

.....

FSOC

2016

ANNUAL
REPORT

.....

FINANCIAL STABILITY OVERSIGHT COUNCIL

Financial Stability Oversight Council

The Financial Stability Oversight Council (Council) was established by the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) and is charged with three primary purposes:

1. To identify risks to the financial stability of the United States that could arise from the material financial distress or failure, or ongoing activities, of large, interconnected bank holding companies or nonbank financial companies, or that could arise outside the financial services marketplace.
2. To promote market discipline, by eliminating expectations on the part of shareholders, creditors, and counterparties of such companies that the U.S. government will shield them from losses in the event of failure.
3. To respond to emerging threats to the stability of the U.S. financial system.

Pursuant to the Dodd-Frank Act, the Council consists of ten voting members and five nonvoting members and brings together the expertise of federal financial regulators, state regulators, and an insurance expert appointed by the President.

The voting members are:

- the Secretary of the Treasury, who serves as the Chairperson of the Council;
- the Chairman of the Board of Governors of the Federal Reserve System;
- the Comptroller of the Currency;
- the Director of the Bureau of Consumer Financial Protection;
- the Chairman of the Securities and Exchange Commission;
- the Chairperson of the Federal Deposit Insurance Corporation;
- the Chairperson of the Commodity Futures Trading Commission;
- the Director of the Federal Housing Finance Agency;
- the Chairman of the National Credit Union Administration; and
- an independent member with insurance expertise who is appointed by the President and confirmed by the Senate for a six-year term.

The nonvoting members, who serve in an advisory capacity, are:

- the Director of the Office of Financial Research;
- the Director of the Federal Insurance Office;
- a state insurance commissioner designated by the state insurance commissioners;
- a state banking supervisor designated by the state banking supervisors; and
- a state securities commissioner (or officer performing like functions) designated by the state securities commissioners.

The state insurance commissioner, state banking supervisor, and state securities commissioner serve two-year terms.

Statutory Requirements for the Annual Report

Section 112(a)(2)(N) of the Dodd-Frank Act requires that the annual report address the following:

- i. the activities of the Council;
- ii. significant financial market and regulatory developments, including insurance and accounting regulations and standards, along with an assessment of those developments on the stability of the financial system;
- iii. potential emerging threats to the financial stability of the United States;
- iv. all determinations made under Section 113 or Title VIII, and the basis for such determinations;
- v. all recommendations made under Section 119 and the result of such recommendations; and
- vi. recommendations—
 - I. to enhance the integrity, efficiency, competitiveness, and stability of United States financial markets;
 - II. to promote market discipline; and
 - III. to maintain investor confidence.

Approval of the Annual Report

This annual report was approved unanimously by the voting members of the Council on June 21, 2016. Except as otherwise indicated, data cited in this report is as of March 31, 2016.

Abbreviations for Council Member Agencies and Member Agency Offices

- Department of the Treasury (Treasury)
- Board of Governors of the Federal Reserve System (Federal Reserve)
- Office of the Comptroller of the Currency (OCC)
- Bureau of Consumer Financial Protection (CFPB)
- Securities and Exchange Commission (SEC)
- Federal Deposit Insurance Corporation (FDIC)
- Commodity Futures Trading Commission (CFTC)
- Federal Housing Finance Agency (FHFA)
- National Credit Union Administration (NCUA)
- Office of Financial Research (OFR)
- Federal Insurance Office (FIO)

Contents

| | | |
|----------|--|-----------|
| 1 | Member Statement | 1 |
| 2 | Executive Summary | 3 |
| 3 | Annual Report Recommendations | 7 |
| 3.1 | Cybersecurity | 7 |
| 3.2 | Risks Associated with Asset Management Products and Activities | 9 |
| 3.3 | Capital, Liquidity, and Resolution | 12 |
| 3.4 | Central Counterparties | 13 |
| 3.5 | Reforms of Wholesale Funding Markets | 14 |
| 3.6 | Reforms Relating to Reference Rates | 14 |
| 3.7 | Data Quality, Collection, and Sharing | 15 |
| 3.8 | Housing Finance Reform | 16 |
| 3.9 | Risk Management in an Environment of Low Interest Rates and Rising Asset Price Volatility | 17 |
| 3.10 | Changes in Financial Market Structure and Implications for Financial Stability | 17 |
| 3.11 | Financial Innovation and Migration of Activities | 18 |
| 4 | Financial Developments | 19 |
| 4.1 | U.S. Treasuries | 19 |
| BOX A: | The Increasing Prevalence of Negative Swap Spreads | 21 |
| 4.2 | Sovereign Debt Markets | 23 |
| BOX B: | Developments in the European Banking Union | 26 |
| BOX C: | Municipal Debt Markets: Challenges in Puerto Rico | 33 |
| 4.3 | Corporate Credit | 34 |
| 4.4 | Household Credit | 37 |
| 4.5 | Real Estate Markets | 39 |
| 4.6 | Foreign Exchange | 46 |
| 4.7 | Equities | 47 |
| 4.8 | Commodities | 48 |

| | |
|---|------------|
| 4.9 Wholesale Funding Markets | 48 |
| 4.10 Derivatives Markets | 56 |
| BOX D: Trade Compression in Derivatives Markets | 62 |
| 4.11 Bank Holding Companies and Depository Institutions | 66 |
| 4.12 Nonbank Financial Companies | 76 |
| 4.13 Investment Funds | 82 |
| BOX E: Third Avenue Focused Credit Fund | 86 |
| 5 Regulatory Developments and Council Activities..... | 91 |
| 5.1 Safety and Soundness | 91 |
| 5.2 Financial Infrastructure, Markets, and Oversight | 99 |
| 5.3 Mortgage Transactions, Housing, and Consumer Protection | 102 |
| 5.4 Data Scope, Quality, and Accessibility | 103 |
| 5.5 Council Activities | 106 |
| 6 Potential Emerging Threats and Vulnerabilities | 109 |
| 6.1 Ongoing Structural Vulnerabilities | 109 |
| 6.2 Cybersecurity: Vulnerabilities to Attacks on Financial Services | 113 |
| 6.3 Asset Price Declines and Increasing Volatility | 114 |
| BOX F: Implications of Lower Commodity Prices | 117 |
| BOX G: Equity Market Volatility on August 24, 2015 | 119 |
| 6.4 Risk-Taking in a Low-Yield Environment | 120 |
| 6.5 Changes in Financial Market Structure and Implications for Financial Stability | 121 |
| BOX H: Perspectives on Fixed Income Market Liquidity | 123 |
| 6.6 Financial Innovation and Migration of Activities | 126 |
| 6.7 Global Economic and Financial Developments | 128 |
| Abbreviations | 129 |
| Glossary | 139 |
| List of Charts | 149 |

1

Member Statement

The Honorable Paul D. Ryan
Speaker of the House
United States House of Representatives

The Honorable Nancy Pelosi
Democratic Leader
United States House of Representatives

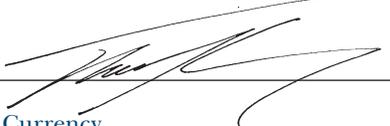
The Honorable Joseph R. Biden, Jr.
President of the Senate
United States Senate

The Honorable Mitch McConnell
Majority Leader
United States Senate

The Honorable Harry Reid
Democratic Leader
United States Senate

In accordance with Section 112(b)(2) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, for the reasons outlined in the annual report, I believe that additional actions, as described below, should be taken to ensure financial stability and to mitigate systemic risk that would negatively affect the economy: the issues and recommendations set forth in the Council's annual report should be fully addressed; the Council should continue to build its systems and processes for monitoring and responding to emerging threats to the stability of the United States financial system, including those described in the Council's annual report; the Council and its member agencies should continue to implement the laws they administer, including those established by, and amended by, the Dodd-Frank Act, through efficient and effective measures; and the Council and its member agencies should exercise their respective authorities for oversight of financial firms and markets so that the private sector employs sound financial risk management practices to mitigate potential risks to the financial stability of the United States.

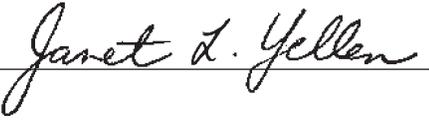

Jacob J. Lew
Secretary of the Treasury
Chairperson, Financial Stability Oversight Council

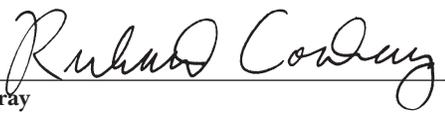

Thomas J. Curry
Comptroller of the Currency
Office of the Comptroller of the Currency

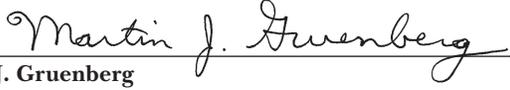

Mary Jo White
Chair
Securities and Exchange Commission


Timothy G. Massad
Chairman
Commodity Futures Trading Commission


Rick Metsger
Chairman
National Credit Union Administration


Janet L. Yellen
Chair
Board of Governors of the Federal Reserve System


Richard Cordray
Director
Bureau of Consumer Financial Protection


Martin J. Gruenberg
Chairman
Federal Deposit Insurance Corporation


Melvin L. Watt
Director
Federal Housing Finance Agency


S. Roy Woodall, Jr.
Independent Member with Insurance Expertise
Financial Stability Oversight Council

2

Executive Summary

In the past year, concerns about slowing global growth, supply gluts in commodities markets, and shifts in exchange rate and monetary policies abroad led to significant price swings across a range of financial assets as U.S. interest rates remained low. Although these developments have created challenges for particular firms and sectors, financial regulatory reforms and a strengthening of market discipline since the global financial crisis have made the U.S. financial system more resilient, as vulnerabilities remained moderate.

U.S. financial regulators and market participants made progress in addressing a number of structural vulnerabilities highlighted in the Council's previous annual reports. The Federal Reserve finalized a rule requiring that global systemically important banks (G-SIBs) increase their holdings of common equity relative to risk-weighted assets (RWAs) and proposed standards for mandatory long-term debt and total loss-absorbing capacity for G-SIBs. The Federal Reserve and the FDIC completed their review of the 2015 resolution plans of eight of the largest, most complex U.S. bank holding companies (BHCs). The agencies jointly determined that five of the firms had submitted plans that were not credible or would not facilitate an orderly resolution under bankruptcy and have notified these firms of the deficiencies in their plans. The Federal Reserve and the FDIC informed all eight firms of the steps they must take in response to the agencies' findings. The International Swaps and Derivatives Association (ISDA) expanded the scope of its Universal Resolution Stay Protocol to cover securities financing transactions. In February 2016, the CFTC and the European Commission announced a common approach to the supervision of central counterparties (CCPs) operating in the United States and the European Union (EU). U.S. prudential regulators and the CFTC issued rules establishing minimum margin requirements for swaps that are not cleared through CCPs. The SEC finalized rules setting forth reporting requirements for securities-based swaps and establishing a process for the registration of securities-based swap dealers and major securities-based swap participants. The OFR, Federal Reserve System, and SEC collaborated on pilot projects to improve the collection and analysis of data on securities financing transactions. These and other actions undertaken over the last year can be expected to make the largest, most interconnected financial institutions more resilient, improve regulators' and firm managers' ability to manage potential distress at such institutions, and reduce the impact of contagion that may arise from interconnections among firms and markets. Despite these important, positive steps, this report identifies a number of structural vulnerabilities and emerging threats in the U.S. financial system that require action from market participants, regulators, and policymakers.

In addition, the Council continued its analysis of potential financial stability risks that may arise from certain asset management products and activities. Based on this work, the Council identified areas of potential financial stability risks and, in April 2016, publicly issued a written update regarding its evaluation. Since May 2015, the SEC has issued several proposed rules affecting the asset management industry. The SEC has proposed rules to enhance data reporting for registered investment companies and registered investment advisers of separately managed accounts, strengthen liquidity risk management programs and disclosure for registered funds, and limit the amount of leverage that registered investment companies may obtain through derivatives transactions.

Lastly, the Council remains focused on taking steps to appropriately address threats to financial stability. Recently, a federal court rescinded the Council's designation of a nonbank financial company for Federal Reserve supervision and enhanced prudential standards. The government is appealing the court's decision. The Council's authority to designate nonbank financial companies remains a critical tool to address potential threats to financial stability, and the Council will continue to defend vigorously the nonbank designations process.

Cybersecurity

Cyber threats and vulnerabilities continue to be a pressing concern for companies and governments in the United States and around the world. Significant investment in cybersecurity by the financial services sector over the past several years has been critical to reducing cybersecurity vulnerabilities within companies and across the sector as a whole, and such investments should continue. Government agencies and the private sector should continue to work to improve and enhance information sharing, baseline protections such as security controls and network monitoring, and response and recovery planning.

Asset Management Products and Activities

The asset management industry's increasing significance to financial markets and to the broader economy underscores the need for the Council's consideration of potential risks to U.S. financial stability from products and activities in this sector. Building on work begun in 2014, including a public request for comment, the Council and staffs of its members and member agencies have carried out analyses and engaged in dialogue regarding these issues. Based on this work, the Council has identified certain areas of potential financial stability risk and provided its views on key areas of focus and next steps to respond to these potential risks.

Specifically, to help mitigate financial stability concerns that may arise from liquidity and redemption risks in pooled investment vehicles, the Council believes that robust liquidity risk management practices for mutual funds, establishment of clear regulatory guidelines addressing limits on the ability of mutual funds to hold assets with very limited liquidity, enhanced reporting and disclosures by mutual funds of their liquidity profiles and liquidity risk management practices, steps to allow and facilitate mutual funds' use of tools to allocate redemption costs more directly to investors who redeem shares, additional public disclosure and analysis of external sources of financing, and measures to mitigate liquidity and redemption risks that are applicable to collective investment funds (CIFs) and similar pooled investment vehicles offering daily redemptions should be considered. Regarding potential financial stability risks associated with leverage, the Council's review of the use of leverage in the hedge fund industry suggests a need for further analysis of the activities of hedge funds. Accordingly, the Council has created an interagency working group that will share and analyze relevant regulatory information in order to better understand whether certain hedge fund activities might pose potential risks to financial stability. With respect to its review of operational risks, securities lending, and resolvability and transition planning, work going forward will involve additional data collection, further engagement and analysis, and monitoring.

Large, Complex, Interconnected Financial Institutions

The size, scope, and interconnectedness of the nation's largest financial institutions warrant continued close attention from financial regulators. While the capital and liquidity positions of the largest BHCs have improved considerably since the financial crisis, the low and relatively flat yield curve, rising credit risk in some market segments, litigation expenses, and other factors have put pressure on BHC equity valuations and profitability. Regulators should continue working to ensure that there is enough capital and liquidity at financial institutions to reduce systemic risk, including finalizing rules setting standards for the minimum levels of total loss-absorbing capacity and long-term debt maintained by G-SIBs and large foreign banking organizations (FBOs) operating in the United States.

Central Counterparties

CCPs can enhance financial stability and increase market resilience by improving transparency, imposing robust risk management and margin standards on clearing members, expanding multilateral netting, and facilitating the orderly management of counterparty credit losses. Because of the critical role these infrastructures play in financial markets, it is essential that they be resilient and resolvable. Member agencies should continue to evaluate whether existing rules and standards for CCPs and their clearing members are sufficiently robust to mitigate potential threats to financial stability. Moreover, with clearing mandates for selected interest rate and credit default index swaps in effect in the United States, and similar mandates either in effect or planned in a number of foreign jurisdictions, member agencies should continue working with international standard setting bodies to implement more granular guidance with respect to international risk management standards in order to enhance the safety and soundness of CCPs. Such guidance should also minimize the potential for material differences between jurisdictions' standards, which could potentially result in regulatory arbitrage by market participants.

Short-Term Wholesale Funding

Intraday counterparty risk exposure in the tri-party repurchase (repo) market contracted significantly in recent years, but more work is needed to bring the settlement of General Collateral Finance (GCF) repo transactions in line with post-crisis reforms. The potential for fire sales of collateral by creditors of a defaulted broker-dealer also remains a significant risk. Additionally, data gaps continue to limit regulators' ability to monitor the aggregate repo market and identify interdependencies among firms and market participants. Regulators will need to monitor market responses to new SEC money market mutual fund (MMF) rules, which become effective this year, and assess where there may be unforeseen risks, as well as potential regulatory and data gaps associated with other types of cash management vehicles.

Reliance on Reference Rates

Post-crisis reforms by the official sector and market participants have improved the resilience of the London Interbank Offered Rate (LIBOR) by subjecting the rate and its administrator to more direct oversight, eliminating many little-used currency/tenor pairings, and embargoing the submissions of individual banks for a three-month period. However, because the volume of unsecured wholesale lending has declined markedly, it is difficult to firmly root LIBOR submissions in a sufficient number of observable transactions. This development makes LIBOR more reliant on the judgment of submitting banks and poses the risk that it may not be possible to publish the benchmark on an ongoing basis if transactions decline further. Regulators and market participants should continue their efforts to develop alternative rates and implementation plans to achieve a smooth transition to these new rates.

Data Gaps and Challenges to Data Quality, Collection, and Sharing

While Council members have made progress in filling gaps in the scope, quality, and accessibility of data available to regulators, much work remains. Regulators face challenges comprehensively monitoring and understanding developments across financial markets, as each agency's data, information, and analysis are focused primarily on the entity types or market segments for which they have regulatory purview. More broadly, markets continually evolve and financial transactions cross regulatory jurisdictions, making data sharing and integration among regulators both at home and abroad, as well as cooperative data analysis, imperatives. Regulators and market participants should continue to work together to improve the scope, quality, and accessibility of financial data.

Housing Finance Reform

The government-sponsored enterprises (GSEs) are now into their eighth year of conservatorship. While regulators and supervisors have taken great strides to work within the constraints of conservatorship to promote greater investment of private capital and improve operational efficiencies with lower costs, federal and state regulators are approaching the limits of their ability to enact wholesale reforms that are likely to foster a vibrant, resilient housing finance system. Housing finance reform legislation is needed to create a more sustainable system that enhances financial stability.

Risk Management in an Environment of Low Interest Rates and Rising Asset Price Volatility

The Council has long been attentive to the possibility that low interest rates may lead some market participants to take on risk to gain higher yields by reducing the duration of their liabilities, by increasing leverage, or by shifting toward assets that are less liquid or embed greater market or credit risk. Such behavior can contribute to excessive asset valuations, which can leave investors susceptible to rapid, unexpected price declines. Elevated asset price volatility associated with downward movement in asset valuations can pose challenges for those market participants that are highly leveraged or hold concentrated and inadequately hedged exposures to affected market segments. The persistent fall in energy and metals commodities prices, large swings in equity valuations, and upward movement in high-yield debt spreads underscore the need for supervisors, regulators, and managers to remain vigilant in ensuring that firms and funds maintain robust risk management standards.

Changes in Financial Market Structure

With the growing importance in certain markets of proprietary trading firms and other market participants that rely heavily on automated trading systems, access to those markets has increased and costs for investors and issuers have generally fallen. However, this shift in market structure may introduce new vulnerabilities, including operational risks associated with the very high speed and volume of trading activity and potential destabilizing price feedback dynamics arising from interactions among high-speed algorithmic trading decisions. Increased coordination among regulators is needed to evaluate and address these risks, particularly in circumstances where economically similar products, such as cash Treasuries and Treasury futures, are traded in different markets and fall under the purview of different regulators.

Financial Innovation and Migration of Activities

New financial products, delivery mechanisms, and business practices, such as marketplace lending and distributed ledger systems, offer opportunities to lower transaction costs and improve the efficiency of financial intermediation. However, innovations may also embed risks, such as credit risk associated with the use of new and untested underwriting models. In other instances, risks embedded in new products and practices may be difficult to foresee. Financial regulators will need to continue to be vigilant in monitoring new and rapidly growing financial products and business practices, even if those products and practices are relatively nascent and may not constitute a current risk to financial stability.

3.1 Cybersecurity

Cybersecurity threats and vulnerabilities continue to be pressing concerns for companies and governments in the United States and around the world. In the U.S. financial system, cybersecurity remains an area of significant focus for both firms and the government sector. This attention is appropriate, as cybersecurity-related incidents create significant operational risk, impacting critical services in the financial system, and ultimately affecting financial stability and economic health.

Financial services sector companies and industry groups, executive branch agencies, financial regulators, and others have made notable progress in improving cybersecurity and resilience throughout the system. This progress includes developing and testing of system-wide plans for responding to major incidents, the expansion of information sharing programs through organizations like the Financial Services Information Sharing and Analysis Center (FS-ISAC), and the continued development of regulatory and non-regulatory structures for assessing and addressing firms' cybersecurity risk levels. Continuing to advance these and other efforts should remain a top priority for business and government leaders, and the Council makes several recommendations for doing so which build on recommendations made in last year's annual report.

Information Sharing

The timely sharing of actionable cybersecurity information between industry and government is critical to preventing and limiting the impact of cybersecurity incidents. The signing into law of the Cybersecurity Act of 2015 provides a foundation for further advances in cybersecurity-related information sharing. The Act establishes a more robust legal framework for sharing cyber-related information between companies and between the public and private sectors. Such information sharing will improve the government's ability to analyze and respond to cyber-related attacks and vulnerabilities that may impact the private sector.

The Council recommends that Treasury, the U.S. Departments of Homeland Security, Justice, and Defense, and financial regulators strongly support efforts to implement this legislation, including coordinating their associated processes with the financial services sector, consistent with processes established by the law.

Work to continue to improve information sharing should recognize the full scope of information that is useful to cybersecurity professionals. This information includes the technical details of malicious activity, as well as supporting information, such as how the incident unfolded, its significance, and what tools and tactics the adversary used. Agencies may possess such information, and should continue to seek appropriate ways to share additional information, leveraging existing information mechanisms where possible, to provide a more complete picture of malicious activity.

The Council recommends that the Financial and Banking Information Infrastructure Committee (FBIIC) and its member agencies continue to foster information sharing by law enforcement, homeland security, and the intelligence community agencies with the FBIIC member agencies.

Baseline Protections

The financial sector's continued efforts to improve cybersecurity as threats and vulnerabilities evolve are critically important. These efforts include taking steps to reduce the risk of incidents by making networks more secure, reducing vulnerabilities, and increasing costs to malicious actors. In addition, the SEC's Regulation SCI, which became effective in November 2015, requires certain key market participants to have comprehensive policies and procedures in place surrounding their technological systems and improves Commission oversight of securities market technology infrastructure.

The financial services sector's continued collaboration with the National Institute of Standards and Technology (NIST) to use the NIST Framework for Improving Critical Infrastructure Cybersecurity and incorporate it into existing industry practices is an important part of such efforts.

It is important to note, however, that the Framework is an evolving guide that establishes a common lexicon for businesses to discuss their cybersecurity posture and is not designed to serve as a regulatory standard. As financial regulators adopt approaches to cybersecurity supervision, the Council recommends that they endeavor to establish a common risk-based approach to assess cybersecurity and resilience at the firms they regulate. Informed by their regulatory and supervisory process, individual regulators could leverage that common risk-based approach to address any unique statutory and regulatory requirements, as well as any distinct cybersecurity risks presented by segments of the financial sector they oversee. The Council also recommends that financial regulators integrate the Framework's lexicon into any common approach to risk assessment and related regulatory and supervisory process to the extent possible to further reinforce the ability of diverse stakeholders to communicate about, and assess more consistently, cybersecurity risk across the financial sector.

In addition, it is important to highlight that the cybersecurity of financial services sector companies depends on both the internal security of companies and also the security of the vendors and service providers on which they rely. To continue to improve the cybersecurity of the financial services sector as a whole, the Council recommends increased engagement between the sector and service providers of all types, including those in the energy, telecommunications, and technology sectors.

Finally, the approaches and authorities to supervise third-party service providers continue to vary across financial regulators. The Council continues to support efforts to synchronize these authorities, by passing new legislation that helps to enhance the security of third-party service providers and the critical services they provide. The Council supports the granting of examination and enforcement powers to NCUA and FHFA to oversee third-party service providers, including information technology, and more broadly, other critical service providers engaged respectively with credit unions and the GSEs.

Response and Recovery

A significant cybersecurity incident affecting the financial services sector has the potential to affect financial stability. Government agencies and the private sector must be prepared to respond to such incidents to limit their impact and expedite recovery processes. These preparations should include developing robust sector-wide plans for responding to a significant cybersecurity incident, and this work is well underway.

Building on this work, as well as the series of cybersecurity exercises conducted by government and industry over the past two years, the Council recommends that agencies and financial sector companies further explore how best to concurrently manage the financial stability and technical impacts of a significant cybersecurity incident. Ultimately, effective response to a significant cybersecurity incident affecting the financial services sector will depend on technical, financial stability, and business response efforts. The Council recommends continuing efforts by the FBIIC members and the private sector to understand how these issues intersect and explore various means for these perspectives to be considered during a crisis.

3.2 Risks Associated with Asset Management Products and Activities

In April 2016, the Council issued a statement providing a public update on its review of potential risks to U.S. financial stability that may arise from asset management products and activities. The statement details the Council's current views regarding potential financial stability risks and next steps to be considered to respond to these potential risks. The Council's evaluation of risks focused on the following areas: (1) liquidity and redemption; (2) leverage; (3) operational functions; (4) securities lending; and (5) resolvability and transition planning.

The Council's public statement builds on an extensive review of potential financial stability risks in the asset management industry, including the Council's May 2014 public conference and its directive to staff at its July 2014 meeting to undertake a more focused analysis of industry-wide products and activities. In December 2014, the Council published a notice seeking public comment regarding whether and how certain asset management products and activities could pose potential risks to U.S. financial stability.

Below are summaries of the Council's views from the public statement across each of the areas covered in its review.

Liquidity and Redemption Risk

The Council believes there are financial stability concerns that may arise from liquidity and redemption risks in pooled investment vehicles, particularly where investor redemption rights and underlying asset liquidity may not match. To help mitigate these financial stability risks, the Council believes that the following steps should be considered: (1) robust liquidity risk management practices for mutual funds, particularly with regard to preparations for stressed conditions by funds that invest in less liquid assets; (2) establishment of clear regulatory guidelines addressing limits on the ability of mutual funds to hold assets with very limited liquidity, such that holdings of potentially illiquid assets do not interfere with a fund's ability to make orderly redemptions; (3) enhanced reporting and disclosures by mutual funds of their liquidity profiles and liquidity risk management practices; (4) steps to allow and facilitate mutual funds' use of tools to allocate redemption costs more directly to investors who redeem shares; (5) additional public disclosure and analysis of external sources of financing, such as lines of credit and interfund lending, as well as events that trigger the use of external financing; and (6) measures to mitigate liquidity and redemption risks that are applicable to CIFs and similar pooled investment vehicles offering daily redemptions.

While exchange-traded funds (ETFs) are not subject to the same types of liquidity and redemption risks as other open-end funds, the Council will continue to monitor other risks that could arise, such as the potential for ETFs to disconnect from the price of their underlying securities for an extended period, and whether such risks could raise financial stability concerns. The Council notes that the SEC is currently reviewing exchange-traded products (ETPs) with respect to a broad variety of issues.

In May 2015, the SEC proposed rules, forms, and amendments to modernize and enhance the reporting and disclosure of information by registered investment companies and registered investment advisers. In September 2015, the SEC issued proposed rules for mutual funds and ETFs designed to enhance liquidity risk management by funds, provide new disclosures regarding fund liquidity, and allow funds to adopt swing pricing to pass on transaction costs to entering and exiting investors. The Council welcomes the SEC's policy initiatives in this area and understands the SEC is currently reviewing public comments on its proposed rules.

To the extent that these or any other measures are implemented by the SEC or other regulators, the Council intends to review and consider whether risks to financial stability remain. This review will take into account how the industry may evolve in light of any regulatory changes, whether additional data is needed to comprehensively assess liquidity and redemption risk, and the differences and similarities in risk profiles among mutual funds and other pooled investment vehicles.

Leverage Risk

The Council's analysis of data from the SEC's Form PF showed that many hedge funds use relatively small amounts of leverage, but leverage appears to be concentrated in a small number of large hedge funds, based on certain measures. The Council acknowledges that the relationship between a hedge fund's level of leverage and risk, and whether that risk may have financial stability implications, is highly complex. While reporting on Form PF has increased transparency, it does not provide complete information on the economics and corresponding risk exposures of hedge fund leverage or potential mitigants associated with reported leverage levels. In addition, since hedge funds' major counterparties are regulated by various regulators with different jurisdictions, no single regulator has all the information necessary to evaluate the complete risk profiles of hedge funds. Accordingly, the Council believes further analysis is needed, and therefore is creating an interagency working group that will share and analyze relevant regulatory information in order to better understand hedge fund activities and further assess whether there are potential risks to financial stability. In particular, the working group will: (1) use regulatory and supervisory data to evaluate the use of leverage in combination with other factors—such as counterparty exposures, margining requirements, underlying assets, and trading strategies—for purposes of assessing potential risks to financial stability; (2) assess the sufficiency and accuracy of existing data and information, including data reported on Form PF, for evaluating risks to financial stability, and consider how the existing data might be augmented to improve the ability to make such evaluations; and (3) consider potential enhancements to and the establishment of standards governing the current measurements of leverage, including risk-based measures of leverage.

In December 2015, the SEC issued a proposed rule on the use of derivatives by registered investment companies, including mutual funds, ETFs, and business development companies. The Council welcomes the SEC's efforts to limit the amount of leverage that registered investment companies such as mutual funds and ETFs may obtain through derivatives transactions, strengthen their asset segregation requirements, and require derivatives risk management programs for certain funds. The Council intends to monitor the effects of any regulatory changes and their implications for financial stability.

Regulators should consider whether aspects of any SEC rules regarding derivatives and data reporting modernization, or other measures, may be appropriate for CIFs subject to their respective jurisdictions. Regulators should consider how the industry may evolve as a result of any final SEC rules, whether additional data is needed to comprehensively assess leverage risk at CIFs, and differences in regulatory regimes.

In May 2015, the SEC issued a proposed rule requiring registered investment advisers to provide annual data on the separately managed accounts they manage. The SEC has proposed important enhancements that would increase data available to monitor the use of leverage in separately managed accounts. The Council welcomes these efforts and understands that the SEC is currently reviewing public comments on the proposed rule. The Council intends to monitor the effects of any regulatory changes and their implications for financial stability.

Operational Risk

The Council has considered whether a disruption or failure of a service provider, or the provision of a flawed service, could result in a transmission of risk to the broader financial system. The use of service providers and reliance on technology within the asset management industry calls for greater understanding of potential risks. While the asset management industry, as with the financial industry as a whole, has placed increasing emphasis on business continuity planning, and individual market participants have information on their own service provider relationships, there is limited information available to enable regulators to assess operational risks across the industry, including service provider risks. Although the incidents to date have not raised financial stability concerns, this does not preclude the potential for future incidents to pose more serious threats.

As a result, the Council will continue its analysis of potential service provider risks, including by engaging with relevant industry participants and other stakeholders, which may also be useful in better understanding potential service provider risks within the financial industry as a whole. The Council's analysis is expected to cover key functions performed by service providers to asset managers, including, among other things, a review of the concentration of service providers, the level of outsourcing of particular services, and the complexity of the infrastructure and activities supported by such providers. The Council will consider whether there is the potential for operational disruptions or problems to cause significant losses and disrupt market functioning. The Council also intends to further evaluate industry practices for managing these risks, such as business continuity and disaster recovery planning for disruptions. As part of this analysis, the Council will consider tools already available to mitigate risks from service providers, as well as potential ways to enhance information sharing among regulators to help evaluate the extent of these risks.

Additionally, the Council will continue to work with the asset management industry and other components of the financial services industry to promote information sharing, best practices, and efforts to improve planning, response, and recovery from cyber incidents.

Securities Lending Risk

Without comprehensive information on securities lending activities across the financial system, regulators cannot fully assess the severity of potential risks to financial stability in this area. Current estimates of the total size of the securities lending market differ widely, and greater transparency is needed. Therefore, the Council encourages enhanced and regular data collection and reporting, as well as interagency data sharing, regarding securities lending activities.

The Council welcomes the efforts of the OFR, Federal Reserve System, and SEC on their recently completed joint securities lending data collection pilot, which surveyed major securities lending agents to collect data covering a wide array of lenders and borrowers. This data collection is critical to better understand securities lending activities across different types of institutions. The Council encourages efforts to propose and adopt a rule for a permanent collection. Data collection efforts should be expanded to include a greater number of market participants. In addition, regulators should continue to monitor cash collateral reinvestment vehicles

and explore ways to gather information on reinvestment practices occurring outside of the regulatory perimeter. The Council encourages relevant agencies to report back to the Council on their assessment of potential risks arising from securities lending activities based on these enhanced data gathering initiatives.

With regard to other data enhancements, the SEC issued a proposed rule in May 2015 to require funds to report monthly on their securities lending activities, including certain counterparty information and position-level information on Form N-PORT. The Council welcomes proposals by the SEC to collect more detailed information on the characteristics of securities lending activities undertaken by registered funds, including data on principal, collateral, counterparties, reinvestment practices, and indemnification agreements.

Finally, the extent to which particular market participants operate across national boundaries is not clear from available data, so it is difficult for regulators to determine how stresses in a foreign jurisdiction may affect securities lending activities in the United States. As current estimates suggest that half of global securities lending activities take place outside of the United States, the Council encourages member agencies to work with key foreign counterparts on enhanced data collection across jurisdictions.

Resolvability and Transition Planning

Resolvability and transition challenges could exacerbate the risks arising from the stress or failure of an asset manager or investment vehicle. In the case of a disorderly liquidation or abrupt failure of an investment vehicle, resolution challenges could amplify the transmission of risks related to liquidity and redemption or leverage. The Council's analysis considered how advance planning by asset managers for certain stress scenarios could mitigate such challenges. SEC staff is working to develop a proposed rule for SEC consideration to require registered investment advisers to create and maintain transition plans that address, among other things, a major disruption in their business. The Council welcomes the SEC's efforts in this area and will monitor the effects of any regulatory changes and their implications for financial stability.

3.3 Capital, Liquidity, and Resolution

Depository institutions across the system have taken meaningful steps to strengthen financial stability by increasing capital levels and liquidity buffers. Meanwhile, regulatory agencies continue to develop and implement rulemakings to further enhance the resilience of these institutions. For instance, in October 2015, the Federal Reserve issued a proposed rule requiring U.S. G-SIBs and large FBOs operating in the United States to maintain a minimum level of total loss-absorbing capacity and long-term debt that could be used to recapitalize these firms' critical operations as part of the resolution process for the firm. The proposal would also require these entities to maintain holding company structures that improve their resolvability. These developments would further operationalize the orderly resolution of a large, complex financial institution, and the Council recommends that the Federal Reserve continue to work toward finalizing these important rules. The Council recommends continued vigilance by regulators to ensure there is enough capital and liquidity at the largest financial institutions to reduce the vulnerability of these firms to economic and financial shocks.

The FDIC and the Federal Reserve completed their review of the 2015 resolution plans of eight of the largest, most complex U.S. BHCs. The agencies jointly determined that five of the firms had submitted plans that were not credible or would not facilitate an orderly resolution under bankruptcy and have notified these firms of the deficiencies in their plans. The agencies continue to review and provide feedback to all resolution plan filers, including large BHCs and designated nonbank financial companies, regarding their resolution plans. The agencies have also taken steps to streamline the information requirements of the plans of smaller, less complex firms so as to reduce the burden of resolution planning for these firms. The Council

recommends that the agencies closely review the plans and take appropriate action, as set forth in the Dodd-Frank Act, to promote resolvability under the U.S. Bankruptcy Code.

In November 2015, ISDA launched its 2015 Universal Resolution Stay Protocol, which expanded the ISDA 2014 Resolution Stay Protocol to cover securities financing transactions. Interested parties (most G-SIBs) can submit a request to become an adhering party of the Protocol, and all eight U.S. G-SIBs have adhered. The 2015 Protocol requires the adhering parties to follow special resolution regimes, which aim to ensure that cross-border derivatives and securities financing transactions are subject to stays on cross-default and early termination rights in the event a counterparty enters into resolution. Subjecting the contracts to these stays enhances the ability of firms or regulators to facilitate an orderly resolution in the event of a firm's failure. The Council recommends that the appropriate member agencies take steps to provide for resolution stay requirements consistent with the Protocol and to encourage a more widespread adoption of contractual amendments for other financial contracts consistent with resolution stay requirements. The Council also recommends that regulators and market participants continue to work together to facilitate industry-developed mechanisms to address similar risks among other financial market participants and in other financial contracts governed by standardized market documentation.

3.4 Central Counterparties

As noted in last year's annual report, CCPs serve important risk-mitigating functions and are key to the effective functioning of a number of markets. The financial stability benefits provided by central clearing are only achievable if CCPs are highly resilient to potential stress. Regulators have made progress in promoting robust risk management and greater transparency, including at systemically important CCPs.

The Council recommends that the Federal Reserve, CFTC, and SEC continue to coordinate in the supervision of all CCPs that are designated as systemically important financial market utilities (FMUs). Member agencies should continue to evaluate whether existing rules and standards for CCPs and their clearing members are sufficiently robust to mitigate potential threats to financial stability, in consultation with each other and the Council's FMU Committee as well as other relevant forums. Member agencies should also continue working with international standard setting bodies to identify and address areas of common concern as additional derivatives clearing requirements are implemented in other jurisdictions. Further, agencies should finalize any outstanding rules regarding CCP risk management standards under their jurisdiction.

In addition, the Council encourages agencies to continue to study the interconnections between CCPs and their clearing members to develop a greater understanding of the potential risks posed by these interconnections. This work should include enhancing the resilience of the clearing system and examining whether current disclosure standards provide market participants with sufficient information to assess their exposures to CCPs. The Council also encourages private sector stakeholders to sponsor and organize a series of CCP tabletop exercises across public and private sector stakeholders that would simulate a stress scenario in an informal setting. Such exercises could improve CCPs' coordination and identify potential operational improvements in the case of a default by one or more clearing members across multiple systemically important CCPs.

While regulators have made progress on CCP resolution planning, the Council encourages regulators to continue working collaboratively to further develop resolution plans for systemically important CCPs that are designed to ensure the continuity of critical services.

3.5 Reforms of Wholesale Funding Markets

Repo Markets

Counterparty risk exposure has been significantly reduced in the tri-party repo market; however, more work is needed to bring the settlement of GCF repo transactions in line with post-crisis reforms. The Council recommends continued monitoring as the CCP responsible for settling interbank GCF repo transactions suspends such transactions in July 2016, as well as sustained efforts by regulators and market participants to reduce intraday credit usage in the interbank GCF repo settlement process.

Further, the potential for fire sales of collateral by creditors of a defaulted broker-dealer remains an important risk. The Council recommends continued monitoring of market developments and recent reforms to determine whether this risk is reasonably mitigated.

Lastly, data is needed to assist policymakers' understanding of how the aggregate repo market operates, the interdependencies of institutions and participants, and changes in risk characteristics, such as collateral and haircuts. Though policymakers have improved visibility into the tri-party repo market, much less is known about the bilateral repo market's size, composition, concentration, pricing, or risk profile. The Council recommends expanding and making permanent the voluntary pilot programs initiated by the OFR, Federal Reserve System, and SEC to improve transparency and risk monitoring in this market.

Money Market Mutual Funds and Other Cash Management Vehicles

In recent years, the SEC adopted structural reforms of MMFs that are intended to make these vehicles less susceptible to potentially destabilizing runs. These measures will be fully implemented later this year, and the Council will continue to monitor and evaluate their effectiveness and broader implications for financial stability, including any unintended consequences. In late 2015 and early 2016, the Council noted measurable shifts between different MMF types in anticipation of the implementation deadline.

In addition, the Council recommends that regulators continue to assess the risks that may be posed by other types of cash management vehicles—such as short-term investment funds (STIFs), local government investment pools, pools for reinvestment of cash collateral from securities lending, and private liquidity funds—and whether regulatory gaps exist for these vehicles. In 2012, the OCC adopted rules that enhanced the reporting of data on STIFs operated by banks under its jurisdiction. The Council recommends that regulators consider what additional data on other types of cash management vehicles is needed and take steps to address any identified data gaps.

