



***“Our Financial Structures –
Are They Prepared for
Financial Instability?”***

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It is a great pleasure to be invited to speak at the Dutch Central Bank and to be introduced by Klaas Knot. I had the pleasure of working with Klaas on a variety of issues related to the Basel Accord, and also had the opportunity to spend some time as a visiting scholar at the Dutch Central Bank, which provided a wonderful opportunity to interact with Klaas and his colleagues on a variety

of research topics. I am happy for the opportunity to discuss how problems in financial markets and at financial intermediaries can spill over into the real economy, especially at a central bank that has had a longstanding interest in these issues.

As always, I should note that the views I express today are my own, not necessarily those of my colleagues on the Federal Reserve’s Board of Governors or the Federal Open Market Committee (the FOMC).

Since the severe financial stresses of 2008, a variety of actions have been taken to strengthen the financial infrastructure and make banks more resilient in the face of adverse shocks. While many banks have improved their capital and liquidity positions since 2008, we still see in the headlines of newspapers around the world that financial stability remains very much an issue.

In some ways, central bankers must approach the issue of financial stability much like a structural engineer. Where are the potential stresses in the system? Under what circumstances could those stresses be particularly problematic? Most importantly, what remedial actions could reduce the possibility of an unstable outcome?

Today I want to highlight an area where remedial action is still required. My goal is to focus more attention on financial structures that by design or reality¹ reduce or avoid capital charges – what is often called engaging in “capital arbitrage.” Such structures are vulnerable to stresses that can have destabilizing effects on financial markets and the broader economy. After some introductory comments about financial structures with inadequate capital, I will touch on two specific areas that merit consideration – money market mutual funds sponsored by banking organizations, and broker-dealer financing.

The Social Costs of Financial Structures with Inadequate Capital

Holding little or no capital for risky activities can, during good times, generate significant profits; even in relatively low-margin businesses. However, during times of stress, the power of leverage works in reverse, amplifying the negative impact of risky activities and necessitating substantial capital and liquidity at a time when both are in short supply.

These problems become compounded in episodes when the inadequacy of capital becomes apparent in the marketplace. Investors who normally fund these structures, very often via short-term lending, flee – and they also flee financial institutions that are perceived to stand behind these structures (sponsoring institutions, which I will discuss in a moment). In this way, the capital arbitrage that motivated the risky structures could contribute to a liquidity strain on what has come to be known as the shadow banking system, and could stress the financial institutions that were integral to its creation. The reason we care about this is that such an episode often produces instability in important channels for funding real economic activity – so these Wall Street concerns can have Main Street impacts.²

Structured investment vehicles or “SIVs” illustrated this dynamic very well. Financial institutions created SIVs as off-balance-sheet structures that were financed with short-term liabilities but frequently invested in longer-term assets, such as mortgage-backed securities.³ The associated credit and interest-rate risk became apparent, as losses from these assets rose. Investors were no longer willing to purchase the short-term paper issued by these structures. Consequently, many financial institutions, as a result of implicit or explicit guarantees, were forced to bring these assets onto their balance sheet – where they were often subject to more significant capital requirements. This led to substantial losses, balance sheet expansion, and a shortage of capital – all of which hindered the meeting of funding needs in the real economy.

Fortunately, the riskiest and most opaque structures of this sort have largely disappeared from the marketplace. But problematic structures still remain.

Runs on complex securitizations, prime money market mutual funds, and investment banks all contributed to the severity of the 2008 crisis. Compounding the problem, the investment bank structures were built on an assumption that runs were unlikely as long as lenders held collateral against their loans. In the depths of the crisis, however, lenders realized that relying on collateral could leave them with securities that they did not wish to hold – or in some cases that they were not even legally allowed to hold.⁴ When large losses on subprime mortgage assets and complex products amplified uncertainty about the value of collateral, investors ran – even though they held collateralized positions.

Despite the lessons provided by the crisis, there remain a variety of financial structures that are “capital efficient” from the perspective of market participants, but in my view continue to be susceptible to strains on short-term funding during times of financial market stress or crisis.

I will argue today that one way to address these structures is to make them the focus of stress tests that result in meaningful decisions about capital adequacy. Continuing the structural engineer analogy, the stress tests can be helpful much in the way that structural engineers test the resilience of different designs against modeled events like earthquakes and storms. Banking organizations that sponsor so-called capital-efficient structures should conduct stress tests that include a focus on whether these structures will require support during periods of severe market or idiosyncratic stress, and what the impact would be on the organization at that time. This might lead financial institutions to be more attentive to these undercapitalized structures, consistent with institutions focusing on the amount of capital required to survive stressed conditions – rather than the capital needed strictly to satisfy regulatory requirements.

By using stress tests to identify the possible capital and liquidity demands from these structures during a crisis, the institution's management, board of directors, and regulators can better determine the appropriateness of the structures and the associated capital and liquidity – and whether these structures are likely to be beneficial to the organization at all times, or only during good times.

Money Market Mutual Funds Sponsored by Banking Organizations

As an example, I want to highlight money market mutual fund sponsors in the United States. Specifically, I will discuss the possibility of using stress tests to illuminate the impact of various scenarios on fund sponsors, many of which are banks or financial institutions.

My primary focus will be on *prime* money market mutual funds, with approximately \$1.41 trillion in total assets as of May 31.⁵ Prime funds invest in a variety of securities that carry more credit risk than traditional U.S. Treasury securities.⁶ Money market mutual funds allow investors to potentially earn a higher return on short-term investments in part because – unlike banks – money market mutual funds are not required to hold capital. As a result, they often pay a competitive rate relative to bank deposits, and they provide investors many features similar to traditional bank deposits – for example, immediate availability of funds as well as a fixed net asset value that does not fluctuate when the value of assets held by the money fund changes.

So money market mutual funds provide investors with an investment vehicle with features like bank deposits – but the funds do not hold capital. The problem is that a financial intermediary – which has no capital, but takes credit risk, and provides under normal circumstances⁷ immediately available funds at a fixed net asset value – may be inviting trouble. Such a fund can be susceptible if the credit risk of the assets it invests in were to rise, causing investors to become concerned about the fund's ability to sell its assets, meet redemption demands, and maintain a stable net asset value.

Consequently, the implicit expectation of a bank-deposit-like investment can unravel, and the incentives to redeem could be strong.

As **Figure 1** shows, when the Reserve Primary Fund could no longer provide a fixed net asset value to investors in the wake of the Lehman Brothers failure, investors ran not only from the Reserve Primary Fund, but also from prime money market mutual funds in general. The top panel shows the outflows in the form of the daily changes in prime fund assets. It is particularly easy for investors to exit prime money market mutual funds, especially when they can easily redeem shares⁸ from a prime fund and invest the proceeds in a government-securities-only fund, even within the same fund family.

As is clear in Figure 1, the large outflow of funds from prime money market mutual funds was accompanied to a notable degree by an inflow of funds to government-only money market mutual funds. This is shown in the bottom panel on the figure.

While the funds may remain in the same fund family with this shift, investors who do *not* exit from the prime money market mutual fund could be financially impacted,⁹ and the prime fund might need to engage in a fire sale of assets to meet investor demands. Furthermore, firms counting on money market mutual funds to provide funding (for example by buying their debt – their commercial paper) can suddenly find that the primary purchasers of their paper are no longer active in the market.¹⁰

Facing all this in 2008, as well as the damage to credit flows and eventually economic activity in general, the U.S. Treasury responded to the run on prime money market mutual funds by providing insurance, and the Federal Reserve created a lending facility designed to provide liquidity to money market mutual funds.¹¹ Questions remain as to whether support could or would be possible today, given changes ushered in by the Dodd-Frank Act.

Our concerns should be amplified by the fact that many prime funds are sponsored by depository institutions or their affiliates. **Figure 2** shows the breakdown of prime money market mutual funds (by percent of assets and by number of funds) by category of sponsor. Just under half the assets are held in funds sponsored by an asset manager not affiliated with a depository institution. But domestic (U.S.) bank holding companies, foreign bank holding companies, and savings and loan holding companies (in other words companies affiliated with depository institutions) combined serve as the sponsoring organizations for a bit more than half the prime fund assets, and more than half of the number of funds.

