

7.1 Framework: Threats as a Combination of Shocks and Vulnerabilities

Episodes of financial disruption typically arise when adverse developments unforeseen by most market participants, commonly referred to as shocks, interact with financial system vulnerabilities. A shock that potentially threatens stability is typically one that induces substantial losses on a class of assets over a short period of time. Recent history provides examples of shocks that created challenges for financial stability, such as the bursting asset price bubbles in stock markets (2000) and housing markets (2007), rapid increases in interest rates (1994), defaults on sovereign debt (for example, Mexico in 1982 or Russia in 1998), or severe operational stress in financial markets (for example, the so-called “flash crash” of May 2010). Shocks can also emerge from, or be exacerbated by, the failure of a specific firm, infrastructure events, or breakdowns in market functioning that create or aggravate losses on a class of assets.

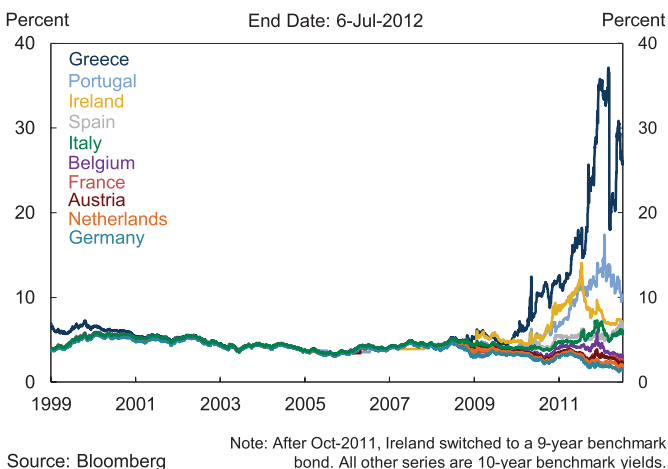
Not all such disturbances necessarily affect the stability of the financial system or the real economy. However, if the financial system is particularly vulnerable to shocks, for example, due to excessive leverage or excessive use of short-term wholesale funding of illiquid assets, a shock could have extreme balance sheet consequences and threaten institutions with insolvency. Market participants in general may not know which specific firms have balance sheets that are most at risk, so they may respond by avoiding exposure to any potential counterparty that might be at risk of insolvency. The resulting attenuation of credit provision could lead to disorderly liquidation of assets by all affected firms, inducing losses in other asset classes, thereby spreading and magnifying the effects of the initial disturbance. Credit flows to the non-financial sector could be disrupted, reducing the pace of real economic activity. In extreme cases, total economic losses could far exceed the original drop in asset value.

Given the inherent difficulty in predicting shocks, perhaps the most important line of defense is to reduce vulnerabilities by ensuring that institutions have sufficient capital and liquidity resources, sound risk-management practices, and strong internal and regulatory controls. Policy efforts can also strengthen financial markets’ ability to withstand shocks by promoting greater informational transparency, for example, by addressing gaps in the availability of data and by producing consolidated audit trails. Additional policy measures that serve to enhance robustness of markets and institutions include comprehensive resolution planning, procedures for orderly liquidation of insolvent institutions, constraints on concentration in financial services, disciplined underwriting standards for credit origination, and exercising due diligence on emerging financial products. Finally, markets can be made more resilient if public authorities can respond to financial stresses in a flexible and timely manner. An example would be the central bank’s role as lender of last resort, accompanied by appropriate safeguards against the risk of moral hazard.

The public policy goal is not to reduce financial market vulnerabilities to zero. Many of the key tasks performed by financial markets inherently involve a degree of vulnerability to certain kinds of risk. Credit provision to risky borrowers, maturity transformation, and the clearing of financial transactions are all activities that can generate vulnerabilities. Accordingly, the goal of public policy is to design regulatory and institutional frameworks that reduce vulnerabilities of markets, institutions, and infrastructures to acceptable levels, while allowing the financial system to continue to serve the needs of the real economy.

Destabilizing shocks are more likely to occur when markets have undergone structural changes, including those from technological development and financial innovation. These changes may be slow moving, occurring over a period of years. For

Chart 7.2.1 Sovereign Yields



example, the proliferation of mortgage-backed securities backed by subprime mortgage debt occurred over approximately eight years. Structural changes that occur during periods of low volatility can be particularly problematic, since such low-volatility episodes can lead to complacency on the part of risk managers and may lead to riskier behaviors in search of higher returns. The full implications of such structural changes are rarely recognized in real time. In particular, so-called “model risk” becomes more of a problem as market participants fail to adjust their risk-management models in response to the structural shifts. As a result, market participants are likely to underestimate the probability of shocks and to be unprepared when a shock actually occurs.

7.2 Areas of Heightened Uncertainty

There are several noteworthy aspects of the current economic environment in which structural change has elevated the level of uncertainty. A clear instance is the trajectory of growth, asset prices, and institutional change resulting from euro area sovereign stresses. The introduction of the euro represented a significant structural change that ushered in a related set of new developing institutions and policies. Initially, the unified monetary policy was associated with a convergence of sovereign yields across euro area countries (**Chart 7.2.1**), although this was not accompanied by a full convergence of macroeconomic fundamentals, such as productivity growth.

The financial crisis and recession of 2007-2009 drew attention to cross-sectional differences in growth prospects, competitiveness, and default risk among euro area countries, with yield spreads widening for some sovereigns. These structural tensions were exacerbated by the cyclical downturn and by the fiscal burdens arising from bank support programs.

Meanwhile, euro area integration on various fronts remained incomplete, complicating the crisis response. While euro area leaders have expressed a desire to deepen European

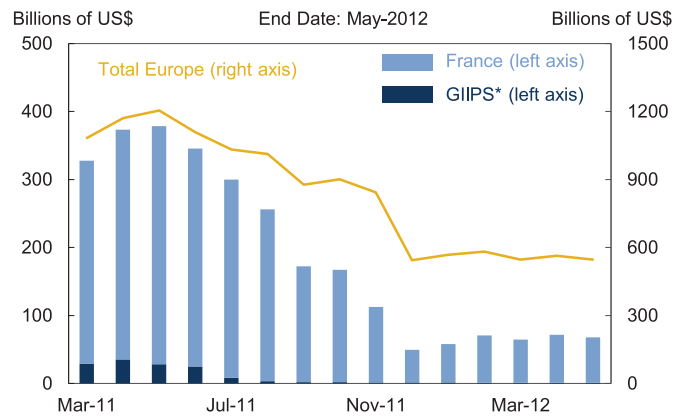
unification, there is continued uncertainty about how European official entities will resolve these fiscal strains and the extent to which euro area institutions may change as a result. Markets continue to believe that exits from the common currency cannot be ruled out, with attendant legal and other uncertainties. In particular, the threat of a breakup of the euro area carries with it redenomination risk—the risk that obligations due in euros will be repaid in an alternative, less valuable, currency.

