STATEMENT OF

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on

AVOIDING TAXPAYER FUNDED BAILOUTS BY RETURNING TO FREE ENTERPRISE AND PRO GROWTH BANK REGULATORY POLICIES

before the

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The views expressed by the author are his own and do not necessarily reflect those of the Federal Deposit Insurance Corporation, its directors, officers or representatives.

Chairman Hensarling, Ranking Member Waters and Members of the Committee, I appreciate the opportunity to testify on issues relating to improving the safety and soundness of our nation's banking system. How policymakers and regulators choose to structure the financial system to allocate the use of the government's facilities and subsidy will define the long-run stability and success of the U.S. economy. My testimony today is based on a paper, titled "Restructuring the Banking System to Improve Safety and Soundness," that I prepared with my colleague Chuck Morris in May 2011. I welcome this opportunity to explain the pro-growth and pro-competition recommendations for the financial system in the paper, which I have attached to this testimony (Attachment 1). Although I am a board member of the FDIC, I speak only for myself today.

Too Important to Fail

Almost three years after passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act), an issue that remains critical to the long-run stability of our financial and economic system is the degree to which the government should subsidize and therefore facilitate ever-greater risk taking among our most dominant financial firms. These firms by their very size and complexity affect the broader economy to an overwhelming degree; and since the recent financial crisis, they have only become more influential and the economy more dependent on their performance.

The largest U.S. financial holding company has nearly $2.4 trillion of assets under GAAP accounting, which is equivalent to 15 percent of nominal GDP. If we take into account the gross fair value of its derivative book, it has nearly $4 trillion of assets, equivalent to 25 percent of

nominal GDP. The largest eight U.S. global systemically important financial institutions in tandem hold $10 trillion of assets under GAAP accounting, or the equivalent of two-thirds of U.S. GDP, and $16 trillion of assets when including the gross fair value of derivatives, which is the equivalent of 100 percent of GDP.

My concern with the largest financial institutions is not only their size but their complexity and the subsidy that facilitates each. Over time, the government's safety net of deposit insurance, Federal Reserve lending and direct investment has been expanded to an ever-broader array of activities outside the historic role of commercial banks -- transforming short-term deposits into long-term loans and operating the payments system that transfers money around the country and the world. In the U.S., the Gramm-Leach-Bliley Act allowed commercial banks to engage in a host of broker-dealer activities, including proprietary trading, derivatives and swaps activities -- all within the federal safety net. Following passage of this Act, in order to compete with subsidized firms, broker-dealers found it necessary to either merge with commercial banks or change their business model by taking on dramatically greater debt and risk. For example, firms like Bear Stearns began to borrow short to lend long and to engage in other bank-like activities. As they increased in size and complexity, the markets correctly assumed that the safety net would extend to these firms. Therefore, institutions engaged in banking activities significantly contributed to the crisis whether they were called "banks" at the time or not.

Even today, following enactment of the Dodd-Frank Act, government support of these dominant firms, explicit and implied, combined with their outsized impact on the broader

economy, gives them important advantages and encourages them to take on ever-greater degrees of risk. Short-term depositors and creditors continue to look to governments to assure repayment rather than to the strength of the firms' balance sheets and capital. As a result, these companies are able to borrow more at lower costs than they otherwise could, and thus they are able increase their leverage far beyond what the market would otherwise permit. Their relative lower cost of capital also enables them to price their products more favorably than firms outside of the safety net can do. For your information, I have included with my testimony a chart (Attachment 2) that shows current leverage ratios for some of the world's largest financial firms. History tells us that without the safety net, the market would have allowed far less leverage.

The Subsidy

The advantages I describe above translate into a subsidy that represents a sizable competitive advantage and which leads to a more concentrated industry. A large and growing body of evidence supports the existence of such a subsidy. A summary of studies is included with my written testimony (Attachment 3). While the estimated size of the subsidy may vary in degree, depending on the methodology, nearly all independent studies calculate the value to be in the billions of dollars. This government subsidy facilitates these firms' growth beyond what economies of size and scope can otherwise justify and subjects the broader economy to the adverse effects of management misjudgments, which in turn entrenches the behavior of repeated financial bailouts within modern economies.

The Dodd-Frank Act was intended to address the build-up of systemic risk and, if necessary, the management of its fallout on the economy. However, there remain systemically

important financial firms that are of a size and complexity that would expose the broader economy to overwhelming consequences should they encounter problems. The Dodd-Frank Act unfortunately does not change the fundamental incentive of the safety net's subsidy, which continues to encourage these firms to leverage and take on excessive risk for higher returns. As long as the subsidy exists, we will have highly leveraged, highly vulnerable institutions that will negatively impact our national economy

The Proposal

To improve the chances of achieving long-run financial stability and making the largest financial firms more market driven, we must change the structure and the incentives driving behavior. The safety net should be narrowed and confined to commercial banking activities as intended when it was implemented with the Federal Reserve Act and the Banking Act of 1933. Importantly, such reforms only will be effective if the shadow banking system is also reformed and its activities subjected to the market's discipline.

Commercial banking organizations that are afforded access to the safety net should be limited to conducting the following activities: commercial banking, securities underwriting and advisory services, and asset and wealth management. Most of these latter services are primarily fee-based and do not disproportionately place a firm's capital at risk. They are similar to the trust services that have long been a part of banking.

Extending the safety net to broker-dealer activities is unnecessary and unwise. While trading and investment activities are important parts of the financial system, they operate more

efficiently and safely without government protections. Keeping them inside the safety net exposes the FDIC Deposit Insurance Fund and the taxpayer to loss. Therefore, activities that should be placed outside the safety net and thus subject to market forces are: most derivative activities; proprietary trading; and trading for customer accounts, or market making. Allowing customer trading makes it easy to game the system by "concealing" proprietary trading as part of it. Also, prime brokerage services require the ability to trade, and essentially allow companies to finance their activities with highly unstable, uninsured, wholesale "deposits" that come with implied protection. This combination of factors, as we have recently witnessed, leads to unstable markets and government bailouts.

Reforming the Shadow Banking System

These actions alone would provide limited benefits if the newly restricted activities migrate to shadow banks -- broker-dealers, for example -- without that sector also being reformed. We need to change incentives within the shadow banking system through reforms of money market funds and the repo market.

First, we must address potential disruptions coming from money market funding of shadow banks that fund long-term assets. Money market mutual funds and other investments that are currently allowed to maintain a fixed net asset value of $1 should be required to have floating net asset values. Shadow banks' reliance on this source of short-term funding would be greatly reduced by requiring share values to float with their market values.

Second, we must change bankruptcy laws to eliminate the automatic stay exemption for mortgage-related repurchase agreement collateral. This exemption, introduced in 2005, resulted in a proliferation in the use of repos based on mortgage-related collateral. This preferential treatment made it possible for complicated and often risky long-term mortgage securities to be used as collateral when the volume of securities was growing rapidly just prior to the bursting of the housing price bubble. One of the sources of instability during the recent financial crisis was repo runs, particularly on repo borrowers using subprime mortgage-related assets as collateral. Essentially, these borrowers funded long-term assets of relatively low quality with very short-term liabilities.

The reforms specified in the proposal I am describing today would not – and are not intended to – eliminate natural market-driven risk in the financial system. They do address the misaligned incentives causing much of the extreme risks stemming from the safety net's coverage of nonbank activities. The result would be a return to a system of free enterprise where broker-dealer related activities are subject to greater market discipline.

The Industry's Reply

Objections to the proposal I offer suggest that it would undermine the competitive position of U.S. firms internationally. However, under the proposal, the largest financial firms would remain large and would be more competitive. It recognizes that the public should not accept the premise that it must subsidize highly risky financial activities in order to compete for international dominance. It is a serious error to presume that if these activities were not subsidized at U.S. commercial banks, they would cease to be offered by other non-subsidized

U.S. firms. Our dynamic markets would continue to provide these services via independent broker-dealers but in a more competitive manner where the taxpayer is not part of the transaction.

Each country is unique in what banking structure best supports its economic growth. I am not aware of research that suggests the U.S. financial system would be less competitive or that economic growth would suffer with commercial banking separated from broker-dealer activities. It is a fact that the emergence and continued success of the U.S. economy from the end of World War II to the 1990s happened during a period where commercial banking was separate from investment banking. Here's one data point: the growth rate of real GDP averaged 3.3 percent from 1955 to 1990, but only 2.3 percent from 1990 to the present.

The argument for bank deregulation prior to 1999 was that size and diversification of activities reduces risk. While in theory that may have seemed a real possibility, we can surely observe that history – from the 1980s to the most recent crisis – suggests otherwise. In each of these periods of financial crisis, regional and smaller banks failed and didn't bring down the economy. In the recent crisis, some of the largest banks would have failed had they not been bailed out to prevent a total economic collapse. Regardless of TARP repayment at a generously low interest rate, millions of American jobs and trillions of dollars in economic wealth remain lost.[1]

[1] The GAO reports that estimates of the economic cost in lost output of the 2007 crisis could range from a few trillion dollars to over $10 trillion. http://www.gao.gov/assets/660/651322.pdf

Large banks and large broker-dealers are critical components of the U.S. economy. But I oppose their government-backed ability, when combined as conglomerates, to carry a size and complexity that evidence suggests exceeds what economies of scale would otherwise justify[2] and thus exposes the real economy to levels of risk that are unnecessary.

Benefits of Change

The proposal outlined in my paper would return U.S. financial firms to a more market-driven model. It would reduce the opaqueness of these firms' operations, enabling the market and supervisors to better oversee their actions. It also would improve the pricing of risk, thus enhancing the allocation of resources within our economic system. In addition, it would promote a more competitive financial system with more – not fewer – firms, as it levels the playing field for financial institutions in the U.S.

As a further benefit, the proposal would facilitate the implementation of Titles I and II of the Dodd-Frank Act, allowing the resolution of a failed SIFI by simplifying the structure of these large financial institutions, making the entire system more manageable through a crisis. Finally, it would raise the bar of accountability for actions taken and, to an important degree, give further credibility to the supervisory authorities' commitment to place these firms into bankruptcy or FDIC receivership when they fail, thus reducing the likelihood of future bailouts.