3.6 Reforms Relating to Reference Rates

In prior annual reports, the Council has recognized the importance of well-governed financial benchmarks that are anchored in observable transactions and resilient against attempted manipulation. Recent progress towards this goal has been made, but because of the scarcity of transactions in wholesale unsecured funding markets, structural weaknesses in the widely used interbank offered rates remain. These weaknesses, combined with the sustained reliance upon LIBOR in particular, necessitate further action by regulators and market participants.

To address these structural weaknesses, the Council recommends that the Alternative Reference Rates Committee (ARRC) and other market participants continue to work to identify alternative, near risk-free rates. The Council further recommends that the ARRC develop a credible implementation plan to achieve a smooth transition to these new reference rates. Such a plan should include well-defined targets and, when possible, detailed timelines in order to provide greater certainty to market participants. These steps will in turn minimize the market confidence issues that may arise during the transition, encourage market participants to abide by the proposed terms of the transition, and discourage market participants from divesting contracts tied to old benchmarks in a disorderly manner.

3.7 Data Quality, Collection, and Sharing

Addressing data needs for the analysis of potential threats to financial stability remains an important priority of the Council, as mentioned in prior reports. The Council recommends that regulators and market participants continue to work together to improve the coverage, quality, and accessibility of financial data, as well as data sharing between relevant agencies. Data sharing improvements may include developing stronger data sharing agreements, collecting common data using standard methodologies, developing and linking together data inventories, and promoting standard criteria, protocols, and appropriately strong security controls to streamline secure sharing of datasets.

Securities Financing Data

Following on the recent pilot data collections of securities financing transactions, the Council recommends that the appropriate member agencies continue to develop a permanent data collection program and to design the collection and its implementation in a manner that facilitates secure sharing and integration of the data with that of other member agencies, in particular with similar data such as that gathered by the tri-party repo collection discussed in [Section 5.4.1](#). This task includes making appropriately aggregated statistics available to the public and contributing to data aggregation and data sharing efforts under the auspices of the Financial Stability Board (FSB) and the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions (CPMI-IOSCO) to gain better understanding of cross-border flows of securities financing transactions by multi-national financial institutions.

Legal Entity Identifier

Broader adoption of the legal entity identifier (LEI) by financial market participants continues to be a Council priority. When the global LEI system begins collecting and publishing information on entity hierarchy data, it will be critical that all legal entities within a complex financial institution have an LEI so that a complete picture of these ownership structures can be viewed by authorities and the public. To facilitate this broad coverage of the LEI, the Council recommends that member agencies continue moving to adopt the use of the LEI in regulatory reporting and other data collections, where appropriate.

Mortgage Data Standards

The Council recommends that member agencies update their regulatory mortgage data collections to include universal loan identifier (ULI) and LEI fields, so these fields are paired with loan records throughout a loan's lifecycle. The Council also recommends that member agencies support the adoption and use of standards in mortgage data, including consistent terms, definitions, and data quality controls, so transfers of loans or their servicing rights create no disruptions to borrowers or investors.

Derivatives Data

Following the ongoing work by the CFTC, with collaboration from the OFR, to harmonize derivatives data reporting, the Council recommends that members and member agencies continue to work on global derivatives data reporting harmonization. Further, given the Congressional repeal of the Dodd-Frank Title VII swap data repository (SDR) indemnification requirement in December 2015, the Council recommends member agencies and the OFR collaborate to identify areas that would benefit from direct access to such granular data collected by the CFTC- and SEC-registered SDRs. These include cross-market monitoring of threats to financial stability, expediting harmonization of derivatives data, promoting best practices for global data aggregation and sharing, and assisting prudential regulation of swap-related activities, as well as monitoring of capital requirements.

Insurance Data

The Council recommends that state regulators and the National Association of Insurance Commissioners (NAIC) continue their ongoing work that improves the transparency of captive reinsurance transactions, including by making publicly available additional financial statement information of captive reinsurers. FIO should continue to monitor and report on issues involved with the regulatory treatment of captive reinsurance.

Pension Data

The Council supports efforts to improve the quality and timeliness of pension data and reporting. The Council recommends that pension regulators continue to work to improve the timeliness and the quality and depth of disclosure of pension financial statements, and will continue to monitor financial developments in pensions.

3.8 Housing Finance Reform

The domestic housing market continued to improve over the past year as sales of new and existing homes increased, prices rose, and the share of properties with negative equity fell. Meanwhile, post-crisis regulatory reforms to the housing finance system within the framework of existing legislation have largely been implemented. Fannie Mae and Freddie Mac (the GSEs) have reduced their retained portfolios more than 50 percent below their levels at year-end 2008 and are now engaging in credit risk transfers on 90 percent of their typical 30-year fixed-rate mortgage acquisitions. Federal regulators have completed rules that more clearly define risk retention requirements for mortgage securitizations, and the representations and warranties framework that governs lender repurchases of defective loans has been refined. The Council recommends that regulators and market participants continue to take steps to encourage private capital to play a larger role in the housing finance system.

FHFA and the GSEs have also made progress on the development of a new housing finance infrastructure, including the Common Securitization Platform (CSP) and a single agency mortgage-backed security. The Council recommends that efforts to advance both the CSP and single security continue.

Notwithstanding the above progress, the GSEs are now into their eighth year of conservatorship. The Council acknowledges that, under existing regulatory authorities, federal and state regulators are approaching the limits of their ability to enact reforms that foster a vibrant, resilient housing finance system. The Council therefore reaffirms its view that housing finance reform legislation is needed to create a more sustainable system.

3.9 Risk Management in an Environment of Low Interest Rates and Rising Asset Price Volatility

Domestic and foreign interest rates remained quite low by historical standards over the last year. The Council has long been attentive to the risk that the ongoing low-interest-rate environment may lead some market participants to take on risk to gain higher net yields by relying more heavily on short-term financing, increasing leverage, or shifting toward assets that are less liquid or contain greater market or credit risk. Such behavior can contribute to excessive asset valuations, which can leave investors susceptible to rapid, unexpected price declines. The Council recommends that supervisors, regulators, and firm management continue to closely monitor and assess the heightened risks resulting from continued reach-for-yield behavior.

Loan growth and underwriting standards in commercial real estate (CRE) have been a point of focus for prudential regulators. In December 2015, the Federal Reserve, the FDIC, and the OCC jointly issued a statement reminding financial institutions of existing regulatory guidance on prudent risk management practices for CRE lending. The agencies have observed substantial growth in many CRE asset and lending markets, increased competitive pressures, rising CRE concentrations in banks, and an easing of CRE underwriting standards. The statement affirms that financial institutions should maintain underwriting discipline and exercise prudent risk-management practices to identify, measure, monitor, and manage the risks arising from CRE lending.

Continuing a trend that began in late 2014, energy prices fell and volatility moved sharply upward in 2015. 2015 also saw falling valuations in high-yield corporate debt markets and significant swings in equity valuations. Rising price volatility and stressed asset valuations can pose challenges for those market participants that are highly leveraged or hold concentrated or inadequately hedged exposures to affected market segments. In this environment, it is important that firms maintain robust risk management standards. The Council recommends that supervisors, regulators, and firm management continue to closely monitor and assess financial institutions' exposures to asset classes experiencing increased volatility, particularly where there are indications that prior reach-for-yield behavior may have contributed to valuation pressure.

Regulators should be attentive to the potential for a substantial increase in asset market volatility to contribute to destabilizing feedback effects such as asset fire sales or adverse liquidity or leverage spirals. To lessen the risk of such phenomena, financial regulators should continue working to ensure that financial institutions maintain robust risk management standards at all points in the credit, business, and interest rate cycles.

3.10 Changes in Financial Market Structure and Implications for Financial Stability

Markets have continued to function well over the past year, despite a notable rise in volatility. Traditional intermediaries are better capitalized and better positioned to withstand periods of stress than they were prior to the crisis. With the growing importance in certain markets of proprietary trading firms and other market participants that make use of automated trading systems, access to those markets has increased and costs for investors and issuers have generally fallen. However, there may be some new risks that are materializing, particularly within fixed income markets, with possible impacts to market functioning and financial stability.

This past year, the Treasury, Federal Reserve, FRBNY, CFTC, and SEC issued a joint staff report to assess the period of intraday volatility in the Treasury market on October 15, 2014. This study examined trading patterns on that day and highlighted the importance of firms that use automated trading systems to transact in Treasury securities and related instruments. It also raised important questions about differing forms of regulatory oversight, market transparency, and the possible need for increased trade reporting and monitoring by the official sector. On January 22, 2016, the Treasury released a Request for Information (RFI) asking market participants for their views about the evolving structure of the Treasury market and the implications for market functioning, liquidity provisioning, and risk management practices. In addition, the RFI calls for more data reporting for the official sector to facilitate enhanced current analysis and event monitoring. The Council supports these efforts and encourages expanding this examination beyond Treasury securities to the entire interest rate products complex. The Council should take up such an examination across interest rate products and venues to examine regulatory treatment of products that have highly correlated underlying risk drivers, and, where appropriate, consider steps to harmonize regulatory treatment.

The Council supports primary regulators in efforts to create greater transparency and resilience of all market participants. The Council supports increased member agency coordination of oversight and regulatory developments pertinent to financial stability risks as markets evolve. In particular, the Council supports exploring the use of coordinated tools such as trading halts, with careful consideration of tradeoffs that such tools may present, across heavily interdependent markets during periods of market stress, operational failure, or other incidents that may pose a threat to financial stability. The Council also recommends enhanced data and information sharing among member agencies to create timely, accurate, and responsive monitoring tools.

3.11 Financial Innovation and Migration of Activities

Continued innovation is critical to the long-term health of the U.S. financial system. It is the means by which market participants respond to changing marketplace demands, make use of new technology, and adapt to evolving regulatory constraints. New financial products, delivery mechanisms, and business practices offer opportunities to lower transaction costs and improve efficiency, but they may also embed risks, such as credit risk associated with the use of new and untested underwriting models. In other instances, risks embedded in new products and practices may be difficult to foresee. Accordingly, the Council encourages financial regulators to continue to monitor and evaluate the implications of how new products and practices affect regulated entities and financial markets, and to assess whether they could pose risks to financial stability. In addition, the Council recommends that policies to protect consumers should be reviewed on an ongoing basis to assess the appropriate treatment of new products.

4

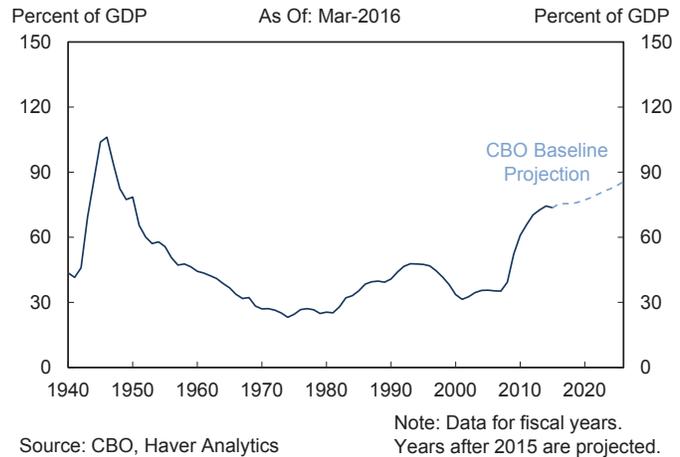
Financial Developments

4.1 U.S. Treasuries

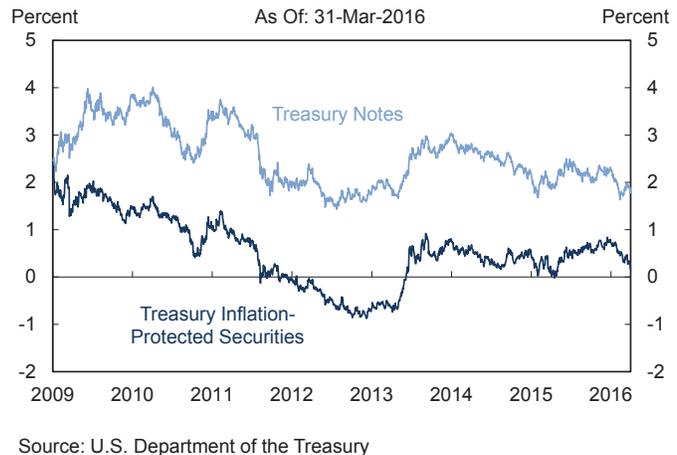
Publicly held U.S. sovereign debt outstanding grew to \$13.9 trillion as of March 2016. Public debt outstanding as a share of gross domestic product (GDP) fell 0.8 percentage point to 73.6 percent over the fiscal year. The Congressional Budget Office (CBO) baseline projects publicly held debt to remain below 76 percent of GDP through 2018 before rising to 85.6 percent of GDP by 2026 (**Chart 4.1.1**). Meanwhile, the average maturity of outstanding marketable debt continued to edge higher in 2015, reaching 69 months by year-end.

By mid-2015, 10-year Treasury note yields had risen well above the 18-month low of 1.68 percent touched in the first quarter, in part due to the improving economy and the anticipation of rising U.S. interest rates (**Chart 4.1.2**). Now, although the Federal Open Market Committee (FOMC) raised the federal funds rate above its long-held target range of 0 to 0.25 percent in December 2015, the 10-year Treasury note yield has fallen to 1.78 percent as of March 2016. This move has been driven largely by concerns about a weaker global economy, as well as global disinflation pressures due to the falling price of oil and other commodities linked to a slowdown in growth in China and other emerging market economies (EMEs). Despite the decline in Treasury yields, swap spreads have fallen rapidly over the past six months (**see Box A**). Meanwhile, over the last twelve months, the real yield on 10-year Treasury Inflation-Protected Securities (TIPS) has fallen 2 basis points to 0.16 percent. As a result, break-even inflation compensation, the difference between nominal and TIPS yields, has fallen over this period. Consistent with this, forward inflation measures based on swaps are near all-time lows.

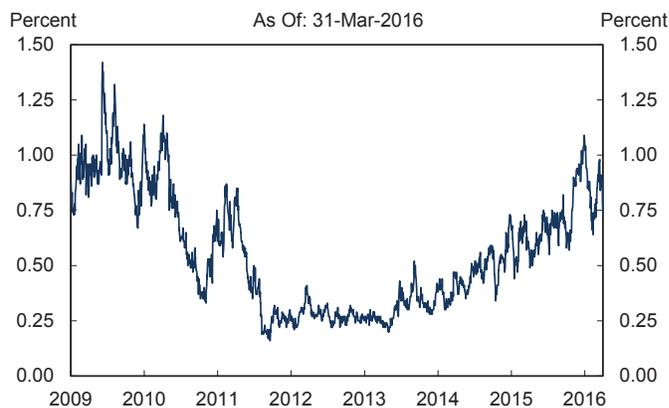
4.1.1 Federal Debt Held by the Public



4.1.2 10-Year Treasury Yields



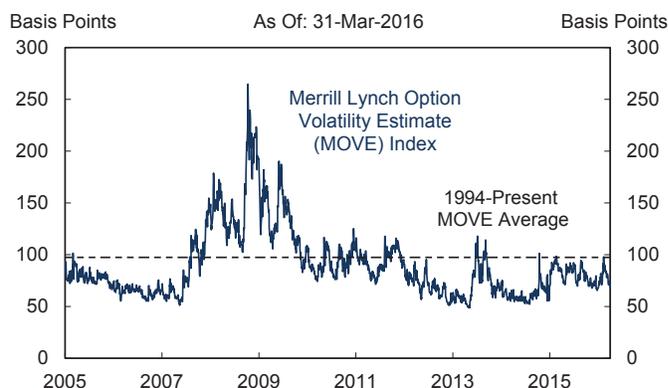
4.1.3 2-Year Treasury Yields



Source: U.S. Department of the Treasury

Yields on 2-year Treasury notes rose significantly over the course of 2015, as market participants anticipated the normalization of monetary policy (**Chart 4.1.3**). However, beginning in 2016, 2-year Treasury yields fell rapidly as expectations for the pace of interest rate increases slowed, and at the end of the first quarter of 2016 stand at 0.73 percent, 17 basis points above their levels from a year earlier. In this environment, implied fixed income volatility, as measured by prices of options on U.S. Treasuries, was near its long-term average for most of 2015 (**Chart 4.1.4**). This range is significantly elevated as compared to the lows of the previous few years.

4.1.4 Fixed Income Implied Volatility



Source: Bloomberg, L.P.

Note: Implied volatility is calculated using a yield curve-weighted index of the normalized implied volatility on 1-month Treasury options.

The major credit rating agencies kept their ratings and outlook on U.S. sovereign debt unchanged over the past year.

Box A: The Increasing Prevalence of Negative Swap Spreads

Swap rates represent the fixed interest rate paid on a standard fixed-for-floating interest rate swap. These rates are frequently used as benchmarks against which many types of asset-backed securities (ABS) and derivatives contracts are priced. Similarly, swap spreads are calculated as the difference between a swap rate and the yield on a Treasury security with the same maturity. Historically, swap spreads have been positive—that is, swap rates are typically higher than the corresponding Treasury yields. More recently, however, this relationship has begun to invert.

A.1 Selected Swap Spreads



Source: Bloomberg, L.P.

30-year swap spreads, which averaged nearly 60 basis points from 2000 through 2007, first crossed below 0 basis points in late 2008, and have remained negative for the vast majority of trading days since that point. Beginning in mid-2015, swap spreads across maturities tightened sharply (**Chart A.1**). These declines drove many swap spreads—which were already well below pre-crisis levels—into negative territory. The historical relationship between swap rates and Treasury yields first inverted in 7-year and 10-year maturities in September 2015, and by the end of the year, maturities as short as three years had displayed negative readings. As of March 2016, swap

spreads across maturities are at or near all-time lows, and remain negative from the 5-year tenor onward.

Many factors—both temporary and structural—may be contributing to the inversion of swap rates and Treasury yields, including:

- **Increased corporate bond issuance:**

Investment grade corporate bond issuance has surged to record highs in recent years, spurred on by low interest rates and strong appetite for mergers and acquisitions (M&A). Many corporate bonds are issued at fixed rates, after which the issuers often enter into pay-floating, receive-fixed swaps. The increased demand for these contracts pushes swap rates downward, lowering swap spreads.

- **Foreign official sector sales of Treasury securities:**

After peaking in August 2015 at \$4.18 trillion, foreign official sector holdings of Treasury securities have fallen by nearly \$100 billion. These sales of Treasury securities may have occurred for a number of reasons, including intervention in foreign exchange (FX) markets by foreign official sector bodies. Such activity places upward pressure on Treasury yields, thereby tightening the spread between swaps and Treasuries.

- **Increased repo financing costs:**

The cost of borrowing Treasury securities in a repo transaction has increased during the post-crisis period. Reasons for this may include increased holdings by central banks and investment funds that have contributed to a relative scarcity of Treasury security collateral, and incentives—both market-based and regulatory—for broker-dealers to reduce reliance on short-term wholesale funding. Transactions in which market participants seek to arbitrage negative swap spreads by borrowing Treasury securities (via repo) while simultaneously entering into a pay-fixed, receive-floating swap have thus become more expensive. This may have

limited the operation of one potential avenue for market forces to push swap spreads higher.

- **Increased attractiveness of swaps for duration positioning:** When market participants seek to adjust the duration, or interest rate sensitivity, of their portfolios, they have a variety of methods by which to do so. Their choice likely reflects a number of factors, including the cost and effectiveness of differing instruments. Many market participants may find entering into swaps to be increasingly attractive relative to maintaining positions in Treasury securities. This could be due to increased clearing of swaps, which reduces counterparty risks. This could also reflect the increasing relative scarcity of Treasury security collateral or other dynamics that may create difficulties in executing trades to acquire Treasury securities. Greater demand for swaps or weaker demand for Treasury securities (or both) would then drive swap spreads downward.
- **Trading dynamics on reporting dates:** Certain market participants, particularly those owned by FBOs, may seek to adjust their balance sheets ahead of regulatory reporting dates by divesting capital-intensive positions. One example is the sale of bonds that are held on-balance sheet, while simultaneously entering into a pay-floating, receive-fixed swap to replicate the coupon payments that would have been realized by holding the bond. This practice would decrease swap rates; if the bonds sold are Treasury securities, this would also increase Treasury yields. Both forces serve to move swap spreads lower.

The decrease in swap spreads does not itself necessarily present concerns regarding domestic financial stability, but may portend important changes in market structure or the allocation of capital. It may also present potential challenges to certain market participants. Many securities and derivatives contracts entail payments tied to swap rates; a rapid decline in these rates could cause large and unexpected changes in the value of these instruments. Prolonged negative spreads could also lead to liquidity concerns in a downturn if institutions replace transactions with traditional liquidity providers with greater reliance on the swaps market. Certain measures used for risk management and asset valuation are also based on credit, volatility, or other risk premia relative to swap rates or Treasury yields. As such, negative swap spreads may affect the incentives and behavior of a wide variety of financial institutions—potentially leading to breakdowns in other historically stable relationships or patterns.

4.2 Sovereign Debt Markets

4.2.1 Developed Economies

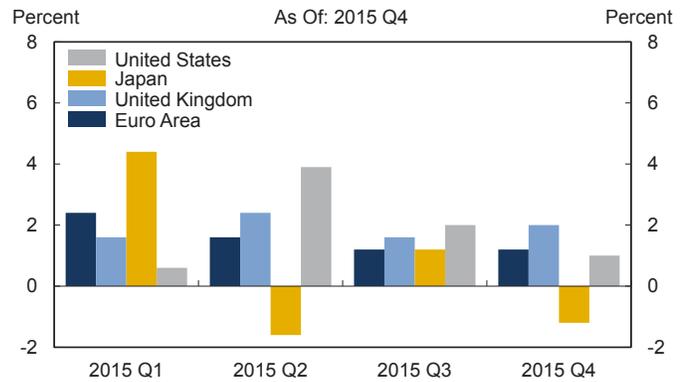
The United States and the United Kingdom both experienced moderate growth over 2015, at 2.4 percent and 2.3 percent respectively (**Chart 4.2.1**). The euro area grew 1.6 percent, somewhat faster than in 2014, partly reflecting a pickup in consumption. Flat wage growth and under-investment by firms, which has led to weak private consumption, continued to weigh on Japan's economy in 2015, with the economy expanding by just 0.5 percent. Both Canada and Australia faced significant headwinds from lower commodity prices, which weakened growth in 2015. The International Monetary Fund (IMF) projects that growth in advanced economies will continue to strengthen modestly in 2016, led by a sustained euro area recovery and a relatively robust U.S. economy (**Chart 4.2.2**).

In 2015, monetary policy remained the primary policy tool used to respond to weak growth and inflation. In contrast to recent U.S. actions, several advanced economies continued to loosen policy through lowering policy rates and expanding asset purchases. To combat disinflationary risks and low growth, the Bank of Japan (BoJ) and the European Central Bank (ECB) have joined other central banks by lowering nominal interest rates into negative territory in an attempt to stimulate private sector demand and encourage investment.

Euro Area

Euro area growth accelerated modestly in 2015 to 1.6 percent, sustaining the sluggish recovery which began in 2013 and bringing the level of real GDP close to its pre-crisis peak. Increased private consumption supported by lower energy prices drove 2015 growth, but investment remained weak. Although net exports boosted growth substantially in previous years, it contributed considerably less in 2015 as the slowdown in emerging markets took hold. Growth remains uneven; it was particularly strong in Spain (3.2 percent), moderate in Germany (1.5 percent), but slower in Italy and France (0.8 and 1.1 percent, respectively)

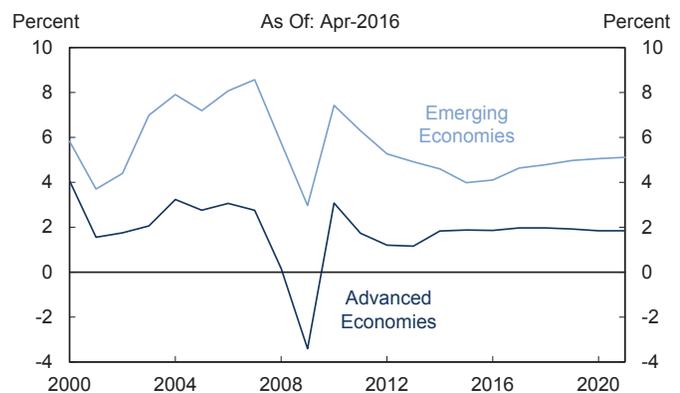
4.2.1 Advanced Economies Real GDP Growth



Source: Eurostat, CAO, BEA, Haver Analytics

Note: Data represents seasonally adjusted quarter-over-quarter annualized real GDP growth rates.

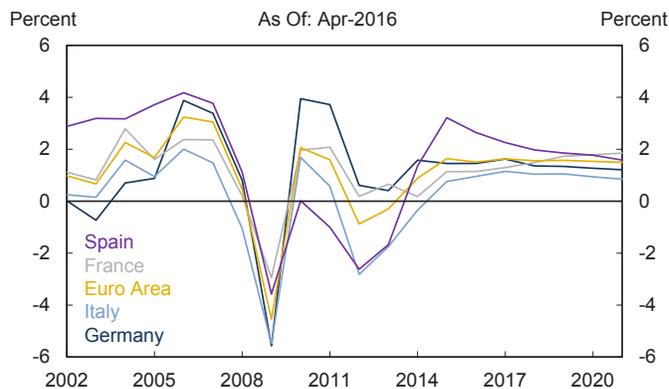
4.2.2 Real GDP Growth



Source: IMF, Haver Analytics

Note: Year-over-year percent change. Data after 2015 are projected.

4.2.3 Euro Area Real GDP Growth

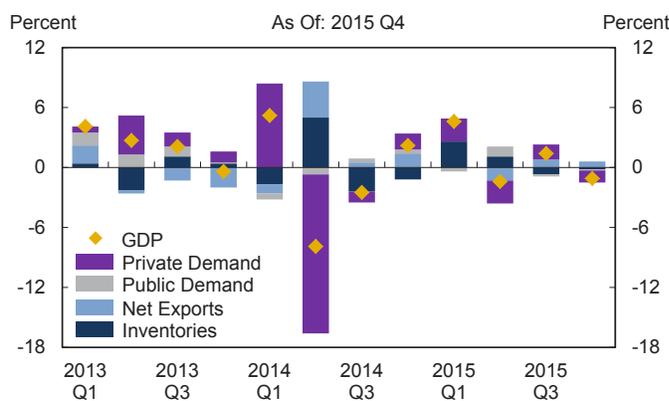


Source: IMF, Haver Analytics

Note: Year-over-year percent change. Data after 2015 are projected.

(Chart 4.2.3). To confront low inflation and prolonged economic slack, during its most recent March 2016 meeting, the ECB reduced its deposit rate further into negative territory, dropped its benchmark interest rate to zero, and expanded the size of its quantitative easing program to €80 billion per month and the scope to include investment grade corporate and municipal securities in addition to sovereign bonds. European governments also made progress toward establishing a Banking Union, designed to improve the resilience of the European financial sector (see Box B). New targeted long-term refinancing operations were also introduced in March in a bid to boost bank lending to the real economy and stoke inflation.

4.2.4 Contributions to Japanese GDP Growth



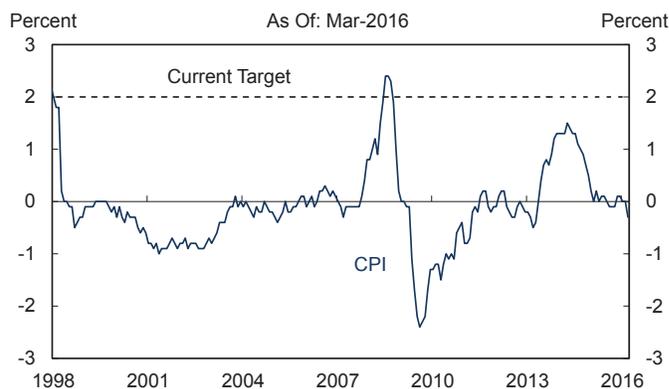
Source: Cabinet Office of Japan, Haver Analytics

Note: Data represents seasonally adjusted quarter-over-quarter annualized real GDP growth rates.

Japan

After contracting by 0.1 percent in 2014, Japan's economy continued to face significant headwinds in 2015, growing by just 0.5 percent. Growth momentum in 2015 was uneven, as GDP growth seesawed from quarter to quarter on sizable swings in the contributions of inventories and private demand (Chart 4.2.4). Private consumption showed signs of a tentative recovery in early 2015, buoyed by incremental wage growth, but the recovery in consumption failed to gain traction, dragging on growth for much of the year. While Japanese authorities expect wage increases and modest export recovery to support growth in real incomes and economic activity in 2016, an unwinding of the inventory buildup in 2015 and continued slowdown in China present downside risks. Core inflation (excluding fresh food, but including energy prices) slipped into negative territory in August 2015 for the first time since April 2013, after hovering at or just above 0 percent throughout the first half of the year (Chart 4.2.5). While core inflation turned positive again in November, it lost momentum in January 2016, and the slowdown in goods price inflation is likely to weigh on core inflation in the near term. In response to global market volatility and attendant effects on business confidence and the inflation outlook, the BoJ surprised markets in January 2016 by adopting negative interest rates on excess reserves, but

4.2.5 Japanese Consumer Price Inflation



Source: Bank of Japan, Haver Analytics

Note: Data represents year-over-year percent change. CPI is adjusted for the consumption tax increase that took effect in April 2014.

has thus far refrained from expanding its asset purchase program. While the negative interest rate policy applies to a relatively small fraction of the excess reserves currently held at the BoJ, this fraction is expected to gradually increase over time.

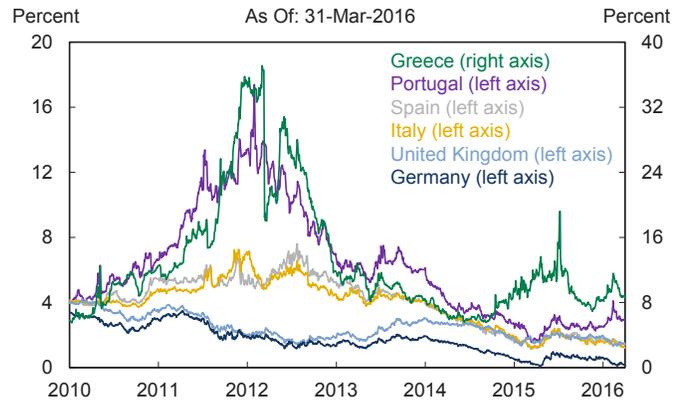
Developed Economy Sovereign Debt

Developed markets' sovereign debt yields are also at or near their 12-month lows. After a sharp rebound in mid-2015, German and other core euro area debt yields resumed their decline and are now close to the record lows of last year, with German 10-year government bonds yielding 0.15 percent (**Chart 4.2.6**). In the United Kingdom, 10-year sovereign yields are also nearing the lows recorded in early 2015, and currently stand at 1.42 percent. Many core European bonds maturing in seven or fewer years continue to trade at negative yields.

Italy and Spain continue to trade in a relatively close range to Germany, with 10-year debt trading between 90 and 170 basis points wide of German Bunds over the past year. Political risks are rising in other peripheral countries as market participants begin to reassess new political majorities' commitment to previous fiscal targets. This is raising borrowing costs in both Portugal and Greece. Portuguese sovereign yields increased sharply relative to German yields in early 2016, with 10-year yields reaching a spread of 392 basis points before partially retracing these moves to end the first quarter. Greek debt is currently trading at near-distressed levels after recovering from the default on its official sector obligations last year, with 10-year bonds trading at a yield of 8.59 percent. Eastern European countries also generally experienced rising 10-year bond yields over the course of 2015.

In Japan, 10-year government bond yields declined 43 basis points over the 12-month period ending in March 2016, first crossing into negative territory in February and reaching -0.04 percent by the end of the quarter.

4.2.6 European 10-Year Yields



Source: Bloomberg, L.P.

Box B: Developments in the European Banking Union

In response to the banking and sovereign debt crises in the euro area, the Heads of State and Government of the EU and the European Commission proposed the creation of a Banking Union in 2012. The proposal aimed to help restore financial stability by weakening the link between banks and their sovereigns and facilitate the application of EU rules to banks within the Banking Union. With a common financial regulatory framework as its basis, the proposal included such initiatives as a single supervisory mechanism, a single resolution mechanism, and a single deposit guarantee scheme. Several of these initiatives have since been implemented; today, the union consists of euro area Member States and is open to non-euro Member States that choose to join.

Single Supervisory Mechanism and Single Resolution Mechanism

The Single Supervisory Mechanism (SSM) constituted one of the pillars of the Banking Union and took full effect in November 2014. Under the SSM, the ECB took on increased responsibility for supervising banks in the Banking Union. The ECB now supervises “significant” institutions directly and coordinates with national supervisors to help supervise institutions considered “less significant.” In addition, at any time, the ECB can decide to directly supervise any one of these latter institutions to ensure the consistent application of heightened supervisory standards. As mandated by the SSM, several key supervisory responsibilities of the ECB include ensuring the safety and soundness of banks under its authority, ensuring compliance with EU prudential rules, and setting higher capital requirements as necessary.

Related to the SSM is the Single Resolution Mechanism (SRM), an initiative designed to provide failing banks with a path toward orderly resolution while minimizing costs to the taxpayer. The SRM took full effect in January 2016 and established the Single Resolution Board (SRB), a central resolution authority. While working closely with national resolution authorities within the Banking Union, the SRB is expected to manage the resolution of significant and cross-border banking groups established within participating Member States. In coordination with the applicable supervisors, the SRB has the ability to influence capital levels by assigning a minimum requirement for own funds and eligible liabilities (MREL) on a case-by-case basis for firms under the SRB’s direct authority. In addition, national resolution authorities within the Banking Union will set MREL for firms under their purview following general instructions from the SRB.

The SRM also established the bank-funded Single Resolution Fund (SRF), which can be used to finance the resolution and potential recapitalization of banks in the Banking Union. The size of the SRF is targeted at 1 percent of covered bank deposits in Banking Union Member States, approximately €55 billion, to be built up and mutualized among banks over the next eight years.

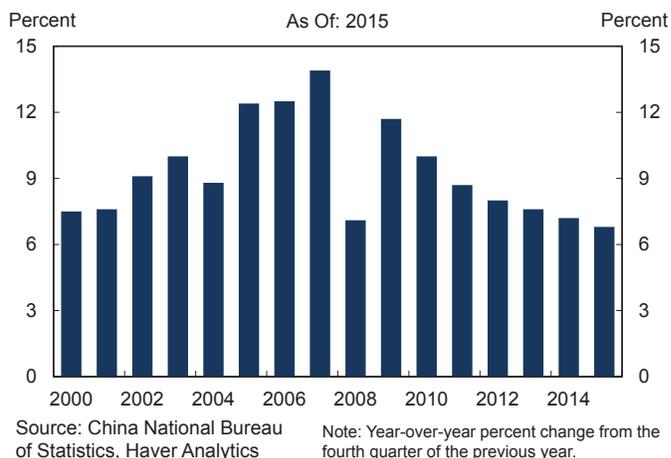
European Deposit Insurance Scheme

In November 2015, the European Commission published a legislative proposal for another major Banking Union initiative: a common deposit insurance system, referred to as the European Deposit Insurance Scheme (EDIS). Although a system of national deposit guarantee schemes and minimum standards exists in the EU currently, that system remains vulnerable to local

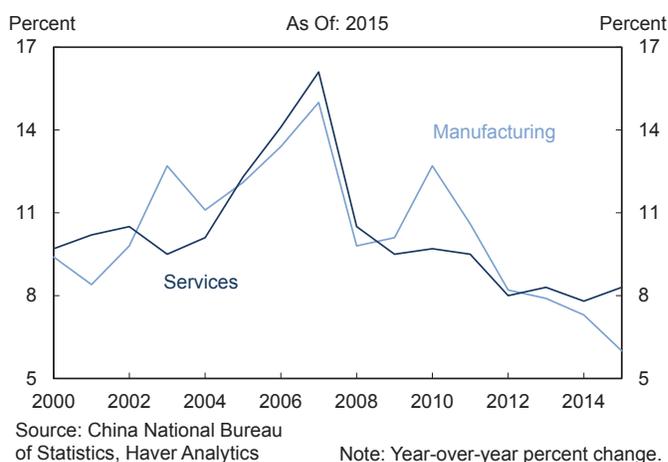
shocks, sovereign credit problems, and concerns related to the absence of an explicit lender of last resort. The EDIS proposal seeks to address these vulnerabilities and reduce the risk of contagion. Legislative approval by the European Council and European Parliament is subject to continued debate regarding the extent to which the proposal's implementation should be linked to certain risk-reducing measures, such as limiting bank exposures to individual sovereigns.

If passed, participation in EDIS will be mandatory for each deposit guarantee scheme of the Banking Union Member States. The European Commission proposes funding the related European Deposit Insurance Fund (EDIF) through contributions by banks, to reach a target of 0.8 percent of covered deposits in the Banking Union (currently close to €43 billion) by 2024, and mutualizing the deposit insurance in stages. The SRB would be modified to create a governance structure that would administer EDIF in coordination with SRF.

4.2.7 Chinese Real GDP Growth



4.2.8 Chinese Manufacturing and Services Growth



4.2.9 Chinese Equity Market (CSI 300 Index)



4.2.2 Emerging Market Economies

Growth in emerging markets and developing economies slowed for a fifth consecutive year in 2015, reaching 4.0 percent, according to the IMF. Slowing growth in China, coupled with recessions in Brazil and Russia, accounted for much of the slowdown. There has been a structural slowdown in Chinese growth, which has fallen from an average of 10.2 percent during 2000-12 to an average of 7.3 percent over the last three years. Elsewhere in Asia, growth remained relatively robust last year, though China's slowdown weighed on some economies, including Indonesia and Malaysia, through trade channels and commodity prices. Lower commodity prices constrained growth in many commodity exporting countries, particularly oil and metals exporters. Russia was hard-hit by falling oil prices and sanctions, with its economy contracting by 3.7 percent in 2015. Growth in Latin America also struggled in the face of low commodity prices and spillovers from a recession in Brazil. Brazil's economy contracted by 3.8 percent in 2015 as the fall in commodity prices, political uncertainty, and tighter fiscal, monetary, and external financing conditions, exacerbated weak economic prospects. The IMF anticipates that emerging market growth will pick up slightly in 2016 to 4.3 percent but notes that risks are tilted toward the downside.

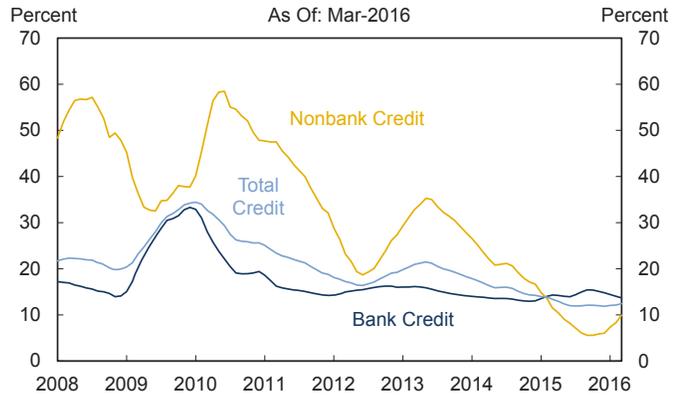
China

Chinese real GDP growth edged down to 6.9 percent in 2015, close to the authorities' target of 7.0 percent, from 7.3 percent in 2014 (**Chart 4.2.7**). Growth was supported by strong consumption growth (public and private), but was dragged down by slowing investment growth. In 2015, growth in China's industrial and services sectors diverged significantly, with services growing at 8.3 percent year-on-year, while industry grew at 6 percent (**Chart 4.2.8**). The industrial sector was affected by both weak real estate and manufacturing investment growth. The outperformance in the services sector was driven partly by strong financial services growth during the equity market volatility (**Chart 4.2.9**). Producer and consumer price inflation also diverged significantly,

amid further declines in commodity prices. Consumer price inflation stayed flat at 1.6 percent for the 12 months through December 2015, while producer price inflation fell to -5.9 percent from 2014's -3.3 percent.