While SEC regulations restrict the credit risk and maturity risk of prime money market mutual fund investments, these funds nonetheless can and do invest in risky assets. An example is provided by the number and value of Dexia obligations held by money market mutual funds at the end of 2010, less than one year before the Belgian and French governments needed to bail out the bank.

As **Figure 3** shows, a large number of money market mutual funds with various types of sponsors held Dexia paper at the beginning of the year in which Dexia failed. However, funds sponsored by banks or bank affiliates were over-weighted relative to funds sponsored by asset management firms not affiliated with a bank, both in the number of funds invested in Dexia and the value of Dexia assets.

Particularly notable is the number of foreign-bank-sponsored money market mutual funds with exposure to Dexia. While money funds unloaded their Dexia holdings before the government bailout, there was a noteworthy willingness to hold the obligations of a troubled large financial intermediary that had widely known problems – perhaps because many expected it to receive government support in the event of distress. This is similar to what happened with the Lehman failure – when such expectations turned out to be quite wrong.

As recent studies have highlighted, it is quite common for money market mutual funds that have impaired assets to obtain support from their sponsors.¹² Whether this is a cash infusion or a purchase at face value of an impaired asset,¹³ this support can represent draws on capital¹⁴ at times when the sponsoring organization is facing other capital pressures.

Figure 4 shows support-related losses by fund sponsors, using data provided by Moody's and broken down by sponsor type. Moody's data capture losses attributed to money market mutual funds that are disclosed on the sponsoring company's financial statements.¹⁵ Note that depository institution sponsors had significant losses during 2008, a time when many depository institutions were already facing significant capital and liquidity pressures.

While most of the losses were during stressful times, even during non-stressful times there are some losses. **Figure 5** sums the losses recognized over the five-year period of 2007 to 2011. The degree of sponsor support is substantial. Support has been quite large and particularly prevalent for prime money market mutual funds which have depository institution or depository institution affiliated sponsors. Over this period, Moody's reports almost \$9 billion in losses associated with money market mutual funds by depository institution or depository institution affiliated sponsors.

The SEC has been working on reform proposals that would provide several measures to reduce the risk of stresses during times of financial market crisis and provide some capital support.¹⁶ I am very supportive of the current push within the SEC for additional reforms, which have the potential of mitigating many of the concerns I am sharing today. As the primary regulator of money funds, the SEC is in a position to adopt rules that would address the vulnerabilities of those funds more comprehensively, effectively, and efficiently than other approaches. However, at this time it is unclear what the final proposal will be, or whether the SEC's final proposal will be adopted.

In the absence of such reforms for *all* money market mutual funds, an alternative for funds with depository institution or depository institution affiliated sponsors would be to include likely money market mutual fund support in the *sponsor's* stress tests. Based on the historical experience of their money market funds, the historical experience of similar funds, and their money market funds' exposures, sponsors could calculate the likely capital support needed from the organization in a stress scenario.

Again, this is an admittedly partial approach, in the absence of more comprehensive reforms that I hope will occur. But this approach would at least make more banking organizations more resilient (it would not be just money market mutual fund structures that would need capital – any financial structure that broke down during stress would need more capital) but it would also make clearer to money market mutual fund investors that banks had capital that could support funds during stressful periods. It would thus make clear that money market mutual funds with well capitalized sponsors are likely to be less risky than those that do not have well capitalized sponsors.

Similarly, other financial products that circumvent standard capital requirements – such as non 2a-7 “money market like” funds, stable value wrap products, and asset-backed commercial paper – could lead investors to expect that the sponsor holds capital for the support that these products could need in times of stress. While some firms are likely to argue they would not provide support for so-called capital efficient products, the high frequency of support of money market mutual funds and other off-balance-sheet items during the crisis makes such claims dubious.

In fact, this support might be *encouraged* by regulators during a crisis, in order to avoid broader problems of financial instability. U.S. banking regulators have¹⁷ tacitly acknowledged that bank holding companies may provide such support, subject to limitations identified in **Figure 6**.¹⁸

Broker-Dealer Financing

Allow me now to turn to a second area for consideration. What we call broker-dealer financing became particularly problematic during the financial crisis. With the failure of Bear Stearns and Lehman, it became apparent that broker-dealers, like traditional depository institutions, could be vulnerable to stresses during times of crisis.

For depository institutions, of course, concerns over the potential for runs have led to significant regulations to reduce their likelihood. During the Great Depression, runs on banks created banking panics that resulted in large losses for depositors and a significant reduction in credit – and those difficult episodes led to a variety of regulations to make runs on banks less likely. The creation of deposit insurance reduced the incentive for insured depositors to run during periods of financial stress, and mitigated the sharp reduction in credit availability that accompanies large deposit outflows from banks. In addition, in the U.S. (and some other countries) depository institutions have access to the central bank's "lender of last resort" credit facilities, which are intended to provide *liquidity* but not protection from *insolvency*. Deposit insurance and the lender of last resort function assist banks in providing one of their fundamental services – transforming short-term deposits into longer-term assets, since the risk of a sudden need to liquidate assets to meet unexpected outflows of deposits is greatly diminished.

Broker-dealers in the United States have not had the benefit of similar regulatory protections. They do not typically have access to central bank lending, and they do not have insurance that reduces the risk of unexpected outflows. Instead, broker-dealers rely on collateralized arrangements that allow them to be market makers, under the assumption that wholesale creditors will be comfortable providing funds as long as there is sufficient collateral backing them. In addition, banks that are part

of larger bank holding companies are subject to Section 23 A and B restrictions designed to protect the deposit insurance fund from providing support to non-bank affiliates, including broker-dealers.

Figure 7 details the direct access that broker-dealers have to central bank credit in various jurisdictions as well as constraints to indirect access through affiliated banks. It shows the differences across countries in providing liquidity to broker-dealers from the central bank or from bank affiliates. In both Switzerland and Japan, broker-dealers do have access to liquidity facilities at the central bank. However, it is not unusual to place limitations on the ability of bank affiliates to provide liquidity to their broker dealer affiliates as countries seek to avoid or limit having deposit insurance funds exposed to non-bank affiliate activities.

Figure 8 summarizes the average composition of the balance sheets of large bank holding companies with high and low concentrations of broker-dealer activities. The figure highlights the very different asset-liability mix, on average, of bank holding companies that have sizeable broker-dealer operations compared to those that do not. A traditional depository institution has loans as the primary asset class, and core deposits as the primary liability category. The loans and certain securities held can serve as collateral for potential discount window borrowings, and deposit insurance limits the incentive for insured depositors to run.

In contrast, bank holding companies with a relatively high concentration of broker-dealer activity tend to hold more assets that are liquid and invest in highly marketable securities that can be refinanced through repurchase agreements – since broker-dealer operations cannot be funded by insured deposits. In short, you see greater use of short-term, non-deposit funding sources at the bank holding companies with high concentrations of broker-dealer activity.

During the financial crisis in 2008, the difficulty in maintaining collateralized funding prompted the introduction of a primary dealer credit facility at the Federal Reserve. This facility

provided a way for broker-dealers to obtain short-term funding for their marketable securities because they otherwise did not have direct access to the Fed's discount window.

Given the potential liquidity challenges to broker-dealer financing during periods of great stress, many broker-dealers have bolstered their regulatory capital and adjusted the composition of their balance sheet. **Figure 9** shows that bank holding companies with large broker-dealer affiliates have been increasing their Tier 1 common equity capital ratios and holding more Tier 1 common equity capital than bank holding companies with less of a concentration in broker-dealer activities (although they have also been increasing their Tier 1 common equity capital). **Figure 10** shows that the improvement in capital is less dramatic when using a leverage ratio measure of capital that does not reflect a shift to lower risk-weighted assets.

Markets are sensitive to the differences in these risk profiles. **Figure 11** shows how stock prices of bank holding companies were impacted during three elevated stress periods – the fall of 2008, the fall of 2011, and the first part of this year. The chart shows that during stress periods, bank holding companies with a low concentration in broker-dealer activities had less stock price response to the stress periods than institutions with greater concentrations in broker-dealer activities.