[2] Gambacorta, Leonardo and van Rixtel, Adrian. 2013. "Structural bank initiatives: approaches and implications," BIS Working Paper No. 412, April.

Conclusion

I will close my remarks by recalling that twice within the past century Americans have experienced the tragedy of vast job and wealth losses due to the economy's exposure to financial crisis. Most recently, the Financial Crisis Inquiry Commission identified a series of abuses that opened our economy to crisis. These included using special purpose vehicles and affiliates to engage in and fund speculative off-balance-sheet activity, and participating in and syndicating for sale low-quality assets.

Finally, I want to conclude by mentioning two admonitions of Adam Smith. First, he argued well that specialization most often increases productivity. I suggest that in the financial services industry, specialization would do much to increase productivity, innovation and other overall benefits to our economic system. Second, Adam Smith wisely warned that,

> "The interest of the dealers....is different from, and even opposite to, that of the public. To widen the market and to narrow the competition, is always the interest of the dealers. To widen the market may be agreeable to the public; but to narrow the competition is against it, and enables the dealers, by raising profits above what they naturally would be, to levy an absurd tax upon their fellow-citizens."

In the United States we must reform financial conglomerates so we have a more stable, more innovative, more competitive system that continues to support the largest, most successful economy in the world.

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Attachment 1

Restructuring the Banking System to Improve Safety and Soundness

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 Michal Kowalik, an Economist in the Banking Research Department at the Bank, contributed substantially to the proposal. The authors would like to thank Viral Acharya, Matt Richardson, Larry White, Richard Sylla, Thomas Philippon, Lasse Pedersen, Jacob Goldfield, and Nada Mora for helpful comments and suggestions.

Executive Summary

Proposal

- This paper provides a specific proposal to limit the financial activities that are covered and thus subsidized by the government safety net in order to protect the financial system and the economy. The U.S. safety net, which consists of central bank loans to solvent but liquidity strained banks and federal deposit insurance, was developed in the early 1900s to protect commercial banks.
- The safety net originally was limited to commercial banks because they are critical to an economy's overall health and growth. Their core activities of making loans funded by short-term deposits provide essential payment, liquidity, and credit intermediation services. But banks also are inherently unstable because depositors will "run" if they believe their bank is in financial trouble.
- While the safety net solves the instability problem, it also creates incentives to take excessive risk because it subsidizes banks. With safety net protection, depositors and other protected creditors are willing to lend to banks at lower interest rates, given the amount of risk. This cheaper funding and reduced market discipline creates incentives for banks to make riskier investments and increase leverage. The subsidy and associated incentive to take greater risks have grown substantially over the past 30 years because the activities the safety net supports has expanded beyond the core banking activities considered necessary to protect.
- The recommendation in this paper is to limit the safety net – and thus its subsidy – to what the safety net should protect by restricting banking organization activities by business line. Under the proposal, banking organizations would continue to provide the core services of commercial banks – making loans and taking deposits to provide payment and settlement,

liquidity, and credit intermediation services. Other allowable services would be securities underwriting, merger and acquisition advice, trust, and wealth and asset management. Banking companies would not be allowed to conduct broker-dealer activities, make markets in derivatives or securities, trade securities or derivatives for either their own account or customers, or sponsor hedge or private equity funds.

- The difference between what banks would and would not be allowed to do is based on the principle that beyond their core services, they should not conduct activities that create such complexity that their management, the market, and regulators are unable to adequately assess, monitor, and control bank risk taking. Current activities conducted by banks that would be prohibited for them, such as trading and market making, are important to the economy. But they should not be subsidized by the safety net because it causes their overproduction, and therefore imposes unnecessary risks and costs on the financial system and economy. In fact, by removing the safety-net's protection for activities such as securities and derivatives market-making, the market for these services should become more competitive and less dominated by the largest investment banks, which currently are all affiliated with commercial banks.
- The benefits of prohibiting banks from conducting high-risk activities outside of their core business, however, would be limited if those activities continue to threaten stability by migrating to the "shadow" banking system. Shadow banks are financial companies not subject to prudential supervision and regulation that use short-term or near-demandable debt to fund longer-term assets. In other words, shadow banks essentially perform the same critical, core functions as traditional banks, but without an explicit safety net or prudential regulation. As a result, the shadow banking system is susceptible to disruptions that threaten

financial and economic stability and lead to additional implicit government guarantees and the associated incentive to take excessive risks.

- To mitigate the incentive for shadow banks and other financial companies to take excessive risk and the associated potential systemic effects, this paper makes two additional recommendations. First, money market mutual funds and other investment funds that are allowed to maintain a fixed net asset value (NAV) of $1 should be required to have floating net asset values. Second, bankruptcy law for repurchase agreement collateral should be rolled back to the pre-2005 rules, which would eliminate mortgage-related assets from being exempt from the automatic stay in bankruptcy when a borrower defaults on its repurchase obligation.
- The problem with fixed NAVs and current bankruptcy law is they provide special treatment – that is, they essentially subsidize – short-term funding. As with the safety net for banks, the subsidy leads to the overproduction of risky shadow banking activities. By reining in this subsidy, these two recommendations should greatly curtail shadow banking activities by exposing shadow bank creditors to the true costs of their investments.

Why Restricting Activities is the Solution

- The reduced market discipline and incentive to take excessive risk caused by the safety net has long been recognized, which is one of the major reasons for the prudential supervision of banks. The incentive to take *excessive* risk traditionally has been contained through strong on-site examinations and minimum capital requirements that were supplemented as appropriate based on the exam results. This does not mean that banks do not take risks, nor that they do not make mistakes that cause them to fail. Banking is a business of risk taking, and when they do make bad decisions that lead to insolvency or liquidity problems, they

should fail and be resolved. Thus, it is the prevention of excessive risk taking arising from the safety net subsidy that prudential supervision is supposed to stop.

- This traditional financial structure and regulatory framework worked well for many years, and it still does for those banks that still operate within the framework, which includes all but the largest universal banks. That framework has three components. First, it limits bank activities to those essential to the economy but inherently unstable. Second, it provides a safety net for banks and their limited activities, which prevents the instability but has undesirable side effects. Third, it includes strong supervision to control the side effects.
- The current financial structure, however, is vastly different. Leading up to the financial crisis, the financial system became dominated by a handful of large *and* complex financial organizations, and these companies have become even more dominant. These complex universal banking companies combine traditional banking activities with a variety of investment banking and insurance activities.
- The problem with this change in structure is not that banks are larger, but that the scope of the safety net and its subsidy – and therefore their sizes – has expanded beyond the traditional bank activities that provide external social benefits. The subsidy is provided, either explicitly or implicitly, to the organization as a whole and not limited to the specific activities for which it was intended. The riskiness of banks can be reduced by the additional activities, for example, if they increase the diversification of bank assets and revenue streams. However, the riskiness of banks also can be increased by the additional activities because they not only are subsidized by the safety net, but also because they create complexity that makes it more difficult for bank management, the market, and regulators to assess, monitor, and contain the excessive risk taking induced by the safety net. Moreover,

the large size of the universal banks – both individually and collectively given the increased interconnections among them – further endangers the stability of the financial system and the overall economy. Thus, the social costs of extending the safety net to large, complex universal banks that cannot be sufficiently monitored by their own management, the market, or regulators greatly exceeds the private benefits to an individual bank.

Evolution of current financial structure

- Over the past 30 years, the U.S. banking system has changed dramatically from the stylized view of banking that arose from the banking panics of the early 1930s. The structure of the banking industry that emerged from the 1930s separated investment banking and other financial services from "traditional" commercial banking – making loans and taking deposits to provide payment, liquidity, and credit intermediation services. These core banking services are the foundation of the financial infrastructure that is critical for the overall health of an economy and its growth.

Regulation

- The 1930s financial structure that lasted largely until the end of the century was shaped by three major legislative and regulatory changes: the Glass-Steagall Act, creation of federal deposit insurance, and the Federal Reserve's Regulation Q.
- The Glass-Steagall Act refers to four provisions of the Banking Act of 1933 that separated commercial and investment banking. Deposit (i.e., commercial) banks were prohibited from conducting securities activities (underwriting and dealing) or affiliating with companies that conducted securities activities. The rationale was that banks are crucial for a well-functioning economy because they settle payments, provide deposits that are available at par

value on demand, and are the primary source of credit for the vast majority of businesses and individuals. These functions are a critical part of the economy's financial infrastructure.

- Banks are provided access to a public safety net because of their importance and susceptibility to runs from using demand deposits to fund longer-term, illiquid loans. Prior to the 1930s, the Federal Reserve's discount window provided a limited safety net for solvent banks.[1] The public safety net was significantly enhanced in 1933 by passage of the Federal Deposit Insurance Act and the associated provision of limited deposit insurance because it protected depositors of banks that failed.
- Access to a safety net, however, increases the incentive for banks to take excessive risks. Given the importance of a stable banking system, the necessity of a public safety net to provide the stability, and an incentive to take greater risk, a mechanism is needed to prevent banks from taking excessive risks and endangering the safety net. The market cannot be solely relied upon to prevent the risk taking because some deposits are insured and banks are inherently opaque. As a result, prudential supervision and regulation must be used to prevent excessive risk taking.
- One of the key regulations of the Banking Act of 1933 was the prohibition of paying interest on demand deposits and the authority to impose ceilings on savings deposit rates, which was implemented through the Federal Reserve's Regulation Q. The rationale for Regulation Q was to prevent competition for deposits from causing instability in the banking system.
- The combined effect of the Glass-Steagall Act, bank access to a government safety net, prudential supervision and regulation, and deposit rate ceilings was a fairly stable, profitable banking industry with a positive franchise value for many years. The franchise value was

[1] Also, only members of the Federal Reserve could borrow from the discount window until the Monetary Control and Depository Institutions Deregulation Act of 1980.

protected to the extent banks were protected from outside competition and competition among themselves.

Increased competition

- Over time, banks faced increasing competition on both the liability and asset sides of the balance sheet. The increase in competition was spurred by advancements in portfolio theory, investment and money management techniques, and information technology combined with greater volatility of the economic environment.