Direct exposures of U.S. institutions to the most stressed euro area countries appear to be low (Charts 7.2.2, 7.2.3, and 7.2.4). However, U.S. banks, money market funds (MMFs), and the insurance industry have indirect exposures through other non-periphery countries and through asset markets. This generates heightened uncertainty about the extent to which evolving conditions could spill over to U.S. markets and institutions.

Another key structural shift interacting with cyclical factors is the increased importance of emerging markets in global growth and the global financial system. The growth trajectories of emerging market economies (EMEs), notably the potential for a marked deceleration of growth in China as discussed in Section 4.4, could have a significant impact on growth and financial stability in the United States. In particular there continues to be uncertainty about the health and robustness of some of these economies, including concerns about banking and financial stability; the sustainability of regional real estate trends; the ability of policymakers to manage inflationary pressures; and the possibility of social unrest. The implications of these uncertainties for the U.S. financial system are primarily driven by the role of the EMEs as global providers of capital and as contributors to global growth.

Uncertainty is also elevated in U.S. housing markets. The 30 percent decline in house prices since January 2006 continues to weigh on U.S. real estate markets, with 12 million mortgages having negative equity and continued high

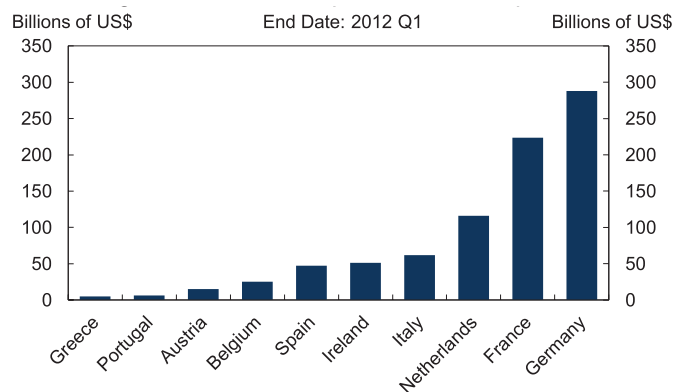
Chart 7.2.2 U.S. MMF Exposure to Europe



Source: SEC

*Greece, Italy, Ireland, Portugal, and Spain.

Chart 7.2.3 Large U.S. Banks' Exposure* to Europe

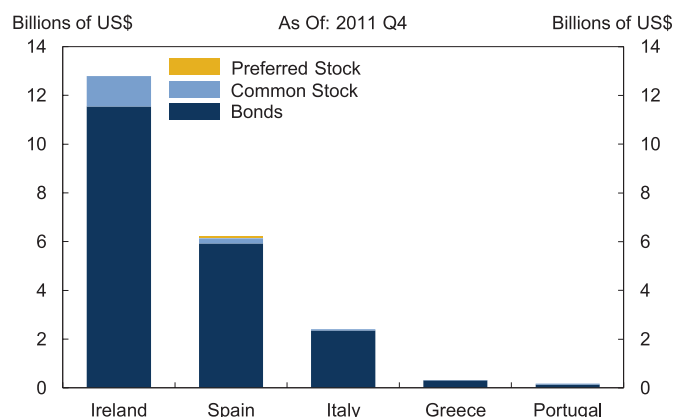


*Exposure includes the sum of all cross-border claims, including claims from derivative products and gross local country claims.

Source: FFIEC

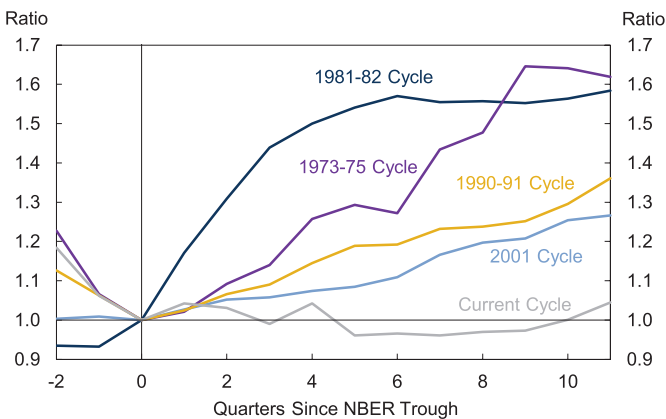
Note: Large banks defined by FFIEC's "LFI" designation.

Chart 7.2.4 Insurance Industry Exposure to Europe



Source: NAIC

Chart 7.2.5 Real Private Residential Investment



Source: BEA Note: Series Set to 1.0 at NBER Trough. Seasonally Adjusted.

levels of foreclosure activity. Additional mortgage losses are possible over the next five years due to increased monthly payments on home-equity loans. The current sluggish growth in the housing sector contrasts with the historical post-recession patterns, where residential investment typically would display solid growth during recoveries (Chart 7.2.5). While there are signs of stabilization in housing prices, and the inventory of existing homes for sale has declined significantly, the overall weakness in the macroeconomy carries with it the risk of further declines in real estate prices, with additional stresses on household and institutional balance sheets.

In addition, the crisis exposed deep flaws in the structure of housing finance that need to be reformed, such as the incentives around securitization, the design of government-sponsored enterprises (GSEs), and the overall quality of mortgage-servicing standards. Financial institutions continue to work through legacy mortgage assets and apply conservative credit standards to new mortgage activity. Given the scarcity of private capital in mortgage markets, federal government support continues to dominate the provision of residential mortgages. While some progress has been made in addressing mortgage loan servicing and foreclosure abuses, as well as gaps in protections for homeowners, lack of uniform servicing standards with appropriate safeguards for consumers, such as single points of contact, continue to create potential adverse consequences for distressed homeowners and their surrounding communities. The structural and cyclical problems of the housing finance market constitute a vulnerability of the financial system that makes the U.S. economy more susceptible to adverse shocks. For example, the effect of a slowdown in economic growth could be amplified by the mortgage market, leading to larger-than-expected declines in home prices and sales.

Another area of uncertainty is the fiscal policy outlook in the United States. A number of fiscal policy issues must be addressed around

the end of 2012, including expiration of the tax cuts originally enacted in 2001 and 2003, expiration of payroll tax cuts, expiration of extended unemployment benefits, the Budget Control Act-mandated sequester, and the need to raise the debt ceiling once again. As was the case with the debt ceiling debate in the summer of 2011, market volatility may increase as these fiscal deadlines approach, possibly weighing on growth. Furthermore, the long-term trajectory of U.S. fiscal policy is generally regarded as unsustainable, given the aging of the population and the likely path for health care expenditures. The way in which these long-term imbalances eventually will be resolved is unclear, representing yet another source of uncertainty for financial markets and the real economy.

