused on capital adequacy, and do not test the BHCs' overall safety and soundness, as would a regular examination. In this and in more granular ways, the SCAP builds from a starting point of existing bank supervision and conclusions about the health of the institutions at issue.

It is logical, in view of such a starting point, that the supervisors relied on raw data that were produced by the BHCs themselves. For example, the stress tests estimated the losses that might occur on first lien mortgages held by each BHC but did not test whether the BHC held the total amount of mortgages that it said it did, or whether it actually had enforceable liens on them.¹⁰³ The tests were not re-audits or re-examinations; they relied on BHC-generated figures whose assumptions were tests only. Thus, to a significant extent, the stress tests rely on the accuracy of the audit and examination process, and the integrity and soundness of the judgments and internal processes of the participating BHCs.¹⁰⁴

The stress test results are presented as the estimates of the supervisors, not those of the institutions tested. The Federal Reserve Board emphasizes that those institutions or other outside analysts might have produced very different estimates, even using a similar set of economic assumptions.¹⁰⁵

F. Independent Analysis of Stress Tests

¹⁰³ Such matters would be covered by the regular audit and examination processes.

¹⁰⁴ In its April report, the Panel noted that the success of the Reconstruction Finance Corporation in stabilizing the U.S. banking system during the Great Depression has since been attributed in large part to the forced write-downs of bank assets to realistic values as determined by the RFC. Panel April Oversight Report, *supra* note 63, at 40. Similarly, the Panel noted that Japan did not emerge from its "Lost Decade" until it began to rigorously examine the valuation of bank assets in 2002, as part of a broader plan of uncovering the true health of the financial system. Panel April Oversight Report, *supra* note 63, at 57-58.

¹⁰⁵ For example, Bank of America argues that its internal projections show that the supervisors underestimated its future income over the next two years while, in many cases, overestimating its loan losses. Bank of America Corp., *Stress Test: Bank of America Would Need \$33.9 Billion More in Tier 1 Common* (May 7, 2009) (online at investor.bankofamerica.com/phoenix.zhtml?c=71595&p=irol-newsArticle&ID=1286200&highlight=).

The Panel asked Professors Eric Talley and Johan Walden to review the stress test methodology. Professor Talley is a Professor of Law and the U.C. Berkeley School of Law (Boalt Hall), and Co-Director, the Berkeley Center for Law, Business, and the Economy; he has been a Visiting Professor of Law at the Harvard Law School during the 2008-2009 academic year. Professor Walden is a Professor in the Haas Finance Group of the U.C. Berkeley Haas School of Business. Both are recognized experts in finance, asset pricing, economic analysis of risk, and economic analysis of law. Their report, “The Supervisory Capital Assessment Program: An Appraisal” (the Appraisal), dated June 2009, is attached as Annex to Section One.

The Appraisal contains an overview of the dominant approaches in the finance literature for measuring risk using statistical models, attempting to understand and situate the approach used by the Federal Reserve Board. It examines the relative strengths and weaknesses of each model, as well as the systemic issue of model uncertainty, resulting from the fact that there is no single consensus approach to measuring financial risk from multiple sources. In this process, the Appraisal also highlights a number of statistical measures for quantifying risk from single sources, noting their usefulness in developing models.

These models include: the *Capital Adequacy Ratio* (which measures the ratio of a bank’s equity capital to the risk-weighted value of its assets), *Value at Risk* (VaR) (which captures the probability of losses exceeding some specified threshold), and the *Expected Shortfall* (which measures the expected amount of losses in the event that losses exceed the VaR threshold).¹⁰⁶ While acknowledging the merits of such summary statistical measures, the Appraisal points out that these measurements classify risk quite roughly and may neglect co-movement among assets, two factors that greatly reduce the amount of information contained in the final number.

After discussing the methods of evaluating single-source risk, the Appraisal treats the problem of calculating a portfolio of risks, highlighting three dominant approaches within the finance literature: *Merton models* (in which companies default at the maturity of a debt when their total asset value is less than the face value of the debt), *First Passage models* (in which a company defaults if its asset value drops below a specified default trigger at any time before maturity), and *Reduced Form models* (which rely completely on empirical data to model default dependencies between firms in discrete periods of time).

On the basis of the conceptual and mathematical analyses that it reflects, the Appraisal makes a number of points about the stress tests. At the outset, it states that:

Based largely on information collected through public document review and conference calls with representatives from the Federal Reserve and the Treasury Department, and taking into account the enormity of the task within a short time horizon, we conclude that the Fed’s risk modeling approach has, on the whole,

¹⁰⁶ Also included are Standard Deviation and Mean Absolute Deviation (statistics commonly used to measure risk).

been a reasonable and conservative one... For example, the macro-economic scenarios they hypothesized under the adverse case appear relatively extreme by historical standards, and the (purportedly one-time) sizing of the capital buffer was made relatively stringent. Moreover, the general approach undertaken here appears to have avoided some of the more dangerous simplifications manifest in certain types of risk modeling... On the whole, then, our assessment is that the SCAP stress tests have provided valuable information to the public.¹⁰⁷

The authors note that:

We warn the Panel that our knowledge of the Fed's program is based largely on the same information possessed by the panel, consisting of two reports, the first (describing methodology) was issued on April 24, and the second (describing results) was issued on May 7. Beyond these reports, we were privy to a number of conference calls involving the Federal Reserve (twice) and the Treasury department (once).¹⁰⁸

The Appraisal begins by explaining that in evaluating any model of risk assessment... it is more constructive to use four criteria:

1. *Intuitiveness*: From a practical perspective, given the complexity of the problem and the limited time frame with which to accomplish it, does the risk model employed appear to make intuitive sense?
2. *Robustness*: Do the results continue to hold across alternative model and/or parametric specifications?
3. *Transparency*: Are both the structure of the risk model and the data inputs clear and transparent to outsiders? If the model is a hybrid of multiple risk models, how clear is the hybridization process?
4. *Replicability*: Is it possible for a third party to gain access to the same data, and to replicate the results within conventional standards of error?

The authors note that the first two of these criteria relate to internal design considerations,¹⁰⁹ while the third and fourth criteria, in contrast, bear on how well the Federal

¹⁰⁷ See Annex to Section One of this report, at 2, 5.

¹⁰⁸ *Id.* at 17.

¹⁰⁹ *Id.* at 18. "The multiple approaches to financial risk modeling, along with the special circumstances under which the SCAP was implemented make the first [criterion] extremely important. Due to the current high uncertainty in capital markets, and the attendant hazards of model risk, the second [criterion] is also relatively crucial."

Reserve Board’s approach might be evaluated by outsiders.¹¹⁰ The Appraisal notes a number of sound elements in the SCAP’s design. It states that:

- “the choice of a two year time horizon does not, *ipso facto*, give us cause for concern (though it may necessarily require updating on a going-forward basis)”;¹¹¹
- “using econometric models that relate loss rates to differing macroeconomic scenarios (baseline and more adverse) is a sensible way to characterize loss exposure”;¹¹²
- “assembl[ing] projections from multiple methodological approaches... helped to avoid some of the most extreme problems associated with model risk”;¹¹³
- “It [was] clearly sensible for the Fed to allow for tailoring of individual BHC’s loss rates”;¹¹⁴
- “the Fed’s approach in specifying and sizing the required SCAP capital buffer seems sensible, transparent, and replicable [and]... within the time and information constraints [in which] they operated, the 6%/4% sizing was, at the very least, a defensible first approximation.”¹¹⁵

However, the Appraisal also states that “the SCAP’s design and implementation do leave some open questions in our minds.”¹¹⁶ The Appraisal’s overriding concern is that, although the stress tests involve a mix of quantitative (modeling) and qualitative (judgments in application of modeling) elements, a lack of transparency in the way the models were applied (even illustratively) makes it impossible to replicate – and hence to evaluate – the stress tests in any

¹¹⁰ *Id.* (“The third [criterion] encapsulates what is, in a sense, a *minimal* condition on observability that need be met; that is, so long as one presumes the competence and good faith of Fed researchers, satisfying the *transparency* [criterion] is tantamount to understanding the material steps undertaken in the enterprise. The fourth criterion – *replicability* – is a more stringent condition than transparency, effectively requiring that an outsider be able to directly verify the Fed’s conclusions. It should be noted, however, that this criterion may be more difficult to satisfy for a program such as SCAP, due to confidentiality issues within the BHCs being studied. We believe, nevertheless, that the third and fourth [criteria] are material considerations, particularly given the high level of market uncertainty, the magnitude of resources at issue, and the failure of state-of-the-art models to capture the market’s risk in 2008.”)

¹¹¹ *Id.* at 19.

¹¹² *Id.* at 26.

¹¹³ *Id.* at 34.

¹¹⁴ *Id.* at 29.

¹¹⁵ *Id.* at 31.

¹¹⁶ *Id.* at 5.

detail. For example, say the authors, the Appraisal could only take a “broad-brush approach” to the SCAP, because:

- “The Fed evidently attempted to synthesize numerous alternative macro-economic models... with subjective judgments of experts across different domains”;¹¹⁷
- “The process by which the initial [loss models] became tailored to each BHC appeared analogously opaque.”¹¹⁸
- The “Fed’s stress test formulation (and particularly the derivation of the adverse case) is potentially subject to criticism as to transparency, its replicability, and its robustness” (for example, in its omission of interest rate, wage and price inflation, and exchange risk that “play a significant role in assessing not only prospective default risks within asset classes but potentially also asset valuations today”).¹¹⁹
- “[T]here is effectively no way for a third party to replicate (or even, evidently, selectively audit) the [loss projections]” used to conduct the stress tests.¹²⁰ The Appraisal continues: “On the basis of our interactions with them, we believe the Fed staff to be both professionally competent and acting in good faith. It may therefore be acceptable to take them at their word. Nevertheless, given the fact that the [loss ranges] constituted an important focal point for the SCAP stress tests, the description of the process did not permit us to pierce through their derivations at anything more than a general level.”¹²¹
- “[T]he significant interaction required between supervisors and the BHCs has the potential of undermining the objectivity of the stress tests... It may well be that the Fed’s efforts [to bolster the objectivity of the tests despite the necessary supervisor-BHC interaction] were wholly successful ... but we are not in a position to either confirm or reject this hypothesis. Indeed, when queried as to whether it would be possible to walk us through one or two examples of the tailoring process for specific (but anonymous) BHCs, Fed researchers reported that such an exercise was not practically feasible.”¹²²

¹¹⁷ *Id.* at 3.

¹¹⁸ *Id.* at 6.

¹¹⁹ *Id.* at 23. Federal Reserve Board staff has told a Panel staff member that interest rate assumptions were “built into” the macro-economic assumptions for the stress tests as well to the data banks provided to the supervisors, that currency exchange risk was also built into that data, and that inflation risk was now so low as to be difficult to factor in.

¹²⁰ *Id.* at 25.

¹²¹ *Id.* at 25-26.

¹²² *Id.* at 27-28.

- “To the extent we have a concern [with the Fed’s approach in specifying and sizing the required SCAP capital buffer] it likely is rooted in a more general concern with... the appropriateness of a 2-year time horizon for projecting required capital buffers.”¹²³ This issue might have been dealt with by:
 - Conducting a longer-term stress test (at least for long-maturing illiquid assets)
 - Quantifying the fraction of illiquid and highly risky assets with distant maturities the BHCs as a group, and each BHC separate, have; or
 - Revisiting the SCAP approach periodically to reassess risk profiles of these assets as they become more current.
- The SCAP does not explore the possibility that BHCs “may be able to use their own segmented corporate structure to compartmentalize (and thus externalize) risk, even if they have an adequate capital buffer in the aggregate.”¹²⁴

G. Next Steps

1. Capital-raising

The ten BHCs estimated to require a capital buffer were required to give the supervisors a Capital Plan by June 8, 2009, explaining how they will raise equity capital. Their options include: (1) selling stock to the markets or under the CAP;¹²⁵ (2) converting existing preferred stock (whether privately held or issued under the CPP); or (3) selling assets. Some of these options are preferable to others and result in higher quality capital. Conversions of preferred to common stock are the weakest option (as no new capital is added) and new equity offerings for cash are the strongest. Asset sales fall in between these options as they raise cash but diminish earnings capacity. The plan must include dates by which the BHC plans to take these actions, which must be completed by November 9, 2009. The plans are not specifically required to address plans to repay TARP funds. However, no bank can repay its TARP capital if this would

¹²³ *Id.* at 29. See also, Lucian Bebchuk, *Near-Sighted Stress Tests* (May 20, 2009) (online at www.forbes.com/2009/05/20/stress-tests-banking-opinions-contributors-maturity.html) (hereinafter “Near-Sighted Stress Tests”).

¹²⁴ *Id.* at 30.

¹²⁵ If there are future CAP transactions, the Panel will need to consider a valuation exercise similar to that in the February report.

cause its capital levels to be inconsistent with “supervisory expectations.”¹²⁶ It is unclear if these expectations will be the same as the capital levels demanded by SCAP.

The most direct way for a BHC to increase its capital base is to earn net income from its normal banking business and add that income to its capital accounts. Estimated PPNR for 2009 and 2010 (as adjusted by reference to performance in the first quarter of 2009) is already reflected in the SCAP calculation and therefore BHCs cannot “earn their way out” of the capital buffer requirements.¹²⁷

Next, a BHC can raise capital by selling assets, usually businesses or branches. For example, Citigroup recently announced that it expects to gain \$2.5 billion in tangible common equity through the sale of its Japanese securities business.¹²⁸ For its part, Bank of America sold nearly a third of its stake in China’s second largest bank.¹²⁹ However, as discussed below, any sale risks a transaction at a “fire sale” price because the buyer knows that the selling BHC must raise capital and is counting on the sale to do so.

A BHC can also raise funds through the sale of additional common stock, the approach most in line with the requirements of the supervisors following the stress tests. But the sale of common stock is not without its own issues. First, existing shareholders’ interests will be diluted by the new sale – that is, part of their investment will in effect be shared with the new shareholders, diluting their proportional ownership of the BHC and the value of their shares. Of course, that may be a completely justified result, since, without an infusion of billions of taxpayer dollars, the common stock of at least some of these institutions would likely have become worthless.¹³⁰ In addition, sale of a large block of shares to a single investor may shift control, or at least reconfigure the control, of the BHC in question.

¹²⁶ Board of Governors of the Federal Reserve System, *Federal Reserve Outlines Criteria It Will Use to Evaluate Applications to Redeem U.S. Treasury Capital from Participants in Supervisory Capital Assessment Program*. (June 1, 2009) (online at www.federalreserve.gov/newsevents/press/bcreg/2009bcreg.htm).

¹²⁷ To the extent that the BHCs’ revenues are strong, however, their ability to sell securities will of course be enhanced.

¹²⁸ Citigroup Inc., *Citi to Sell Nikko Cordial Securities to Sumitomo Mitsui Banking Corporation and to Forge Alliance with Sumitomo Mitsui Financial Group* (May 1, 2009) (online at www.citigroup.com/citi/press/2009/090501a.htm).

¹²⁹ Amy Or, *BofA Raises US\$7.3 Bln from CCB Share Sale to 4 Investors*, Wall Street Journal (May 13, 2009) (online at online.wsj.com/article/BT-CO-20090513-708215.html?mod=crnews).

¹³⁰ Since warrant holders, including the holders of stock options, are generally protected against dilution by the terms of the warrants, a paradoxical result might be that the executives who were in charge of the troubled institutions would incur far less loss (if stock values recovered) than ordinary common shareholders. Thus, where bank executives are compensated to any extent by the issuance of stock or stock options, they may have a conflict of interest when deciding whether common stock, rather than a sale of assets, should be part of their BHC’s capital plan.

Such sales of common stock may be made to investors in the open market or in a private offering, or the BHC may rely on the CAP and issue mandatory convertible preferred stock (which will be treated as tier 1 common) to Treasury.

The BHCs may also convert preferred stock into common stock, as Citibank is in the process of doing. This conversion may include existing preferred stock issued to private parties or the preferred stock issued to Treasury under the CPP. Since this involves moving Treasury's assets to a more risky class of securities, Treasury has stated that it expects such a conversion to be accompanied by new capital raises or exchanges of private capital securities into common equity.¹³¹

2. TARP Repayment

Many banks, including the BHCs involved in the stress tests, have indicated their desire to repay funds received under TARP programs, and several smaller banks have already done so.¹³² The Panel's next report will discuss certain issues arising from the TARP repayment process in detail, but it is worth discussing the interplay of the SCAP with TARP repayment.

BHCs that do not need to raise additional equity capital may be permitted to repay TARP funds. The Federal Reserve Board has designed criteria that it will use to determine whether to allow a BHC to repay TARP funds.¹³³ BHC applications for repayment must be first approved by the primary federal supervisor before being sent to Treasury. A BHC that wishes to repay funds must show that it can issue debt without relying on TLGP. It must also show that it has access to the public equity markets. Additional criteria that the Federal Reserve Board will consider include the bank's ability to continue to act as an intermediary for lending to families and businesses, its ability to maintain appropriate capital levels, its ability to "continue to serve as a source of financial and managerial strength and support to its subsidiary bank(s) after the redemption," and its ability to meet "funding requirements and obligations to counterparties" while again lessening its reliance on government funds and guarantees.¹³⁴

Since the announcement that BHCs will need to use new, non-guaranteed capital to repay TARP funds, several BHCs have issued non-guaranteed debt. However, these BHCs had to pay

¹³¹ U.S. Department of the Treasury, *FAQs on Capital Purchase Program Repayment and Capital Assistance Program*, at 3 (online at www.financialstability.gov/docs/FAQ_CPP-CAP.pdf) (accessed June 8, 2009) (hereinafter "CPP FAQs").

¹³² As of May 27, 20 banks have repaid the TARP funds they received. Goldman Sachs, Morgan Stanley, BB&T, and JPMorgan, among others, have announced their intentions to repay TARP funds as soon as possible. Brian Wingfield, *Banks Ready To Throw in the TARP*, *Forbes* (June 1, 2009) (online at www.forbes.com/2009/06/01/banking-tarp-fed-business-beltway-tarp.html).

¹³³ Board of Governors of the Federal Reserve System, *Press Release* (June 1, 2009) (online at www.federalreserve.gov/newsevents/press/bcreg/20090601b.htm).

¹³⁴ *Id.*

relatively high interest rates on this debt.¹³⁵ In addition to repaying the preferred stock issued under the CPP, BHCs will have to repurchase the warrants that were issued at the same time.¹³⁶ The price at which those warrants will be repaid has already become a source of controversy with respect to non-stress test banks.¹³⁷ This issue is one which the Panel will be paying close attention to in the near future.¹³⁸

H. Issues

1. The context and purpose of the stress tests

To date, \$245 billion has been injected into the banking system and an additional \$69.8 billion into the American International Group (AIG). After raising \$75 billion more in public or private funds, the nations' largest banking institutions will be well capitalized enough to withstand further economic difficulties, at least during 2009 and 2010. It has to be noted that the \$75 billion dollar figure rests on existing taxpayer support of the banking system, and the SCAP must be understood in this context. The stress tests' stated purpose was to ensure that the BHCs were well capitalized enough to withstand continued economic bad news and to continue lending to qualified borrowers, but the subtext of the tests was to calm the markets. The markets have been calmed, but it must be understood that the underlying regulatory and legal systems that permitted the financial crisis to occur have not changed, and the current financial position of the BHCs relies on massive amounts of government assistance, the impact of which has not been clearly identified in the supervisors' assessment of the BHCs' current and future financial viability.

¹³⁵ Since SCAP, the BHCs have raised \$35 billion in stock and \$13 billion in debt. The BHCs' notes ranged from 271 basis points over U.S. Treasuries to 562 basis points over U.S. Treasuries. Compare the spread on Citigroup's recent non-guaranteed debt offering, 8.765 percent ten-year notes (562.5 basis points over U.S. Treasuries) with a Citigroup debt offering prior to the financial crisis, 5.773 percent ten-year notes (130 basis points over U.S. Treasuries). Citigroup Inc., Form FWP (May 15, 2009) (online at www.sec.gov/Archives/edgar/data/831001/000095012309008985/y77311fwfwp.htm); Citigroup Inc., Form FWP (Sept. 6, 2007) (online at www.sec.gov/Archives/edgar/data/831001/000095012307012318/y39368afwp.htm). See Figure 5 for other recent BHC debt issuances.

¹³⁶ See, e.g., U.S. Department of the Treasury, *Securities Purchase Agreement Standard Terms*, at 42 (Oct. 26, 2008) (online at www.financialstability.gov/docs/agreements/BOA_10262008.pdf) (The agreement contains terms setting up a direct repurchase by Treasury of all bank securities based on a negotiated fair market value. These terms cover the repurchase of warrants and do not specifically provide for auctions to third parties as a method of pricing the repurchase.).

¹³⁷ See, e.g., Old National Bancorp, Form 8-K (May 11, 2009) (online at www1.snl.com/Cache/c7780441.htm) (first publicly-traded company to finalize repurchase of its warrants from Treasury); Linus Wilson, *Valuing the First Negotiated Repurchase of the TARP Warrants*, Social Science Research Network (May 23, 2009) (online at papers.ssrn.com/sol3/papers.cfm?abstract_id=1404069) (arguing that, based on economic models, that Treasury did not receive fair market value for the Old National Bank warrants).

¹³⁸ The effect on the projected capital buffers of potential repayment of CPP infusions was apparently not taken into account in computing whether an institution would require a capital buffer or the size of that buffer.

The supervisors' releases indicate that infusions of funds under the CAP may be necessary to make up any failure by the ten institutions to raise the necessary capital in the private market. But there are other forms of government assistance whose impact on the tests was not made clear.

The loan guarantees provided by Treasury and the FDIC and the availability of funds through the various liquidity programs established by the Federal Reserve Board during the early days of the crisis would appear to lower substantially the cost of funds for the 19 BHCs, presumably increasing their net income during the testing period. This raises the question of how solid those earnings would be if the government programs were removed or if external economic conditions caused the Federal Reserve Board to tighten the money supply even modestly.

2. Issues relating to the design of the stress tests

The stress tests are conducted within the bounds of the current supervisory context and do not represent a new measure or test of risk. They start with the amounts and values projected by the tested institutions themselves. The extent to which the supervisors delved deeply into the BHC-provided data to verify its accuracy is unclear. This is not to question the good faith of either the supervisors or the tested institutions. But the experience of the last two years cannot but cause some to question the adequacy of both the risk management practices of many of the nation's largest financial institutions and of the scope of the supervisory regime to which those institutions were subjected. As one serious example, the stress test reports assert that the 19 BHCs tested are all well capitalized, but they do not discuss or rebut claims by a number of respected economists that at least some of the same banks are in fact insolvent.¹³⁹

Reliance on the present system may well be understandable in view of the short time frame within which the tests had to be done, but the time pressures could have been mitigated by a rolling set of tests adjusted for operating results and changes in economic assumptions. Failure to do so may be seen as limiting the usefulness of the tests.

A number of issues with the modeling techniques used in the stress tests were noted by Professors Talley and Walden in their report. These include a lack of sensitivity to the ownership structure of BHCs, the exclusion of a number of micro- and macroeconomic factors (such as interest rates and inflation), and the use of the relatively short time horizon of two years. In their opinion, these factors might have affected the results of the stress tests.¹⁴⁰

¹³⁹ Nouriel Roubini, *According to Press Reports the IMF May Allegedly be Increasing Its Estimate of Global Bank Losses to \$4 trillion, a Figure Consistent with Estimates by a Variety of Independent Bank Analysts*, RGE Monitor (Apr 10, 2009) (online at www.rgemonitor.com/roubini-monitor/256364/according_to_press_reports_the_imf_may_allegedly_be_increasing_its_estimate_of_global_bank_losses_to_4_trillion_a_figure_consistent_with_estimates_by_a_variety_of_independent_bank_analysts).

¹⁴⁰ See Annex to Section One of this report, at 23, 33, 34.

When the two alternative economic scenarios were announced, commentators immediately criticized the scenarios for insufficient “harshness.”¹⁴¹ They stated that the baseline scenario especially was too optimistic in light of an economy that at that time was deteriorating rapidly and beginning to follow the path of the more adverse scenario.¹⁴² Nouriel Roubini, for example, has suggested that policymakers “used assumptions for the macro variables in 2009 and 2010 [for] both the baseline and more adverse scenarios that are so optimistic that actual data for 2009 are already worse than the adverse scenario.”¹⁴³ He has challenged the GDP, unemployment, and home prices assumptions in both the baseline and adverse scenarios.¹⁴⁴ The OECD released baseline real GDP and unemployment projections that were equal to the SCAP’s more adverse scenario assumptions.¹⁴⁵ On the other hand, some comparisons suggest that the assumptions are appropriate. In their review of the stress test methodology, Professors Talley and Walden state that, “[t]he criteria used for assessing risk, and the assumptions [the Federal Reserve Board] made in calibrating the more adverse case have typically erred on the side of caution.”¹⁴⁶ In the end, it is not clear that we know whether the economic assumptions were harsh enough or what the BHCs’ capital needs would be if the economy continued along the path it appeared to be following in February.

The ability to extrapolate the data by those wishing to modify the model to use their own macroeconomic assumptions is somewhat limited. Treasury officials informed the staff of the Panel that sufficient data would be available such that private analysts would be able to build on the results disclosed, substituting their own assumptions with respect to the direction of the economy, and working out for themselves what the capital needs of the BHCs would be under even more adverse conditions. The publicly announced results of the SCAP focused only on the more adverse scenario. The model may be replicated,¹⁴⁷ but it is not clear that private analysts

¹⁴¹ See generally Douglas J. Elliott, *Bank Stress Test Results*, Brookings (May 18, 2009) (online at www.brookings.edu/opinions/2009/0512_stress_test_results_elliott.aspx); Paul Krugman, *Stressing the Positive*, New York Times (May 7, 2008) (online at www.nytimes.com/2009/05/08/opinion/08krugman.html) (“The regulators didn’t have the resources to make a really careful assessment of the banks’ assets, and in any case they allowed the banks to bargain over what the results would say. A rigorous audit it wasn’t.”); Nouriel Roubini, *Ten Reasons Why the Stress Tests Are “Schmess” Tests and Why the Current Muddle-Through Approach to the Banking Crisis May Not Succeed*, RGE Monitor (May 8, 2009) (online at www.rgemonitor.com/roubini-monitor/256694/ten_reasons_why_the_stress_tests_are_schmess_tests_and_why_the_current_muddle-through_approach_to_the_banking_crisis_may_not_succeed) (hereinafter “Roubini Article”); Edmund L. Andrews and Eric Dash, *Government Offers Details of Bank Stress Test*, New York Times (Feb. 25, 2009) (online at www.nytimes.com/2009/02/26/business/economy/26banks.html) (hereinafter “Andrews and Dash Article”).

¹⁴² Unemployment rose to 9.4 percent in April 2009. Employment Situation, *supra* note 60. GDP fell 5.9 percent in the first quarter of 2009 from the previous quarter. Gross Domestic Product, *supra* note 59.

¹⁴³ Roubini Article, *supra* note 141; Andrews and Dash Article, *supra* note 141.

¹⁴⁴ *Id.*

¹⁴⁵ Organization for Economic Cooperation and Development, *OECD Economic Outlook Interim Report*, at 68 (Mar. 2009) (online at www.oecd.org/dataoecd/18/1/42443150.pdf).

¹⁴⁶ See Annex to Section One of this report.

¹⁴⁷ Stress Test Consequences, *supra* note 35.

could use these data to build their own models or to test the strength of the supervisors' modeling. Without the ability to replicate and re-test, the robustness of the model remains in question.

Professor Lucian Bebchuk, among others, has argued that the failure to take into account mark-to-market values for "toxic assets," necessarily undervalues bank liabilities to the extent that those liabilities result in losses after 2010.¹⁴⁸ This point is also echoed in the report from Professors Talley and Walden.¹⁴⁹ Professor Bebchuk notes that the total estimate of potential bank losses published by the supervisors is as much as \$600 billion and that no attempt has been made "to come up with a precise estimate of the extent to which, at the end of 2010, the economic value of the troubled assets will fall below [their] face value."¹⁵⁰ Bebchuk acknowledges the Federal Reserve Board's recognition of this problem, but he responds that:

To get a full picture of the banks' situation, bank supervisors should estimate also the decline in the economic value of banks' positions with longer maturities. Only then will the stress tests be able to deliver reliable figures for the additional capital necessary to make the banking sector healthy and vigorous.¹⁵¹

This approach suggests a useful insight about what the stress tests do and do not do. Their purpose is to compute the amounts necessary, within the framework of existing supervisory and risk management techniques, to keep BHCs well capitalized for two years if a specified set of economic assumptions is borne out. What they do not do is to compute the point at which BHCs will be stressed beyond the breaking point – even under the supervisors' view that BHCs are now well capitalized – based on their current balance sheets. For example, banks hold \$1.068 trillion in core commercial real estate (CRE) loans.¹⁵² A recent study commissioned by Deutsche Bank suggests that the majority of losses on CRE loans will not affect bank balance sheets for several more years when poorly underwritten CRE loans made in the easy credit years (e.g., 2005-2007) will reach maturity and will in many instances fail to qualify for refinancing:

¹⁴⁸ Near-Sighted Stress Tests, *supra* note 123.

¹⁴⁹ See Annex to Section One of this report.

¹⁵⁰ Near-Sighted Stress Tests, *supra* note 123.

¹⁵¹ Near-Sighted Stress Tests, *supra* note 123.

¹⁵² Core CRE does not include construction, multi-family, or farm loans.

Figure 3: Estimate of Core CRE Loans Not Qualifying for Refinance, 2009-18¹⁵³

Maturity Year	Maturing Loans		Loans Not Qualifying for Refinance			
	#	Balance (dollars in billions)	#	Balance (dollars in billions)	%(#)	%(\$)
2009	2,556	18.1	923	8.0	36.1	44.0
2010	3,053	33.0	1,375	21.1	45.0	63.9
2011	4,443	42.6	2,510	29.0	56.5	68.2
2012	4,340	56.3	2,675	43.7	61.6	77.6
2013	5,051	39.1	2,635	25.2	52.2	64.5
2014	4,898	47.8	2,986	33.2	61.0	69.6
2015	8,807	89.0	5,587	60.9	63.4	68.5
2016	10,331	123.9	6,295	88.8	60.9	71.7
2017	9,598	127.4	5,827	94.7	60.7	74.3
2018	895	4.2	108	1.4	12.1	33.7
Total	53,972	581,542,418,727	30,921	406,163,154,040	57.3	69.8

As the report explains, the high percentage of loans not qualifying for refinancing, and hence in danger of default without significant injections of new equity, is attributable to the combined effects of stricter underwriting standards, steep declines in property values, and reduced income streams to finance the loans because of lower rents and increased vacancies.¹⁵⁴ The findings are based on quantitative data for commercial mortgage-backed securities (CMBS), which constitute 25 percent of the core CRE market. While the authors of the report state that there was insufficient data to perform a detailed study in the larger non-CMBS sector, the authors say they expect a similar if not higher level of maturity defaults on non-securitized CRE bank portfolio loans because portfolio loans typically have shorter maturities (which would not allow sufficient time for property values to recover from their present depressed levels) and higher risk profiles than CMBS.¹⁵⁵ As another hearing witness explained, however, it is possible that a higher proportion of maturity defaults can be avoided in the non-CMBS sector because banks face fewer legal and practical obstacles in attempting workouts with their borrowers.¹⁵⁶ The extent to which the stress tests, which were never intended to look more than two or three

¹⁵³ This data is used with permission of Deutsche Bank and was originally compiled in a different form for a Deutsche Bank special report. See Richard Parkus and Jing An, *The Future Refinancing Crisis in Commercial Real Estate*, at 3-4 (Apr. 23, 2009) (online at cop.senate.gov/documents/report-042309-parkus.pdf). This report was also submitted as written testimony for the Panel’s May 28, 2009 hearing on *Impact of Financial Recovery Efforts on Corporate and Commercial Real Estate Lending* in New York.

¹⁵⁴ *Id.* at 11.

¹⁵⁵ See Congressional Oversight Panel, Oral Testimony of Richard Parkus, *Hearing on Corporate and Commercial Real Estate Lending* (May 28, 2009) (hereinafter “Oral Testimony of Richard Parkus”).

¹⁵⁶ See Congressional Oversight Panel, Oral Testimony of Kevin Pearson, *Hearing on Corporate and Commercial Real Estate Lending* (May 28, 2009).

years in the future, fully grapple with the prospect of massive future CRE loan defaults is uncertain.¹⁵⁷

Several of the institutions tested were not traditional banking enterprises, and yet, by choosing to become BHCs, have become subject to the higher capital requirements of banks and the assumptions and analysis of risk that underlie those requirements. Is this appropriate, or should certain BHCs be subjected to alternative measures of regulatory capital or be assessed for risk using different tests? One issue (discussed above in “Specific Limitations of the Stress Tests”) is that the accuracy of the input (the data on which the tests were performed) depended on prior supervisory examinations; in the present climate the nature of those examinations has itself been questioned, and the stress testing may ultimately improve the examinations themselves. The supervisors noted that, in some cases, data initially presented were inaccurate or resulted in double counting and that data was corrected and resubmitted. As noted above, no full re-examination of the tested BHCs was possible in the time period in which the test occurred, but that fact necessarily places some limitation on the tests’ results.