In response to the global financial crisis, Chinese authorities induced a massive increase in bank lending to local governments and the property sector beginning in 2009 (Chart 4.2.10). This surge was accompanied by an even faster expansion in nontraditional forms of credit, especially trust loans (Chart 4.2.11). While nonbank credit growth has fallen significantly, from 23 percent at the end of 2013 to 9 percent at the end of 2015, overall credit growth, at 13 percent year-on-year, remains more than double nominal GDP growth. Reflecting this, overall credit to the nonfinancial sector has continued to increase, albeit at a slower pace, reaching 196 percent of GDP in June 2015 (Chart 4.2.12). Over 2015, the People's Bank of China (PBOC) cut interest rates several times to stimulate the economy. Further, the PBOC lifted the official cap on setting deposit rates, a positive step toward full financial sector liberalization, which is necessary for China's structural transition. Capital outflows out of China were also large during 2015, amid shifts in Chinese residents' and foreign investors' exchange rate expectations and increasing exchange rate volatility. Intensified outflows can be traced to August 2015, when the PBOC surprised the markets with a change in its exchange rate policy that caused the renminbi (RMB) to fall 3 percent against the U.S. dollar (USD) over two days.

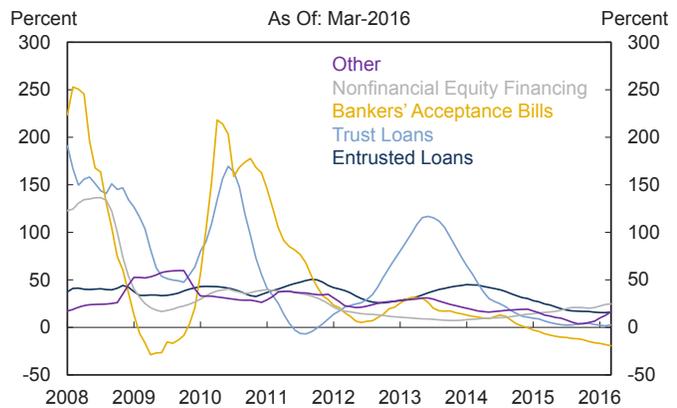
4.2.10 Chinese Credit Growth



Source: The People's Bank of China, Haver Analytics

Note: 12-month percentage change of 3-month rolling average. Total credit is defined as total social financing, a broad measure that includes some equity financing.

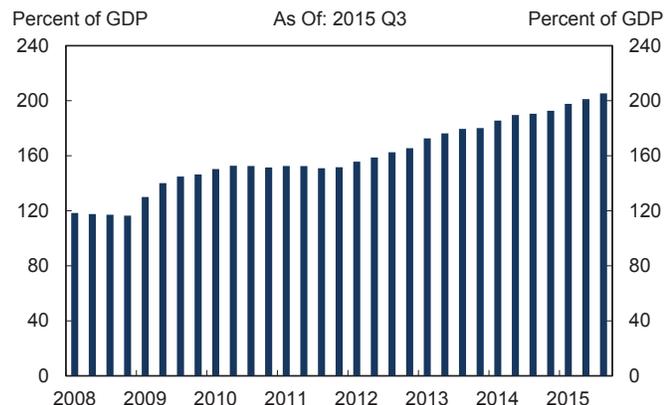
4.2.11 Components of Chinese Nonbank Credit Growth



Source: The People's Bank of China, Haver Analytics

Note: 12-month percentage change of 3-month rolling average.

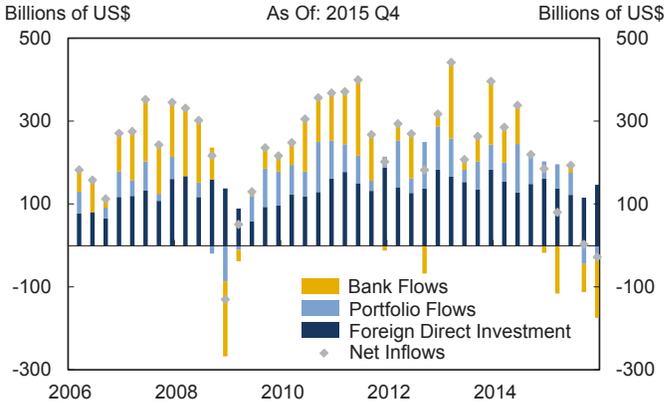
4.2.12 Credit to the Chinese Nonfinancial Private Sector



Source: China National Bureau of Statistics, BIS, Haver Analytics

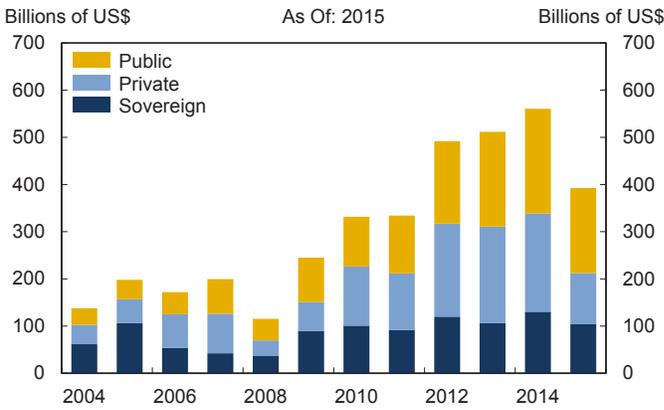
Note: Rolling 4-quarter sum of GDP.

4.2.13 Gross Capital Flows to EMEs



Source: IMF, Haver Analytics

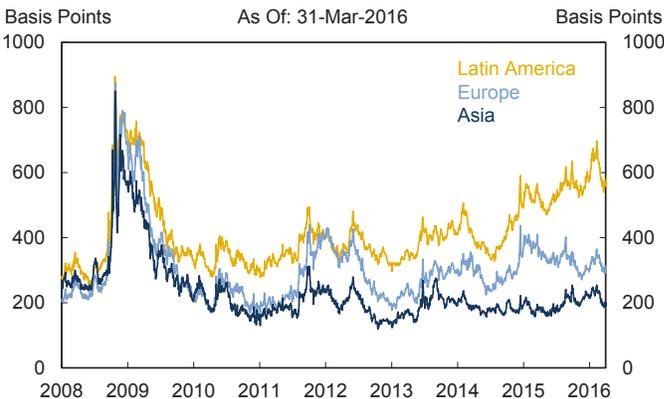
4.2.14 Emerging Market Gross Global Bond Issuance



Source: Dealogic

Note: Public includes issuance by municipal and state-owned enterprises. Bonds with a maturity of greater than 1 year.

4.2.15 Emerging Market Bond Spreads



Source: JP Morgan, Haver Analytics

Note: JP Morgan EMBI+ Sovereign Spreads indices for each region.

Emerging Market Debt

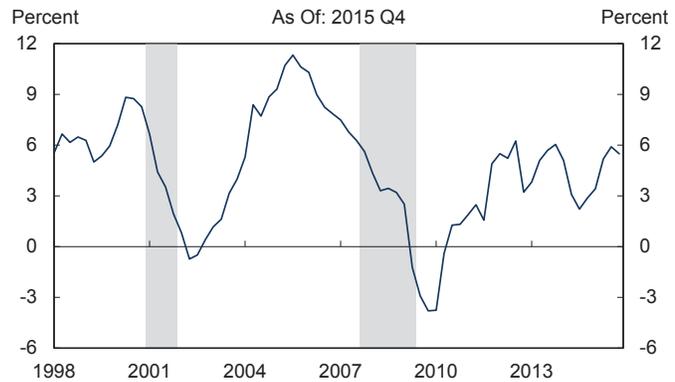
Amidst this economic slowdown, EMEs witnessed a reversal in net capital flows, which were negative in total for 2015 for the first time since 1988, and gross debt issuance was down 30 percent to \$392 billion from the record issuance in 2014 (Charts 4.2.13, 4.2.14). These negative trends have been sharpest in EMEs most closely linked to commodities, with Latin America hit the hardest on a regional basis. Brazil, in particular, has experienced economic and political stress, causing credit default swap (CDS) spreads to widen significantly (Chart 4.2.15). Venezuelan debt continues to trade at severely distressed levels, while Russian sovereign spreads have come down from early 2015 highs despite the fall in oil prices. Overall, EME debt experienced multiple rating agency downgrades, with Brazil falling below investment grade.

4.2.3 U.S. Municipal Markets

Improving fiscal conditions helped drive performance gains in the municipal bond market. Total state and local government revenues increased 5.5 percent (**Chart 4.2.16**). Overall, municipal bond ratings improved in 2015, with upgrades exceeding downgrades. Municipal analysts expect continued improvement in the state and local sectors throughout 2016 with no widespread budget or credit troubles.

While current budgets are slowly improving, many state and local governments face serious long-term fiscal imbalances in the coming decades due to unfunded public pension obligations and liabilities for healthcare benefits (**see Section 4.13.4**). Bond ratings have begun to reflect these long-term risks, with rating agencies updating methodologies to better reflect the difficult political and economic dynamics of funding public pension liabilities. The two most notable downgrades in 2015, for the State of Illinois and the City of Chicago, resulted from the growth in unfunded pension liabilities and court decisions that overturned statutes designed to reduce such liabilities.

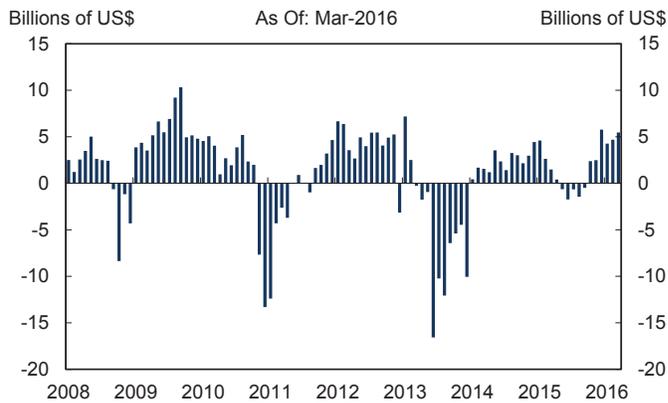
4.2.16 Change in State and Local Government Tax Revenues



Source: Census Bureau

Note: Data represents year-over-year change. Revenue measures includes revenues from property, individual income, corporate income, and sales taxes. Gray bars signify NBER recessions.

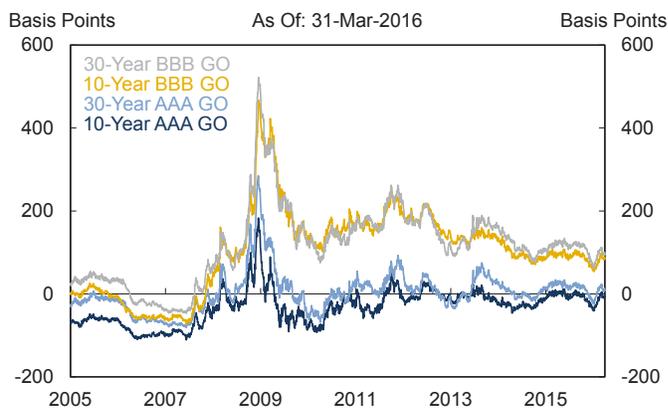
4.2.17 Long-Term Mutual Fund Flows: Municipal Bonds



Source: ICI, Haver Analytics

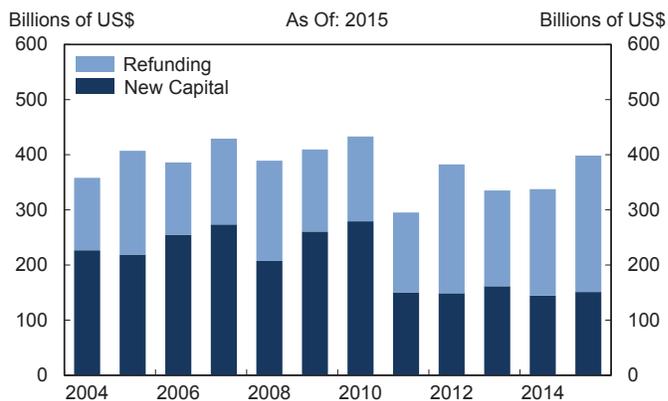
Notwithstanding these long-term issues, the municipal bond market reflected the improving forecast in current state and local budgets. Municipal bond funds experienced moderate but mostly positive inflows throughout 2015 (Chart 4.2.17), and yield spreads for tax-exempt general obligation (GO) bonds generally tightened throughout the year, reflecting steady demand (Chart 4.2.18). Total municipal bond issuance grew approximately 18 percent over 2013 and 2014 levels, with modest net positive issuance of \$20 billion for the year (Chart 4.2.19). The municipal sector had an overall investment return of approximately 3 percent, positive despite the issuance of certain negative credit ratings, such as for Chicago, and developments related to Puerto Rico's fiscal challenges (see Box C).

4.2.18 Municipal Bond Spreads



Source: Thomson Reuters MMD, Haver Analytics Note: Spreads between municipal and Treasury securities of comparable maturities.

4.2.19 Municipal Bond Issuance



Source: Thomson Reuters, SIFMA Note: Excludes maturities of 13 months or less and private placements.

Box C: Municipal Debt Markets: Challenges in Puerto Rico

Puerto Rico continues to face a challenging fiscal situation due to both high levels of debt and the lack of economic growth. Economic opportunity has dwindled in Puerto Rico for nearly a decade. The economy shrunk by 13 percent between 2006 and 2014. There are 126,000 fewer jobs now than there were in December 2007—a decline of 12.5 percent. The current unemployment rate of 11.8 percent, while lower than its peak, is still 5.2 percentage points higher than that of the highest U.S. state.

The outstanding debt of roughly \$70 billion represents more than 100 percent of Puerto Rico's gross national product. The debt is unusually complex with eighteen different issuers and twenty creditor committees with competing claims. Debt service consumes one-third of all central government revenues, more than five times the average state. In addition to its high level of outstanding public debt, the Commonwealth has \$46 billion in pension liabilities but only \$2 billion in net assets, the lowest funding level of any major pension system in the country. More than 330,000 current and future beneficiaries rely on the public pension systems as a critical source of retirement income.

In June 2015, the governor of Puerto Rico announced that Puerto Rico debts are “not payable” and “that they would probably seek significant concessions from as many as all of the island's creditors.” Since this announcement, five of the island's instrumentalities and public corporations have defaulted. In May, Puerto Rico's government enacted a debt moratorium bill allowing the government to temporarily suspend payments on certain of its debts. The Commonwealth has stated it expects to have insufficient liquidity to make large upcoming debt payments in July. Most of the government's bonds have been trading between 30 and 70 cents on the dollar, as market participants have anticipated future defaults for some time.

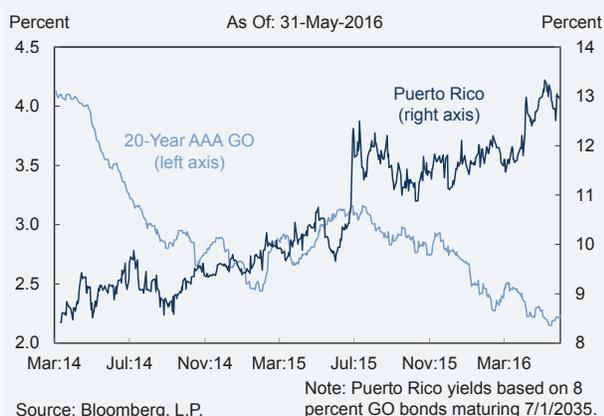
Puerto Rico's government is currently negotiating with creditors to provide debt relief to the Commonwealth.

The Commonwealth's latest proposal to creditors, released on April 11, 2016, would reduce its tax-supported debt from \$49.2 billion to \$37.4 billion and cap annual debt service payments at 15 percent of government revenues.

Under U.S. bankruptcy law, Puerto Rico lacks the ability to restructure its debts and the debts of its municipalities. Bills have been proposed in the U.S. Congress that would give Puerto Rico and its municipalities access to federal restructuring authority. Without access to a court-supervised restructuring process, creditor lawsuits would likely be disparate and disorderly, making any voluntary restructuring difficult to achieve.

Despite Puerto Rico's fiscal problems, there has been little spillover thus far to the broader municipal bond market. On average over the past year, overall inflows into municipal bond mutual funds remain positive and average municipal bond yields have fallen (**Chart C.1**).

C.1 Municipal Bond Yields



4.3.1 Debt to Assets for Nonfinancial Corporations

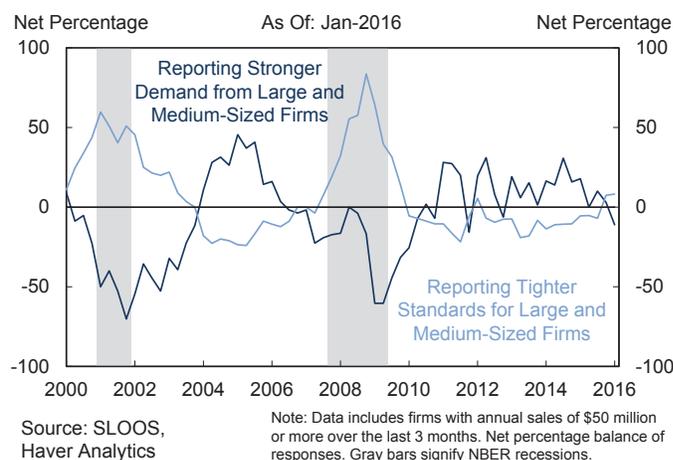


4.3 Corporate Credit

Corporate Bank Lending

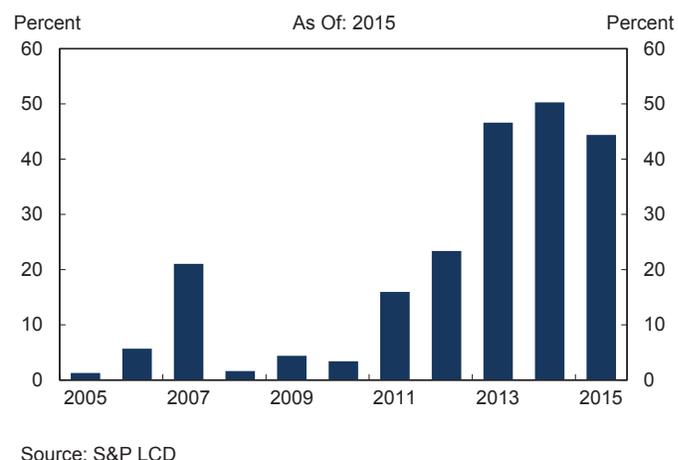
Nonfinancial corporate balance sheet leverage is now close to the peak levels seen before the financial crisis. However, continued high earnings for non-energy firms bolstered balance sheets and allowed corporations to maintain elevated levels of cash holdings, which are highly concentrated among technology firms. Balance sheets weakened for oil and natural gas firms as oil prices fell. On balance, total outstanding bank and nonbank loans to corporations edged up through the year. Despite the increase in total debt, the ratio of debt to assets for the sector remains slightly below its long-term average (**Chart 4.3.1**).

4.3.2 Bank Business Lending Standards and Demand



Throughout most of the year, bank respondents to the Federal Reserve Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS) reported stronger demand for commercial and industrial (C&I) loans by firms; however demand began to fall and underwriting standards tighten towards the end of 2015 (**Chart 4.3.2**).

4.3.3 Covenant-Lite Volume as a Percent of Total Issuance



The interagency Shared National Credits (SNC) Review for 2015 indicated credit risk in syndicated lending was high, despite a relatively favorable economic environment. Loose underwriting standards were noted, particularly in leveraged lending, characterized by minimal or no covenant controls and incremental advance provisions greatly favoring borrowers (**Chart 4.3.3**). Weak underwriting continued to be found in leveraged loans. Weak characteristics observed included: equity cures, nominal equity, and minimal de-leveraging capacity. In addition, covenant protection deteriorated, as evidenced by the reduced number of financial features and various accordion features, including incremental facilities that allow increased debt above starting leverage and the dilution of senior secured positions.

Loans rated special mention and worse totaled \$373 billion, or 9.5 percent of the portfolio, up from \$341 billion last year. The criticized SNC portfolio is comprised of a significant volume of leveraged loans. While leveraged loans represent only 26 percent of commitments, they represent 83 percent of special mention and 57 percent of classified commitments.

During the second half of 2015, investors started to shift away from riskier corporate debt, forcing some banks to hold leveraged loans they had planned to syndicate or to sell them at a discount, particularly in the oil and gas sector. The shift in investor sentiment resulted in a tightening of underwriting standards in the leveraged loan market during fourth quarter of 2015, as total debt used to fund large leveraged buyouts (LBOs) declined noticeably. In 2015, the ratio of debt to earnings before interest, taxes, depreciation, and amortization (EBITDA) on leveraged loans declined modestly to 4.8, from 4.9 in 2014 (Chart 4.3.4). Consistent with investors' aversion to risky debt, LBOs financed with debt multiples of 7 or higher declined sharply in 2015.

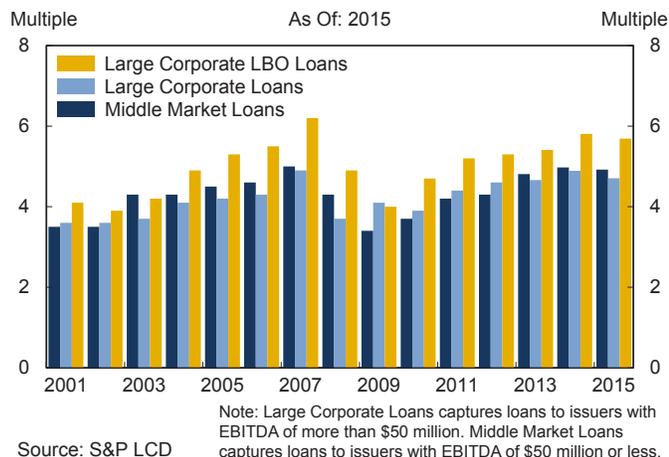
While the delinquency rate on C&I loans ticked up, it remains very low by historical standards (Chart 4.3.5).

Corporate Credit Markets

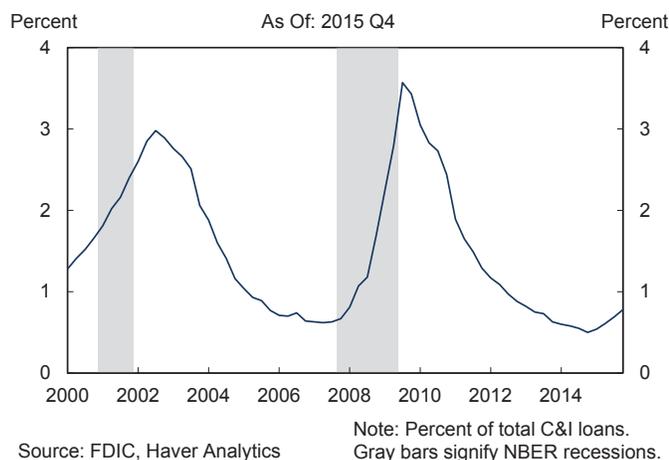
Low interest rates supported robust gross issuance of corporate bonds, with investment grade firms issuing debt at a torrid pace. Investment grade issuance of \$1.23 trillion in 2015 represented a 9.6 percent increase over 2014 issuance and a record-high for a third consecutive year (Chart 4.3.6).

However, in the second half of the year, spreads rose and issuance slowed for bonds issued by speculative-grade firms, in part reflecting the effect of lower oil prices, and in part due to rising concerns about global growth prospects. High-yield debt outstanding increased only slightly above 2014's record level to \$1.70 trillion.

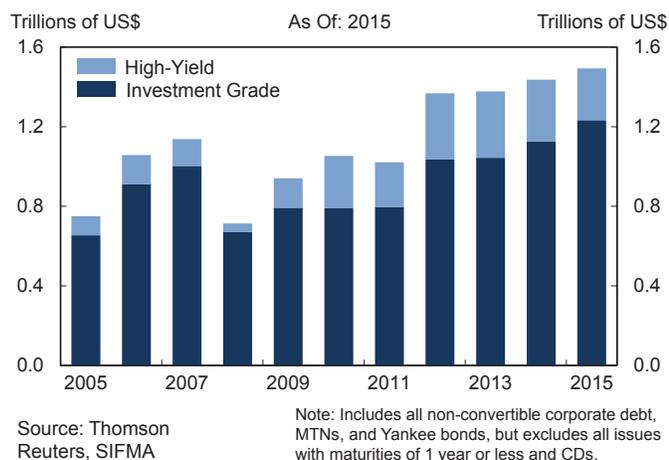
4.3.4 Leveraged Loans: Debt to EBITDA Ratios



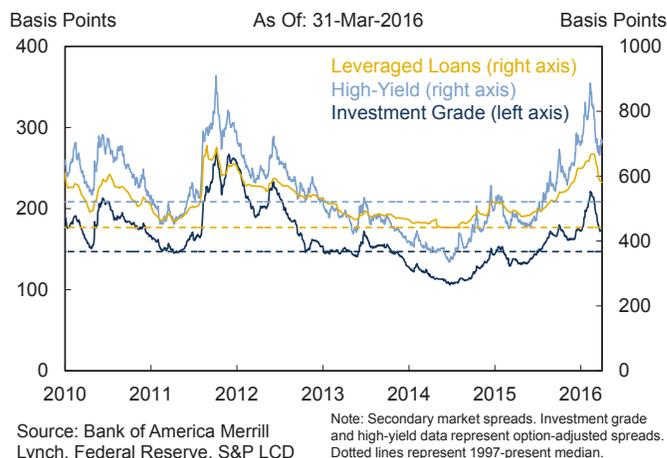
4.3.5 Noncurrent Commercial and Industrial Loans



4.3.6 Corporate Bond Issuance



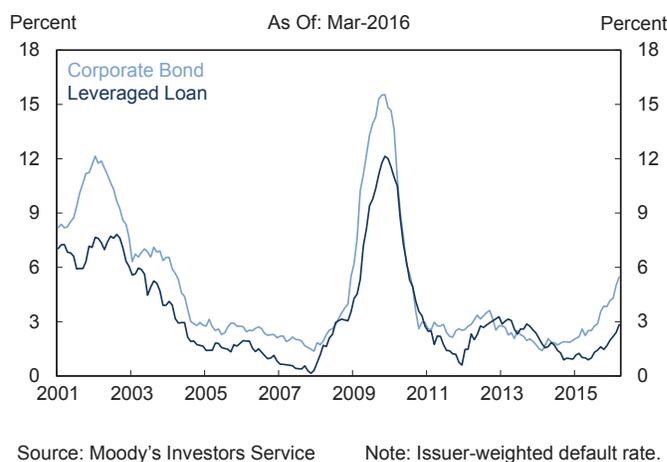
4.3.7 Corporate Credit Spreads



High-yield bond markets, which have a high exposure to the commodity and energy sectors relative to other debt markets, widened in mid-February to a spread over 850 basis points above Treasuries, a level last seen following the U.S. downgrade in 2011. High-yield spreads fell to approximately 700 basis points over Treasuries at the end of March 2016. By contrast, the sell-off in investment grade bonds was much more muted, trading only 74 basis points above their long-term median level (Chart 4.3.7).

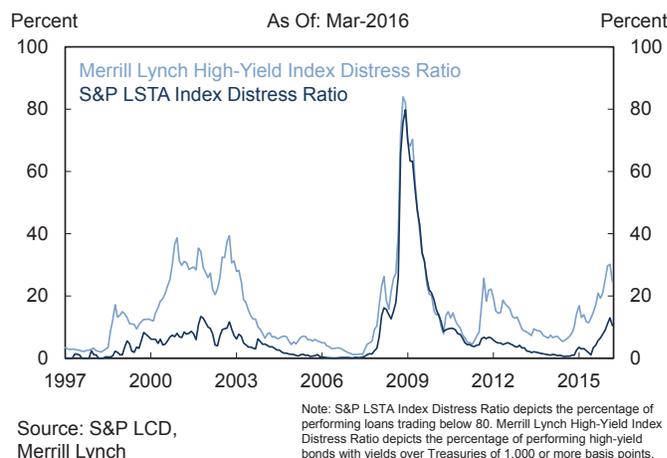
Although the default rates on nonfinancial corporate bonds and loans rose slightly during the year, they remain low compared to recent history (Chart 4.3.8). However, the amount of high-yield bonds and leveraged loans trading at distressed levels has risen significantly (Chart 4.3.9). Historically, such a significant rise has led to a rise in defaults.

4.3.8 Rolling 12-Month Default Rate



Despite a decline in issuance from the all-time highs of 2014 (Chart 4.3.10), issuers of collateralized loan obligations (CLOs) remain the most important buyer of leveraged loans (Chart 4.3.11). Issuance has declined for a variety of reasons, including reduced demand due to stress in the leveraged loan market and poor recent performance of outstanding CLO equity. Although loan mutual funds have experienced outflows for the past two years, at year-end 2015 they continued to be the second largest investor in leveraged loans, after CLOs.

4.3.9 Distressed Ratios

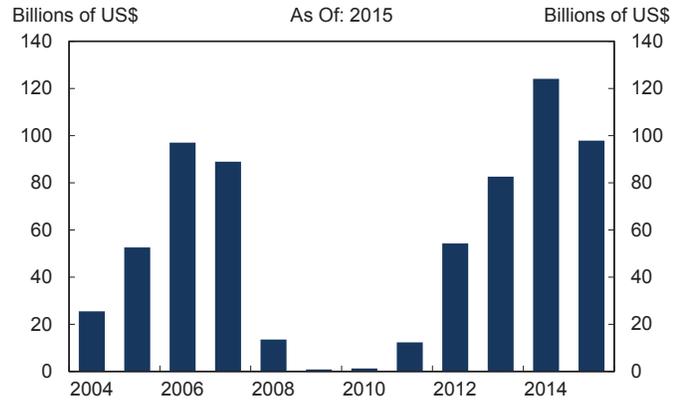


4.4 Household Credit

Household debt, which is largely made up of mortgages, student loans, auto loans, and credit card debt, increased markedly in the years leading up to the financial crisis and declined sharply early in the recovery. Since 2012, household debt has grown at only a slightly slower rate than disposable personal income, indicating that the post-crisis deleveraging period has concluded. Household debt is currently slightly above 100 percent of disposable personal income, down from a high of 128 percent in 2007 (**Chart 4.4.1**). The recent growth in household debt has been driven by robust growth in consumer credit and modest increases in mortgage debt. Borrowers with lower credit scores or low down payments rely heavily on government-backed mortgages, and credit conditions for these borrowers remain tighter than in the pre-crisis period.

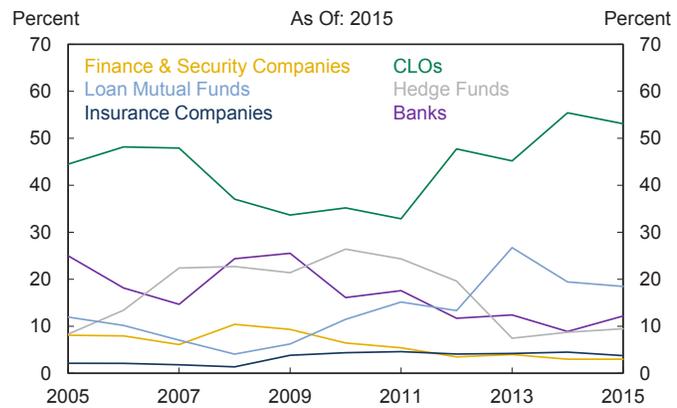
Improving labor markets, low interest rates, and slow debt growth have driven the debt service ratio (the ratio of debt service payments to disposable personal income) to near 30-year lows (**Chart 4.4.2**). As debt burdens have fallen, households have steadily become more current on their debts. The percentage of household debt that is delinquent decreased from 12 percent in 2009 to around 5 percent in 2015, still significantly above its pre-crisis level. Delinquency transition rates for current mortgages averaged 1.1 percent in 2015, which was considerably lower than the 1.45 percent average seen in the pre-crisis years, although the overall delinquency rates remain somewhat elevated as the courts work through the remaining stock of foreclosures. Credit card delinquency rates are lower than pre-crisis levels, and the 90+ day delinquency rates on auto loans are only slightly higher than the levels seen in 2000-2005. Student loans remain the exception, and the delinquency rates on student loans have remained high. The share of delinquent debt that is more than 120 days late has continued to decline, although it

4.3.10 CLO Issuance



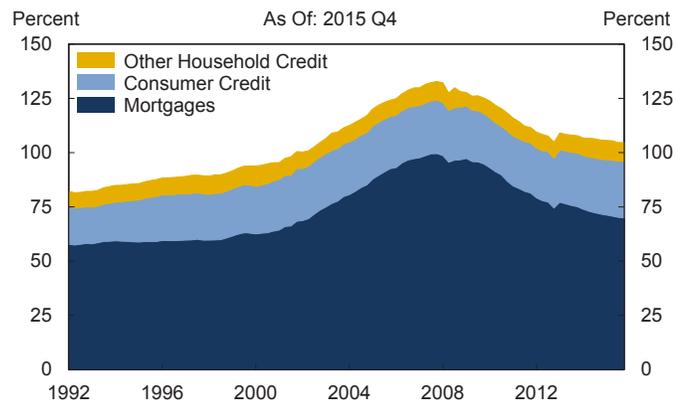
Source: S&P LCD

4.3.11 Leveraged Loan Primary Market by Investor Type



Source: S&P LCD

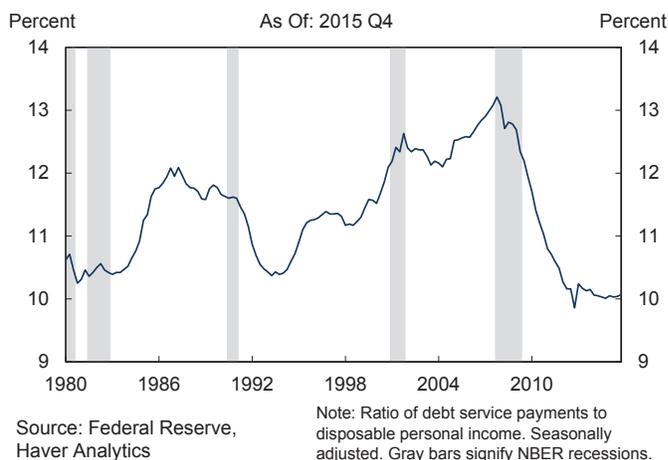
4.4.1 Household Debt as a Percent of Disposable Personal Income



Source: BEA, Federal Reserve, Haver Analytics

Note: Other Household Credit includes debts of both households and nonprofits.

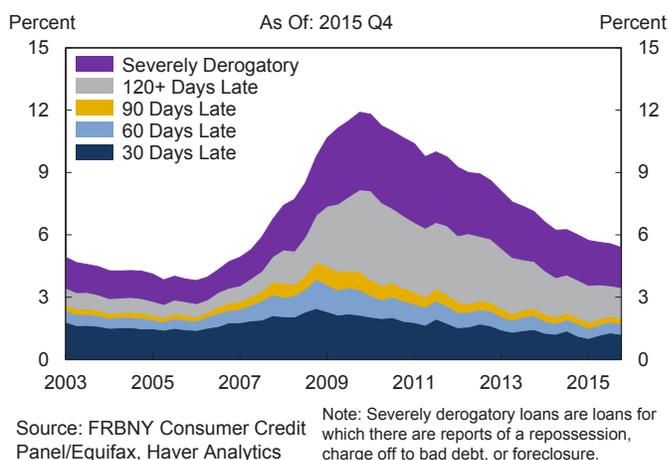
4.4.2 Household Debt Service Ratio



remains elevated relative to pre-crisis levels (**Chart 4.4.3**). While aggregate measures of the debt burden have improved, many households still face difficulties meeting their financial obligations.

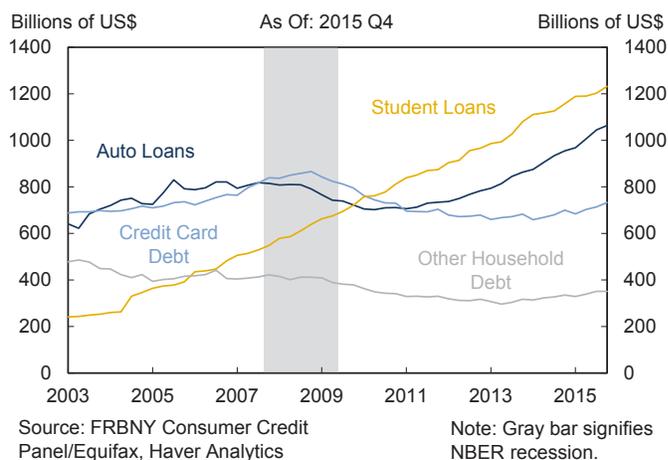
Consumer credit, which excludes mortgages and accounts for about one quarter of total household debt, expanded in 2015 compared to 2014. The increase was driven by continued, robust growth in auto and student loans, which together accounted for over 80 percent of the increase in consumer credit in 2015 (**Chart 4.4.4**). The increase in auto loans reflects easing underwriting standards for borrowers with all credit histories created from a highly competitive environment and stronger consumer demand for motor vehicles. Federal programs remain the primary source of student loan balances, which continue to expand rapidly as a result of rising education costs and a growing number of borrowers. Credit card debt growth was anemic in the years following the crisis, and has remained subdued in 2015 compared to both pre-crisis levels and recent auto and student loan growth.

4.4.3 Share of Household Debt by Delinquency Status



Delinquency rates on all types of household debt except for student loans have decreased since 2010, although delinquency rates on mortgage debt and home equity lines of credit (HELOCs) remain high relative to their pre-crisis levels. In 2015, delinquency rates for credit card loans and mortgages continued their steady decline, while for auto loans and HELOCs, delinquency rates were mostly flat. In contrast, student loan delinquencies edged up a bit from elevated levels, after a period of rapid increases between 2011 and 2013 (**Chart 4.4.5**). The credit card delinquency rates for consumers with high credit scores are currently near their historical averages, and the decrease in overall credit card delinquency rates reflects, in part, a composition shift in outstanding balances to these higher credit score borrowers.

4.4.4 Components of Consumer Credit



Student loan delinquencies, at around 12 percent, remained quite elevated in 2015. The slow labor market recovery, combined with high

and growing student debt burdens, pushed many borrowers into delinquency. Ninety-three percent of total student debt outstanding is government-guaranteed, and the risk to lenders is mitigated by the fact that student loan debt is difficult to discharge in bankruptcy, and that the federal government has extraordinary collection authority on the sizeable share of student loans it originated or guaranteed. Nonetheless, high student debt burdens could negatively affect household consumption and loan demand, and limit access to other forms of credit, such as mortgages, for borrowers.

4.5 Real Estate Markets

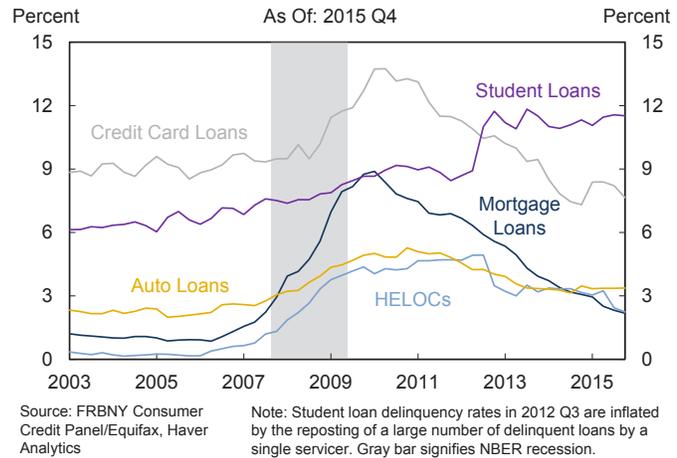
4.5.1 Housing Market Overview

The housing market strengthened across most major indicators, with higher house prices, growth of both new and existing home sales, and improved borrower performance relative to 2014. At the same time, the homeownership rate ticked downward year-over-year in 2015 and now sits at levels last seen in the early 1990s. This decline in homeownership has corresponded with strong demand for rental properties and a surge in multifamily construction.