7.3 Robustness of Financial Institutions and Markets

While some indicators point to an increased level of robustness of financial institutions and markets over the past year, there continue to be areas of serious concern. The aggregate tier one capital ratio of domestically owned bank holding companies (BHCs) was 13.3 percent of risk-weighted assets as of the first quarter of 2012, the highest level in more than 10 years (**Chart 7.3.1**). Increased robustness can also be seen in the broker-dealer (BD) industry, which shows a sharp decline in leverage since 2007. Stress test results from the 2012 Comprehensive Capital Analysis and Review (CCAR) demonstrated the increase in capital, particularly common equity, held by the largest U.S. banking institutions since the onset of the financial crisis. Even so, 4 of the 19 BHCs had post-stress capital ratios that fell below one or more regulatory minimums after including all planned capital distributions. The aggregate BHC funding profile has been strengthened by increased reliance on core deposits (**Chart 7.3.2**), continued reduction in short-term wholesale funding (**Chart 7.3.3**), and a substantial increase in the fraction of assets that are highly liquid. There is concern, however, that these funding and liquidity

Chart 7.3.1 Aggregate BHC Capital Ratios

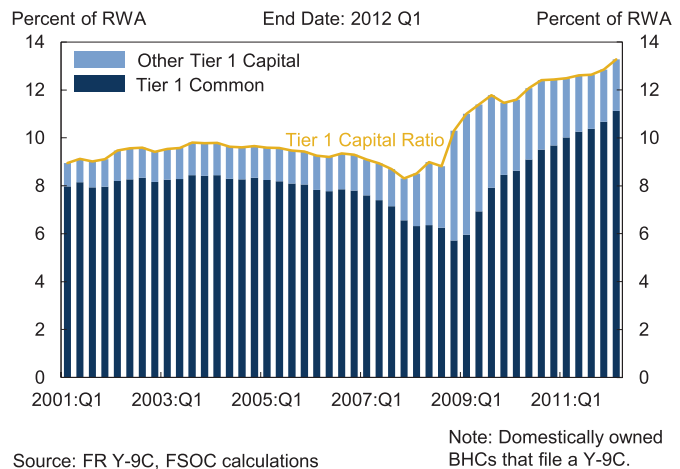


Chart 7.3.2 Core Deposits as a Percent of Total Liabilities

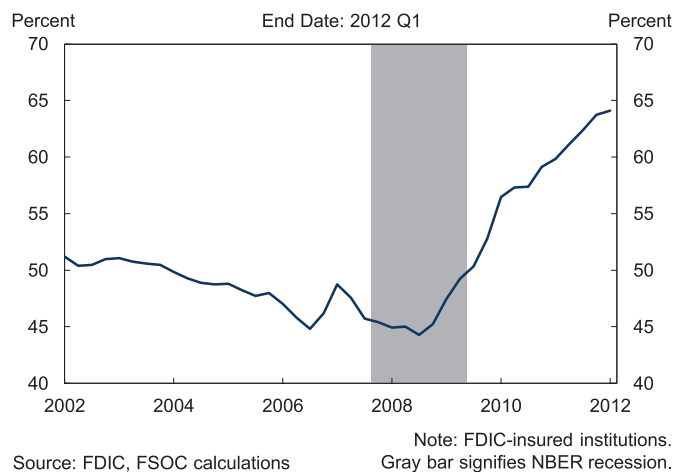


Chart 7.3.3 Short-Term Wholesale Funding

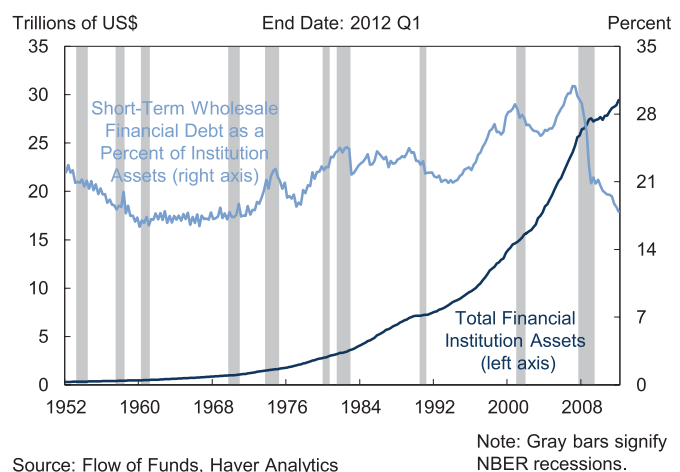
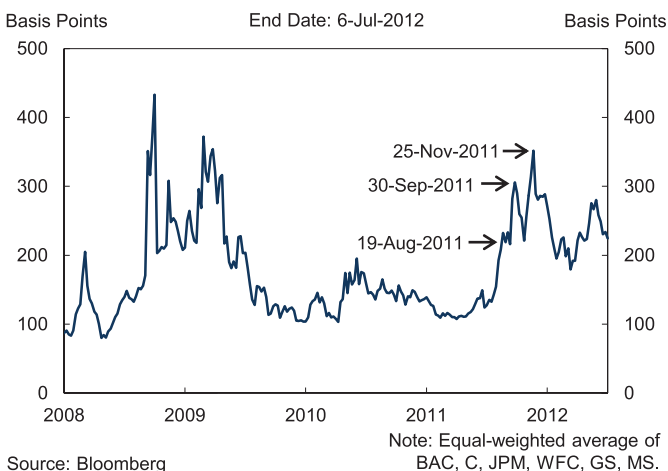


Chart 5.2.12 CDS Spreads of 6 Large Complex BHCs



developments may be short-lived implications of the low interest rate environment and the temporary unlimited coverage for non-interest-bearing transaction accounts under Section 343 of the Dodd-Frank Act, which is scheduled to expire on December 31, 2012.

Other indicators suggest a less sanguine view of U.S. financial institutions. The average cost of buying credit protection on the six largest U.S. BHCs started to rise in August 2011, with increasing concerns about the euro area stability. (See Chart 5.2.12, displayed here for convenience.) While credit default swap (CDS) spreads on these BHCs have come down somewhat since their peak in November 2011, they remain above the levels that prevailed from mid-2009 through mid-2011. Similarly, market valuations of the large BHCs are well below book value. Revenues at these institutions remain challenged by general market uncertainty and the low interest rate environment, and BHC earnings growth is largely dependent on non-recurring accounting items. In addition, approximately 12 percent of all institutions within the commercial banking sector still remain on the FDIC's problem bank list, accounting for approximately 2 percent of sectoral assets.