3. Issues Relating to the Process and Implementation

The primary issue identified by Professors Talley and Walden with the stress test process is the program’s lack of “transparency to outsiders and replicability of its results.” They state that it would be “virtually impossible for the third parties to replicate the SCAP’s conclusions, or even major sub-components of it.” As a result, while they express the utmost trust in the Federal Reserve Board’s assessment, they are ultimately unable to confirm any of its conclusions.¹⁵⁸

The supervisors informed the staff of the Panel that there was no “negotiation” of the results of the SCAP and that the BHCs were merely informed of the supervisors’ estimates, with adjustments arising only from the specified first quarter adjustments and clear errors and omissions. The range of the adjustments permitted, however, and the lack of a full explanation of those adjustments necessarily raise questions in this regard. For example, it is unclear how large an effect accounting changes had on the BHCs’ first quarter earnings,¹⁵⁹ and how much of the resulting earnings improvements flowed through to the adjustments that were made with

¹⁵⁷ At the Panel’s hearing in New York on May 28, 2009, there was disagreement among Panel witnesses as to whether the stress tests’ use of a three-year analysis was sufficient to account for the future strains on bank balance sheets attributable to a balloon in expected maturity defaults for CRE loans. *See* Oral Testimony of Richard Parkus, *supra* note 155 (“I do, however, understand the timeframe for the stress test was, I believe, three years. And that, if that is the case, that would, in my view, be fairly short, as many of the mortgages we are looking at do not mature for quite a while.”); Congressional Oversight Panel, Oral Testimony of Federal Reserve Bank of New York Vice President of Bank Supervision Til Schuermann, *Hearing on Corporate and Commercial Real Estate Lending* (May 28, 2009) (“For sure, there are going to be some of the losses that will occur after this horizon, but I think I feel comfortable that a sizable portion of the commercial real estate exposure was, in fact, taken into account in the stress test.”).

¹⁵⁸ *See* Annex to Section One of this report, at 34

¹⁵⁹ For further discussion of the impact of the recent accounting changes, *see supra* note 80.

respect to the capital buffer by reason of earnings improvements. This leads to questions regarding whether the process could have been better handled and whether there should have been more transparency and clearer communication as to what exactly was communicated to the BHCs, which BHCs were affected, and which numbers were being adjusted.

Securities trading portfolios were specifically “stressed” only for the five BHCs that were the largest traders (this is, for those with trading accounts of \$100 billion or more). That process showed very large estimated losses in the securities trading portfolios of the five BHCs for which the exercise was conducted. Given the size of those losses, the way the stress tests take into account estimated securities trading losses of the BHCs with trading accounts of less than \$100 billion is unclear, and it is thus difficult to tell how or if those losses have been appropriately accounted for.

4. The Impact of Q1 Adjustments

Adjustments were presented on a net basis, and thus it is not possible to see how much of the \$110 billion reduction in capital buffer produced by the first quarter adjustments was due to sales of assets and conversions of preferred securities and other capital actions and how much was due to “strong PPNR.”¹⁶⁰ This approach undercuts the transparency of the process. It is also important because many commentators do not believe that the strong earnings of the first quarter are likely to be repeated. Knowing how much of the first quarter adjustments were due to earnings would assist independent analysts in running their own versions of the stress tests.

5. Presentation of Data

While 12 categories of assets were measured, only eight categories of assets were reported out in the SCAP results, and some assets were grouped together. For example, estimated losses on “First Lien Mortgages” are reported in aggregate, while first lien mortgages were divided into prime, Alt-A, and sub-prime for the purposes of estimation. Estimated losses in the various categories of securities are also aggregated together. It is possible that significant information is obscured by the aggregation of data, and since the public knew that 12 categories of assets were being measured, some expectation of obtaining this information had been raised. This aggregation prevented the public from fully replicating the tests or from comparing the results of the testing on the 19 banks, or other banks, with different variables.¹⁶¹ Neither Treasury nor the supervisors have explained why this information was not made available.

¹⁶⁰ SCAP Results, *supra* note 24.

¹⁶¹ The Wall Street Journal and the Financial Times both applied the SCAP methodology to small- and mid-size banks. However, they could not exactly replicate the testing. Financial Times Study, *supra* note 101; Maurice Tamman and David Enrich, *Local Banks Face Big Losses*, Wall Street Journal (May 19, 2009) (online at online.wsj.com/article/SB124269114847832587.html).

Because results are presented on the “more adverse” scenario alone, the ability to extrapolate results from a single set of data is impaired. Even though the “baseline” scenario was likely too optimistic, publishing the results from that scenario would have improved transparency and enabled private analysts, who can play an important role in the way information is used, to present their own predictions and analyses.

6. Should Stress Testing Be Repeated?

As discussed above, Treasury conducted a one-time stress test on the 19 largest U.S. BHCs under the CAP. While Treasury intended the CAP to ensure that BHCs have adequate capital cushions to weather worse-than-anticipated economic conditions in the short-term, it is uncertain whether Treasury will conduct any future stress testing during or after the current crisis. It is uncertain whether this expanded form of stress testing will or should become a permanent fixture of the financial regulatory system. While Treasury has created capital cushion requirements through year-end 2010 under the CAP, it has not required fundamental or permanent changes in capital adequacy requirements or general regulatory processes.

There are advantages and disadvantages of more permanent use of stress testing. On one hand, regular stress testing of large banks may enable regulators to: (1) limit the sorts of risk-taking that contributed to the current crisis; and (2) counterbalance the heightened moral hazard that the government, through TARP, has created for too-large-to-fail institutions.¹⁶² Moreover, the one-time nature of the stress tests is difficult to understand in light of how rapidly, and sometimes radically, the fortunes of banking institutions have changed over the past two years. These rapid changes led to some institutions requiring multiple capital infusions. For example, both Citigroup and Bank of America, after participating in the initial round of CPP investments, received emergency capital infusions and asset guarantees which were eventually allocated to the TIP program.¹⁶³ Given the questions raised about the economic assumptions incorporated into the baseline and adverse scenarios of the stress tests and about the continuing uncertainty around the value and terms for write-down of many bank assets, a strong case can be made for six-month repetitions of the stress tests for the next few years.

While comprehensive internal stress testing existed at banks here and abroad even before the onset of the current crisis,¹⁶⁴ there is a justified skepticism about the sufficiency of bank risk

¹⁶² See Sebastian Mallaby, *Stress Tests Forever*, Washington Post (May 9, 2009) (online at www.washingtonpost.com/wp-dyn/content/article/2009/05/07/AR2009050703538.html).

¹⁶³ For more information, see Panel’s January and February reports. Congressional Oversight Panel, *Accountability for the Troubled Asset Relief Program* (Jan. 9, 2009) (online at cop.senate.gov/reports/library/report-010909-cop.cfm); Congressional Oversight Panel, *Valuing Treasury’s Acquisitions* (Feb. 6, 2009) (online at cop.senate.gov/reports/library/report-020609-cop.cfm).

¹⁶⁴ See Bank for International Settlements (BIS), *Stress Testing at Major Financial Institutions: Survey Results and Practice*, at 2 (Jan. 2005) (online at www.bis.org/publ/cgfs24.pdf) (noting that stress testing is “becoming an integral part of the risk management frameworks of banks and securities firms” and that it “benefits

management programs. In particular, internal testing lacks public transparency and accountability, which are especially important in the case of too-big-to-fail institutions because of the government's recent interventions. Additionally, bank executives can continue to take excessive risks in the future – as they did prior to the current crisis – regardless of whether or how they engage in internal stress testing. Transparency, which the Federal Reserve Board has stated is justified to restore confidence in the banking system, would also be missing if stress testing were conducted within the context of the normal supervisory process where results are not made public, but stress tests as part of regular examinations still have merit in and of themselves.

Regular government stress testing may lose support as time passes because of debates over: (1) methodologies; (2) government capacity and resources; and (3) the perception of negotiation between banks and their regulators.¹⁶⁵

7. Should Stress Testing Be Expanded to a Wider Range of Banks?

Since the passage of EESA in October 2008, Treasury has devoted a great deal of attention and resources to so-called too-large-to-fail institutions. The health of these institutions has considerable bearing on the financial system because of the enormous value of their combined assets and the breadth of their transactions involving other institutions and private citizens. Moreover, while these institutions have complex structures and, in some cases, branches and business ventures across the globe, efforts to stabilize too-big-to-fail institutions may require fewer human resources overall than efforts to conduct a similar exercise for a far larger number of institutions ranging in size from just under \$100 billion in assets to the comparatively very small capitalization of some community banks. Moreover, the events of the financial crisis necessarily caused Treasury and the Federal Reserve Board to devote particularly heavy focus to large institutions.

Nonetheless, Treasury has provided capital infusions under the TARP to a wider range of institutions over the time since the passage of EESA. By focusing on small institutions in addition to large ones, Treasury has sought to: (1) minimize line-drawing problems inherent in providing capital infusions to only the largest institutions; (2) expand the geographic reach of its efforts; (3) increase the overall breadth of its stabilizing influences; and (4) respond to concerns among taxpayers that TARP targeted only Wall Street, not Main Street.

Despite Treasury's overall strategy to include banks of all sizes in its stabilization programs, Treasury and the Federal Reserve Board chose not to include even a sample of smaller

from its flexibility, comprehensibility and the onus that it puts on management to discuss the risks that a firm is currently running.”).

¹⁶⁵ Stress testing under the CAP raised considerable concerns among observers. *See, e.g.*, discussion earlier in this report, *supra* note 141.

banks in stress testing (even though those banks are eligible for infusions under the CAP).¹⁶⁶ BHCs not included in the stress tests are responsible for one-third of the assets and close to half of the loans in the US banking system.¹⁶⁷ While the federal government's capacity may be strained by conducting stress tests on as many institutions as it has given capital infusions, such an approach could: (1) have the same general benefits as other efforts toward smaller banks, as discussed in the preceding paragraph; and (2) expand the reach and potential benefits of the stress tests generally.

With the first round of stress testing complete, Treasury should explain whether it intends to conduct stress tests on additional institutions in the future. If it does not intend to do so, Treasury should explain more fully why it chose to make capital infusions available to smaller institutions under the CPP, CAP, and other programs but not to include those institutions in stress testing, and therefore not require the same additional capital buffer of medium and smaller institutions.

8. Issues regarding Capital-Raising and Related Issues

The BHCs needing to establish an additional regulatory capital buffer must present a plan to their supervisors by June 8 and complete the elements of that plan by November 9. This may have the impact of limiting their bargaining power with respect to asset dispositions as potential counterparties know that the seller has to raise funds in a "fire sale." For example, Bank of America's sale of part of its holding in China Construction Bank was effected at a high 14 percent discount to CCB's market price. The supervisors may need to exercise flexibility in oversight of the BHCs' capital plans in order to make sure they are permitted to get the best price possible in the sales of assets and their own securities.

It is unclear what the impact of the stress tests will be on the PPIP program.¹⁶⁸ To the extent the stress test may have been built on unrealistic values for toxic assets, they will have created a disincentive to sell those assets at market prices, decreasing the likelihood of PPIP achieving its stated goals.¹⁶⁹ On the other hand, to the extent the stress tests have accurately revealed that some banks are healthy, they may be more likely to sell toxic assets to the PPIP program at realistic prices. If PPIP ends up setting inflated prices for toxic assets, it is harder to assess what effect the stress tests will have on PPIP.

¹⁶⁶ Financial Stability Plan Fact Sheet, *supra* note 26.

¹⁶⁷ SCAP Design Report, *supra* note 32, at 1.

¹⁶⁸ U.S. Department of Treasury, *White Paper: Public Private Investment Program* (Mar. 23, 2009) (online at www.treas.gov/press/releases/reports/ppip_whitepaper_032309.pdf). PPIP targets so-called "toxic assets" – the troubled loans and securities on banks' balance sheets. The immediate goal is to use a combination of private and public capital to buy "toxic assets." The intended result is to improve liquidity and promote bank lending.

¹⁶⁹ *U.S. Banks Have \$168 Billion Reason to Avoid PPIP*, Bloomberg (May 29, 2009) (online at www.bloomberg.com/apps/news?pid=20601208&sid=aa5Joz86_K6w&refer=finance).

The SCAP did not take into account the possibility of repayment of TARP funds. Only banks that do not need CAP funds will be permitted to repay CPP funds,¹⁷⁰ and they will only be permitted to do so once they have proved they can issue debt securities without a government guarantee and with the approval of their supervisors. However, repayment will necessarily have an impact on the capital of BHCs that repay TARP funds, and it might be argued that more attention should be paid to the danger of driving down capital after so much effort has been expended in shoring it up.

9. Issues Relating to the Banks Not Tested

The selection of the 19 largest BHCs, and not others, for the stress tests may distort the BHC marketplace in a few ways. First, by verifying that these 19 BHCs are healthy, the stress tests may provide them with a competitive advantage against smaller banks whose viability has not been confirmed. Second, the market might interpret the selection of these 19 largest BHCs as an indication that the supervisors consider them “too big to fail.” Both effects could lead to market participants favoring the tested BHCs against smaller competitors, distorting the marketplace.

I. Recommendations

- If economic conditions continue to worsen, raising the possibility that the “more adverse” scenario may be met or exceeded, the stress tests of the 19 BHCs should be repeated under the more difficult economic assumptions, looking forward at least two years.¹⁷¹ It should be noted that as of June 5, 2009, the unemployment rate for May had climbed to 9.4 percent¹⁷² and the average for the first five months of 2009 had reached 8.5 percent, compared with the assumed 2009 average of 8.9 percent under the more adverse scenario. We recommend that Treasury publicly track the status of its stress test macro-economic assumptions (unemployment, GDP, and housing prices) and repeat the stress test if the adverse scenario assumptions have been exceeded.
- Stress testing should be a regular feature of the 19 BHC’s examination cycle so long as an appreciable amount of toxic assets remain on their books, economic conditions do not substantially improve, or both. Public disclosure of the main results of such tests should continue to be a part of this process. Between supervisory stress tests, the BHCs should be required to run the stress tests themselves, according to

¹⁷⁰ CPP FAQs, *supra* note 131.

¹⁷¹ Additional stress tests that consider more alternatives – longer periods of time, more adverse conditions – would permit experts to evaluate the robustness of the tests and, if the results remain strong, to develop more confidence in the strength of the financial institutions tested.

¹⁷² Employment Situation, *supra* note 60.

supervisory guidance, and to submit the results as part of their ongoing supervisory examinations. Additionally, regulators should use stress tests on an ad hoc basis for all banks or BHCs where circumstances, including the bank's business mix, dictate.

- More information should be released with respect to the results of the stress tests. More granular information on estimated losses by sub-categories (e.g., the 12 loan categories that were administered versus the eight that were released) should be disclosed. The components of the first quarter adjustments should be disclosed, showing more clearly the impact of capital actions and revenue. Additional information will improve transparency of the process and increase confidence in the robustness of the tests.
- The results of the stress tests under the “baseline” economic scenario should be released or Treasury should explain why they were not released.
- The CPP repayment process should be more transparent, and information should be available to the public with respect to eligibility for repayment, the approval process, and the process for valuation and repurchase of warrants. Treasury should also make clear how it proposes to use repaid TARP funds. The relationship of the SCAP results to CPP repurchase must be completely transparent.
- Capital weaknesses must be addressed. At the same time, supervisors should be aware of the business needs of the BHCs. The supervisors should be encouraged to exercise discretion and flexibility in oversight of the capital plans of the BHCs required to raise a SCAP buffer. In particular, supervisors should be sensitive to the need of BHCs to be able to time capital-raising and asset dispositions in response to market conditions and not to be forced into uneconomic transactions in order to meet inflexible timetables. This discretion, however, should not be used as an excuse to avoid the pressing need to address capital weaknesses.

J. Conclusions

The three-month stress testing of the nation's largest BHCs was an unprecedented cross-supervisor effort, conducted in the midst of a financial crisis and deteriorating national and international economic condition; the effort involved on the part of the more than 150 experts involved is highly commendable. It is also extremely encouraging that the Federal Reserve Board has been willing to make public information involving the tests on an almost unprecedented (although unfortunately incomplete) scale.

The tests must be placed in context. They were conducted solely within the present supervisory context and are based on the principle that the supervisors can require capital in excess of the regulatory baseline when either bank or economic conditions dictate. They are not a thorough re-examination of the banks involved (although they are based on the results of prior

examinations), and they rely on a combination of bank data, modeling based on particular economic assumptions, and qualitative judgments of the experienced examiners involved, many of whose conclusions have not been made public.

Independent experts asked by the Panel to review the stress tests found the economic modeling used to conduct them to be generally soundly conceived and conservative, based on the limited information available to those experts. And the addition of capital to ten of the tested BHCs is certainly a good step forward. Moreover, the stress-testing regimen can be valuable if it is firmly instituted by the supervisors themselves for future periods and is repeated by the supervisors if bank or economic conditions worsen to a greater degree than assumed in the stress test modeling.

All the same, the stress tests should not be taken for more than they are. As indicated above, they were conducted within the present supervisory context only, and they are a temporary two-year projection of a one-time capital buffer that need not be rebuilt. They do not model BHC performance under “worst case” scenarios, and as a result they do not project the capital necessary to prevent banks from being stressed to near the breaking point. Most important, for some observers, they do not address the question whether the values shown on bank balance sheets for certain classes of assets are too high; by restricting themselves to a two-year time frame, their conclusions thus do not take into account the possibility that the asset values assumed (particularly for so-called toxic assets) may undervalue bank liabilities to the extent that those liabilities result in losses after 2010.

The short-term effect of the stress tests was positive, and the financial markets have calmed to some extent. The Panel concludes that it would be as much a mistake to dismiss the stress tests as it would be to assign them greater value than they merit or in fact that the supervisors claim for them. The fact that the holding companies have added certain amounts of capital on certain assumptions does not mean that the financial crisis is over or that the holding companies are now free from the risk of the sort of crisis-laden conditions many found themselves experiencing during 2008 and early 2009. While no one should gainsay the potentially positive results of the tests, it would be equally unwise to think that those results reflect a diagnosis of all of the potential weaknesses or create a necessarily sufficient buffer against future reverses for the banking system.

K. Tables

Figure 4: BHCs Subject to the Stress Test

Name of BHC	Primary Location	Total BHC Assets¹⁷³ (as of 3/31/2009) (dollars in billions)	TARP Capital Injections to BHC¹⁷⁴ (to date) (dollars in billions)	Other Significant Entities in BHC / Major Recent Acquisitions
Bank of American Corporation	Charlotte, NC	2,323.0	45.0	Merrill Lynch Countrywide
JPMorgan Chase & Co.	New York, NY	2,079.0	25.0	Bear Stearns Washington Mutual
Citigroup, Inc.	New York, NY	1,823.0	45.0	
Wells Fargo & Company	San Francisco, CA	1,286.0	25.0	Wachovia
The Goldman Sachs Group, Inc.	New York, NY	926.0	10.0	
Morgan Stanley	New York, NY	626.0	10.0	
MetLife, Inc.	New York, NY	491.0	0.0	
PNC Financial Services Group, Inc.	Pittsburgh, PA	286.0	7.6	National City
U.S. Bancorp	Minneapolis, MN	264.0	6.6	
The Bank of New York Mellon	New York, NY	204.0	3.0	

¹⁷³ National Information Center, *Top 50 Bank Holding Companies Summary Page* (online at www.ffiec.gov/nicpubweb/nicweb/Top50Form.aspx) (accessed June 5, 2009). This web site compiles data on total BHC assets based on BHCs' quarterly Consolidated Financial Statements (FR Y-9C) and ranks BHCs by total assets on a quarterly basis. The data used in this chart comes from the most recent financial statements, which include information through March 31, 2009. One bank that qualified for the stress tests because it held over \$100 billion in total assets as of December 31, 2009 – KeyCorp – no longer holds assets exceeding \$100 billion. GMAC received an exemption from filing a FR Y-9C form for the first quarter of 2009. See Board of Governors of the Federal Reserve System, *Letter to David J. DeBrunner* (Apr. 13, 2009) (online at www.federalreserve.gov/boarddocs/legalint/BHC_ChangeInControl/2009/20090413a.pdf). Data on GMAC's total assets was taken from the company's quarterly 10-Q filed with the SEC. See GMAC LLC, Form 10-Q (online at www.sec.gov/Archives/edgar/data/40729/000119312509105735/d10q.htm) (accessed May 19, 2009).

¹⁷⁴ June 5 TARP Transactions Report, *supra* note 13.

Name of BHC	Primary Location	Total BHC Assets (as of 3/31/2009) (dollars in billions)	TARP Capital Injections to BHC (to date) (dollars in billions)	Other Significant Entities in BHC / Major Recent Acquisitions
GMAC LLC	Detroit, MI	180.0	13.4	
SunTrust Banks, Inc.	Atlanta, GA	179.0	4.9	
Capital One Financial Corporation	McLean, VA	177.0	3.6	
State Street Corporation	Boston, MA	145.0	2.0	
BB&T Corporation	Winston-Salem, NC	143.0	3.1	
Regions Financial Corporation	Birmingham, AL	142.0	3.5	
American Express Company	New York, NY	120.0	3.4	
Fifth Third Bancorp	Cincinnati, OH	119.0	3.4	
KeyCorp	Cleveland, OH	98.0	2.5	

Figure 5: Capital-Raising to Date

Company	Equity	Debt	SCAP Requirements
American Express Co.	\$500 million in stock ¹⁷⁵	\$3.0 billion of non-guaranteed five- and ten-year notes ¹⁷⁶	
Bank of America Corp.	\$20.8 billion in stock ¹⁷⁷		\$33.9 billion
BB&T Corp.	\$1.5 billion in stock ¹⁷⁸		
The Bank of New York Mellon Corp.	\$1.2 billion in stock ¹⁷⁹		
Capital One Financial Corp.	\$1.6 billion in stock ¹⁸⁰	\$1 billion of non-guaranteed five-year notes ¹⁸¹	
Citigroup, Inc.		\$2 billion of non-guaranteed ten-year notes ¹⁸²	\$5.5 billion
Fifth Third Bancorp			\$1.1 billion
GMAC LLC			\$11.5 billion
Goldman Sachs Group Inc.			
JPMorgan Chase & Co.	\$5.0 billion in stock ¹⁸³	\$2.5 billion of five-year notes ¹⁸⁴	

¹⁷⁵ American Express Co., Form 8-K (June 1, 2009) (online at www.sec.gov/Archives/edgar/data/4962/000093041309003114/c57844_ex1.htm).

¹⁷⁶\$1.25 billion of 7.25 percent five-year notes (527 basis points over U.S. Treasuries) and \$1.75 billion of 8.125 percent ten year notes (502 basis points over U.S. Treasuries). American Express Co., Form 8-K (May 20, 2009) (online at www.sec.gov/Archives/edgar/data/4962/000093041309002795/c57673_8k.htm)

¹⁷⁷ Bank of America, Form 8-K (May 27, 2009) (online at www.sec.gov/Archives/edgar/data/4962/000093041309003114/c57844_ex1.htm).

¹⁷⁸ BB&T Corp, Form 8-K (May 12, 2009) (online at www.sec.gov/Archives/edgar/data/92230/000119312509114095/d8k.htm).

¹⁷⁹ Bank of New York Mellon Corp., Form 8-K (May 12, 2009) (online at www.sec.gov/Archives/edgar/data/1390777/000095012309008628/y77159e8vk.htm).

¹⁸⁰ Capital One Financial Corp., Form 8-K (May 11, 2009) (online at www.sec.gov/Archives/edgar/data/927628/000119312509107460/d8k.htm).

¹⁸¹ 7.494 percent five-year notes (540 basis points over U.S. Treasuries). One Financial Corp., Form FWP (May 20, 2009) (online at www.sec.gov/Archives/edgar/data/927628/000119312509115052/dfwp.htm).

¹⁸² 8.765 percent ten-year notes (562.5 basis points over U.S. Treasuries). Citigroup Inc., Form FWP (May 15, 2009) (online at www.sec.gov/Archives/edgar/data/831001/000095012309008985/y77311fwfwp.htm).

¹⁸³ JPMorgan Chase & Co., Form 8-K (June 1, 2009) (online at www.sec.gov/Archives/edgar/data/19617/000119312509122723/d8k.htm).

¹⁸⁴ 4.696 percent five-year notes (271 basis points over U.S. Treasuries). JPMorgan Chase & Co., Form FWP (May 13, 2009) (online at www.sec.gov/Archives/edgar/data/19617/000001961709000793/fwp51309.htm).

Company	Equity	Debt	SCAP Requirements
KeyCorp.	\$750 million in stock ¹⁸⁵		\$1.8 billion
MetLife Inc.			
Morgan Stanley	\$6.2 billion in stock ¹⁸⁶	\$4 billion of five and ten-year notes ¹⁸⁷	\$1.8 billion
PNC Financial Services Group Inc.	\$600 million in stock ¹⁸⁸		\$600 million
Regions Financial Corp.	\$1.9 billion in stock ¹⁸⁹		\$2.5 billion
State Street Corp.	\$2.0 billion in stock ¹⁹⁰	\$500 million of five-year, senior notes ¹⁹¹	
SunTrust Banks, Inc.	\$1.4 billion in stock ¹⁹²		\$2.2 billion
U.S. Bancorp	\$2.4 billion ¹⁹³		
Wells Fargo & Co.	\$8.6 billion in stock ¹⁹⁴		\$13.7 billion
	\$54.5 billion	\$13 billion	\$ 67.5 billion

¹⁸⁵ Key Corp., Form 8-K (June 1, 2009) (online at www.sec.gov/Archives/edgar/data/19617/000119312509122723/d8k.htm).

¹⁸⁶ Initial offering of \$4 billion. Morgan Stanley, Form 8-K (May 8, 2009) (online at www.sec.gov/Archives/edgar/data/895421/000095010309001058/dp13415_8k.htm). Second offering of \$2.2 billion. Morgan Stanley, Form 8-K (June 1, 2009) (online at www.sec.gov/Archives/edgar/data/895421/000095010309001280/dp13673_8k.htm)

¹⁸⁷ \$2 billion of 6.0 percent five-year notes (385 basis points over U.S. Treasuries) and \$2 billion of 7.3 percent ten-year notes (399 basis points over U.S. Treasuries). Morgan Stanley, Form FWP (May 8, 2009) (online at www.sec.gov/Archives/edgar/data/895421/000090514809001909/efc9-0580_formfwf.htm).

¹⁸⁸ PNC Financial Service Group, Inc., Form 8-K (May 20, 2009) (online at www.sec.gov/Archives/edgar/data/713676/000119312509119280/d8k.htm).

¹⁸⁹ Regions Financial Corp., Form 8-K (May 20, 2009) (online at www.sec.gov/Archives/edgar/data/1281761/000119312509115380/d8k.htm).

¹⁹⁰ State Street Corp., Form 8-K (May 21, 2009) (online at www.sec.gov/Archives/edgar/data/93751/000119312509116176/d8k.htm).

¹⁹¹ 4.3 percent five-year notes (196 basis points over U.S. Treasuries). State Street Corp., Form 8-K (May 22, 2009) (online at www.sec.gov/Archives/edgar/data/93751/000119312509117661/d8k.htm).

¹⁹² SunTrust Banks, Inc., Form 8-K (June 1, 2009) (online at www.sec.gov/Archives/edgar/data/750556/000119312509121956/d8k.htm).

¹⁹³ U.S. Bancorp., Form 8-K (May 11, 2009) (online at www.sec.gov/Archives/edgar/data/36104/000129993309002107/htm_32711.htm).

¹⁹⁴ Wells Fargo & Co., Form 8-K (May 8, 2009) (online at www.sec.gov/Archives/edgar/data/72971/000089882209000287/wfc8k.htm).

Figure 6: Banks That Have Repaid Their TARP Funds under the CPP as of May 29, 2009

Bank	CPP Repayment Date	CPP Repayment Amount (dollars in millions)	Amount Remaining to Repay (dollars in millions)	Does Treasury Still Hold Warrants?	Warrant Repurchase Amount (dollars in millions)
Washington Federal Inc.	05/27/2009	200.0	0	Y	
TCF Financial Corp.	04/22/2009	361.2	0	Y	
First Niagara Financial Group	05/27/2009	184.0	0	Y	
Iberiabank Corp.	03/31/2009	90.0	0	N	1.2 (05/20/2009)
Bank of Marin Bancorp	03/31/2009	28.0	0	Y	
Old National Bancorp	03/31/2009	100.0	0	N	1.2 (05/08/2009)
Signature Bank	03/31/2009	120.0	0	Y	
Sterling Bancshares, Inc.	05/05/2009	125.2	0	Y	
Berkshire Hills Bancorp, Inc.	05/27/2009	40.0	0	Y	
Alliance Financial Corporation	05/13/2009	26.9	0	Y	
FirstMerit Corporation	04/22/2009	125.0	0	N	5.0 (05/27/2009)
Sun Bancorp, Inc.	04/08/2008	89.3	0	N	2.1 (05/27/2009)
Independent Bank Corp.	04/22/2009	78.2	0	N	2.2 (05/27/2009)
Shore Bancshares, Inc.	04/15/2009	25.0	0	Y	
Somerset Hills Bancorp	05/20/2009	7.4	0	Y	
SCBT Financial Corp.	05/20/2009	64.8	0	Y	

Bank	CPP Repayment Date	CPP Repayment Amount (dollars in millions)	Amount Remaining to Repay (dollars in millions)	Does Treasury Still Hold Warrants?	Warrant Repurchase Amount (dollars in millions)
Texas Capital Bancshares, Inc.	05/13/2009	75.0	0	Y	
Centra Financial Holdings, Inc./Centra Bank, Inc.	03/31/2009	15.0	0	N	.8 (04/15/2009) ¹⁹⁵
First Mantowoc Bancorp, Inc.	05/27/09	12.0	0	N	.6 (05/27/2009)
First ULB Corp.	04/22/09	4.9	0	N	.2 (04/22/2009)
Valley National Bancorp	06/03/09	75.0	225.0	Y	
HF Financial Corp.	06/03/09	25.0	0	Y	

¹⁹⁵ For certain privately held institutions such as this one, Treasury immediately exercised a warrant for additional preferred shares. Upon exiting TARP, the institution repurchased those additional shares for the total repurchase amount indicated.

**Annex to Section One: The Supervisory Capital Assessment Program:
An Appraisal**

The Supervisory Capital Assessment Program: An Appraisal

Eric Talley* & Johan Walden†
June, 2009

Executive Summary

This report covers three topical domains. First, we offer a survey of risk modeling, including conventional statistical measures of risk, the characteristics of competing risk models, and the strengths and weaknesses of each. Second, we draw from this overview a set of core criteria that are (in our estimation) critical in evaluating the Federal Reserve Board’s approach to risk assessment in the context of the Supervisory Capital Assessment Program (SCAP, or “stress tests”). Finally, we use these insights and desiderata to assess the relative merits of the SCAP analysis, as reflected in two reports published by the Federal Reserve Board of Governors on April 24 and May 7.

Our survey of competing risk assessment models covers a relatively broad swath of approaches, ranging from static systematic risk modeling, to dynamic structural models (including Merton and first-passage models), to more data-driven reduced form models. Each class of models has relative strengths and weaknesses which we describe within our report. Ultimately, the choice of risk model often turns on tradeoffs between (a) the simplicity/richness of the theoretical account; (b) the practical availability of data; (c) the reliability of the data; and (d) the underdetermined identity of a single appropriate model to use to assess financial risk (*i.e.*, “model uncertainty”).

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From what we are able to discern about the specifics of the stress tests, the Fed’s approach appears to hybridize numerous canonical risk modeling approaches, and in broad strokes seems most consistent with a *conditional loss* approach. That is, the stress tests attempted to elicit information from the nineteen largest bank holding companies (BHCs) about likely losses that would be visited upon their asset portfolios over a two year time horizon under specified macro-economic conditions. The implementation of this approach ultimately boiled down to a four-step process. In the first stage, SCAP designers posited two macroeconomic hypothetical states – a “baseline” scenario and a “more adverse” scenario. Second, within each of these states, the Fed attempted to formulate expected Indicative Loss Rate (ILR) ranges within each asset class and across all institutions, which reflected estimates of both the frequency of default and losses given default under each scenario. In the third, the BHCs and the Fed applied a process that allowed each BHC to vary from the predetermined ILR ranges (above) into loss and resource estimates tailored at the firm level. In the fourth step, the banks reported their asset and exposure levels under each macro-economic scenario, which implied what (if any) additional common equity buffer was necessary at the BHC level.