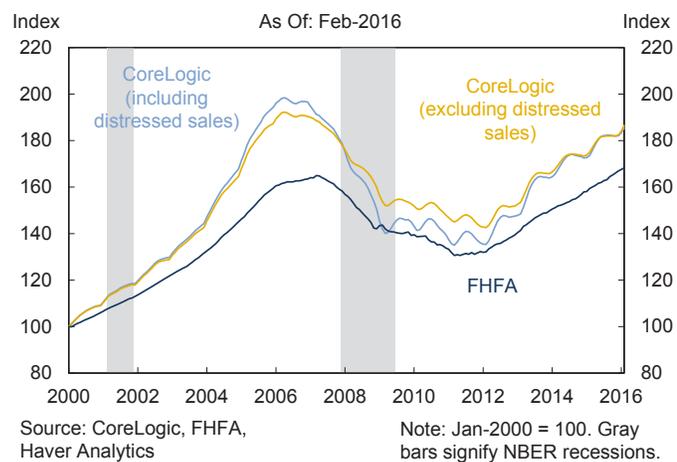
The FHFA's national repeat-sales home price index has recovered its losses incurred during the housing market collapse. The index increased 5.6 percent in the 12 months ending in February 2016 and is now slightly higher than the previous high recorded in March 2007 (**Chart 4.5.1**). Other home price indices edged closer to their previous highs over the course of the year.

Existing home sales increased 5.8 percent in the year ending March 2016, and new home sales increased 8.5 percent, or about 475,000 units. Similarly, construction starts for single-family homes increased 14.5 percent. However, new construction and sales of single-family homes remain well below levels experienced in the decade before the housing market collapse. The shift away from homeownership has resulted in much higher demand for new multifamily housing units. In the year

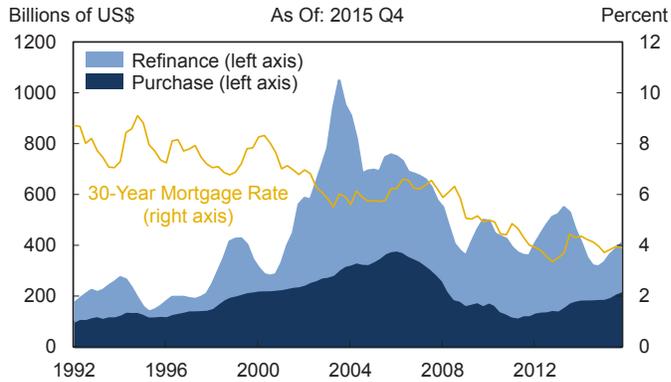
4.4.5 90+ Day Delinquency Rate by Loan Type



4.5.1 National Repeat Sales Home Price Indices



4.5.2 Mortgage Originations and Rates



Source: Mortgage Bankers Association, Freddie Mac Primary Mortgage Market Survey

Note: Originations represent all 1-4 family homes. Originations calculated as 4-quarter moving averages. Mortgage rates calculated as quarterly averages.

ending March 2016, multifamily building permits accounted for 37.7 percent of all new residential permits, while multifamily construction starts accounted for 33.4 percent of all newly started units. Historically, from 1990 to 2007, multifamily permits averaged less than 20 percent of all residential permits while multifamily housing starts averaged less than 17 percent of all residential starts. However, given continued evidence of consumer preferences for homeownership, changes in credit availability could affect the demand for both multifamily and single-family units moving forward.

Household formation grew at a tepid pace in 2015, and remains below long-term averages. The number of renter-occupied properties grew at a faster rate than that of owner-occupied properties over the course of the year, bringing the national homeownership rate down from 64.0 percent at year-end 2014 to 63.8 percent at year-end 2015. With fewer households owning their own homes, high demand for rentals has continued to keep rental vacancy rates at their lowest level since the mid-1990s. Housing affordability—measured as a comparison of median mortgage payments to median income—decreased about 5 percent in 2015, as home prices increased more than incomes.

A decline in mortgage rates in 2015 resulted in an increase in total originations, attributable in part to borrowers refinancing (**Chart 4.5.2**). Refinance originations totaled \$749 billion in 2015, or a 49 percent increase from 2014. Purchase originations increased 16 percent in 2015 to reach \$881 billion.

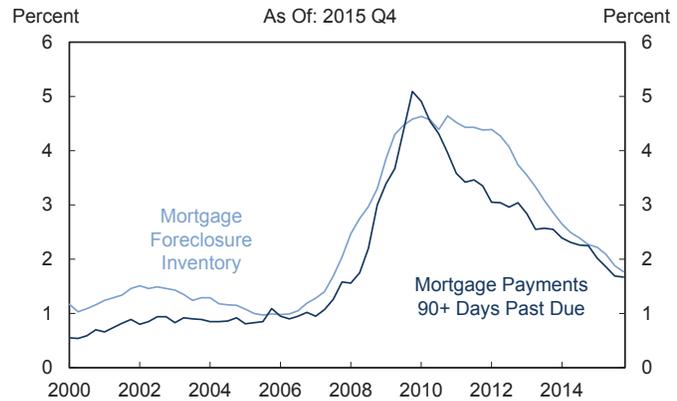
The performance of outstanding mortgage loans continued to improve in 2015 as delinquencies, foreclosures, and the number of households with negative equity all declined. The estimated number of delinquent loans declined from 2.3 million as of year-end 2014 to 1.9 million as of year-end 2015—a faster rate improvement than seen in 2014. The pipeline of mortgages likely to proceed to foreclosure has also declined as the share of loans with payments more than 90 days past due dropped

from 2.3 percent to 1.7 percent between year-end 2014 and year-end 2015 (**Chart 4.5.3**). Over the same period, the share of mortgages in foreclosure dropped from 2.3 percent to 1.8 percent. Sustained price increases, completed foreclosures on underwater loans, loan modifications, and the amortization of older loans have helped lower the percentage of mortgages with negative equity from 10.7 percent at year-end 2014 to 8.5 percent by year-end 2015 (**Chart 4.5.4**). This improvement equates to approximately 1.0 million households rising out of negative equity in 2015.

Underwriting standards for new mortgages remained relatively conservative over the past year, particularly when compared to the decade prior to the collapse in the housing market. The segment of purchase originations for borrowers with FICO scores below 600, which composed nearly 10 percent of originations in the early 2000s, is almost nonexistent in the current environment, accounting for only 0.1 percent of the market (**Chart 4.5.5**). Conversely, the share of loans with FICO scores over 760 increased to 43.2 percent in 2015 and has almost doubled from 23.0 percent in 2001. As in 2014, the SLOOS showed the vast majority of respondents reporting that their credit standards remained unchanged in 2015; however there was an increase in respondents reporting easing credit standards during the year. Similarly, the OCC's 2015 Survey of Credit Underwriting Practices reported that over 80 percent of respondents held residential real estate lending standards unchanged in 2015, despite somewhat more pronounced easing of overall lending standards.

In the year ending February 2016, the GSEs completed a total of 2.01 million refinances, which was an increase from the 1.61 million refinances completed in the prior 12 months. However, the number of Home Affordable Refinance Program (HARP) refinances declined over this period as a result of many borrowers regaining equity in their homes. The Federal Housing Administration's (FHA) total refinance volume increased 90 percent to

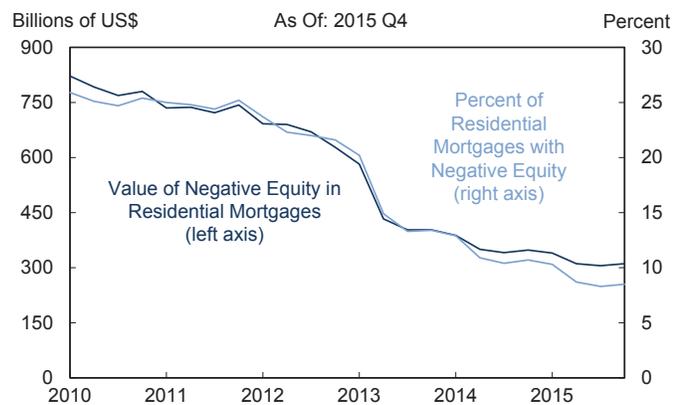
4.5.3 Mortgage Delinquency and Foreclosure



Source: Mortgage Bankers Association, Haver Analytics

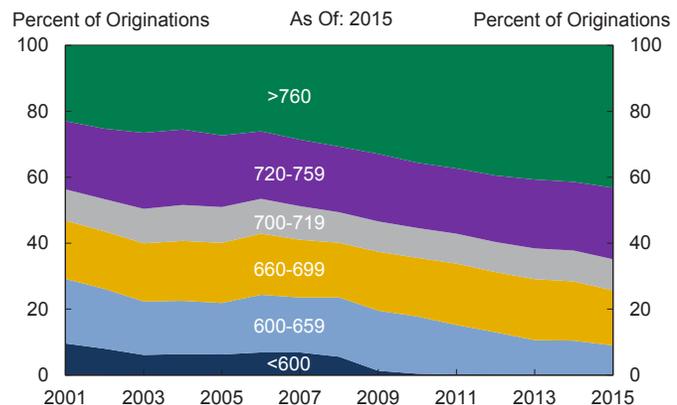
Note: Percent of all mortgages.

4.5.4 Mortgages with Negative Equity



Source: CoreLogic

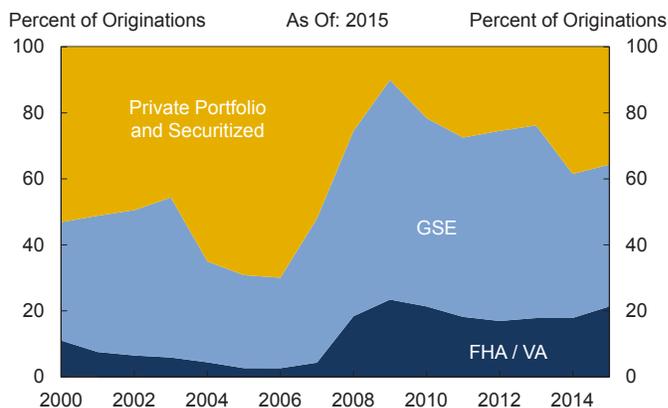
4.5.5 Purchase Origination Volume by Credit Score



Source: McDash, FHFA calculations

Note: Includes first lien purchases only.

4.5.6 Mortgage Originations by Product

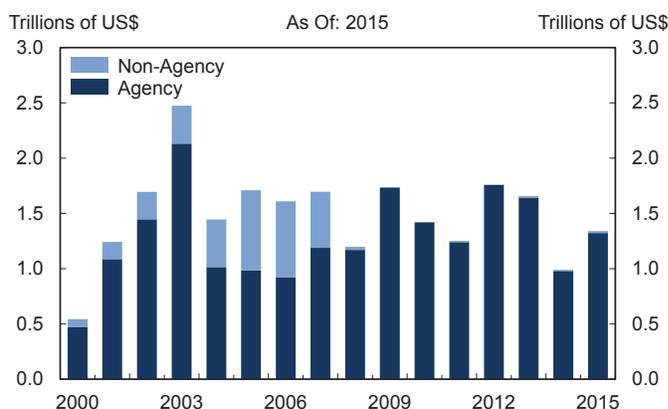


Source: Inside Mortgage Finance

362,000 refinances between fiscal years 2014 and 2015.

The share of mortgages backed by the federal government has been trending lower since its peak in 2009, primarily as a result of the increase in the share of mortgages held on bank balance sheets. Approximately 64 percent of mortgages originated in 2015 were guaranteed by the federal government—up from 61 percent in 2014 but well below the peak of nearly 90 percent in 2009 (**Chart 4.5.6**). However, nearly all residential mortgage-backed security (RMBS) issuance in 2015 was guaranteed by the federal government because the private label market remains dormant (**Chart 4.5.7**).

4.5.7 RMBS Issuance



Source: Fannie Mae, Freddie Mac, Ginnie Mae, Bloomberg, L.P., Dealogic, Thomson Reuters, SIFMA

As of March 2016, the Federal Reserve held about \$1.75 trillion in agency mortgage-backed securities (MBS), or about 28 percent of outstanding agency MBS. While the Federal Reserve ended its large-scale asset purchase program in 2014, it has continued to reinvest maturing principal payments in agency MBS. The continuing low spread of 30-year agency MBS yields over 10-year U.S. Treasury yields suggests that the demand for agency MBS remains strong overall (**Chart 4.5.8**).

4.5.8 Agency MBS Yield and Spread



Source: Bloomberg, L.P.

Originations of HELOCs rose 37 percent through the third quarter of 2015; however, the number of HELOC accounts, and the balances associated with those accounts, declined slightly. On net, the pace of HELOC closure and pay-down exceeded the pace of originations. Approximately \$90 billion in HELOC balances, more than one-quarter of outstanding balances, face payment resets in 2016 and 2017. While increased house prices, a growing economy, and proactive measures by certain lenders over the past year have improved the financial positions of some borrowers, about 60 percent of the debt facing payment resets over the next two years is associated with negative-equity borrowers.

Nonbank financial firms continued to increase their mortgage servicing portfolios in 2015, as nonbanks now account for over 32 percent of

the market among large servicers (**Chart 4.5.9**). Nonbanks also continued to grow their share of originations among the largest lenders. Last year, nonbank firms accounted for 31 percent of mortgages originated by the largest 25 lenders, up from 28 percent the year before.

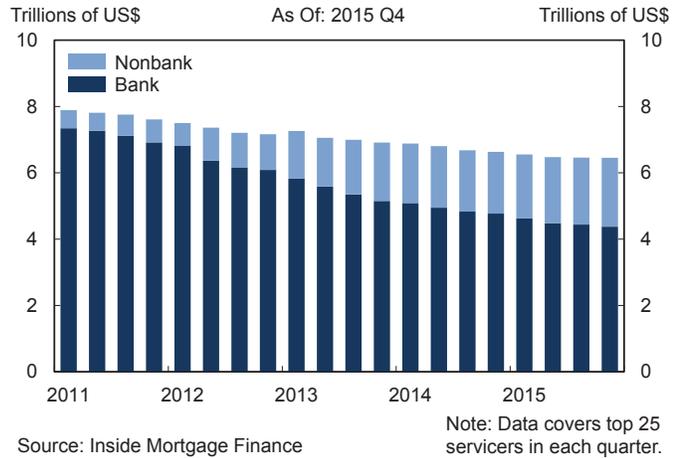
Investor activity in the housing market typically takes the form of home purchases for rental purposes. Such activity is often measured indirectly via the share of all-cash sales—transactions which are more common among investors than primary residents. Cash sales fell to an estimated 32.5 percent of total sales in September 2015, partly reflecting a decline in the share of real estate owned (REO) property sales. This represented a 3.4 percentage point decline from a year earlier and a 14.1 percentage point decline from the January 2011 peak. Investors may also participate in the rental market through equity real estate investment trusts (REITs) and, more recently, a growing rental property securitization market.

4.5.2 Government-Sponsored Enterprises

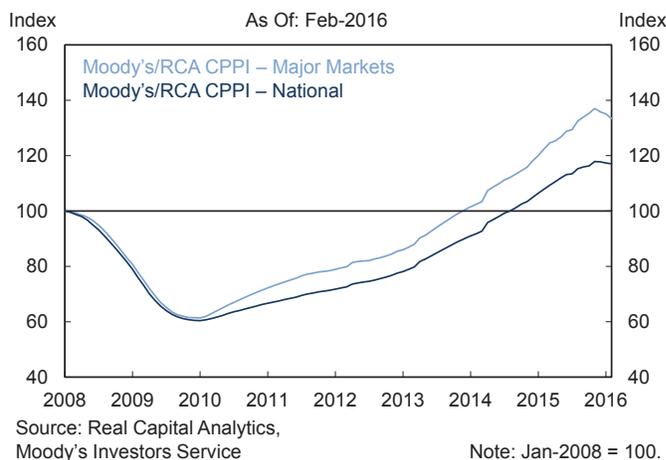
GSE issuance of new MBS increased in 2015, as both refinance and purchase activity were higher than those of the prior year. In 2015, Fannie Mae issued \$472 billion and Freddie Mac issued \$351 billion in new single-family MBS, up from \$376 billion and \$255 billion in 2014, respectively. Fannie Mae and Freddie Mac both saw declines in net income in fiscal year 2015 relative to fiscal year 2014, due in part to lower income from resolution agreements and continued declines in net interest income from retained mortgage portfolio assets.

In accordance with the FHFA 2015 Scorecard, the GSEs continued to expand their use of several risk-sharing structures. In 2015, they issued credit risk-sharing agreements on reference pools of mortgages with an aggregate unpaid principal balance of about \$417 billion—well above the Scorecard target of \$270 billion. Investors in the most senior tranches of these securities were composed largely of mutual funds, and the most junior tranches disproportionately attracted hedge funds. On a limited basis, Fannie Mae and Freddie

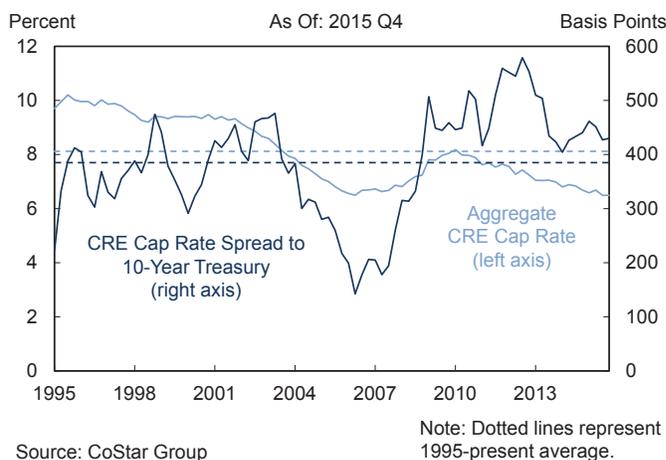
4.5.9 Mortgage Servicing Market



4.5.10 Commercial Property Price Indices



4.5.11 CRE Capitalization Rates and Spreads



Mac also negotiated bilateral agreements with private entities to insure or reinsure portions of guaranteed pools.

4.5.3 Commercial Real Estate

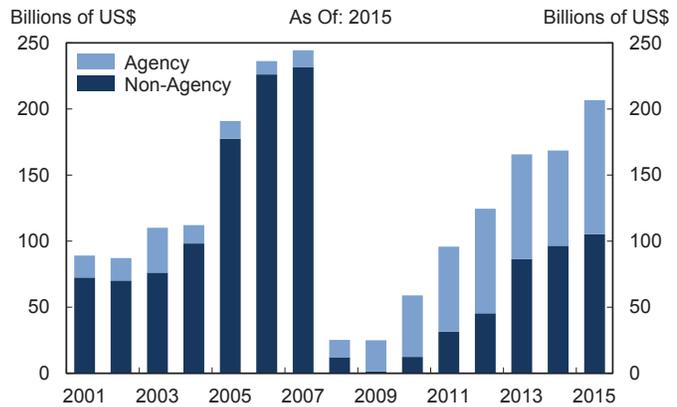
CRE markets continued to strengthen over the past 12 months as measured by several key metrics. As of February 2016, the national CRE price index experienced year-over-year growth of 8.5 percent, with retail experiencing moderate growth relative to other sectors (**Chart 4.5.10**). National prices as well as those in major markets did fall in late 2015 and early 2016, however, representing the first monthly price declines in nearly six years. Commercial mortgage originations in dollar terms were 24 percent higher in 2015, and spending on new construction of commercial, nonresidential properties increased by just over 10 percent. Multifamily construction remains near pre-crisis levels in terms of number of new units.

CRE capitalization rates—the ratio of a property's annual net operating income to its price—are at historically low levels (**Chart 4.5.11**). However, the CRE risk premium—the spread between CRE capitalization rates and the 10-year Treasury yield—is slightly above its long-term average. If investors become more cautious about future CRE performance, they would demand a higher risk premium. These higher required returns would put downward pressure on commercial property values, particularly for properties with weakened net income or in markets that have experienced the largest gains in prices since the recession.

CRE loans outstanding—excluding multifamily residential loans—reached \$1.9 trillion in December 2015, an increase of nearly \$200 billion from December 2014. In the prior year, the growth in loans outstanding was only \$100 billion. Between the third quarter of 2014 and the third quarter of 2015, CRE delinquency rates steadily fell from 1.76 percent to 1.14 percent. Correspondingly, the CRE charge-off rate fell from 0.06 percent to 0.04 percent.

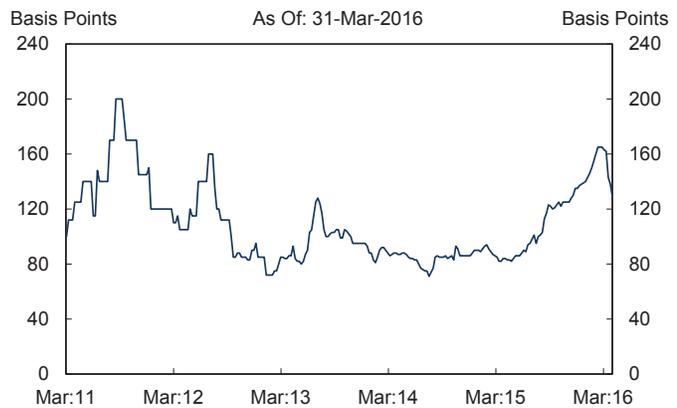
While improvement in reported delinquency and charge-off rates was evident, underwriting standards appeared to have loosened in some CRE portfolios. Bank examiners surveyed for the OCC's 2015 Survey of Credit Underwriting Practices indicated that CRE lending, including commercial construction, residential construction, and other CRE loans, is a growing concern in 75 percent of all banks. This compares to 65 percent in the same survey a year ago. At least one bond rating service has noted weakening underwriting standards for properties placed in commercial mortgage-backed securities (CMBS); higher leverage and increased interest-only and partial interest-only loans were cited as the primary concerns. In 2015, CMBS issuance continued its multi-year climb, rising above \$200 billion for the first time since 2006 (Chart 4.5.12). As in recent years, agency securities, for which the underlying assets are primarily multifamily properties, made up nearly half of total issuance in 2015. This differs significantly from pre-crisis issuance, in which agency CMBS accounted for only 6.4 percent of total 2004-2007 issuance, largely reflecting a change in the GSEs' business models. CMBS spreads began to widen with the broader credit markets in the second half of 2015 and in February 2016 reached their highest levels since late 2011, before tightening somewhat by the end of the first quarter (Chart 4.5.13).

4.5.12 CMBS Issuance



Source: Inside Mortgage Finance

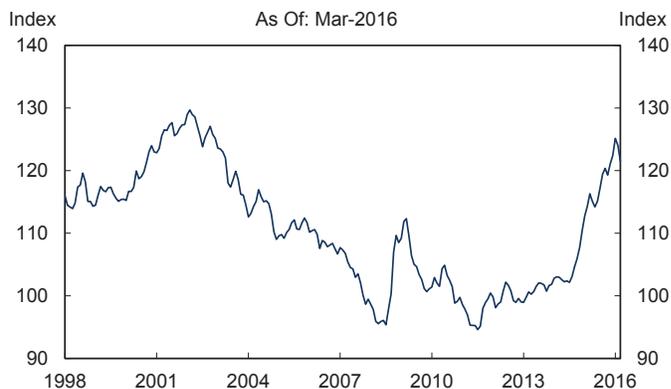
4.5.13 CMBS Senior Debt Spreads



Source: Barclays

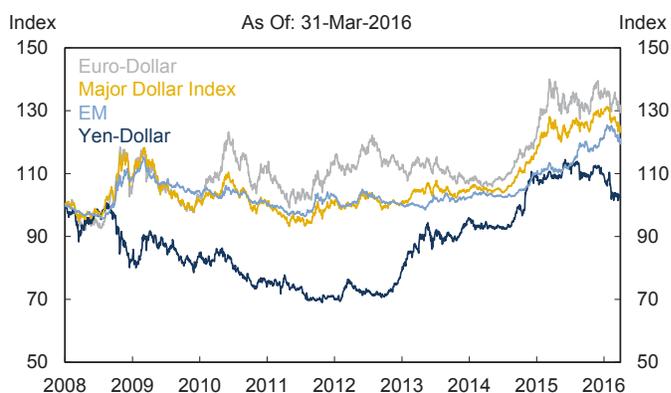
Note: Cash spread of new issue, non-agency, 3.0 dufer, 10-year last cash flow CMBS.

4.6.1 Nominal U.S. Dollar Trade-Weighted Index



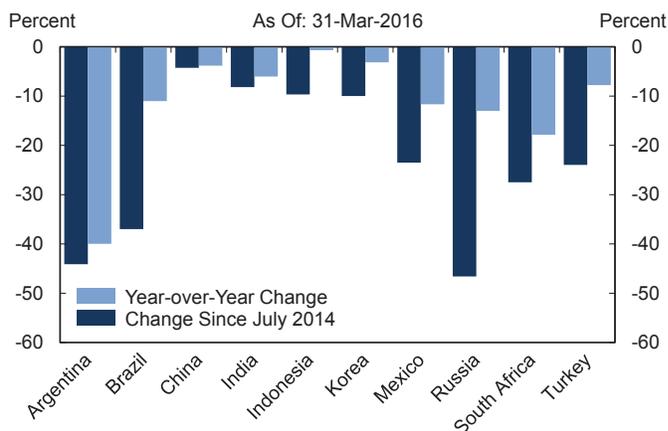
Source: Federal Reserve, Haver Analytics
 Note: Nominal U.S. Dollar Trade-Weighted Index is a weighted average of the FX value of the U.S. dollar against the currencies of a broad group of major U.S. trading partners.

4.6.2 U.S. Dollar Exchange Rates



Source: Federal Reserve, Haver Analytics
 Note: 1-Jan-2008 = 100. EM is a weighted average of the FX values of the dollar against a subset of currencies in the broad index that do not circulate widely outside the country of issue.

4.6.3 Change in U.S. Dollar Exchange Rates



Source: Wall Street Journal, Haver Analytics

4.6 Foreign Exchange

The dollar has appreciated significantly on a trade-weighted basis since mid-2014, driven by slower foreign growth relative to the U.S. economy, increased concerns about global outlook, continued monetary accommodation relative to the United States, and a fall in commodity prices (Chart 4.6.1). After depreciating rapidly against the dollar from mid-2014 to March 2015, the euro and the Japanese yen were largely stable for the remainder of 2015 (Chart 4.6.2). However, since February 2016, market volatility, safe haven inflows, and repatriation of overseas retained earnings have resulted in appreciation of the yen vis-à-vis the dollar, with the yen in April reaching its strongest level against the dollar since October 2014. Emerging market currencies, particularly the Brazilian real, the Mexican peso, and the South African rand, have continued to face significant pressure, weakening considerably against the dollar over the past year (Chart 4.6.3). The Argentinian peso dropped as it was allowed to float. Tumbling oil prices have also resulted in a weakening of a number of oil exporters' currencies, particularly the Russian ruble and Kazakh tenge.

On August 11, 2015, China announced changes to how it sets its daily reference rate for the RMB against the dollar. China has indicated the change in its exchange rate policy is another step in its move to a more market-determined exchange rate. The policy shift resulted in RMB depreciation of 3 percent against the dollar over two days. Since this policy shift, the RMB has depreciated 4.6 percent against the dollar. The RMB has faced significant downward pressure throughout the past year due to moderating GDP growth in China and expectations for Federal Reserve interest rate increases. It is estimated that the Chinese authorities sold more than \$480 billion in reserves from August 2015 through March 2016 to stem the RMB depreciation, although much of the outflow was used to repay debt owed to foreigners. In December 2015, the PBOC unveiled a new trade-weighted exchange rate

index which tracks the RMB against a basket of 13 currencies. The Chinese authorities have since emphasized stability of the RMB against this basket of currencies in addition to the U.S. dollar. In November 2015, the IMF agreed to include the RMB in the Special Drawing Rights basket of major world currencies and gave it a 10.9 percent weighting.

4.7 Equities

Both developed and emerging market equities saw weak performances over the last year (**Chart 4.7.1**). U.S. indices, range-bound over the first half of 2015, turned sharply downward in August, but retraced these losses in October. Equity markets in the U.S. and other major developed countries fell sharply again in January and early February of 2016, but have largely rebounded to their end-2015 levels. Heightened concerns about global growth, including a slowdown in China and declining commodities prices, influenced U.S. markets. Overall, U.S.-listed companies saw a contraction in revenues over 2015 and a contraction in earnings in the second half of the year. These were the first such extended contractions in revenues and earnings since 2008, and were driven primarily by considerable stress among resource sector companies affected by the global decline in energy and metals prices. The S&P 500 fell 0.8 percent over 2015 while the index's composite trailing price-to-earnings (P/E) ratio rose slightly but remained below its 20-year average of 19.4 (**Chart 4.7.2**).

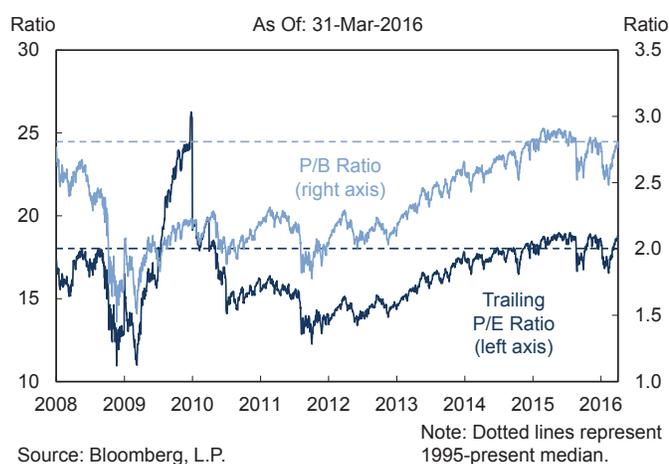
U.S. equity market implied volatility, as measured by the Chicago Board Options Exchange Volatility Index (VIX) averaged 16.7 over 2015, which is below its historical average dating to 1995 (**Chart 4.7.3**). Volatility levels declined through the first half of the year but spiked in August to highs last seen during the European sovereign debt stress of 2011 amid an unexpected devaluation in the Chinese RMB. Volatility trended higher throughout the fourth quarter due to concerns about weaker global growth and moved up sharply during the first quarter of 2016.

4.7.1 Returns in Selected Equities Indices

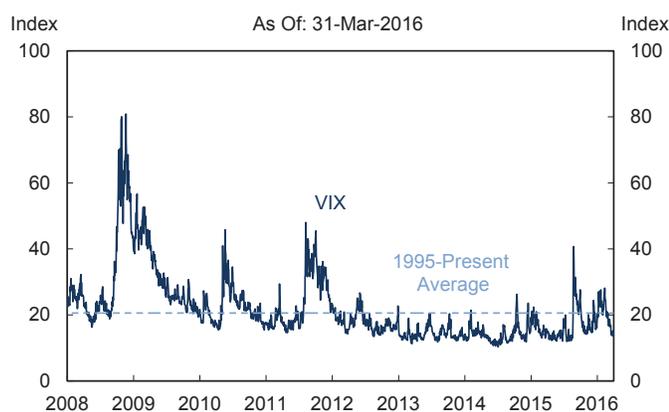
| | Change from 31-Mar-2015 to 31-Mar-2016 | Annual growth rate from 31-Mar-2011 to 31-Mar-2016 |
|----------------------------|--|--|
| Major Economies | | |
| U.S. (S&P) | -0.4% | 9.2% |
| Euro (Euro Stoxx) | -14.9% | 2.5% |
| Japan (Nikkei) | -12.7% | 11.4% |
| U.K. (FTSE) | -8.8% | 0.9% |
| Selected Europe | | |
| Germany (DAX) | -16.7% | 7.2% |
| France (CAC) | -12.9% | 1.9% |
| Italy (FTSE MIB) | -21.8% | -3.6% |
| Spain (IBEX) | -24.3% | -3.8% |
| Emerging Markets | | |
| MSCI Emerging Market Index | -14.1% | -6.5% |
| Brazil (Bovespa) | -2.1% | -6.1% |
| Russia (RTS) | -0.5% | -15.6% |
| India (Sensex) | -9.4% | 5.4% |
| China (Shanghai SE) | -19.9% | 0.5% |
| Hong Kong (Hang Seng) | -16.6% | -2.5% |

Source: Capital IQ

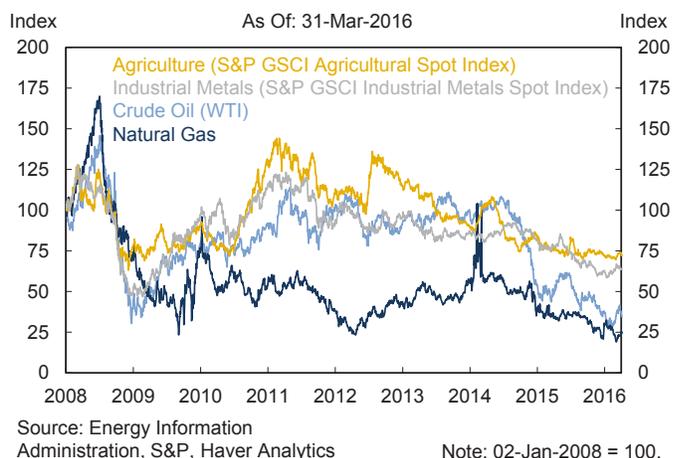
4.7.2 S&P 500 Key Ratios



4.7.3 Equity Market Volatility



4.8.1 Commodities

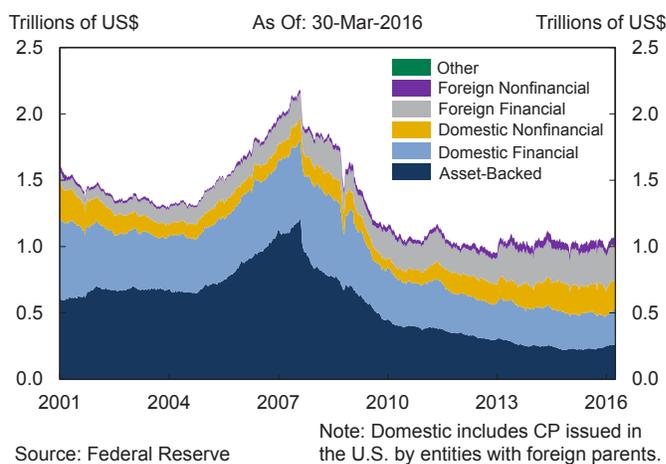


4.8 Commodities

Commodity prices continued to decline in 2015, led by a 37 percent drop in oil during the second half of the year as persistent global oversupply, lower global demand, and dollar appreciation weighed on the energy market (**Chart 4.8.1**). Weakness in oil was mirrored across the broader commodity complex, with the overall S&P GSCI decreasing over 25 percent during the course of the year.

Prices of industrial metals fell in 2015, due primarily to growing concerns over slowing demand in China. Prices of agricultural commodities also declined last year, but much less so than energy prices, amid ample agricultural supply conditions. The S&P GSCI Industrial Metals Index and Agricultural Commodities Index fell 23 percent and 12 percent in 2015, respectively. Oil prices continued to be volatile in 2016 and are now down 62 percent from 2014 highs, as key producers in the Gulf and the United States maintain high production levels despite lower prices.

4.9.1 Commercial Paper Outstanding



4.9 Wholesale Funding Markets

4.9.1 Unsecured Borrowing

Commercial Paper

The average level of commercial paper (CP) outstanding over the 12 months ending March 2016 was \$1.03 trillion, representing a 1.2 percent decline from the previous year (**Chart 4.9.1**). Since 2012, total CP outstanding has remained relatively flat, hovering largely between \$950 billion and \$1.1 trillion—more than 50 percent below the market's peak in 2007. A sizable decrease in domestic financial CP outstanding more than offset smaller gains in foreign financial CP, domestic nonfinancial CP, and asset-backed commercial paper (ABCP). After moving higher in 2013 and 2014, the domestic CP market shrank by 3.9 percent over the past year. Meanwhile, nonfinancial CP continued its multi-year climb, with its average outstanding level increasing 0.9 percent on

the year. This contrasts with the financial CP market, which fell 3.0 percent.

CP issuance totaled \$19.8 trillion over the past 12 months, a 2.7 percent decrease from the \$20.3 trillion issued in the prior year. The 6.5 percent decline in issuance of CP with a maturity between one and four days—a category which accounts for over 60 percent of total CP issuance—countered the increase in issuance across longer maturities.

After holding steady for much of 2015, interest rates on overnight, AA-rated CP increased by roughly 20-25 basis points in December (**Chart 4.9.2**). This move immediately followed the FOMC decision to raise the target range for the federal funds rate. Interest rates on somewhat longer-term CP, such as 90-day, AA-rated CP, rose more gradually in the third quarter of 2015 before spiking in the fourth quarter—at least in part reflecting expectations of a higher federal funds rate. The interest rates on 90-day, AA-rated CP closed the year ending March 2016 between 35 and 45 basis points higher.

Large Time Deposits

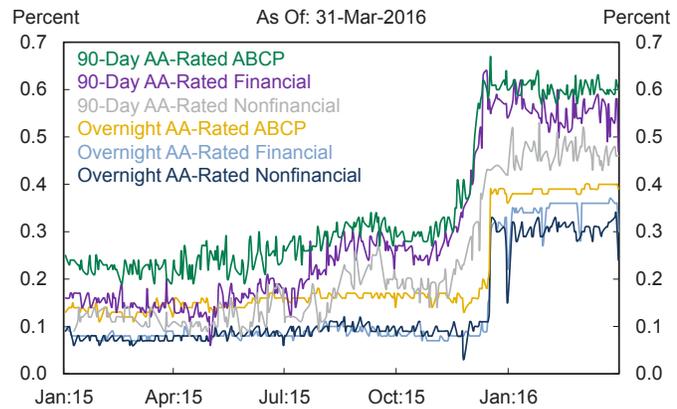
The average level of large time deposits at commercial banks, which include wholesale certificates of deposit (CDs), increased 0.7 percent to \$1.69 trillion in the 12 months ending March 2016. This slight uptick followed two consecutive years of moderate growth in large time deposits, though current levels are still more than 22 percent below crisis-era highs.

4.9.2 Secured Borrowing

Repo Markets

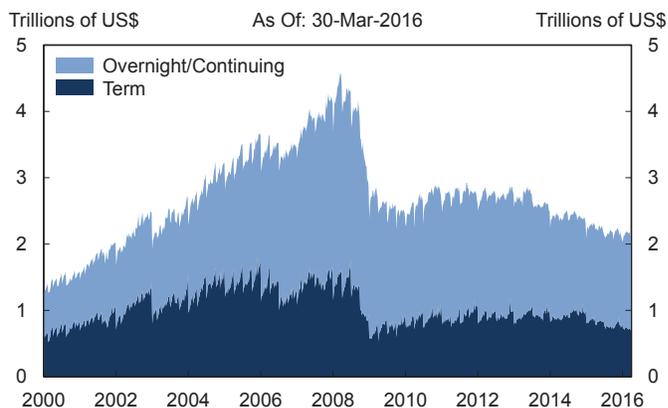
The U.S. repo market can be separated into two segments based on differences in settlement. In the tri-party repo market, clearing and settlement occurs through a system operated by a clearing bank that provides collateral valuation, margining, and management services to ensure the terms of the repo contract are met. GCF repo, a financial service offered by the Fixed Income Clearing Corporation

4.9.2 Commercial Paper Interest Rates



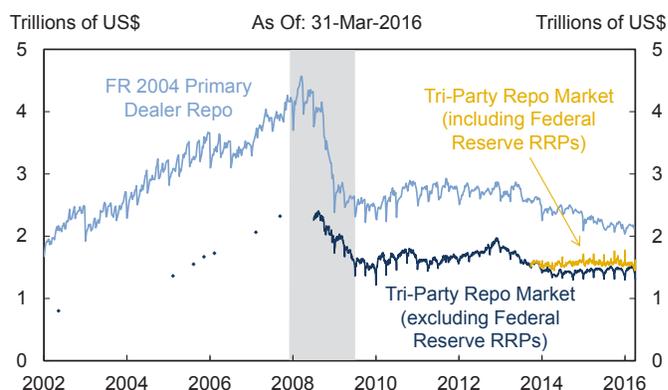
Source: Federal Reserve

4.9.3 Primary Dealer Repo Agreements



Source: FRBNY

4.9.4 Value of the Repo Market



Note: Limited data were provided by the clearing banks prior to April 2008. These figures are estimates based on the data provided. Daily Federal Reserve RRP operations beginning in September 2013 are depicted; small-scale RRP test operations undertaken periodically at earlier dates are not depicted. Gray bar signifies NBER recession.