- On the liability side, banks had to compete with money market mutual funds (MMMFs) and savings association NOW accounts that paid interest on close substitutes for bank demand deposits. They also faced greater competition for household savings from mutual funds, pension funds, and insurance companies.

  - MMMFs started in 1971 as a competitive alternative to bank deposits because they paid a market interest rate and were allowed to maintain a net asset value (NAV) of $1 a share as long as their actual NAV is greater than 99.5 cents (i.e., they do not "break the buck") and not too far above $1, and they met certain investment (quality and maturity) requirements. They allow investors to withdraw funds on demand and have limited check-writing privileges. MMMF shares are held by individuals, institutional investors, and corporate and noncorporate businesses as an alternative to bank deposits for cash management and payments purposes. MMMFs started out investing in highly-rated financial and nonfinancial company commercial paper (CP) and short-term Treasury securities, and then over the years expanded to other money market instruments (MMIs), such as asset-backed commercial paper (ABCP), and short-term repurchase agreements (repos).

- It is important to note that although an MMMF investor technically owns equity shares of the fund – that is, there is *no leverage* – the investor is more like a depositor because the expectation is that funds can be withdrawn at a par value of $1 a share – that is, there is no equity and *leverage is infinite*. As a result, MMMF investors act more like depositors and will run whenever they are concerned about a fund's safety so they can redeem their shares for $1 before the fund "breaks the buck" and reduces the value of the shares.

- NOW accounts were developed by savings and loans in the early 1980s as a competitive alternative to demand deposits that paid interest. NOW accounts essentially were just like demand deposits – funds were available upon demand and had unlimited check-writing privileges – but they could pay interest because the depository institution reserved the right to require notice before allowing funds to be withdrawn or transferred by check.

• On the asset side, banks faced competition in making loans from investment banks (junk bonds, securitization, and nonfinancial commercial paper), mortgage brokers, and specialty lenders such as unaffiliated finance companies (primarily consumer lending), captive lenders (auto financing, retailers), and factors (trade receivable lending).

- Banks have long faced competition in making loans from unaffiliated and captive finance companies and factors. Commercial paper became a competitive alternative to bank operating loans for large, highly-rated nonfinancial companies in the late 1960s and early 1970s.

- Competition for bank loans increased substantially beginning in the 1980s with the growth of junk bonds and an ability to originate and distribute loans through the development of mortgage-backed securities (MBS), followed by other types of asset-

backed securities (ABS), which are typically backed by consumer loans (credit cards, auto, student).

Shadow banking

- The combination of alternatives to bank deposits and loans created an alternative system for providing complete end-to-end banking – from gathering funds to making loans – which collectively comprises the so-called shadow banking system.[2]
  - In contrast to a typical bank that conducts the entire process of borrowing funds from savers, making loans to ultimate borrowers, and holding the loans to maturity, credit intermediation through the shadow banking system is a vertical process that takes place through a series of entities – collectively called shadow banks – similar to a supply-chain manufacturing process.
  - Funding for each of the entities takes place in wholesale markets. Money market instruments – specifically CP, ABCP, and short-term repos – are a major source of funds at virtually each step in the process.[3] The major investors in the MMIs are MMMFs and other short-term investment funds that have a fixed NAV of $1.[4] At some steps of the process, major funding sources also include medium-term notes and ABS that are purchased by long-term investors, such as mutual funds, pension funds, and insurance companies.
  - A typical example of the shadow banking intermediation process is as follows:
    1. A loan is made by either a nonbank financial company or a bank. The nonbank companies finance the initial loans with CP or medium-term notes (MTN).

[2] The description of the shadow banking system and the process described below is largely from Pozar, Adrian, Ashcraft, and Boesky.
[3] The one exception is the step that actually securitizes loans into MBS/ABS.
[4] There are also direct investors in these money market instruments, such as securities lenders.

2. The loan is sold to a bank or broker-dealer conduit, which is an intermediate entity that temporarily warehouses the individual loans until it has enough to package together as an MBS or ABS. The conduits are funded with ABCP.
3. The loan warehouse sells the package of loans to a securitization sponsor that sets up a trust to hold the loans, which is financed by selling MBS/ABS backed by the loans. This is the only step in the process not financed by MMIs.
4. The ABS are purchased by a variety of entities that are funded by a variety of sources.
    a. Entities that purchase ABS and tend to fund them with longer-term sources of funds include mutual funds, pension funds, and insurance companies.
    b. BHCs may purchase ABS and hold them on bank balance sheets funded by deposits. However, prior to the financial crisis, they generally held them in off-balance-sheet entities, such as structured investment vehicles (SIVs) or other conduits, that were funded by CP or ABCP. The CP or ABCP, in turn, was typically purchased by MMMFs and other MMI funds with fixed $1 NAVs.
    c. Investment banks and BHCs purchase ABS for a variety of reasons. They may be held by a securities subsidiary as a proprietary trading asset, in inventory for filling customer trades, or warehoused for creating collateralized debt obligations (CDOs). The ABS are typically funded with repos and sometimes ABCP, which again are funded by MMMFs and other MMI funds with fixed $1 NAVs.

<u>Expansion of bank activities</u>

- Increased competition for banks from the shadow banking organizations combined with regulatory capital requirements (stemming from the Basel I Accord) that were higher than for

their competitors led to reduced profits and declining franchise values. As a result, banking organizations looked for alternative activities, revenue streams, and business models, which included the originate-to-distribute shadow banking business model. Whereas the traditional banking model of making loans and holding them to maturity earned profits from loan-deposit rate spreads, the shadow banking model earned profits from fees and trading gains.

- Some banks responded to the increased competition by focusing first on being able to engage in traditional investment banking and securities activities and later more broadly on broker-dealer and shadow banking activities.
  - Banks were able to whittle away at the Glass-Steagall Act restriction on investment banking activities in the 1990s by creating Section 20 securities subsidiaries that were supported by Federal Reserve Board approvals of higher thresholds for being "principally engaged" in securities activities.[5]
  - To fully participate, however, banks needed the Glass-Steagall Act prohibition on affiliation with securities companies to be repealed, which was achieved with the passage of the Gramm-Leach-Bliley Act (GLBA) in 1999. The GLBA allowed the formation of financial holding companies (FHCs), which were BHCs engaged in certain nonbanking activities, such as securities underwriting, broker-dealer activities, and insurance underwriting, not permitted for BHCs.

[5] One of the Glass-Steagall Act provisions was Section 20 of the Banking Act of 1933. Section 20 prohibited Federal Reserve member banks from affiliating with organizations that "engaged principally in the issue, floatation, underwriting, public sale, or distribution of stocks, bonds, debentures, notes, or other securities." For many years, the administrative limit for not being "principally engaged" was that underwriting and dealing accounted for 5 percent or less of a subsidiary's gross revenue. As banks became larger, underwriting and dealing became cost effective even with the 5 percent revenue limit. Over time, banking organizations began petitioning for larger limits, which the Federal Reserve agreed to based on assessments of the risks and benefits to the economy, with the limit eventually rising to 25 percent in 1997.

- Significant changes in the investment banking industry also occurred to take full advantage of the opportunities of the shadow banking industry. With the growth of bond markets and the development of MBS securities in the 1980s, investment banks moved from partnership structures to public corporate structures. The corporate structures essentially allowed the investment banks to engage in riskier activities that put the firm's capital at risk, such as proprietary trading, leveraged lending, and hedge fund sponsorship, that the partners were much less willing to do when their own money was at risk. The risks were exacerbated by relying on debt financing, i.e., leverage, much of which was short-term repos. In fact, it became much easier to use debt after 2004 when the SEC allowed broker-dealers to use their internal risk management models to compute the haircuts for calculating their net capital.[6]

Implications for financial structure, stability, and risk

Changes in financial structure and stability

- The sharp line between commercial and investment banks is significantly blurred as each has engaged in shadow banking activities.
  - The larger banking organizations engage in activities that were traditionally limited to investment banks, which exposes them to investment bank risks. Traditional banks that take in deposits and make and hold loans to maturity have to manage credit and interest rate risk. As FHCs have expanded activities to earning fees from trading and ABS underwriting, their risk exposures expanded to include market risk from trading and the risk from having to roll over uninsured wholesale money market funding risks.

[6] Prior to the 2004 SEC ruling, the SEC determined the haircuts used to calculate the leverage ratios of broker-dealers. The 2004 ruling allowed the broker-dealers to use their internal risk management models to compute these haircuts. The ruling followed a similar change to the Basel I Accord from 1996, under which commercial banks could compute their capital requirements for trading positions using their own models.

- Similarly, the larger investment banks now engage in activities that were traditionally limited to commercial banks, which exposes them to commercial bank risks. By switching from partnerships to public corporate structures, taking on leverage, and making direct investments and loans that are held on the balance sheet, investment banks expanded their risk exposures beyond market risk to credit and funding risk.

- With the largest financial companies – both banking and investment banking organizations – being the key players in shadow banking activities, both types of organizations play a special role in the economy that once was limited to commercial banks. Through shadow banking activities, both types of organizations ultimately provide the same credit intermediation function of traditional banks – lending long term using short-term funds available upon demand.

- The expansion of activities by commercial and investment banks has led to a less stable financial system because it is dependent on wholesale, money market funding without an explicit safety net of insurance and access to central bank lender-of-last-resort facilities.
  - Just like banks were subject to depositor runs that created liquidity crises before deposit insurance was available, virtually every step of the shadow banking process is dependent on uninsured investments in MMMFs and other MMI funds with fixed NAVs of $1.
  - Investors in these money market funds have full access to their money as long as the underlying NAV is $1 or more, so once concerns arise about the quality of the underlying assets, i.e., that the underlying NAV will drop below $1, investors have an incentive to withdraw their funds before others. A loss in funding at any step of the process will cause the system to break down just like a loss in funding at a traditional commercial bank.