Based largely on information collected through public document review and conference calls with representatives from the Federal Reserve and the Treasury Department, and taking into account the enormity of the task within a short time horizon, we conclude that the Fed’s risk modeling approach has, on the whole, been a reasonable and conservative one. The criteria used for assessing risk, and the assumptions they have evidently used in calibrating the more adverse case have typically erred on the side of caution, and have generally avoided some of the more dangerous simplifications manifest in some sorts of risk modeling. In light of the short time period with which they had to work, our assessment is that the Fed has done a commendable job.

At the same time, SCAP’s design and implementation do leave some open questions in our minds. Perhaps the most significant of these questions concern the SCAP’s transparency and replicability. Each of the

four stages outlined above evidently involved the combination of quantitative and qualitative measures. For example, in the initial setting of ILRs, the Fed evidently attempted to synthesize numerous alternative macro-economic models (which themselves produce noisy estimates of losses) with subjective judgments of experts in different asset classes. The precise mechanism for combining these various inputs, however, was left largely unspecified. In addition, the process by which the initial ILRs became tailored to each BHC in Stage 3 appeared analogously opaque. While such synthesis is sometimes a good way to deal with model uncertainty, data availability, confidentiality, and measurement error, it renders the results virtually incapable of replication (or even much detailed understanding) by an outsider. This lack of transparency and replicability is a potential cause for concern, and it ultimately confines our analysis to a general assessment of the program's broad-brush approach.

In addition, we discuss a number of other concerns that we believe also to be material. These include concerns that the SCAP was insufficiently sensitive to BHC ownership structure; that it neglected other sorts of micro- and macro-economic risks (such as interest rate, inflation, and cash flow / liquidity risks) that may be relevant in predicting loss ranges¹; that the SCAP used a short time horizon (two years) that may have been insufficient relative to the maturity of the underlying illiquid assets; and that the Fed might have done additional robustness checks by varying the sizing of the cap or the measure of equity capital employed.

¹This may be particularly the case for the amortized cost / accrual treatment that the SCAP report accords to loans held to maturity – an assumption that may obscure liquidity risks implicit in those assets.

1 Introduction and Background

In March 2009, we were asked by representatives of the Congressional Oversight Panel (COP) to offer a generalized overview of risk modeling, and to evaluate the Federal Reserve’s Supervisory Capital Assessment Program (SCAP, or “stress tests”) in light of this overview. During the ensuing two months, we assisted the COP in understanding and interpreting the SCAP, and in particular in reviewing two substantive reports issued by the Federal Reserve Board of Governors. The first (describing methodology) was issued on April 24, and the second (describing results) was issued on May 7. We will refer to these reports as the “SCAP-D&I” report and the “SCAP-OR” report, respectively. In addition to our review of these two reports, we were privy to a number of conference calls involving the Federal Reserve (twice) and the Treasury department (once) during April and May of 2009.

We are both academics, unaffiliated with either the reporting banks or the regulatory entities involved in SCAP. Professor Talley is a Professor of Law at the University of California at Berkeley School of Law, and currently the Haas Visiting Professor of Law and Corporate Finance and Harvard Law School. He holds a law degree and a PhD in economics, and specializes in business law, corporate finance, and the economic analysis of law. Professor Walden is an Assistant Professor of Finance at the University of California Haas School of Business. He holds PhDs in both Financial Economics and Applied Mathematics, and specializes in asset pricing, risk measurement of catastrophic risks, and financial derivatives pricing. (Our *curricula vitae* are attached as Appendix B of this report). We do not seek, nor have we been offered, any compensation for our participation in this review process.

In what follows, we endeavor to accomplish three goals. First, we offer a survey of risk modeling, including various probabilistic and statistical measures that are relevant in assessing risk vulnerabilities in the context of financial risk. We also overview the practical enterprise of risk measurement / management, considering the core characteristics, strengths and weaknesses of competing risk models from the finance literature. Second, we draw from this overview a set of core criteria that

we think are critical in evaluating the Fed’s approach to risk assessment in the context of SCAP. Finally, we use these insights and desiderata to assess the relative merits of the Federal Reserve’s Supervisory Capital Assessment Program (SCAP, or “stress tests”), as reflected in two reports published on April 24 and May 7.

Our principal conclusions are that the Fed’s risk modeling approach has, on the whole, been a reasonable one, and for the most part it has erred on the side of conservatism. For example, the macro-economic scenarios they hypothesized under the adverse case appear relatively extreme by historical standards, and the (purportedly one-time) sizing of the capital buffer was made relatively stringent. Moreover, the general approach undertaken here appears to have avoided some of the more dangerous simplifications manifest in certain types of risk modeling. Finally, we believe from our interactions with them that the research staff at the Fed responsible for the implementation of SCAP were professionally competent, acted in good faith, and performed their roles with reasonable care.² On the whole, then, our assessment is that the SCAP stress tests have provided valuable information to the public.

At the same time, however, the SCAP’s design and implementation do leave some open questions in our minds. Perhaps the most significant of these questions concerns the SCAP’s transparency and replicability. Each of the principal stages of the SCAP evidently involved the combination of what was described to us as quantitative and qualitative measures. For example, in the initial setting of ILRs, the Fed evidently attempted to synthesize numerous macro-economic models (which themselves produce noisy estimates of losses) with subjective judgments of experts across different domains. While such synthesis is often a good way to deal with model uncertainty, data availability, and measurement error, the precise mechanism of execution remained somewhat difficult

²It is important to be clear that we did not observe any actual use or application of the models used by the Federal Reserve Board and the Supervisors, nor were we given detailed information about the way in which the models were applied. Our necessarily limited assessment is based only on the presentation and demeanor of the members of the Federal Reserve Board’s Research Staff with whom we spoke; those individuals appeared to be knowledgeable and skilled professional economists with a broad knowledge of the relevant modeling literature.

to penetrate. In addition, the process by which the initial ILRs became tailored to each BHC appeared analogously opaque. This lack of transparency and replicability is a genuine concern, and it ultimately confines our analysis to a general assessment of the program’s broad-brush approach.

In addition, we have a few other concerns that we believe to be material (or potentially so). These include concerns that the SCAP was insufficiently sensitive to BHC ownership structure; that it neglected other sorts of micro- and macro-economic risks (such as interest rate, inflation, and cash flow / liquidity risks) that may be relevant in predicting loss ranges; that the SCAP used a short time horizon (two years) that may have been insufficient relative to the maturity of the underlying illiquid assets; and that the Fed did not evidently conduct robustness checks by varying the sizing of the cap or the measure of equity capital employed.

Our analysis proceeds as follows. The next section of this report offers a primer on default risk and risk modeling, including a description of principal approaches for risk modeling that can be found in the literature. Section 3 uses this review to distill four critical desiderata that warrant critical attention in evaluating any risk assessment such as SCAP. In Section 4, we apply these criteria to the actual design, implementation, and results of the SCAP. Finally, Section 5 concludes.

2 Capital Adequacy and Default Risk: A Primer

The traditional approach to risk management in banking regulation has been to define so-called Financial Soundness Indicators (FSIs), and impose hard constraints on these, leading to a *rule based* system for controlling risk. For example, in the 1988 Basel Accord, a requirement of the so-called *Capital Adequacy Ratio*, CAR, was defined as follows:

$$CAR \geq 8\%.$$

The CAR measure is defined to capture the ratio of capital reserves to the face value of loans (the assets) of a bank. A higher CAR therefore

means that the bank is better prepared to handle losses on loans. Banks that satisfy these requirements are said to be *well capitalized*.

Theoretically, the definition of CAR is straightforward:

$$CAR = \frac{C}{A},$$

where C is the equity capital and A is the total value of assets. In practice, calculating C and A is not as trivial. For the capital, C , both liquid capital (C_1 , so-called Tier 1 capital) and illiquid capital (C_2 , so-called Tier 2 capital), which can only be accessed if the bank ceases lending, should be included, yielding $C = C_1 + C_2$. For the assets, A , the definition in practice takes into account that some assets are less risky than others, to provide a value weighted formula. The total assets are then calculated as

$$A = \omega_1 A_1 + \omega_2 A_2 + \cdots + \omega_N A_N,$$

where A_i is the face value of asset i and w_i is the corresponding weight associated with the asset. Historical bank supervisory practice in the United States has been to require that Tier 1 capital exceed 4% or risk-adjusted asset values. Of this 4% minimum threshold, Board of Governors policy has generally held that it predominantly consist of common equity, or (so-called) Tier 1 Common Capital.³ Similar requirements for BHSs to be well capitalized exist, although the specific numbers are different than what is required for individual banks.

The different weights provide a rough classification of risk classes. Moreover, under the traditional approach inter-dependencies of risks are not taken into account (e.g., it is a very different situation if two asset classes are perfectly correlated compared with if they are independent) which makes the measure even rougher. Finally, banks have had the possibilities to move some loans, of relatively low risk compared with their risk weight, off balance sheet which made the number even less

³Tier 1 Common capital consists of Tier 1 capital, less all non-common elements, which include qualifying perpetual preferred stock, qualifying minority interest in subsidiaries, and qualifying trust preferred securities.

informative.

To adjust for this uncertainty, the CAR bound was traditionally chosen conservatively, and other Financial Soundness Indicators were also used to get an idea of the overall health of banks' balance sheets. For example, in the *Financial Soundness Indicators: Compilation Guide, (2001)* (a publication by the IMF), a set of *core* and encouraged indicators were defined. The core indicators were as follows:

Type of indicator	Definition
Capital adequacy	Regulatory capital to risk-weighted assets (CAR) Regulatory Tier 1 capital to risk-weighted assets Nonperforming loans net of provisions to capital
Asset quality	Nonperforming loans to total gross loans Sectoral distribution of loans to total loans
Earnings and profitability	Return on assets Return on equity Interest margin to gross income Noninterest expenses to gross income
Liquidity	Liquid assets to total assets (liquid asset ratio) Liquid assets to short-term liabilities
Sensitivity to market risk	Net open position in foreign exchange to capital

The encouraged set contained an additional 28 indicators. The idea was that the indicators, together with a conservative principle for bounds, would help banks avoid excessively risky positions. However, the Basel Committee on Bank Supervision decided to abandon the previous rule-based system, in favor of a more quantitative credit risk modeling approach, in which external and internal portfolio risk management models could be used to measure the total portfolio risk of a banks assets. The risk metric was the so-called *Value at Risk* (VaR), which is described in greater detail below.

In addition, the Committee recommended a *risk-bucketing* system to control the VaR, in which each risk class faces a fixed capital charge per dollar and the total capital requirement for the portfolio is the sum of the individual capital requirements. As shown in Gordy (2003), this method provides an approximation of the VaR of the portfolio, which is only exact under strong assumptions.⁴

⁴Specifically, if the risks satisfy the properties of *asymptotic fine granularity* and there being a *single systematic risk factor*, then the sum of the individual VaRs equals the portfolio VaR.

2.1 Statistical measures of risk

In this section we briefly describe the VaR methodology, and the related scenario/conditional loss method of assessing risk. Our discussion endeavors to contain a minimum of mathematical notation. A more rigorous discussion, which also compares the VaR methodology with other statistical methods is provided in the appendix.

Let X represent the loss size of an individual risk or portfolio of risks. Here, positive values of X represents losses, and thus as losses grow so does the value of X . In general, X can be viewed as a *random variable*, i.e., its value *ex ante* is not known. A full characterization of the distribution of losses is given by the *cumulative distribution function*, or cdf, $F(x)$. Defined, $F(x)$ is the probability that X is not larger than some specified realization, denoted as x , or in mathematical terms $F(x) = \mathbb{P}(X \leq x)$. As an example, the cdf of a standardized normal distribution is shown in Figure 1 below. As seen in the figure, the value is with very high probability somewhere between $X = -3$ and $X = +3$.

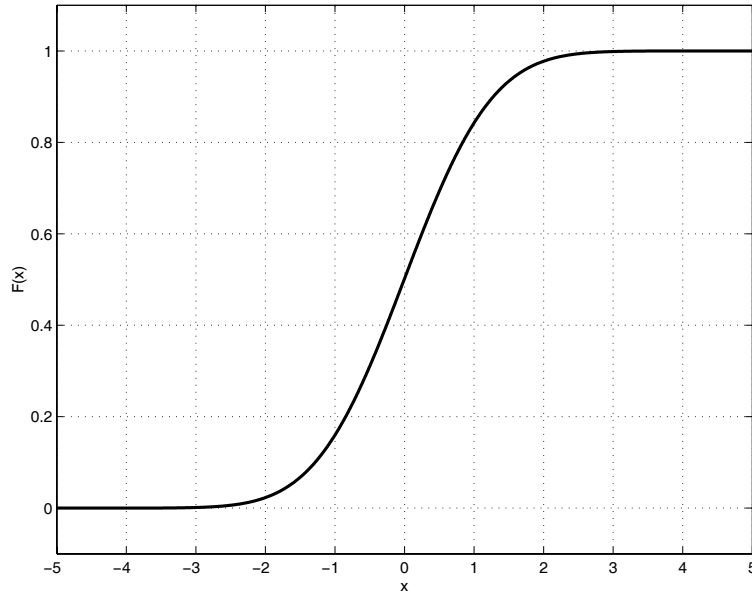


Figure 1: *Cdf of standardized normal distribution.*

The cdf provides a full characterization of the loss distribution, and thereby of the riskiness of X . However it is often not feasible to work directly with the cdf, since:

- It can be a high-dimensional object (and thus very complex),
- It is often difficult to estimate with significant accuracy.

Therefore, several statistical measures have been developed to represent the riskiness of a random variable by either a single number or a small collection of them. Such numbers are very useful, and we provide a brief review of them below. It is important to remember, however, that such summary variables generally provide only a simplification, and will not completely capture the full risk structure of X . In Appendix A, several such measures are discussed. Here, we focus on the *value at risk*, which is useful in estimating the risk exposure to low probability events.

For the portfolio of risks, X , the VaR describes the magnitude of loss that corresponds to a pre-specified “tail risk” cutoff point within a distribution. For example, the VaR of x at the 95% confidence level implies that the probability that losses are higher than x are $1 - 95\% = 5\%$. In Figure 2 below, we illustrate that the VaR at the 95% confidence level for the standardized normal distribution, is 1.65, representing a 5% probability that losses exceed 1.65. In practice, the VaR is always associated with a time horizon. For example, the VaR at the 95% confidence level could represent the loss exposure over a six-month horizon.

Although the VaR is easier to handle than the cdf, it still needs to be estimated empirically. Since the VaR is usually defined to measure low probability events (i.e., so-called “tail events”), and such events are, by definition, rarely observed, estimation can prove to be a difficult task, especially if the estimate is purely statistical, e.g., from historical data. Also, the previous discussion applies to individual risks as well as to portfolio risks. However, for portfolio risks, there is an additional difficulty in estimating the joint behavior of the risks, since there are so many degrees of freedom of this behavior.

Additional assumptions about the risk structure may therefore be needed. For example, the risks may be related to macro economic

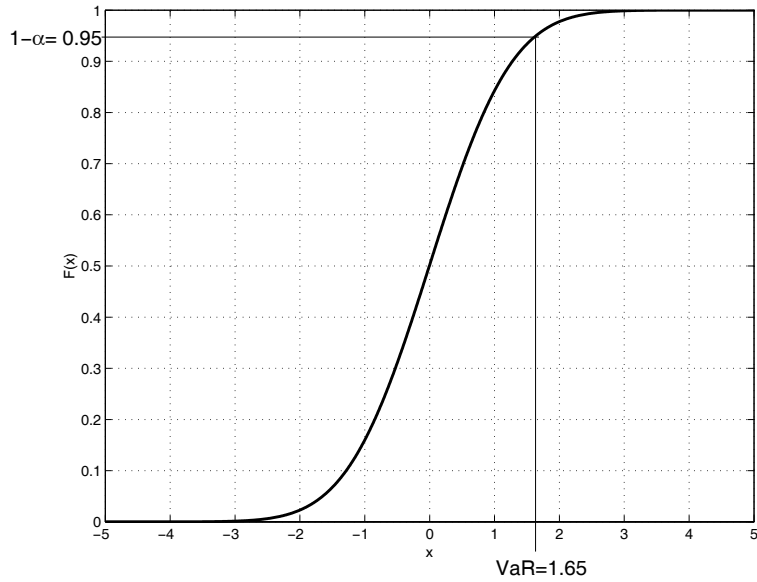


Figure 2: *Value at risk of standardized normalized function at the 95% confidence level.*

variables and different scenarios for the development of these variables may be developed. Given probability estimates for each macroeconomic scenarios, a mapping from the macroeconomic variables to the losses, X , can be made, leading to a VaR estimate. This is a so-called scenario/conditional loss approach.

We next describe the type of risk-models that have been developed for credit risk of individual firms and the assumptions on which they are based. These models form the basis for the *portfolio credit risk models* that have been developed in recent years and that will be discussed in the next section. There are many different versions of them, and all we can hope to do is to offer a first cut at their general features. The models represent the state-of-the-art of risk modeling of individual firms and risk portfolios and therefore offer a valuable comparison to the SCAP approach.

Before describing these models, however, it is important to pause and note that the underdetermined nature of risk modeling itself introduces a risk on any attempt to quantify and characterize risk exposures: That

the researcher will erroneously utilize a particular risk model, even if another risk model would actually be more appropriate. In other words, because it is often difficult (if not impossible) to test which of a plausible set of risk models is appropriate for a given situation, one's choice of model can itself introduce considerable uncertainty. In what follows, we refer to this concept as *model uncertainty*.

2.2 Credit risk models

During the last five decades, risk modeling has evolved continually. Much of the early progress in risk modeling was a byproduct of the significant advances in portfolio theory from the mid twentieth century. The canonical model emerging from that era was often quite stylized and made relatively strong (and restrictive) assumptions. Among these assumptions were the following:

- Risk was measured as variance, σ^2 (or, equivalently, standard deviation),
- Risk was effectively a static phenomenon, resolving itself at the end of a single period.

The portfolio choice models for individual investors that these early models grew from were initially introduced in Markowitz (1952) and Roy (1952), and were extended to an full-economy setting in Sharpe (1964), Lintner (1965) and Treynor (1962), with the introduction of the so-called *Capital Asset Pricing Model* (CAPM). A key implication of the portfolio choice model is that *idiosyncratic* risk can be diversified away in a large portfolio, whereas *systematic* risk can not. A defining trait of idiosyncratic risk is that its variability is statistically independent of other risks, including the overall market. Intuitively, then, if one were to spread her investments across many small investments that themselves represented only idiosyncratic risk, she could effectively eliminate risk entirely (or at least approximately so). In contrast, diversification over investments that share common systematic risk does nothing to reduce the aggregate riskiness of the portfolio. In practice, most investments have a mixture of systematic and idiosyncratic components, and thus diversification is

helpful in reducing the idiosyncratic (but not systematic) components of those risks. Consequently, to a diversified investor, only the systematic risk component “matters” in assessing the value of an investment.

This fundamental relationship between diversification, idiosyncratic risk, and systematic risk has proven to be tremendously important in finance and risk management. It is, at core, one of the chief claimed sources of value within much of the credit derivatives market. Nevertheless, because of its relatively stylized assumptions, the traditional portfolio choice model has limited potential for calibration to a real world environment, which has led to the development of more advanced models. We turn to these models below.

Merton models

As noted above, one of the core weaknesses of the capital asset pricing models were their static (i.e., “one-period”) view of risks. This is clearly a poor fit for most capital markets, where purchases and sales occur on a continuous and ongoing basis. It should therefore not be terribly surprising that some of the first extensions of risk modeling were in the direction of *dynamic* risk management frameworks. Perhaps the original (and certainly most well known) dynamic model for individual firm default was introduced in Merton (1974). The core driver in the Merton model was to think of the total asset value of a firm, denoted A , at some time T as a random variable. If the firm has debt with face value D , that matures at T , then the firm will default if and only if $A \leq D$ at the time of maturity. Thus, the default risk is $F(D)$, where F is the cdf of the firm’s asset value at T .⁵

By design, the Merton model delivers predictions about the probability of default; however, it can also yield endogenous predictions about losses conditional on default (expected shortfall). That is, the size of A relative to D not only yields information about whether an obligor will default at time T , but it also suggests how much creditors may

⁵Recall that $F(x)$ describes the probability that the realization of some random variable X is no higher than some specified value, x . A standard assumption about A is that it is *log-normally* distributed, i.e., that $A = e^X$, where $X \sim N(\mu, \sigma)$ is normally distributed.

salvage once a default occurs: in the event of default, and assuming that the absolute priority rule holds, creditors should expect to receive a liquidation value of A , so that their (approximate) recovery rate⁶ is $\frac{A}{D}$. Effectively, then, as an obligor goes deeper into default, the Merton model also predicts a smaller recovery rate. In principle, it is also possible to calibrate the distribution on the firm's assets against a number of economic factors; in practice, one critique of Merton models (and first passage models, described below) is that calibration tends to rely on stock market data, neglecting other important information (such as credit ratings).

The Merton model is sometimes referred to as *structural model*: In other words, it makes concrete assumptions about what events trigger a default (asset values which are less than the face value of debt at maturity), and about the distributions of asset values (which can, in turn, be developed from economic arguments). Since additional structure is put on the model, the estimation of default risk becomes empirically less challenging and better results can be provided, *as long as the assumptions underlying the structure* are correct. This advantage, of course, is also a potential vulnerability: those very additional assumptions that give the Merton model its structure (i.e., conditions for default and distributional assumptions) may be poor representations of reality. The possibility that one's model performs poorly in this manner is sometimes referred to as *model risk*. It is often difficult to measure model risk directly, and even indirect tests are sometimes not terribly helpful. Consequently, the researcher or analyst must often take care not to depend too heavily on a single model (or calibration thereof) in making predictions or risk assessments.

Finally, the discussion so far has concentrated on firm-specific defaults. To understand portfolio risk *across firms*, the dependence structure between different obligors needs to be understood. A large amount of research has developed structural models to understand these depen-

⁶We say approximate because this figure excludes transaction costs, legal costs, and possible violations of the absolute priority rule. It also assumes liquidation (rather than renegotiation) of the debt.

dencies. Typically, it is assumed that firms are exposed to *macro economic* risk factors (e.g., unemployment, and other business cycle related risks), representing systematic risk, as well as to idiosyncratic risk. If the exposures for individual firms are known, then the joint risk – and thereby the riskiness of a portfolio – can be calculated.

First passage models

Among the stronger structural assumptions made by the Merton model is that default can only occur at the point of maturity (which we have denoted as T). In practice, one may expect default to occur earlier, *e.g.*, if the face value of debt is higher than the asset value before maturity. An extension of the Merton model, often referred to as *first passage models*, assume that default will occur if the firm ever becomes insolvent – that is, if at *any* time prior to maturity, assets fall below the face value of the debt (i.e., if at any point in time $A \leq D$). In order to think about pre-maturity defaults, then, one would need to understand the dynamic path of asset growth / shrinkage, effectively modeling asset value at all times, or $A(t)$. First passage models typically do this by assuming that $A(t)$ follows some specified *stochastic process*. In more general approaches, the *default barrier* need not be exactly the face value of debt, but that itself could change over time, according to a different stochastic process, so that the default barrier is at $D(t)$. In general, first-passage approaches imply higher default risks than Merton models, since events may cause $A(t)$ to dip below $D(t)$ on a transitory basis, even if solvency were to be recovered by time T . In such situations, default would occur under a first passage model (but not a Merton model).

Because they represent a generalization of the Merton model, first passage models have many similar features. For example, they can deliver not only endogenous predictions about the likelihood of default, but also characterize (if appropriately specified) the recovery rates associated with default.⁷ First passage models can also lend themselves

⁷A word of caution however, is in order here: If the default barrier $D(t)$ is simply equal to the face value of the debt, then obligors will default immediately upon the instant of insolvency and the recovery rates should never be below 1.0. Thus, for first-passage models to predict creditor risk, they must generally presume that $D(t) < D$ (or the functional equivalent of this relationship). While certainly plausible, this

to portfolio-level generalization using macroeconomic risk factors, and summation across portfolio components.

Reduced form models

Beginning in the 1990s, a different approach in risk modeling began to become more common, which we refer to as “reduced form models.” In a reduced form model, individual default is modeled as a time dependent jump process. The risk that a firm defaults between t and $t + \Delta t$ is, roughly speaking, $\lambda(t)\Delta t$, where $\lambda(t)$ is the *intensity* of the process. The dependencies between firm defaults are then modeled by the correlations across instantaneous firm defaults.⁸ Reduced form models typically use information from the bond market to estimate and price default probabilities, and it is also straightforward to incorporate credit agency information into these models.

Unlike the Merton or first-passage models, reduced form models do not typically turn on underlying structural assumptions, which makes them less susceptible to model risk. They purchase this benefit, however by relying almost completely on empirical data, and can therefore only provide as good results as is permitted by this data. This dependence can raise a few practical problems. First, the data for calibrating reduced form models may be unavailable, incomplete, and/or difficult to come by. Second, even when available, the data may be subject to observation error, which can significantly compromise the validity of the results.⁹ Third, because reduced form models do not draw from theoretical models of individual (or firm-level) behavior, it is more difficult to know which data are most relevant for inclusion in a model. Finally, since the models are based on historical data, they have no way of predicting what will happen after rare, drastic, changes in the underlying economic environment (so-called regime shifts). The last point is especially important for the current situation.

An additional potential distinction of reduced form models is that relationship is still not well understood.

⁸This is often accomplished using a copula function, as described in Appendix A.

⁹These first two limitations also affect other risk models, but perhaps not to the same extent as reduced form models.

they do not necessarily yield predictions about recovery rates conditional on default. In some well-known reduced form models, for example, recovery rates are assumed to be constant, even when default becomes widespread, an assumption that appears inconsistent with empirical observation (see Altman 2006). Other reduced form models, however, attempt to account for differential rates of recovery in addition to default rates.

2.3 Summing Up

Although the discussion of risk models described above has been brief, it encapsulates a set of approaches that are relatively highly advanced and extensively analyzed in the literature. At the same time, it is important to note that all of them have been developed to describe portfolio risk in the proverbial steady state of “normal times.” The SCAP was conceived, designed and implemented in a time of unprecedented economic and financial uncertainty. Consequently, concerns related to model risk and model appropriateness are probably quite high. It may well be the case that prudent risk regulation (at least given the current state of affairs) requires a more multifaceted approach.

3 Stress Test Desiderata

As is clear from the discussion above, there are multiple ways to measure financial risk exposure. Many of them involve difficult tradeoffs between data availability, complexity, and model uncertainty. Consequently, as a general matter of institutional design, we are still not in a position to claim that one method for measuring risk is “better” than others. Rather, in evaluating any model of risk assessment, we suggest that it is more constructive to use a set of four desiderata, specified as follows:

1. *Intuitiveness*: From a practical perspective, given the complexity of the problem and the limited time frame with which to accomplish it, does the risk model employed appear to make intuitive sense?
2. *Robustness*: Do the results continue to hold across alternative

model and/or parametric specifications?

3. *Transparency*: Are both the structure of the risk model and the data inputs clear and transparent to outsiders? If the model is a hybrid of multiple risk models, how clear is the hybridization process?
4. *Replicability*: Is it possible for a third party to gain access to the same data, and to replicate the results within conventional standards of error?

The first two of these desiderata relate to internal design considerations. The multiple approaches to financial risk modeling, along with the special circumstances under which the SCAP was implemented make the first desideratum extremely important. Due to the current high uncertainty in capital markets, and the attendant hazards of model risk, the second desideratum is also relatively crucial.

The third and fourth desiderata, in contrast, bear on how well the Fed's approach might be evaluated by outsiders. The third desideratum encapsulates what is, in a sense, a *minimal* condition on observability that need be met; that is, so long as one presumes the competence and good faith of Fed researchers, satisfying the *transparency* desideratum is tantamount to understanding the material steps undertaken in the enterprise. The fourth desideratum – *replicability* – is a more stringent condition than transparency, effectively requiring that an outsider be able to directly verify the Fed's conclusions. It should be noted, however, that this criterion may be more difficult to satisfy for a program such as SCAP, due to confidentiality issues within the bank holding companies being studied. We believe, nevertheless, that the third and fourth desiderata are material considerations, particularly given the high level of market uncertainty, the magnitude of resources at issue, and the failure of state-of-the-art models to capture the market's risk in 2008.

4 Description and Evaluation of the SCAP Program

In this section, we move from a general discussion of risk measurement to a description and evaluation of the Fed’s implementation of SCAP.¹⁰ We warn the Panel that our knowledge of the Fed’s program is based largely on the same information possessed by the panel, consisting of two reports, the first (describing methodology) was issued on April 24, and the second (describing results) was issued on May 7. We will refer to these reports as the “SCAP-D&I” report and the “SCAP-OR” report, respectively. Beyond these reports, we were privy to a number of conference calls involving the Federal Reserve (twice) and the Treasury department (once).

4.1 The SCAP’s General Approach

Beginning in February 2009, the Federal Reserve conducted a risk assessment of the portfolios of 19 domestic bank holding companies (BHCs) with year-end (2008) assets exceeding \$100 billion. Each of the BHCs was asked to project credit losses and revenues for a two year period ending December 2010. Although the time horizon was limited in nature, we note that any risk assessment must “draw the line” at some terminal date; moreover, the further out one pushes that finish line, the noisier and more unreliable the predictions grow. Thus, the choice of a two year time horizon does not, *ipso facto*, give us cause for concern (though it may necessarily require updating on a going-forward basis, as discussed below).

The SCAP program diverged from more routine stress tests in at least three ways. First, it endeavored to move across all major asset classes, rather than taking a “compartmentalized” approach that considered only one or two asset classes. Second, it endeavored to have greater horizontal control than ordinary supervisory stress tests, by gauging banks’

¹⁰The SCAP’s design and implementation was jointly conducted by the Federal Reserve Board of Governors, the Federal Reserve Banks, the FDIC, and the Comptroller of the Currency. In a slight abuse of notation, this report will attribute SCAP to the Fed, reflecting the coordinating role played by the Board of Governors, and the listed authorship of the April 24 and May 7 reports.

responses in relation to a more standardized set of risk metrics than conventional stress tests. (April 24 Report, at 4). Finally, it embraced a buffer size that is larger (and thus more conservative) than historical precedents.

Methodologically, we found it difficult to categorize the Fed’s approach as being consistent with any single risk model described above (i.e., Merton models, first-passage models, reduced form models). Rather, our discussions with representatives from the Fed revealed that it is likely a hybrid of numerous approaches, ultimately presented as a scenario/conditional loss assessment (as described above).

Although the Fed’s process was relatively complex, it is probably fair to divide it into four distinct phases. Stage 1 — ostensibly conducted without input from the banks — involved using numerous data sources to forecast projections of various macro-economic measures (explained below): They identified a normal or “baseline” scenario, and a “more adverse” scenario. In Stage 2 — also conducted without bank input — researchers forecasted loss ranges for each asset class in each of the baseline and more adverse macroeconomic scenarios to develop a uniform schedule of indicative loss rate (ILR) ranges. With these uniform loss ranges in hand, Stage 3 involved harvesting and normalizing actual BHC-level data, in order to tailor forecast loss exposures across each holding company, again under both the normal and adverse scenario. During this process, an iterative process between the Fed and the individual BHCs evidently allowed BHCs to utilize a loss range that varied from that prescribed in Stage 2. Finally, in Stage 4, the Fed assessed each BHC’s capital adequacy relative to its forecast losses in the normal and adverse scenarios. Using a (historically conservative) criterion to assess capital adequacy, the Fed then determined the extent (if any) to which there was a shortfall in capital adequacy at each BHC.

In the following subsections, we describe and comment on each of these stages *ad seriatim*.

4.2 Stage 1: Macroeconomic Measures and Scenarios

The first decision facing the Fed was the question of which specific macroeconomic indicators would anchor their approach for projecting loss rates. As one can imagine, there are an unbounded number of conceivable statistical models that relate macroeconomic variables to loss exposures, any one of which might be helpful in predicting financial vulnerability. As a pragmatic matter, however, it is impossible to move forward without embracing (at least provisionally) a specific, perhaps simplified model (or set thereof). Not surprisingly, then, the design of SCAP limits attention to a finite set of macroeconomic prospective measures (in this case, three): (1) Gross Domestic Product Growth; (2) Unemployment, and (3) Housing Prices. In essence, the Fed’s embrace of these core factors reflects an assessment that – while perhaps they are not the only factors that are helpful in predicting loss rates – they are, on balance, the most important ones.

For each macroeconomic factor, the SCAP went on to develop two types of projections for 2009-2010: A “baseline case” projection, which roughly reflects consensus expectations about how these factors were likely to evolve; and a “more adverse case” projection. The latter was meant to embody a relatively (but not maximally) pessimistic projection. It should be noted that, consistent with a conservative practice, the Fed primarily focused on the adverse case for purposes of projecting losses, which in turn yielded prescriptions for appropriate capital buffers for BHCs.