Source: FRBNY

that allows securities dealers to exchange government securities among themselves for cash anonymously, also settles on the clearing banks' tri-party repo settlement platforms. In contrast, within the bilateral repo market, the repo counterparties are responsible for the valuation and margining of collateral.

Total borrowing by primary dealers across both segments of the repo market oscillated between \$2.0 trillion and \$2.3 trillion over the 12 months ending March 2016 while trending slightly lower over this period (Chart 4.9.3). Financing activity in the tri-party repo market—inclusive of transactions involving the Federal Reserve but exclusive of GCF transactions—was largely unchanged for the second consecutive year following the declines seen in 2013, as the volume of collateral financed in the tri-party repo market remained in a narrow range between \$1.5 trillion and \$1.7 trillion (Chart 4.9.4). The number of individual tri-party repo deals declined from 7,859 in March 2015 to 7,485 in March 2016.

In 2014, the OFR, Federal Reserve System, and SEC launched a data collection pilot focused on the bilateral repo market. Nine BHCs participated in the pilot on a voluntary basis, reporting trades executed under bilateral repo and securities lending agreements—jointly referred to as bilateral repo in the pilot—by all of their U.S. BHC-affiliated securities dealers during three separate trading days in the first quarter of 2015. The participating dealers reported that counterparties sometimes preferred to use a securities lending contract when negotiating an exchange of cash for collateral, perhaps reflecting differences in prevailing market practice or regulatory requirements. This data collection provided important insights into the structure of the bilateral repo market, although the total size of this segment can only be estimated due to the limited scope of the pilot.

Data on primary dealer repo activity, both in the tri-party and bilateral markets, as well as data on all dealers in the tri-party market, is

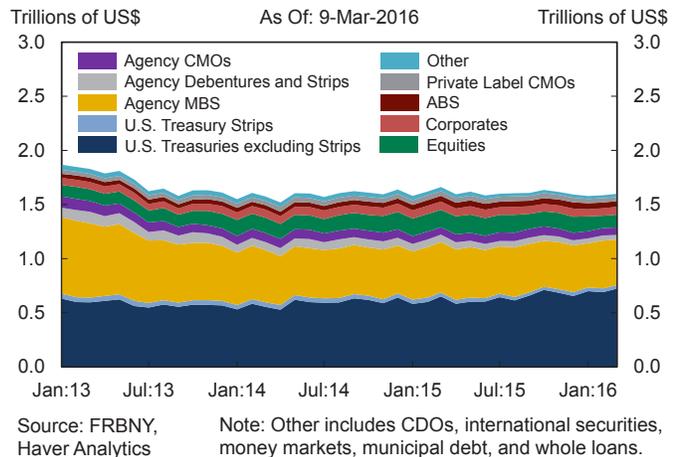
used to estimate the total size of the bilateral repo market. As of March 2015, this estimate was \$3.2 trillion for reverse repo (securities in and cash out for dealers) and \$1.9 trillion for repo (securities out and cash in for dealers). Dealers participating in the data collection pilot are estimated to account for slightly more than half of total bilateral repo segment trading, on average. A substantial amount of bilateral repo market activity captured by the data collection pilot was conducted among affiliated entities. Interaffiliate trades made up 25 percent of traded volume in reverse repo and 41 percent of traded volume in repo.

Collateral composition in the tri-party repo market trended towards higher-quality securities over the past year. In March 2016, Fedwire-eligible collateral, which includes U.S. Treasury and agency securities as well as agency MBS, accounted for 80.5 percent of the total collateral financed. Prior to 2016, Fedwire-eligible collateral had not comprised more than 80 percent of total tri-party repo collateral since November 2013 (**Chart 4.9.5**).

Results from the data collection pilot suggest that collateral financed in the bilateral repo segment also largely consists of government securities. Transactions involving U.S. Treasuries represented 61 percent of the total value for reverse repo and 81 percent for repo. Nearly all equities and a substantial amount of corporate debt securities reported as collateral in the pilot were documented as securities lending transactions rather than bilateral repo transactions.

Margins that cash investors required in tri-party repo transactions were little changed in over the past year, reflecting relatively stable perceptions of counterparty creditworthiness. Median margins on bilateral repo trades reported in the pilot data collection were smaller than those charged by tri-party investors, with a somewhat tighter distribution range in most cases (**Chart 4.9.6**).

4.9.5 Collateral in the Tri-Party Repo Market



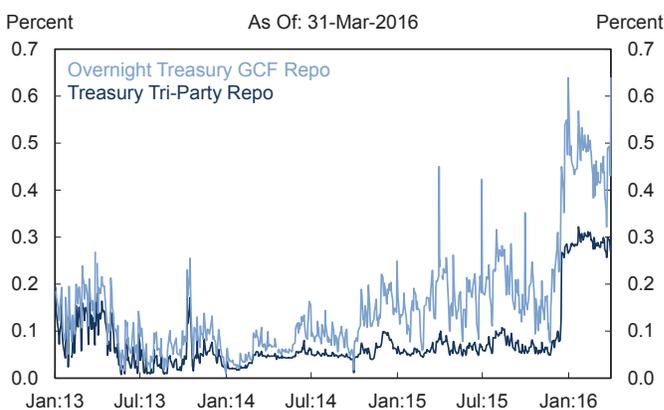
4.9.6 Bilateral Repo Haircuts

As Of: Mar-2015

| | 10 th Percentile | Median | 90 th Percentile | Maximum |
|---|-----------------------------|--------|-----------------------------|---------|
| U.S. Treasuries (including Strips) | 0% | 0% | 1% | 5% |
| Government Agency | 0% | 0% | 0% | 1% |
| Corporate | 0% | 0% | 0% | 5% |
| Private Label CMO, MBS, and ABS | 0% | 2% | 3% | 20% |

Source: OFR/Federal Reserve/SEC Bilateral Repo Data Collection Pilot Note: Excludes interaffiliate transactions and transactions using securities lending contracts.

4.9.7 Treasury Tri-Party and GCF Repo Rates



Source: Bank of New York Mellon, DTCC, Bloomberg, L.P.

The bilateral repo pilot provided additional transparency into the maturity of repo transactions. Maturities varied depending on collateral type, but most reported transactions were open—in which the transaction can be recalled at any time—or overnight. For example, 52.2 percent of reported transactions backed by Treasury securities were open or overnight, while nearly 94 percent of reported transactions backed by equities were open or overnight. These transactions backed by equities generally reflect broker-dealers covering short positions under securities lending agreements. In contrast, the weighted-average maturity (WAM) under bilateral and tri-party repo agreements on less liquid collateral for the largest broker-dealers was in excess of three months at year-end 2015, generally reflecting the financing of firm inventory (see [Section 4.12.1](#)).

Introduction of new tri-party repo market rate indexes in the fall of 2015 contributed to improving pricing transparency. These indexes reflect a single composite overnight rate that investors receive in tri-party repo transactions across various types of government securities collateral. Over the past year, overall Treasury tri-party repo rates have hovered just above the rate paid via the Federal Reserve’s reverse repo operations (RRPs). Treasury GCF repo rates are more volatile, especially around quarter-ends, largely reflecting the pullback of broker-dealers affiliated with non-U.S. BHCs from the repo market close to the reporting dates ([Chart 4.9.7](#)).

Rates in the bilateral repo segment available through the pilot data collection were distributed in a much wider range as compared to the tri-party repo rates. The wider distribution of rates reflects the more diverse composition of bilateral repo market participants with varying credit profiles or different motivations for executing bilateral trades. For example, unlike tri-party trades, bilateral trades can be executed for the purpose of borrowing a specific security. These trades

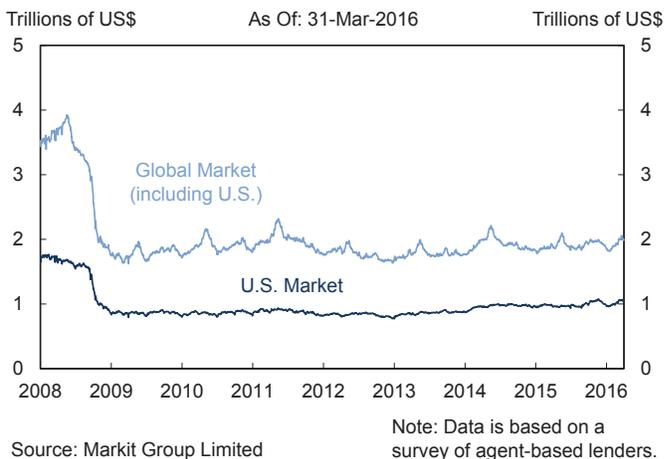
could entail a rate substantially lower than the general level of money market rates.

In 2015, intraday credit usage in the tri-party market remained below 5 percent of each dealer's aggregate tri-party book. All such credit was capped and provided on a committed basis. However, the industry is still working to bring the settlement of GCF repo transactions in line with the post-crisis reforms effected for tri-party repo generally. To this end, the Fixed Income Clearing Corporation will be suspending a subset of GCF transactions which require uncapped and uncommitted intraday credit by July 2016.

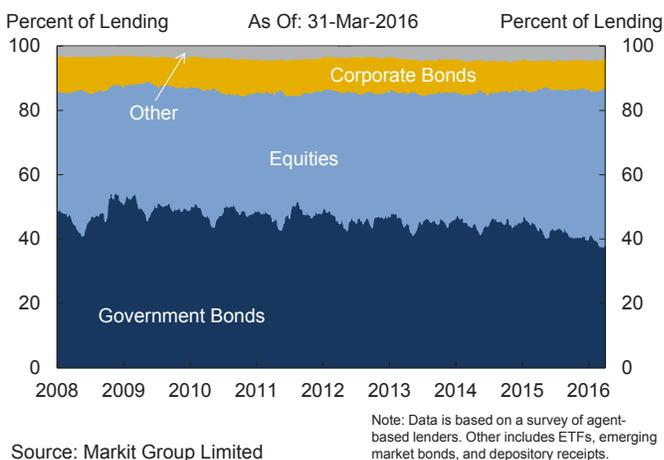
In December 2015, the FOMC raised the target range for the federal funds rate by 25 basis points to 0.25 to 0.50 percent. In concert with that decision, the Federal Reserve raised two key administered rates—the offered rate on overnight reverse repurchase agreement operations (ON RRP) and the interest on excess reserves (IOER) rate—to 0.25 percent and 0.50 percent, respectively. These changes in administered rates were consistent with previous FOMC communications concerning its plans for policy normalization. To support effective monetary policy implementation following the commencement of policy normalization, the FOMC indicated that capacity at the ON RRP facility would be temporarily elevated. In keeping with that plan, the FOMC indicated that the aggregate volume of ON RRP operations would be limited only by the Federal Reserve's holdings of Treasury securities available for such purposes—a level of about \$2 trillion. The FOMC also maintained a per-counterparty daily limit of \$30 billion for ON RRP operations.

After the changes in the Federal Reserve's administered rates became effective, the federal funds rate moved near the middle of the new target range and most other money market interest rates moved up in step with the federal funds rate. Apart from days around quarter-ends, take-up at the Federal Reserve's ON RRP operations generally ranged from \$50

4.9.8 Value of Securities on Loan



4.9.9 Global Securities Lending by Security Type



billion to \$150 billion in 2015—levels similar to those observed, on average, over much of 2014. Take-up has fallen well below this range in early 2016, however. As expected, ON RRP take-up at quarter-ends was substantially larger—including take-up of about \$475 billion at year-end—reflecting the decline in overnight investment options available to MMFs and other institutional investors, which is primarily attributable to the pullback of non-U.S. counterparties at those times. ON RRP operations have generally established a soft floor on the level of repo rates and have helped to keep the federal funds rate and other money market interest rates at levels consistent with the FOMC's policy intentions. Overnight funding rates briefly moved below the FOMC's target range at year-end, again largely reflecting the efforts of foreign depository institutions to limit the size of their balance sheets. However, the federal funds rate and other short-term rates quickly moved back to the middle of the target range when normal trading conditions resumed at the start of 2016.

Securities Lending

The estimated value of securities on loan globally was approximately \$2.0 trillion as of March 2016—modestly higher than the estimated value at the same point one year earlier (**Chart 4.9.8**). The value of securities on loan continued to hover between \$1.8 trillion and \$2.1 trillion during this period, remaining within the range that it has largely occupied over the past five years. The estimated U.S. share of the global market ticked upward, reaching a post-crisis high of over 54 percent in late 2015, before falling to 51 percent as of the end of the first quarter of 2016.

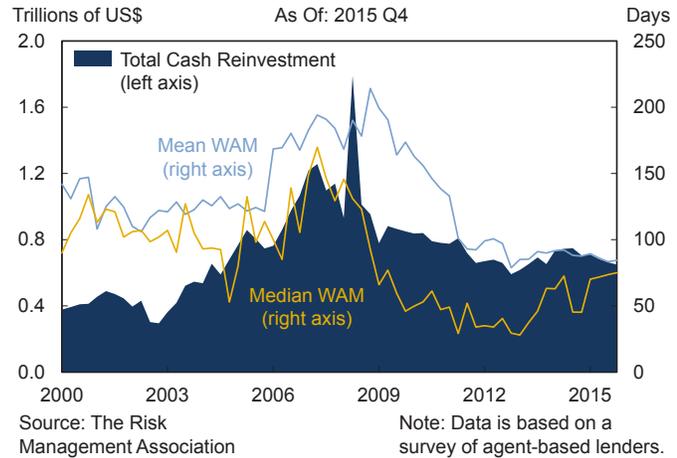
Government bonds and equities are estimated to comprise over 85 percent of the securities lent globally (**Chart 4.9.9**). In the first three months of 2016, the share represented by equities climbed higher to approximately 49 percent, surpassing government bonds, which fell by an offsetting amount, and which now account for approximately 38 percent of the market. Retirement funds, mutual funds, and

government bodies—including central banks—remain the most active lenders of securities.

Collateral management practices vary across jurisdictions, likely due to differences in both market structure and regulatory requirements. In the United States, cash is used as collateral for the majority of securities lending transactions, though this share is estimated to have declined in recent years. In 2015, the use of cash collateral in the United States is estimated to have fallen from \$705.0 billion to \$649.4 billion (**Chart 4.9.10**). The median WAM of cash reinvestment reversed the downward trend observed in 2014, while the mean WAM continued to decline slightly in 2015. Outside of the United States, non-cash collateral, such as equities, corporate bonds, or ABS, is estimated to account for a greater portion of total collateral than cash.

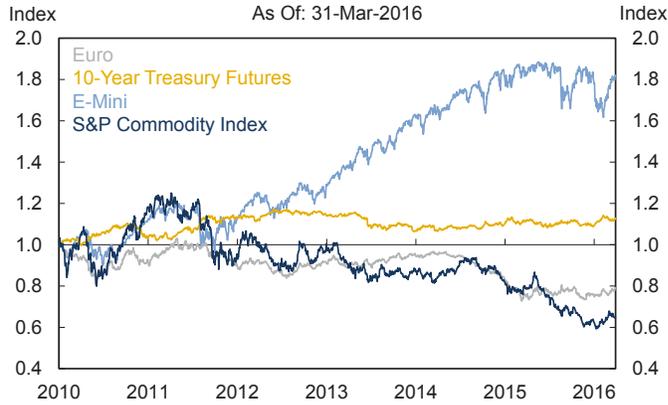
To improve data availability with respect to securities lending, in 2014 the OFR, Federal Reserve System, and SEC launched a data collection pilot focused on this market. This pilot was completed in the first quarter of 2016. The participating agencies are currently analyzing the collected data. Aggregate results will be published, which will provide market participants and policymakers with better insights into the structure of the securities lending market, including collateral management practices.

4.9.10 U.S. Securities Lending Cash Reinvestment



4.10 Derivatives Markets

4.10.1 Normalized Future Prices



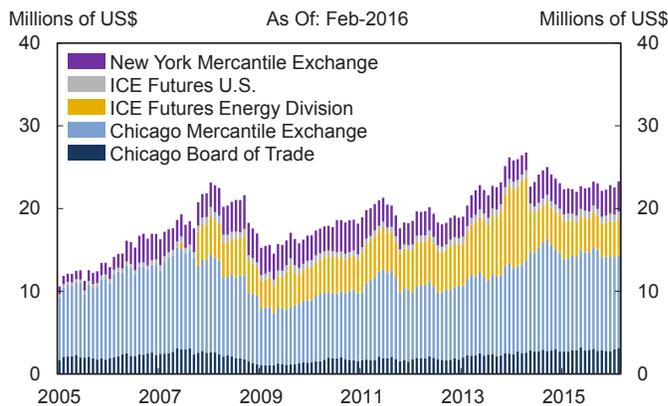
Source: Bloomberg, L.P.

4.10.2 Market Volatility Indices



Source: Bloomberg, L.P.

4.10.3 Selected Exchange Open Interest



Source: CFTC

4.10.1 Futures

Futures markets in the first half of 2015 were relatively subdued, with equity futures and many currency and fixed income product prices remaining relatively flat over the period (Chart 4.10.1). These moderated price movements left some market volatility measures just above multi-year lows, often well below ranges experienced during the financial crisis or during periods of international market uncertainty, such as in 2011 (Chart 4.10.2). From these levels, equity market volatility spiked at the end of August, sparked by growth and credit concerns in China; this volatility peaked on August 24, with extreme market movements in the opening hour, resulting in a significant number of market halts and, in the following months, discussions of potential market structure reforms (see Box G). Though fixed income volatility remained low in late summer, in February 2016, both Treasury and equity volatility indices pointed to increased market uncertainty, and, in combination with a rise in Treasury prices, a potential “flight to quality.”

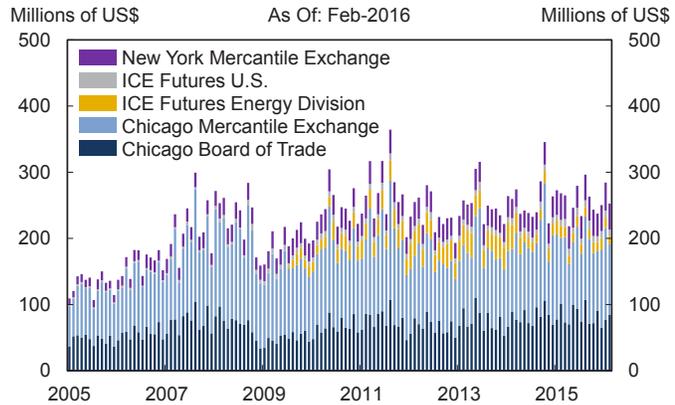
One exception to the moderate trend in early 2015 was in the energy futures markets, where declines in crude oil prices in late 2014 caused crude oil volatility to strongly increase in late 2014 and remain elevated since that point. These price movements occurred against a background of generally flat activity and position levels in the rest of the futures market. Open interest and volume on many of the major futures exchanges remained relatively unchanged through the year, often at or just below historic highs (Charts 4.10.3, 4.10.4). These levels come after a strong recovery in market activity after the financial crisis, with some specific periods of unusually high activity as seen in August 2011 and October 2014 attributable to widely-known points of similarly unusual volatility. Open interest and trading volume of specific futures products have seen somewhat more variation in recent years, with strong increases in crude oil gross positions and, to a lesser extent, Treasury futures (Charts

4.10.5, 4.10.6). These increases mirror the underlying movements in product volatility, with the initial increases in crude oil futures positions and volume occurring in the latter part of 2014, continuing through this year.

Net positions held by market participants in these contracts, as reported in the CFTC weekly position reports, have generally been lower than prior years, on a net basis, for many major contracts (**Charts 4.10.7, 4.10.8**). As energy prices fell during the last few years, the positions of commodity end-users like oil producers mirrored the downward trend. During the same period, reductions in short dealer positions balanced this change in positioning. In the fixed income space, positions across a number of investor categories fell into and through 2015, returning to average historical ranges. This net fall is in contrast to the increase in gross open interest noted in some products.

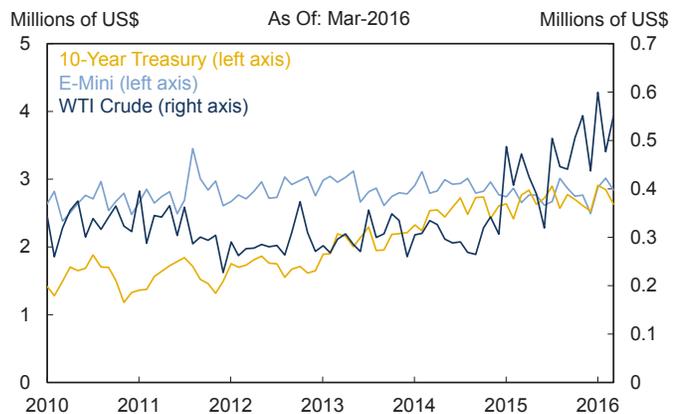
With changes in the regulatory structure for U.S. swaps markets, there has been a movement of activity between swap and futures markets, commonly known as “swap futurization.” One area of specific note is in commodities, primarily energy, as a number of new swap-equivalent futures products were introduced in late 2012 when swap rules came into effect. Much of the transition from swap to futures products for this asset class was completed late that year, with fewer large investors transitioning in recent years. Interest rate swap futures contracts continue as a listed alternative to swaps on a few U.S. futures exchanges, including the Chicago Mercantile Exchange (CME) and Eris. Volumes and open interest in these products, which either deliver an interest rate swap of a specified maturity or cash settle, increased rapidly immediately after their introduction; however, the size of the market for these products still remains much smaller than that for standard interest rate swaps (**Chart 4.10.9**).

4.10.4 Selected Exchange Volume



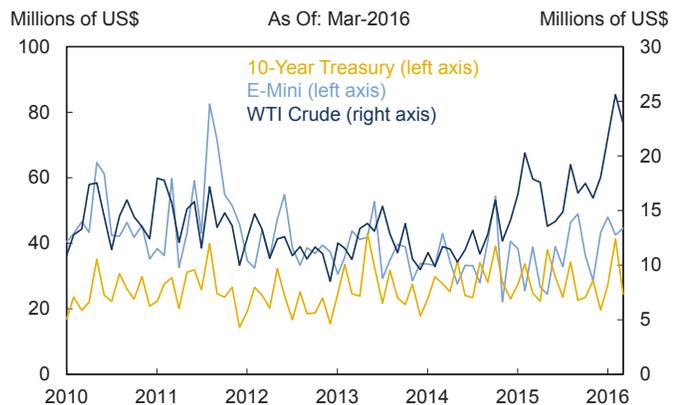
Source: CFTC

4.10.5 Selected Futures Open Interest



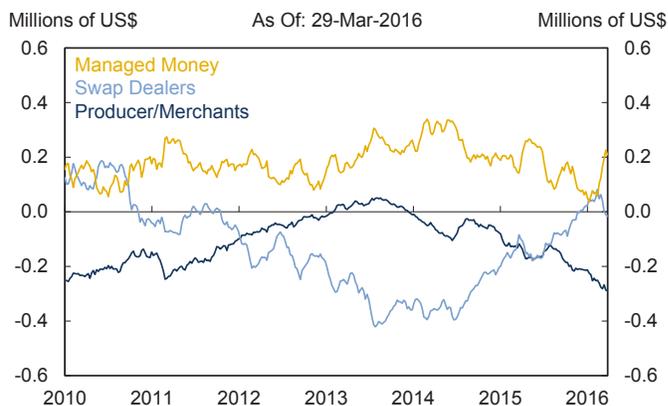
Source: Bloomberg, L.P.

4.10.6 Selected Futures Volume



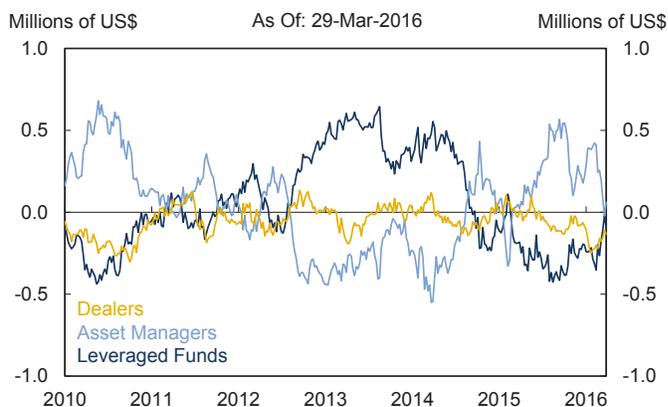
Source: Bloomberg, L.P.

4.10.7 WTI Crude COT



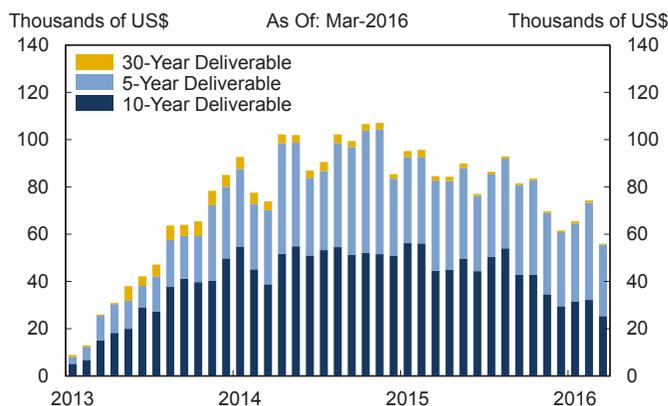
Source: Bloomberg, L.P.

4.10.8 10-Year Treasury Traders in Financial Futures



Source: Bloomberg, L.P.

4.10.9 CME Rate Swap Futures Open Interest



Source: Bloomberg, L.P.

4.10.2 Options

Options are contracts providing the owner with the right to buy or sell a specific underlying interest at a specified price. Options can be used by investors to hedge their investments in equity securities and other products. While options can trade on exchanges or in the over-the-counter (OTC) market, all standardized (or listed) options are traded on registered national securities exchanges. Moreover, except for certain index options, standardized options can trade on multiple exchanges. Transactions in standardized options are all centrally cleared by a single clearing agency—the Options Clearing Corporation. The Options Clearing Corporation also is the issuer and guarantor of each standardized options contract.

Currently, there are fourteen registered national securities exchanges which list and trade standardized equity options, and they offer different market models (e.g., pro-rata execution allocation, price-time execution allocation) and pricing structures (e.g., payment for order flow, make-take fee structure). Over half of these exchanges (or options facilities of existing exchanges) were established in the last decade, including, more recently, EDGX Options in 2015 and ISE Mercury in January 2016. According to Options Clearing Corporation data, the total exchange-traded equity options volume has been relatively steady since 2008, ranging from approximately 3.3 billion contracts per year to approximately 3.8 billion contracts per year, with the exception of 2011, in which there was volume of 4.2 billion contracts. Moreover, there are currently over 4,000 equity securities underlying exchange-traded equity options, and more than 800,000 individual exchange-traded options series on these underlying equity securities.

With respect to OTC equity options, which generally are not centrally cleared by a clearing agency and settle bilaterally between the counterparties, Bank for International Settlements (BIS) data shows that the global notional amount of outstanding OTC equity

options was approximately \$3.8 trillion as of the end of 2015. The notional amount of outstanding OTC equity options increased significantly between 1998 and the first half of 2008 from approximately \$1.1 trillion to over \$7.5 trillion, before declining sharply in the second half of 2008 to approximately \$4.8 trillion. Since the second half of 2008, the notional amount remained relatively steady in the \$3.8 trillion to \$4.9 trillion range (Chart 4.10.10).

While the notional amount of outstanding OTC equity options is large in absolute magnitude, OTC equity options accounted for less than one percent of the global OTC derivatives market as of the end of 2015. Furthermore, this fraction has been generally declining over time (Chart 4.10.11).

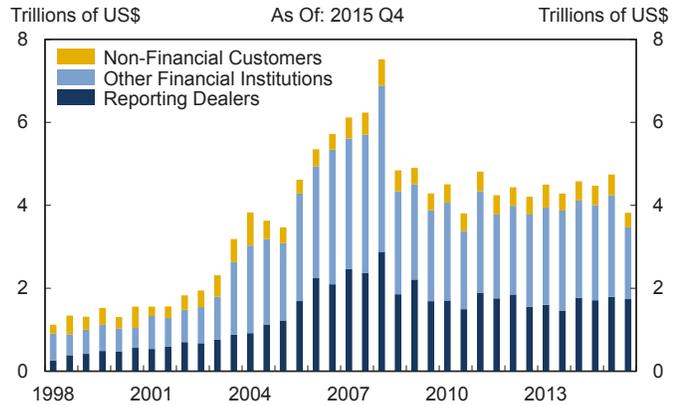
BIS data also shows that the global market value of OTC equity options transactions was almost \$350 billion as of the end of 2015. The market value of OTC equity options transactions increased significantly between 1998 and the second half of 2007 from under \$200 billion to approximately \$900 billion, before declining to approximately \$500 billion in the second half of 2009. The market value of OTC equity options transactions remained in the \$350 billion to \$530 billion range since the second half of 2009 (Chart 4.10.12).

Within the U.S. banking sector, OTC equity option exposures are concentrated in a small number of major institutions. Among BHCs, the largest six institutions, accounting for 53 percent of aggregate sector assets, hold 90 percent of the OTC equity option notional outstanding that is held by BHCs (Chart 4.10.13).

4.10.3 OTC Derivatives

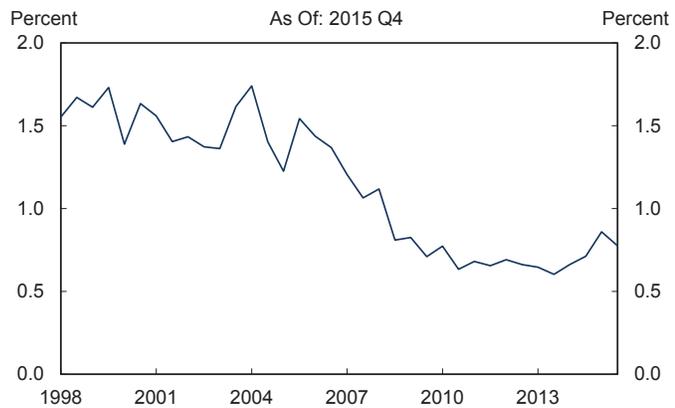
Globally, the gross notional amount of outstanding OTC derivatives across all asset classes declined to an estimated \$493 trillion as of the end of 2015, down 29 percent from its peak in 2013 (Chart 4.10.14).

4.10.10 OTC Equity Options: Global Notional Outstanding



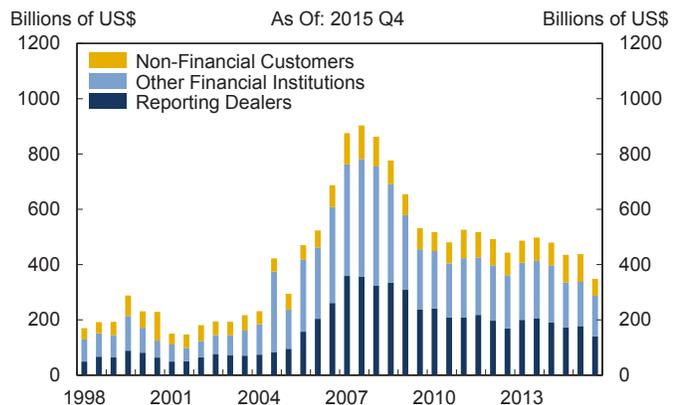
Source: BIS, Haver Analytics

4.10.11 OTC Equity Option Share of All OTC Derivatives



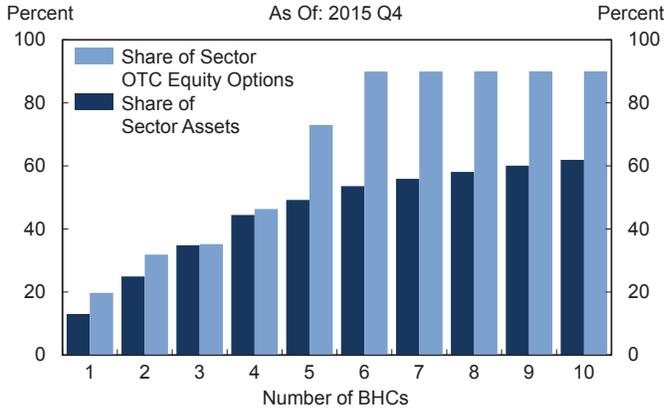
Source: BIS, Haver Analytics

4.10.12 OTC Equity Options: Global Market Value



Source: BIS, Haver Analytics

4.10.13 BHC OTC Equity Option Exposure

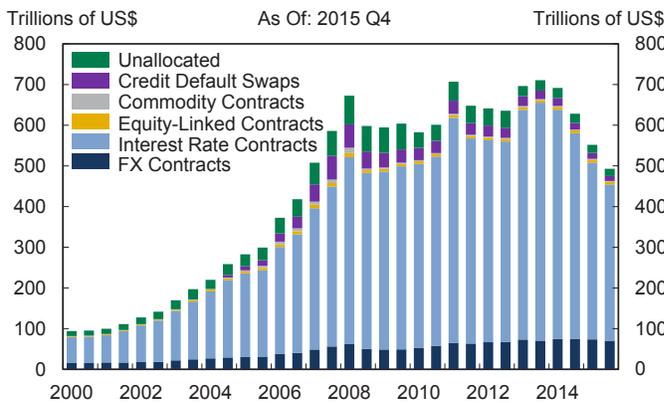


Source: FR Y-9C

Note: Ten largest U.S. BHCs. Share of options calculated as notional amounts outstanding.

The decline is primarily driven by a reduction in the notional outstanding for interest rate derivatives (IRDs), which is largely attributable to increased compression activity in recent years. Compression is a risk management process that allows market participants to terminate derivatives contracts with offsetting or nearly offsetting risk exposures to reduce the size of notional exposures (see Box D). On a global basis, IRDs continue to dominate the OTC derivatives markets, accounting for nearly 78 percent of total notional amounts outstanding as of the end of 2015.

4.10.14 Global OTC Derivatives Market

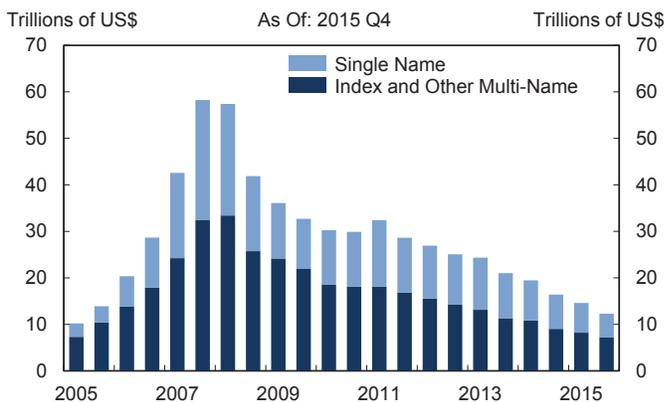


Source: BIS, Haver Analytics

Note: Notional amounts.

Although the underlying market activity for IRDs has remained high, the increased level of compression activity has resulted in a significant reduction in the overall outstanding notional size of the market, making it appear as if the IRD market is declining. Based on BIS data, since the beginning of 2014 to June 2015, the total global notional outstanding for IRDs declined from \$585 trillion to \$435 trillion, further falling to \$384 trillion at the end of 2015. During the period from the beginning of 2015 to June 2015, compression has reduced the notional outstanding of IRDs by \$230 trillion, according to ISDA data. When adjusted for compression, the IRD notional outstanding would be approximately \$620 trillion as of June 2015, an increase of 18 percent since the beginning of 2014 (Chart D.3 in Box D). CCP-level compression has grown rapidly and accounts for over 98 percent of IRD compression activity.

4.10.15 Credit Derivatives Outstanding



Source: BIS, Haver Analytics

Note: Notional amounts.

The global notional outstanding for credit derivatives continued to decline from its pre-crisis levels to an estimated \$12.3 trillion as of the end of 2015 (Chart 4.10.15). While compression has contributed to the decline in outstanding notional in the CDS market, the decline over the past year is largely attributed to a reduction in inter-dealer activity, according to the BIS, and in part to loss of investor appetite in credit derivatives combined with general structural changes associated with derivatives market reform regulations adopted after the financial crisis.

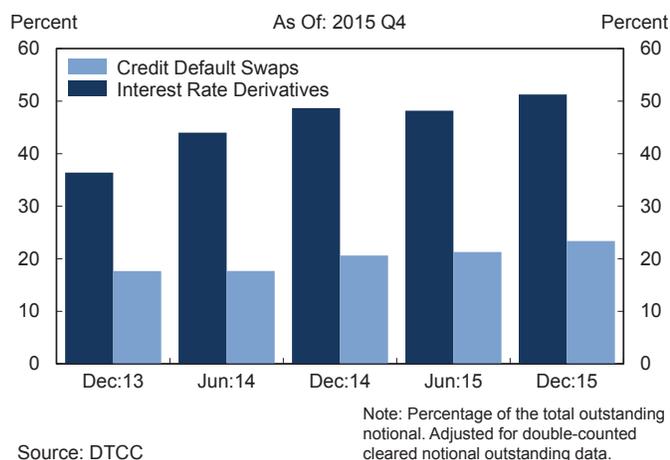
In the United States, the CFTC's Weekly Swaps Report provides a snapshot of aggregate data on OTC derivatives volumes and notional amounts for transactions involving U.S. market participants that do not reference individual securities or small baskets of securities based on data submitted to SDRs. As with the trends noted in the global market, the notional outstanding amounts for IRDs and CDS index swaps in the U.S. market have steadily declined since the beginning of 2014 and stood at approximately \$250 trillion and \$4.8 trillion respectively as of December 2015, in part due to compression. Although the stock of outstanding positions declined, the notional trading volume of IRD transactions has grown to a daily average of over \$519 billion as of the fourth quarter of 2015, an increase of 10 percent from the same period in 2014.

4.10.4 Central Counterparty (CCP) Clearing

In 2009, the Group of Twenty (G-20) leaders agreed that all standardized OTC derivatives should be centrally cleared. The Tenth Progress Report on Implementation of OTC Derivatives Market Reforms published by the FSB indicates that as of September 2015, 12 of 24 FSB member jurisdictions had frameworks in place and standards for making specific central clearing determinations for a substantial portion of the OTC derivatives transactions in their jurisdictions. During 2015, the market share of the centrally cleared notional amount outstanding globally stood at an estimated 51 percent for IRDs and 23 percent for credit derivatives, according to Depository Trust & Clearing Corporation (DTCC) data (**Chart 4.10.16**). A greater share of the global OTC derivatives market is expected to transition to central clearing in the coming years as EU authorities implement central clearing rules.

In the United States, requirements to centrally clear certain types of interest rate and credit derivatives have been in force since 2013. Clearing volumes have continued to remain high following a rapid growth in 2014. On average, approximately \$277 billion in notional volume of IRDs and \$14 billion in notional volume of CDS index swaps were cleared each day during the fourth quarter of 2015.