Changes in financial market infrastructures are likely to make the derivatives market less vulnerable to shocks. In recent years, there have been substantial increases in the volume of swaps contracts being centrally cleared, which represents a significant step toward improved management of credit risks in these markets. In addition, informational transparency to regulators has been enhanced by the expansion of trade repositories (TRs). The availability of data from the Trade Information Warehouse, the TR for CDS, proved extremely useful to regulators in determining patterns of exposures to Greek sovereign default risk during the period leading up to the Greek debt restructuring in March 2012. Finally, it is anticipated that, pursuant to Title VII of the Dodd-Frank Act, many types of swaps will be traded on swap execution facilities (SEFs) and

security-based SEFs in the near future. This development should significantly enhance both pre- and post-trade transparency of price and volume information on executed transactions to swaps market participants. While the SEC and CFTC have not yet finalized rules relating to the regulation of SEFs and security-based SEFs, both agencies have issued detailed proposals.

Another form of vulnerability has been highlighted by the failure of segregation procedures to fully protect customers of MF Global. **(See Box D: MF Global Bankruptcy.)** For decades, segregation of customer funds has been the lynchpin of customer protection in futures markets. While MF Global customers recovered 72 percent of the value of their accounts for trading on U.S. futures exchanges within a few months of the bankruptcy, they lost use of those funds for critical weeks and are still owed hundreds of millions of dollars in the aggregate. MF Global customers trading on foreign exchanges have received a much lower percentage of recovery. The CFTC has taken steps to enhance customer protection and has solicited input on further possible actions.

Financial reform efforts are essential in restoring the strength and stability of financial institutions and markets. Nevertheless, less-regulated institutions and markets could be perceived to hold competitive advantages. Accordingly, vulnerabilities could continue or increase if some participants choose to move business lines or activities to take advantage of perceived gaps or inconsistencies in regulation. This is particularly a concern when comparable financial activities are not subject to a comparable degree of regulatory stringency. This could occur, for example, if a lightly regulated swaps participant were to expand its business to approximate a full swaps dealership without the requisite regulatory oversight. The Dodd-Frank Act provides mechanisms to address such regulatory gaps, for example, by requiring oversight of all swap dealers and major swaps participants and improving regulatory oversight on nonbank

financial companies that could pose a threat to U.S. financial stability.

7.4 Continuing Vulnerabilities in the Financial System

A number of characteristics of the current financial system continue to render it vulnerable to a variety of shocks and create the potential to amplify the destructive effects of such shocks.

Different types of vulnerabilities can arise in financial systems. First, some vulnerabilities are inherent to the role that financial systems play in the economy. For example, maturity transformation (turning short-term savings into long-term capital investment) is an essential service of financial markets. But such transformation carries certain potential instabilities, such as the risk that short-term debt may not be rolled over or even the possibility of a run on a financial institution. Similarly, providing credit to risky borrowers is an important function of financial institutions. However, some degree of credit losses associated with such lending is inevitable. These sorts of vulnerabilities can be mitigated by appropriate public policy structures, including prudential regulation and supervision, robust capital and liquidity requirements, deposit and share insurance, orderly liquidation authority, and the role of the central bank as lender of last resort, but they cannot be fully eliminated.

A second type of vulnerability arises from control weaknesses in operations, risk management, and governance. Examples would include the possibility of erroneous trade completion in a high-speed trading environment, the danger of cybersecurity breaches, and risk-management deficiencies in financial institutions. Such vulnerabilities highlight the importance of regulatory measures, such as prudential capital and liquidity requirements and risk-management standards, as well as private-sector risk controls.

Finally, a third class of vulnerabilities is generated by the behavioral responses of market participants to financial developments, which could lead to undesirable vulnerabilities in the aggregate. An example would be the tendency for some investors to take on additional risk in a low interest rate environment in an effort to reach for yield. Another example would be the spillovers from the actions of firms in highly concentrated market segments or asset classes. Regulatory measures can be useful in addressing these sorts of vulnerabilities. For example, appropriate compensation regulation can deter firms from providing incentives to take on excessive risk. Equally important is to help ensure that stakeholders bear losses in downside scenarios and are subject to market discipline on an ongoing basis.

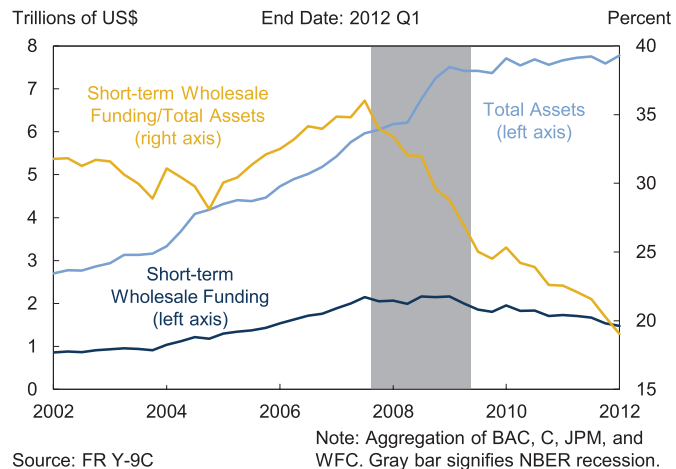
These three types of vulnerabilities are not mutually exclusive: a given source of market vulnerability might be associated with all three types to varying degrees, so any classification of specific vulnerabilities is to some extent arbitrary. In the following text, we discuss specific vulnerabilities of each of these types in the current environment, with the vulnerabilities classified according to which characteristics are most predominant.

7.4.1 Inherent Vulnerabilities

Run Risk in Wholesale Short-Term Funding Markets

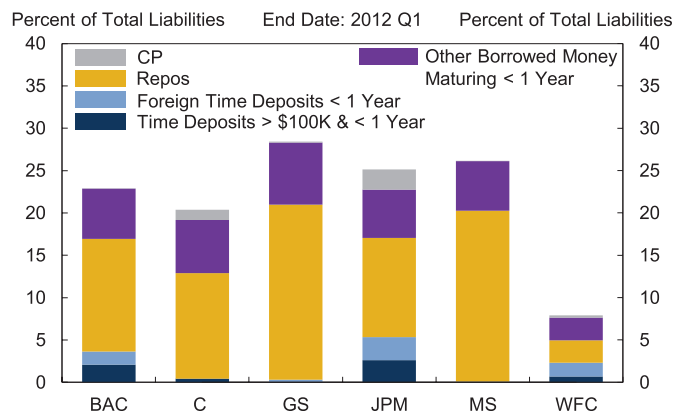
Broker-dealers (BDs) and other market participants typically fund some of their portfolio holdings and securities inventories using short-term funding, obtained through repos, commercial paper, and unsecured short-term lending. While use of short-term wholesale funding has decreased overall (**Chart 5.2.7, displayed here for convenience**), the very large BHCs, especially those with large BD operations, continue to display a substantial dependence on short-term, less stable funding sources (**Chart 7.4.1**). Moreover, as discussed in Section 5.2, the U.S. branches and agencies of foreign banks also rely heavily on short-term funding through MMFs and uninsured wholesale

Chart 5.2.7 Short-Term Wholesale Funding at Largest BHCs



Source: FR Y-9C

Chart 7.4.1 Less-Stable Funding Sources at 6 Largest BHCs



Source: FR Y-9C

Note: Liabilities excluding minority interest.

depositors. In practice, institutions that rely on short-term funding must maintain strong short-term credit ratings. In June 2012, Moody's reduced its short-term ratings by one notch for three large dealer banks: Barclays, Goldman Sachs, and Morgan Stanley. Markets will be monitoring the impacts of the downgrades on these banks' funding models.