- The heavy involvement of large banking organizations (in the form of FHCs) and investment banks in shadow banking activities exposes them to similar risks that previously had been eliminated by deposit insurance in retail banking.
  - Bank subsidiaries are still protected from insured depositor runs, but the holding companies and banks are now exposed to money market fund runs.
  - The bank subsidiaries also are exposed to money market runs because the banks often provide credit lines on the ABCP that fund ABS held by affiliated holding company subsidiaries, such as off-balance-sheet conduits and SIVs. The ABCP often needs a credit line or guarantee so that it has the AAA rating needed to make it an eligible investment for MMMFs. So if MMMFs decide not to roll over their ABCP investments in an SIV and the value of the underlying ABS is below par, the SIV would sell the ABS to the bank guarantor at par, which means the bank takes the loss and has to fund the ABS on balance sheet. In other words, the credit and funding risk to the bank from guaranteeing the off-balance-sheet funding of ABS with ABCP is the same as if it held the underlying ABS on its own balance sheet.
  - To make matters worse, even though the risks to the bank of holding assets on balance sheet or guaranteeing them off balance sheet are the same, FHCs had an incentive to move the assets off balance sheet because it can fund those assets with much less capital.[7] Specifically, the risk-based capital requirements of FHCs had a much higher risk weight for holding the loans or ABS on balance sheet than for guaranteeing the ABCP funding

[7]Acharya, Schnabl, and Suarez provide evidence consistent with regulatory arbitrage being a reason for the use of ABCP programs by banks. They also document changes in regulatory rules that enabled banks to perform this type of regulatory arbitrage. In July 2004, the OCC, Federal Reserve, FDIC, and OTS exempted assets in ABCP programs from the calculation of risk-weighted assets. As a result, assets moved from banks' balance sheets to ABCP programs did not have to be considered when calculating risk-weighted assets for capital requirements. Moreover, under the Basel I and Basel II Accords, assets placed in ABCP programs carried lower capital charges than the same assets carried on balance sheets.

of an off-balance-sheet entity. As a result of this arbitrage of regulatory capital requirements, FHCs became much riskier because they could fund the credit risk with much higher leverage.

- FHCs also are exposed to runs by money market investors even if the MMIs are not fully guaranteed because of reputational risk. Although subsidiary conduits and SIVs that hold ABS are technically bankruptcy remote, FHCs either purchase assets and bring them on balance sheet or provide capital support to avoid the negative reputational effects of defaulting on the securities funding the subsidiaries.
- Finally, the broker-dealer subsidiaries of investment banks and FHCs also are exposed to MMI runs. As already noted, broker-dealers use repos and ABCP to fund ABS held as part of their proprietary trading business, as inventory for filling customer trades, and for creating CDOs.

<u>New activities make it more difficult to manage and monitor risk</u>

- Overall, the largest financial companies conduct a variety of traditional and non-traditional banking activities, many of which have increased the complexity of their operations and portfolios. The potential problem is not that the new activities are risky – all financial activities are inherently risky, even traditional banking activities. These companies may even benefit from additional activities, for example, if they increase the diversification of their assets and revenue streams. However, it is more likely that these benefits are outweighed by the significant complications the activities pose for bank management, the market, and regulators to assess, monitor, and contain risk taking that is ultimately borne by the public safety net and endangers financial stability. Specifically, as explained below, combining banking and nonbanking activities makes it more difficult for bank management to manage

risk, for the market to monitor and effectively discipline banks, and for regulatory authorities to supervise and regulate banks and price deposit insurance.

- Complexity makes *risk management* much more difficult.[8]
  - Risk management is particularly difficult when a banking organization has many different operational divisions and activities. Examples include understanding all of the different business lines and their interactions, having appropriate management information systems, and appropriately allocating and pricing capital across activities. Such difficulties and shortcomings in risk management practices and effectiveness at several U.S. and foreign global banking organizations leading up to and during the recent financial crisis are highlighted in two reports by the Senior Supervisors Group (2008, 2009).
  - The risk management of a complex institution can also vary with the background of its senior leadership. For example, trading is risky in the short term, so it attracts people predisposed to taking risks. In contrast, lenders tend to have a longer term perspective. As a result, an organization's risk culture and appetite is likely to be lower if its senior leadership has a commercial banking background rather than a trading background.
  - To the extent that a bank's senior management has difficulty understanding and managing its risks, it is even more difficult for supervisors to scrutinize and monitor a banking organization's risks.
- Reduced transparency reduces *market discipline*. Banking organizations with a variety of nontraditional activities tend to be less transparent than others, which makes it difficult for the market to discipline their risk taking. Relative to nonfinancial companies, it is difficult

[8] All aspects of managing a large, complex financial company is difficult, but given the context of this paper, the focus is on risk management.

for investors to evaluate the condition of traditional banks and their riskiness because their balance sheet assets and activities are opaque and easily changed.[9] Traditional banking is opaque because banks have more information than investors about the quality and risk of their loans. Banks that engage in nontraditional activities, such as trading, hedge funds, private equity, and market making are even less transparent because the success of these strategies depends on the confidentiality of their positions and speed at which their exposures can be changed. Given the lack of transparency, regulators must play a larger role relative to the market in monitoring and disciplining banks, but as discussed below, regulators also are at a disadvantage when dealing with banks that are engaging in nontraditional activities.

- Some activities make *bank supervision* more difficult.
  - The goal of prudential supervision is to control excessive risk taking by banks so that they are safe and sound and do not endanger the safety net. Supervision includes reviewing a bank's operations and risk management policies; monitoring its financial condition, lending, operations, risk management, and other practices; and enforcing regulatory rules. Because of the periodic nature of bank supervision, supervisors get only a snapshot of bank processes, risk exposures, and capital positions at a given time. Even for the largest complex banking organizations, at which supervisory staff work on site and are continuously looking at some part of the organization and its operations, supervisors still only have snapshots of various operations, albeit at higher frequencies. These snapshots are limited in their ability to predict the safety of a bank's processes, its risk exposures, and its capital positions between supervisory examinations. The

[9] Morgan provides evidence on the increased opacity of banks from combining lending and trading activities.

flexibility to adjust risk profiles between exams depends, to some extent, on a banking organization's activities and the nature of the risks.

- Many of the nontraditional activities that the large, complex banking organizations engage in are difficult to supervise effectively because they are very risky in the short term, which can quickly change a bank's risk profile. For example, trading and market-making are high frequency activities that result in thousands of daily transactions. As a result, snapshots of the positions of these activities may have limited predicative value for future positions. Continuous supervision at the largest banking organizations clearly provides a better understanding of their risks than the traditional approach of periodic exams. Nevertheless, understanding and monitoring the risks still can be difficult, especially when management itself has difficulties in understanding and monitoring risk. Thus, while bank supervision is not meant to prevent risk taking, and is subject to errors regardless of a bank's activities, effective supervision of complex organizations that engage in many nontraditional banking activities is even more difficult.

• Banks with a variety of activities require much more *complex regulations*, which can be difficult for management, the market, and regulators to monitor and understand.

- The history of the Basel capital requirements provides a good example of the difficulty in effectively regulating complex financial companies. The increased variety and complexity of bank activities required much more complex capital standards, which the financial crisis showed were not very effective in adequately aligning bank risks with capital levels.
- One problem is that the various capital requirements under Basel are essentially relative prices, and they are set either administratively through regulation or using the banks' own

internal models. Administratively setting risk weights generally will misprice risks. In addition, allowing banks to set risk weights with their own risk models can systematically under price risk. In fact, news articles (Braithwaite, Vaughan) cite several examples of U.S. and foreign banks that plan on "managing" risk weights or are engaging in "risk-weighted asset optimization" to lower their risk-weighted assets and increase their risk-based capital ratios. Thus, it should not be surprising that leading up to the financial crisis the regulatory capital requirements did not adequately align bank capital levels with their risk.

  - The Basel requirements also created opportunities for regulatory arbitrage that was a major contributor to the risk taking of the large, complex banking companies and the financial crisis. For example, the capital charge for an MBS based on a pool of subprime loans was lower than that for a portfolio of mortgages held on the balance sheet. Capital charges were also lower for an MBS held in off-balance-sheet conduits than on the balance sheet.

- Complexity of activities makes it difficult to *price deposit insurance*. Deposit insurance would not lead to excessive risk taking if the premiums were priced appropriately to reflect a bank's risk. However, pricing deposit premiums correctly is difficult for the same reasons that it is difficult to determine capital requirements.

- To the extent it is possible, *resolving large, complex banks* is much more difficult and costly. Even with the FDIC's new authority under the Dodd-Frank Act to liquidate a failed complex banking organization, doing so in a quick and orderly manner will be difficult.

  - The Lehman Brothers failure in 2008 is a good example of the difficulty in resolving a complex company. The number of transactions and complexity of interconnections made

it very difficult to determine the company's value quickly enough to find a buyer and have it reopened the following Monday morning. Moreover, Lehman Brothers was a relatively simple company compared to some of the largest BHCs. Some of these BHCs have a thousand or more majority-owned subsidiaries, several of which could be as large and complex as Lehman Brothers. It would be much harder to wind down or find enough buyers to transfer the critical operations necessary for an orderly resolution.

- In summary, the financial system has become less stable over the past 30 years as banks and other financial companies have expanded into more complicated activities. The root of the problem is that large, complex financial companies are funding long-term, illiquid assets with liabilities available upon demand. In addition, after the crisis, the concentration of the industry and complexity of activities at the largest banks increased. The industry is dominated by a handful of companies that combined are half as large as annual U.S. economic output, and the failure of any of them could cause financial instability. Finally, because these companies are so large and complex, they and other institutions that are viewed as systemically important receive an implicit government guarantee on their debt and sometimes on their equity, which creates the incentive to take excessive risk, thereby further increasing systemic risk (the too-big-to-fail problem).

Proposal to Reduce Costs and Risks to the Safety Net and Financial System

- This proposal to reduce costs and risks to the safety net and financial system has two parts.
  - The first part proposes to restrict bank activities to the core activities of making loans and taking deposits and to other activities that do not significantly impede bank management, the market, and regulators in assessing, monitoring, and controlling risk. However, prohibiting banks from engaging in activities that do not meet these criteria and that

threaten financial stability would provide limited benefits if those activities migrate to shadow banks.

- The second part proposes changes to the shadow banking system by making recommendations to reform money market funds and the repo market.