One way to assess the increased market sensitivity of bank holding companies might be to model in stress tests how a sudden shortage of liquidity might impact broker-dealer operations, and determine the capital implications. Potentially, broker-dealers could be structured in such a way that liquidity facilities would not be necessary for broker-dealers during times of financial stress.

However, if a stress test highlights the benefits to those firms of having additional capital or more liquid assets, it should also take into account the costs involved. Firms might be less willing to make markets in less liquid assets or might shrink their balance sheets to meet higher capital

requirements, and thus reduce market-making activities in potentially important sectors of financial markets.

An alternative would be to develop a framework where, under certain conditions, liquidity facilities would be regularly made available for broker-dealers during periods of high stress. This arrangement would recognize that, like more traditional depositories, broker-dealers are subject to illiquidity in markets, and their reaction to that illiquidity can exacerbate the problem.

From a public policy perspective, the rationale for promoting market functioning during times of stress is that liquidity strains and other stresses at market makers, like the matter of runs on depositories, can have a broader impact on the overall economy. However, more analytical work needs to be done to better understand broker-dealer activities during times of stress, as well as the potential costs and benefits of alternatives for addressing the potential for stresses at broker-dealers.¹⁹ At a minimum, stress tests that focus on the behavior of broker-dealers and their counterparties during times of stress should be undertaken and their implications well understood.

Concluding Observations

In conclusion, I would note that a major innovation that resulted from the financial crisis was increased attention to stress tests. The stress tests provide an opportunity for banking organization management teams, boards of directors, investors, and regulators to better understand the impact of stressful financial conditions. Increasing the focus of stress tests beyond safety and soundness of individual institutions to more systemic concerns and implications — such as how markets and institutions behave during periods of stress — is an under-researched area that deserves more attention. These are the relatively early stages of understanding how best to conduct stress tests, and

what the implications of those tests should be for financial institutions. This is, and will continue to be, an iterative process.

I have highlighted two areas where more work needs to be done. The first is to provide more focus on financial structures that were designed to be “capital efficient.” Such structures can be major stress points in the financial infrastructure. Using stress tests to better understand the implications of undercapitalized financial structures will take time, but needs to be better integrated into frameworks for managing and supervising institutions. Money market mutual funds with bank or bank affiliated sponsors provide one example, especially because there has been a pattern of support for money market mutual funds without an explicit recognition that such funds can be a capital drain during times of stress.

A second area that deserves more attention is the behavior and resilience of broker-dealer arrangements during times of financial stress. While the role of depositories and their susceptibility to runs has received much attention, I believe more work needs to be done on the implications of potential crisis-related stresses at broker-dealers that do not have access to liquidity facilities. Utilizing stress tests to better understand vulnerabilities should help inform us about ways to enhance financial stability.

Thank you again for inviting me to speak with you today. I look forward to our continued progress on these important issues of financial stability – which, as we have learned, can impact the real economy and all its participants.

NOTES:

¹ In the case of money market mutual funds, the initial motivation of the design was to provide investors a way to avoid Regulation Q restrictions. In practice, the money market mutual fund structure also has what some would see as a competitive benefit – holding no capital while banks did need to hold capital. Thus, even after

Regulation Q restrictions no longer applied, money market mutual funds remained an alternative to deposits in banks.

² For more information see prior speeches including the following:

- “Remarks for a Panel Discussion of the Global Outlook and Risks” – <http://www.bostonfed.org/news/speeches/rosengren/2012/060712/index.htm>
- “Money Market Mutual Funds and Financial Stability” – <http://www.bostonfed.org/news/speeches/rosengren/2012/041112/index.htm>
- “Avoiding Complacency: The U.S. Economic Outlook, and Financial Stability” – <http://www.bostonfed.org/news/speeches/rosengren/2012/032712/index.htm>
- “Global Financial Intermediaries: Lessons and Continuing Challenges” – <http://www.bostonfed.org/news/speeches/rosengren/2011/101911/index.htm>
- “Towards Greater Financial Stability in Short-Term Credit Markets” – <http://www.bostonfed.org/news/speeches/rosengren/2011/092911/index.htm>
- “Defining Financial Stability, and Some Policy Implications of Applying the Definition” – <http://www.bostonfed.org/news/speeches/rosengren/2011/060311/index.htm>

³ In other words, engaged in credit intermediation and maturity transformation.

⁴ See the recent speech by Federal Reserve Board Governor Daniel Tarullo, who noted that “In addition, the presumed stabilizing function of collateral was weakened, since a default by a dealer or clearing bank could leave lenders with securities posted as collateral that they had no desire, operational capacity, or even, in some cases, legal authority to hold, or at least liquidate in an orderly way.” See “Shadow Banking After the Financial Crisis” available on the Board’s website at the following link: <http://www.federalreserve.gov/newsevents/speech/tarullo20120612a.htm>.

⁵ Source: iMoneyNet data

⁶ For example, prime money market funds have a significant exposure to short-term debt instruments of European banks.

⁷ It should be noted that the money market fund industry discloses that investments may lose value and are not insured by the Federal Deposit Insurance Corporation.

⁸ MMMF investors are shareholders, not depositors.

⁹ For example, heavy redemption pressures may force fire sales of assets that depress net asset values or concentrate losses over a shrinking number of shares.

¹⁰ The Investment Company Institute notes that “money market funds hold more than one-third of corporate commercial paper.” A paper by Sergey Chernenko and Adi Sunderam describes this impact on borrowers of money market funds in 2011. See “The Quiet Run of 2011: Money Market Funds and the European Debt Crisis” – Working Paper, Harvard Business School, March 2012.

¹¹ For a description of actions taken during this period and the impact of the Federal Reserve lending facility, see a forthcoming article in *The Journal of Finance* entitled “How Effective Were the Federal Reserve Emergency Liquidity Facilities? Evidence from the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility”, by Burcu Duygan-Bump, Patrick M. Parkinson, Eric S. Rosengren, Gustavo A. Suarez, and Paul S. Willen; and the related working paper of the same title and authorship, available at <http://www.bostonfed.org/bankinfo/qau/wp/2010/qau1003.pdf>. Also see John V. Duca, “Did the Commercial Paper Funding Facility Prevent a Great Depression Style Money Market Meltdown?” published by the Research Department of Federal Reserve Bank of Dallas, available at the following link: <http://www.dallasfed.org/assets/documents/research/papers/2011/wp1101.pdf>. Another paper that highlights that a failure to address problems in short-term credit markets contributed to the Great Depression is John V. Duca, “The Money Market Meltdown of the Great Depression, in the *Journal of Money, Credit, and Banking* (forthcoming).

¹² Patrick E. McCabe discusses earlier periods of support in “The Cross Section of Money Market Fund Risks and Financial Crises” – Federal Reserve Board Working Paper 2010-51. Also see “Money Market Mutual Funds and Financial Stability,” a speech by Eric Rosengren at Federal Reserve Bank of Atlanta 2012 Financial Markets Conference, Stone Mountain, Georgia April 11, 2012, available at the following link: <http://www.bostonfed.org/news/speeches/rosengren/2012/041112/index.htm>. In addition, a forthcoming white paper detailing our analysis of sponsor support is expected to be published this summer by the Federal Reserve Bank of Boston.

¹³ The purchase could be actual or promised. The Boston Fed used actual purchases in its analysis, to be conservative. Other studies (such as Moody’s) have also noted promised purchases or guarantees.

¹⁴ Even guarantees, which may require no initial cash outlay, result in a recorded liability on the books of the sponsor and an associated reduction in sponsor capital.

¹⁵ Source: Moody's. Data for the period August 2007 to December 2011 obtained from public disclosures, either at the fund level or holding company level (ultimate sponsor). Holding company level support was generally reported on a pre-tax basis in local currencies. In certain instances, local currencies were converted into U.S. dollars as of the reporting date and losses associated with non 2a-7 stable value funds were included in the aggregate loss/gain amounts reported by the holding company. As such, the gains/losses may be over/under stated in these instances.