In order to form the *baseline case*, the Fed largely depended on the commercial forecast providers Consensus Forecasts (CF), the Blue Chip Survey (BCS), and the Survey of Professional Forecasters (SFP). From what we are able to discern, the baseline cases for GDP Growth and Unemployment emanated directly from these forecasts, and were computed by taking the (evenly-weighted) average one- and two-year forecasts for across all three providers (See SCAP D&A Table 1). The baseline housing price forecast, in contrast, was more of a hybrid, com-

binning data from the Case-Shiller 10-city CME-traded futures market (<http://housingrdc.cme.com/index.html>) and a special question related to housing prices drawn from one of the commercial surveys (Blue Chip).¹¹

Perhaps not surprisingly, the Fed’s formulation of the *adverse case* was somewhat more complicated than the baseline case. In spirit (and in broad strokes), the idea behind the adverse case is relatively clear: The Fed was trying to assemble an alternative scenario that did not correspond to the “worst possible case,” but rather a proxy measure for something that looked like a 10% (or possibly 15%) “tail event.” Figure 3 demonstrates this conceptually for a 10% tail event. Suppose the baseline or “expected value” projection of some macroeconomic variable (e.g., unemployment) is \bar{x} . Since the “true” realization of that variable is not known with precision, one could imagine that its future value is probabilistically distributed over a range of realizations, so that \bar{x} merely reflects its expected or “average” value. The considerable noise associated with that projection is reflected by the bell-shaped density curve in the Figure that includes \bar{x} . Conceptually, the Fed’s adverse case imagines an outcome \bar{x}_A that corresponds to a critical cutoff point such that – given the probabilistic distribution – there is at most 10% probability that the future value of the factor would fall below \bar{x}_A . This corresponds to the shaded region in Figure 3 below.

4.2.1 Comments and Concerns

On the whole, the Fed’s approach for specifying a focal set of macroeconomic factors – and baseline / adverse cases within each – appears sensible to us. As noted above, to do anything in this area it is necessary to embrace (however provisionally) some characteristic set of macroeconomic factors for predicting losses; and here, the three factors embraced by the Fed are well-known drivers of specific financial risks. Indeed, particularly in the context of housing- and mortgage-related defaults, we concur that these are among the most predictive of any factors, and

¹¹In principle, both prices from a well developed futures market and a well-designed survey instrument could generate forward projections about housing price fluctuations (though we note that the CME futures markets on the Case-Shiller does not appear particularly deep). The relative contributions of each source in the Fed’s projections are not entirely clear.

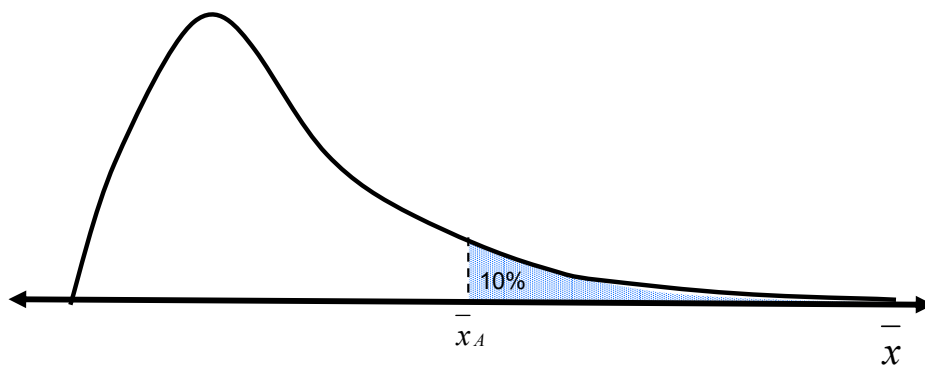


Figure 3: *Value at risk of standardized normalized function at the 95% confidence level.*

therefore we agree with their inclusion. Moreover, the Fed’s reliance of survey- and market-based data (when available) rather than historical data to project these factors forward seems well placed. Although we have some misgivings about the use of survey data and shallow market data in general, here it likely enjoys a distinct advantage, since historical data is likely to be particularly unhelpful in an “extraordinary” crisis, such as the one that we have arguably found ourselves since the fall of 2008.

That does not mean that we have no concerns as to this part of the enterprise, however. In particular, the Fed’s stress test formulation (and particularly the derivation of the adverse case) is potentially subject to criticism as to transparency, its replicability, and its robustness. As to transparency, for example, both the SCAP-D&I and the SCAP-OR are

somewhat ambiguous in their approaches to formulating an adverse case. As to GDP growth and unemployment, the figures appear to aim intermittently at either a 10% or 15% tail risk mass, but the documents seem to refer to this risk margin loosely. We are unsure, for example, why the Fed simply did not pick a particular tail risk (or better yet a series of two or more alternative tail risk measures), rather than referring imprecisely to a broad range. (This imprecision may, of course, be symptomatic of the economic uncertainty that imbues the entire enterprise).

Moreover, the Fed’s formulation of a probabilistic distribution for these factors appears to draw on two principal inputs – (a) variation in historical forecasting errors for each forecasting service (essentially a measure of their historical precision¹²); and (b) more nuanced set of distributional predictions drawn from survey responses in the SPF. It is difficult to discern, however, how exactly this hybrid was computed. For housing prices, in contrast, tail risks appear to be generated almost entirely by historical variation since 1900 (see SCAP-D&I fn 4); but the document treats it so tersely that it is difficult to tell for sure.¹³ The opacity of this process necessarily implicates issues of replicability as well. Although the baseline cases appear to be straightforward and largely replicable with available data, the adverse is both more difficult to deduce from first principles, to infer from the Fed’s description, and to replicate in practice.

We also have some concerns about the robustness of the formulation of the baseline and adverse cases. As noted above, it might have been more helpful (but also more cumbersome) to analyze multiple adverse cases rather than only one. In addition, even though the Fed’s approach captured some of the more important macroeconomic factors, it

¹²We point out one potential quibble with plausibility here: historical error rates among professional forecasters might also serve as the basis for a more refined “baseline” case. That is, the Fed might have tried to assemble a “weighted” average of each forecast, in which the weights correspond to the relative precision of each forecast. It is unclear why this approach was not undertaken (though it is possibly due to data limitations owing to the shorter track record of some forecasters).

¹³For example, it is not clear from footnote 4 whether the 10% threshold in housing prices is drawn from Case-Shiller index (and we are unsure if it goes back much past the 1980s) or some other index, and if so what that index was.

omits others, such as interest rate risks, wage- and price inflation, and exchange rate risk. Each of these factors could play a significant role in assessing not only prospective default risks within asset classes, but potentially also asset valuations today. For example, to the extent that cash flow streams from mortgage assets constitute a large component of the BHCs’ value, and to the extent that many existing mortgages are themselves susceptible to interest rate risk, default rates would likely be quite sensitive to upward pressure on interest rates holding GDP, unemployment and even housing prices constant.

4.3 Stage 2: Projected Indicative Loss Rates

Given its baseline- and adverse-case projections for GDP growth, unemployment and housing prices, the next step of Stage 1 was to use each projection to generate anticipated indicative loss rates (or ranges thereof) within each asset class. As the SCAP-D&I and the SCAP-OR make clear (as did our conference calls), the Fed formulated a uniform set of loss ranges based the predictions made by a set of statistical models employed by the various agencies. Mathematically, the basic idea here was that for each asset class (denoted k) and future year (denoted t), the Fed would predict an indicative loss rate ($ILLR_{k,t}$), which is itself a function of unemployment in that year ($Unemp_t$), change in GDP in that year (ΔGDP_t), and changes in housing prices for that year (ΔH_t). This conceptual relationship might be represented by a heuristic framework as follows¹⁴:

$$ILLR_{k,t} = f_k(Unemp_t, \Delta GDP_t, \Delta H_t, Z_t) + \varepsilon_{k,t},$$

where $f_k(\cdot)$ represents a function that maps three macro-indicators ($Unemp_t, \Delta GDP_t, \Delta H_t$) into an “indicative loss rate” for asset class k , Z_t represents other (undisclosed) controls; and $\varepsilon_{k,t}$ represents the prediction error. Using regression and related statistical techniques, the Fed

¹⁴We note that this is but a heuristic model. While quite general, it is possible that the Fed used a set of predictive models that varied even from this general specification (through non-additive errors, for example). Indeed, one of our criticisms of the Fed’s approach here is that it is impossible to tell, exactly, what their precise empirical strategy was.

appears to have used historical data to estimate parameters of $f_k(\cdot)$. Using those parametric estimates, our understanding is that the Fed then projected out loss rates for both the baseline and more adverse cases of $(Unemp_t, \Delta GDP_t, \Delta H_t)$ for each of the next two years. The result of this projection, in turn, constituted the kernel of the two-year cumulative ILRs derived by the fed (See SCAP-OR, at p. 5, Table 1).

Although this general approach seems straightforward enough, it leaves a considerable number of details open. One of the more significant details relates to the precise nature and functional form taken by $f_k(\cdot)$. Here there is infinite room for variation – the function could be linear or non-linear; continuous or categorical; it could embed notions of dynamic credit cycles and ratings migration; it could embed the assumptions of systematic risk models, structural models, first passage models, reduced form models, VaR metrics, or a combination of them; it could involve lagged macroeconomic factors; it could involve varying use of other controls (Z_t). Neither the SCAP-D&I nor the SCAP-OR states explicitly how the Fed performed its macro-modeling, or the projections that emanated therefrom. To the contrary, that the SCAP-OR reports ILR *range* projections rather than specific *level* projections further compounded our uncertainty (at least initially) about their approach. A subsequent conference call with the Fed revealed that our confusion about the functional form of $f_k(\cdot)$ — as well as the expression of ILRs in ranges rather than scalar levels — was likely an artifact of a common characteristic: inter-agency heterogeneity. Specifically, each of the federal regulatory agencies involved in SCAP¹⁵ has access to its own unique data sources and agency-specific sets of models to generate loss projections. (In some instances, there also appeared to be considerable *intra*-agency heterogeneity of modeling approaches / data). The inter-agency collaboration in administering SCAP, according to our current understanding, therefore produced a range of predicted loss rates by asset class. In turn, the ILR ranges reported in SCAP-OR appear to represent the maximal and minimal loss predictions across agency

¹⁵That is, the Federal Reserve Board of Governors, the FDIC, the Federal Reserve Banks, and the Comptroller of Currency.

models for each asset class.

4.3.1 Comments and Concerns

Comparing this part of the ILR process (or at least our current understanding of it) to our desiderata articulated in Section 4 yields mixed conclusions. On the one hand, using econometric models that relate loss rates to differing macroeconomic scenarios (baseline and more adverse) is a sensible way to characterize loss exposure. Indeed, it is in many ways necessary: is difficult to think of any other way to go about generating loss rate projections. Moreover, the Fed’s utilization of heterogeneous forecasting models and data across agencies (thereby generating ILR ranges) represents a coherent (and somewhat clever) way to address potential robustness problems. Assuming the inter-agency heterogeneity is a reasonable proxy for epistemological ambiguity surrounding the appropriate model specification, the cross-agency collaboration represents a helpful way to account for model uncertainty issues that frequently plague risk management practices. Indeed, as the SCAP-OR report notes, average two-year loss rates on total loans under the adverse scenario exceeds the same two-year historical loss rate measure for all commercial banks in every year since 1920.¹⁶

On the other hand, beyond its description in broad strokes, the precise manners in which the ILRs were generated remains rather opaque. At no time have we been made privy to any of the macro model specifications used to forecast loss rates, the data fed into those models, or even a more detailed description about the distributional characteristics of projections themselves yielded by those models (beyond the upper and lower bounds evidently reflected in the ILRs). The description of the ILRs in the April 24 SCAP-D&I report was somewhat light on detail, which seemed peculiar given the fact that the ILR ranges would presumably have been communicated to the BHCs long before April 24. The actual ILRs used were not reported until the SCAP-OR report was

¹⁶The SCAP-OR report also notes that the Fed’s loss projections appear to be comfortably in the middle range of projections issued by others. While this is helpful and informative, it probably would have been more helpful to provide additional detail about the range of other analysts’ projections.

issued on May 7. The opacity of the ILR modeling process, in turn, also rendered the ILR ranges impossible to replicate, a fact that Fed researchers acknowledged to committee staff in a conference call.

Ultimately, while the broad-brush descriptions of the approach here seem both sensible and plausibly robust, there is effectively no way for a third party to replicate (or even, evidently, selectively audit) the ILR projections. We note that this stands in a stark contrast to the level of detail that was provided in the stress tests for Fannie May and Freddie Mac, for which even software for the stress test was eventually made public.¹⁷ We understand that that confidentiality issues lead to restrictions: one way around this may be to create a “representative” bank (e.g., an average bank) and provide a detailed description for the analysis of such a bank.

On the basis of our interactions with them, believe the Fed staff to be both professionally competent and acting in good faith. It may therefore be acceptable to take them at their word. Nevertheless, given the fact that the ILRs constituted an important focal point for the SCAP stress tests, the description of the process did not permit us to pierce through their derivations at anything more than a general level.

4.4 Stage 3: Tailored Loss Rates and Firm-Level Exposures

In the next stage of the SCAP, the 19 individual BHCs were provided with the ILRs and submitted material estimating their loss, income and resource figures over the two-year test period. Although the ILRs represented a starting point for estimating net loss exposure, during this reporting process the individual BHCs were allowed to make a case for varying from the prescribed ILRs if they could demonstrate a strong case for deviation. During this process, BHCs provided highly granular data, and supervisors made tailored adjustments according to numerous factors, including geographic differences, portfolio characteristics, international exposure, origination year, supervisory knowledge and other factors.

¹⁷See http://www.access.gpo.gov/nara/cfr/waisidx_06/12cfr1750_06.html

By the Fed’s estimate, upwards of 150 staff economists, managers, and financial analysts worked to assess the individual BHCs’ disclosures both across firms and across asset classes. This large array of staff was almost certainly warranted, given that the general heterogeneity of models and assumptions that individual BHCs use to manage and assess their firm-level risks. Ultimately, within our heuristic model, this cross-sectional design resulted in a set of tailored loss rates (or $TLLR_{i,k,t}$) for each firm i , asset class k , and year t such that:

$$TLLR_{i,k,t} = f_k(Unemp_t, \Delta GDP_t, \Delta H_t, Z_t, Y_{i,t}) + \varepsilon_{i,k,t},$$

where $Unemp_t$, ΔGDP_t , ΔH_t , and Z_t are as defined above, $Y_{i,t}$ denotes firm-specific controls that effectively tailor the projected loss rate for each firm. It is these loss rates that are ultimately reported in the SCAP-OR report (see SCAP-OR Table 3 and appendices).

In addition to loss rates, supervisors and BHCs worked to establish estimates of resources available to each BHC in the form of pre-provision net revenue (PPNR), along with projected allowances for loan and lease losses (ALLL) through 2011. As with the loss rates, the PPNR estimates took account of macroeconomic modeling and projected forward the two-year more adverse case. Any shortfall between anticipated losses and resources available to cover them through PPNR and ALLL would presumably come out of the capital buffer of the firm (discussed shortly).

4.4.1 Comments and Concerns

In our view, the tailoring process for loss exposures and resources presents something of a double edged sword. On the one hand, it is clearly sensible for the Fed to allow for tailoring of individual BHC’s loss rates. The 19 tested BHCs have significant cross sectional differences in portfolio characteristics, geographic presence, international exposure, management style, and other important characteristics relevant to loss exposure. To ignore that heterogeneity would be at the very least awkward, and at most antithetical to the SCAP’s mission. Indeed, if the ILRs were imposed rigidly and uniformly, in a one-size-fits-all fashion across

the 19 BHCs, the result could conceivably penalize those BHCs whose portfolios are carefully assembled to be relatively safe and hedged, and benefit those BHCs whose risks are relatively pronounced.

On the other hand, the process of tailoring introduces a number of intangible variables that can significantly skew the reliability of the stress tests in unpredictable (and perhaps unknowable) ways. Most notably, the significant interaction required between supervisors and the BHCs has the potential of undermining the objectivity of the stress tests. To be sure, this sort of interaction has always been part (indeed, in some respects an unavoidable one) of the bank supervision process. And, moreover, we have no doubt that the Fed endeavored to standardize and regularize its individual assessments across institutions and asset types, thereby bolstering the objectivity of the tests notwithstanding the significant interaction with BHCs. It may well be that the Fed's efforts in this direction were wholly successful, but we are not in a position to either confirm or reject this hypothesis. Indeed, when queried as to whether it would be possible to walk us through one or two examples of the tailoring process for specific (but anonymous) BHCs, Fed researchers reported that such an exercise was simply not practically feasible. In essence, it appears that the individual tailoring process was sufficiently complex that walking through a single example would necessitate (effectively) replicating the tailoring process *writ large*.¹⁸ As noted above, the Fed's derivation of even the uniform ILR ranges was sufficiently opaque to render replication elusive. The tailoring process amplified that opacity (and thus the non-replicability of the process) by orders of magnitude.

4.5 Stage 4: Determination of Buffer

Given a firm-specific set of adverse-case cumulative loss rates and risk-weighted assets, the final step of the process was to determine whether each BHC would possess a sufficient capital buffer at the end of 2010. As noted above, bank supervisory practice has historically required Tier

¹⁸Although we have no reason to doubt this assertion, the fact remains that it is somewhat of a show stopper for replication purposes.

1 capital to exceed 4% of the risk-weighted assets (RWA), and that Tier 1 capital itself be predominantly composed of voting common stockholders equity. For purposes of the SCAP (but only the SCAP), the Fed effectively re-sized the buffer to require each BHC to achieve a Tier 1 capital ratio of 6%, and a Tier-1 common capital ratio of 4% at the end of 2010, assuming the more adverse scenario were to transpire. Clearly, any BHC that passes muster under this re-sized test would, *a fortiori*, surpass historical minimum capital requirements. The Fed made adjustments to reflect after-tax growth in capital, anticipated accounting reforms, and with first-quarter PPNR numbers and capital structure changes at each of the BHCs. The results, reported in the SCAP-OR, indicate that 10 of the 19 BHCs required additions to their Tier 1 and/or Tier 1 common capital buffers, while the remaining 9 BHCs were already compliant.

4.5.1 Comments and Concerns

In our opinion, the Fed’s approach in specifying and sizing the required SCAP capital buffer seems sensible, transparent, and replicable. Relative to historical practice, it errs on the side of conservatism, and it attempts to provision for adequate capital needs at the end of 2010. Given the uncertainty of the current crisis, it seems defensible (at least to us) to vary in the conservative direction from historical practice. It is not altogether clear why the Fed pursued this conservatism by re-sizing (increasing) the buffer, as opposed to (say) formulating a more stringent capital definition (such through alternative capital measurement criteria tangible common equity¹⁹). Nevertheless, our sense is that within the time and information constraints they operated, the 6% / 4% sizing was, at the very least, a defensible first approximation. Indeed, by requiring buffers that are – at least by historical standards – supererogatory, the Fed has partially hedged against the possibility that after two years, we may still not be completely “out of the woods”.

¹⁹All ratings agencies utilize a TCE definition. Although these definitions are not identical across ratings agencies, we can see nothing that would prevent the Fed from either hybridizing them, or alternatively using each of them alternatively, as a potential robustness check. This alternative was apparently not pursued.

To the extent we have a concern with this stage of the process, it likely is rooted in a more general concern with assessing the appropriateness of a 2-year time horizon for projecting required capital buffers. At present, it is unknown how long the current recession will last, and it is quite plausible (though hopefully not probable) that it will continue for 3, 4, 5 or more years to come. Many of the impaired and illiquid assets on the BHCs' balance sheets are long term assets, maturing many years (or even decades) into the future. In all likelihood, most of these assets (and attendant risks) will remain on the books of the BHCs far past the end of the two year stress test period. The SCAP does not address (nor was it designed to address) subsequent impairment that these securities may continue to incur should the economy suffer through a series of adverse years.²⁰ Of course, if a longer time horizon is used, new issues arise. For example, with a longer horizon, the treatment of new cash flows becomes important — a nontrivial issue.²¹

One way to deal with this maturity issue would have been to conduct a longer-term stress test, projecting out the adverse case further into the future (at least for long-maturing illiquid assets in the BHCs portfolios). Quite clearly, that option was not pursued by the Fed in its design of the SCAP. To be sure, there are many hazards associated with making longer-term projections, and they are always subject to considerable noise. A second best would be to attempt to quantify for each BHC and across all BHCs what fraction of illiquid and highly risky assets have distant maturities. This would at least give provide an upper bound to loss exposures within those particular asset classes. Another potential option would be to revisit the SCAP approach periodically to reassess the risk profiles of these assets as they become more current. This approach may be the most practical at this stage, but it would be

²⁰We note, moreover, that not only are such assets more subject to ordinary volatility risk, but they are also more susceptible to risk factors left out of SCAP, such as interest rate and inflation risk.

²¹In the stress test of Freddie Mac and Fannie May, a ten year horizon was used and a “No new business” assumption was made, i.e., incremental cash flows were assumed to be reinvested in risk-free assets. The advantages and disadvantages of such an approach were discussed in the Report to Congressional Committees: GAO-02-521, see <http://www.gao.gov/new.items/d02521.pdf>

inconsistent with the Fed’s claim that the SCAP enterprise was to take place once and only once.

Finally, although it is not specifically a question about the capital buffer, we also have a concern about the extent to which the bank holding company is invariably the appropriate unit of analysis. In many respects, analyzing risks and assets at the consolidated holding company level makes sense, since it is a central repository for all obligations and revenue sources across its subsidiary entities. At the same time, the SCAP report does not explore the extent to which the BHCs may be able to use their own segmented corporate structure to compartmentalize (and thus externalize) risk, even if they have an adequate capital buffer in the aggregate. In other words, while the SCAP results endeavor to ensure the existence of an adequate capital buffer at the aggregate BHC level, it does not say much about how those resources and risks are (or should be) distributed within the parent-subsiary structure of each BHC. Would it be plausible, for example, for an apparently solvent BHC nonetheless to represent a considerable risk, since most of its exposure is concentrated in subsidiaries that are remote from its asset sources? Our current understanding of the SCAP design and implementation suggests that we cannot fully address such questions.²²

5 Conclusion

In this report we have attempted to accomplish three goals. The first was to offer a general survey of the basic ingredients of measuring risk, as well as an overview of the most common approaches to modeling financial risk. The second was to draw from this overview a set of core desiderata that are critical (in our view) for evaluating the Federal Re-

²²As a formal matter, federal banking regulations are often said to require bank holding companies to be a “source of strength” for their subsidiary banks – effectively imposing guarantor status on BHCs. See Regulation Y, Bank Holding Company Act, 12 U.S.C. 225 et seq. (1956); Board of Governors v. First Lincolnwood Corp., 439 U.S. 234 (1978). In principle, then, an effective source-of-strength doctrine implies that the BHC is the correct unit of analysis. In practice, however, the doctrine remains a poorly understood tool in the arsenal of banking regulators, with a number of potential limitations. Perhaps consequentially, it has been invoked only rarely historically.

serve's approach to risk assessment SCAP. Finally, we use these insights and desiderata to assess the relative merits of the SCAP analysis and results.

We conclude that the Federal Reserve Board's risk modeling approach is, on the whole, a reasonable one, erring for the most part on the conservative side. Given the enormity of the task, the degree of ambient uncertainty in the economy, the new presidential administration, and the need to act expeditiously, the Fed has assembled an approach in SCAP that provides helpful information about the prospective risks faced by bank holding companies, and a constructive prescriptive means for addressing those risks. The program also, as far as we can tell, assembled projections from multiple methodological approaches, and in so doing helped to avoid some of the most extreme problems associated with model risk. That this accomplishment was achieved in around four months is impressive, and it deserves both commendation and recognition.

Notwithstanding our general concurrence with the Fed's approach, however, we are left with some open questions about SCAP's design and implementation. Perhaps the most significant concerns relate to the program's transparency to outsiders and replicability of its results. As noted above, it would be virtually impossible for third parties to replicate the SCAP's conclusions, or even major sub-components of it. The lack of replicability is not, perhaps, too surprising given the confidential nature of the information at issue. But even from the standpoint of the (weaker) desideratum of transparency, it was difficult to discern precisely how the Fed assembled its indicative loss rate projections, or worked with banks to reconcile their own estimates to the indicative loss rates provided. This lack of transparency and replicability is a genuine concern, and ultimately confines our analysis to a general assessment of the program's broad-brush approach. Mollifying this concern somewhat is our impression that the Fed researchers who designed and implemented are professionally competent and acted in good faith and with due care. Even so, we would have preferred to see a more transparent implementation.

In addition, we have a few other concerns that we believe to be material (or potentially so). These include concerns that the SCAP was insufficiently sensitive to BHC ownership structure; that it neglected other sorts of micro- and macro-economic risks (such as interest rate, inflation, and cash flow / liquidity risks) that may be relevant in predicting loss ranges; that the SCAP used a short time horizon (two years) that may have been insufficient relative to the maturity of the underlying illiquid assets; and that the Fed did not evidently conduct robustness checks by varying the sizing of the cap or the measure of equity capital employed.

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Appendix A - Statistical risk measures

This Appendix contains a description of different statistical risk measures, and is more mathematical than the main text. Consider a variable, X , representing the loss of an individual risk or portfolio of risks. Here, positive values of X represent losses, and a larger X thus represents a larger loss. In general, X is a *random variable*, i.e., its value *ex ante* is not known.

A full characterization of the distribution of losses is given by the *cumulative distribution function*, or cdf, which is defined as:

$$F(x) = \mathbb{P}(X \leq x),$$

i.e., $F(x)$ is the probability that X is not larger than some specified realization, denoted as x . As an example, consider a loss that is either \$0, with 50% chance, or \$1 with 50% chance. In this case, the cdf is given in Figure 4. The cdf contains three regions, showing that there is a 0% chance that $X < 0$, a 50% chance that $0 \leq X < 1$ and a 100% chance that $1 \leq X$. This type of distribution — of a random variable that can take on two values — is frequently called a Bernoulli distribution. Statisticians frequently write $X \sim Be(p)$ for a Bernoulli distribution, X ,

such that the chance that X is 1 is p and the chance that X is zero is $1 - p$.

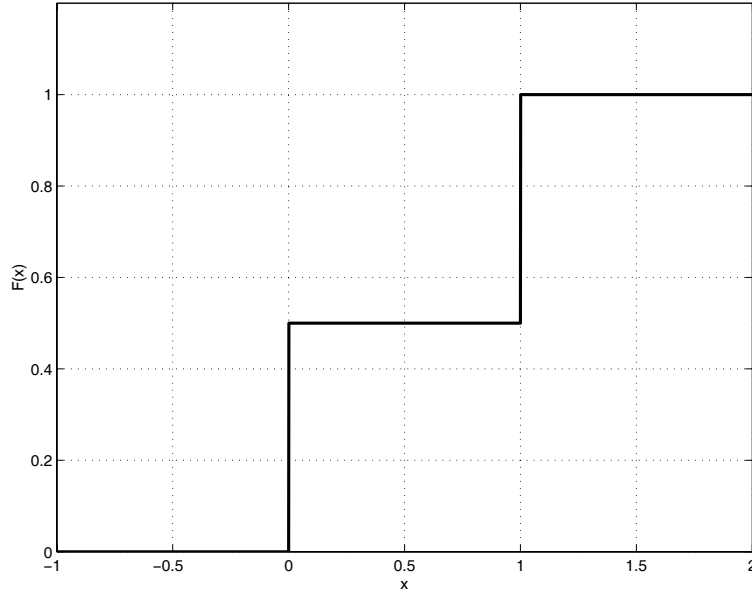


Figure 4: *Example of cdf.*

A commonly encountered distribution is the so-called normal distribution. The cdf of a standardized normal distribution is shown in Figure 1 below. As seen in the figure, the value is with very high probability somewhere between $X = -3$ and $X = +3$.

Another way of characterizing a random variable with a smooth cdf is with the *probability density function*, the pdf. Formally, the pdf is defined as the derivative of the cdf,

$$f(x) = F'(x), \quad F(x) = \int_{-\infty}^x f(y)dy.$$

The interpretation is that whereas the cdf provides the probability that X is not greater than x , the pdf provides the probability that X is very close to x , i.e.,

$$\mathbb{P}\left(x - \frac{\epsilon}{2} \leq X \leq x + \frac{\epsilon}{2}\right) \approx f(x)\epsilon, \quad (1)$$

for small ϵ . As an example, the pdf of the standardized normal distribution is given in Figure 5 below.

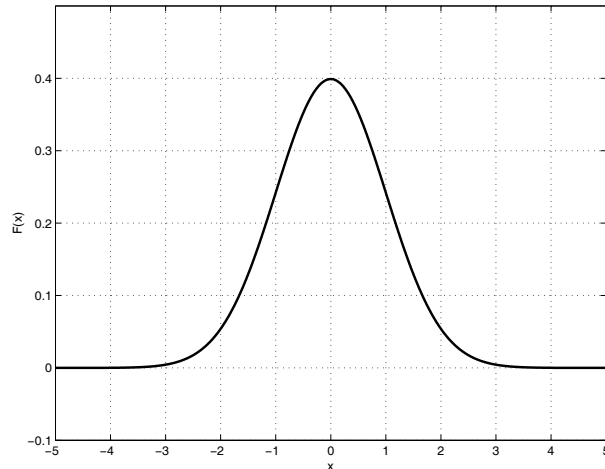


Figure 5: Pdf of standardized normal distribution.

We see in the figure that the chance is the highest that X is close to 0 and then atrophies in either direction as one moves away from $x = 0$, in line with the previous figure.

The expectation (or mean) of a random variable is defined as:

$$\mu = EX = \int_{-\infty}^{\infty} xf(x)dx.$$

From a well known result in statistics (called the law of large numbers), the average of a many independent draws of X is close to EX . The expectation of the standard normalized distribution is 0 and the expectation of the Bernoulli variable, $X \sim Be(p)$ is $EX = p$. If X represents a portfolio of risks, EX would represent the expected losses of the portfolio.

There are several ways to measure risk of a random variable. We describe the most common:

Variance, standard deviation and coefficient of variation

The *standard deviation* is perhaps the most commonly used measure reflecting riskiness. It is defined as

$$\sigma(X) = \sqrt{E[(x - \mu)^2]} = \sqrt{\int_{-\infty}^{\infty} (x - \mu)^2 f(x) dx} = \sqrt{\sigma^2(X)}, \quad (2)$$

where $\sigma^2(X)$ is the *variance* of the risk. In Figure 6 below, three normal distributions are shown, with different standard deviations. The standardized normal distribution has $\sigma(X) = 1$. The second distribution is defined as $X_2 = 2X$, and is therefore twice as risky, $\sigma(X_2) = 2$. We see in the figure that, indeed, the probabilities of X being further away from its mean (0) is higher for X_2 than for X . The third distribution is $X_3 = 0.5X_2$, with $\sigma(X_3) = 0.5$.

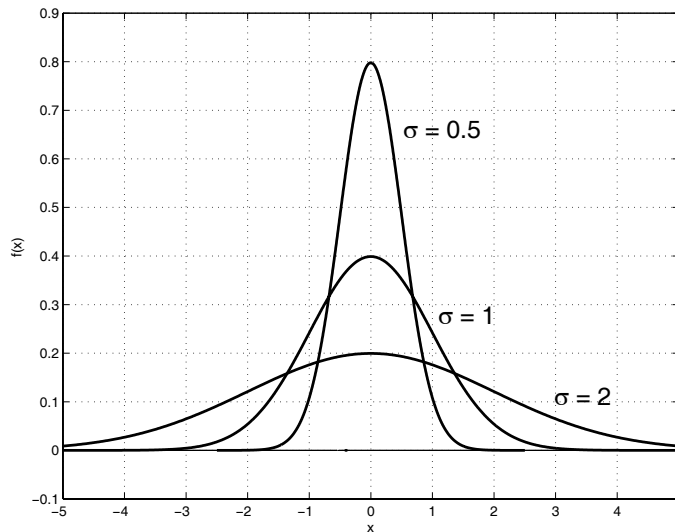


Figure 6: *Standard deviation of three normal distributions.*

In general, if X is a standardized normal distribution, then $X' = \mu + \sigma X$ is a normal distribution with mean μ and standard deviation σ . For such a random variable, we write $X' \sim N(\mu, \sigma)$. At times, it can prove convenient to work with a normalized version of the standard

deviation called the *coefficient of variation*:

$$c = \frac{\sigma}{\mu}.$$

As noted previously, standard deviation does not provide a complete characterization of riskiness. For example, $X \sim Be(0.5)$ has $\sigma(X) = 0.5$, as has $X' \sim N(0.5, 0.5)$. However, whereas X is either 0 or 1, X' can take on arbitrary large values.

Mean absolute deviation and general p -measures

Generalizations of the standard deviation measure are given by

$$\sigma_p(X) = \sqrt[p]{E[(x - \mu)^p]} = \sqrt[p]{\int_{-\infty}^{\infty} (x - \mu)^p f(x) dx}, \quad (3)$$

where $p \geq 1$. The special case $p = 2$ corresponds to standard deviation, whereas $p = 1$ corresponds to the so-called *mean absolute deviation*. Higher p 's will emphasize extreme deviations from the mean to a larger extent. The mean absolute deviation puts less emphasis on large deviations than the standard deviation, whereas the $p = \infty$ -measure (which is obtained by letting p tend to infinity) measures the maximum deviation from the mean.