4.10.16 Global Central Clearing Market Share



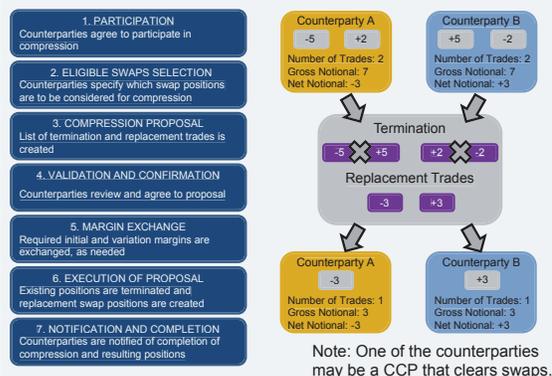
Box D: Trade Compression in Derivatives Markets

Compression is a mechanism that emerged more than a decade ago as a tool to reduce OTC derivatives gross notional exposure, associated risks, and operational inefficiencies. Compression has the potential to reduce operational and counterparty credit risks associated with derivatives transactions. Importantly, compression also has the effect of reducing the notional amounts of outstanding trades, which has implications for the measurement of derivatives market exposures over time. The use of this mechanism has rapidly grown in recent years, driven by tougher regulations and developments in clearing.

Compression

As a post-trade risk management service, compression enables two or more counterparties (including CCPs) to terminate and replace similar swap transactions with a smaller number of trades and a decreased gross notional value before the positions expire without changing the market risk profile (e.g., present value and future cash flows) of the trading position embodied by those trades (**Chart D.1**). Compression can be done on a bilateral or multilateral basis, which allows a group of market participants to compress their trades based on a set of agreed parameters in periodic cycles. It should be noted that the accounting treatment for derivatives compression activities differ between U.S. generally accepted accounting principles (GAAP) and international financial reporting standards (IFRS) and affect the preferred approach in different jurisdictions.

D.1 Bilateral Compression Process



Compression vs. Netting

While both compression and netting (e.g., payment or close-out netting) are risk-reducing mechanisms, netting generally refers to a process which allows market participants to reduce their counterparty credit risk based on a netting agreement (e.g., standard ISDA legal agreements) by offsetting amounts due. Unlike compression, netting does not change the number of individual trades or gross notional outstanding. Different terms such as tear-up, netting, or termination may be used by market participants and CCPs, but if used to describe the process of reducing the number of individual trades or gross notional value, they all are references to compression. Compression is thus akin to the netting of fungible, exchange-traded instruments.

D.2 Currently Available Compression Options

| Provider | Non-cleared Swaps | | Cleared Swaps | | | |
|--------------------------------------|---|---------------|---------------|-----------------|---------------------------|-----------------------------------|
| | Bilateral | Multilateral* | Multilateral* | Duo / Bilateral | Unilateral / Solo Netting | Unilateral / Solo Coupon Blending |
| Bilateral (no service provider) | ✓ | | | | | |
| TriOptima (private service provider) | | ✓ | ✓ | | | |
| CME (CCP) | | | | | ✓ | ✓ |
| EUREX (CCP) | | | ✓ | ✓ | ✓ | ✓ |
| LCH (CCP) | | | ✓ | ✓ | ✓ | ✓ |
| Swap Execution Facilities (SEFs)** | | | | | ✓ | ✓ |
| | More eligible market participants, frequent compression cycles, and options | | | | | |

Note: *There are 30-40 compression cycles annually, each with a single currency. ** SEFs are trading venues that offer trade execution services for swaps that are mandated for central clearing and SEF trading. Compression trades can be executed on SEFs, but the compression itself is performed by CCPs.

Source: TriOptima, CME, EUREX, LCH

Growth of Compression

Initially developed for non-centrally cleared derivatives, new compression offerings by CCPs and swap execution facilities (SEFs) have emerged for centrally cleared IRD transactions. These new service offerings, by CCPs in particular, have expanded compression to more products and market segments as the demand for compression and central clearing volumes have grown (Chart D.2).

Compression provides a number of potential benefits to market participants and CCPs. By reducing the size and number of swaps positions outstanding, compression helps to reduce operational risk and administrative costs. Compression can also reduce the overall level of counterparty risk among two or more market participants by eliminating offsetting trades. Compression also allows CCPs to reduce the number of individual positions and gross notional amount of outstanding positions on their swap book, thereby decreasing the complexity and cost of liquidating or porting a swap portfolio in a default scenario.

Because notional amounts are used in implementing certain regulations, trade compression may have implications for the impact of regulations on financial institutions. New capital rules have given dealers and derivatives clearing banks strong incentives to compress trades. The new Basel III capital standards and the U.S. risk-based capital and supplementary leverage ratio (SLR) rules require banks and BHCs to hold capital against their RWAs and total leverage exposures which depend in part on derivatives exposures outstanding. Thus, dealers and banks are increasingly motivated to use compression to reduce the notional size of their swaps portfolios.

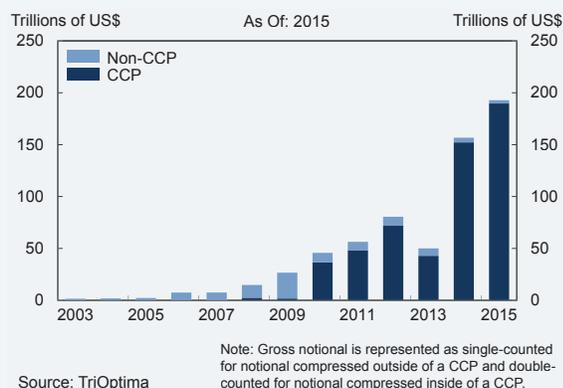
At the end of 2015, cumulative global OTC IRD compression volume is estimated to have grown

to over \$600 trillion in notional outstanding (Chart D.3). CCP-level compression has grown rapidly and accounts for an estimated 98 percent of IRD compression activity.

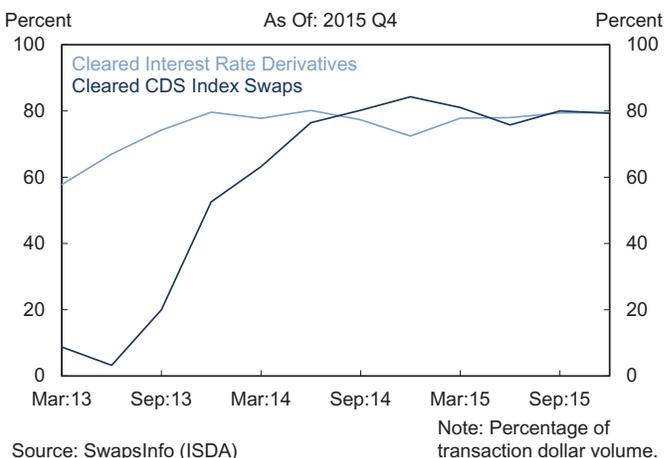
The Effect of Clearing and Compression

Compression may change the way observers measure the overall size of OTC derivatives markets. Notional traded volumes are growing while, due to compression, notional outstanding levels are falling. As CCPs and market participants increase their use of compression, gross notional outstanding in OTC derivatives may continue to decline even as net exposures to OTC derivatives remain constant or increase. However, though recent compression efforts may lead to short-term reductions in gross notional even as exposure increases, the netting and simplification achieved through compression may better align portfolio notional and exposure levels over longer horizons. Innovative forms of compression, which in some cases involve replacing existing contracts with new ones with different economic terms including changes in risk profile, may involve additional operational complexities and other risks which need to be closely monitored.

D.3 Interest Rate Derivative Compression Volume



4.10.17 U.S. Central Clearing Market Share



Taken together, these clearing volumes account for about 84 percent of the average daily volume aggregated across these two product classes (**Chart 4.10.17**). At the same time, these clearing volumes are concentrated with LCH. Clearnet and CME for interest rate swaps and ICE Credit and ICE Europe for CDS.

4.10.5 Non-Cleared Swaps

Margin requirements imposed by CCPs on their clearing members significantly reduce the counterparty risk of cleared transactions. Although a broad swath of the OTC derivatives market is expected to eventually be centrally cleared, a smaller segment of non-centrally clearable products may continue to play an important role for various types of market participants, for example, by facilitating their hedging activities. The non-centrally cleared market segment notional outstanding remained significant at about 33 percent of the global OTC IRD market at the end of July 2015. These products are not currently subject to regulatory margin requirements. To address risks associated with non-cleared OTC derivatives, in 2015, the prudential regulators (the federal banking agencies, the FHFA, and the Farm Credit Administration) and the CFTC finalized respective rules establishing requirements for initial and variation margining for swaps that are not centrally cleared (**see Section 5.2.1**). The new margin requirements are scheduled to phase in starting in September 2016. In March 2016, regulators in Japan published final uncleared swap margin rules. Regulators in the EU published final draft regulatory technical standards for collateralization of uncleared swaps in March 2016.

4.10.6 Regulated Platform Trading

Globally, jurisdictions have continued to make progress in implementing the G-20 Leaders' 2009 commitment that OTC derivatives be traded on exchanges or electronic trading platforms, where appropriate. In the United States, mandatory trading of certain interest rate and CDS index products on regulated platforms has been in effect since 2014, and as such, the United States remains one of two jurisdictions with platform trading rules in

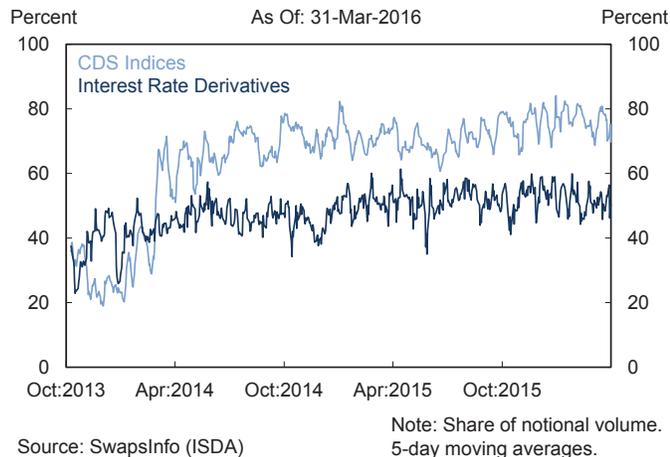
force. SEFs, a new type of OTC derivatives trading platform in the United States, allow multiple participants to trade OTC derivatives by accepting bids and offers, thereby bringing additional transparency and price competition to the swaps market.

Recent data reported by ISDA shows that on-SEF trading volumes have steadily increased over the course of 2015, following rapid growth in 2014. The average share of total notional volumes executed through SEFs has steadily increased from 45 to 53 percent for IRDs and 72 to 75 percent for CDS index swaps between the fourth quarters in 2014 and 2015 (**Chart 4.10.18**). The combined average daily notional volume for IRDs and CDS index swaps executed through SEFs reached \$319 billion during the fourth quarter of 2015, up from \$290 billion the same period in 2014 (**Chart 4.10.19**).

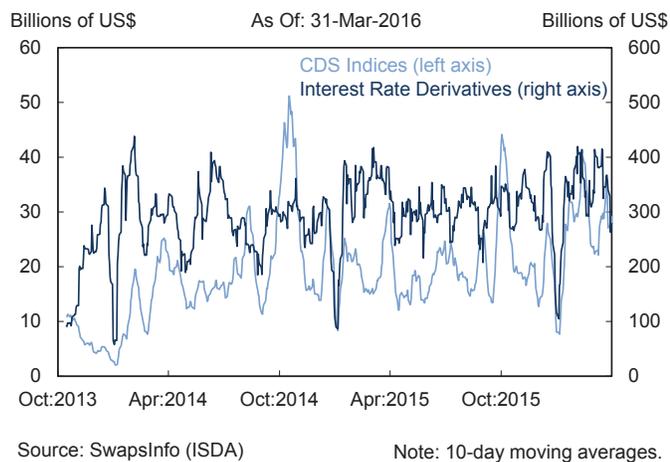
Since the beginning of mandatory SEF trading in 2014, market activity for USD-denominated IRD contracts has steadily increased. The average daily notional volume reached over \$331 billion during the fourth quarter of 2015, up 3 percent from the fourth quarter of 2014 and 38 percent from the fourth quarter of 2013 (**Chart 4.10.20**).

A recent study by the Bank of England finds a positive link between SEF trading (both voluntary and mandatory) and a significant improvement in liquidity, in particular for USD-denominated interest rate swaps which are most affected by the SEF mandate. The study postulates that the increases in volume and market liquidity result from enhanced transparency and the reduced search costs provided by SEFs. The associated reduction in execution costs associated with SEF trading is economically significant. Another recent academic paper by researchers from the SEC and Rutgers University examined the effect of post-trade reporting requirements and found similar improvements in liquidity and transaction costs in CDS markets. The CFTC granted full registration to 21 SEFs and continues to review the applications of additional SEFs.

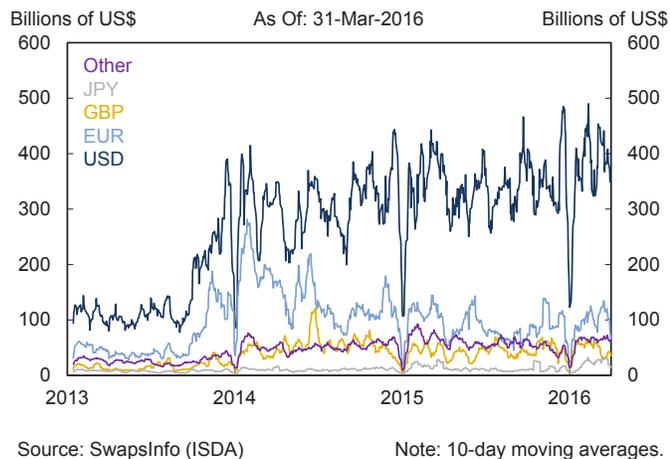
4.10.18 U.S. On-SEF Trading Share



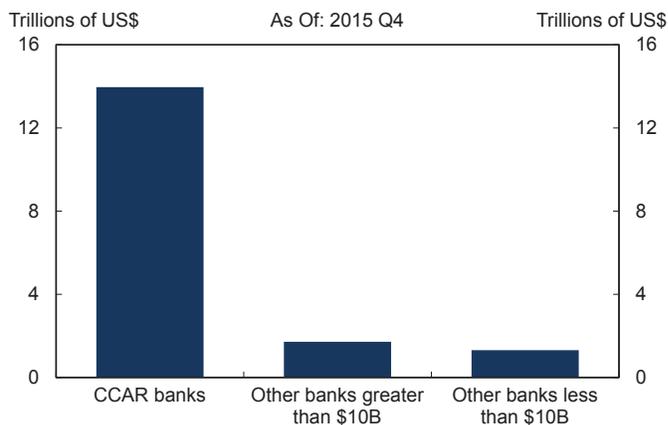
4.10.19 U.S. On-SEF Trading Volume



4.10.20 Interest Rate Derivatives Market Activity by Currency

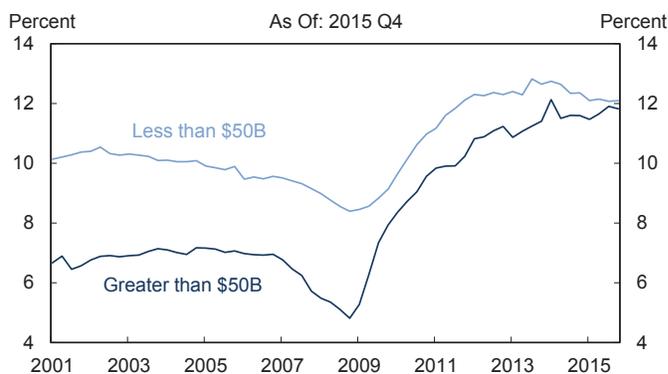


4.11.1 BHC Total Assets



Source: FR Y-9C

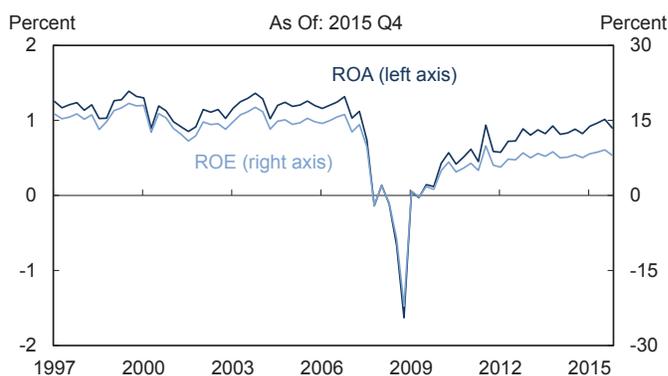
4.11.2 Common Equity Tier 1 Ratios



Note: Prior to 2014 Q1, the numerator of this ratio is tier 1 common capital. Beginning 2014 Q1 for "advanced approaches" BHCs and in 2015 Q1 for all other BHCs, the numerator is common equity tier 1 capital. For advanced approaches BHCs that have exited their parallel run, the denominator is total RWAs calculated under the advanced approaches framework (the standardized approach is used otherwise).

Source: FR Y-9C

4.11.3 Return on Equity and Return on Assets



Note: Return on equity is equal to net income divided by average equity. Return on assets is equal to net income divided by average assets.

Source: FR Y-9C

4.11 Bank Holding Companies and Depository Institutions

4.11.1 Bank Holding Companies and Dodd-Frank Act Stress Tests

BHCs are companies with at least one commercial bank subsidiary. Subsidiaries of BHCs may include other BHCs as well as nonbanks such as broker-dealers, investment advisers, and insurance companies. As of the fourth quarter of 2015, BHCs in the United States with greater than \$1 billion in assets held about \$17 trillion in assets collectively. More than three quarters of this total was held by the 31 BHCs, each with more than \$50 billion in total consolidated assets, that participated in the Federal Reserve's 2015 forward-looking stress testing and capital planning exercises (Chart 4.11.1).

Capital Adequacy

Capital levels at BHCs have risen significantly since the 2008 financial crisis. In July 2015, the Federal Reserve finalized a rule requiring each of the institutions identified as a G-SIB to increase its ratio of common equity tier 1 capital to RWAs by between an estimated 1.0 and 4.5 percentage points, depending on the magnitude of the bank's systemic footprint. Later in the year, the agency proposed standards for mandatory long-term debt and total loss-absorbing capacity for those large institutions. Since the crisis, the ratio of common equity tier 1 capital to RWAs has more than doubled at firms with more than \$50 billion in assets, and smaller BHCs have seen capital levels increase by more than a third (Chart 4.11.2). Higher capital levels such as these provide a larger buffer to absorb adverse fluctuations in net income that may result from poor profitability, operational and legal risks, and losses on loans and trading account assets. Many of the largest BHCs already meet the new standards for the minimum capital ratios, capital conservation buffers, and surcharges for systemically important financial institutions, although some of these requirements will not be fully phased-in for several more years.

Profitability

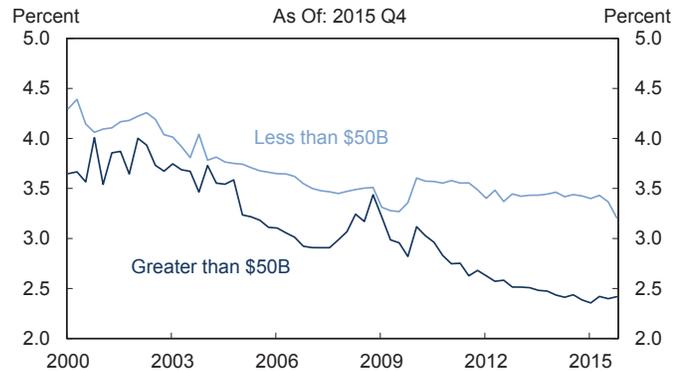
Earnings remained relatively flat in 2015, as BHCs continued to face a challenging interest rate environment and witnessed heightened foreign macroeconomic uncertainties. While return on equity (ROE) and return on assets (ROA) declined in the fourth quarter, they remain in their post crisis ranges (**Chart 4.11.3**). Net interest margins (NIMs) did not change significantly in 2015, with NIMs at large BHCs remaining close to their 15-year lows. The smaller post-crisis decline in NIMs at small and medium-size BHCs is in part attributable to a larger reduction in the cost of deposits at those institutions in the current interest rate environment (**Chart 4.11.4**). After several years of being elevated by mortgage-related lawsuits, litigation expenses at the largest firms declined in 2015 (**Chart 4.11.5**). Those declines in litigation expenses, combined with other efforts to cut costs, have bolstered profitability through a decline in noninterest expenses.

Asset Quality

Loans grew marginally as a share of assets in 2015, but that share remained well below its pre-crisis level. Robust growth in C&I loans and CRE has been partially offset by a reduction in residential mortgages held in loan portfolios in recent years (**Chart 4.11.6**). Loan loss reserves as a proportion of non-performing loans (NPLs) have grown across small and large banks in recent years (**Chart 4.11.7**). The share of NPLs continued to trend down in 2015 to its lowest level since 2006, but remained above its average from 1995 to 2005 (**Chart 4.11.8**). Despite the trend lower, delinquency rates on corporate loans have recently ticked higher following stress in the energy sector.

The Federal Reserve's SLOOS suggests that lending standards have remained relatively unchanged for both C&I and consumer loans in the past several years. Standards for many types of residential mortgages have eased gradually over that period, but remain fairly tight, particularly for nontraditional borrowers and borrowers with poor credit histories. Banks also had indicated strengthening demand and

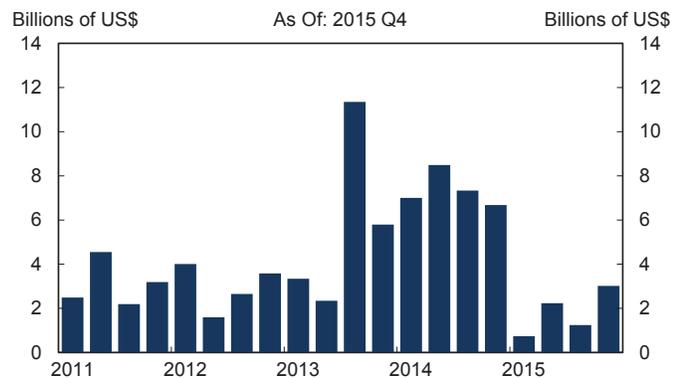
4.11.4 Net Interest Margins



Note: Bank holding companies must have completed the FR Y-9C form for the entire period between Q1 2010 and Q2 2015 to be included in this figure.

Source: FR Y-9C

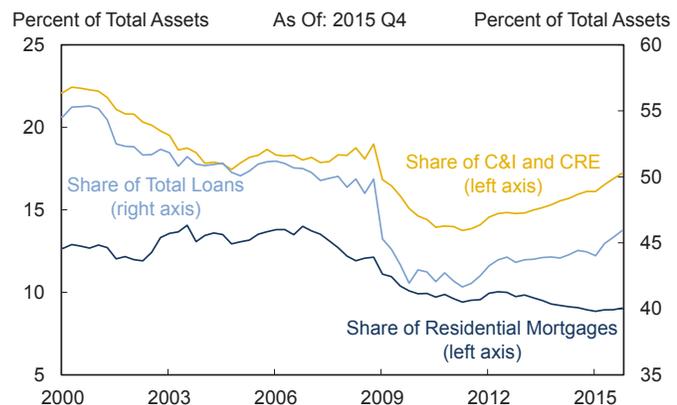
4.11.5 Litigation Expenses at Selected BHCs



Note: Includes litigation expenses at Bank of America, Citigroup, Goldman Sachs, JPMorgan Chase, Morgan Stanley, and Wells Fargo.

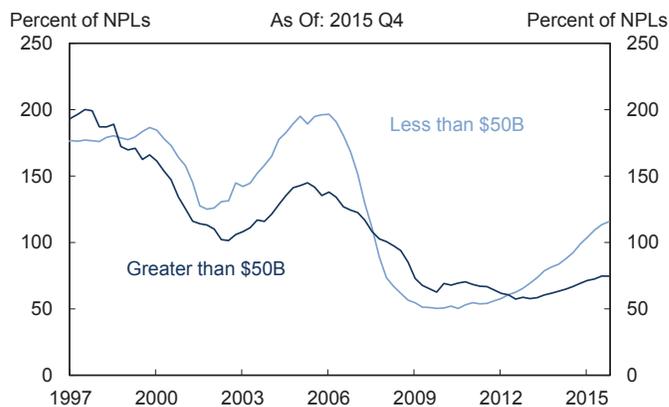
Source: FR Y-9C

4.11.6 Loan-to-Asset Ratios



Source: FR Y-9C

4.11.7 Loan Loss Reserves



Source: FR Y-9C

loosening standards for CRE loans over the past several years. However, standards on those loans were unchanged over the second half of 2015, and the federal banking agencies jointly issued a statement highlighting prudent risk management practices for CRE lending in December.

Trading asset and securities balances, as proportion of assets, remained flat in 2015. Higher-risk securities balances, which include securities like CLOs and structured products, declined as a proportion of total securities balances (**Chart 4.11.9**).

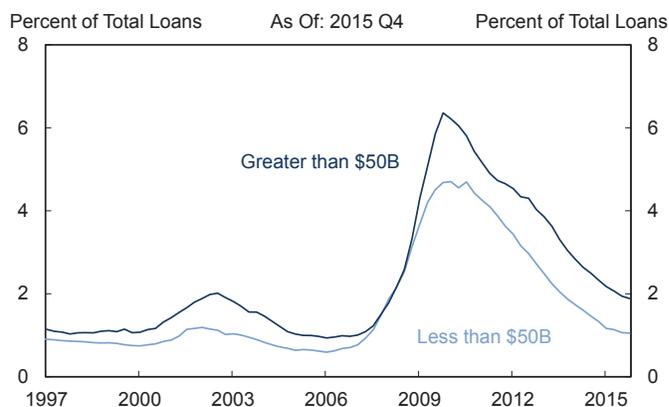
Forward-Looking Assessment

In March 2015, the Federal Reserve released the results of the 2015 annual Dodd-Frank Act stress tests (DFAST) and the Comprehensive Capital Analysis and Review (CCAR). A total of 31 BHCs with total consolidated assets of \$50 billion or more participated in the annual stress tests and CCAR.

DFAST evaluated whether the 31 BHCs have sufficient capital to absorb losses resulting from stressful economic and financial market conditions, using hypothetical scenarios designed by banking supervisors as well as the companies themselves. The supervisory severely adverse scenario used in DFAST 2015 reflected conditions of severe post-war U.S. recessions as it had in previous years, but included a more severe deterioration in corporate credit quality. That assumed deterioration resulted in a greater widening of corporate bond spreads, decline in equity prices, and increase in equity market volatility than in the 2014 severely adverse scenario. In the nine quarters of the planning horizon covered in the stress test, the aggregate projected tier 1 common equity ratio for the 31 BHCs fell from 11.9 percent in the third quarter of 2014, to a minimum level of 8.3 percent under the severely adverse scenario (**Chart 4.11.10**), but remained well above the minimum requirement of 5.0 percent.

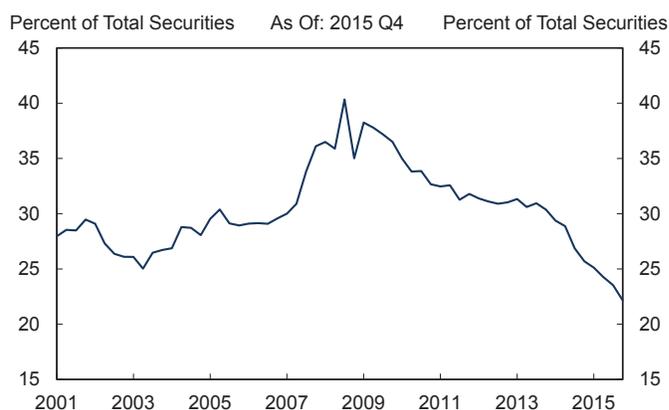
Through CCAR, the Federal Reserve evaluates the capital adequacy and the capital planning

4.11.8 Non-Performing Loans



Source: FR Y-9C

4.11.9 Higher-Risk Securities



Source: FR Y-9C

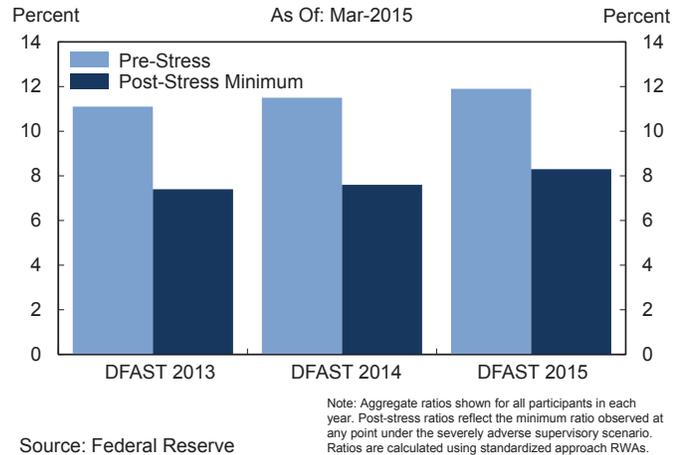
processes of the 31 BHCs, including proposed capital actions such as dividend payments and stock repurchases. The Federal Reserve considers both qualitative and quantitative factors in analyzing a firm's capital plan. In 2015, the Federal Reserve did not object to the capital plans and planned capital distributions of 28 of the 31 BHCs; issued a conditional non-objection to one BHC, requiring it to correct weaknesses in its capital planning process; and objected to the capital plans of two BHCs due to widespread and substantial weaknesses across their capital planning processes (**Chart 4.11.11**). The common equity capital ratio of the 31 BHCs collectively, a metric that compares high-quality capital to RWAs, has more than doubled from 5.5 percent in the first quarter of 2009 to 12.3 percent in the fourth quarter of 2015, reflecting a \$689 billion increase in common equity capital to \$1.1 trillion during the same period.

Liquidity Management

Over the past several years, holdings of selected high-quality liquid assets (HQLA) have increased at BHCs subject to the Liquidity Coverage Ratio (LCR), and holdings have remained relatively flat at other BHCs (**Chart 4.11.12**). Agency MBS balances have increased and Treasury securities balances have remained flat in recent quarters (**Chart 4.11.13**). However, BHCs subject to the LCR have seen a marginal decline in the ratio of selected HQLA to total assets in 2015, mainly due a decline in reserve balances deposited at Federal Reserve Banks. The decline in reserve balances reportedly mirrors a reduction in BHCs' use of certain types of less stable deposit funding which is subject to significant run-off rate assumptions in the LCR regime.

The proposed net stable funding ratio (NSFR) complements the LCR by defining a liquidity standard with the objective of reducing funding risk over a one-year horizon and limiting the reliance on short-term wholesale funding. Estimates of the aggregate NSFR for BHCs subject to the LCR continue to be generally near or above the required ratio of 100 percent

4.11.10 Initial and Stressed Tier 1 Common Capital Ratios



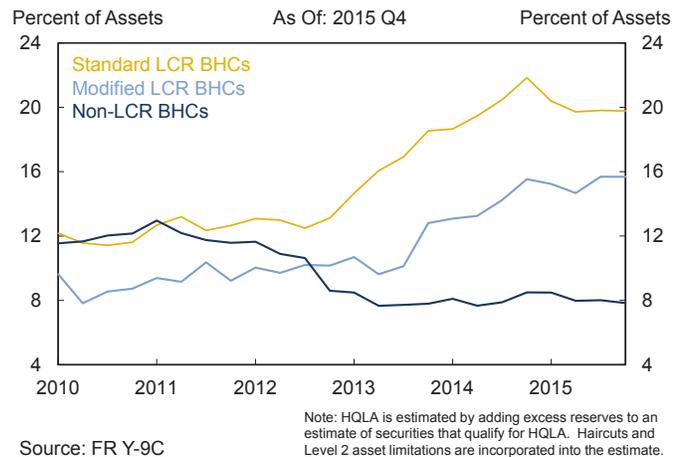
4.11.11 Federal Reserve's Actions in CCAR 2015

| Non-Objection to Capital Plan | | |
|-------------------------------|------------------------|-------------------|
| Ally Financial | Comerica | MUFG Americas |
| American Express | Discover Financial | Northern Trust |
| Bank of America** | Fifth Third Bancorp | PNC Financial |
| Bank of New York Mellon | Goldman Sachs* | Regions Financial |
| BB&T | HSBC North America | State Street |
| BBVA Compass | Huntington Bancshares | SunTrust |
| BMO Financial | JPMorgan Chase* | U.S. Bancorp |
| Capital One Financial | KeyCorp | Wells Fargo |
| Citigroup | M&T Bank | Zions |
| Citizens Financial | Morgan Stanley* | |
| Objection to Capital Plan | | |
| Deutsche Bank | Santander Holdings USA | |

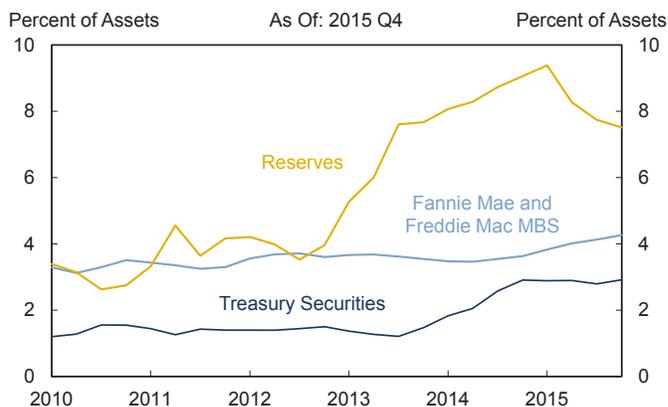
Note: *Goldman Sachs, JPMorgan Chase, and Morgan Stanley met minimum capital requirements on a post-stress basis after submitting adjusted capital actions. **Bank of America submitted a new capital plan to address certain weaknesses in its capital planning processes at the end of September 2015 as required by the Federal Reserve, and, in December 2015, the Federal Reserve announced that it did not object to the resubmitted capital plan.

Source: Federal Reserve

4.11.12 Selected High-Quality Liquid Assets at BHCs

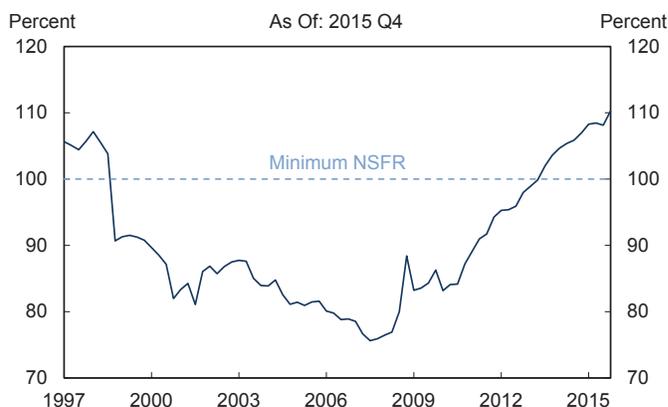


4.11.13 Selected Liquid Assets at Standard LCR BHCs



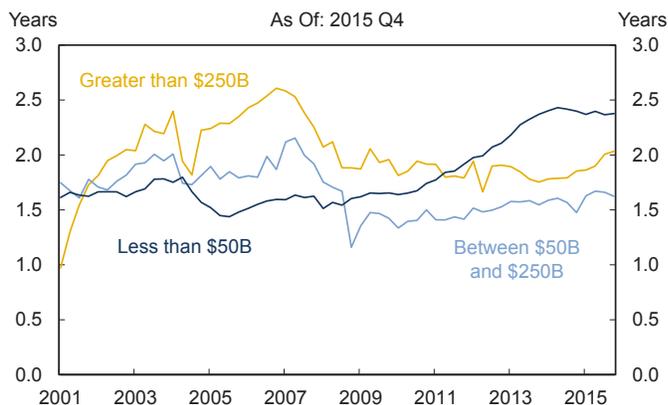
Source: FR Y-9C

4.11.14 Net Stable Funding Ratio at Standard LCR BHCs



Source: FR Y-9C, FR 2900
 Note: NSFR is estimated using quarter-end balances reported in FR Y-9C and FR 2900 filings.

4.11.15 Weighted-Average Duration Gap



Source: FR Y-9C

(Chart 4.11.14). The share of liabilities in repurchase agreements has declined in recent years.

The duration gap, a measure of interest rate risk at BHCs, has remained relatively stable at small and large banks. For small banks, the elevated measure suggests a heightened sensitivity to interest rate fluctuations (Chart 4.11.15).

Market Perception of Value and Risk

Large BHC equity valuations, as measured by price-to-book (P/B) and price-to-earnings ratios, were generally flat in 2015. Valuations declined in the first quarter of 2016 and remain below their pre-crisis levels (Chart 4.11.16).

Concerns about low oil prices, the challenging interest rate environment, and sluggish global growth likely contributed to the valuation declines. Credit spreads at the six largest BHCs generally were unchanged in 2015 and widened in the first quarter of 2016, but remain well below the levels they reached during the financial crisis (Chart 4.11.17).

Trends in Consolidation of BHCs

The volume of M&A in the banking industry increased in 2015 and is currently approaching pre-crisis levels. Deal volume is being driven predominantly by mergers among BHCs for which the combined entity will hold less than \$10 billion in assets (Chart 4.11.18).

Consolidation can be motivated by a desire to increase market presence or attain economies of scale, particularly in the context of low NIMs. In the current regulatory environment, however, mergers that increase the size and complexity of banking institutions could potentially lead to higher levels of supervision and regulation. For example, BHCs with \$10 billion or more in assets are required to have internal stress testing procedures; those with \$50 billion or more in assets are subject to supervisory stress testing and the Federal Reserve's CCAR; and advanced approaches institutions, generally those with \$250 billion or more in assets or \$10 billion or more in on-balance-sheet foreign exposure, are subject to

other requirements, such as the countercyclical capital buffer (CCyB) and SLR.

Insured Commercial Banks and Savings Institutions

At the end of 2015, the banking industry included 6,182 FDIC-insured commercial banks and savings institutions with total assets of \$16.0 trillion. There were 1,688 institutions with assets under \$100 million and 702 institutions with assets over \$1 billion. The total number of institutions fell by 322 during 2015 due to failures and mergers. Failures of insured depository institutions have continued to decline since the financial crisis; eight institutions with \$7 billion in total assets failed in 2015, which represents the smallest number of failures since 2007 (Chart 4.11.19).

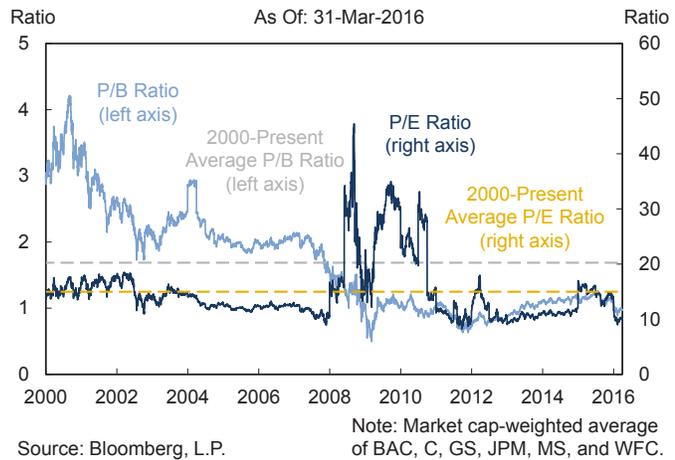
As of December 31, 2015, 183 institutions—3.0 percent of all institutions—were on the FDIC’s “problem bank” list, compared to 291 problem banks in December 2014. Banks on this list have financial, operational, or managerial weaknesses that require corrective action in order to operate in a safe and sound manner.

Pre-tax income for all U.S. commercial banks and savings institutions totaled \$235 billion in 2015, representing a 6.2 percent increase from 2014 (Chart 4.11.20), driven in large part by the sale, securitization, and servicing of mortgage loans. Net interest income rose by 2.2 percent, primarily due to a decline in interest expense, and interest-earning assets grew 5.8 percent. Almost two-thirds of commercial banks and savings institutions reported higher earnings in 2015 compared to 2014. Credit quality continues to improve as the noncurrent ratio declined to 1.56 percent of total loans. Loan loss provisions increased 24 percent from 2014 to cover the risk inherent in the growing loan portfolio as well as to cover rising risk in the energy sector.