This continued reliance on short-term funding for illiquid assets can be a source of instability if borrowers have difficulty rolling over their maturing short-term debt on economically viable terms. This dynamic could force borrowers to sell long-duration assets under fire-sale conditions, generating a self-reinforcing negative feedback loop by putting downward pressure on prices that, in turn, stresses the balance sheets of a wider range of institutions.

The vulnerabilities associated with the use of short-term funding for illiquid assets may be exacerbated by ongoing structural weaknesses in the tri-party repo market and in MMFs. The tri-party repo market relies heavily on intraday credit extensions from the clearing banks, is exposed to weaknesses in the credit and liquidity risk-management practices of market participants, and lacks a mechanism to help ensure orderly liquidation of tri-party repo collateral by creditors of a defaulting dealer. **(See Box G: Ongoing Vulnerabilities in the Tri-Party Repo Market.)** MMFs can be subject to runs if the \$1.00 net asset value (NAV) is believed to exceed the liquidation value of the fund. **(See Box H: Money Market Fund Responses to Euro Area Uncertainty.)**

7.4.2 Potential Control Weaknesses

High-Speed Trading

High-speed automated trading has become common in equity and derivatives markets, and is also spreading to markets for Treasury securities and foreign exchange. **(See Section 5.4, Box F: Algorithmic and High-Frequency Trading.)** It is likely that high-speed trading increases market liquidity in normal market conditions. However, any market in which liquidity is

BOX G: ONGOING VULNERABILITIES IN THE TRI-PARTY REPO MARKET

While regulators have gained much better visibility into the activity of the tri-party repo market in recent years, it remains a significant source of potential contagion. Despite the recent steps taken by participants to advance changes in the market's infrastructure to mitigate key vulnerabilities, progress is taking longer than initially anticipated. Three specific sources of vulnerability remain of great concern to the Council:

- Heavy reliance by market participants on intraday credit extensions from the clearing banks,
- Weakness in the credit and liquidity risk management practices of many market participants, and
- Lack of a mechanism to ensure orderly liquidation of tri-party repo collateral by creditors of a defaulting dealer.

Over-reliance on intraday credit. Currently, tri-party repo trades “unwind” every day, meaning that the clearing bank returns cash to the lender's account and returns collateral to the borrower's account. Trades are not settled until several hours later. For several hours each afternoon, dealers require funding of their entire tri-party repo book that lenders do not provide. This \$1.7 trillion funding need is provided by the two clearing banks.

This is a potentially unstable situation. In times of market stress, the clearing bank faces a conflict of interest between its own risk-management needs and the role it performs as a lender to dealers experiencing funding problems. Given its intraday exposure to dealers, the clearing bank could have a strong incentive, in the face of a dealer's deteriorating credit quality, to refrain from unwinding in order to avoid extending credit and taking on exposure to the dealer's collateral.

Poor risk management practices. Some dealers remain very dependent on short-term repo funding and are heavily exposed to rollover risk. Of particular concern is the use of short-term borrowing to finance

less liquid collateral, such as asset-backed securities or corporate bonds. In addition, some lenders do not exercise sufficient rigor in setting haircuts and in evaluating appropriate asset types as collateral, particularly for less liquid assets. This can create a destabilizing cycle: if lenders do not feel protected by the haircuts they have in place, they may respond to a dealer stress event or rising price volatility by increasing haircuts sharply, further reducing the dealer's ability to obtain needed funding. Instability is also intensified by the fact that some lenders (notably MMFs subject to Rule 2a-7 under the Investment Company Act) accept collateral that they are unable to hold and liquidate gradually following a default. These lenders are likely to pull back their funding altogether if they are subject to redemptions to avoid being forced to take possession of the collateral—further destabilizing market conditions. Presently, there is no process in place to prevent lenders from taking on collateral that they could not properly manage or permissibly hold outright.

Absence of a mechanism to facilitate orderly liquidation of a defaulted dealer's collateral.

A large dealer's default could leave lenders with billions of dollars of collateral that they would likely seek to liquidate quickly. The resulting large volume of asset sales could depress prices, significantly impair market liquidity, and erode the capital of many financial firms through mark-to-market losses. This erosion of capital could, in turn, create intense pressure for holders to shrink their balance sheets by selling additional assets, creating a downward spiral. There is currently no mechanism in place to ensure that lenders will be able to liquidate the collateral of a defaulted dealer gradually over time in a manner that avoids this sort of fire sale dynamic.

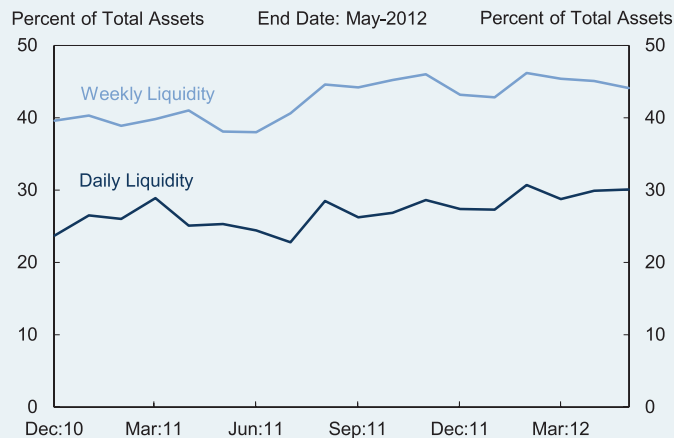
BOX H: MONEY MARKET FUND RESPONSES TO EURO AREA UNCERTAINTY

Vulnerabilities from reliance on short-term funding can be compounded by structural problems with money market funds (MMFs). MMFs are promoted to institutional and retail investors as stable investments that provide cash on demand at a constant net asset value (NAV) of \$1 per share, very much like bank deposits. However, these funds are prone to runs, as investors have an incentive to exit a fund at \$1 per share if they suspect that its NAV is likely to decline below \$1 (that is, they expect the fund to “break the buck”). A clear example is the wave of redemptions from MMFs after the Reserve Primary Fund broke the buck in September 2008 because of its Lehman exposures.