Value at Risk (VaR) and expected shortfall

As mentioned, the Bernoulli distribution and the normal distribution have very different properties, in that the Bernoulli distribution is bounded whereas the normal distribution is unbounded. The standard deviation has little to say about this so-called *tail-behavior* of the distributions. The Value at Risk measure is tailored to provide more information about low probability events.

A VaR of x at the α confidence level implies that the probability of losses higher than x are $1 - \alpha$, i.e.,

$$\mathbb{P}(X > x) = 1 - \alpha \quad (4)$$

or, using the cdf,

$$F(x) = \alpha. \tag{5}$$

Thus,

$$VaR_\alpha(X) = F^{-1}(\alpha) \tag{6}$$

In Figure 2, we show the VaR at the 95% confidence level for the standardized normal distribution, being 1.65, representing a 5% probability that losses exceed 1.65.

The VaR thus takes the distribution's tail behavior into account. It does not, however, provide information about how large the losses will be, given that they exceed the losses at the 95% level. For example, a 5% chance of 1.6501 is very different from a 1% chance of 1.6501 and a 4% chance of 10, although they will give the same VaR at the 5% level.

The *expected shortfall* separates between these two situations, though. The expected shortfall is the expected loss, given that the VaR level is exceeded:

$$ES_\alpha = E[X|X > VaR_\alpha(X)] \tag{7}$$

The VaR together with the ES therefore provides additional information about the tail behavior of the distributions. We provide a more detailed discussion of the VaR measure in the next section.

Correlations and copulas

So far, we have only studied one individual risk, X , even though we allowed the interpretation that it can represent a whole portfolio of risks. If so, a crucial question is how the properties of the individual risks carry over to the portfolio risk. To calculate the distribution of the portfolio risk, information about the distribution of the individual risks — the *marginal distributions* — is not sufficient. For example, if X_1 and X_2 are standardized normal distributions, then $VaR_{0.95}(X_1) = VaR_{0.95}(X_2) = 1.65$, but $VaR_{0.95}(X_1 + X_2)$ can not be immediately inferred. If $X_2 = X_1$, $VaR_{0.95}(X_1 + X_2) = 2 \times 1.65 = 3.3$ whereas if $X_2 = -X_1$, $VaR_{0.95}(X_1 + X_2) = 0$. These are the two extreme examples of perfectly positively and negatively correlated risks, and there are many cases in between. The main point is that the risk-dependence of risks will be crucial in

determining the risk of a portfolio.

The simplest way to estimate the portfolio risk is with the correlation. The correlation between two risks is defined as

$$\rho = \frac{E[(X_1 - \mu_1)(X_2 - \mu_2)]}{\sigma_1 \sigma_2}, \quad (8)$$

where μ_1 and σ_1 are the mean and standard deviation of X_1 , and μ_2 and σ_2 are similarly defined for X_2 . The correlation is always between -1 (perfectly negatively correlated) and 1 (perfectly positively correlated), and provides one measure of the dependence of risks.

In the case of joint multivariate distributions, knowing all the correlations between risks (which is in itself a challenging task) is sufficient to provide a full characterization any portfolio of these risks, but, in general, the *joint cumulative distribution*, $F(x_1, x_2) = \mathbb{P}(X_1 \leq x_1 \cap X_2 \leq x_2)$ is needed to fully understand the portfolio risk. The joint distribution can not be inferred from the marginal distributions and, moreover, the joint distribution is typically hard to measure. This has lead to the development of simplified assumptions about the relationships of different risks.

Several types of dependencies have been studied, like joint multivariate normal distributions, and elliptical distributions. In recent years, copulas, which offer a tractable way of constructing a joint distribution from marginal distributions, have become popular. Copulas are analytically tractable, especially for specific assumptions about the dependence structure, e.g., the *Gaussian copula*, *Frank copula*, *Clayton copula*, etc. They are also completely general, since the so-called *Sklar's theorem* ensures that any joint distribution can be expressed via a copula.

To find out which is the correct copula to use, however, is as difficult a problem as finding out which is the joint distribution function. This is a high-dimensional problem, which is difficult to estimate with high confidence — especially in the tails of the distribution. Therefore, any choice of copula in practice makes a strong assumption about the risk distribution.

If the joint distribution of the risks in a portfolio, $F(X_1, X_2, \dots, X_N)$

is known, all the previous risk-measures can be calculated. However, usually only limited information is available, since empirically it is difficult to estimate

- the (marginal) tail distributions of individual risks. Empirical knowledge about these is limited as they occur so rarely.
- the joint behavior of the risks, since there are so many degrees of freedom of this behavior.

In practice, any risk-model will therefore have to be based on additional assumptions — assumptions that may not be directly testable.

Appendix B – Curricula Vitae of Talley & Walden

Eric L. Talley
Professor of Law
Faculty Co-Director, Berkeley Center for Law, Business and the Economy
University of California, Berkeley (Boalt Hall) School of Law
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(510) 642-7875 (office – UC Berkeley)
(617) 496-4099 (office – AY 2008-09)
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Web: www.ericталley.com

Professional/Employment

- 2008-2009 **Robert B. and Candice J. Haas Visiting Professor in Corporate Finance and Law**, Harvard Law School, Cambridge, MA.
- 2006-Pres. **Professor of Law**, University of California, Berkeley (Boalt Hall) School of Law. Co-Director, Berkeley Center for Law, Business and the Economy.
- 2004-Pres. **Senior Economist**, RAND Corporation, Santa Monica, CA, Institute for Civil Justice (Adjunct staff).
- 2006 **Guest Commentator**, *Marketplace* Radio; American Public Media. Weekly appearances on national *Marketplace* public radio program discussing significant trends in business, law, and the economy.
- 2005-2006 **Visiting Professor of Law**, University of California, Berkeley (Boalt Hall) School of Law. Co-Director, Berkeley Center for Law, Business and the Economy.
- 2005-2006 **Ivadelle & Theodore Johnson Chair in Law and Business**, University of Southern California, Gould School of Law.
- 2005-2006 **Professor of Finance and Business Economics (Secondary Appointment)**, University of Southern California, Marshall School of Business.
- 2000-2005. **Professor of Law**, University of Southern California Law School. (Director, USC Center in Law Economics and Organization, 2002-2004; Director, USC/Caltech Olin Center for the Study of Law and Rational Choice, 2002-2004).
- 2003 (Spr.) **Visiting Research Fellow**, Institute for Civil Justice, RAND Corporation, Santa Monica, CA.
- 2001 (Spr/Aut.) **Visiting Professor of Law**, California Institute of Technology, Department

of Humanities and Social Sciences.

- 2000 (Aut.)* **Visiting Professor of Law and Alfred P. Sloan Research Fellow,** Georgetown University Law Center.
- 1997-2000* **Associate Professor of Law,** University of Southern California Law School.
- 1995-1997* **Assistant Professor of Law,** University of Southern California Law School.
- 1993-94* **Contract Specialist,** Brown & Bain, Palo Alto, CA (non-practicing consultant).
- 1993* **Summer Associate,** Brown & Bain, Palo Alto, CA.
- 1993* **Lecturer,** Stanford Economics Department. Intermediate microeconomics.
- 1990, 1992* **Instructor,** Stanford Law School. Taught two seminars for law faculty on the fundamentals of economic analysis and game theory.

Courses Taught

- I. Corporate Law
- II. Corporate Finance
- III. Corporate Finance Topics (seminar)
- IV. Contracts and Commercial Law
- V. Mergers and Acquisitions
- VI. Securities Regulation
- VII. Law and Behavioral Economics (seminar)
- VIII. Law and Economics
- IX. Law and Game Theory (seminar)
- X. Quantitative Methods in the Law

Education

- Ph.D./J.D. **Stanford University Department of Economics & Stanford Law School.** 1989-95, 1999. Dissertation Committee: Paul R. Milgrom. (Principal); Ian Ayres; A. Mitchell Polinsky.
- B.A. **University of California, San Diego.** 1984-88. Magna Cum Laude. Majors: economics and political science; minor: mathematics.
- High School **Los Alamos High School,** Los Alamos, NM. 1981-84.

Books

- EXPERIMENTAL LAW AND ECONOMICS (Edward Elgar Publishing Ltd., forthcoming 2008) (co-editor, Jennifer Arlen).

Publications

- *Going Private Decisions and the Sarbanes Oxley Act of 2002: A Cross-Country Analysis* (with Ehud Kamar and Pinar Karaca-Mandic), 25:1 J. LAW ECON. & ORG. 107-33 (2009).
- *Public Ownership, Firm Governance, and Litigation Risk*, U. CHICAGO L. REV. (forthcoming 2008)
- *Hope and Dispair in the Magic Kingdom, In Re. Disney Shareholders Litigation*, ICONIC CASES IN CORPORATE LAW (Jonathan Macey, ed.) (2008) (with James D. Cox)
- *Introduction to Experimental Law and Economics*, in EXPERIMENTAL LAW AND ECONOMICS (Edward Elgar Publishing Ltd., 2008) (with Jennifer Arlen).
- *Investor and Industry Perspectives on Investment Advisers and Broker-Dealers*, RAND Technical Report TR-556-SEC (with Angela A. Hung, Noreen Clancy, Jeff Dominitz, Claude Berrebi, and Farrukh Suvankulov).
- *Design of the Qatar National Research Fund*, RAND Technical Report TR-209-QF (2008) (with Debra Knopman, Victoria A. Greenfield, Gabrielle Bloom, Edward Balkovich, D. J. Peterson, James T. Bartis, Stephen Rattien, Richard Rettig, Mark Y.D. Wang, Michael Mattock, Jihane Najjar, & Martin C. Libicki).
- *Experimental Law and Economics*, in HANDBOOK OF LAW AND ECONOMICS (A. Mitchell Polinsky & Steven Shavell, eds.) (2007) (with Colin Camerer).
- *Market Design with Endogenous Preferences* (with Aviad Heifetz & Ella Segev), 58 GAMES & ECON. BEHAVIOR 121-153 (2007).
- *Cataclysmic Liability Risk Among Big-Four Auditors*, 106 COLUM. L. REV. 1641 (2006).
- *On the Private Provision of Corporate Law* (with Gillian Hadfield), 22 J. LAW, ECON. & ORG 414 (2006).
- *Expectations and Legal Doctrine*, in PARADOXES AND INCONSISTENCIES IN THE LAW 183-204 (O. Perez & G. Taubner, eds. 2006).
- *Bargaining in the Shadow of Different Regimes* (with Ian Ayres), in Ian Ayres, OPTIONAL LAW (2005).
- *Unregulable Defenses and the Perils of Shareholder Choice* (with Jennifer Arlen), 152 U.

- PENN. L. REV. 577 (2003). *Corporate Practice Commentator* designation as author of one of the “Ten Best Corporate and Securities Articles written in 2004.”
- *Endowment Effects and Corporate Agency Relationships*, 31 J. LEGAL. STUD. 1 (2002) (with Jennifer Arlen and Matt Spitzer).
 - *On the Demise of Shareholder Primacy (or, Murder on the James Trains Express)*, 75 SO. CAL. L. REV. 1211 (2002) (comment on essay by V.C. Leo Strine).
 - *Securities Fraud Class Actions: 70 Years Young*, in RAND Review (Summer 2004), at 42.
 - *Playing Favorites with Shareholders*, 75 SO. CALIF. L. REV. 276 (2002) (with Stephen Choi) (reprinted with permission in 44 CORPORATE PRACTICE COMMENTATOR 235 (2002)).
 - *Law and Economics (Theory of)*, in THE OXFORD COMPANION TO AMERICAN LAW (David S. Clark, ed.) (2002).
 - *Your (Increasingly) Legal Options*, USC LAW 45 (Fall 2001).
 - *The Corporate Opportunity Doctrine*, in 2001 USC INSTITUTE FOR CORPORATE COUNSEL: READING MATERIALS (2001) (with Mira Hashmall).
 - *Disclosure Norms*, 149 U. PENN. L. REV. 1955 (2001).
 - *A Theory of Legal Presumptions* 16 J. L. ECON. & ORG. 1 (2000) (with Antonio Bernardo & Ivo Welch).
 - *Judicial Auditing*, 29 J. LEGAL STUD. 649 (2000) (with Matthew Spitzer).
 - *Taking the “I” Out of “Team”: Intra-Firm Monitoring and the Content of Fiduciary Duties*, 24 J. CORP. LAW 1001 (1999).
 - *Precedential Cascades: An Appraisal*, 73 SO. CAL. L. REV. 87 (1999).
 - *Turning Servile Opportunities to Gold: A Strategic Analysis of the Corporate Opportunities Doctrine*, 108 YALE L. J. 277 (1998). *Corporate Practice Commentator* designation as author of one of the “Ten Best Corporate and Securities Articles written in 2004.”
 - *Interdisciplinary Gap-Filling: Game Theory and the Law*, 22 J. LAW & SOC. INQ. 1055 (1997) (review essay).
 - *Investment Policy and Exit-Exchange Offers within Financially Distressed Firms*, 51 J. FINANCE 871 (1996) (with Antonio Bernardo).
 - *Liability-Based Fee Shifting Rules and Settlement Mechanisms Under Incomplete Information*, 71 CHI.-KENT L. REV. 461 (1995).

- *Distinguishing Between Consensual and Non-consensual Advantages of Liability Rules*, 105 YALE L. J. 235 (1995) (with Ian Ayres).
- *Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade*, 104 YALE L.J. 1027 (1995) (with Ian Ayres).
- *Contract Renegotiation, Mechanism Design and the Liquidated Damages Doctrine*, 46 STAN. L. REV. 1195 (1994).
- BARGAINING UNDER INCOMPLETE INFORMATION AND THE DESIGN OF LEGAL RULES, Doctoral Dissertation, Stanford University (1999).

Submitted Papers, Working Papers and Works-in-Progress

- *On Uncertainty, Ambiguity and Contractual Conditions* (2008)
- *Optimal Liability for Terrorism* (with Darius Lakdawalla) (2005)
- *Uncorporated Professionals* (with John Romley) (2004) (available for download at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=587982).
- *Equilibrium Expectations and Legal Doctrine* (2005).
- *The Impact of Regulation and Litigation on Small Business and Entrepreneurship: An Overview*, RAND Working Paper WR-317-ICJ (2006) (with Lloyd Dixon, Susan M. Gates, Kanika Kapur, and Seth A. Seabury).
- *Criteria Used to Define a Small Business in Determining Thresholds for the Application of Federal Statutes*, RAND Working Paper WR-292-ICJ (2005) (with Ryan Keefe and Susan M. Gates).
- *A Defense of Shareholder Favoritism* (with Stephen Choi 2002).
- *Incentives, Investment, and the Legal Protection of Trade Secrets* (with Gillian Lester) (submitted to J. LEGAL STUD., Oct. 2004) (revise and resubmit).
- *Corporate Governance, Executive Compensation and Securities Litigation* (May 2004) (with Gudrun Johnsen).
- *Private Information, Self-Serving Biases, and Optimal Settlement Mechanisms: Theory and Evidence* (November 2003) (with Seth Seabury).
- *Trade Secrets and Mutual Investments* (with Gillian Lester) USC Law School Working Paper # 00-15; Georgetown Law and Economics Research Paper No. 246406 (Oct. 2000).
- *A Note on Presumptions with Sequential Litigation*, USC Olin Working Paper # 99-9 (with

Antonio Bernardo) (1999).

- *Property Rights, Liability Rules, and Coasean Bargaining Mechanisms under Incomplete Information*, Stanford Olin Working Paper # 108 (1994).
- *Incentive Theory Falls Into Diablo Canyon: Optimal Regulation Under Political Constraints* (September, 1993).

Funding/Grants

- Securities and Exchange Commission Grant to study investment advisors and broker dealers, RAND Corporation, 1/2007-3/2008; \$280,000 (research staff, task director).
- Ewing Marion Kauffman Foundation, 3-year support grant to fund RAND Center for the Study of Small Business Regulation and Litigation; 11/03-10/06; \$1,500,000 (co-PI).
- John Olin Foundation, 3-year support grant to fund USC/Caltech Program in Law and Rational Choice, 6/02-6/05; \$300,000 (PI).
- University of Southern California, 3-year Seed Money Grant to Implement USC Center in Law, Economics and Organization, 7/00-6/03; \$800,000 (co-PI).
- University of Southern California Zumberge Junior Faculty Award, 8/97-6/98; \$30,000 (PI).

Endowed Presentations and Addresses

- Twenty-Fifth Annual Francis G. Pellegi Distinguished Lecture in Law, Delaware Journal of Corporate Law, Widener University, October 2008.
- Ninth Annual Distinguished Speaker Series, McGeorge Law School, University of the Pacific, November 2001 (*Common Agency in Fiduciary Law*).

Consulting/Testimony

- Ammari Electronics et al. v. SBC Yellow Pages (2008-09). Retained as expert on economic valuation of contract rights and damages calculation in breach of contract class action alleging delivery shortfalls of advertiser-sponsored directories.
- Marvell Technology Group (2007-08). Retained as expert consultant to provide corporate governance training to senior executive and board relating to managerial oversight, appropriate delegation, and conflicts of interest.
- Recipco v. Citigroup (Smith Barney) and Rothstein (2007). Retained as expert on corporate governance matters pertaining to the formation of, conduct of, and reaction to an internal investigation performed by a special litigation committee formed by a board of a privately-held company.

- Fitzhugh v. Granada Healthcare (2007). Retained as expert on corporate structure, limited liability, agency, the purposes of the corporate form, and piercing the corporate veil.
- Inamed LLC v. Newcomb et al. (2006). Retained as expert on the economic incentives regarding fiduciary and professional conduct obligations that an in-house attorneys owe to former employers in civil lawsuit involving a concentrated industry.
- Islamic Republic of Iran v. The United States of America (2006). Retained as expert for U.S. State Department on the nature and economic valuation of loss in context of property and contractual rights allegedly belonging to Iran but never repatriated. Iran-United States Claims Tribunal, The Hague, Netherlands.
- John Garamendi, California Insurance Commissioner v. Credit Lyonnais et al. (2004-05). Retained as expert on nature of optimal deterrence and damages in context of purchase/sale of financial assets.
- Doe v. Unocal Corp. (2003). Retained as expert on organizational structure, limited liability, agency, the purposes of the corporate form, and piercing the corporate veil.
- Deutsche Bank, North America Equities Research (2002). Retained to acquaint stock analysts of factors relevant to prospective injunctive relief order in breach of contract action between Boston Scientific Corporation & Cook, Inc.
- Robert J. Wagner vs. Aaron Spelling Productions et al. (2002). Retained as expert on bargaining dynamics and nature of economic loss in contractual settlement concerning cancelled network television series.
- Gonzales v. Michael Angelo's Foods (1999). Designated as expert on corporate opportunity appropriation.
- ARI Property Management Corp. v. Van Zoebrook et al (2001-02). Retained as expert on corporate opportunity appropriation.
- In re Tata Consultancy (1993). Retained as expert on reasonableness of liquidated damages provision in employment contract.

Recent Media Appearances (Selected)

- “Marketplace” American Public Radio: [Corporate Trials and Retrials](#) (January 2005) (interview with [Tess Vigeland](#) regarding ongoing white collar crime trials).
- “Marketplace” American Public Radio: [Merger Mania](#) (February 2005) (interview with [Kai Ryssdal](#)).
- “Marketplace Report on Day-to-Day” National Public Radio: [The Marketplace Report: SEC May Relax Regulations](#) (February 2005) (interview with [Tess Vigeland](#) regarding possible decline of corporate oversight and compliance regulations in the post-Enron era).
- “Marketplace” American Public Radio: [So Long and Farewell to the SEC](#) (June 2005) (interview with [Kai Ryssdal](#) regarding the departure of William Donaldson from the SEC).
- “Morning Edition,” National Public Radio: [Pension Fund Sues Morgan Stanley](#) (July 2005) (interview with Wendy Kaufman discussing Morgan Stanley compensation litigation by pension fund).
- “Marketplace” American Public Radio: [Cornering the Corner Office](#) (January 2006) (interview with [Tess Vigeland](#) regarding the SEC's proposed executive compensation reforms).
- “Marketplace” American Public Radio: [Ben Bernanke Preview](#) (January 2006) (interview with [Lisa Napoli](#) about the Federal Reserve's new chair).
- “Marketplace” American Public Radio: [Corporate Pension Plan Changes](#) (February 2006) (interview with [Lisa Napoli](#) regarding the recent trend in pension cutbacks and freezes at major U.S. Companies).
- “Marketplace” American Public Radio: [Betting on home prices](#) (February 2006) (interview with [Tess Vigeland](#) regarding real estate derivative markets) -- RealAudio Format.
- “Marketplace” American Public Radio: [The Supreme Court's Impact on Business](#) (March 2006) (interview with [Mark Austin Thomas](#) providing an update of business-related cases before the Court during the current term).
- “Marketplace” American Public Radio: [Regulating the NYSE](#) (March 2006) (interview with [Chery Glaser](#) regarding the challenges that confront the NYSE as it moves from a non-profit to a for-profit corporation).
- “Marketplace” American Public Radio: [Talley on Fastow](#) (March 2006) (interview with [Chery Glaser](#) regarding the Enron trial, Andrew Fastow's testimony and Sarbanes-Oxley)

- “Marketplace” American Public Radio: [Ernon Trial Continues](#) (April 2006) (interview with [Mark Austin Thomas](#) discussing the much-anticipated testimony of Ken Lay, and personality differences between himself and Jeffrey Skilling).
- “Marketplace” American Public Radio: [Accounting standards for small business](#) (April 2006) (interview with [Mark Austin Thomas](#) discussing the SEC's Advisory Committee on Small Business' recommendation that the internal controls section of the Sarbanes-Oxley act be relaxed for small-cap and micro-cap issuers)
- “Marketplace” American Public Radio: [Demand Is High for Lawyers](#) (April 2006) (interview with [Mark Austin Thomas](#) discussing the recent increases in large law firm salaries for first year associates) -- RealAudio Format.
- “Marketplace” American Public Radio: [Going Bankrupt Isn't Cheap](#) (April 2006) (interview with [Mark Austin Thomas](#) discussing legal and professional fees being paid in high-profile bankruptcies).
- “Marketplace” American Public Radio: [Shareholder Activism](#) (May 2006) (interview with [Mark Austin Thomas](#) discussing shareholder activism).
- “Marketplace Money” American Public Radio: [Secrets and Stocks](#) (May 2006) (interview with [Kai Ryssdal](#) regarding the secrecy policies of companies like Google and how much that should matter for investors).
- “Marketplace” American Public Radio: [White House Economic Forecast](#) (June 2006) (interview with Stace Vanek-Smith discussing inferences from mid-year report on the economy).
- “Marketplace” American Public Radio: [HP Drama Unfolds on Capitol Hill](#) (September 2006) (interview with [Kai Ryssdal](#) regarding the ‘pretexting’ scandal at Hewlett-Packard Co.).
- “Mornings on 2” KTVU Television (September 2006) (interview with Ross McGowan discussing the ‘pretexting’ scandal at Hewlett-Packard Co.).
- “Morning Edition,” National Public Radio: [Merck Cleared in Vioxx Death Case](#) (March 2007) (interview with Wendy Kaufman discussing litigation strategy and settlement in multi-district tort litigation).
- “Marketplace Money” American Public Radio: [The changing face of investor lawsuits](#) (June 2007) (interview with [Tess Vigeland](#) regarding recent Supreme Court business and securities cases).
- “Forum” (with Michael Krasny); KQED Radio, San Francisco: [Stock option backdating scandal](#) (August 2007) (panel interview and discussion with Dave Iverson).
- “Marketplace” American Public Radio: [Is there subprime in your portfolio?](#) (August 2007) (interview with [Ashley Milne-Tyte](#) regarding contagion effects from the subprime market crisis).

Awards and Service

- Chair, Dean Search Committee, Haas Business School, UC Berkeley (2007-2008).
- Member, National Science Foundation Law and Social Science Grant Evaluation Panel (2008 - Present).
- Board of Directors (Elected), American Law and Economics Association (Three-year term: June 2005- May 2008).
- Program Committee, American Law and Economics Association Annual 2006 Conference (with D. Rubinfeld, and K. Pastor) (November 2005 – May 2006).
- Chair, Administration and Finance Committee (Elected), USC Law School 2004-05.
- Finance Committee, University of Southern California Board of Trustees (faculty representative), 2004-05.
- Representative (Elected), Faculty Senate, University of Southern California 2004-05.
- Board Treasurer, The Growing Place Early Childhood Education Center Board of Directors (non-profit) 2004-05.
- Director, The Growing Place Early Childhood Education Center Board of Directors (non-profit), 2002-2004.
- *Corporate Practice Commentator* designation as author of one of the “Ten Best Corporate and Securities Articles written in 2004 (for *Unregulable Defenses and the Perils of Shareholder Choice*). 4/05.
- Chair, Faculty Appointments Committee, USC Law School 2003.
- Chair, AALS Section in Law and Economics, 2004-05.
- Chair, AALS AALS Section in Contracts, 2007-08.
- Chair, Faculty Handbook Committee, University of Southern California, 2002-03. Oversaw complete reorganization of faculty handbook (approved by USC Faculty Senate, 2004).
- Alfred P. Sloan Foundation Research Fellowship, Georgetown Law Center. 9/00-12/00.
- *Corporate Practice Commentator* designation as author of one of the “Ten Best Corporate and Securities Articles written in 1999” (for *Turning Servile Opportunities to Gold: A Strategic Analysis of the Corporate Opportunities Doctrine*). 3/00.

- Zumberge Junior Faculty Research Award, USC. 7/97 - 7/99.
- Centennial Teaching Award, Stanford University. 6/95.
- Articles Editor, *Stanford Law Review* 1993-94 (Volume 46).
- Outstanding Teaching Assistant Award in Economics. 3/94; 6/94; 12/94.
- Hellman Prize for Outstanding Law-Review Note, *Stanford Law Review*. 5/94
- Fellow, Stanford Center for Conflict and Negotiation. 11/92-10/93
- Goldsmith Award for Outstanding Paper in Dispute Resolution. 4/93
- Hilmer Oehlmann, Jr. Prize for excellence in legal research and writing. 5/92
- John Olin Foundation Fellowship in law and economics. 4/94; 6/94; 6/92
- Phi Beta Kappa
- Departmental Honors in both economics and political science, University of California, San Diego. Graduated Magna Cum Laude from Revelle College. 12/88

Professional Affiliations

- Referee, *American Economic Review*; *Rand Journal of Economics*; *Journal of Law, Economics & Organization*; *Journal of Legal Studies*; *Review of Economic Studies*; *International Review of Law and Economics*; *International Economic Review*; *Journal of Law and Economics*.
- Member, American Law and Economics Association; Western Economics Association
American Finance Association
- Board of Advisors, Southern California Center on Governance.

PhD Students/Advisees

- Surajeet Chakravarty, USC Economics Department (PhD), Lecturer, University of Exeter Business School.
- Svetlana Pevnitskaya, USC Economics Department (PhD), Assistant Professor of Economics, North Carolina State University.
- Kathy Zeiler, Caltech, Social Science (PhD) / USC Law (JD), Associate Professor of Law, Georgetown University

- Jingfeng Lu, USC Economics Department (PhD), Assistant Professor, National University of Singapore Department of Economics.
- Brian Broughman, UC Berkeley JSP Program (PhD), Assistant Professor of Law, University of Indiana.
- Michael Gilbert, UC Berkeley JSP Program (PhD), Assistant Professor of Law, University of Virginia.

Personal

- Date of Birth: 26 March, 1966.
- Married (since 1998) to Prof. Gillian Lester, UC Berkeley Law School. Two children, ages 5 and 7.
- Hobbies include cycling, hiking, classical/jazz guitar, tennis, and skiing.

JOHAN WALDEN

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Web: <http://www.haas.berkeley.edu/faculty/walden.html>

GENERAL Male, Born 1969, Married, Swedish citizen

EDUCATION Ph.D., Financial Economics, Yale University, 2005.
• Title of Thesis: “Investing when knowledge is limited – Essays in Financial Economics”
M.A., Financial Economics, Yale University, 2004.
Docent (equivalent to Associate Professor), Applied Mathematics, Uppsala University, Sweden, 2000.
• Title of Docent lecture: “Solving differential equations numerically with wavelets”
Ph.D., Applied Mathematics, Uppsala University, Sweden, 1996.
• Title of Thesis: “Wavelet solvers for hyperbolic PDEs”
M.S., Business studies and Economics, Uppsala University, Sweden, 1996.
M.S., Engineering Physics, Uppsala University, Sweden, 1992.
B.A., History, Uppsala University, Sweden, 1992.

RESEARCH INTERESTS Asset pricing, heavy tailed risk distributions, human capital and capital markets, numerical asset pricing

EXPERIENCE *Assistant professor of finance, UC Berkeley, Haas School of Business, Berkeley, CA, 2005-*

Management consultant, McKinsey & Company, Stockholm, Sweden, 1999-2002.

- *Position:* Engagement manager (March 2001-July 2002), Associate (Oct 1999-Feb 2001).
- *Responsibilities:* Leading McKinsey teams (1-3 consultants) and client groups (1-5 persons) in overall study and managing teams’ day-to-day work.
- *Other:* Member of asset management and financial institutions practices. Participated in practice knowledge development and attended training sessions and conferences.

Postdoctoral research associate, Yale University, Department of Mathematics, New Haven, CT, 1997-1999.

- Developed and implemented fast numerical algorithms for solving partial differential equations, using wavelet methods.

Software consultant (part time), Fast Mathematical Algorithms and Hardware Corporation, Hamden, CT, 1997-1999.

- Developed and implemented fast C algorithms for analysis of noisy data.

Lecturer, Uppsala University, Department of Scientific Computing, Uppsala, Sweden, 1996-1997.

- Taught courses in “C++ programming” (undergraduate) and “Wavelet theory” (graduate).

Analyst (part time), Swedish National Institute of Building Research, Sweden, 1990-1992.

- Implemented and analyzed macroeconomic models of Swedish housing sector.

Group leader, Swedish Army, Enköping, Sweden, 1989-1990.

Teaching:

- MBA core finance, 2006, 2007, 2008, 2009.
- Executive education: Berkeley CED 2006, 2007, 2008 and Singapore NUS 2006, 2007, 2008.

HONORS, GRANTS & FELLOWSHIPS

- Cheit Award for Teaching Excellence in EW MBA program, 2007.
- UC Berkeley Junior Faculty Research Grant, 2005, 2006, 2007.
- National University of Singapore, RMI grant, 2007, 2008, 2009.
- Lehman Brothers Fellowship for Research Excellence in Finance, 2004, one of five finalists.
- Swedish Foundation for International Cooperation in Research and Higher Education (STINT), Fellowship for research in US, 1997-1999.
- ICOSAHOM travel grant, to International Conference in Spectral and High Order Methods, Herzliya, Israel 1998.
- Society for Industrial and Applied Mathematics' (SIAM) competition for best student paper in applied and computational mathematics, one of five finalists, 1996.
- Swedish Natural Research Council (NFR), Grant, 1992-1996.
- Stiegler's Fellowship for excellence in undergraduate studies, 1992.
- Marquis Who's Who, Included since 1998.

WORKING PAPERS

- "Capital, Contracts and the Cross Section of Stock Returns," with Christine Parlour.
 - Presented at London Business School, INSEAD, EWFS 2008, WFA 2008, CEPR summer meeting 2008 and NBER spring asset pricing meeting 2008. *Revise and Resubmit at Review of Economic Studies*
- "Asset Pricing in Large Information Networks," with Han Ozsoylev.
 - Presented at Oxford Symposium on Financial Markets 2008, NBER summer asset pricing meeting 2008, University of Toulouse, Annual Cowles conference. *Revise and Resubmit at Review of Financial Studies*
- "Optimal Budding Strategies under Heavy Tailed Valuations," with Rustam Ibragimov.
 - *Revise and Resubmit at Management Science.*
- "Pricing and Capital Allocation for Multiline Insurance Firms," with Rustam Ibragimov and Dwight Jaffee.
 - Presented at the 2008 Symposium on Non-Bayesian Decision Making and Rare, Extreme Events, Bergen, Norway. Submitted
- "Insurance Equilibrium with Monoline and Multiline Insurance," with Rustam Ibragimov and Dwight Jaffee.
 - Presented at University of Tokyo and American Risk and Insurance Association 2008, Portland, Or. Submitted.
- "On the Survival of Irrational Investors in Large Financial Markets," with Yuri Fedyk.
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Section Two: Additional Views

A. Rep. Jeb Hensarling

1. General Program Overview

As a member of the Congressional Oversight Panel (COP or the panel) for the Troubled Asset Relief Program (TARP), it has become evident to me that, unfortunately, the program is no longer being utilized for its intended purposes of financial stability and taxpayer protection. It is being used instead to promote the economic, social and political agendas of the current administration. As evidenced by TARP's financing of two bankrupt auto makers, multiple capital infusions into "healthy" institutions, increased complexity for institutions wishing to repay TARP, I have come to the conclusion that Congress' original intent for financial stability and taxpayer protection is no longer being respected and the program should be unwound.