¹⁶ In addition to the proposals that have been floated by the SEC, there have been a variety of proposals that would make money market funds less of a systemic risk. For example, see “Reforming Money Market Funds: A Proposal by the Squam Lake Group,” published January 14, 2011, available at <http://www.squamlakegroup.org/Squam%20Lake%20MMF%20January%2014%20Final.pdf> and Testimony by David S. Sharfstein – “Perspectives on Money Market Mutual Fund Reform” – before the Senate Committee on Banking, Housing, and Urban Affairs on June 21, 2012.

¹⁷ 2004 Interagency Policy Statement on Banks/Thriffs Providing Financial Support to Funds Advised by the Banking Organization or its Affiliates.

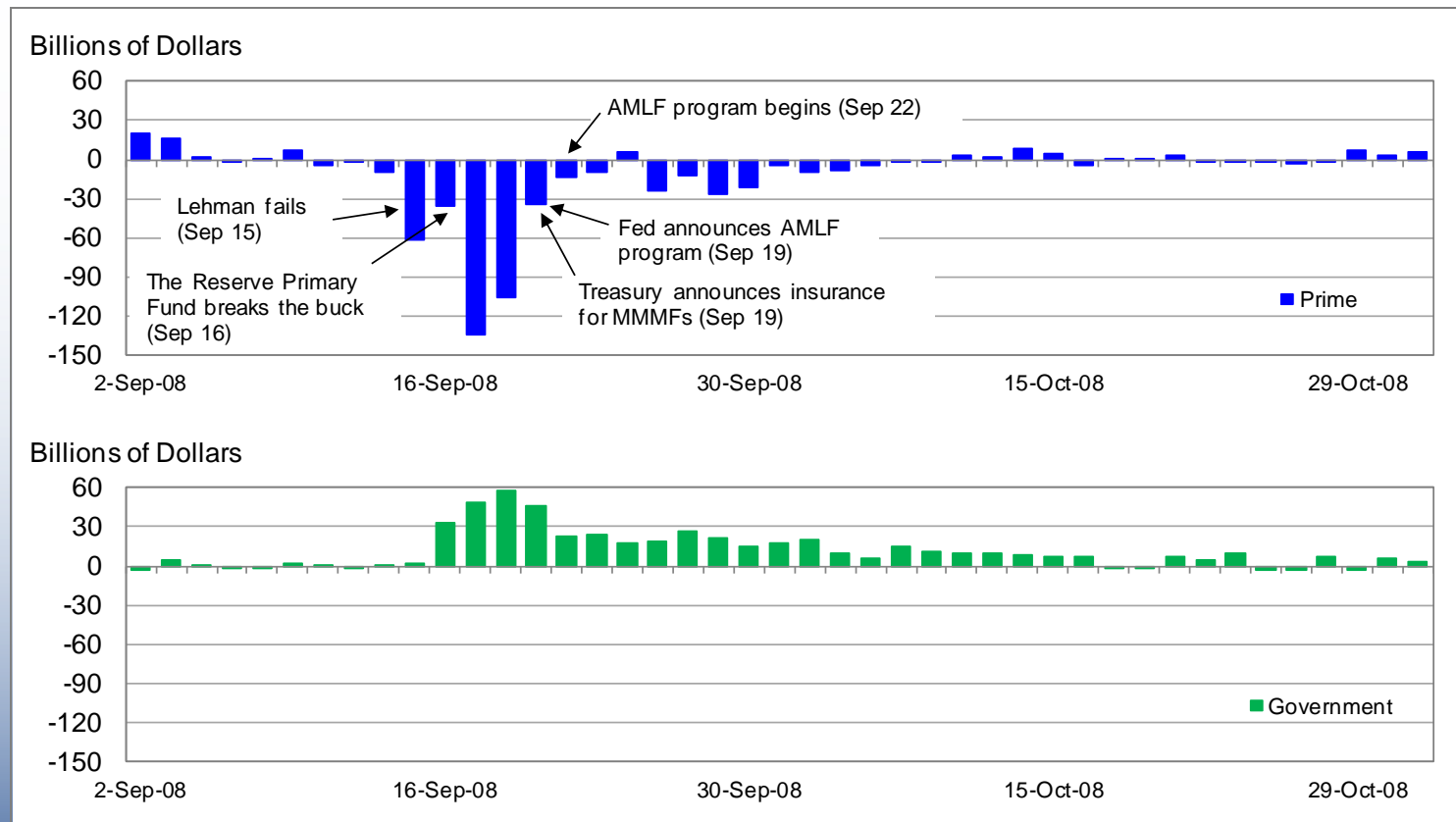
¹⁸ While bank holding companies are able to provide support, insured bank subsidiaries may find it difficult to provide support due to Federal Reserve Act Section 23A and 23B restrictions designed to protect deposit insurance funds from being used to support non-bank affiliate activities. While 23A exemptions were provided during the crisis, the Dodd-Frank Act made such support much more difficult, going forward.

¹⁹ For example, discount window loans are typically extended to depository institutions to provide liquidity, not to protect from insolvency. A decision to extend a loan is informed by banking supervisors' assessments of an institution's financial condition and risk management practices. Similar information would need to be available regarding any potential discount window borrowers.