A more recent episode of large-scale MMF redemptions is the response of MMFs to increased uncertainty about euro area stability in June 2011. This episode provides an opportunity to examine potential vulnerabilities in the MMF industry. In June 2011, the potential for European bank downgrades and rising concern about the euro area periphery debt crisis prompted concerns about MMF exposures to European banks. Prime MMFs began experiencing substantial redemptions, with assets falling by \$165 billion (or 5.1 percent) in June 2011 and with some MMFs losing as much as 20 percent of their assets during this period.

MMFs were able to satisfy these redemptions with internally generated liquidity. **(See Chart 5.3.7, displayed here for convenience.)** In addition, while MMFs’ euro area exposures had generated negative press attention, these positions had not actually experienced any losses affecting the mark-to-market value of MMFs’ portfolios. MMFs were also better able to absorb these redemptions because they occurred on a steady basis over a period of weeks, as opposed to the sort of run on MMFs that occurred in 2008, where investors withdrew over \$300 billion in a matter of days from prime MMFs, several of which were simultaneously experiencing mark-to-market losses in their portfolios. These mitigating circumstances allowed MMFs to absorb redemptions in the summer of 2011 while maintaining a stable NAV.

Chart 5.3.7 Prime Funds Liquidity

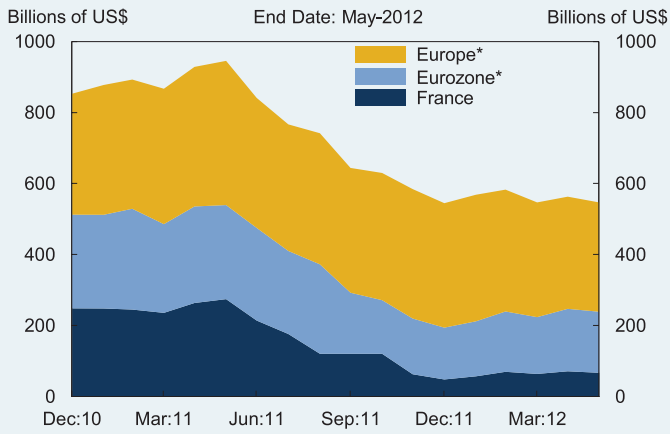


Source: OFR, SEC

Following this period of redemptions, MMFs rapidly reduced their exposure to euro area counterparties. For example, prime MMF exposures to French issuers declined from a peak of \$274 billion at May 31, 2011, to \$176 billion (or 36 percent) by July 31, 2011, and to as low as \$48 billion by December 31, 2011. Overall euro area exposures of prime MMFs decreased considerably from nearly 30 percent of prime MMF assets to 18 percent of assets between May 31, 2011, and May 31, 2012 **(Chart H.1)**.

While this rapid reduction in short-term dollar funding for euro area banks reduced MMF exposure to the debt crisis, it added to strains in the global financial system. For those institutions in which MMFs continue to invest, credit has been provided at shorter maturities and increasingly in secured form through repurchase agreements. From March 2011 to May 2012, the weighted average life for prime MMFs declined from 81 to 71 days. As of June 2012, MMFs have a relatively small direct exposure of approximately \$1 billion to Spanish banks, with no direct exposure to Italian or Greek banks. Prime MMFs also, on average, reduced their overall credit exposure, shifting portfolio assets from bank certificates of deposit into government debt and repos **(Chart H.2)**.

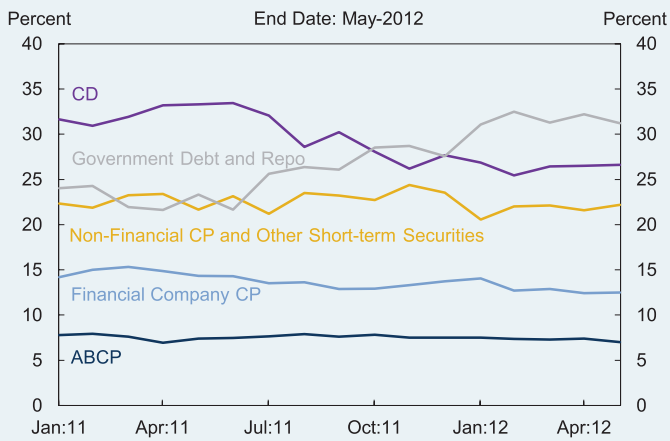
Chart H.1 Prime Fund Bank Holdings



Source: SEC

*Note: Inclusive of entire area below.

Chart H.2 Prime Fund Portfolio Composition



Source: SEC

provided by automated trading strategies could find significant amounts of liquidity suddenly withdrawn if those automated strategies pause due to changes in market conditions. Evidence suggests that the so-called “flash crash” of May 2010 involved a temporary liquidity withdrawal of this type. Attenuated market liquidity, in turn, can adversely affect market functioning more generally. Risk controls must keep pace with these developments. Unfortunately, the risk arising from high-speed trading is difficult to assess because it is opaque and difficult to monitor (particularly in real time).

Complex Trading Strategies and Risk Management

The effects of advances in technology and financial innovation have also resulted in financial firms employing trading and hedging strategies that rely increasingly on complex assumptions regarding the performance and interrelationships of financial instruments and contracts. Recent events, including the publicly announced trading losses at JPMorgan Chase (JPM), highlight the risks that can develop in the use of such complex strategies. This incident reinforces how essential it is that assumptions underlying trading and risk management models be properly validated and monitored on an ongoing basis to help ensure that risks of complex trading strategies are appropriately measured and understood. Institutions also should establish a process to review the effect of approved model changes to help ensure that such changes are appropriate.

Cybersecurity

Cyberattacks represent an increasing threat to financial institutions and the infrastructure components on which financial systems depend for communicating, sharing information, and conducting business. The number and sophistication of malicious incidents continue to grow as business and financial institutions continue to adopt Internet-based commerce systems. Account takeovers can occur, including fraudulent money transfers and counterfeiting of stored value cards. Third-party payment processor breaches represent a continuing risk,

whereby the computer networks of large payment processors are targeted, potentially leading to financial losses and compromised personally identifiable information.

Cyber criminals are becoming more sophisticated, and attack vectors are evolving. Social-engineering techniques used in attempts to gain unauthorized access into networks and systems are shifting from generalized and random to highly targeted. Another cyber threat can emerge from individuals with direct access to core processing centers. Such individuals may be in a position to steal intellectual property, insider information, or data that can damage the reputation of the company. Market participants report that attacks targeting data and assets are increasingly focused on institutional aspects of infrastructure as opposed to retail operations. These types of attacks are associated with increased severity of potential losses and could be increasingly disruptive. Cyber threats also pose a potentially significant risk to the stability of financial markets through the disruption of critical payment, clearing, and settlement systems for key financial institutions.