2. Background and the Congressional Oversight Panel's Statutory Responsibilities

On October 3, 2008, Congress voted to enact and the president signed into law the Emergency Economic Stabilization Act of 2008 (EESA). The act provided the United States Treasury with the authority to spend \$700 billion to stabilize the U.S. economy and prevent a systemic meltdown. The act also established two bodies with broad oversight responsibilities: the COP and the Financial Stability Oversight Board (FSOB). The act placed audit responsibilities in the GAO and a Special Inspector General for the Troubled Asset Relief Program (SIGTARP).

While the oversight and audit organizations have some overlapping responsibilities, only the COP is specifically empowered to hold hearings, take testimony, receive evidence, administer oaths to witnesses, and review official data, and is required to write reports on the extent to which the information on transactions has contributed to market transparency.¹⁹⁶

The EESA statute requires COP to accomplish the following, through regular reports:

- Oversee Treasury's TARP-related actions and use of authority;
- Assess the impact to stabilization of financial markets and institutions of TARP spending;
- Evaluate the extent to which TARP information released adds to transparency; and
- Ensure effective foreclosure mitigation efforts in light of minimizing long-term taxpayer costs and maximizing taxpayer benefits.

¹⁹⁶ Congressional Research Service, *Emergency Economic Stabilization Act: Preliminary Analysis of Oversight Provisions* (Nov. 20, 2008).

All are tremendous responsibilities. However, the American people, through Congress, determined that each were necessary and expressed confidence that the COP, as an organization and an arm of Congress, was the right body to carry out the assigned tasks.

It is no secret that I voted against EESA. However, as the only sitting member of Congress on the COP, I have consistently expressed my commitment to ensure that the TARP program works, that decisions made are based on merit and not political considerations, and most importantly, that the taxpayers are protected. I respect the panel and each of its members and staff; however, I fear that by choosing to focus much of its work on issues not central to our mandate the panel has missed critical opportunities to provide effective oversight.

The American people have long understood that when it comes to government actions, sunshine is the best disinfectant. The COP is supposed to ensure that the sun is always shining when it comes to Treasury's actions and the use of TARP funds. However, due to the panel's pursuit of interesting topics for legislative and policy debates, taxpayers have not received answers as to whether the TARP program works, how decisions are being made or what the banks are doing with the taxpayers' money. A number of anecdotes exist, but the panel has the ability to establish the facts.

As I have said in the past, effective oversight begins with a vigorous examination of those who administer the TARP. Unfortunately, the panel has conducted only one hearing with a Treasury official during its six-month existence. As a starting point, I echo my call that the panel hold a hearing each month with the Secretary of the Treasury or a senior designee with TARP management responsibilities. If the Treasury refuses to participate, the panel should hold its officials to account for not participating. If the panel refuses to call regular hearings with Treasury officials, the American public and Congress should hold the panel to account for negligence.

Additionally, effective taxpayer accountability requires that the panel question TARP recipients. To date, the panel has questioned 3 institutions, representing 0.11 percent of total TARP authorization, out of over 600¹⁹⁷ TARP recipients. None of the major TARP recipients have been questioned in a public hearing.

If presented with the opportunity, I believe the taxpayers would pose the following types of questions to the TARP recipients in a matter-of-fact, plainspoken American manner:

- Did the financial stability of the economy require that you accept TARP funds in the first place? Did your business model, risk management techniques, compliance protocols and underwriting standards threaten macroeconomic stability?

¹⁹⁷ Total number of financial institutions participating in Treasury's Capital Purchase Plan. See U.S. Department of the Treasury, *Seventh Tranche Report to Congress* (June 3, 2009) (online at www.financialstability.gov/docs/TrancheReports/7th_Tranche-Report-Appendix.pdf).

- If so, have you addressed those issues to ensure that taxpayers won't be called upon once again to infuse capital into your company? Please tell us what remedial actions you took and why you think they will be effective.
- If the financial stability of our economy did not require a TARP infusion into your company, did Treasury "force" you to accept any TARP funds? If so, please tell us what happened.
- When can taxpayers expect you to repay the TARP funds?
- To achieve the goal of financial stability, do you anticipate the need for additional TARP funds? If so, how much and when will you need the additional TARP funds?
- Has Treasury refused to permit you to repay all or any part of your TARP funds in the name of financial stability? If so, please tell us about your disagreement with Treasury.
- We realize that money is fungible, but please tell us what you did with your TARP funds.
- Has Treasury or anyone from the government "encouraged" (or directed) you to (i) extend credit to any person or entity or (ii) forgive or restructure any loan that may run counter to the goal of your company's financial stability?
- Using the TARP funds your company has received as leverage, has Treasury or anyone from the government "assisted" (or directed) you in managing the affairs of your institution?
- Did your receipt of TARP funds result in new lending activity or increased lending activity?

While the COP has reviewed a number of historical precedents and commented on various policies, including how Iceland handled its banking crisis, the panel cannot tell the American people what safeguards Treasury has in place to ensure that TARP money is not being wasted or if TARP money is being used in their best interest. The panel knows the answers to ancillary questions regarding how Spain, Germany, and Italy handled their banking crises, but the panel cannot answer fundamental questions on how Treasury is handling the current crisis. For example, the COP should ascertain how Treasury measures success, how it will know when TARP funds are no longer required, and what is Treasury's exit strategy. The taxpayers deserve to know answers to these fundamental questions, and it is the COP's duty to help provide them.

As SIGTARP discussed at length in its last report, TARP has expanded a "tremendous" amount in scope, scale and complexity.¹⁹⁸ I am including analysis of and questions about

¹⁹⁸ Office of the Special Inspector General for the Troubled Asset Relief Program, *Quarterly Report to Congress* (Apr. 21, 2009) (online at

additional, key TARP-related issues upon which the panel has so far failed to shed light. I have also provided a few observations on the panel's June report.

a. Investigation of Chrysler's and GM's Bankruptcy and Restructuring

Under the terms of the proposed Chrysler restructuring plan, the Chrysler senior secured creditors will receive 29 cents on the dollar and the pension funds of the United Auto Workers (UAW), each an unsecured creditor, will receive 43 cents on the dollar and a 55 percent equity ownership interest in the "new" Chrysler, even though the claims of the senior secured creditors are of a higher bankruptcy priority than the claims of the UAW.¹⁹⁹ The State of Indiana's pension funds, one group of Chrysler's secured creditors, filed an appeal to the Chrysler sale, causing the bankruptcy judge to freeze the proceedings. In their filing, the funds stated, "This attack on the most fundamental of creditor rights has been funded, orchestrated and controlled by Treasury, despite its complete lack of statutory and constitutional authority to do so."²⁰⁰

Under the terms of the proposed GM restructuring plan, the United States and Canadian governments, the UAW pension funds and the GM bondholders will receive an initial common equity interest in GM of 72.5 percent, 17.5 percent and 10 percent, respectively. The equity interest of the UAW pension funds and the GM bondholders may increase (with an offsetting reduction in each government's equity share) to up to 20 percent and 25 percent, respectively, upon the satisfaction of specific conditions. The GM bondholders have been asked to swap \$27 billion in debt for a 10-25 percent common equity interest in GM, while the UAW has agreed to swap \$20 billion in debt for a 17.5-20 percent common equity interest and \$9 billion in preferred stock and notes in GM.²⁰¹ Apparently, even though the bankruptcy claims of the UAW pension funds and the GM bondholders are of the same priority, the UAW will receive a disproportionately greater distribution than the GM bondholders in the reorganization.

Given the unorthodox reordering of the rights of the Chrysler and GM creditors, a fundamental question arises as to whether the Administration directed that TARP funds be used to advance its policy and legislative objectives rather than to stabilize the American economy as required by EESA. In other words, did the Administration use any TARP funds as a carrot or stick? The Administration should also inform the American taxpayers regarding its proposed

www.sig tarp.gov/reports/congress/2009/April2009_Quarterly_Report_to_Congress.pdf (hereinafter "SIGTARP April Report").

¹⁹⁹ Chad Bray and Alex P. Kellog, *Court Affirms Chrysler Sale but Puts Deal on Hold Until Monday*, Wall Street Journal (June 3, 2009) (online at online.wsj.com/article/SB124423529553090069.html#mod=testMod).

²⁰⁰ Tiffany Kary, et al., *Chrysler Says Indiana Pension Funds Can't Win Appeal*, Bloomberg (June 4, 2009) (online at www.bloomberg.com/apps/news?pid=20601103&sid=aDSQ2KKXfDPI).

²⁰¹ Peter Whoriskey, *U.S. Gets Majority Stake in New GM*, Washington Post (June 1, 2009) (online at www.washingtonpost.com/wpdyn/content/article/2009/05/31/AR2009053101959.html?sid=ST2009060100034).

exit strategy from the Chrysler, GM and other TARP investments and whether it plans to reinvest such proceeds in other entities.

The panel has agreed to hold a public hearing on the Chrysler and GM reorganizations. I commend the panel for this oversight effort. An effective hearing will take place as soon as possible in the nation's capitol and include senior Treasury officials, auto company executives, union executives, TARP recipient bondholders, and non-TARP recipient bondholders, to name a few. In order to discharge its specific duties and responsibilities under EESA in a professional and timely manner, the panel should seek answers to the following additional questions (among others):

- Why would certain Chrysler and GM creditors agree to accept less than what they were contractually owed and entitled to receive under bankruptcy law?²⁰²
- Specifically, what is the legal and business justification for preferring the claims of the UAW pension funds over the claims of (i) the Chrysler senior secured creditors since the claims of such creditors are of a higher bankruptcy priority and should receive preferential treatment under bankruptcy law, and (ii) the GM bondholders since the claims of the UAW and the GM bondholders are of the same bankruptcy priority (both unsecured) and should receive identical (or at least substantially similar) treatment under bankruptcy law?
- Does it matter that some of the creditors were also TARP recipients? TARP beneficiaries who were also secured bondholders of Chrysler - including Citigroup, JP Morgan Chase, Morgan Stanley, and Goldman Sachs - agreed to the swap of \$6.9 billion in debt for just \$2 billion in cash. Did these institutions acquiesce with the knowledge that losses from their Chrysler holdings may be replenished with TARP funds? Were they pressured into doing so? How would the taxpayer know whether or not Treasury channeled TARP funds through these institutions as a backdoor way of financing the auto industry and, indirectly, UAW claims? Were any of the GM bondholders TARP recipients?

²⁰² Thomas Lauria, a senior bankruptcy and reorganization attorney with the international law firm White & Case LLP, who represents a group of Chrysler creditors, recently stated on CNBC that the Administration flagrantly violated constitutional principles by trampling on the contractual rights of the Chrysler bondholders. This is a serious charge by a seasoned and well respected attorney at a top-tier law firm and should be investigated by the panel. See Thomas Lauria, *Interview: GM, Bonds & Beyond*, CNBC (May 13, 2009) (online at www.cnbc.com/id/15840232?video=1122734987&play=1); Thomas Lauria, *Interview: A Case of Gangster Government*, CNBC (May 8, 2009) (online at www.cnbc.com/id/15840232?video=1118369112&play=1); Thomas Lauria, *Interview: White House Bullying Bondholders?*, CNBC (May 6, 2009) (online at www.cnbc.com/id/15840232?video=1116040367&play=1).

- Why would TARP recipients (that by definition owe substantial sums to the United States government) agree to settle bankruptcy claims for less than the maximum amount allowable under bankruptcy law?
- Who authorized those decisions—the management of each TARP recipient or Treasury acting as the de facto manager of the TARP recipients—and what, if any, fiduciary duties were violated?
- If management of each such TARP recipient voluntarily agreed to forgive part of its claim against Chrysler and GM, as applicable, what was their legal basis for making such a gift?
- Why would TARP recipients agree to transfer part of their bankruptcy claims to another creditor—the UAW—and not use such amounts to repay their TARP loans?
- Did the Administration “reimburse” Chrysler and GM for any TARP funds transferred to the UAW?
- Did the Administration chose to prefer one group of employees—UAW members and their retiree benefits fund—over other non-UAW employees whose pension funds invested in GM bonds? Under such an approach the retirement plans of the UAW employees would be enriched while the retirement plans of the non-UAW employees would be diminished.
- What message does this send to the financial markets—should investors expect their contractual rights to be ignored when dealing with the United States government? How will the cases of GM and Chrysler affect future financings and reorganizations?
- What message does this send to non-UAW employees whose pension funds invested in Chrysler and GM indebtedness—you lose part of your retirement savings because your pension fund does not have the special relationships of the UAW?
- Is the Administration setting corporate policy and/or running the day-to-day affairs of Chrysler and GM, including the two reorganizations? If so, under what authority?
- Did the Administration “force” Chrysler to accept a deal with Fiat?
- Have the Chrysler and GM boards of directors and officers abandoned their fiduciary duties and acquiesced in the management decisions made by the Administration?
- Has the Administration appropriately discharged its fiduciary duties in its role as the de facto manager of an insolvent Chrysler and GM?

- Will the United States government be open to suit by private parties based upon the breach of its fiduciary duties owed to Chrysler and GM and their shareholders and creditors?
- Should the panel recommend that SIGTARP, which performs audits and investigations on abuse and fraud, investigate any such inappropriate use of TARP funds?
- What is the Administration's exit strategy regarding the investment of TARP funds in Chrysler and GM?

On top of a bankruptcy that will give the UAW a sweeter deal than comparable GM creditors, there is also the wider concern that GM is becoming another black hole for taxpayer dollars. The government will presumably receive a 72.5 percent initial ownership stake in exchange for \$50 billion of TARP funds committed so far. Although the President has called the government a "reluctant" shareholder that will "take a hands-off approach, and get out quickly," the Administration has presented no exit strategy for its ownership, nor any plan for recouping equity investments. In its latest baseline, the Congressional Budget Office (CBO) estimated that the TARP auto program carried about a 74 percent subsidy rate for the taxpayer – a rate calculated *before* GM announced bankruptcy and *before* loans were converted to what will amount to common stock. Congress and the public still have little knowledge of how the Administration will manage the automaker, how it assesses risks of taxpayer losses, and a strategy to unwind its investment. These issues will require rigorous and ongoing investigation by the COP.

Regrettably, the consequences of these actions may not be limited to Chrysler and GM but may resonate through and have a chilling effect on the broader bond and capital markets. Once investors realize that their contracts may not be respected by the Administration, if they even agree to participate, they will demand interest rate and other premiums to compensate for the enhanced risk. Such expenses will be passed on to consumers and will render American businesses at a competitive disadvantage to their foreign counterparts. Following the well-stumbled path of unintended consequences, two misguided attempts perhaps to favor the UAW may cause other hard working Americans to lose their jobs to business enterprises organized in foreign countries that continue to respect the sanctity of a contract. How can the Administration believe that its actions in the Chrysler and GM reorganizations will go unnoticed by the investment community? These "technicalities" may have not garnered the attention of most Americans but they are front-and-center issues with financial institutions and their counsel and investors. How can an Administration that is beating the drum with one hand to encourage financial institutions to extend credit poke the same financial institutions in the eye with the other hand? I suspect this lesson has not been lost on the financial community and may serve as one of the reasons for the community's tepid embrace of the TALF and PPIP programs.

b. Transparency of Bank of America's Acquisition of Merrill Lynch

Recently, reports have appeared to the effect that Treasury “coerced” Bank of America into purchasing Merrill Lynch even though Bank of America’s management concluded that the transaction was not in the best interest of the bank and its shareholder. In May the chair of the panel, Professor Elizabeth Warren, sent a letter to Treasury Secretary Geithner requesting his “thoughts on the issue.” In order to determine what actually occurred, the panel should investigate whether Treasury threatened to withhold TARP funds if Bank of America withdrew from the acquisition, when any such threats were made and if such actions impacted Bank of America’s decision to acquire Merrill Lynch.

c. TALF and PPIP

The COP’s April report indicates a lack of participation by potential investors in other government programs like the Term Asset-Backed Securities Loan Facility (TALF) and the Public-Private Investment Program (PPIP), due to the uncertainty regarding changing terms and conditions of the programs.²⁰³ Although the Federal Reserve announced that requests for participation in TALF increased \$11.5 billion from last month, the program had a rocky start and may pose a greater risk as it brings on commercial and residential mortgage-backed securities (MBS).²⁰⁴ The PPIP, which has not yet gone live, continues to be a program in limbo, and the FDIC now says it will delay the sale of legacy loans.²⁰⁵

As we await further details and in order to discharge its specific duties and responsibilities under EESA in a professional and timely manner, the panel should address the following inquiries:

- How have these uncertainties--specifically including the complex executive compensation rules, the threatened “outing” of certain AIG employees and their families, the alleged inequitable treatment of certain creditors of Chrysler and GM, and the pending SIGTARP investigations--affected the TALF and PPIP programs?
- Why haven’t hedge funds, private equity funds and other investors embraced the TALF and PPIP programs as anticipated by Treasury?
- Has Treasury marketed these programs to passive foreign investors and tax exempt organizations (as well as the typical domestic investors) and what regulatory and other burdens prohibit or limit the participation by such investors?

²⁰³ Jody Shenn, *Dudley’s TALF Comments Add Signs of a PPIP Stall*, Bloomberg (June 5, 2009) (online at www.bloomberg.com/apps/news?pid=newsarchive&sid=a2W17tAD6rEA).

²⁰⁴ Scott Lanman and Sarah Mulholland, *Fed Says TALF Loan Requests Increase to \$11.5 Billion*, Bloomberg (June 2, 2009) (online at www.bloomberg.com/apps/news?pid=20601087&sid=aUonjouK30hU).

²⁰⁵ Margaret Chadbourn, *FDIC Said to Delay PPIP Test Sale of Distressed Loans*, Bloomberg (June 2, 2009) (online at www.bloomberg.com/apps/news?pid=20601103&sid=aVLm8N96tvV0&refer=us).

- Are the tax laws written so as to encourage passive foreign investors to invest in performing loans and securities but discourage such investors from investing in distressed loans and securities?
- Why hasn't the panel called leaders in the financial and investment communities to testify as to why they consider the TALF and PPIP programs unattractive?
- What do potential investors like and what do they dislike, and why?
- Is it possible to address the "dislikes" in a reasonable and mutually beneficial manner?
- Why have some investors abandoned their participation in the programs after expressing initial interest?
- What legal and financial impediments exist?
- What other impediments exist?
- If Treasury is struggling to introduce market-ready investment programs, why hasn't the panel offered its assistance?

I am certainly not suggesting that hedge fund managers be permitted to structure the programs de novo, but since Treasury desperately needs private capital to arrest the financial crisis it seems entirely appropriate for the panel to solicit and consider the views of the targeted investor classes. Treasury and the panel must remember that private sector investors have limited capital to deploy and numerous attractive opportunities to consider and will not choose to invest in any Treasury program unless they expect to earn an appropriate risk adjusted rate of return without excessive administrative and regulatory burdens. These private sector institutions owe a fiduciary duty to their investors (which often include pension funds and university endowments) and simply cannot allocate capital to off-market investments.

With the full knowledge that private dollars will not participate unless they anticipate upside potential, the panel should also ask Treasury to provide more detail on how it assesses downside risk to the taxpayers of the TALF and PPIP programs. SIGTARP, for example, has already made several recommendations to Treasury on ways to reduce risk and the potential for fraud in TALF and PPIP. It is extremely concerned with the inclusion of legacy residential MBS in TALF, stating the Treasury should screen individual securities, have more stringent requirements for loans used as collateral, and require higher haircuts for all MBS. In addition, SIGTARP believes that PPIP is "inherently vulnerable to fraud, waste and abuse," including various conflicts of interests between participants.²⁰⁶

d. June COP Report

²⁰⁶ SIGTARP April Report, *supra* note 198.

The report is fairly straightforward in that it focuses on the mechanics of the recently completed stress tests. Although I voted “yes” to the report, I offer the following questions and observations.

i. Underlying Legal and Regulatory System. Increased government involvement in our housing markets created significant distortions and disruptions. This increased involvement is contrary to the oft-repeated, now disproven claims of proponents of expanded government control of our economy that a “wave” of market deregulation over the last 20 years caused the current crisis. To the contrary, facts indicate that there were at least five key factors which contributed to financial crisis, at least four of which were a direct result of government involvement. Those four factors — highly accommodative monetary policy by the Federal Reserve, continual federal policies designed to expand home ownership, the congressionally-granted duopoly status of housing GSEs Fannie Mae and Freddie Mac, and an anti-competitive government-sanctioned credit rating oligopoly — are thoroughly discussed in the Joint Dissenting Views to the COP’s “Special Report On Regulatory Reform” that I offered along with Senator John Sununu along with a fifth factor (failures throughout the mortgage securitization process that resulted in the abandonment of sound underwriting practices).²⁰⁷ As such, a thorough recitation of those points here would be redundant.

ii. Further Information on Counterparty Risk. The current COP report gives a broad overview of how bank holding companies (BHCs) provided estimates of counterparty losses, potentially occurring from deterioration in the credit markets, under the two stress test scenarios. But the fact remains that there is still a considerable amount of uncertainty about the inputs used to stress test counterparty agreements like credit default swaps and similarly-structured products. The panel neglects to provide much detail beyond what the Federal Reserve’s SCAP “Design and Implementation” presents in its white paper. What was the interaction like between the BHCs, who ran the tests, and the Federal Reserve, who supervised them? Was the Fed able to validate counterparty data? There is also little discussion of disparate data among BHCs, and how the Federal Reserve rationalized what is a complicated framework with interdependent assumptions on the risks of default. If the financial institutions already have counterparty data available to reasonably assess losses, were another set of market shocks to occur, why is there still so much uncertainty about systemic risk? Is there any way for the Federal Reserve to separate the potential losses from agreements like credit default swaps from other potential trading losses? Information that addresses these questions would enable COP to fulfill its responsibility of assessing how effective TARP funds have been in stabilizing financial markets.

iii. Application of the Mark-to-Market Rules. Was the methodology applied to the “more adverse” scenario too conservative? That is, if the newly relaxed mark-to-market rules

²⁰⁷ Congressional Oversight Panel, *Special Report on Regulatory Reform: Modernizing the American Financial Regulatory System: Recommendations for Improving Oversight, Protecting Consumers, and Ensuring Stability*, at 54-89 (Jan. 29, 2009) (online at cop.senate.gov/documents/cop-012909-report-regulatoryreform.pdf).

were applied to the "more adverse" scenario by how much would the additional capital requirements have dropped? A lesser capital requirement would decrease the likelihood that the BHCs would have to raise equity capital by (i) selling stock in the market or under CAP, (ii) converting preferred stock (whether privately held or issued under the CPP) into common stock, or (iii) selling assets. No such alternative is in the best interests of the taxpayers or the BHCs and, as such, should be avoided unless necessary and appropriate. Perhaps prudent underwriting necessitates the use of the old mark-to-market rules under the theory ABS securities will continue to be worth far less than their face values. The panel should continue to investigate by how much the additional capital requirements would have dropped if the recently modified mark-to-market rules were applied to the "more adverse" scenario.

iv. "Negotiation" of Stress Tests. The report raises the question as to whether the stress test results were "negotiated" between the BHCs and their supervisors. The report notes that the supervisors informed the staff of the panel that there was no "negotiation" of the results except with respect to specific first quarter adjustments and clear errors and omissions.

The report also asks if the process could have been better handled in a more transparent manner. Although such inquiry is no doubt appropriate, absent evidence to the contrary, I think it might be counterproductive to dig aggressively into the discussions between the BHCs and their supervisors because such discussions were no doubt candid and may have indeed resulted in lower capital requirements for specific institutions. It's naive to think otherwise. It does not follow, however, that the regulators were persuaded to recommend inappropriately low additional capital requirements for any institution. Regulated entities and their supervisors typically discuss (and argue) at length the results of an examination or audit. Through this back-and-forth process each side presents its case and advocates the merits of its position. The regulated entity works to assist the regulator in better understanding how the applicable regulations should apply to its business, financial position and operating results, and the regulator argues in support of its application of the regulations to the regulated entity. This process is critical for the regulators because they are generally significantly outnumbered by the employees of the regulated entities. Regulated entities and their supervisors must have an open line of communication that permits each to speak frankly. Such interaction and exchange of ideas between a regulated entity and its supervisor by no mean implies that the regulated entity acted in an inappropriate manner or that the regulator conceded an issue that is not in the best interest of the taxpayers. If credible evidence develops to the contrary the panel should promptly investigate, otherwise any investigation will most likely yield only the obvious: the supervisors presented their results to the BHCs; the BHCs commented on any inconsistencies, errors and omission; the supervisors made any modifications to their reports that they considered appropriate in their sole and absolute discretion; and the results were released.

v. CMBS. I continue to receive less than enthusiastic reports regarding the commercial real estate market. If all commercial real estate loans and CMBSs were marked-to-market the

additional capital requirement could jump dramatically. The supervisors should diligently monitor these loans and securities.

vi. Government Intervention, Exit Strategy and Related Issues. The following sentences were included in a draft version of the June report, but were not included in the final report. They are important issues to consider in the context of TARP's effectiveness, and I have included them below:

“To the extent that BHCs rely on CAP funds in meeting their capital buffer needs, all the issues involved in government ownership of companies' common stock are raised. Promised Treasury guidance as to the corporate governance principles that will be followed does not yet seem to have been published, and will be crucial.”

“Since government intervention in the markets causes uncertainty, and may make investors less likely to participate in capital raising by the BHCs, the Administration should be as transparent as possible with respect to policy issues regarding intervention.”

“Treasury should publish the corporate governance policies or guidelines which it will follow as a shareholder in institutions requiring CAP funding.”

In addition, and in order to discharge its specific duties and responsibilities under EESA in a professional and timely manner, the panel should investigate the following related issues (among others):

- What is Treasury's exit strategy with respect to each TARP investment? Treasury should specify its exit strategy on an entity-by-entity basis with a time line and in sufficient detail.
- What TARP investments does Treasury expect to hold at the end of 2009 and each of the next five years? Treasury should specify on an entity-by-entity basis and in sufficient detail.
- Does Treasury anticipate that it will need to make additional investments in any of the current TARP recipients or any other entity? If so, in what amount, in what form, for what entity and for what purpose?
- Does Treasury anticipate that it will reinvest any repaid TARP funds, that is, is TARP a revolving credit/investment facility?
- Will Treasury remain a passive investor or will it undertake to designate the directors and officers of the TARP recipients and in substance exercise day-to-day control over the management and affairs of such entities?

- Will Treasury timely announce its decision to act in a passive or active manner with respect to the TARP recipients so as to lessen the uncertainty regarding the large block of shares held by the public sector?
- Will Treasury follow and respect applicable state corporate and federal and state securities law?
- If the government acts as the de facto management of any TARP recipient will it be liable to suit as a controlling person and subject to all applicable federal and state corporate, securities and other rules and regulations?
- What are the consequences of the United States government serving as the de facto manager of Chrysler, GM and the largest financial institutions?
- Will the government mandate which cars will be built and which borrowers will qualify for loans?
- How will “non-subsidized” businesses compete with TARP recipients whose government shareholder may literally print money?
- Will TARP recipients receive favorable government contracts or other direct or indirect subsidies the award of which is not based upon objective and transparent criteria?
- Will TARP recipients promptly disclose all contractual arrangements (oral or written) between each TARP recipient and the government, together with a detailed description of the contract, its purpose, the transparent and open competitive bidding process undertaken and the arm’s length and market directed nature of the contract?
- Will TARP recipients be able to obtain private or public credit or enter into other contractual arrangements at favorable rates because of the implicit governmental guarantee of such indebtedness and contracts?
- Will any such subsidies violate U.S. law or the laws of any foreign jurisdiction?
- How may all aspects of the relationship between each TARP recipient and the government be made more transparent, accountable and beyond reproach?
- What are the best practices the government should adopt with respect to its role as the sole TARP investor?
- Will employees (and members of their immediate families) of the government that work with or supervise any TARP recipients be barred from seeking employment or serving as a director with TARP recipients or from working with any public policy

shop, law firm or other organization that represents any TARP recipients for a period of, say, at least five-years following the departure from government service of such employee?

- Will governmental employees (and members of their immediate families) be barred from serving as directors, managers or employees of any TARP recipient during their government service?
- What corporate governance, compliance, risk management and internal control protocols and procedures will the government adopt with respect to its role as a creditor and shareholder of the TARP recipients?
- Will the government in its capacity as a shareholder of each TARP recipient undertake to abide by all insider trading, controlling shareholder and other applicable rules and regulations?
- Will the government exert disproportionate influence over management relative to its actual ownership interests in the TARP recipients?
- How will Treasury resolve any conflict of interest between its role as a creditor or equity holder in any TARP recipient and as a supervising governmental authority for any such TARP recipient?
- Will the IRS, SEC, Federal Reserve, FDIC and other governmental agencies be able to discharge their regulatory and enforcement responsibilities with respect to each TARP recipient without political influence?
- Will management of the TARP recipients support the government's slate of proposed directors and thus disenfranchise the remaining shareholders under the proxy rules?
- If Treasury plans to sell its common stock to the public what are the appropriate benchmarks that will trigger such sales?
- Should Treasury sell its shares in the market (whereby the TARP recipients will not share in the proceeds, but the TARP advances will be repaid) or should Treasury agree to retain its stock and permit the TARP recipients to sell newly issued shares to third-parties (whereby the TARP recipients will retain the proceeds from the offering, but the TARP advances will remain outstanding)?

Section Three: Correspondence with Treasury Update

On behalf of the Panel, Chair Elizabeth Warren sent a letter on May 11, 2009 to Federal Reserve Board Chairman Bernanke to request certain documents and information related to the SCAP and to arrange a series of meeting to discuss SCAP.²⁰⁸ Negotiations regarding the production of the requested materials are ongoing.

On behalf of the Panel, Chair Elizabeth Warren sent a letter to Secretary Geithner on May 12, 2009, inviting him to testify before the Panel on Wednesday, June 17, 2009.²⁰⁹ The Panel seeks to continue its public dialogue with Secretary Geithner, which began with his first appearance before the Panel on April 21, 2009. The letter specifically requests that the Secretary appear before the Panel to discuss the results of the stress tests and the questions the results raise concerning methodology, repayment of TARP funds, and the next steps for the use of TARP money.

On behalf of the Panel, Chair Elizabeth Warren sent a letter on May 19, 2009 to Secretary Geithner and Chairman Bernanke referencing public concern that Treasury and the Board had applied strong pressure on Bank of America to complete its acquisition of Merrill Lynch, despite Bank of America's concerns about Merrill Lynch's deteriorating financial state.²¹⁰ The letter cites this episode as an example of the conflicts of interest that can arise when the government acts simultaneously as regulator, lender of last resort, and shareholder. The letter concludes by soliciting Secretary Geithner's and Chairman Bernanke's thoughts on how to manage these inherent conflicts to ensure that similar episodes do not undermine government efforts to stabilize the financial system in the future.

On behalf of the Panel, Chair Elizabeth Warren sent a letter on May 26, 2009, to Secretary Geithner requesting information about Treasury's Temporary Guarantee Program for Money Market Funds, which is funded by TARP.²¹¹ The Temporary Guarantee Program uses assets of the Exchange Stabilization Fund to guarantee the net asset value of shares of participating money market mutual funds. The letter requests a description of the program mechanics and an accounting of its obligations and funding mechanisms.

²⁰⁸ See Appendix I of this report, *infra*.

²⁰⁹ See Appendix II of this report, *infra*.

²¹⁰ See Appendix III of this report, *infra*.

²¹¹ See Appendix IV of this report, *infra*.

Section Four: TARP Updates Since Last Report

In addition to the release of the stress test results on May 7, 2009 (see Section One of this report), Treasury and the Federal Reserve Board released data and made program adjustments to a number of initiatives under the Financial Stability Plan since the release of the Panel's last oversight report.

A. Automotive Industry Financing Program (AIFP)

On June 1, 2009, a federal bankruptcy judge approved the sale of the majority of Chrysler's assets to the Italian automaker Fiat, clearing the way for the company to exit the bankruptcy process. On the same day, General Motors (GM) filed for chapter 11 bankruptcy following the approval of its revised viability plan by the President's Auto Industry Task Force. The Administration pledged to support GM through an expedited chapter 11 proceeding with an additional public investment of \$30.1 billion under AIFP. The additional cash infusion will raise the total US investment in GM to \$49.8 billion. In return, the government will receive \$8.8 billion in debt and preferred stock, giving it a 60 percent ownership stake in the new GM.

B. Additional CPP Investment in GMAC

On May 21, 2009, Treasury announced a \$7.5 billion preferred equity investment in GMAC. GMAC was one of ten banks subjected to "stress tests" under the SCAP determined to be in need of additional capital. Treasury mandated that the auto lender raise \$9.1 billion in new tier 1 capital within six months. \$3.5 billion of this investment will go toward addressing the capital shortage. The remaining \$4 billion will be used to support new financing for Chrysler dealers and customers, a condition of federal assistance. GMAC must submit a plan for meeting the remainder of its capital needs to Treasury by June 8. Treasury also announced its intention to exercise the right to exchange an earlier \$884 million loan to GM for common equity interests in GMAC, giving the government a 35.4 percent equity interest in GMAC.