Figure 1

Daily Change in Money Market Mutual Fund Assets in Prime and Government Funds

September 2, 2008 - October 31, 2008

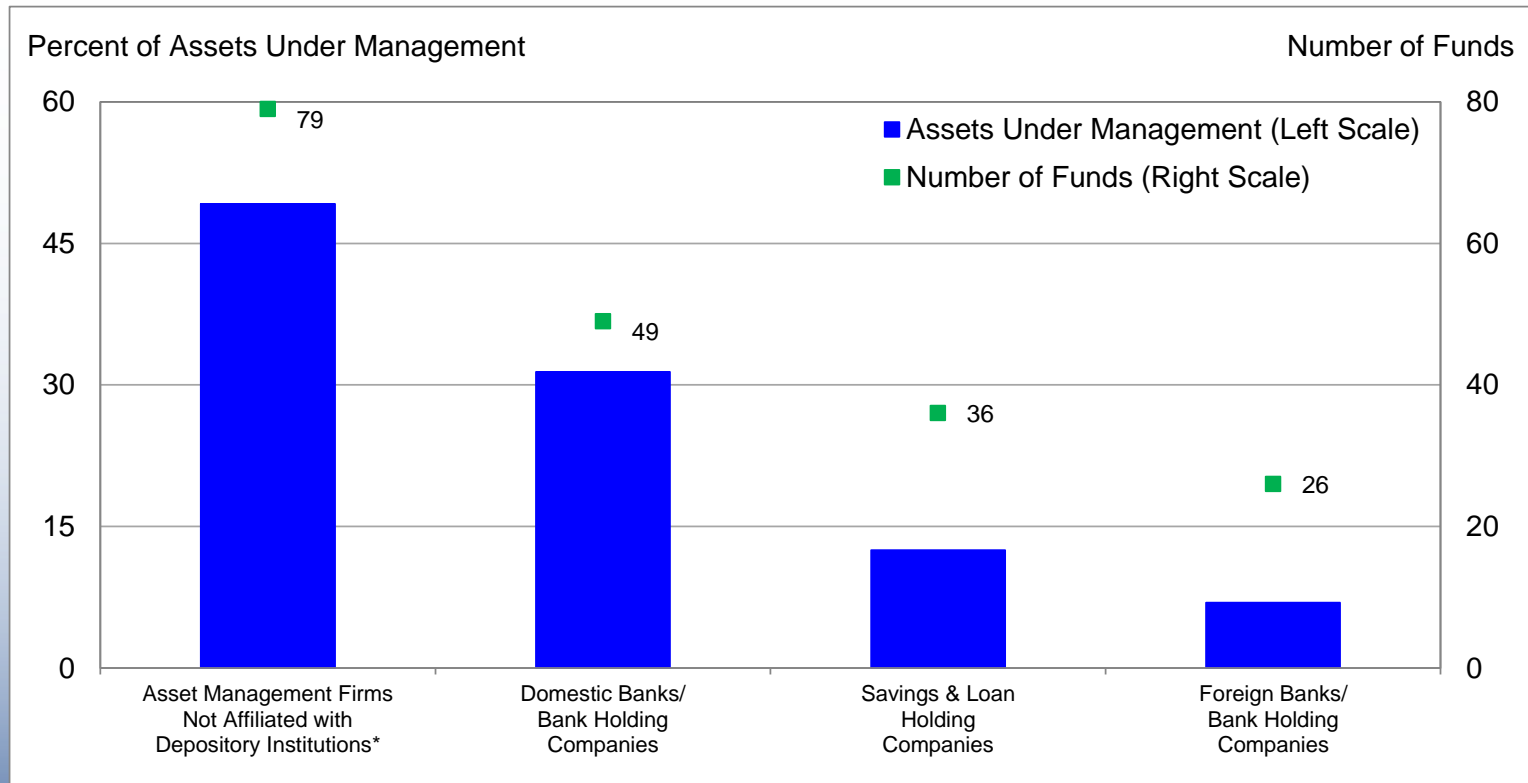


Source: iMoneyNet

Figure 2

Prime Money Market Mutual Funds by Fund Sponsor Type

As of May 31, 2012



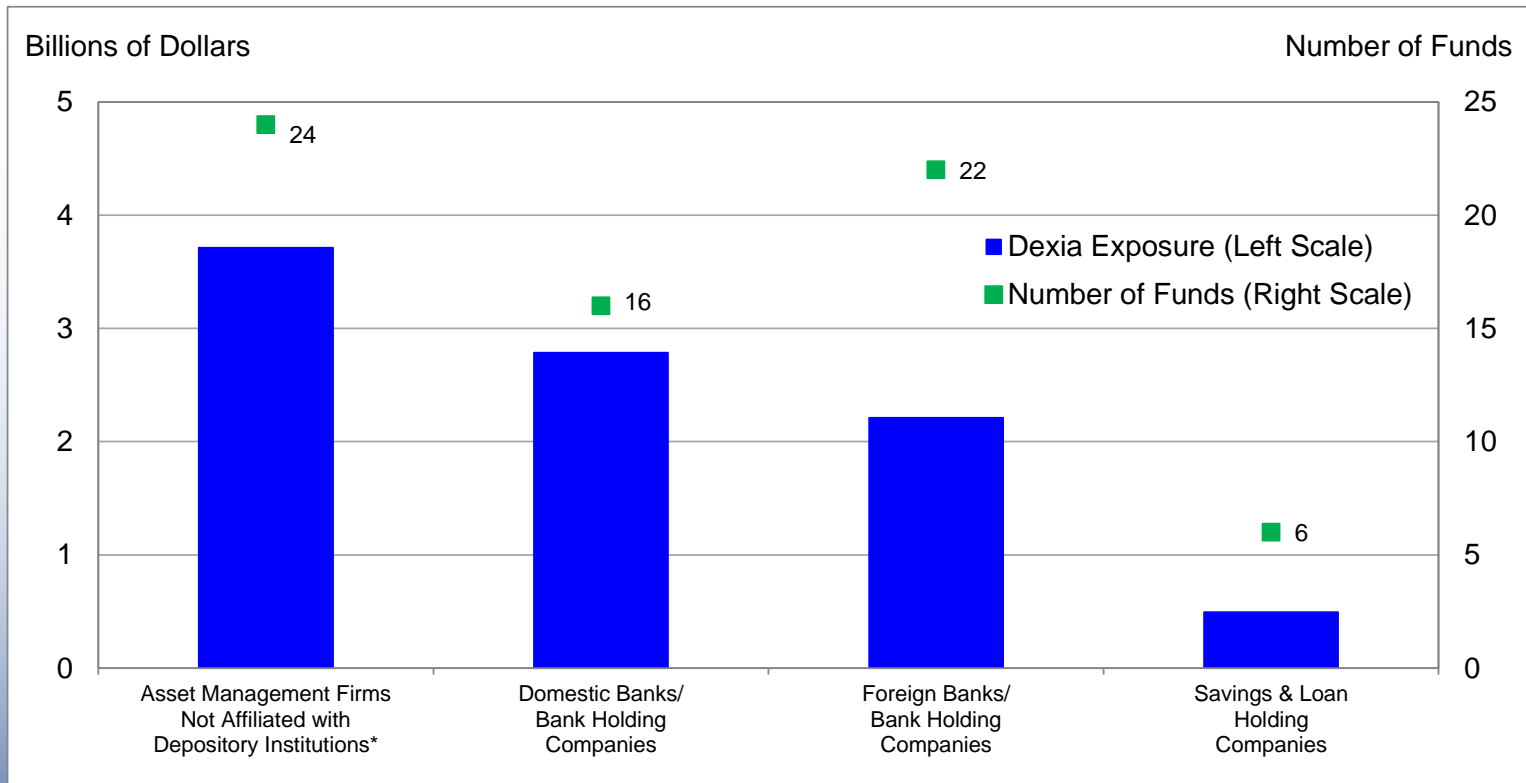
*All other asset management firms classified by affiliation.

Source: iMoneyNet, Mutual Fund Company Websites

Figure 3

Dexia Exposure by Fund Sponsor Type

As of December 31, 2010



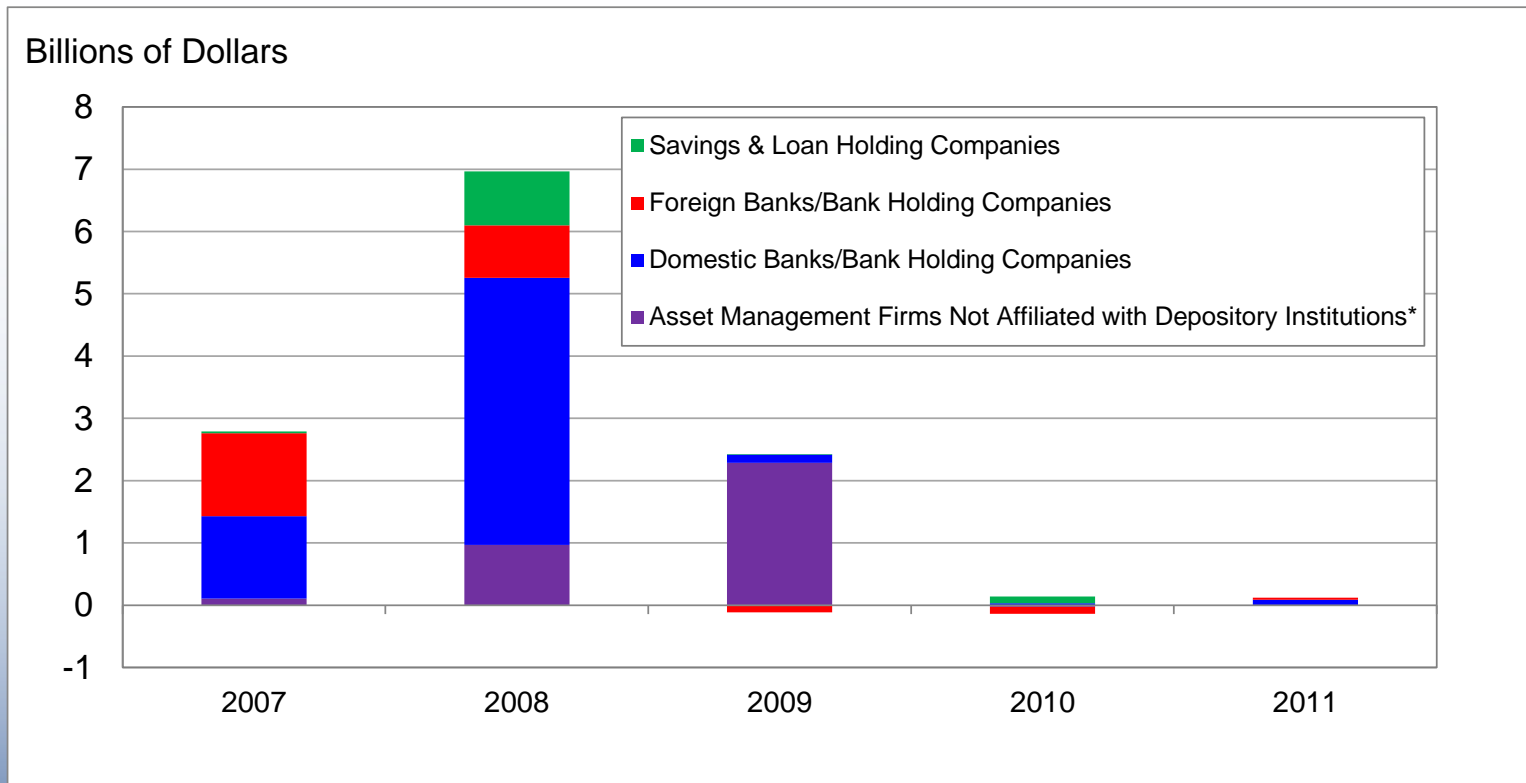
*All other asset management firms classified by affiliation.