Restricting activities of banking organizations

- The financial activities of commercial, investment, and shadow banks can be categorized in the following six groups (Richardson, Smith, and Walter):
  - Commercial banking – deposit taking and lending to individuals and businesses.
  - Investment banking – underwriting securities (stocks and bonds) and providing advisory services.
  - Asset and wealth management services – managing assets for individuals and institutions.
  - Dealing and market making – securities, repos, over-the-counter (OTC) derivatives.
  - Brokerage services – retail, professional, and institutional investors, and hedge funds (prime brokerage).
  - Proprietary trading – trading for own account and owning hedge and private equity funds.
- Using the criterion for permissible activities stated above, banking organizations would be able to conduct the following activities: commercial banking, investment banking, and asset and wealth management services. Investment banking and asset and wealth management services are mostly fee-based services that do not put much of a firm's capital at risk. In addition, asset and wealth management services are similar to the trust services that always have been allowed for banks.
- In contrast, the other three categories of activities – dealing and market making, brokerage, and proprietary trading – have little in common with core banking services and create risks

that are difficult to assess, monitor, and control. Banking organizations would not be allowed to do any trading, either proprietary or for customers, or make markets because it requires the ability to do trading.[10] In addition, allowing customer but not proprietary trading would be difficult to enforce because the securities inventory used to facilitate customer trading cannot be easily distinguished from proprietary assets. Prime brokerage services not only require the ability to conduct trading activities, but also allow companies to finance their activities with "free balances," which can be highly unstable funds.[11]

- Other potential restrictions include limits on bank investments. Historically, bank investments were restricted to loans and investments in investment-grade securities. As demonstrated in the financial crisis, the complexity of many asset-backed securities made it very difficult to determine their credit quality. As a result, consideration should be given to restrictions on investing in "complicated" securities, such as multilayer structured securities (e.g., CDOs) that are difficult to value, and to determine and monitor credit quality.

- Off-balance-sheet holdings and exposures should be supervised and regulated as if they were on-balance-sheet because, as was also demonstrated in the crisis, they ultimately put a bank's capital at risk.

- The recommended activity restrictions would make banks more transparent and would enable better risk management, market discipline, supervision, regulation, and resolution.

- The proposed activity restrictions will improve the risk management of banks by focusing their activities solely on the traditional banking business with exposure only to risks inherent in these activities.

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[10] Banking organizations would be allowed to purchase and sell derivatives to hedge their assets and liabilities.
[11] Hedge funds hold cash balances with their prime brokers to finance and facilitate transactions. "Free balances" is the cash a hedge fund client has a right to demand on short notice.

- The underlying factors that make commercial banking successful are inherently different from those that make securities firms successful. Banking is based on a long-term customer relationship where the interests of the bank and customer are the same. Both the bank and loan customers benefit if borrowers do well and are able to pay off their loans. In contrast, trading is an adversarial zero-sum game – the trader's gains are the customer's losses. Thus, restricting these activities removes a conflict of interest between a bank and its counterparty customers, which could produce a more stable, less risky company.
- The inherent riskiness of securities trading, dealing, and market-making attracts, and in fact requires, people who are predisposed to taking short-term risks rather than lenders with a long-term perspective. The combination of securities with commercial banking activities in a single organization provides opportunities for the senior management and boards of directors to be increasingly influenced by individuals with a short-term perspective. As a result, the increased propensity of these corporate leaders to take risk leads to more of a short-term-returns culture throughout the organization.

- Prohibiting the activities mentioned above would allow capital regulation to be simplified and improved. Capital regulation would be simpler and more effective because there would be less need for complicated risk-based requirements if the balance sheet is largely limited to loans and investment-grade securities. For example, capital regulation could be structured as a relatively high, simple leverage ratio combined with supervision.[12] Moreover, regulatory

[12] Admati, DeMarzo, Hellwig, and Pfleiderer provide an excellent discussion of the reasons for substantially increasing bank capital requirements. Hellwig provides arguments for abandoning risk-sensitive capital requirements.

arbitrage between balance-sheet and off-balance-sheet activities and between banking and trading books is difficult to prevent with regulation.

- Critics of restricting bank activities argue it would reduce the economies of scale and scope that are critical for the largest banks to be successful in global markets and that large corporations want one-stop shopping for their financial services. These arguments, however, are not persuasive.
  - First, there is no strong evidence of economies of scale at the sizes of the largest banking companies. There are many conceptual and empirical problems with studies of economies of scale.[13] Nevertheless, older studies from the 1990s show that there are no economies of scale when banks are larger than about $250 million in assets, although the threshold is likely to be higher in today's economy because of inflation and advancements in information technology. Although a more recent study from the mid-2000s suggests there are economies of scale for the largest banking organizations, the results are highly questionable because there are so few banks at the sizes in question and the study uses data prior to the problems that banks had during the financial crisis.
  - Second, there is even less evidence of economies of scope.[14] In fact, there is evidence that multiple functions of large, complex banks actually increase systemic risk and anecdotal evidence that if bank activities are restricted as suggested here, a more competitive nonbank financial industry would emerge and thrive.

[13] DeYoung comments that it is not really possible to provide empirical evidence for or against existence of economies of scale in large and complex financial institutions because there are too few of them for a meaningful statistical analysis to be conducted.
[14] Richardson, Smith, and Walter provide a survey of empirical studies on economies of scale.

- Third, large corporations would still be able to do one-stop shopping for commercial and traditional investment banking services, although they would have to go to securities dealers to purchase swaps and other derivatives for hedging purposes.
- Finally, even if there are economies of scale or scope, it does not necessarily mean that banks should be allowed to continue to conduct all of their current activities. Whether they should depends on comparing the marginal benefits from the reduced private costs of operation to the social costs associated with financial crises. Given the large costs of the 2007-9 crisis and the continued weakness of the economic recovery five years after the crisis began, the efficiencies and cost benefits of size and scope would need to be extremely large.

- Critics of restricting activities also question how we would go about divesting the prohibited activities. The divestitures that were required by the Glass-Steagall Act and the breakup of AT&T in the 1980s suggest that divestitures can be conducted in an orderly manner in a relatively short period of time.

- Critics of restricting activities also are concerned that it would cause two major problems for U.S. banks because they would face a competitive disadvantage relative to universal banks, mostly from Europe, that are allowed to conduct the full range of activities.
  - One problem is it would drive U.S. banks to move to other countries. However, it seems highly improbable that any other country would be willing or able to expand its safety net to new large and complex banking organizations.
  - Second, the competitive disadvantage of U.S. banks would lower their franchise values, which would provide an incentive to take even greater risks to raise lost revenues and maintain ROEs. However, the virtue of restricting activities is that it is easier for the

supervisors and the market to detect, prevent, and if necessary punish excessive risk taking.

Reforming the shadow banking system

- Restricting the activities of banking organizations alone, however, does not completely address the stability of the financial system. In fact, it could worsen the risk of financial instability by pushing even more activities from the regulated banking sector to large, interconnected securities firms, which would expand the sector that was an integral part of the financial crisis.

- As previously discussed, the source of this instability is the use of short-term funding for longer-term investment in the shadow banking market, i.e., the maturity and liquidity transformation conducted by a lightly regulated/unregulated sector of the financial system. We believe this source of systemic risk can be significantly reduced by making two changes to the money market.

- The first recommendation addresses potential disruptions coming from money market funding of shadow banks – money market mutual funds and other investment funds that are allowed to maintain a fixed $1 NAV should be required to have floating net asset values.
  - The primary MMIs today are MMMFs and repos. Individuals, institutional investors, and nonfinancial companies are the primary holders of MMMF and other MMI funds with a fixed $1 NAV, which in turn are major investors in repos along with other financial companies.
  - Some have suggested that MMMFs should be backed by government guarantees. We see no reason why the safety net should be extended and the taxpayer put at risk when other solutions are feasible. In addition, providing government guarantees would require

prudential supervision to prevent excessive risk taking, but it would not be effective because of the ability of funds to rapidly shift their risk profiles.

- The runs during the crisis on MMMFs occurred because of concerns about the quality of their investments and because of the promise to maintain a $1 NAV. MMMF investment rules have been strengthened by increasing the minimum average quality and decreasing the maximum average maturity of their investments.[15] However, because of the difficulty in calibrating these requirements, it is not clear that the vulnerability of MMMFs to runs in a systemic event would be significantly reduced as long as the fixed $1 NAV is maintained. We believe reliance on this source of short-term funding and the threat of disruptive runs would be greatly reduced by eliminating the fixed $1 NAV and requiring MMMFs to have floating NAVs.

- Critics of eliminating a $1 NAV for MMMFs argue that this limits cash management options for large corporations. However, MMMFs were first introduced to evade interest rate ceilings on deposits, and the only remaining Regulation Q deposit rate ceiling – the prohibition of paying interest on business transactions deposits – was eliminated by the Dodd-Frank Act. Some may be concerned that their deposits will be largely uninsured, but they are uninsured when invested in MMMFs. In addition, European MMMFs historically have mostly used floating NAVs. Although the percentage of fixed NAV European MMMFs has increased in recent years, the majority still have floating NAVs.

- The second recommendation addresses potential disruptions stemming from the repo financing of shadow banks – the bankruptcy law for repurchase agreement collateral should

[15] Some of the new rules for MMMFs are: 30 percent of assets must be liquid within one week, no more than 3 percent of assets can be invested in second-tier securities, the maximum weighted-average maturity of a fund's portfolio is 60 days, and MMMFs have to report their holdings every month.

be rolled back to the pre-2005 rules. By making this change, mortgage-related assets would no longer be exempt from the automatic stay in bankruptcy when a repo borrower defaults on its repurchase obligation.