C. Term Asset-Backed Securities Loan Facility (TALF)

The Federal Reserve Board approved the addition of legacy commercial mortgage-backed securities (Legacy CMBS) to the classes of assets eligible for TALF loans. Legacy CMBS are those issued *before* January 1, 2009. Previously, the Board had announced it would expand the range of acceptable TALF collateral to include new CMBS (those issued *after* January 1, 2009) starting with the June 16 subscription date. Legacy CMBS are expected to join TALF beginning with the subscription in late July. The terms of TALF coverage of Legacy CMBS will differ from those for other assets. The haircut (adjusted for length of maturity) will be a standard 15 percent of par – the face amount – of the Legacy CMBS financed. Because the haircut is based on par value, it will increase with every dollar that the Legacy CMBS are valued

below par. Thus, the government compensation for risk increases as its collateral loses value. The interest rate carry (the amount that can be earned in excess of the interest paid to the New York Fed) will be capped at 90 percent; this is the first explicit ceiling on TALF returns. The cap amounts to a second haircut of six to eight percent.

On June 2, 2009, the Federal Reserve Bank of New York offered its June TALF subscription on non-mortgage asset-backed securities (ABS). In the two hours the facility was open, \$11.5 billion in loans were requested. More than three quarters of the funds were secured by assets backed by credit card debt (\$6.2 billion) or auto loans (\$3.3 billion). As a point of comparison, there was a total of \$10.6 billion in loans at the May facility, \$1.7 billion at the April facility and \$4.7 billion at the March facility.

D. Making Home Affordable Program (MHA)

On May 14, 2009, Secretary Geithner and Housing and Urban Development (HUD) Secretary Shaun Donovan announced two new program components intended to help homeowners obtain modifications and stabilize property values in areas suffering from home price declines.

- 1. Foreclosure Alternatives Program** provides incentives for servicers and borrowers to pursue short sales and deeds-in-lieu (DIL) of foreclosure in cases where the borrower is generally eligible for a MHA modification but is unable to complete the process. The program aims to simplify and streamline the short sale and deed-in-lieu process by providing a standard process flow, minimum performance timeframes, and standard documentation.
- 2. Home Price Decline Protection Incentives** will provide lenders additional incentives for modifications in areas where home price declines have been most severe and there is concern that the market has yet to bottom out. The program will provide cash payments to lenders based on the rate of recent home price declines in a local housing market, as well as the average cost of a home in that market. The incentive payments on all modified homes will help cover the incremental collateral loss on those modifications that do not succeed.

Treasury also released a progress report on MHA. According to the report, since MHA was announced in early March, 14 servicers, including the nation's five largest, had signed contracts and begun modifications under MHA. The servicers had extended offers on over 55,000 trial modifications and mailed over 300,000 letters with information about trial modifications to troubled borrowers.

E. Public-Private Investment Program (PPIP)

On June 3, 2009, the FDIC announced that the June pilot auction of illiquid bank assets under the Legacy Loans Program (LLP), one component of the Administration's two-part Public-Private Investment Program (PPIP), would be postponed. According to the FDIC, the auction was postponed because many banks have been able to raise new capital without having to contemplate selling bad assets through the LLP. The FDIC did not state when the postponed auction would take place. A pilot auction for receivership assets, those assets retained by the FDIC from failed banks, is scheduled to take place in July.

F. CPP Monthly Lending Report

Treasury released its first CPP Monthly Lending Report, a survey of all CPP participants designed to provide insight into their lending activities. The report captures three data points on a monthly basis: average outstanding balances of consumer loans, commercial loans, and total loans from all CPP participants. This first report includes data from 500 banks from February 2009 and March 2009. The report shows that the total average outstanding loans for all CPP participants were \$5,279 billion in February 2009 and \$5,237 billion in March 2009. The CPP Monthly Lending Report joins the Monthly Lending and Intermediation Snapshot of the top 21 CPP participants (launched in January) as Treasury's primary sources of public data on lending trends and loans outstanding from CPP institutions.

G. Repayment of TARP Funds

On June 1, 2009, the Federal Reserve Board released an outline of the criteria it will use to evaluate applications to redeem Treasury capital from the 19 BHCs that participated in SCAP. The Board's primary requirements for approval are a demonstration on the part of the BHC that it can access the long-term debt markets without reliance on a guarantee from the FDIC and the ability to successfully access public equity markets. Among other things, a BHC must also demonstrate the ability to maintain certain minimum capital levels and to serve as a source of financial and managerial strength and support to its subsidiary banks. Redemption approvals for an initial set of BHCs are expected to be announced the week of June 8. Applications will be evaluated periodically thereafter.

H. Administration Proposal on Regulating Over-the-Counter (OTC) Derivatives

On May 13, 2009, the Obama Administration announced its proposal for a comprehensive regulatory framework to cover all OTC derivatives. In a letter to Congress, Secretary Geithner identified the four broad objectives of the proposal: (1) preventing activities in derivatives markets from posing risk to the financial system; (2) promoting the efficiency and transparency of those markets; (3) preventing market manipulation, fraud, and other market abuses; and (4) ensuring that OTC derivatives are not marketed inappropriately to unsophisticated investors. The proposal requires legislative action to amend the Commodity

Exchange Act and enhance the regulatory authority of the Commodity Futures Trading Commission (CFTC) and the Securities and Exchange Commission (SEC). Under the proposal, a new regulatory regime of OTC derivatives would require the clearing of all standardized OTC derivatives through regulated central counterparties, enhanced supervision and regulation of firms who deal in OTC derivatives by the CFTC and the SEC, and stricter recordkeeping and recording requirements, including the movement of all standardized trades onto regulated exchanges and regulated electronic execution systems.

I. Metrics

The Panel’s April oversight report highlighted a number of metrics that the Panel and others, including Treasury, the Government Accountability Office (GAO), Special Inspector General for the Troubled Asset Relief Program (SIGTARP), and the Financial Stability Oversight Board, consider useful in assessing the effectiveness of the Administration’s efforts to restore financial stability and accomplish the goals of the EESA. The Panel’s May oversight report described some significant movement that had occurred in a few of the indicators in the time between the Panel’s April and May reports. This report highlights changes that have occurred in several indicators since the release of the Panel’s May report.

- **Interest Rate Spreads.** Several key interest rate spreads have dropped significantly in recent weeks, most notably the 3-month and 1-month LIBOR-OIS spreads and the TED spread. The Fed attributes the moderation of many of these spreads to its lending programs as well as to the somewhat improved general economic outlook.²¹²

Figure 7: Interest Rate Spreads

Indicator	Current Spread (as of 6/8/09)	Percent Change Since Last Report (5/7/09)
3 Month LIBOR-OIS Spread ²¹³	0.41	-45.06%
1 Month LIBOR-OIS Spread ²¹⁴	-0.10	-45.02%
TED Spread ²¹⁵ (in basis points)	47.76	-38.67%

²¹² House Committee on the Budget, Testimony of Board of Governors of the Federal Reserve System Chairman Ben S. Bernanke, *Challenges Facing the Economy: The View of the Federal Reserve*, 111th Cong. (June 3, 2009) (online at budget.house.gov/hearings/2009/06.03.2009_Bernanke_Testimony.pdf).

²¹³ *3 Mo LIBOR-OIS Spread*, Bloomberg (online at www.bloomberg.com/apps/quote?ticker=.LOIS3:IND) (accessed June 8, 2009).

²¹⁴ *1 Mo LIBOR-OIS Spread*, Bloomberg (online at www.bloomberg.com/apps/quote?ticker=.LOIS1:IND) (accessed June 8, 2009).

Indicator	Current Spread (as of 6/8/09)	Percent Change Since Last Report (5/7/09)
Conventional Mortgage Rate Spread ²¹⁶	1.57	-6.55%
Corporate AAA Bond Spread ²¹⁷	2.00	-15.25%
Corporate BAA Bond Spread ²¹⁸	4.05	-21.51%
Overnight AA Asset-backed Commercial Paper Interest Rate Spread ²¹⁹	0.18	-35.71%
Overnight A2/P2 Nonfinancial Commercial Paper Interest Rate Spread ²²⁰	0.32	-23.81%

²¹⁵ *TED Spread*, Bloomberg (online at www.bloomberg.com/apps/quote?ticker=.TEDSP:IND) (accessed June 8, 2009).

²¹⁶ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release H.15: Selected Interest Rates: Historical Data* (Instrument: Conventional Mortgages, Frequency: Weekly) (online at www.federalreserve.gov/releases/h15/data/Weekly_Thursday_/H15_MORTG_NA.txt) (accessed June 8, 2009); Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release H.15: Selected Interest Rates: Historical Data* (Instrument: U.S. Government Securities/Treasury Constant Maturities/Nominal 10-Year, Frequency: Weekly) (online at www.federalreserve.gov/releases/h15/data/Weekly_Friday_/H15_TCMNOM_Y10.txt) (accessed June 8, 2009) (hereinafter “Fed H.15 10-Year Treasuries”).

²¹⁷ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release H.15: Selected Interest Rates: Historical Data* (Instrument: Corporate Bonds/Moody’s Seasoned AAA, Frequency: Weekly) (online at www.federalreserve.gov/releases/h15/data/Weekly_Friday_/H15_AAA_NA.txt) (accessed June 8, 2009); Fed H.15 10-Year Treasuries, *supra* note 216.

²¹⁸ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release H.15: Selected Interest Rates: Historical Data* (Instrument: Corporate Bonds/Moody’s Seasoned BAA, Frequency: Weekly) (online at www.federalreserve.gov/releases/h15/data/Weekly_Friday_/H15_BAA_NA.txt) (accessed June 8, 2009); Fed H.15 10-Year Treasuries, *supra* note 216.

²¹⁹ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release: Commercial Paper Rates and Outstandings: Data Download Program* (Instrument: AA Asset-Backed Discount Rate, Frequency: Daily) (online at www.federalreserve.gov/DataDownload/Choose.aspx?rel=CP) (accessed June 8, 2009); Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release: Commercial Paper Rates and Outstandings: Data Download Program* (Instrument: AA Nonfinancial Discount Rate, Frequency: Daily) (online at www.federalreserve.gov/DataDownload/Choose.aspx?rel=CP) (accessed June 8, 2009) (hereinafter “Fed CP AA Nonfinancial Rate”).

²²⁰ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release: Commercial Paper Rates and Outstandings: Data Download Program* (Instrument: A2/P2 Nonfinancial Discount Rate, Frequency: Daily) (online at www.federalreserve.gov/DataDownload/Choose.aspx?rel=CP) (accessed June 8, 2009); Fed CP AA Nonfinancial Rate, *supra* note 219.

- **Commercial Paper Outstanding.** Commercial paper outstanding, a rough measure of short-term business debt, is an indicator of the availability of credit for enterprises. Levels of financial, nonfinancial, and asset-backed commercial paper continued to decline in May, indicating a sustained tightening of credit for businesses.

Figure 8: Commercial Paper Outstanding

Indicator	Current Level (as of 6/8/09) (dollars billions)	Percent Change Since Last Report (5/7/09)
Asset-Backed Commercial Paper Outstanding (seasonally adjusted) ²²¹	557.4	-10.55%
Financial Commercial Paper Outstanding (seasonally adjusted) ²²²	530.5	-10.80%
Nonfinancial Commercial Paper Outstanding (seasonally adjusted) ²²³	156.7	-2.85%

- **Lending by the Largest TARP-recipient Banks.** Treasury’s Monthly Lending and Intermediation Snapshot tracks loan originations and average loan balances for the 21 largest recipients of CPP funds across a variety of categories, ranging from mortgage loans to commercial and industrial loans to credit card lines. Originations increased across all categories of bank lending in March when compared to February;²²⁴ however, Treasury notes that this could be due to the three additional business days in March or to

²²¹ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release: Commercial Paper Rates and Outstandings: Data Download Program* (Instrument: Asset-Backed Commercial Paper Outstanding, Frequency: Weekly) (online at www.federalreserve.gov/DataDownload/Choose.aspx?rel=CP) (accessed June 8, 2009).

²²² Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release: Commercial Paper Rates and Outstandings: Data Download Program* (Instrument: Financial Commercial Paper Outstanding, Frequency: Weekly) (online at www.federalreserve.gov/DataDownload/Choose.aspx?rel=CP) (accessed June 8, 2009).

²²³ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release: Commercial Paper Rates and Outstandings: Data Download Program* (Instrument: Nonfinancial Commercial Paper Outstanding, Frequency: Weekly) (online at www.federalreserve.gov/DataDownload/Choose.aspx?rel=CP) (accessed June 8, 2009).

²²⁴ U.S. Department of the Treasury, *Treasury Department Monthly Lending and Intermediation Snapshot Data for October 2008 - March 2009* (May 15, 2009) (online at www.financialstability.gov/docs/surveys/Snapshot_Data_March%202009.xls) (hereinafter “Treasury Snapshot March Summary Data”).

a seasonal increase in loan activity in the closing days of a quarter.²²⁵ A continued spike in refinancing activity is particularly noteworthy. Changes in average loan balances were relatively minor from February to March, with mortgage and other consumer loan balances up modestly and home equity, credit card, consumer and industrial loan, and commercial real estate loan balances down over the period.²²⁶ The data below exclude lending by two large CPP-recipient banks, PNC Bank and Wells Fargo, because significant acquisitions by those banks since last October make comparisons difficult.

Figure 9: Lending by the Largest TARP-recipient Banks

Indicator	Most Recent Data (March 2009) (dollars in billions)	Percent Change Since February 2009	Percent Change Since October 2008
Total Loan Originations	220.2	30.80%	0.91%
Mortgage Refinancing	53.1	11.04%	183.04%
Total Average Loan Balances	3,390.2	-0.96%	-0.95%

- Loans and Leases Outstanding of Domestically-Chartered Banks.** Weekly data from the Federal Reserve Board track fluctuations among different categories of bank assets and liabilities. The Federal Reserve Board data are useful in that they separate out large domestic banks and small domestic banks. Loans and leases outstanding for large and small domestic banks have remained largely flat over the past month, with both falling slightly.²²⁷ However, while total loans and leases outstanding at large domestic banks have dropped by over three percent since EESA was enacted, total loans and leases outstanding at small domestic banks have increased by 1.37 percent over that time period.²²⁸

²²⁵ U.S. Department of the Treasury, *Treasury Department Monthly Lending and Intermediation Snapshot: March Summary Analysis* (May 15, 2009) (online at www.financialstability.gov/docs/surveys/SnapshotAnalysisMarch2009.pdf) (hereinafter “Treasury March Snapshot”).

²²⁶ *Id.*

²²⁷ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release H.8: Assets and Liabilities of Commercial Banks in the United States: Historical Data* (Instrument: Assets and Liabilities of Large Domestically Chartered Commercial Banks in the United States, Seasonally adjusted, adjusted for mergers, billions of dollars) (online at www.federalreserve.gov/releases/h8/data.htm) (accessed June 8, 2009).

²²⁸ Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release H.8: Assets and Liabilities of Commercial Banks in the United States: Historical Data* (Instrument: Assets and Liabilities of Small Domestically Chartered Commercial Banks in the United States, Seasonally adjusted, adjusted for mergers, billions of dollars) (online at www.federalreserve.gov/releases/h8/data.htm) (accessed June 8, 2009).

Figure 10: Loans and Leases Outstanding

Indicator	Current Level (as of 6/8/09) (dollars in billions)	Percent Change Since Last Report (5/7/09)	Percent Change Since ESSA Signed into Law (10/3/08)
Large Domestic Banks - Total Loans and Leases	3984.8	-0.13%	-3.32%
Small Domestic Banks - Total Loans and Leases	2480.3	-0.14%	1.37%

- **Housing Indicators.** Foreclosure filings stayed relatively level from March to April, increasing by a modest 0.25 percent, while remaining markedly above the level of last October. Housing prices, as illustrated by the S&P/Case-Shiller Composite 20 Index, continued to dip in March. The index is down over ten percent since October 2008.

Figure 11: Housing Indicators

Indicator	Most Recent Monthly Data	Percent Change From Data Available at Time of Last Report (5/7/09)	Percent Change Since October 2008
Monthly Foreclosure Filings ²²⁹	342,038	0.25%	22.35%
Housing Prices - S&P/Case-Shiller Composite 20 Index ²³⁰	141.35	-2.17%	-10.02%

J. Financial Update

In its April oversight report, the Panel assembled a summary of the resources the federal government has committed to economic stabilization. The following provides: (1) an updated accounting of the TARP, including a tally of dividend income and repayments the program has

²²⁹ RealtyTrac, *Foreclosure Activity Press Releases* (online at www.realtytrac.com/ContentManagement/PressRelease.aspx) (accessed June 8, 2009).

²³⁰ Standard & Poor's, *S&P/Case-Shiller Home Price Indices* (Instrument: Seasonally Adjusted Composite 20 Index) (online at www2.standardandpoors.com/spf/pdf/index/SA_CSHomePrice_History_052619.xls) (accessed June 8, 2009).

received as of June 3, 2009; and (2) an update of the full federal resource commitment as of June 3, 2009.

1. TARP

a. Costs: Expenditures and Commitments

Through an array of programs used to purchase preferred shares in financial institutions, offer loans to small businesses and auto companies, and leverage Federal Reserve Board loans for facilities designed to restart secondary securitization markets, Treasury has committed to spend \$645.8 billion, leaving \$54.2 billion available for new programs or other needs.²³¹ Of the \$645.8 billion that Treasury has committed to spend, \$434.7 billion has already been allocated and counted against the statutory \$700 billion limit.²³² This includes purchases of preferred stock, warrants and/or debt obligations under the CPP, TIP, SSFI Program, and AIFP initiatives, a \$20 billion loan to TALF LLC, the special purpose vehicle used to guarantee Federal Reserve Board TALF loans, and the \$5 billion Citigroup asset guarantee already exchanged for a guarantee fee composed of additional preferred stock and warrants.²³³ Additionally, Treasury has allocated \$15.2 billion to the Home Affordable Modification Program, out of a projected total program level of \$50 billion, but has not yet distributed any of these funds. Treasury will release its next tranche report when transactions under TARP reach \$450 billion.

b. Income: Dividends and Repayments

Secretary Geithner's testimony to the Senate Banking Committee on May 20 included Treasury's estimate of TARP funds remaining for allocation as of May 18. Treasury provided two figures, \$98.7 billion and \$123.7 billion,²³⁴ the later including an estimated \$25 billion in CPP investments that Treasury expects recipients to repay or liquidate.²³⁵ Although describing this estimate as "conservative," neither Secretary Geithner nor Treasury has identified the institutions that will supply these anticipated repayments, when they will supply these repayments, or any methodological basis underpinning this figure. The total amount of CPP repayments currently stands at \$1.772 billion.²³⁶

²³¹ EESA limits Treasury to \$700 billion in purchasing authority outstanding at any one time as calculated by the sum of the purchases prices of all troubled assets held by Treasury. EESA, *supra* note 1, at §115(a)-(b).

²³² U.S Department of the Treasury, *Seventh Tranche Report to Congress* (June 3, 2009) (online at www.financialstability.gov/docs/TrancheReports/7th_Tranche-Report-Appendix.pdf).

²³³ June 5 TARP Transactions Report, *supra* note 13.

²³⁴ After these figures were provided to the Senate Committee on Banking, Housing, and Urban Affairs, Treasury allocated an additional \$44.5 billion of TARP funds in loans to GM, GMAC, and Chrysler. Including these allocations would bring Treasury's estimates to \$54.2 billion and \$79.2 billion, respectively.

²³⁵ Geithner Testimony, *supra* note 98.

²³⁶ June 5 TARP Transactions Report, *supra* note 13.

In addition, Treasury's investment in preferred stock entitles it to dividend payments from the institutions in which it invests, usually five percent per annum for the first five years and nine percent per annum thereafter.²³⁷ Treasury has not yet begun to officially report dividend payments on its transaction reports.

c. TARP Accounting as of June 3, 2009

Figure 12: TARP Accounting (as of June 3, 2009)

TARP Initiative (Dollars in billions)	Announced Funding	Purchase Price	Repayments	Dividend Income
Total	645.8	434.7 ²³⁸	1.8 ²³⁹	6.2 ²⁴⁰
CPP	218.0	199.4	1.8	4.8
TIP	40.0	40.0	0	1.1
SSFI Program	70.0	69.8	0	0
AIFP	80.3	80.3	0	0.2
AGP	12.5	5.0	0	0.1
CAP	TBD	0.0	0	0
TALF	80.0	20.0	0	0
PPIP	75.0	0.0	0	0
Supplier Support Program	5.0	5.0	0	0
Unlocking SBA Lending	15.0	0.0	0	0
HAMP	50.0	15.2	0	0

2. Other Financial Stability Efforts

a. Federal Reserve Board, FDIC, and Other Programs

²³⁷ See, e.g., U.S. Department of the Treasury, Bank of New York Mellon, *Securities Purchase Agreement: Standard Terms*, at A-1 (Oct. 28, 2008) (Annex A).

²³⁸ See June 5 TARP Transactions Report, *supra* note 13.

²³⁹ See June 5 TARP Transactions Report, *supra* note 13.

²⁴⁰ As of June 3, 2009. This information was passed on by Treasury officials to Panel staff.

In addition to the more direct expenditures Treasury has undertaken through TARP, the federal government has also engaged in a much broader program directed at stabilizing the U.S. financial system. Many of these programs explicitly augment Treasury funds, like FDIC guarantees of securitization of PPIF Legacy Loans or asset guarantees for Citigroup and Bank of America, or operate in tandem with Treasury programs, such as the interaction between PPIP and TALF. Other programs, like the Federal Reserve Board’s extension of credit through its §13(3) facilities and special purpose vehicles or the FDIC’s Temporary Liquidity Guarantee Program, stand independent of TARP and seek to accomplish different goals.

b. Total Financial Stability Resources as of June 3, 2009

Beginning in its April report, the Panel broadly classified the resources that the federal government has devoted to stabilizing the economy through a myriad of new programs and initiatives, as outlays, loans, or guarantees. Although the Panel has calculated the total value of these resources at over \$4 trillion, this would translate into the ultimate “cost” of the stabilization effort only if: (1) assets do not appreciate; (2) no dividends are received; no warrants are exercised, and no TARP funds are repaid; (3) all loans default and are written off; and (4) all guarantees are exercised and subsequently written off.

Figure 13: Federal Government Financial Stability Effort (as of June 3, 2009)

Program (Dollars in billions)	Treasury (TARP)	Federal Reserve Board	FDIC	Total
Total	700	2,440.7	1,427.4	4,568.1 ²⁴³
<i>Outlays</i> ²⁴¹	466.4	0	29.5	495.9
<i>Loans</i>	86.9	2123.7	0	2,210.6
<i>Guarantees</i> ²⁴²	92.5	317	1,397.9	1,807.4
<i>Uncommitted TARP Funds</i>	54.2	0	0	54.2

²⁴¹ The term “outlays” is used here to describe the use of Treasury funds under the TARP, which are broadly classifiable as purchases of debt or equity securities (*e.g.*, debentures, preferred stock, exercised warrants, etc.). The outlays figures are based on: (1) Treasury’s actual reported expenditures; and (2) Treasury’s anticipated funding levels as estimated by a variety of sources, including Treasury pronouncements and GAO estimates. Anticipated funding levels are set at Treasury’s discretion, have changed from initial announcements, and are subject to further change. The outlays concept used here represents cash disbursements and commitments to make cash disbursements and is not the same as budget outlays, which under EESA §123 are recorded on a “credit reform” basis.

²⁴² While many of the guarantees may never be exercised or exercised only partially, the guarantee figures included here represent the federal government’s greatest possible financial exposure.

²⁴³ This figure differs substantially from the \$2,476-2,976 billion range of “Total Funds Subject to SIGTARP Oversight” reported during testimony before the Senate Finance Committee on March 31, 2009. Senate Committee on Finance, Testimony of SIGTARP Neil Barofsky, *TARP Oversight: A Six Month Update*, 111th Cong. (Mar. 31, 2009) (online at finance.senate.gov/hearings/testimony/2009test/033109nbtest.pdf). SIGTARP’s

Program (Dollars in billions)	Treasury (TARP)	Federal Reserve Board	FDIC	Total
AIG	70	112.5 ²⁴⁵	0	182.5
<i>Outlays</i>	70 ²⁴⁴	0	0	70
<i>Loans</i>	0	112.5 ²⁴⁶	0	112.5
<i>Guarantees</i>	0	0	0	0
Bank of America	52.5	87.2	2.5	142.2
<i>Outlays</i>	45 ²⁴⁷	0	0	45
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	7.5 ²⁴⁸	87.2 ²⁴⁹	2.5 ²⁵⁰	97.2

accounting, designed to capture only those funds potentially under its oversight authority, is both less and more inclusive than the Panel's, and thus the two are not directly comparable. Among the differences, SIGTARP does not account for Federal Reserve Board credit extensions outside of the TALF or FDIC guarantees under the Temporary Liquidity Guarantee Program and sets the maximum Federal Reserve Board guarantees under the TALF at \$1 trillion.

²⁴⁴ This number includes both investments in AIG under the SSFI program: a \$40 billion investment made on November 25, 2008, and a \$30 billion investment made on April 17, 2009 (less a reduction of \$165 million representing bonuses paid to AIG Financial Products employees). June 5 TARP Transactions Report, *supra* note 13.

²⁴⁵ The value of loans extended by the Federal Reserve Board to AIG has been calculated according to a different methodology from that used in previous Panel reports. Previously, this figure reflected the current balance sheet value of credit extended to AIG and the Maiden Lane II and III SPVs. The Panel has replaced this measurement of government exposure with the maximum amounts the Federal Reserve Board is authorized to loan, as described below.

This number represents the total credit line the Federal Reserve Board is authorized to extend to AIG (\$60 billion) and the maximum amount that the FRBNY is authorized to lend to the Maiden Lane II LLC (\$22.5 billion) and Maiden Lane III LLC (\$30 billion) special purpose vehicles. See Board of Governors of the Federal Reserve System, *Federal Reserve Board and Treasury Department Announce Restructuring of Financial Support to AIG* (Nov. 10, 2008) (online at www.federalreserve.gov/newsevents/press/other/20081110a.htm).

²⁴⁶ As of June 5, the value of loans outstanding to AIG stands at \$84 billion. This includes \$43 billion in loans directly provided to AIG as well as \$41 billion in the outstanding principal amount of loans extended to special purpose vehicles (approximately \$18 billion to Maiden Lane II and \$23 billion to Maiden Lane III). See Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release H.4.1: Factors Affecting Reserve Balances* (June 4, 2009) (online at www.federalreserve.gov/releases/h41/Current/) (hereinafter "Fed Balance Sheet June 4").

²⁴⁷ June 5 TARP Transactions Report, *supra* note 13. This figure includes: (1) a \$15 billion investment made by Treasury on October 28, 2008 under the CPP; (2) a \$10 billion investment made by Treasury on January 9, 2009 also under the CPP; and (3) a \$20 billion investment made by Treasury under the TIP on January 16, 2009.

²⁴⁸ Bank of America Asset Guarantee, *supra* note 41 (granting a \$118 billion pool of Bank of America assets a 90 percent federal guarantee of all losses over \$10 billion, the first \$10 billion in federal liability to be split 75/25 between Treasury and the FDIC and the remaining federal liability to be borne by the Federal Reserve Board).

²⁴⁹ Bank of America Asset Guarantee, *supra* note 41.

²⁵⁰ Bank of America Asset Guarantee, *supra* note 41.

Program (Dollars in billions)	Treasury (TARP)	Federal Reserve Board	FDIC	Total
Citigroup	50	229.8	10	289.8
<i>Outlays</i>	45 ²⁵¹	0	0	45
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	5 ²⁵²	229.8 ²⁵³	10 ²⁵⁴	244.8
Capital Purchase Program (Other)	168	0	0	168
<i>Outlays</i>	168 ²⁵⁵	0	0	168
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	0	0	0	0
Capital Assistance Program	TBD	TBD	TBD	TBD ²⁵⁶
TALF	80	720	0	800
<i>Outlays</i>	0	0	0	0
<i>Loans</i>	0	720 ²⁵⁸	0	720
<i>Guarantees</i>	80 ²⁵⁷	0	0	80

²⁵¹ June 5 TARP Transactions Report, *supra* note 13. This figure includes: (1) a \$25 billion investment made by Treasury under the CPP on October 28, 2008; and (2) a \$20 billion investment made by Treasury under TIP on December 31, 2008.

²⁵² Citigroup Asset Guarantee, *supra* note 41 (granting a 90 percent federal guarantee on all losses over \$29 billion of a \$306 billion pool of Citigroup assets, with the first \$5 billion of the cost of the guarantee borne by Treasury, the next \$10 billion by FDIC, and the remainder by the Federal Reserve). *See also* Final Citi Guarantee Terms, *supra* note 41 (reducing the size of the asset pool from \$306 billion to \$301 billion).

²⁵³ Citigroup Asset Guarantee, *supra* note 41.

²⁵⁴ Citigroup Asset Guarantee, *supra* note 41.

²⁵⁵ This figure represents the \$218 billion Treasury has anticipated spending under the CPP, minus the \$50 billion investments in Citigroup (\$25 billion) and Bank of America (\$25 billion) identified above. This figure does not account for anticipated repayments or redemptions of CPP investments, nor does it account for dividend payments from CPP investments.

²⁵⁶ Funding levels for the CAP have not yet been announced but will likely constitute a significant portion of the remaining \$54.2 billion of TARP funds.

²⁵⁷ Geithner Testimony, *supra* note 98, at 1; June 5 TARP Transactions Report, *supra* note 13. This figure represents: a \$20 billion allocation to the TALF special purpose vehicle on March 3, 2009; Treasury's announcement of an additional \$35 billion dedicated to the TALF; and \$25 billion dedicated to supporting TALF loans to purchase legacy securities under the PPIP.

²⁵⁸ This number derives from the unofficial 1:10 ratio of the value of Treasury loan guarantees to the value of Federal Reserve Board loans under the TALF. *See* Financial Stability Plan Fact Sheet, *supra* note 26 (describing the initial \$20 billion Treasury contribution tied to \$200 billion in Federal Reserve Board loans and announcing potential expansion to a \$100 billion Treasury contribution tied to \$1 trillion in Federal Reserve Board loans).

Program (Dollars in billions)	Treasury (TARP)	Federal Reserve Board	FDIC	Total
PPIF (Loans) ²⁵⁹	50	0	600	650
<i>Outlays</i>	50	0	0	50
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	0	0	600 ²⁶⁰	600
PPIF (Securities) ²⁶¹	25	0	0	25
<i>Outlays</i>	10 ²⁶²	0	0	10
<i>Loans</i>	15	0	0	15
<i>Guarantees</i>	0	0	0	0
Home Affordable Modification Program	50	0	0	50 ²⁶⁴
<i>Outlays</i>	50 ²⁶³	0	0	50
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	0	0	0	0

Because Treasury is responsible for reimbursing the Federal Reserve Board for \$80 billion of losses on its \$800 billion in loans, the Federal Reserve Board's maximum potential exposure under the TALF is \$720 billion.

²⁵⁹ Because PPIF funding arrangements for loans and securities differ substantially, the Panel accounts for them separately. Treasury has not formally announced either total program funding level or the allocation of funding between the PPIF Legacy Loans Program and Legacy Securities Program. However, the FDIC recently announced that it was postponing the implementation of the Legacy Loans program. See FDIC Loans Program Statement, *supra* note 25. It is not yet clear whether this postponement will affect the allocation of TARP funds for the LLP.

²⁶⁰ U.S. Department of the Treasury, *Fact Sheet: Public-Private Investment Program*, at 2 (Mar. 23, 2009) (online at www.treas.gov/press/releases/reports/ppip_fact_sheet.pdf) (hereinafter "Treasury PPIF Fact Sheet") (explaining that, for every \$1 Treasury contributes in equity matching \$1 of private contributions to public-private asset pools created under the Legacy Loans Program, FDIC will guarantee up to \$12 of financing for the transaction to create a 6:1 debt to equity ratio). If Treasury ultimately allocates a smaller proportion of funds to the Legacy Loans Program (i.e., less than \$50 billion), the amount of FDIC loan guarantees will be reduced proportionally.

²⁶¹ In previous reports, the Panel projected that Treasury would split the \$100 billion allocated to PPIF evenly between legacy loans and legacy securities. However, it now appears that Treasury will allocate \$25 billion to the TALF for legacy securities, implying that only \$25 billion of TARP funds will be directly allocated to PPIF Legacy Securities.