Source: SEC Form N-MFP, Mutual Fund Company Websites, Federal Reserve Board Staff

Figure 4

Fund Sponsor Support-Related Losses (Gains) by Fund Sponsor Type

2007 - 2011



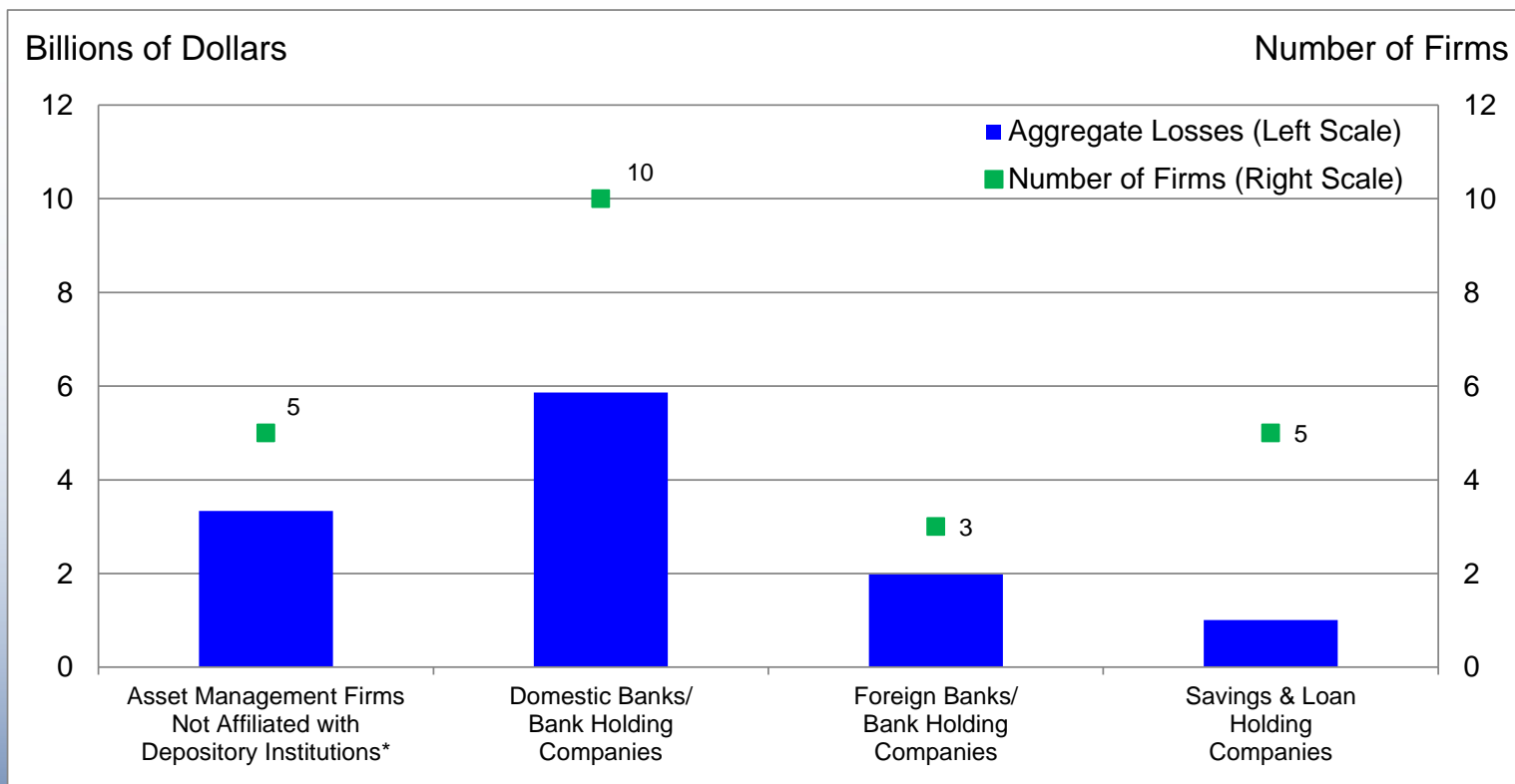
*All other asset management firms classified by affiliation.

Source: Moody's Data (in certain instances, losses associated with non 2a-7 stable value funds were included in the aggregate loss/gain amounts reported by the holding company)

Figure 5

Fund Sponsor Support-Related Losses by Fund Sponsor Type

2007 - 2011



*All other asset management firms classified by affiliation.

Source: Moody's Data (in certain instances, losses associated with non 2a-7 stable value funds were included in the aggregate loss/gain amounts reported by the holding company)

Figure 6

BHC Support of Affiliated Mutual Funds

Bank holding company (BHC) support of affiliated mutual funds is not limited by affiliate transaction restrictions

BHCs are expected to have policies and procedures in place for addressing, monitoring and controlling risks associated with the provision of support for affiliated mutual funds

A BHC must structure its support of an affiliated mutual fund to comply with restrictions on permissible investments

Actions taken by a BHC in support of a mutual fund may alter the BHC's balance sheet, resulting in increased capital charges for the BHC

¹For the purposes of this slide, an “affiliated mutual fund” refers to a mutual fund for which the bank or affiliate is an investment adviser.

²2004 Interagency Policy Statement on Banks/Thriffs Providing Financial Support to Funds Advised by the Banking Organization or its Affiliates.

Figure 7

Broker-Dealer Access to LOLR Facilities

Direct and indirect access to LOLR facilities in major countries is limited¹

1. Access to LOLR Facilities is typically restricted to depository institutions
2. Affiliate transaction or large exposure limits or similar regimes typically apply²

Country	Availability of Direct Access	Limitations on Indirect Access
U.S.	No Access Limited to Depository Institutions	Exposures to any one affiliate limited to 10% of capital and surplus; exposure to all affiliates limited to 20% of capital and surplus
ECB	No Access Limited to Depository Institutions	Large exposure limits typically apply, but exact requirements and application vary by country
England	No Access Limited to Depository Institutions	Exposures to all affiliates typically limited to 25% of capital, subject to exceptions based on the type of transaction or location and character of the affiliate; will be affected by ring-fencing proposal
Japan	Yes Securities companies have access to the standing liquidity facility	No quantitative limits, but transactions cannot be disadvantageous to the bank
Switzerland	Yes Securities dealers may be counterparties to the liquidity-shortage financing facility	Exposures to all affiliates typically limited to 25% of capital, with some exemptions available for exposures to fully consolidated subsidiaries
Australia	No Access Limited to Depository Institutions and Payment Related Parties	Exposures to non-bank subsidiaries of a bank or Australian parent are typically limited to 25% of Level 1 capital base if the subsidiary is regulated or 15% if the subsidiary is unregulated and aggregate exposure to most of these subsidiaries is limited to 35% while aggregate exposures to a non-Australian parent and its subsidiaries are limited to 50% of capital base, with aggregate exposures to non-bank entities capped at 25%