- One reason for the runs on repos during the crisis was because of the prevalence of repo borrowers using subprime mortgage-related assets as collateral. Essentially, these borrowers funded long-term assets of relatively low quality with very short-term liabilities. The price volatility of subprime MBS rose sharply when subprime defaults started reducing MBS income flows. As a result, haircuts on subprime repos rose sharply or the repos were not rolled over.
- The eligibility of mortgage-related assets as collateral exempt from the automatic stay in bankruptcy in case of default by the borrower is relatively recent. The automatic stay exemption allows the lender to liquidate the collateral upon default as opposed to having to wait for the bankruptcy court to determine payouts to secured creditors.
- Prior to 2005, collateral in repo transactions eligible for the automatic stay exemption was limited to U.S. government and agency securities, bank certificates of deposits, and bankers' acceptances. The Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 expanded the definition of repurchase agreements to include mortgage loans, mortgage-related securities, and interest from mortgage loans and mortgage-related securities. This meant that repos collateralized by MBS, CMOs, CMBS, and CDOs backed by mortgage-related assets became exempt from the automatic stay.
- We believe the problem of runs by repo lenders would be significantly reduced by rolling back the bankruptcy law for repurchase agreement collateral to the pre-2005 rules. The problem with the current bankruptcy law for repos is it provides special treatment – that

is, it essentially subsidizes – short-term funding with mortgage-related collateral relative to other longer-term repo collateral or securities-based lending. As with the safety net for banks, the subsidy leads to the overuse of short-term repo funding, and therefore the overproduction of risky shadow banking activities.

- Overall, these two changes to the rules for money market funds and repo would increase the stability of the shadow banking system because term lending would be less dependent on "demandable" wholesale funding and more reliant on term funding. Fixed NAVs, like the just-noted problem with current repo bankruptcy law, provide special treatment and therefore subsidize short-term funding. These subsidies lead to an overreliance on short-term funding and excessive risk in shadow banking activities. With the recommended changes, shadow banks would rely less on short-term wholesale funding and more on term funding, which would continue to be provided by institutional investors such as mutual funds, pension funds, and life insurance companies. While this might increase the cost of funds and, therefore, the cost of mortgages and other consumer loans, it would be less risky and more reflective of the true costs.

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Attachment 2

CAPITALIZATION RATIOS FOR GLOBAL SYSTEMICALLY IMPORTANT BANKS (G-SIBs)

Data as of fourth quarter 2012

	Basel Risk-Based Capital			Tangible Capital				Components of Tangible Capital				Price-to-Book	
				GAAP		IFRS ESTIMATE [4]							
Institution[1]	Tier 1 Capital[2] ($Billions)	Risk-Weighted Assets ($Billions)	Tier 1 Capital Ratio[3] (Percent)	Total Assets ($Billions)	Leverage Ratio[5] (Percent)	Total Assets ($Billions)	Leverage Ratio[5] (Percent)	Total Equity[6] ($Billions)	Goodwill ($Billions)	Other Intangibles ($Billions)	Deferred Tax Assets ($Billions)	Price-to-Book Ratio[7] (Percent)	Price-to-Adjusted Tangible Book Ratio[7] (Percent)
U.S. G-SIBs													
Bank of America	155	1,206	12.89	2,212	5.79	3,540	3.55	237	70	13	33	0.57	1.22
Bank of New York Mellon	17	111	15.02	359	4.02	381	3.77	36	18	5	0	0.85	2.40
Citigroup	137	971	14.06	1,865	5.61	2,878	3.57	189	26	8	56	0.64	1.24
Goldman Sachs	67	400	16.75	939	7.07	1,707	3.87	76	4	1	5	0.88	1.03
JPMorgan Chase	160	1,270	12.59	2,359	5.89	3,947	3.48	204	48	10	11	0.86	1.33
Morgan Stanley	54	307	17.72	781	5.79	1,749	2.55	62	7	4	8	0.62	0.89
State Street	14	72	19.13	222	5.78	228	5.64	21	6	3	0	1.06	1.82
Wells Fargo	127	1,077	11.75	1,423	8.13	1,485	7.78	158	26	20	0	1.24	1.82
Average U.S. G-SIBs	730	5,415	13.49	10,160	6.17	15,914	3.88	983	204	63	113	0.85	1.28
Foreign G-SIBs													
Banco Santander (Spain)	80	716	11.17			1,631	2.97	108	32	4	25	0.84	2.35
Bank of China Limited (China)	121	1,149	10.54			2,009	6.53	136	0	2	3	0.94	0.98
Barclays (UK)	82	611	13.35			2,354	3.08	89	8	4	5	0.60	0.75
BBVA (Spain)	46	423	10.77			819	4.04	56	9	3	13	0.91	1.67
BNP Paribas (France)	97	709	13.63			2,451	3.47	111	14	3	10	0.67	0.92
BPCE Group (France)	60	489	12.21			1,474	3.52	65	5	2	7	...	...
Crédit Agricole Group (France)	79	617	12.85			2,580	2.72	98	19	2	7	...	...
Deutsche Bank (Germany)	63	417	15.13			2,517	1.63	68	15	3	10	0.56	0.93
HSBC (UK)	151	1,124	13.44			2,693	5.16	175	21	8	8	1.13	1.44
ING Bank (Netherlands)	51	358	14.35			1,074	4.11	48	2	1	2	...	...
Nordea bank (Sweden)	31	276	11.17			870	3.65	36	3	1	0	1.03	1.18
Royal Bank of Scotland (UK)	90	726	12.43			2,073	3.72	103	0	21	5	0.53	0.71
Société Générale (France)	52	416	12.50			1,607	2.84	61	7	2	7	0.48	0.66
Standard Chartered (UK)	41	302	13.45			637	5.77	44	7	1	1	1.36	1.65
UBS (Switzerland)	44	205	21.29			1,343	2.52	49	6	1	9	1.17	1.71
UniCredit (Italy)	63	549	11.44			1,191	3.83	85	15	5	21	0.34	0.70
Average Foreign IFRS	1,150	9,087	12.65			27,324	3.61	1,334	162	64	132	0.84	0.98
Other Foreign G-SIBs													
Credit Suisse (Switzerland; CHF, U.S. GAAP)	42	229	18.44	969	3.06			45	8	0	8	...	...
Mitsubishi UFJ FG (Japan; JPY, Local GAAP)	136	1,114	12.22	2,672	5.07			151	0	13	4	0.68	0.79
Mizuho FG (Japan; JPY, Local GAAP)	81	633	12.75	2,064	3.66			86	0	6	5	0.85	1.06
Sumitomo Mitsui FG (Japan; JPY, Local GAAP)	84	654	12.81	1,692	4.76			95	0	10	5	0.81	1.06
Average All Foreign G-SIBs	1,492	11,717	12.74	34,720	3.77			1,711	170	93	154	0.83	1.02
Average U.S. BHC by Size Group[8]													
U.S. G-SIBs	730	5,415	13.49	10,160	6.17	15,914	3.88	983	204	63	113	0.85	1.28
Ten Largest Non-G-SIBs[9]	171	1,499	11.41	1,913	8.21	1,927	8.15	226	57	12	6	0.94	1.59
Ten Largest Less Than $50 Billion[10]	24	191	12.85	293	7.91	293	7.91	33	8	1	2	1.07	1.51
Ten Largest Less Than $1 Billion[10]	1	7	13.40	10	8.67	10	8.67	1	0	0	0	...	...

Source: Bankscope (Data updated as of April 19, 2013), Bloomberg LP, Federal Reserve Y-9C Reports, International Monetary Fund, and 10-Q reports.

Notes:

[1] Global systemically important banks (G-SIBs) are defined by the Financial Stability Board and include eight U.S. bank holding companies (BHC). Foreign G-SIBs report in local currencies, which are converted into U.S. dollars using IMF International Financial Statistics exchange rates.

[2] Tier 1 Capital is equity capital less unrealized gains on available-for-sale debt securities, unrealized losses on available-for-sale equity securities, disallowed preferred stock, disallowed goodwill, disallowed servicing assets, disallowed deferred tax assets, and other tier 1 capital components.

[3] Tier 1 capital ratios and underlying data are calculated and reported under Basel I standards for U.S. Banks, under the China Banking Regulation Commission regulations for the Bank of China, under Basel II for Banco Santander, BBVA, ING Bank, Mitsubishi UFJ FG, Mizuho FG, Nordea Bank, Royal Bank of Scotland, Standard Chartered, Sumitomo Mitsui FG, and Unicredit, and under Basel 2.5 for Barclays, BNP Paribas, BPCE Group, Credit Agricole, Credit Suisse, Deutsche Bank, HSBC, Societe Generale and UBS.

[4] Differences in accounting requirements for netting and offsetting of assets and liabilities result in significant differences in banks' total assets. The ability to offset under International Financial Reporting Standards (IFRS) is limited in comparison with Generally Accepted Accounting Principles (GAAP), especially for derivatives traded with the same counterparty under an International Swaps and Derivatives Association (ISDA) Master Netting Agreement. U.S. GAAP permits the netting of derivative receivables and payables, and the related cash collateral received and paid when a legally enforceable master netting agreement exists between a firm and a derivative counterparty. U.S. GAAP discloses gross derivative assets and liabilities and the offset amount applied to derivatives in the notes to the consolidated financial statements rather than in the consolidated balance sheet. To narrow the difference in total assets between IFRS and U.S. GAAP reporting institutions, the U.S. G-SIBs IFRS estimates follow the methodology used by ISDA in its Netting and Offsetting Report (May 2012, http://www2.isda.org/functional-areas/research/studies/) and adds the disclosed offsetting amount applied to derivatives back to total assets in order to calculate total assets. Total assets are as reported in the consolidated balance sheet while the offset applied to derivatives is as reported in the notes to the consolidated financial statements on derivatives in each firm's 10-Q report.

[5] The Leverage Ratio is the ratio of adjusted tangible equity to adjusted tangible assets. Adjusted tangible equity, adjusted tangible assets, and adjusted tangible book subtract goodwill, other intangibles, and deferred tax assets.

[6] Equity Capital is the basic GAAP measure of net worth, defined as total assets minus total liabilities.

[7] Median price-to-book ratios and price-to-adjusted tangible book ratios are used instead of averages for subgroups and for U.S. BHC size groups. Data are not available for six bank holding companies with assets less than $1 billion, as well as for BPCE Group, Credit Agricole Group, and ING Bank.

[8] Bank holding companies that are owned by a foreign parent or reported a net loss in fourth quarter 2012, and thrift holding companies that did not file a full FRY-9C report as of fourth quarter 2012 were excluded.

[9] Six of the ten largest non-G-SIB (American Express, KeyCorp, Northern Trust, PNC, Suntrust and U.S. Bancorp) reported the fair value of their derivative positions in their 10-Q reports. The leverage ratio for these six banks is 8.53 percent under U.S. GAAP and 8.47 percent under the IFRS estimate. The 6 basis point difference is used to adjust the leverage ratio for the entire group from 8.21 percent to 8.15 percent and to estimate total assets under the IFRS estimate. The remaining four bank holding companies reported minimal derivative exposure.