²⁶² Treasury PPIF Fact Sheet, *supra* note 260, at 4-5 (outlining that, for each \$1 of private investment into a fund created under the Legacy Securities Program, Treasury will provide a matching \$1 in equity to the investment fund; a \$1 loan to the fund; and, at Treasury's discretion, an additional loan up to \$1). In the absence of further Treasury guidance, this analysis assumes that Treasury will allocate funds for equity co-investments and loans at a 1:1.5 ratio, a formula that estimates that Treasury will frequently exercise its discretion to provide additional financing.

²⁶³ Government Accountability Office, *Troubled Asset Relief Program: March 2009 Status of Efforts to Address Transparency and Accountability Issues*, at 55 (Mar. 31, 2009) (GAO09/504) (online at www.gao.gov/new.items/d09504.pdf); Geithner Testimony, *supra* note 98. Of the \$50 billion in announced TARP

Program (Dollars in billions)	Treasury (TARP)	Federal Reserve Board	FDIC	Total
Automotive Industry Financing Plan	80.3	0	0	80.3
<i>Outlays</i>	13.4 ²⁶⁵	0	0	13.4
<i>Loans</i>	66.9 ²⁶⁶	0	0	66.9
<i>Guarantees</i>	0	0	0	0
Auto Supplier Support Program	5	0	0	5
<i>Outlays</i>	5 ²⁶⁷	0	0	5
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	0	0	0	0
Unlocking SBA Lending	15	0	0	15
<i>Outlays</i>	15 ²⁶⁸	0	0	15
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	0	0	0	0

funding for this program, only \$15.2 billion has been allocated as of June 3, and no funds have yet been disbursed. See June 5 TARP Transactions Report, *supra* note 13.

²⁶⁴ Fannie Mae and Freddie Mac, government-sponsored entities (GSEs) that were placed in conservatorship of the Federal Housing Finance Agency on September 7, 2009, will also contribute up to \$25 billion to the Making Home Affordable Program, of which the HAMP is a key component. See U.S. Department of the Treasury, *Making Home Affordable: Updated Detailed Program Description* (Mar. 4, 2009) (online at www.treas.gov/press/releases/reports/housing_fact_sheet.pdf).

²⁶⁵ June 5 TARP Transactions Report, *supra* note 13. This figure represents Treasury's equity stake in GMAC.

²⁶⁶ June 5 TARP Transactions Report, *supra* note 13. Treasury's initial allocation to GM was effectively a loan. Under the terms of the company's pending bankruptcy proceedings the \$49.9 billion in debt obligations to Treasury will be converted to a 60 percent stake in the restructured company and \$8.8 billion in debt and preferred stock. See U.S. Department of the Treasury, *Fact Sheet: Obama Administration Auto Restructuring Initiative, General Motors Restructuring* (May 31, 2009) (online at www.financialstability.gov/latest/05312009_gm-factsheet.html). It is less clear how Treasury's \$17 billion in loans to Chrysler will be affected by its bankruptcy proceedings. It appears that approximately \$9 billion lent before the Chrysler bankruptcy will be converted to an eight percent equity stake, while \$8 billion will be retained as first-lien debt. See U.S. Department of the Treasury, *Obama Administration Auto Restructuring Initiative, Chrysler-Fiat Alliance* (Apr. 30, 2009) (online at www.financialstability.gov/latest/tg_043009.html).

²⁶⁷ June 5 TARP Transactions Report, *supra* note 13.

²⁶⁸ Geithner Testimony, *supra* note 98, at 15.

Program (Dollars in billions)	Treasury (TARP)	Federal Reserve Board	FDIC	Total
Temporary Liquidity Guarantee Program	0	0	785.4	785.4
<i>Outlays</i>	0	0	0	0
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	0	0	785.4 ²⁶⁹	785.4
Deposit Insurance Fund	0	0	29.5	29.5
<i>Outlays</i>	0	0	29.5 ²⁷⁰	29.5
<i>Loans</i>	0	0	0	0
<i>Guarantees</i>	0	0	0	0
Other Federal Reserve Board Credit Expansion	0	1,291.2	0	1,291.2
<i>Outlays</i>	0	0	0	0
<i>Loans</i>	0	1,291.2 ²⁷¹	0	1,291.2
<i>Guarantees</i>	0	0	0	0

²⁶⁹ This figure represents the current maximum aggregate debt guarantees that could be made under the program, which, in turn, is a function of the number and size of individual financial institutions participating. \$334.6 billion of debt subject to the guarantee has been issued to date, which represents about 43 percent of the current cap. Federal Deposit Insurance Corporation, *Monthly Reports on Debt Issuance under the Temporary Liquidity Guarantee Program: Debt Issuance under Guarantee Program* (May 20, 2009) (online at www.fdic.gov/regulations/resources/TLGP/total_issuance4-09.html).

²⁷⁰ This figure represents the FDIC's provision for losses to its deposit insurance fund attributable to bank failures in the third and fourth quarters of 2008. See Federal Deposit Insurance Corporation, *Chief Financial Officer's (CFO) Report to the Board: DIF Income Statement (Fourth Quarter 2008)* (online at www.fdic.gov/about/strategic/corporate/cfo_report_4qtr_08/income.html); Federal Deposit Insurance Corporation, *Chief Financial Officer's (CFO) Report to the Board: DIF Income Statement (Third Quarter 2008)* (online at www.fdic.gov/about/strategic/corporate/cfo_report_3rdqtr_08/income.html). As of June 5, 2009, the FDIC had not yet released first quarter 2009 data.

²⁷¹ This figure is derived from adding the total credit the Federal Reserve Board has extended as of June 3, 2009 through the Term Auction Facility (Term Auction Credit), Discount Window (Primary Credit), Primary Dealer Credit Facility (Primary Dealer and Other Broker-Dealer Credit), Central Bank Liquidity Swaps, loans outstanding to Bear Stearns (Maiden Lane I LLC), GSE Debt (Federal Agency Debt Securities), the value of Mortgage Backed Securities Issued by GSEs, Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility, and Commercial Paper Funding Facility LLC. See Fed Balance Sheet June 4, *supra* note 246. The level of Federal Reserve Board lending under these facilities will fluctuate in response to market conditions and independent of any federal policy decisions.

This calculation is slightly changed from previous reports. The Panel previously looked at the balance sheet value of Federal Reserve Board holdings in Maiden Lane I LLC and the Commercial Paper Funding Facility; in this report, the Panel calculates this figure as the outstanding principal amount of the loans extended to these SPVs.

Program (Dollars in billions)	Treasury (TARP)	Federal Reserve Board	FDIC	Total
Uncommitted TARP Funds	54.2 ²⁷²	0	0	54.2

²⁷² One potential use of uncommitted funds is Treasury's obligation to reimburse the Exchange Stabilization Fund (ESF), currently valued at \$50.5 billion. See U.S. Department of Treasury, *Exchange Stabilization Fund, Statement of Financial Position, as of April 30, 2009* (online at www.ustreas.gov/offices/international-affairs/esf/esf-monthly-statement.pdf) (accessed June 5, 2009). Treasury must reimburse any use of the fund to guarantee money market mutual funds from TARP money. See EESA, *supra* note 1, at §131. In September 2008, Treasury opened its Temporary Guarantee Program for Money Mutual Funds, U. S. Department of Treasury, *Treasury Announces Temporary Guarantee Program for Money Market Mutual Funds* (Sept. 29, 2008) (online at www.treas.gov/press/releases/hp1161.htm). This program uses assets of the ESF to guarantee the net asset value of participating money market mutual funds. *Id.* EESA §131 protected the ESF from incurring any losses from the program by requiring that Treasury reimburse the ESF for any funds used in the exercise of the guarantees under the program, which has been extended through September 18, 2009. U.S. Department of Treasury, *Treasury Announces Extension of Temporary Guarantee Program for Money Market Funds* (Mar. 31, 2009) (online at www.treas.gov/press/releases/tg76.htm).

Section Five: Oversight Activities

The Congressional Oversight Panel was established as part of EESA and formed on November 26, 2008. Since then, the Panel has issued six oversight reports, as well as its special report on regulatory reform, which was issued on January 29, 2009.

Since the release of the Panel's May oversight report, the following developments pertaining to the Panel's oversight of TARP took place:

- The Panel held a hearing in New York City on May 28 entitled, "The Impact of Economic Recovery Efforts on Corporate and Commercial Real Estate Lending." Witnesses representing banks, businesses, and the Federal Reserve Bank of New York discussed the impact of the financial crisis on credit availability for mid-market businesses that rely on commercial and industrial loans and commercial real estate loans to operate. Written testimony and video from the hearing can be found on the Panel's website at <http://cop.senate.gov/hearings/library/hearing-052809-newyork.cfm>.
- At a Panel hearing on April 21, 2009, Secretary Geithner pledged to arrange weekly Treasury briefings on TARP activities for Panel staff. Based on the Secretary's pledge, Panel staff has since received numerous briefings on topics including the methodology and results of the stress tests, lending data from CPP participants, and home ownership programs.
- The Panel and Treasury have reached agreement on a protocol for Treasury's production of documents to the Panel. Treasury has stated that it will begin production of requested documents shortly, but no documents have been produced pursuant to this protocol as of the date of this report. The Panel is in the process of negotiating a similar protocol with the Federal Reserve Board.

Upcoming Reports and Hearings

- The Panel will release its next oversight report in July. The report will provide an updated review of TARP activities and continue to assess the program's overall effectiveness. The report will also examine the terms of repayment of TARP money, including the repurchasing of warrants.
- The Panel is currently working with Treasury to find a date for Secretary Geithner to make his second appearance at a Panel oversight hearing in June.
- The Panel is planning a field hearing in Detroit in early-July to hear testimony on Treasury's administration of the Automotive Industry Financing Program.

- On May 20, 2009, the President signed into law the Helping Families Save Their Homes Act of 2009 (P.L. 111-22). Section 501 of the law requires the Panel to submit a special report to Congress that provides an analysis of the state of the commercial farm credit markets and considers the use of farm loan restructuring as an alternative to foreclosure by recipients of TARP assistance. To inform its composition of this report, the Panel is planning a field hearing on farm credit in the coming weeks.

Section Six: About the Congressional Oversight Panel

In response to the escalating crisis, on October 3, 2008, Congress provided Treasury with the authority to spend \$700 billion to stabilize the U.S. economy, preserve home ownership, and promote economic growth. Congress created the Office of Financial Stabilization (OFS) within Treasury to implement a Troubled Asset Relief Program. At the same time, Congress created the Congressional Oversight Panel to “review the current state of financial markets and the regulatory system.” The Panel is empowered to hold hearings, review official data, and write reports on actions taken by Treasury and financial institutions and their effect on the economy. Through regular reports, the Panel must oversee Treasury’s actions, assess the impact of spending to stabilize the economy, evaluate market transparency, ensure effective foreclosure mitigation efforts, and guarantee that Treasury’s actions are in the best interests of the American people. In addition, Congress instructed the Panel to produce a special report on regulatory reform that analyzes “the current state of the regulatory system and its effectiveness at overseeing the participants in the financial system and protecting consumers.” The Panel issued this report in January 2009.

On November 14, 2008, Senate Majority Leader Harry Reid and the Speaker of the House Nancy Pelosi appointed Richard H. Neiman, Superintendent of Banks for the State of New York, Damon Silvers, Associate General Counsel of the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO), and Elizabeth Warren, Leo Gottlieb Professor of Law at Harvard Law School to the Panel. With the appointment on November 19 of Congressman Jeb Hensarling to the Panel by House Minority Leader John Boehner, the Panel had a quorum and met for the first time on November 26, 2008, electing Professor Warren as its chair. On December 16, 2008, Senate Minority Leader Mitch McConnell named Senator John E. Sununu to the Panel, completing the Panel’s membership.

**APPENDIX I: LETTER FROM CHAIR ELIZABETH WARREN TO
FEDERAL RESERVE CHAIRMAN BEN BERNANKE REGARDING THE
CAPITAL ASSISTANCE PROGRAM, DATED MAY 11, 2009**

Congress of the United States
CONGRESSIONAL OVERSIGHT PANEL

May 11, 2009

The Honorable Ben S. Bernanke
Chairman
Board of Governors of the Federal Reserve System
20th Street and Constitution Avenue, NW
Washington, DC 20551

Dear Chairman Bernanke:

The announcement of the Capital Assistance Program, on February 25, 2009, described the Program's objectives as "[restoring] . . . confidence in the strength and viability of our financial institutions."¹ The announcement emphasizes a "one-time forward looking supervisory assessment" designed to test the ability of each of the nation's 19 largest bank holding companies to absorb the losses generated by a worse-than-expected decline in economic activity. As the Federal Reserve Board recognizes, the ability of such institutions to maintain adequate capital under current conditions is essential to the efforts to stabilize the financial system.

Because of their importance, the Congressional Oversight Panel (the "Panel") has undertaken a study of the theories underlying and details of the assessment. The Panel is being assisted in conducting its study by Professors Eric Talley and Johan Walden. Professor Talley is a member of the faculty of the UC Berkeley School of Law (where he is co-director of the Berkeley Center for Law, Business, and the Economy), and a visiting member of the faculty of the Harvard Law School. Professor Walden is a member of the faculty of the UC Berkeley Haas School of Business.

I am writing to you, in my capacity as Chair of the Congressional Oversight Panel, to obtain the information specified below (the "Specified Information") and to arrange a series of meetings (the "Meetings") to discuss the Specified Information and related topics. The Specified Information and the Meetings are necessary for the Panel to carry out section 125 of the Emergency Economic Stabilization Act of 2008, and the Panel is seeking the Specified Information and the Meetings pursuant to section 125(e)(3) of that Act.

¹ U.S. Treasury, *The Capital Assistance Program and its role in the Financial Stability Plan*, at 1 (Feb. 25, 2009).

The Specified Information is:

1. all memoranda concerning, and written descriptions of, any risk management, bank capital, economic, regulatory, legal, or statistical model or theory underlying or contributing to the Assessment;
2. all memoranda concerning, and written descriptions of, what the Assessment will attempt to measure or has attempted to measure, including, but not by way of limitation, the manner in which the Program proposes to measure or has measured cataclysmic risk;
3. all memoranda concerning, written descriptions of, and simulations pertaining to, the distributional and any other assumptions on which the Assessment rests, and the theories underlying and content of the projections it will employ or has employed, both in general terms and with respect to specific institutions;
4. all memoranda concerning, written descriptions of, and simulations pertaining to, the theories underlying and content of all economic assumptions that may be or have been incorporated in, or used as part of, the Assessment, both in general terms and with respect to specific institutions;
5. all memoranda concerning, written descriptions of, and simulations pertaining to, the thresholds, terms, and manner in which the Assessment will be or have been applied to specific institutions, including, but not by way of limitation, the ranges of outcomes within which any judgments about capital adequacy or the need for infusion of additional capital will be or have been made, whether in general terms or with respect to any specific institution; and
6. all information obtained during, or contained in notes or recordings of, the Meetings.

The Meetings. The Meetings will be one or more gatherings to discuss all or part of the Specified Information, attended by (i) officials of the Federal Reserve Board, including, but not by way of limitation, the senior officials of the Federal Reserve Banks, who are responsible for the Assessment, (ii) members or staff of the Panel, or both, and (iii) Professor Talley, Professor Walden, or both.

* * * *

Capitalized terms in this letter that are not defined above are defined in a document entitled “Congressional Oversight Panel – Supervisory Assessment Request, Definitions and Protocol for Document Production and Protection, dated May 11, 2009,” enclosed with this letter.

I would be happy to answer any questions about this letter that you may have. If you would prefer, a member of your staff can contact the Panel's Executive Director, Naomi Baum, to discuss any such questions. Ms. Baum's telephone number is [REDACTED].

Kindly respond to the requests for information, and for the meetings, described, within seven (7) calendar days from the date of this letter. In that connection, please provide the Panel with the names of one or more individuals who will be responsible for responding to this letter within three (3) days from the date of this letter.

Very truly yours,

A handwritten signature in black ink, appearing to read "E. Warren", written in a cursive style.

Elizabeth Warren
Chair
Congressional Oversight Panel

Enclosure

Congressional Oversight Panel – Supervisory Assessment Request
Definitions and Protocol for Document Production and Protection,
dated May 11, 2009

Documents defined in the letter, dated May 11, 2009 (the “Letter”), from Elizabeth Warren, Chair of the Congressional Oversight Panel (the “Panel:), to Hon. Ben S. Bernanke, Chairman of the Federal Reserve Board, to which this document relates, shall have the same meaning in this document as they have in the Letter.

Definitions.

As used in the Letter:

1. Any reference to “assessment” means the one-time forward looking supervisory assessment described in the Treasury White Paper entitled “The Capital Assistance Program and its Role in the Financial Stability Plan,” (February 25, 2009), appearing at http://www.ustreas.gov/press/releases/reports/tg40_capwhitepaper.pdf, as such supervisory assessment has been defined, designed, and implemented, and applied both generally and to all relevant bank holding companies and their subsidiaries, by staff of one or more of the Department of the Treasury, the OCC, OTS, the Board of Governors of the Federal Reserve System (including, but not by way of limitation, the Federal Reserve Banks), the Federal Deposit Insurance Corporation, and the National Credit Union Administration.

2. Any reference to “information” means any writings, drawings, graphs, charts, photographs, sound recordings, images, and other data or data compilations, by whomever prepared, whether in “hard copy” (i.e., paper) form or stored in any medium from which information can be obtained either directly or, if necessary, after translation by the responding party into a reasonably usable form, as well as the identity of any person employed by or serving as an agent or consultant for the Government, or with whom any employee or agent or consultant of the Government may have communicated, who may have knowledge relevant to the requested information and information sufficient for the Panel to contact such person including but not limited to such person’s name, title, telephone number, and electronic mail address.

3. Any reference to the “Federal Reserve Board,” or to any other department, agency, or instrumentality of government, shall include a reference to any bureau, office, or instrumentality thereof, including, but not by way of limitation, the Federal Reserve Banks.

Document Production.

1. The specified information is limited to any and all information described in the nine paragraphs of the Letter that is in the possession of the Federal Reserve Board (directly or subject to physical or electronic storage on behalf of the Federal Reserve Board), or to which the Federal Reserve Board has access, or the right (whether via existing agreement or under the law) to obtain access. Information is subject to the terms of this request regardless of the source of such information, the person or persons by or on behalf of whom such information was prepared or generated, and the person or persons by whom such information is now held.

2. To the extent that the Federal Reserve Board is aware of any information that is not in Federal Reserve Board's possession, custody, or control that would otherwise constitute specified information, please provide information sufficient to identify and locate that information and to request its production to the Panel.

3. In the event that specified information is withheld on any basis, please provide to the Panel a written description of (i) the type of information that is being withheld; (ii) the general subject matter to which the information relates; (iii) the reason such information is being withheld, including, but not by way of limitation, the statute or regulation under which such information is being withheld and the application of such statute or regulation to such information (described with sufficient detail that the Panel can determine the applicability of such statute or regulation to the information); (iv) the date, author, and addressee, if applicable; and (v) the relationship of the author and addressee, if applicable.

4. This request is continuing in nature and applies to any newly discovered information or to information generated or received after the date of the Letter. To the extent that any information is not provided to the Panel because it has not been located or discovered as of the return date or is generated or received after the return date, please produce such information to the Panel as soon as possible after its discovery or, if the information will not be produced for any reason, please provide the Panel with the information requested in the immediately preceding paragraph of this letter.

Document Protection.

1. Any individual hired or retained by the Panel under section 125(d)(2) of the Emergency Economic Stabilization Act of 2008 will execute a confidentiality agreement with the Panel prior to obtaining access to any portion of the specified information provided to the Panel by the Federal Reserve Board. The agreement will provide that such individual is subject to the ethical and non-disclosure obligations of an employee of the United States Senate and of the Panel. Any issues relating to such obligations may be directed to, and will be addressed by, the Panel's Ethics Counsel.

2. The Panel will not provide any of the specified information directly to the public. Instead, it will refer those who request such specified information to the Federal Reserve Board.

3. The Panel will not disclose the text of any of the specified information in any document originated by the Panel, without notifying the Federal Reserve Board and providing a reasonable time for the Federal Reserve Board to state its objections. Notwithstanding the immediately preceding sentence, the Panel may include a general description or descriptions, analysis, or analyses of any such information in any such document. Any draft of any such documents prepared by any consultant to the Panel will be reviewed by senior staff of the Panel to assure that no improper disclosure has occurred.

4. The Panel does not intend to disclose to the public any trade secret and commercial or financial information that is contained within or as part of any specified information and that is privileged or confidential such that it is subject to the terms of 18 U.S.C. § 1905.

5. We believe that the Panel is generally not authorized to withhold information from Congress, see 31 U.S.C. § 716(e)(3), or from a court. Should the Panel receive a congressional request or court order that would require the Panel to produce any portion of the Specified Information, the Panel will notify the Federal Reserve Board of the request prior to disclosure

and provide the Federal Reserve Board with the opportunity to express any concerns it may have about such production to the requester or to the court. In addition, the Panel will notify the recipient of the records of the proprietary nature of the material, including using a legend advising that further release may be prohibited by 18 U.S.C § 1905.

6. To ensure the confidentiality and security of the specified information, the Panel will store such information in locked cabinets in a locked room on the Panel's premises, to which only the Panel's Executive Director, Deputy Director, and Chief Clerk have keys. A log will be kept of any person who is granted access to that room.

Except as provided in the next paragraph, electronic data will be stored on a single computer in encrypted form; such computer will be placed in the locked room described in the preceding paragraph. The computer will be password-protected and will not be connected to any other computer or network; the USB ports that would otherwise permit copying from that computer will be disabled. Logs will be kept of any document printed from the computer and such document will be numbered to permit its identification; any such documents will be subject to the same controls as those described above for documents originally in paper form.

With the approval of the Federal Reserve Board (and, where applicable, any other department, agency, or instrumentality of the government that originated such Specified Information) Specified Information may be stored on a secure computer to which Professors Talley and Walden shall have Internet access on an encrypted basis or on a secure computer located at the Federal Reserve Banks of Boston and San Francisco.

**APPENDIX II: LETTER FROM CHAIR ELIZABETH WARREN TO SECRETARY
TIMOTHY GEITHNER REGARDING THE POSSIBILITY OF THE SECRETARY
APPEARING BEFORE A PANEL HEARING IN JUNE, DATED MAY 12, 2009**

Congress of the United States
CONGRESSIONAL OVERSIGHT PANEL

May 12, 2009

The Honorable Timothy F. Geithner
Secretary of the Treasury
United States Department of the Treasury
Room 3330
1500 Pennsylvania Avenue, N.W.
Washington, D.C. 20220

Dear Mr. Secretary:

I write in my capacity as Chair of the Congressional Oversight Panel (the Panel) to invite you to testify before the Panel on Wednesday, June 17, 2009. As you are aware, the Panel was established by section 125 of the Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343 (EESA), to conduct oversight of the Troubled Asset Relief Program (TARP). Your appearance on April 21, 2009 greatly assisted the Panel in its TARP oversight duties required by the statute, and we appreciate your cooperation with Panel staff in the weeks since the hearing. Due to recent TARP-related developments, and as part of the Panel's ongoing oversight responsibility, the Panel would appreciate your appearance at a hearing to be held in June.

The pace of new developments in TARP over the past few weeks highlights the significance of regular appearances before the Panel. The unveiling of the results of the Supervisory Capital Assessment Program (SCAP), and the questions it poses concerning methodology, repayment of TARP funds, and next steps for the use of TARP money, are topics the Panel would like to explore with you at an upcoming hearing. The Panel would like to work with your staff to schedule a mutually convenient time and date for an oversight hearing in June.

The Treasury Department and the Panel share a common goal of transparency; we look forward to your prompt attention to these matters.

Sincerely,



Elizabeth Warren
Chair
Congressional Oversight Panel

**APPENDIX III: LETTER FROM CHAIR ELIZABETH WARREN TO
SECRETARY TIMOTHY GEITHNER AND FEDERAL RESERVE CHAIRMAN
BEN BERNANKE REGARDING THE ACQUISITION OF MERRILL LYNCH BY
BANK OF AMERICA, DATED MAY 19, 2009**

Congress of the United States
CONGRESSIONAL OVERSIGHT PANEL

May 19, 2009

The Honorable Timothy F. Geithner
Secretary of the Treasury
United States Department of the Treasury
Room 3330
1500 Pennsylvania Avenue, N.W.
Washington, D.C. 20220

The Honorable Ben S. Bernanke
Chairman
Board of Governors of the Federal Reserve System
20th Street and Constitution Avenue, N.W.
Washington, D.C. 20551

Dear Secretary Geithner and Chairman Bernanke:

The New York State Attorney General, Andrew Cuomo, has sent a letter, dated April 23, 2009, to Senator Christopher Dodd, the Chairman of the Senate Committee on Banking, Housing, and Urban Affairs; Congressman Barney Frank, the Chairman of the House Financial Services Committee; Mary Schapiro, the Chairman of the U.S. Securities and Exchange Commission; and me, in my capacity as Chair of the Congressional Oversight Panel. The letter asserts that the Department of the Treasury and the Federal Reserve Board intervened to alter the course of the then-pending acquisition of Merrill Lynch by Bank of America (“BofA”).

The assertions have not been established or even subjected to formal challenge. But they still raise a critical policy issue, namely, the proper role of the Treasury and the Board in dealing with individual financial institutions during the administration of the Troubled Asset Relief Program (the “TARP”).

There appears to be no dispute that intense discussions took place among Treasury, the Board, and Kenneth Lewis, the Chairman and CEO of BofA, in December 2008, after BofA’s shareholders had approved the acquisition of Merrill Lynch. The discussions came when Treasury and the Board learned that BofA had concluded that it could, and should, stop the transaction because of Merrill Lynch’s deteriorating financial condition. Mr. Lewis has indicated in a statement made under oath to the Attorney General’s investigators that he changed his mind about ending the merger after it was strongly suggested that the government would remove BofA’s Board of Directors and

senior management if the transaction were terminated, but that if it completed the transaction, BofA would receive additional federal assistance to provide a financial cushion for its taking on Merrill Lynch's liabilities. Treasury had made a \$25 billion capital infusion into BofA in October 2008, and it made an additional \$20 billion infusion into BofA in January 2009, after the Merrill Lynch acquisition was completed.

The fact and nature of the discussions among the Treasury, the Board, and BofA – whatever their exact content - were disclosed neither to the shareholders of BofA nor to the public, whose tax dollars the TARP spends. But for Attorney General Cuomo, the nondisclosure would continue to this day.

The reaction to these disclosures underscores the importance of clear, timely, communication with the American people, to say nothing of affected investors, about the financial stability package. Unexpected disclosures only increase the perception that the government cannot operate openly in administering the TARP, despite the fact that the country's largest banks are being supported with billions of dollars of public funds.

More important, this interaction among Treasury, the Board, and BofA is a warning of the dangers that can arise when the government acts simultaneously as regulator, lender of last resort, and shareholder. (Treasury had purchased \$15 billion in convertible preferred stock and warrants of BofA on October 28, 2008; as indicated above, it purchased an additional \$20 billion of BofA preferred stock and warrants on January 16, 2009.) The TARP by its very nature creates conflicts of interest for Treasury and the Board. The conflicts can arise not only when the nation's senior financial officials are faced with decisions by a private institution that they believe would adversely affect the stability plan, but also when they are asked to make regulatory decisions that affect the institutions in which the government holds shares. Federal officials can act effectively under these circumstances only if strict controls, transparency, and a disciplined response to situations at all levels, earn the trust of the financial sector, the investment community, and the public.

The Panel is interested in your thoughts on how to manage this inherent conflict and on the controls you have put in place to ensure that your efforts to provide stability to the country's financial system are not undermined by these conflicts.

Very truly yours,



Elizabeth Warren
Chair
Congressional Oversight Panel

**APPENDIX IV: LETTER FROM CHAIR ELIZABETH WARREN TO
SECRETARY TIMOTHY GIETHNER REGARDING THE
TEMPORARY GUARANTEE PROGRAM, DATED MAY 26, 2009**

Congress of the United States

CONGRESSIONAL OVERSIGHT PANEL

May 26, 2009

The Honorable Timothy F. Geithner
Secretary of the Treasury
U.S. Department of the Treasury
Room 3330
1500 Pennsylvania Avenue, NW
Washington, D.C. 20220

Dear Mr. Secretary:

I am writing to request information about the U.S. Department of the Treasury's Temporary Guarantee Program for Money Market Funds (Treasury Guarantee Program or the Program), which is funded by the Troubled Asset Relief Program (TARP).

In September 2008, Treasury created the Treasury Guarantee Program in the wake of the Reserve Primary Fund "breaking the buck."¹ The Treasury Guarantee Program uses assets of the Exchange Stabilization Fund (ESF) to guarantee the net asset value of shares of participating money market mutual funds. Participation is restricted to publicly offered money market mutual funds regulated under Rule 2a-7 of the Investment Company Act of 1940 and registered with the Securities and Exchange Commission and is contingent on the payment of a participation fee. While Treasury has publicly released accounting of the amount of fees collected under the Program, it does not appear to have released a detailed accounting of the total value of funds guaranteed under the Program.²

Treasury has stated that "[t]he amount of the Guarantee Payment is dependent on the availability of funds in the Exchange Stabilization Fund,"³ and there is a provision in the standard contract between the Treasury Department and Program participants stipulating that "[t]he Guarantee Payment shall in no event exceed the amount available for payment within the ESF on the Payment Date, as determined by the Treasury in its sole and absolute discretion."⁴

¹ U.S. Department of the Treasury, *Treasury Announces Temporary Guarantee Program for Money Market Mutual Funds* (Sept. 29, 2008) (online at www.treas.gov/press/releases/hp1161.htm).

² U.S. Department of the Treasury, *Treasury Announces Extension of Temporary Guarantee Program for Money Market Funds* (Mar. 31, 2009) (online at www.treas.gov/press/releases/tg76.htm) (hereinafter "Treasury Program Extension Announcement") (reporting that the Program "currently covers over \$3 trillion of combined fund assets.").

³ U.S. Department of the Treasury, *Summary of Terms for the Temporary Guaranty for Money Market Funds*, at 2 (accessed May 19, 2009) (online at <https://treas.gov/offices/domestic-finance/key-initiatives/money-market-docs/TermSheet.pdf>).

⁴ See, e.g., U.S. Department of the Treasury, *Guarantee Agreement – Stable Value*, at ¶ 1(j) (accessed May 19, 2009) (online at https://treas.gov/offices/domestic-finance/key-initiatives/money-market-docs/Guarantee_Agreement_Stable-Value.pdf).

The ESF currently has approximately \$50 billion of capital of various liquidities.⁵ Section 131 of the Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343 (EESA), which was passed after the Program began, protects the ESF from incurring any losses from the Treasury Guarantee Program by requiring that Treasury reimburse the ESF for any funds used in the exercise of the guarantees under the Program.⁶ While the Program had an initial term of three months, it has been extended numerous times, most recently through September 18, 2009.⁷

As part of its oversight responsibilities, the Congressional Oversight Panel is monitoring all TARP funding commitments and cash flows. In support of this effort, and in light of the complicated financing arrangements utilized in this particular instance, the Panel requests the following information:

- (1) The total current and historical value of money market mutual funds participating in the Treasury Guarantee Program;
- (2) The extent to which the investments in the money market funds that are guaranteed under the Treasury Guarantee Program are also insured or supported by programs initiated by the Federal Reserve in response to the financial crisis and the interplay between these liquidity support and guarantee programs;
- (3) The extent to which the Treasury Department's obligations to exercise the guarantees under the Program are mitigated by its discretion to withhold payment when there are inadequate funds in the ESF given its requirement under EESA to refund the ESF when it is depleted;
- (4) The amount of TARP funds, if any, the Treasury Department has reserved for the possibility of its obligation to pay the guarantees under the Treasury Guarantee Program;
- (5) The Treasury Department's position on its legal responsibility to reimburse Program participants in the event that TARP money has been totally expended;
- (6) Whether the Treasury Department has any plans to extend the program beyond September 18, 2009.

The Panel requests that you provide this information as soon as possible, but not later than Wednesday, June 3, 2009.

⁵ See, e.g., U.S. Department of the Treasury, *Exchange Stabilization Fund State of Financial Position as of March 31, 2009* (accessed May 19, 2009) (online at <https://treas.gov/offices/international-affairs/esf/esf-monthly-statement.pdf>) (reporting \$50,038,405,934 of total Program assets, which include about \$23 billion in foreign currency holding, \$15 billion in U.S. Government Securities, and \$9 billion in International Monetary Fund Special Drawing Rights).

⁶ See section 131 of EESA, codified at 12 U.S.C. § 5236(a).

⁷ See Treasury Program Extension Announcement, *supra* note 2.

Mr. Timothy F. Geithner

May 26, 2009

Page 3

If you have any questions or would like additional information, please contact me or have a member of your staff contact Charlie Honig at [REDACTED] or [REDACTED].

Thank you for your attention to this request.

Sincerely,

A handwritten signature in black ink, appearing to read "E. Warren".

Elizabeth Warren
Chair
Congressional Oversight Panel

cc. Rep. Jeb Hensarling

Mr. Richard H. Neiman

Mr. Damon A. Silvers

Sen. John E. Sununu