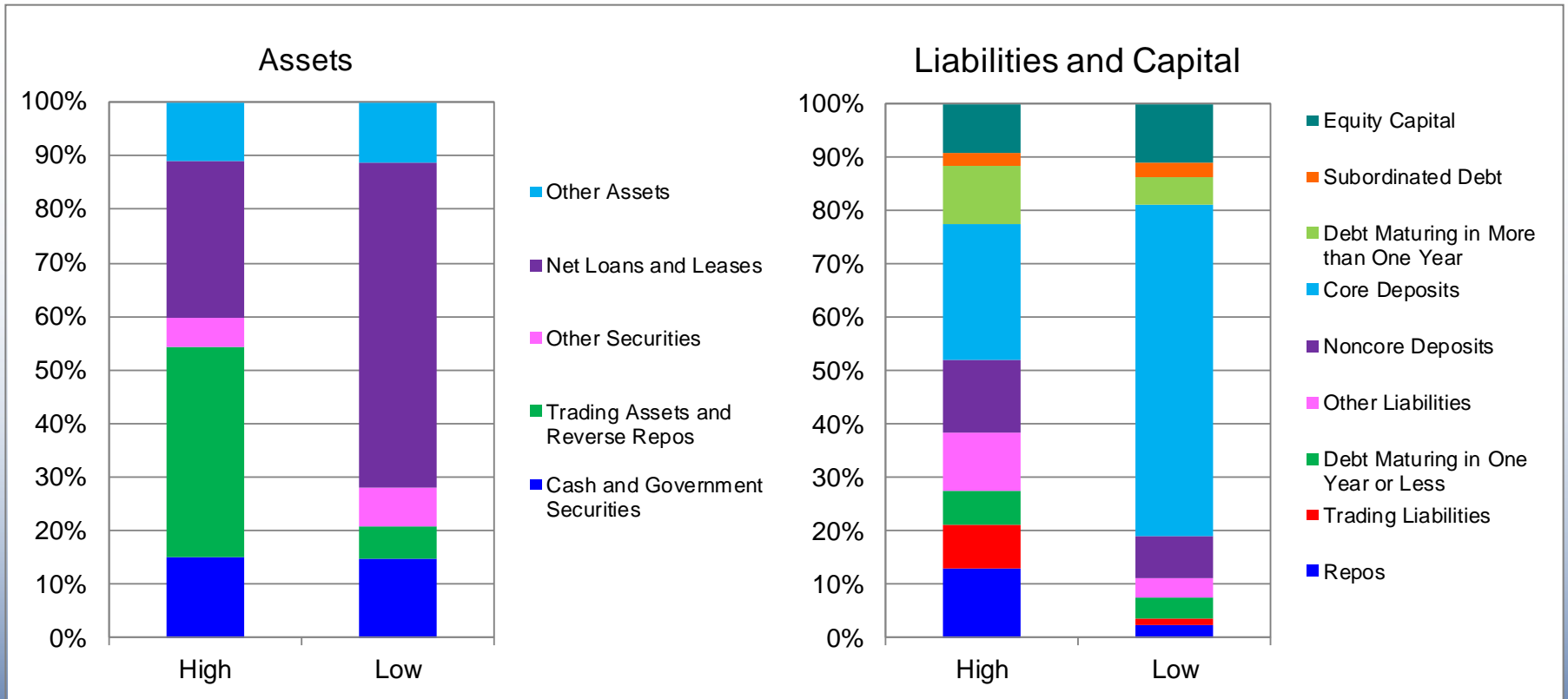
¹The information presented in this chart is intended as a high-level summary of the law; the organizational and corporate structure of any bank and its affiliated broker-dealer, together with the specific factual situation will impact any analysis. Regulatory developments, including, for example, the implementation of the Capital Requirements Directive IV, may modify these limitations and requirements.

²In some instances, appropriately collateralized loans to affiliated broker-dealers may be excluded from these limits. However, safety and soundness or similar limitations may also restrict a broker-dealer's indirect access to the LOLR through an affiliated depository institution.

Figure 8

Balance-Sheet Composition of Large Bank Holding Companies by Broker-Dealer Activity Concentration

As of March 31, 2012

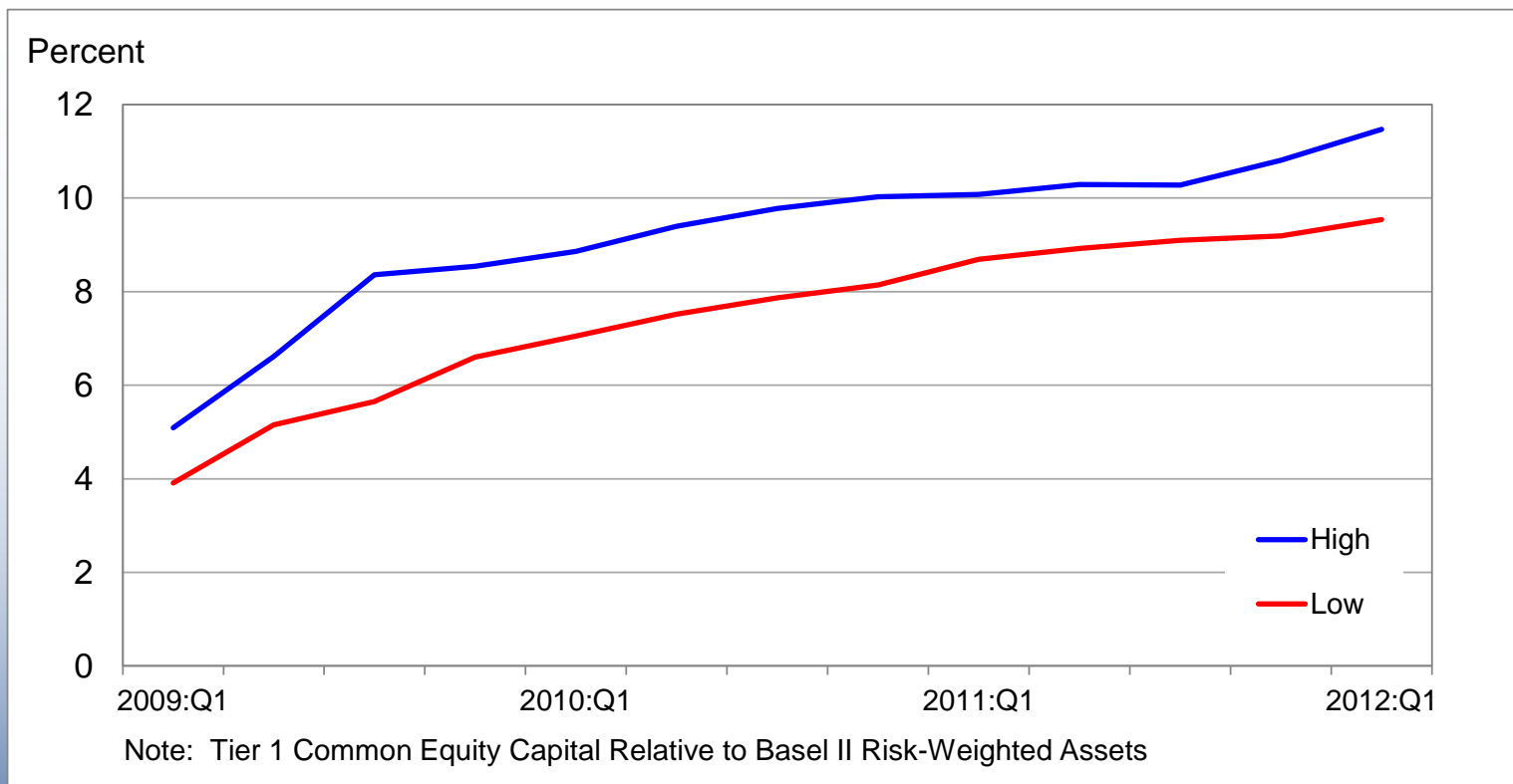


Source: Consolidated Financial Statements for Bank Holding Companies (FR Y-9C)

Figure 9

Tier 1 Common Equity Capital Ratio of Large Bank Holding Companies by Broker-Dealer Activity Concentration