[10] The ten largest U.S. bank holding companies with assets less than $50 billion and the ten largest U.S. bank holding companies with assets less than $1 billion reported de minimis derivative exposures. We assume that total assets and the adjusted tangible equity to adjusted tangible assets ratio are essentially the same under U.S. GAAP and the IFRS estimate.

Attachment 3

TBTF Subsidy for Large Banks--Literature Review

June 2013

Prepared for:

Thomas Hoenig, Vice Chair - Federal Deposit Insurance Corporation

Findings of Studies on the TBTF Subsidy:

Acharya, Anginer and Warburton:

- Funding cost advantage of 28 basis points annually for the period of 1990-2010; the cost advantage peaked at over 120 basis points in 2009. The authors estimate that the 2009 estimate represents a subsidy of $100 billion.

Baker and MacArthur:

- Average funding cost advantage increased to 78 basis points for 2008:4-2009:2 implying a subsidy of $34 billion per year to the 18 BHCs with more than $100B in assets in 2009:1

Brewer and Jagtiani:

- Acquirers paid more than $15 billion in added premiums in 8 merger deals that brought the combined organization to over $100B in assets

Ghandi and Lustig:

- The largest commercial banks receive a subsidy of 3.10 percent of their market capitalization, which amounts to $4.7 billion per bank in 2005 dollars

Haldane:

- The average annual subsidy for the top five U.K. banks from 2007-2009 was over £50 billion.

Jacewitz and Pogash:

- The largest banks pay approximately 45 basis points lower in risk premiums for uninsured deposits.

Kelly et al:

- The value of the government guarantee extended to the financial sector during the crisis peaked at over $150 billion.

Li et al:

- CDS spreads are reduced by 23 basis points pre-crisis and 56 basis points post-crisis due to a TBTF subsidy for the 20 largest institutions.

Noss and Sowerbutts:

- Using three methodologies the authors find TBTF subsidies of approximately £40 billion, £30 billion, and £120 billion for U.K. banks.

Oxera (prepared for RBS):

- The value of state support for a financial system with total assets of approximately £7 trillion and volatility of about 4 percent, the subsidy is about £5.9 billion per year.

Stogin, Steve, Amanda Hindlian, Sandra Lawson, Jorge Murillo, Koby Sadan, and Balakrishna Subramanian (Goldman Sachs Global Markets Institute Report).

- Within a subset of bond-issuing banks, the six largest banks enjoyed a slight funding advantage of 6bps on average from 1999 to 2007.
- The funding advantage increased during the crisis but has since reversed to a funding *disadvantage* of 10 bps on average.

Tsesmelidakis, Zoe and Robert C. Merton:

- Wealth transfers to investors amount to $365 billion ($129 billion to shareholders and $236 billion to bondholders) during the crisis (2007-2010)
- Bondholders realized massive wealth transfers in 2008 and 2009, but no subsidies were recorded for 2010
- Results apply to financial institutions with banks a subset of this

Ueda and Weder di Mauro:

- Banks in major countries enjoyed an estimated funding cost advantage of 60 basis points in 2007, rising to 80 basis points in 2009.

<u>Additional Calculations of a TBTF Subsidy Based on Prior Study Findings:</u>

Bloomberg editorial (based on a study by Ueda and Weder di Mauro cited below):

- The 10 largest U.S. banks receive a subsidy of $83 billion per year

Bloomberg (forthcoming in Bloomberg Markets):

- At the request of Bloomberg Markets, Anginer (of Acharya, Anginer and Warburton) calculated that bondholders of the six biggest U.S. banks are willing to accept lower returns—amounting to $82 billion from 2009 to 2011 ($37.3 billion in 2009 after TARP, $29.9 billion in 2010, and $14.6 billion in 2011)
- When other breaks are added in Bloomberg calculates that the amount of the subsidy jumps to $102 billion since 2009

Bibliography, Findings and Methodological Summaries of TBTF Subsidy Studies and Additional Calculations:

Acharya, Viral V., Deniz Anginer, and A. Joseph Warburton. "The End of Market Discipline? Investor Expectations of Implicit State Guarantees." March 2013.

Findings:

- An annual funding cost advantage of 20 basis points from 1990-2010, representing approximately $20 billion per year.
- The cost advantage peaked at over 120 basis points in 2009, representing a funding advantage of $100 billion.

Methodology:

Using data for the period 1990-2010, the authors find that investors' expectations of government support are embedded in the credit spreads on bonds issued by major U.S. financial institutions. To calculate the amount of the subsidy that results from the assumption of government support, the authors compute the credit spread on each financial institution's bonds as the difference between the yield on its bonds and the corresponding maturity-matched Treasury bond. The authors find a significant negative relationship between spreads and systemic importance. In particular, they find that size—as a measure of systemic importance—has a negative effect on spreads. A test of the effect of size on the relationship between spread and risk shows that for institutions that achieve systemically important status, spreads are less sensitive to risk. The authors quantify the value of the funding subsidy in basis points; this amount is then calculated as a dollar value by multiplying the annual reduction in funding costs by the institution's total uninsured liabilities.

Baker, Dean, and Travis MacArthur. "The Value of the "Too Big to Fail" Big Bank Subsidy." Issue Brief, The Center for Economic Policy Research, September 2009.

Findings:

- An average funding cost advantage of 29 basis points for institutions with more than $100 billion in assets for the period 2000-2007. This advantage increased to 78 basis points for the period from the fourth quarter of 2008 through the second quarter of 2009.
- The increase—of 49 basis points—is estimated to imply a subsidy of $34 billion per year to the 18 bank holding companies with more than $100 billion in assets in the first quarter of 2009.

Methodology:

The authors calculate the difference between the average quarterly cost of funds for institutions with less than $100 billion in assets to the average quarterly cost of funds for institutions with more than $100 billion in assets for the periods 2000-2007 and 2008:4-2009:1. The authors then calculate the difference in the differences between the two time periods to determine if there was a TBTF subsidy. The authors acknowledge that there could be multiple explanations for growth in the difference between the costs of funds for the two groups of banks in the 2008:4 – 2009:2 period, but after adjusting for other possible explanations, the authors find that the spread between large and smaller

banks could have increased by 9 basis points following the crisis. For the TBTF banks, this represents an annual subsidy of $6.3 billion. The authors caution that this subsidy may only be temporary and that spreads may return to more normal levels once financial markets settle. The authors use data on U.S. banks provided by the FDIC.

Bloomberg, editors. "Why Should Taxpayers Give Big Banks $83 Billion a Year?" February 20, 2013.

Findings:

- The 10 largest banks in the United States by assets, receive a taxpayer subsidy of $83 billion a year. The top 5 banks account for $64 billion of this total—an amount roughly equal to their typical annual profits.

Methodology:

Using the findings of Ueda and Weder di Mauro (below), Bloomberg multiplies the total liabilities of the 10 largest U.S. banks to calculate a subsidy of $83 billion.

Bloomberg (forthcoming in Bloomberg Markets). Ivry, Bob, "No Lehman Moments as Biggest Banks Deemed Too Big to Fail." May 10, 2013.

Findings:

- Bondholders of the six biggest U.S. banks are willing to accept lower returns, which amounted to $82 billion from 2009 to 2011. ($37.3 billion in 2009 after TARP, $29.9 billion in 2010, and $14.6 billion in 2011.)
- Adding in other breaks, the amount of the subsidy jumps to $102 billion since 2009.

Methodology:

- At the request of Bloomberg Markets, Deniz Anginer (Acharya, Anginer, and Warburton) calculated the subsidy received by six U.S. banks as a result of bondholders accepting lower returns (because bondholders believe these institutions will be bailed out).
- Bloomberg takes the Anginer estimate and adds tax breaks and additional income from the Federal Reserve's mortgage-bond purchases and the interest it pays for bank deposits and calculates that the amount of the subsidy jumps to $102 billion since 2009.

Brewer, Elijah III and Julapa Jagtiani. "How Much Did Banks Pay to Become Too-Big-To-Fail and to Become Systemically Important?" Working paper No. 11-37. Federal Reserve Bank of Philadelphia. 2 September 2011.

Findings:

- Acquirers paid at least $15.3 billion in added premiums in the eight merger deals that brought the combined organizations to over $100 billion in assets (the TBTF threshold).

Methodology:

Using data from the merger boom of 1991-2004, Brewer and Jagtiani analyze the differences in market reactions to bank acquisitions depending on whether the acquisition caused the acquiring organization to cross the threshold from being too small to warrant government support in the event of failure to

becoming too big to fail. The authors use OLS regressions to estimate the effect of crossing the TBTF threshold on the cost of the acquisition, the abnormal stock market returns, and the cost of funds measured as bond spreads. They show that when banks cross the TBTF threshold they pay an acquisition premium, that abnormal returns increase, and that banks face a lower cost of funds. The authors use the estimated coefficients from the OLS results to predict the value of the government subsidy. The data sample is restricted to U.S. banks.

Ghandi, Priyank and Hanno Lustig. "Size Anomalies in U.S. Bank Stock Returns: A Fiscal Explanation." April 18, 2011.

Findings:

- The authors find a subsidy of 3.10 percent for the largest commercial banks and a 3.25 percent tax on the smallest banks. This translates into an annual subsidy to the largest commercial banks of $4.71 billion per bank in 2005 dollars.

Methodology:

Ghandi and Lustig show that a long position in the stock portfolio of the largest U.S. banks and a short position in the stock portfolio of the smallest banks underperforms an equally risky portfolio of all non-bank stocks and government and corporate bonds by nearly 8 percent per year over 39 years. The authors interpret this difference as the ex-ante distortion of an implicit government guarantee for the largest financial firms. The authors then build a general equilibrium model of asset prices and calibrate it to match the subsidy. The authors decompose the subsidy into a 3.10 percent subsidy to the largest banks and a 3.25 percent disaster tax on the smallest banks. In the absence of the subsidy, all banks would pay a 3.25 percent disaster tax. The authors multiply the subsidy by the average market cap of the largest banks to calculate the annual subsidy. The data cover U.S. financial institutions.