Robustness of Operational, Risk Management, and Governance Controls at Central Counterparties

In its 2009 meeting in Pittsburgh, the G-20 established the goal of having standardized swap contracts centrally cleared by the end of 2012. This objective was codified in Title VII of the Dodd-Frank Act. Central clearing of swaps will enhance the stability and soundness of over-the-counter (OTC) derivatives markets in a variety of ways, including improved counterparty risk management and multilateral netting of contracts. However, it could also lead to an increased number of financial contracts cleared by a relatively small number of central counterparty (CCP) clearinghouses, which mitigate counterparty credit risk between market participants by becoming the universal counterparty and providing time-specific settlement of transactions. As a result, these clearing institutions have become associated

with even more critical concentration of risk than before.

The default of a major participant could impair the liquidity available to a CCP, requiring that liquidity for settlement be replaced from the CCP's own resources if it is to meet its obligations in a timely fashion. The Principles for Financial Market Infrastructures, finalized this past April by the Committee on Payment and Settlement Systems (CPSS) and the International Organization of Securities Commissions (IOSCO), provides a set of international standards for CCPs and other financial market utilities that address these issues. In addition, Title VIII of the Dodd-Frank Act provides an enhanced regulatory framework for CCPs through the Council's authority to designate financial market utilities as systemically important.

Data Standards and Analytics

The financial crisis revealed that lack of data standards and poor data management threatened financial stability in several ways. Those who created, collected, and relied upon financial data found that financial data quality and scope simply had not kept up with the increasing complexity of, and innovation in, modern financial markets. That was especially the case as financial activity migrated from traditional depository institutions into the capital and securitization markets and across national borders. Consequently, during the crisis, a lack of consistent and high-quality data made it difficult or impossible for some market participants and their regulators to monitor risks in trading books, gauge overall exposures to specific counterparties, price complex securities, or even assess the potential losses that individual firms might face due to falling house prices. Different data systems using different naming conventions made comparisons difficult or impossible, even within the same firm. Resolving a large, complex financial institution like Lehman Brothers was hobbled by the snarled nature of insufficient, conflicting, and inconsistent data.

Since then, policymakers have broadened the scope of data they collect and have made efforts to improve their quality. Examples include the new Form PF (for private funds) and data to be collected by swap data repositories and security-based swap repositories for swaps and other derivatives, as well as international efforts by the International Monetary Fund (IMF) and the Financial Stability Board (FSB) to close data gaps, particularly for derivatives and nontraditional funding activities. Yet significant gaps remain in both the scope and quality of data needed to monitor and enhance financial stability. More needs to be done, particularly in the activities that have traditionally resided outside the regulators' sphere such as securitization markets and OTC derivatives.

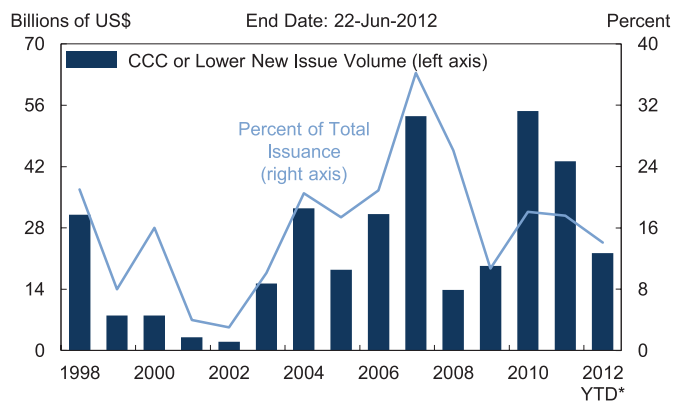
Data standards facilitate improvements in data quality. For instance, efforts to establish a global legal entity identifier (LEI) have made significant progress in the last year, including the establishment of the CFTC Interim Compliant Identifier (CICI) initiative, but work remains to be done to complete this important effort. The Office of Financial Research (OFR), established in Title I of the Dodd-Frank Act, is tasked with improving the quality of financial data and data analytics along multiple dimensions, including LEI implementation and enhancement.

7.4.3 Behavioral Vulnerabilities

Managing Risk in a Low Interest Rate Environment

An unusually low rate environment, such as that currently in place, is prone to several behavioral vulnerabilities. Market participants may have an incentive to take on additional leverage, credit risk, and duration risk in an effort to boost yields. While increased risk taking is one possible transmission mechanism for expansionary policies, such reach for yield behavior without appropriate risk management could leave many participants with portfolios that are more vulnerable to adverse market moves.

Chart 7.4.2 Credit Quality of High-Yield New Issues



Note: Includes Split B, CCC and non-rated new issuances.
 Source: JP Morgan * 2012 data are YTD as of 22-Jun-2012.

The tendency to reach for yield may be especially pronounced for entities such as pension funds or insurance companies that face a stream of quasi-fixed nominal liabilities. For example, the investment yield for life insurers in aggregate is only around 1.1 percentage points above the minimum yield needed to maintain policyholder reserves, leaving these insurers with a relatively small margin of error. Hedge funds also may have an incentive to reach for excess yield if they manage to specific hurdle rates expected by their investors or if the value of their fund is considerably below the high-water mark that would trigger a large payout. In addition, money market funds may have an incentive to increase their risk profiles, especially if the low interest rates do not provide sufficient yield to cover their expenses.

We do not see much evidence of such behaviors currently. Risky assets do not exhibit signs of overvaluations associated with widespread reach-for-yield behavior. If anything, measures of risk premia for equities and corporate bonds are very wide by historical standards. However, indicators of such behaviors should be watched carefully, including leverage, contractual terms, borrower characteristics, the use of levered instruments for funding, issuance of “covenant lite” loans, and the rate of original issue, CCC-rated high-yield bonds (**Chart 7.4.2**).

Eventually, interest rates will move up to more normal levels. If market participants are adequately prepared for such an increase in rates, and if this increase occurs gradually, it is unlikely that financial stability would be adversely affected. However, a rapid increase in interest rates could be disruptive. For example, interest rates could increase rapidly following a loss in investor confidence in the sustainability of U.S. fiscal policy. It is unclear how well prepared fixed income markets are to the possibility of such rapid interest rate movements. Those especially vulnerable would be market participants with highly leveraged carry-trade positions. It is important to recognize that while any institution in isolation can insulate itself from movements in interest

rates via swaps and derivatives, these contracts are in zero net supply in the aggregate. As a result, some market participants must be exposed to interest rate risk.