2009:Q1 - 2012:Q1

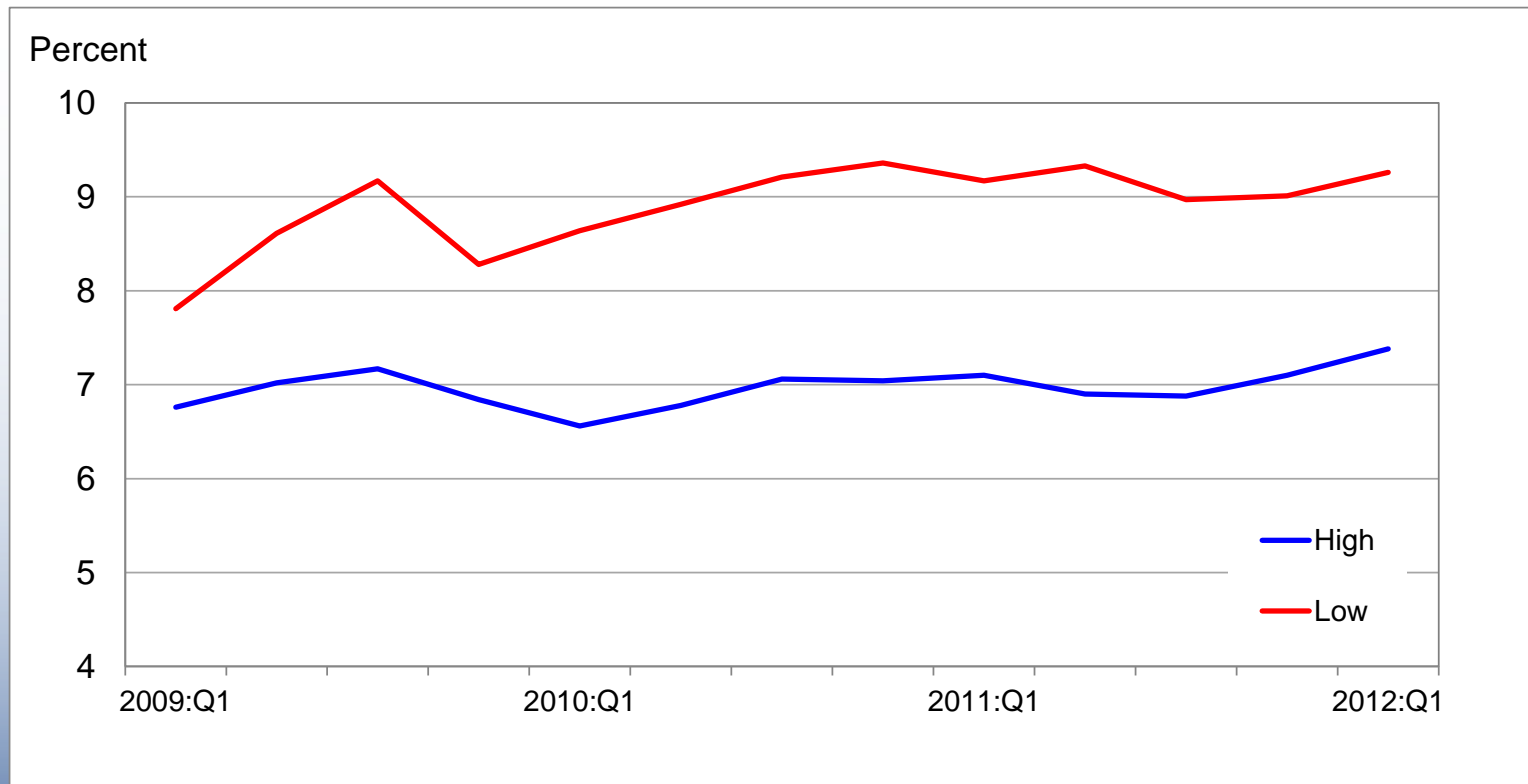


Source: Consolidated Financial Statements for Bank Holding Companies (FR Y-9C)

Figure 10

Leverage Ratio of Large Bank Holding Companies by Broker-Dealer Activity Concentration

2009:Q1 - 2012:Q1

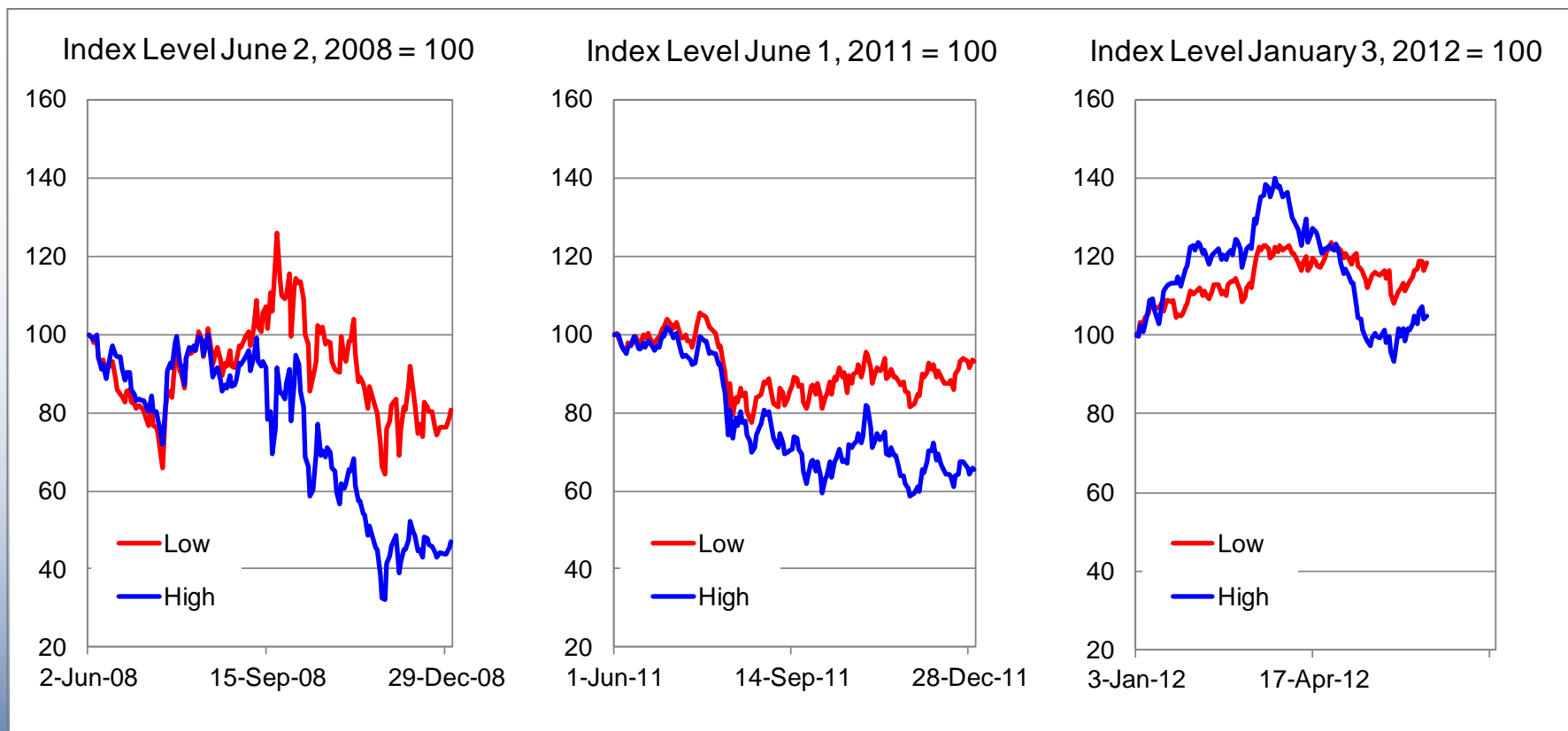


Source: Consolidated Financial Statements for Bank Holding Companies (FR Y-9C)

Figure 11

Stock Price Fluctuations at Large Bank Holding Companies by Broker-Dealer Activity Concentration

June 2, 2008 - December 31, 2008, June 1, 2011 - December 30, 2011, January 3, 2012 - June 22, 2012



Source: Bloomberg