Haldane, Andrew. "The $100 billion question." Comments by Mr. Andrew G Haldane, Executive Director, Financial Stability, Bank of England, at the Institute of Regulation & Risk, Hong Kong, 30 March 2010.

Findings:

- The average annual subsidy for the top five UK banks from 2007-2009 was over £50 billion.

Methodology:

The author calculates the value of a TBTF subsidy by employing the difference in bank credit ratings that include the credit rating agency's judgment of expected government support and the ratings that exclude that support. He finds the average rating difference is higher for large banks than for small ones. The monetary measure of the subsidy is estimated by "mapping from the ratings to the yields paid on bank's bonds; and then by scaling the yield difference by the value of each bank's ratings-sensitive liabilities." The sample includes banks and building societies in the UK as well as global banks over the period 2007 - 2009.

Haldane, Andrew. "On being the right size." Speech given by Andrew G. Haldane, Institute of Economic Affairs' 22nd Annual Series, The 2012 Beesley Lectures, 25 October 2012.

Findings:

- A subsidy of $70 billion per year for the period 2002-2007. By 2009, the subsidy reached over $700 billion per year.

Methodology:

The author estimates the subsidy with the ratings-based measure used in Haldane (2010). The sample includes the 29 world's largest banks (as defined by the Financial Stability Board).

Jacewitz, Stefan, and Jonathan Pogach. "Deposit rate advantages at the largest banks." FDIC Working Paper, 2012.

Findings:

- The largest banks pay approximately 45 basis points in lower risk premiums for uninsured deposits.

Methodology:

This study makes use of the fact that the difference in interest rates banks pay on insured and uninsured deposits in part reflects the risk of the bank as perceived by the market. The authors use money market deposit accounts with a minimum deposit of $100,000 as their measure of uninsured deposits and money market deposit accounts with $25,000 as their proxy for insured deposits. The authors calculate the difference in the interest rates offered on uninsured and insured money market deposit accounts at all banks for the period 2005-2010. The authors interpret the differences in interest rates across these two accounts as the market perceived risk of the bank.

The authors then calculate the difference-in-difference of these rates between large and small banks. Using this methodology, the authors find that large banks pay a lower risk premium than small banks. Finally, the authors use OLS regressions to explore what part of the lower risk premium paid by larger banks cannot be explained by observable differences in risk across those banks. The authors find an unexplained residual difference in risky deposit rates between large and small banks of approximately 45 bps. They conclude that this unexplained difference in interest rates is consistent with a TBTF subsidy.

Kelly, Bryan, Hanno Lustig, and Stijn van Nieuwerburgh. "Too-Systemic-To-Fail: What Option Markets Imply About Sector-Wide Government Guarantees." Working Paper No. 11-12 Fama-Miller Paper Series University of Chicago Booth School of Business. 2011.

Findings:

- The authors find that the anticipation of future government intervention during a financial sector collapse lowers the market price of financial sector crash insurance (measured by index put options on the sector) in essence creating crash insurance subsidies.

    - Specifically, the authors find that the market was not initially reassured by TARP as the funds would be used to purchase preferred shares that would dilute shareholders. However, once programs were announced for the purchase of toxic assets the collective bailout guarantee became valuable.
- The estimated dollar value of the guarantee extended to the financial sector is calculated to have peaked at over $150 billion.

Methodology:
The authors use the difference between the price of a basket of put options on individual financial firms and the price of a put option on the financial sector index as the basis for measuring the size of a collective bailout guarantee to the financial sector. The authors use an asset pricing model with rare events to study the impact of sector-wide bailout guarantees on option prices. The model is able to explain financial sector joint stock and option moments only when it incorporates a government bailout guarantee of the sector. The authors use the parameters of the model to infer the effect of the bailout guarantee on a firm's expected return and cost of capital as well as the overall dollar size of the government subsidy. The sample period covers January 2003 – June 2009.

Li, Zan, Shisheng Qu, and Jing Zhang. "Quantifying the value of implicit government guarantees for large financial institutions." Modeling Methodology, Moody's Analytics, January 2011.

Findings:
- The authors calculate that CDS spreads were reduced by 23 basis points pre-crisis and 56 basis points post-crisis due to a TBTF subsidy for the 20 largest institutions.

Methodology:

The study explores differences in funding costs between large and all other banks in two stages for the period November 2001 through May 2010. The authors first calculate the difference between an observed CDS spread to an estimated 'fair market' CDS spread using information from the equities market for all institutions in the sample. The authors then compare the observed and estimated fair market CDS spreads between the largest banks and smaller institutions. The data used include information on the 20 largest and 63 other U.S. financial institutions that have CDS spreads and other market information available. (The authors also perform analysis on European data but the estimates in this summary include only U.S. institutions.)

Noss, Joseph and Rhiannon Sowerbutts. "The implicit subsidy of banks." Financial Stability Paper No. 15. Bank of England. May 2012.

Findings:
- The funding advantage, historical-price contingent claims, and options-price contingent claims approaches produce estimates of approximately £40 billion, £30 billion, and £120 billion, respectively, in TBTF subsidies.

Methodology:

The authors use three methodologies to estimate values of a TBTF subsidy—a funding advantage approach, a historical-price contingent claims approach, and an options-price contingent claims approach.

- The funding advantage approach mirrors that of Haldane (2010) and (2012).
- The contingent claims models estimate the subsidy as the expected annual payment from the government to banks needed to prevent their default. This requires estimation of the distribution of banks' future asset values.
    - The options-price contingent claims approach mirrors that of Oxera (2011), except the authors "value the subsidy as a look-back option discounted at a rate of 1.2 percent, calibrated to the distribution of bank equity prices during 2010."
    - The historical-price contingent claims approach estimates the distribution of banks' future asset values based on historical prices of bank equity. To account for rare but large downward movements in asset prices, the authors use statistical techniques to predict extreme asset returns. They use an empirical density function to model the distribution of equity prices, fitted to the center of the distribution. They then add a Generalized Pareto distribution to the lower tail of returns, to capture the rare events for which there are a lower number of observations.

The authors use data from UK banks in 2010 in their study.

Oxera (prepared for The Royal Bank of Scotland). "Assessing state support to the UK banking sector." March 2011.

Findings:

- Estimates show the value of state support for a financial system with total asset values of approximately £7 trillion and volatility of about 4 percent, is about £5.9 billion per year.

Methodology:

The report estimates the value of state support using data from 2010 in three steps: determining the magnitude of systemic shocks that would require the government to provide support, calculating the probability that such a shock would occur, and estimating the expected government payment that would be needed in the event of such shock. The authors use various shares of bank Tier 1 capital as the proxy for the "systemic threshold" - the amount of asset value loss the system could withstand without requiring government intervention. They estimate the risk of such a shock using the variance in the equity prices of banks in the UK and the ratio of equity to assets. Lastly, the authors employ a Black-Scholes model to estimate the value of a European put option on the system's assets as a proxy for the level of state support necessary in the event of a shock. The study focuses on the U.K. banking sector.

Stogin, Steve, Amanda Hindlian, Sandra Lawson, Jorge Murillo, Koby Sadan, and Balakrishna Subramanian. 2013. "Measuring the TBTF effect on bond pricing," Goldman Sachs Global Markets Institute Report, May.

Findings:

- Within a subset of bond-issuing banks, the six largest banks enjoyed a slight funding advantage of 6bps on average from 1999 to 2007.
- The funding advantage increased during the crisis but has since reversed to a funding *disadvantage* of 10 bps on average.

Methodology:

The authors compare bank bond spreads over maturity-matched Treasuries for a subset of U.S. banks. The set of banks are drawn from institutions that are included in the IBOXX Investment Grade Index, which contains daily pricing information for investment grade bonds from January 1999 to March 2013. Banks are defined as all firms that have at least one FDIC-insured affiliate. The average number of banks included in the index over all years is 24. The authors calculate the median spread of the bank bond on a daily basis. Next, the authors rank the bank by assets and compare the average spread of the six largest banks to the average spread of the remaining banks in their data.

Tsesmelidakis, Zoe and Robert C. Merton, "The Value of Implicit Guarantees." Working Paper, September 2012.

Findings:

- Wealth transfers to shareholders and debt holders amount to $129 billion and $236 billion, respectively.
- Debt holders realized massive wealth transfers in 2008 and 2009, but no subsidies were recorded for 2010.
- Most subsidies accrue to the banking subsector; the period from October 2008 to June 2009 accounts for most of the subsidies.
- The determinants of the subsidies are highly related to proxy variables for company size, default correlation, and systemic risk.

Methodology:

Calculates how firms considered too-big-to-fail benefit from access to cheaper funding during crises by combining a structural-model-based methodology for estimating a TBTF premium with a comprehensive data set of bond characteristics and prices in the primary and secondary markets for a sample of 74 U.S. financial institutions. Data are for the years 2007-2010. Separate benefits are calculated for shareholders and debt holders. Shareholder benefits are calculated as of time of issuance while debt holder benefits are calculated over the life of the bond.

Authors estimate that actual subsidies could be twice as high as other forms of debt financing are ignored.

Ueda, Kenichi and Beatrice Weder di Mauro. "Quantifying structural subsidy values for systemically important financial institutions." IMF Working Paper WP/12/128, May 2012.

Findings:

- Banks in major countries enjoyed an estimated funding cost advantage of 60 basis points in 2007 and 80 basis points in 2009.

Methodology:

In calculating the credit default ratings of financial institutions, Fitch Ratings estimates a measure of external support that reflects both the probability of parent company and government support. The authors use this information as a proxy for the likelihood of government intervention on behalf of a financial institution. The authors then estimate the effect of the government support on the long-term rating of the financial institution. The data include information on 895 banks rated by Fitch in 2007 and 2009.

As a point of reference when considering the magnitude of the TBTF subsidy calculations, the following table reports the net income of the top 10 BHCs for 2008-2012.

Net income of top 10 BHCs, 2008-2012	
Year	Net Income ($Bs)
2008	-$19.5
2009	$37.5
2010	$56.4
2011	$69.0
2012	$68.9