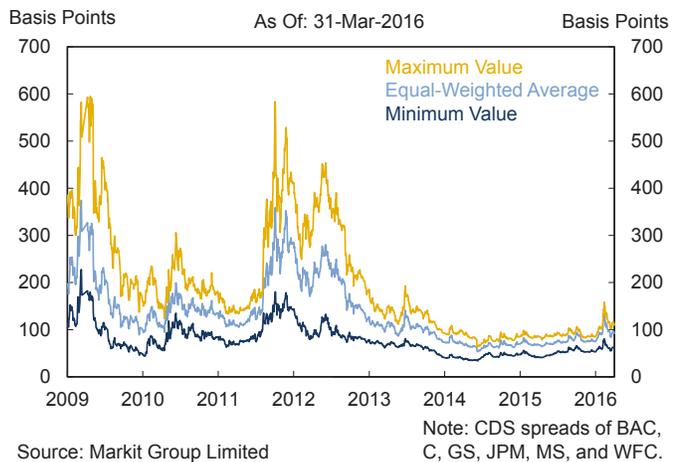
4.11.2 U.S. Branches and Agencies of Foreign Banks

Assets of U.S. branches and agencies of foreign banks total \$2.4 trillion and represent approximately 15 percent of total U.S. banking

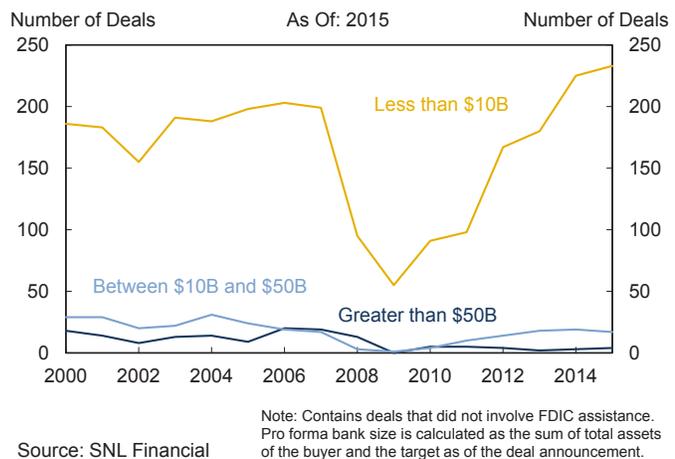
4.11.16 P/B and P/E Ratios of Six Large Complex BHCs



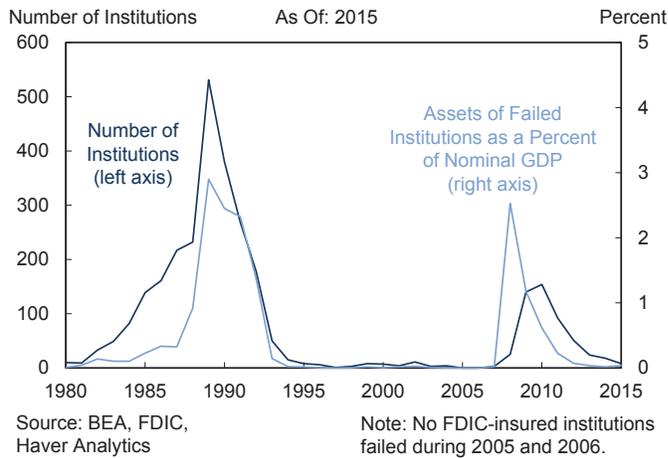
4.11.17 CDS Spreads of Six Large Complex BHCs



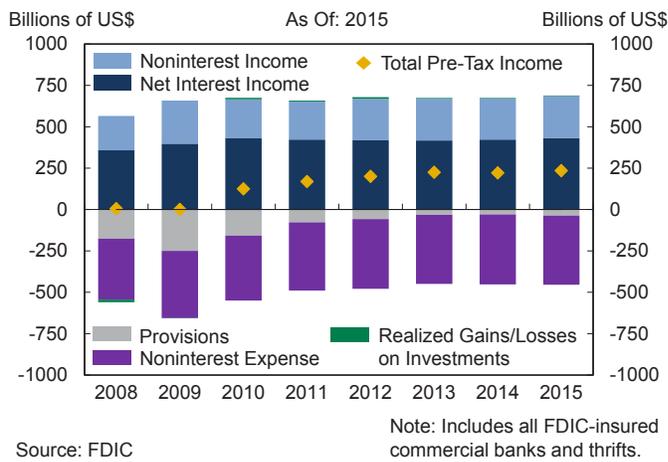
4.11.18 Number of Deals by Size of Pro Forma Bank



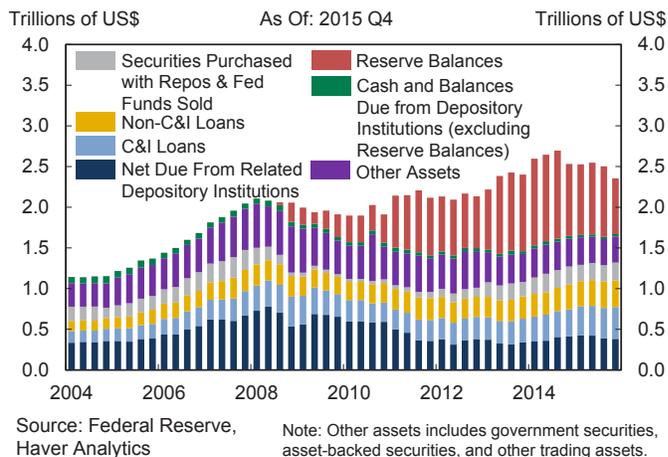
4.11.19 FDIC-Insured Failed Institutions



4.11.20 Commercial Bank and Thrift Pre-Tax Income



4.11.21 U.S. Branches and Agencies of Foreign Banks: Assets



assets (Chart 4.11.21). Aggregate assets held by U.S. branches and agencies of foreign banks declined during 2015, reflecting declining levels of reserves held at the Federal Reserve, and roughly mirroring the decline in total depository institution reserves held there. Cash balances have exhibited some quarter-end volatility, likely due in part to efforts to manage balance sheet exposures to meet international quarter-end leverage and liquidity ratio targets (Chart 4.11.22).

Loan balances for many U.S. branches and agencies of foreign banks grew more quickly in 2015 than at any other time during the post-crisis period, consistent with loan balance trends observed for domestically chartered commercial banks. The loan growth was broad-based, with C&I and loans to nonbank financial institutions accelerating more quickly than other major loan categories. In aggregate, C&I loan balances held at these branches and agencies represent approximately 20 percent of total C&I loans provided by the U.S. banking sector.

The funding profiles of some U.S. branches and agencies of foreign banks have changed meaningfully since the financial crisis. Coinciding with aggregate asset declines were overall reductions in non-transactional deposit liabilities and net balances due to parent organizations and related affiliates (Chart 4.11.23). Certain banks, predominantly non-European firms, continue to rely heavily on the U.S. wholesale funding market. In some cases, these firms use this market to provide dollar funding to their parent organizations and related affiliates, reflected in large positions that are net due from related depositories.

Beginning in July 2016, FBOs with more than \$50 billion in U.S. non-branch assets will be required to establish a U.S. Intermediate Holding Company (IHC) and adhere to certain enhanced prudential standards. The additional capital, leverage, and liquidity requirements imposed on the IHC may create incentives for changes to U.S. operating structures for FBOs subject to the rule and asset movements

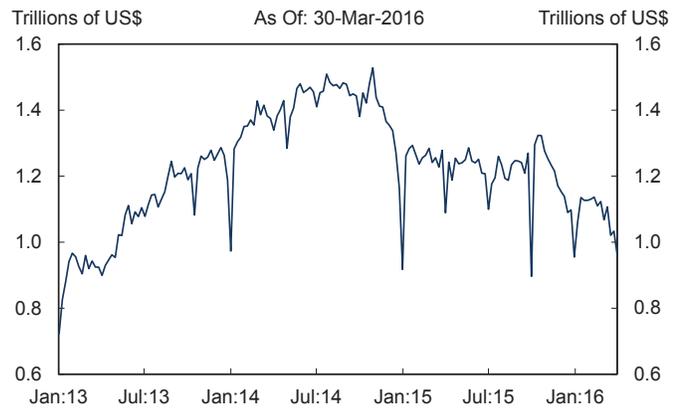
out of the IHC, either to U.S. branches or to non-U.S. jurisdictions. In particular, as of late 2015, several firms have experienced material declines in their broker-dealer assets held inside the IHC, while some U.S. branches have grown, a trend likely motivated in part by the forthcoming IHC requirements. U.S. branches and agencies remain outside the IHC and so are subject to more limited requirements, such as holding a liquidity buffer.

4.11.3 Credit Unions

Credit unions are member-owned, not-for-profit depository institutions that are chartered to serve individuals in specific fields of membership. As of the fourth quarter of 2015, there were 6,021 federally insured credit unions (FICUs) with aggregate assets of \$1.2 trillion. Roughly three quarters of them (4,500) held under \$100 million in assets, 1,271 held between \$100 million and \$1 billion, and 250 held over \$1 billion. Of those with less than \$100 million in assets, 40 percent held less than \$10 million. The long-standing trend toward consolidation continued in 2015, particularly among smaller institutions. Of the 5,176 FICUs with less than \$50 million in assets at the end of 2010, 1,206 were no longer active as a FICU five years later. Total assets at credit unions grew 7.3 percent year-over-year in the fourth quarter of 2015. Membership in FICUs continued to rise, reaching over 102 million members in 2015, up 14 percent in the last five years.

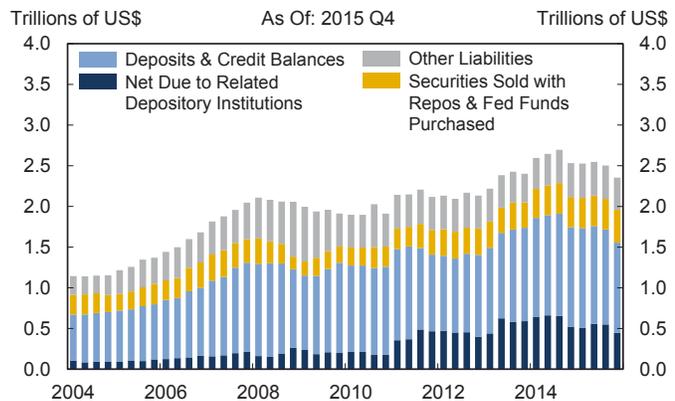
The composition of credit unions nationally continues to shift. Corporate credit unions, which provide critical services to the broader natural-person credit union system, continue to consolidate and deleverage as they refocus their business strategies and adapt to the post-crisis regulatory environment. As of December 2015, 12 corporate credit unions, holding \$21 billion in assets in aggregate, served consumer credit unions—a sharp fall from 27 corporate credit unions holding \$96 billion in assets in 2007. Consumer credit unions continue to play an important role among U.S. households. Data from the Federal Reserve’s Survey of Consumer Finances indicate that just over a third of households have some financial affiliation with a credit union, and almost 18 percent of

4.11.22 Cash Assets of U.S. Branches and Agencies of Foreign Banks



Source: Federal Reserve

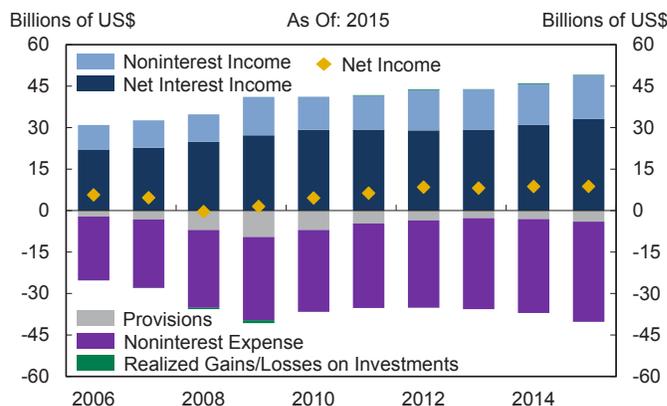
4.11.23 U.S. Branches and Agencies of Foreign Banks: Liabilities



Source: Federal Reserve, Haver Analytics

Note: Other liabilities includes transaction accounts, non-transaction accounts, and other borrowed money.

4.11.24 Credit Union Income



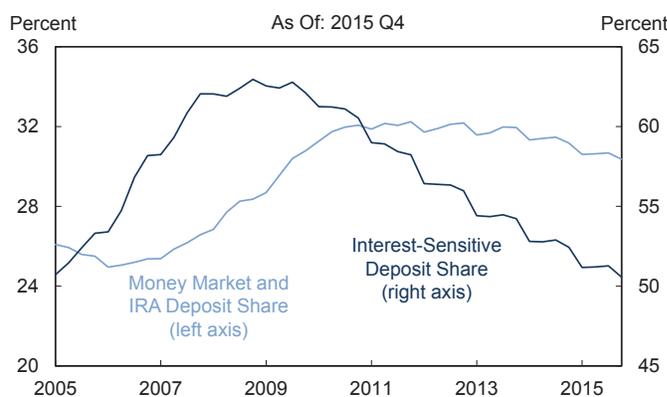
Source: NCUA

Note: Federally insured credit unions.

households use credit unions as their primary financial institution. Credit unions account for about 13 percent of private consumer installment lending.

Financial performance at credit unions generally improved in 2015, in part due to the improving economy and rising loan demand. Consumer credit unions earned \$8.7 billion in net income in 2015, up 0.3 percent from 2014 (**Chart 4.11.24**). Loans outstanding at credit unions increased 10.5 percent in 2015, having increased 10.4 percent in 2014. Credit unions witnessed a return on average assets (ROAA) of 75 basis points in 2015, falling slightly from 80 basis points in 2014. The modest decrease in ROAA in 2015 reflected a slight increase in provisions for loan losses. The aggregate credit union NIM was 2.85 percent of average assets in 2015, little changed from 2014 and down 40 basis points from its 2010 high.

4.11.25 Credit Union Deposits

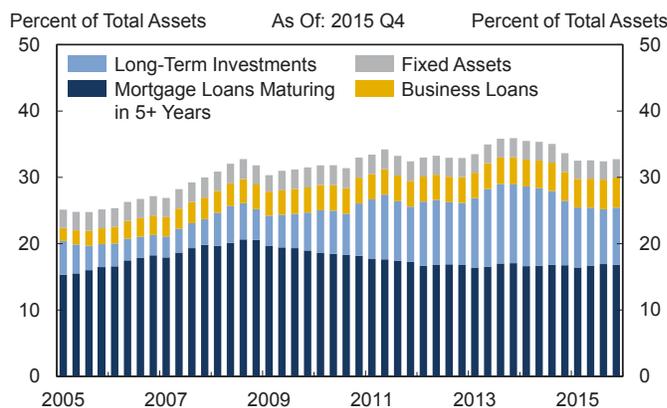


Source: NCUA

Note: Federally insured credit unions. Interest-sensitive deposit share includes money market and IRA deposit share, share certificates, and certain other deposits.

The current low interest rate environment, as well as the implications of the eventual transition to a higher rate environment with a potentially flatter yield curve, continues to present challenges for the industry. Many credit unions reduced their exposure to interest-rate risk in 2015, though risks remain. Although interest-sensitive deposits continue to decline as a share of total liabilities and are nearing pre-crisis levels, the share of money market accounts and individual retirement account (IRA) deposits remains elevated (**Chart 4.11.25**). Net long-term assets as a share of total assets declined in 2015 but remain high relative to the pre-crisis period (**Chart 4.11.26**). Having exhausted other sources of earnings growth, some credit unions appear to be searching for yield by lengthening their term of investments to boost near-term earnings.

4.11.26 Credit Union Net Long-Term Assets



Source: NCUA

Note: Federally insured credit unions. Long-term investments mature in three or more years.

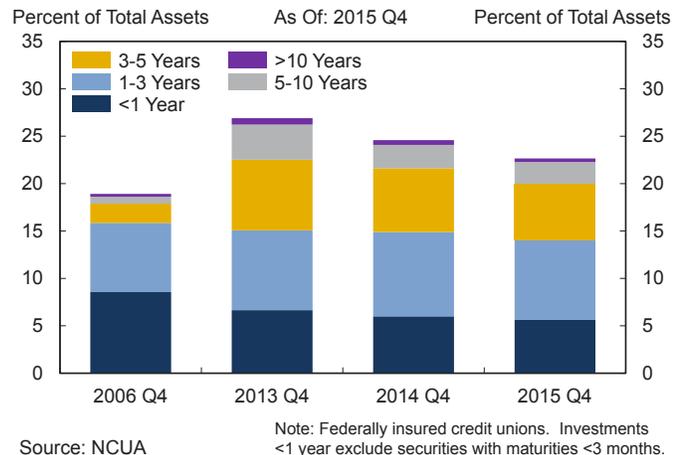
Investments in total trended higher through 2012, rising from under 19 percent of assets in the fourth quarter of 2006 to more than 27 percent in the fourth quarter of 2012. Since the end of 2012, investments have edged down as a share of assets, at least partly reflecting substitution toward lending as loan demand increased. The share of investments with greater

than three years' maturity increased sharply from 3 percent of assets in the fourth quarter of 2006 to 12 percent in the first quarter of 2014. Since then, the share has fallen to just below 9 percent at the end of 2015 (**Chart 4.11.27**).

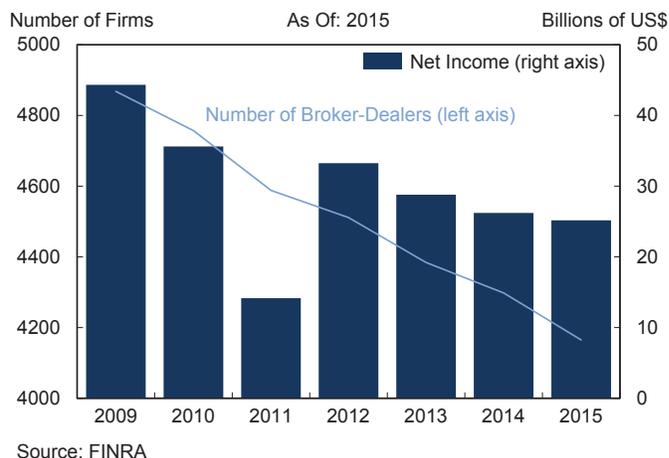
Although credit unions' close ties to specific geographies or business organizations offers certain advantages, localized economic distress can present these institutions with certain unique challenges. Two U.S. industries which highlight potential concentration risk are energy and transportation. The sharp decline in the price of oil since 2014 has led to a decline in investment and increased layoffs in energy companies, leading to strains on the credit unions exposed to the sector. Although it is known that 46 federally chartered credit unions with \$8 billion in assets are exposed to petroleum-refining businesses, total credit union exposure is unknown, in part because state-chartered institutions are not required to report their fields of membership routinely. In addition, credit unions exposed to the taxicab industry have seen recent stress following increased competition from ridesharing companies and a decline in demand for traditional taxi services. Eight credit unions have significant member ties to the taxi industry and are affiliated with approximately \$3.5 billion in loans backed by taxi medallions. One credit union with concentrated exposure to the industry was placed into conservatorship in 2015 and merged with another credit union in the first quarter of 2016.

Although the NCUA insures the deposits of most federally chartered and state-chartered credit unions, not all are federally insured. At the end of 2015, 126 credit unions, collectively controlling \$14.9 billion in assets in nine states and serving 1.3 million members, were privately insured and were not covered by federal deposit insurance. In addition, the Commonwealth of Puerto Rico has a number of cooperative credit institutions which are not insured by NCUA. In the third quarter of 2015, there were 116 cooperativas chartered by the Commonwealth, with \$8.5 billion in combined assets. These institutions are insured by the commonwealth agency Corporación Pública para la Supervisión y Seguro de Cooperativas (COSSEC).

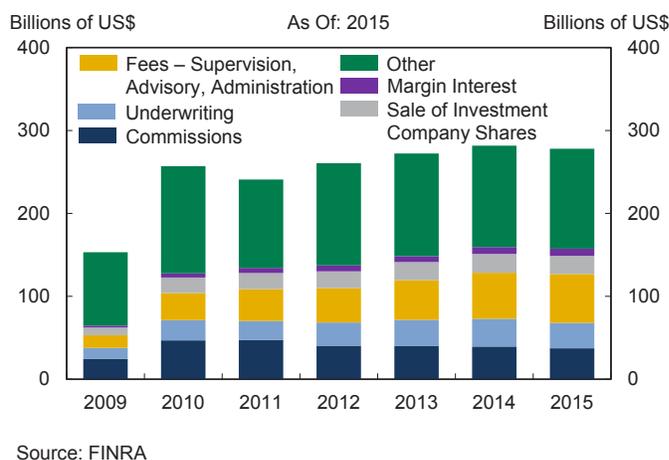
4.11.27 Credit Union Investments by Maturity



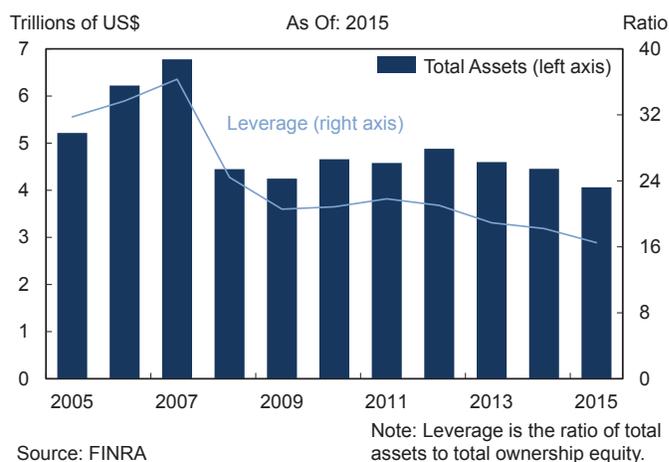
4.12.1 Number of Broker-Dealers and Industry Net Income



4.12.2 Broker-Dealer Revenues



4.12.3 Broker-Dealer Assets and Leverage



4.12 Nonbank Financial Companies

4.12.1 Securities Broker-Dealers

As of year-end 2015, there were approximately 4,200 securities broker-dealers registered with the SEC. The number of broker-dealers registered with the SEC has declined steadily since 2009, which is mainly due to consolidation and declining net income (**Chart 4.12.1**). Aggregate net income in the sector has declined 3.8 percent over the past year, and is more than 43 percent below its 2009 level.

Aggregate broker-dealer revenues fell 1.3 percent in 2015, as increases in supervisory, advisory, and administrative fees were more than offset by declines in underwriting fees and commissions (**Chart 4.12.2**).

The U.S. broker-dealer sector is relatively concentrated; approximately 60 percent of industry assets were held by the top 10 broker-dealers as of year-end 2015. The concentration of the largest broker-dealers has remained fairly constant over the past several years. Assets held within the U.S. broker-dealer industry declined 9.0 percent to \$4.1 trillion in 2015, well below the peak of \$6.8 trillion in 2007 (**Chart 4.12.3**).

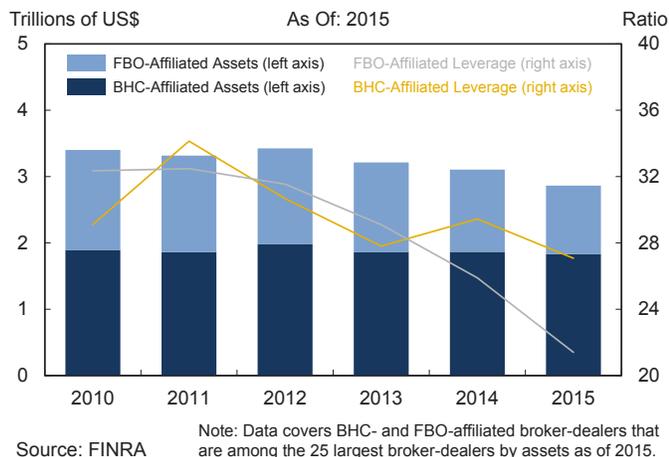
Broker-dealers typically obtain leverage through the use of secured lending arrangements, such as repos and securities lending transactions. Broker-dealer leverage, measured in various ways, has also declined markedly since the crisis. The leverage ratio at broker-dealers, measured as total assets over equity, was 17 in aggregate as of year-end 2015, well below the peak of 36 as of year-end 2007.

Most of the largest U.S. broker-dealers are affiliated with U.S. BHCs or FBOs. Since 2010, assets for the BHC-affiliated broker-dealers have been relatively flat, while assets for FBO-affiliated broker-dealers declined by nearly 32 percent. BHC-affiliated broker-dealers had an aggregate leverage ratio of 27 as of year-end 2015, while FBO-affiliated broker-dealers had an aggregate leverage ratio of 21 (**Chart 4.12.4**).

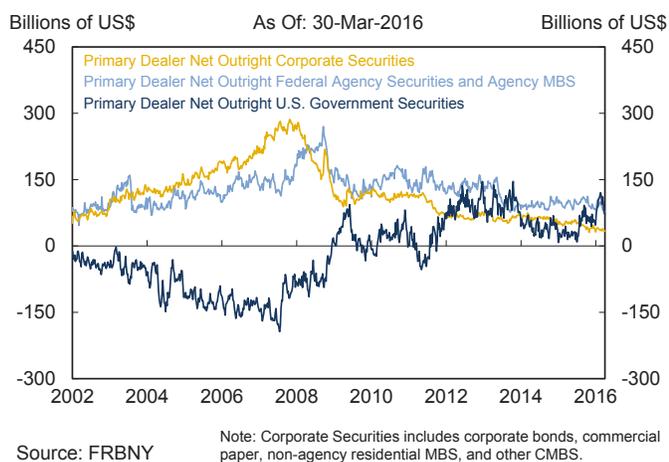
Unlike the traditional banking sector model which relies in large part on the use of customer deposits for funding, broker-dealers generally fund themselves through short-term secured financing arrangements. Since the crisis, broker-dealers have relied very heavily on unsecured financing from their parent companies and affiliates. Broker-dealer financing activity through repo agreements decreased approximately 38 percent from 2012 through 2015. Because of the nature of this activity, as well as lessons learned during the financial crisis, broker-dealers are focused on liquidity risk. A broker-dealer's short-term liabilities are typically supported by a very liquid asset base such as U.S. Treasury securities, as well as agency debt and MBS. For the largest broker-dealers, the WAM of repo for very liquid products was approximately one month as of year-end 2015. Less liquid assets such as high-yield debt are typically financed through term-secured financing arrangements, capital, or long-term lending from the parent company. For the largest broker-dealers, the WAM of repo for less liquid assets was in excess of three months as of year-end 2015.

After falling from late 2013 through late 2014, primary dealer net holdings of U.S. government securities rose sharply in mid-2015 and again in early 2016, reaching a net long position of approximately \$71 billion as of March 2016 (Chart 4.12.5). This increase in net U.S. government securities has accompanied a similarly-sized net decrease in holdings by foreign official institutions over the second half of 2015. While primary dealers could be exposed to greater interest rate risk as a result of this shift, available data on inventories do not include hedges or other offsetting positions. Meanwhile, primary dealer net holdings of agency securities and corporate securities edged downward over the past year to net long positions of approximately \$78 billion and \$34 billion, respectively.

4.12.4 Large Broker-Dealer Assets and Leverage by Affiliation



4.12.5 Primary Dealer Securities



4.12.6 Selected U.S. Financial Holding Companies and Insurers

| Name | Total Assets | Name | Total Assets |
|-------------------------|---------------|-----------------------|--------------|
| JPMorgan Chase | 2,351,698,000 | Capital One | 334,179,916 |
| Bank of America | 2,147,391,000 | GE Capital | 318,826,145 |
| Wells Fargo | 1,787,632,000 | New York Life | 301,657,000 |
| Citigroup | 1,731,210,000 | TIAA | 288,956,000 |
| MetLife | 877,933,000 | HSBC North America | 271,888,608 |
| Goldman Sachs | 861,419,000 | TD Group | 267,143,521 |
| Morgan Stanley | 787,465,000 | Manulife/John Hancock | 253,994,000 |
| Prudential Financial | 757,388,000 | Lincoln | 251,937,000 |
| Berkshire Hathaway | 552,257,000 | State Street | 245,198,879 |
| AIG | 496,943,000 | Northwestern Mutual | 239,514,000 |
| U.S. Bancorp | 421,853,000 | State Farm | 231,690,000 |
| Bank of New York Mellon | 393,780,000 | The Hartford | 228,348,000 |
| PNC | 358,690,085 | BlackRock | 225,261,000 |

Source: National Information Center, SNL Financial, Company Filings

Note: Thousands of U.S. dollars. Data as of 2015 Q4. GAAP and SAP accounting. Insurers listed in blue. Entity classifications correspond to those used by the National Information Center and SNL Financial. Asset levels correspond to consolidated financial reporting.

4.12.2 Insurance Companies

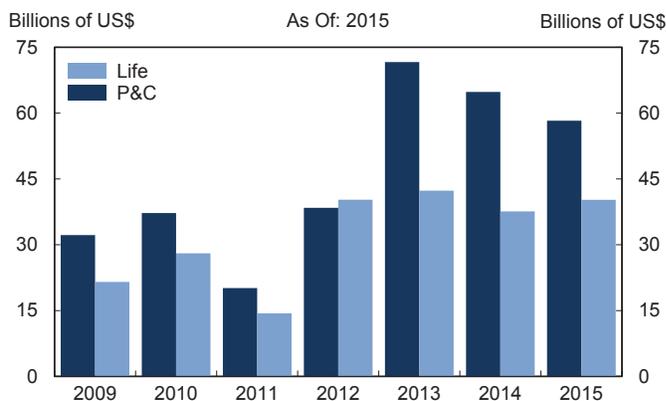
Insurance companies and related businesses contributed \$469.2 billion to U.S. GDP in 2015, approximately 2.6 percent of the total. Total revenues received by insurance companies from premiums and deposits on policies and annuity products totaled \$1.2 trillion in 2015. Insurers continue to rank among the largest U.S. financial corporations based on total assets (Chart 4.12.6). In each of the property and casualty (P&C) and life insurance sectors, the ten largest firms constitute roughly half of the market, as measured by total assets and premiums from contracts written.

Measured by net income, licensed insurance companies earned \$98.5 billion in 2015, down 4.4 percent from the previous year (Chart 4.12.7). Licensed U.S. P&C companies reported \$58.3 billion in net income for 2015, and the life insurance sector reported \$40.2 billion. The P&C sector saw continued growth in premiums, offset in part by an increase in paid and incurred losses, resulting in lower net income than in 2014. Life insurers reported a slight decrease in premiums along with greater use of reinsurance, but lower reserve increases than in 2014 allowed for an increase in net income.

The current low interest rate environment continues to be cited as a challenge to the profitability of the insurance industry, particularly life insurers. The net yield on invested assets of insurers has generally declined since 2009 (Chart 4.12.8). While the low interest rates have not caused a significant shift in insurers' investment allocations, insurers have modestly increased investment in certain asset types to capture higher expected yields.

The amount of capital in the insurance industry has increased over the past several years. In the life insurance sector, equity, which includes capital and surplus, has grown steadily since 2010 (Chart 4.12.9). This growth has generally kept pace with the growth in assets; the ratio of equity-to-assets has remained relatively constant, hovering between 8.75 percent and

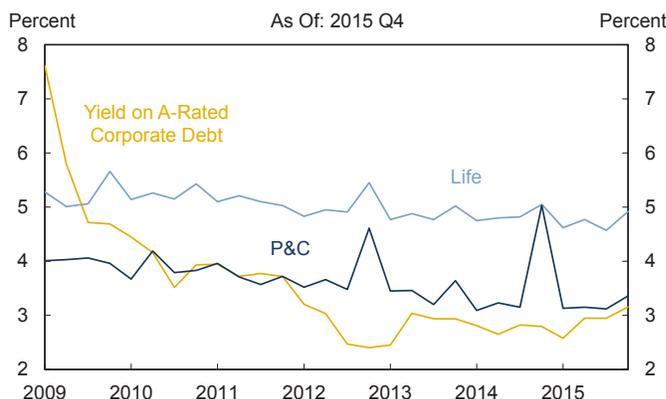
4.12.7 Insurance Industry Net Income



Source: SNL Financial

Note: Life includes accident and health.

4.12.8 Net Yield on Invested Assets



Source: SNL Financial, Bank of America Merrill Lynch, Haver Analytics

Note: Life includes accident and health.

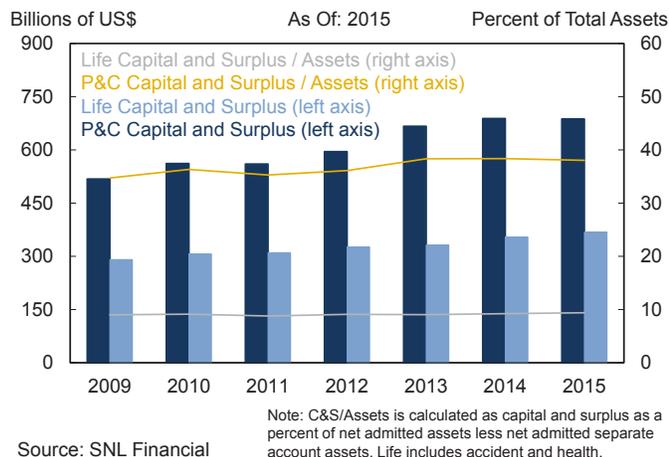
9.50 percent since 2010. In the P&C sector, year-end 2015 equity was essentially flat year-over-year, marking an end to the steady increase in equity over the previous five years. The capital-to-asset ratio in this sector has remained relatively constant, hovering between 35 and 40 percent. The P&C sector continues to operate with far less asset leverage than the life insurance sector. In general, P&C businesses have greater volatility in earnings from underwriting than life insurers due to the impact of catastrophic events.

4.12.3 Specialty Finance

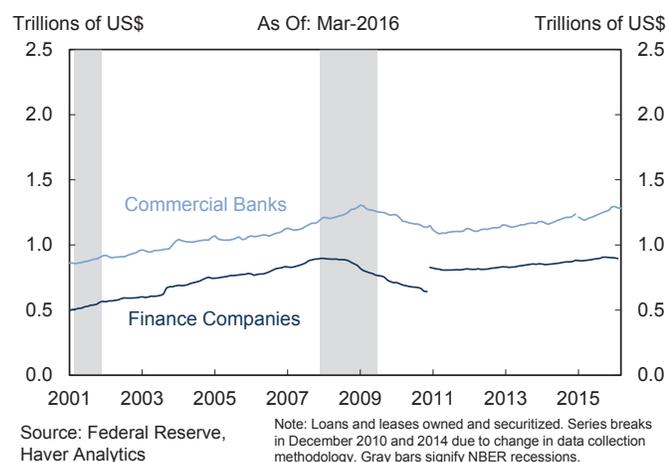
Credit activity in the specialty lending sector expanded at a moderate pace over the past 12 months. Specialty finance companies owned approximately \$901 billion of consumer loans and leases and \$420 billion of business loans and leases as of January 2016 (Charts 4.12.10, 4.12.11). This loan volume represented growth of 2.3 percent and 4.0 percent, respectively, from one year earlier. Specialty finance companies' ownership of real estate loans and leases declined 18.8 percent, however, to \$119 billion, and remains well below its pre-crisis peak of \$612 billion.

While specialty finance companies trail commercial banks in overall consumer lending volume, these firms do maintain an outsized market share in certain types of origination activity. Amid surging auto loan growth, for example, specialty finance companies (excluding captive auto lenders and buy-here, pay-here dealers) originated 13.4 percent of total auto loans in the first quarter of 2016, down from 13.6 percent in the first quarter of 2015. These firms, however, accounted for 36.7 percent and 36.8 percent of subprime auto originations, respectively, in those periods—well above the 27.8 percent and 26.1 percent subprime market share of banks and credit unions (Chart 4.12.12).

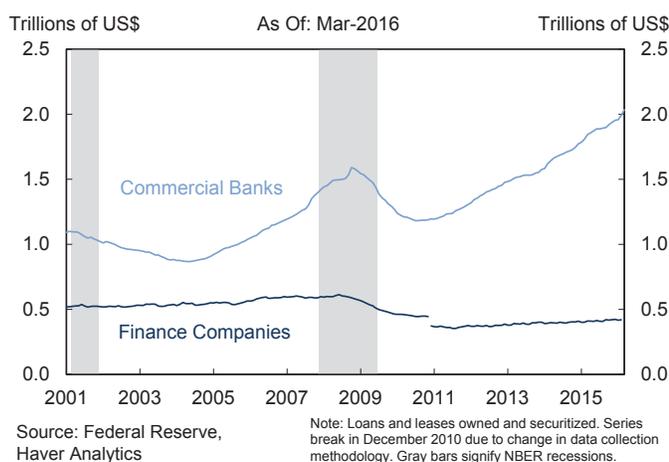
4.12.9 Insurance Industry Capital and Surplus



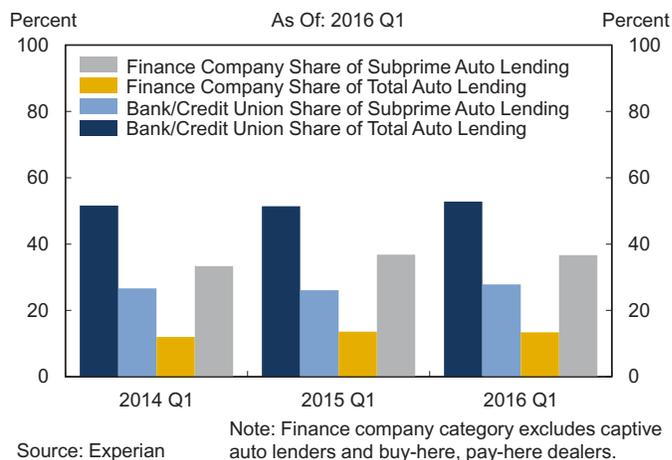
4.12.10 Consumer Loans and Leases Outstanding



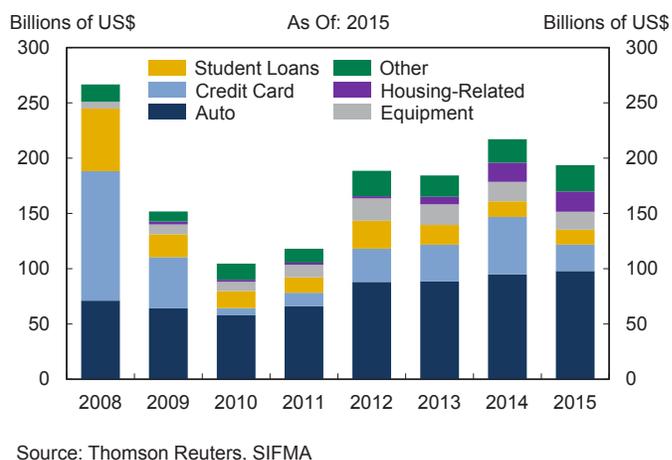
4.12.11 Business Loans and Leases Outstanding



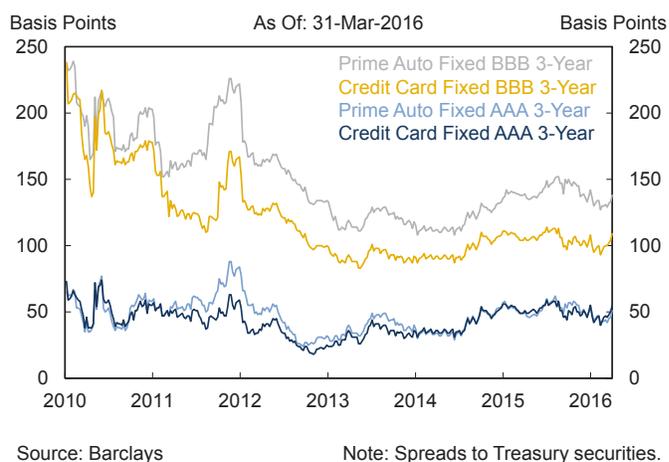
4.12.12 Subprime Auto Lending



4.12.13 ABS Issuance



4.12.14 Selected ABS Spreads



Given the absence of a deposit base, specialty finance companies are generally more reliant on securitization to meet their funding needs than are banks. Total ABS issuance was \$194 billion in 2015, representing an 11 percent decline from 2014 issuance (Chart 4.12.13). Credit card ABS were the primary driver behind the fall in ABS issuance as volume decreased from approximately \$52 billion in 2014 to \$24 billion in 2015. Auto loan ABS issuance edged upward, increasing just over 3 percent on the year. Subprime auto loan securitizations continue to grow at a faster pace, however. Subprime auto loan ABS outstanding have grown 175 percent since 2010 to reach \$38.3 billion and now account for approximately 20 percent of total auto loan ABS outstanding. Meanwhile, student loan ABS issuance declined for the third consecutive year as the amount of government-guaranteed issuance continued to decrease following the elimination of the Federal Family Education Loan Program in 2010. Credit spreads on securitized products, including credit card and auto loan ABS, widened from mid-2014 through mid-2015 to reach multiyear highs; spreads then retraced some of this movement to tighten gradually over the second half of 2015 and early 2016 (Chart 4.12.14).