Moral Hazard Issues for Large, Complex Financial Institutions

Behavioral vulnerabilities of large, complex financial institutions could increase with the complexity and size of these institutions. These vulnerabilities occur because an expectation of government support could generate more risk taking by institutions that are perceived as too big or too complex to fail. Indeed, many observers interpret actions taken by government authorities during the recent crisis as evidence that the public sector provides an implicit guarantee to large complex financial institutions. Such beliefs, if widespread, could lead to increased concentration in financial services and greater risk taking by those institutions deemed protected, as the implicit government guarantee reduces market discipline. The result could be higher overall risk in financial markets with attenuated risk management.

Large financial institutions continue to have a high degree of operational complexity and interconnectedness. These complexities may reflect the diverse lines of businesses and locations in which these firms operate, but lead to legal structures with activities spread over hundreds, and in some cases thousands, of subsidiaries (**Chart 7.4.3**). Market participants could believe that the complexity and interconnectedness of these companies could make them harder to resolve and induce further likelihood of government support in a stress environment. Such beliefs could therefore promote continued moral hazard problems for such complex financial entities.

In addition, there may continue to be perceptions that some institutions may receive special treatment by virtue of their size. Such beliefs could be exacerbated by greater concentration in the financial services industry. The financial industry

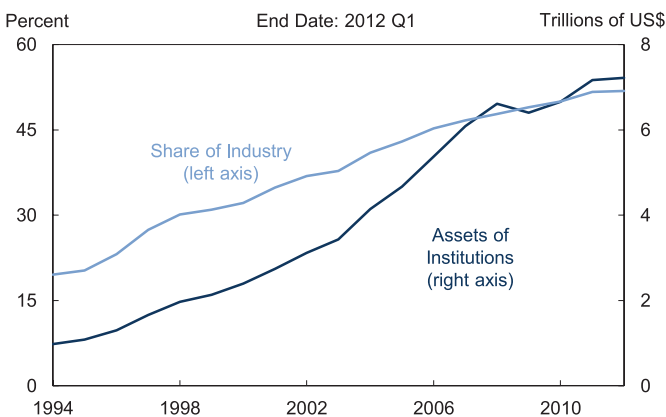
Chart 7.4.3 Complex Financial Institutions in 2012

Institution	Total Subsidiaries	% Foreign Subsidiaries	Countries of Operation
JP Morgan	5183	57%	72
Bank of America	4647	21%	56
Citigroup	3556	31%	93
Goldman Sachs	3550	39%	53
Morgan Stanley	2718	40%	64

Source: Bankscope

As of: 17-May-2012

Chart 7.4.4 Assets of the 10 Largest Depository Institutions



Source: FDIC

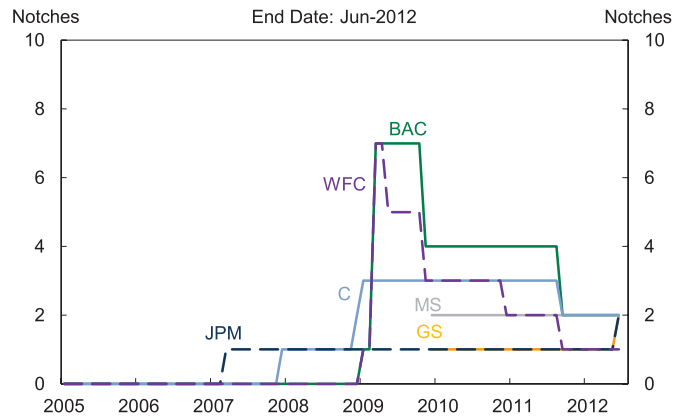
has become increasingly concentrated for decades, a trend enhanced in part by such legislative developments as the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 permitting interstate branching, and the Gramm-Leach-Bliley Act, enacted in 1999, that allowed affiliations among commercial banks, investment banks, and insurance companies. This trend continued through the crisis (**Chart 7.4.4**) in part due to acquisitions of failing firms. As of the first quarter of 2012, the 10 largest banks held 52 percent of industry assets, worth approximately 47 percent of GDP, compared with 45 percent of industry assets, worth approximately 40 percent of GDP at the end of 2006. Notwithstanding this trend towards greater concentration, the U.S. banking system remains significantly less concentrated than that of most developed countries.

These moral hazard problems are partially addressed by raising capital requirements. An additional important priority is to develop credible and robust failure resolution procedures for large complex institutions—procedures that would allow the institution to be liquidated or restructured, as appropriate, with minimal damage to the markets as a whole. The FDIC is authorized to resolve certain failing financial companies under the Dodd-Frank Act and has developed a resolution strategy for such firms that will promote financial stability by minimizing contagion and requiring accountability by forcing the firms' shareholders and creditors to bear losses.

The credit rating agencies appear to have recognized that the Dodd-Frank Act limits the ability of the government to provide extraordinary support to shareholders and creditors of large complex financial institutions. This recognition can be seen in the reduced uplift the major rating agencies incorporate into the long-term ratings for a number of large financial institutions, many of which have been downgraded or

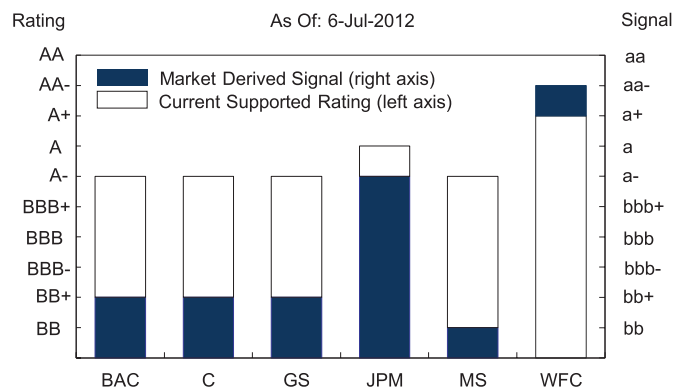
assigned a negative rating outlook as a result (Chart 7.4.5). However, a degree of ratings uplift still remains for the largest banks, typically 1 to 2 notches for large bank holding companies and 2 to 3 notches for large bank subsidiaries. In addition, there is evidence that market-derived indicators of credit quality tend to be lower than the levels assigned by ratings agencies (Chart 7.4.6). While ratings agencies typically report uplifts only for long-term ratings, these uplifts also support the short-term ratings that help firms access short-term unsecured wholesale funding. Vulnerabilities can arise when a financial institution's funding model depends in part on the belief that the government will provide support, rather than only on the intrinsic strength of the institution and its portfolio.

Chart 7.4.5 Moody's BHC Systemic Support Uplift



Source: Moody's

Chart 7.4.6 S&P Current Actual Rating & Market Derived Signal*



Source: Standard & Poor's Rating Services

*Note: Market derived signal is CDS-based.