A different type of specialty finance which focuses on consumer loans is marketplace lending. In the United States, marketplace lending platforms reported rapid growth in 2015, with varying estimates suggesting \$18-36 billion in loans originated over the year and a cumulative \$40-50 billion in loans originated to date. Marketplace lenders are online nonbank lenders which use electronic data sources and emerging technologies, including algorithmic underwriting models, for customer acquisition and loan origination and servicing. These data sources include traditional underwriting statistics, such as income and debt obligations, but may also include other forms of information, such as real-time business accounting and payment and sales history.

Marketplace lending still represents a small portion of the overall consumer lending sector, but it has grown significantly in terms of both loan volumes and market participants. Marketplace lenders fund operations in a variety of ways, including through public offerings, venture capital, loans from banks, and peer-to-peer lending, where individual—usually retail—investors provide funding to individual borrowers. More recently, whole loan sales to institutional investors and the securitization market in particular have become an increasingly important source of term funding. Approximately \$4.9 billion of ABS backed by loans originated by marketplace lenders were issued in 2015, contributing to a cumulative \$7.2 billion of such ABS to date.

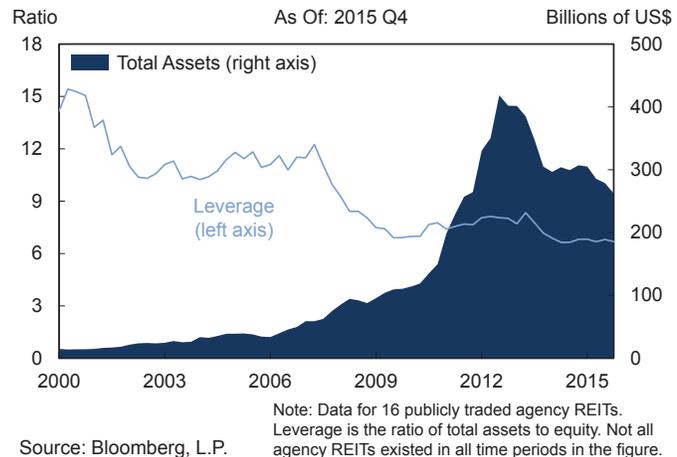
4.12.4 Agency REITs

Total agency REIT assets declined nearly 15 percent in 2015, from \$307 billion to \$262 billion (**Chart 4.12.15**). Agency REIT assets are now 37 percent below their peak levels in 2012. Many firms have begun to gradually diversify into new asset classes, such as credit risk sharing securities offered by the GSEs, though agency MBS continue to make up the vast majority of industry assets.

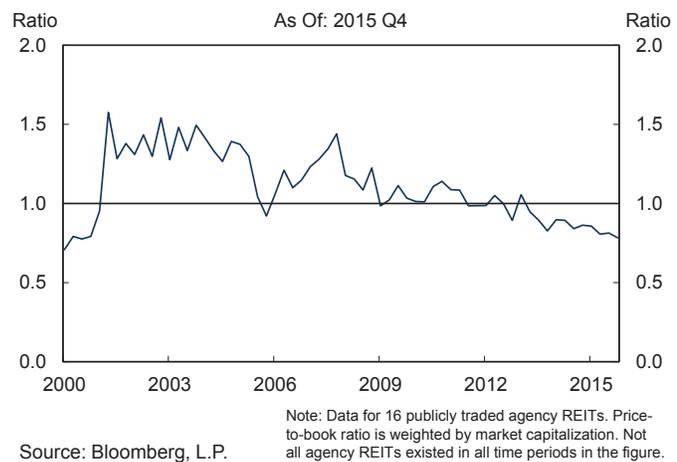
Leverage has remained relatively flat, with the sector's ratio of total assets to equity oscillating in a fairly tight band between 6.6 and 6.9 over the past two years. Agency REITs continue to vary widely in their use of leverage, however, with individual firms' asset-to-equity ratios ranging from 4.0 to 11.0.

Less accommodative funding conditions and the underperformance of mortgage duration hedges due to tightening swap spreads weighed heavily on the earnings of agency REITs over the past year. Share prices of most agency REITs underperformed broader U.S. equities, with many firms experiencing declines of more than 20 percent. The sector's P/B ratio continued its multi-year downward trend, reaching 0.78 by year-end 2015 (**Chart 4.12.16**). In such an environment, the issuance of new equity as a means of funding portfolio growth

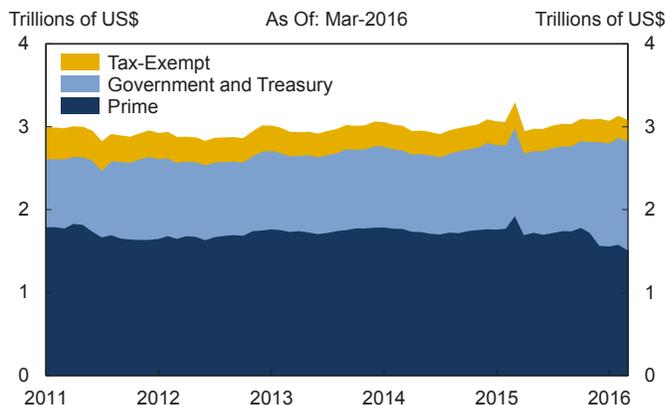
4.12.15 Agency REIT Assets and Leverage



4.12.16 Agency REIT Price-to-Book Ratio



4.13.1 MMF Assets by Fund Type



Source: SEC

is unattractive, as firms would typically prefer to sell assets in order to repurchase shares. This dynamic has contributed to the continued decline in total assets.

While funding conditions in the repo market have tightened marginally, no agency REITs have reported material disruptions. A number of agency REITs gained access to the Federal Home Loan Bank (FHLB) system in 2015 via the use of captive insurers eligible to obtain FHLB advances. These advances are generally attractive to agency REITs because they represent lower-cost sources of funding, particularly when financing the purchase of whole loans. In response to this development, FHFA amended the eligibility criteria for FHLB membership in January 2016, effectively eliminating agency REITs' ability to access FHLB advances. While this is expected to result in increased funding costs for some firms, the relatively modest usage of FHLB advances by most agency REITs makes it unlikely that this will have implications for the overall availability of funding.

4.13 Investment Funds

4.13.1 Money Market Mutual Funds

MMFs held approximately \$3.07 trillion in assets as of March 2016, a level largely consistent with observed levels over the past five years. Approximately half of these assets (\$1.52 trillion) are held by prime MMFs, with another 43 percent (\$1.31 trillion) held by government and Treasury MMFs (**Chart 4.13.1**).

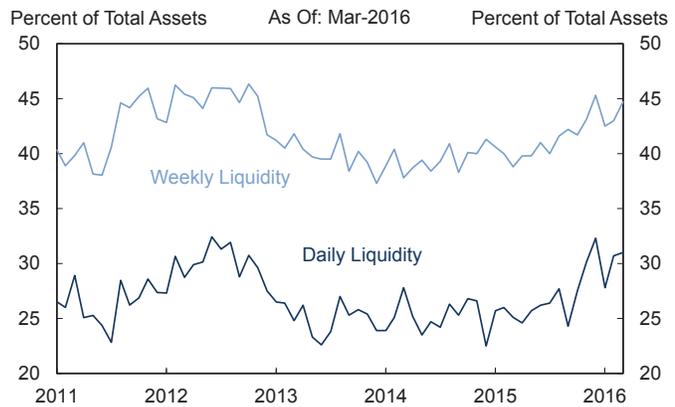
In July 2014, the SEC adopted new money market reforms, which will require a floating net asset value (NAV) for institutional prime and institutional tax-exempt MMFs. As a result, the daily share prices of these funds will fluctuate due to changes in the market-based value of fund assets. The reforms permit MMF boards of directors to impose liquidity fees and redemption gates in non-government MMFs if a MMF's weekly liquid assets fall below 30 percent of total assets and require boards to impose liquidity fees if a MMF's weekly liquid

assets fall below 10 percent of total assets, unless the MMF's board determines that the fee would not be in shareholders' best interest. These reforms are intended to mitigate the risk of runs in prime and tax-exempt MMFs. Retail MMFs are defined as MMFs which have policies and procedures reasonably designed to limit all beneficial owners of the fund to natural persons. Retail funds may maintain a stable NAV, but are subject to gates and fees. Government funds may maintain a stable NAV and may elect to impose gates and fees. The main parts of the reforms will become effective in October 2016. Despite the stability in overall MMF assets, late 2015 and early 2016 saw the first measurable shifts between different MMF types in anticipation of the implementation deadline. For example, as was widely expected, many fund complexes have announced that they will be, or are already in the process of, converting some of their prime MMFs to government MMFs. The Council expects to monitor flows among MMFs and other investment vehicles as investors respond to the new features of MMFs which must be in place by October 2016.

A trend towards consolidation in MMFs continues. As of March 2016, there were 490 MMFs, down from 542 at the same point in 2015. The industry remains relatively concentrated, as the top ten fund sponsors manage 72 percent of total MMF assets. Although the Federal Reserve raised interest rates in December 2015, short-term rates remain near historic lows. Many MMFs continue to waive their management fees and/or subsidize returns to keep net yields positive and retain their investor base; however, it is possible MMFs may reinstate management fees if rates continue to increase.

Prime MMFs' share of assets convertible to cash within one business day—known as daily liquidity—trended higher in late 2015 and early 2016, reaching 31 percent at the end of the first quarter of 2016. This is significantly higher than the 10 percent minimum required by SEC rules. The share of assets convertible to cash

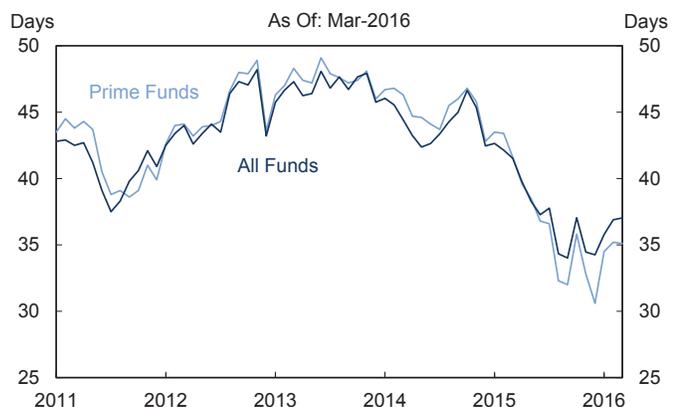
4.13.2 Liquid Asset Shares of Prime MMFs



Source: SEC

Note: Weighted by fund size.

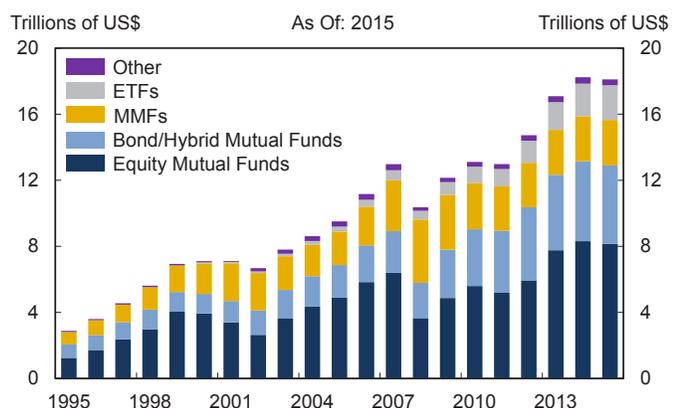
4.13.3 Weighted-Average Maturity of MMFs



Source: SEC

Note: Weighted by fund size.

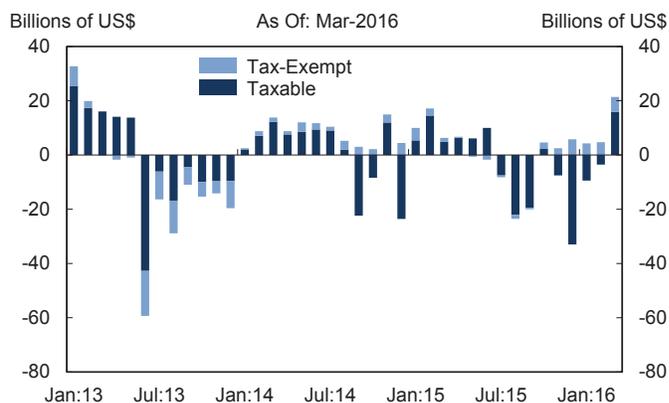
4.13.4 Net Assets of the Investment Company Industry



Source: ICI, Haver Analytics

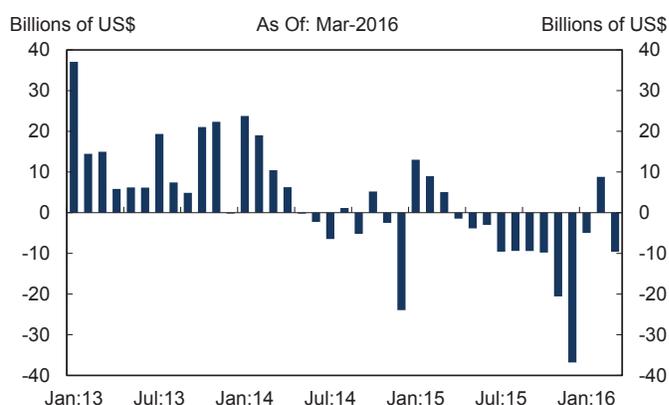
Note: Other is composed of unit investment trusts and closed-end funds.

4.13.5 Monthly Bond Mutual Fund Flows



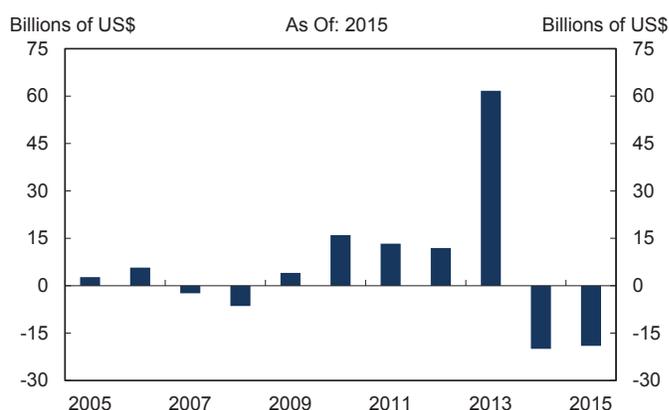
Source: ICI, Haver Analytics

4.13.6 Monthly Equity Mutual Fund Flows



Source: ICI, Haver Analytics

4.13.7 Bank Loan Mutual Funds: Annual Flows



Source: Morningstar, Inc.

within seven business days—known as weekly liquidity—also increased over the past few months and now stands at nearly 45 percent, well above than the 30 percent minimum required by the SEC (**Chart 4.13.2**). The WAM of all MMFs decreased over the past 12 months, from 42 days to 37 days, and fell from 42 days to 35 days for prime funds (**Chart 4.13.3**). This shortening was likely due in part to an anticipation of rising interest rates.

MMFs continue to be major participants in the Federal Reserve’s overnight reverse repurchase agreement and term reverse repurchase agreement (term RRP) operational exercises. In connection with the Federal Reserve’s raising of short-term interest rates in December 2015, the daily \$300 billion cap on the ON RRP was temporarily suspended, though the per-counterparty daily limit of \$30 billion remains in place.

4.13.2 Mutual Funds

Assets under management (AUM) of U.S. mutual funds and other investment companies have grown from approximately \$2.8 trillion in 1995 to \$18.0 trillion in December 2015 (**Chart 4.13.4**). Long-term (equity and bond/hybrid) mutual funds, with assets of \$12.9 trillion, represented 70 percent of total investment company AUM as of December 2015, down 2 percentage points from December 2014. Flows into long-term funds were positive in early 2015, turned negative in the second half of the year and into the beginning of 2016 (**Charts 4.13.5, 4.13.6**) amid a weaker outlook for the global economy, and were negative for the year as a whole.

Bank loan and high-yield bond funds experienced a second year of outflows after five years of inflows from 2009-2013. Bank loan mutual funds, which primarily invest in lower-rated bank loans with floating interest rates, had net outflows of \$19 billion in 2015, compared to outflows of \$20 billion in 2014 and inflows ranging from \$4 billion in 2009 to \$62 billion in 2013 (**Chart 4.13.7**). High-yield bond funds, which primarily invest in lower-

rated bonds and other types of debt securities which offer a higher rate of interest because of a higher risk of default, had net outflows of \$15 billion in 2015, compared to outflows of \$17 billion in 2014 and inflows ranging from \$3 billion to \$26 billion from 2009-2013 **(Chart 4.13.8)**.

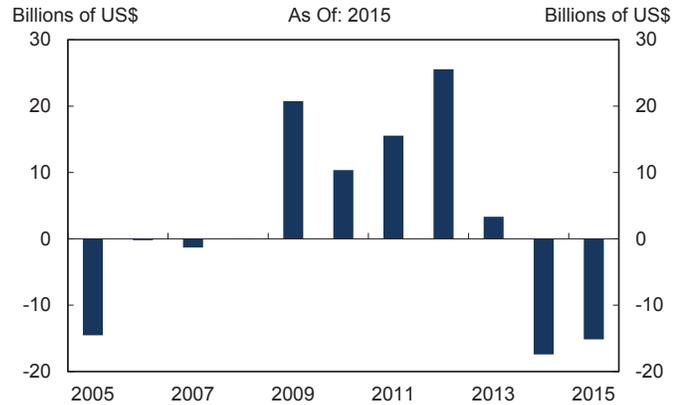
Bank loan and high-yield bond fund outflows peaked in December, amid growing concern over the financial condition of non-investment grade issuers (especially in the energy and commodities industries) and the announced closure of Third Avenue Focused Credit Fund, which had emphasized investments in low-rated and financially distressed corporate borrowers whose debt became largely illiquid **(see Box E)**. High-yield bond fund outflows decreased in late December and early January, and flows turned positive for the month ending February 2016.

Despite concerns about the financial condition of Puerto Rico and some state and local issuers, \$15 billion flowed into tax-exempt bond funds in 2015, compared to inflows of \$28 billion in 2014 and outflows of \$58 billion in 2013.

Alternative mutual funds, which include funds pursuing bear market, long-short, market neutral, and inverse strategies, grew at a reduced pace, with inflows of \$10 billion in 2015, down from \$15 billion in 2014 and \$42 billion in 2013 **(Chart 4.13.9)**.

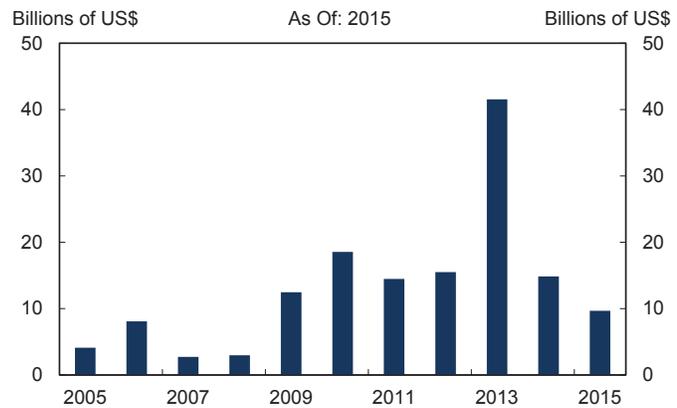
Investors in equity funds continued to gravitate toward passive, index-based investment products. Index mutual funds and ETFs now represent 42 percent of U.S. equity fund AUM compared to 27 percent in 2009. Over the past 12 months, global net flows into index equity funds were \$254 billion while global net flows out of actively managed equity funds were \$161 billion **(Chart 4.13.10)**.

4.13.8 High-Yield Mutual Funds: Annual Flows



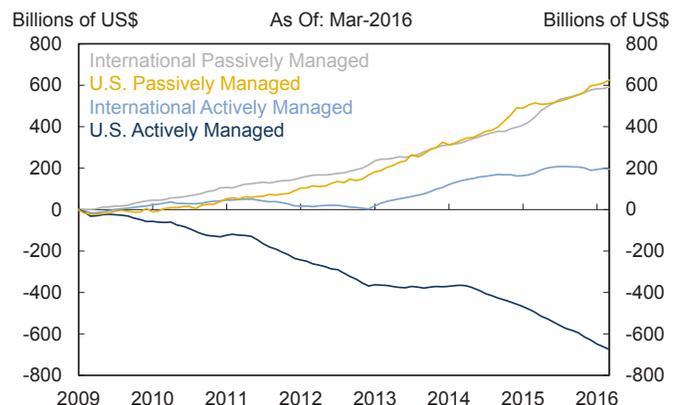
Source: Morningstar, Inc.

4.13.9 Alternative Mutual Funds: Annual Flows



Source: Morningstar, Inc.

4.13.10 Cumulative Equity Fund Flows



Source: Morningstar, Inc.

Note: Includes ETFs and mutual funds.

Box E: Third Avenue Focused Credit Fund

On December 16, 2015, the SEC issued a temporary order granting Third Avenue's Focused Credit Fund (FCF)'s request to suspend redemption rights until the fund has liquidated. This followed FCF's earlier announcement that "investor requests for redemption ... in addition to the general reduction of liquidity in the fixed income markets, have made it impracticable for FCF going forward to create sufficient cash to pay anticipated redemptions without resorting to sales at prices that would unfairly disadvantage the remaining shareholders." Since 2000, such suspensions have been rare, and in 2008, only two municipal bond funds suspended cash redemptions.

Starting in the third quarter of 2014, FCF faced heavy redemptions against the backdrop of underperformance. FCF's AUM fell from \$3.5 billion in July 2014 to \$788 million at the time it suspended redemptions, due to a combination of market action and redemptions. Since its inception in 2009, FCF had emphasized investments in low-rated and financially distressed corporate borrowers, an increasing portion of which had become illiquid over the course of 2015. Current SEC rules require FCF to disclose its position-level holdings on a quarterly basis, and such disclosures made the fund's low credit quality transparent to its investors. As of July 31, 2015, nearly 90 percent of FCF's assets were CCC or below and unrated assets. The fund represented in its filing seeking SEC approval to suspend redemptions, "it had become apparent during the week of December 7, 2015 that the fund was unable to find buyers even for otherwise liquid securities at rational prices and that redemptions would likely continue." FCF disclosed in its July 31 Form N-Q filing that only 9 percent of its assets met the illiquid asset definition.

The actions by FCF came at a time of heightened volatility in the high-yield credit market, and other high-yield mutual funds also saw significant outflows. However, no other high-yield funds were forced to suspend redemptions.

4.13.3 Exchange-Traded Products

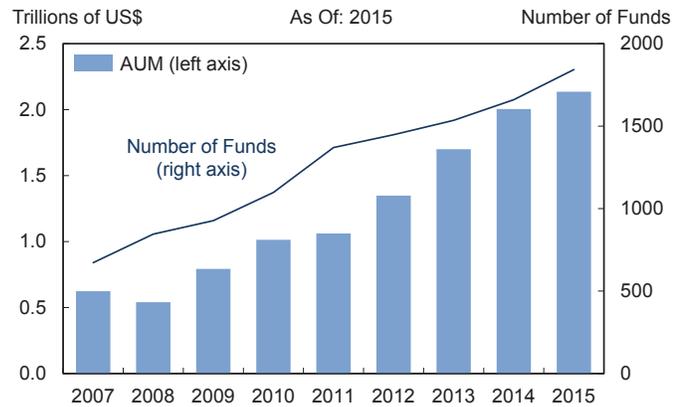
ETPs include 1940 Act-registered ETFs, non-1940 Act-registered ETPs (e.g., those which primarily hold commodities or physical metals), and exchange-traded notes. U.S.-listed ETPs continued to grow at a faster pace than other types of investment vehicles, with AUM over \$2.1 trillion, a 6.5 percent increase from the previous year (**Chart 4.13.11**).

The ten largest ETP managers account for 95 percent of total ETP assets; products managed by nine of these ETP managers experienced net inflows in 2015. Equity and fixed income ETFs experienced strong rates of asset growth. However, some of the rapid-growing ETFs hold international equity and also provide protection from a strengthening U.S. dollar relative to the euro and the yen (so called, “currency hedged ETFs”). The universe of ETFs also expanded as the number of ETFs focused on alternative asset classes increased, and some traditional mutual fund managers entered the market with index-based ETFs. In June 2015, the Commission issued a request for comment seeking input on a number of issues related to the listing and trading of new, novel, or complex ETPs.

4.13.4 Pension Funds

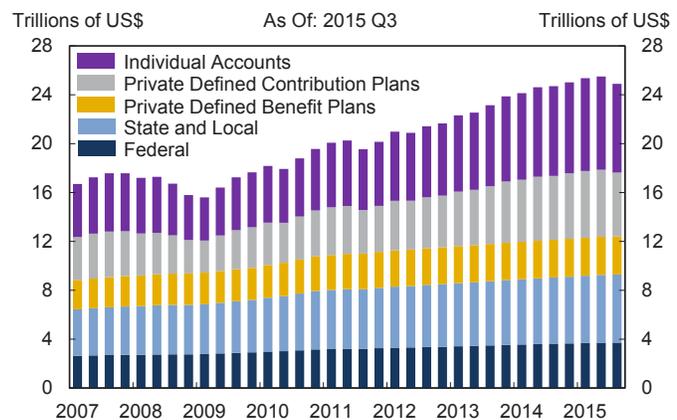
As of the third quarter of 2015, the combined AUM of private and public pensions, including federal pensions and defined contribution plans, was approximately \$25.3 trillion (**Chart 4.13.12**). Changes to pension allocations can amplify asset price volatility and exacerbate business cycle fluctuations. However, the broader impact of such changes and potential risks emanating from pension funds are difficult to assess given data limitations, including lack of uniform reporting, timeliness, and granularity of pension assets, liabilities, and return assumptions.

4.13.11 U.S.-Listed ETP AUM and Count



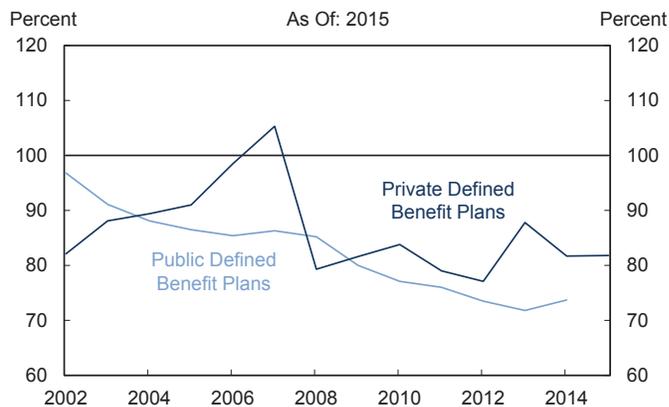
Source: Morningstar, Inc.

4.13.12 Retirement Fund Assets by Plan Type



Source: Federal Reserve, Haver Analytics

4.13.13 Public and Private Pension Funding Levels



Source: Public Fund Survey, Milliman 2016 Pension Funding Study

Corporate Plans

Corporate defined benefit funded status—the estimated share of fund liabilities covered by current assets—was little changed in 2015 (**Chart 4.13.13**). One estimate of the funded status of the 100 largest corporate defined benefit pension plans in the United States rose to 81.8 percent in December 2015, an increase of 0.1 percentage point from the previous year. The slightly higher aggregate corporate funded status resulted in part from a 25 basis point increase in discount rates and an update to life expectancy assumptions. Corporate pension discount rates, which are used to value pension liabilities, rose in tandem with Treasury yields. Large investment losses, however, partially offset the benefits of lower pension liabilities.

As of the end of 2014, many corporate plan sponsors began to incorporate new mortality assumptions which generally reflect increases in life expectancy. In 2016, however, per Internal Revenue Service (IRS) Notice 2015-53, corporate pension plans are authorized to use static mortality tables dating back several years for use in actuarial valuations. Industry analysis indicates an increase of up to 3.4 percent in liabilities based on full adoption of mortality tables from the Society of Actuaries as of December 2014. While this change is expected to result in higher pension liabilities, the magnitude of those changes will depend on the demographics of plan participants and the degree to which longevity risk is hedged. Pension funds can obtain relief via risk transfer mechanisms such as longevity swaps, pension close-out deals arranged with insurers, and buy-out or buy-in options.

Multiemployer Plans

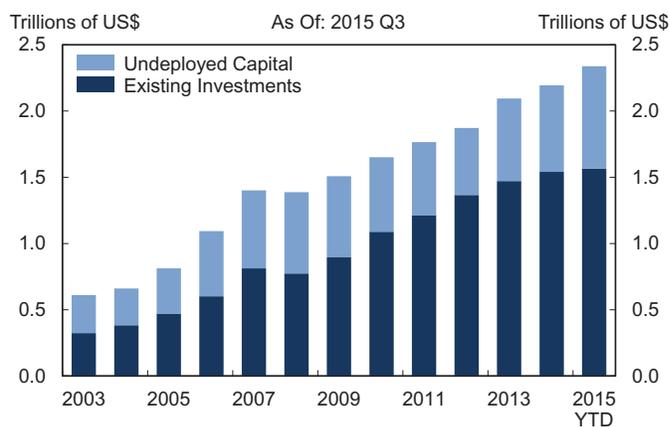
Plans in the multiemployer sector are on average 79 percent funded, though 214 plans (17 percent of all multiemployer plans) are funded at less than 65 percent of total liabilities. The total shortfall for multiemployer plans which are less than 65 percent funded is estimated at \$65 billion.

The Pension Benefit Guaranty Corporation (PBGC) insurance program for private sector multiemployer defined benefit pension plans is projected to have insufficient funds to cover the projected future demands from plans requiring financial assistance. It is more likely than not the program will run out of money in 2025. In December 2014, the Multiemployer Pension Reform Act of 2014 was passed. The law increased the premiums multiemployer plans pay to the PBGC and changed the PBGC's ability to provide financial assistance through a partition of plan liabilities. It also allowed multiemployer plans projected to become insolvent in the next 20 years (15 in some cases) to apply to the Treasury Department for permission to reduce pension benefits if doing so would allow the plan to remain solvent over the long-term and continue to provide benefits at least 10 percent higher than the level of the PBGC guarantee, with further protections for the aged and disabled. In September 2015, one large multiemployer pension fund filed an application to reduce benefits with the Treasury Department, with two others following in December 2015, and another in March 2016.

Public Plans

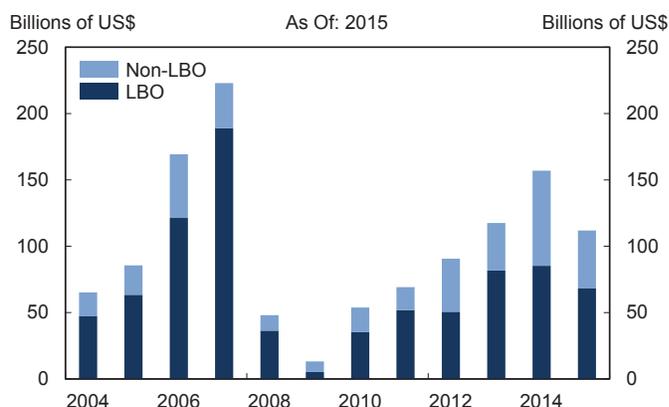
In 2015, the aggregate funded status of U.S. public pension plans is 68.9 percent, slightly lower than last year. However, this estimate is based on 2014 data (the latest available) and thus does not account for mark-to-market changes in public pensions' investment holdings in 2015. Indeed, an independent estimate of funded ratios based on market valuations of plan assets shows a 3.5 percentage point increase in funded ratios from 2014. Also of note, public pension funds generally use a different set of accounting rules than private pension funds. This enables them to assume investment returns based on long-run expectations, which are significantly higher than average post-crisis returns, and thus could overstate funded status.

4.13.14 U.S. Private Equity AUM



Source: Preqin

4.13.15 M&A Loan Volume for Private Equity-Backed Issuers



Source: S&P LCD

4.13.5 Alternative Funds

Hedge Funds

As of the third quarter of 2015, hedge fund industry gross AUM grew 2.7 percent to \$6.28 trillion, and net assets grew 3.5 percent to \$3.48 trillion. Leverage—measured as gross divided by net assets—was 1.8, which was about unchanged from a year ago. Industry assets from a total of 8,635 funds are concentrated, with the largest 50 funds as measured by gross assets controlling approximately 31 percent of industry gross assets, unchanged from a year ago. According to one estimate, North American hedge fund returns suffered in 2015 with the industry generating an overall return of only 0.1 percent. This overall return was driven by weak performance in event driven funds (-6.39 percent), multi-strategy funds (-2.30 percent), and equity funds (-0.09 percent).

Private Equity

Private equity AUM for U.S.-focused funds increased approximately 6.6 percent to \$2.3 trillion over the 9 months ending September 2015, driven by solid fundraising results and an increase in the unrealized value of portfolio assets (**Chart 4.13.14**). Existing investments grew 1.6 percent over this period to \$1.6 trillion, while undeployed capital grew 18.3 percent to \$773 billion. The rapid growth in private equity assets compared to other asset classes including hedge funds has been driven primarily by superior performance as average private equity investments returned 9.7 percent in the 12 months ending June 2015.

Regulatory pressure on leverage multiples and historically high purchase price multiples helped drive a decline in private equity-backed activity in 2015. Private equity-backed acquisition related activity fell 29 percent from 2014 to \$111.9 billion (**Chart 4.13.15**).

Since the Council's 2015 annual report, progress in implementing financial reform has included further strengthening of capital, leverage, and liquidity standards for financial institutions; continued application of supervisory and company-run stress tests; continued supervisory review and comment on large banking organizations' resolution plans; implementation of additional reforms of the derivatives markets; and measures to enhance consumer protection.

In addition, the Council continued to fulfill its mandate to monitor potential risks to U.S. financial stability and serve as a forum for discussion and coordination among the member agencies. The Council has also engaged in a review of potential risks from asset management activities and a review of CCP risk management practices and plans.

The following is a discussion of the significant financial regulatory reforms implemented by the Council and its member agencies since the Council's 2015 annual report.

5.1 Safety and Soundness

5.1.1 Enhanced Capital and Prudential Standards and Supervision

Capital, Leverage, and Liquidity Standards

The banking agencies continued to make significant progress over the last year in implementing capital, leverage, and liquidity standards. In particular, the Federal Reserve issued a number of proposals that would impose additional capital or liquidity requirements on the largest BHCs.

In July 2015, the Federal Reserve issued a final rule establishing the methodology to identify whether a U.S. top-tier BHC that is an advanced approaches institution is a G-SIB. A U.S. BHC meeting the criteria to qualify as a G-SIB would be subject to a risk-based capital surcharge, which is calibrated based on its systemic profile. A key purpose of the surcharge is to require a G-SIB to hold additional capital to increase its resilience, thus enhancing financial stability. G-SIBs must either hold substantially more capital, reducing the likelihood that they would fail, or they must shrink their systemic footprint, thus reducing the harm their failure would do to the U.S. financial system. The final rule requires a G-SIB to calculate the surcharge using the higher of two methods: the first method builds on the Basel Committee on Banking Supervision (BCBS) framework for calculating the surcharge based on measures of systemic importance; the alternate method is calibrated to result in significantly higher surcharges and replaces substitutability with a measure of the firm's reliance on short-term wholesale funding. The G-SIB surcharge is added to the G-SIB's capital conservation and countercyclical capital buffers (if triggered) for purposes of the regulatory capital rule. Failure to maintain the capital conservation buffer and applicable G-SIB surcharge would subject the G-SIB to restrictions on capital distributions and certain discretionary bonus payments.

In October 2015, the Federal Reserve issued a proposed rule to require U.S. G-SIBs to meet a new long-term debt requirement and a new total loss-absorbing capacity requirement. The proposed long-term debt requirement would set a minimum level of eligible external long-term debt that could be used to recapitalize these firms' critical operations upon failure of the parent holding company. The complementary total loss-absorbing capacity requirement would set a new minimum level of eligible external total loss-absorbing capacity, which can be met with both regulatory capital and long-term debt. To satisfy these requirements, G-SIBs would have to issue instruments that can be used to ensure losses from the banking organization are borne by its investors in the case of failure. The top-tier U.S. IHCs of foreign G-SIBs would be required to meet new long-term debt and total loss-absorbing capacity requirements by issuing these instruments to a foreign parent company. The proposal would also subject the operations of both U.S. and foreign G-SIBs to "clean holding company" limitations that would prohibit certain activities and cap the value of liabilities of top-tier U.S. BHCs of U.S. G-SIBs and top-tier intermediate U.S. holding companies of foreign G-SIBs to further improve their resolvability and the resilience of their operating subsidiaries.

In November 2015, the Federal Reserve proposed a rule requiring all depository institution holding companies and covered nonbank companies that are required to calculate the LCR to publicly disclose several measures of their liquidity profile. A covered company would be required to publicly disclose on a quarterly basis quantitative information about its LCR calculation, as well as a discussion of certain features of its LCR results, including its average eligible HQLA.

On December 21, 2015, the Federal Reserve voted to affirm the CCyB amount at the current level of 0 percent, based on its assessment that financial vulnerabilities remained moderate. That assessment reflected in part the relatively low levels of leverage and maturity transformation in the financial sector, as well as continued modest growth in household debt. The Federal Reserve also proposed a policy statement detailing the framework that it would follow in setting the CCyB, a macroprudential tool that can be used to increase the resilience of the financial system when there is a somewhat higher risk of elevated losses in the future, so that it is then available to help absorb losses and moderate the reduction in credit supply associated with worsening credit conditions. The framework consists of a set of principles for translating assessments of financial-system vulnerabilities that are regularly undertaken by the Federal Reserve into the appropriate level of the CCyB.

In June 2015, the federal banking agencies finalized revisions to the regulatory capital rules, which were originally adopted in 2013, applicable to advanced approaches banking organizations. The revisions clarify certain requirements of the advanced approaches risk-based capital rule based on observations made by the agencies during the parallel run review process of advanced approaches banking organizations. The revisions also enhance consistency of the agencies' advanced approaches risk-based capital rule with relevant international standards.

In April 2016, the Federal Reserve finalized a rule to amend its LCR requirement. The final rule allows investment grade, U.S. general obligation state and municipal securities to be counted as HQLA up to certain levels if they meet the same liquidity criteria which currently apply to corporate debt securities. The limits on the amount of a state or municipality's securities which could qualify are based on the liquidity characteristics of the securities. The final rule applies only to institutions supervised by the Federal Reserve and subject to the LCR requirement.

Enhanced Prudential Standards

In July 2015, the Federal Reserve issued a final order which established enhanced prudential standards for General Electric Capital Corporation (GECC), a nonbank financial company designated by the Council in July 2013 for Federal Reserve supervision and enhanced prudential standards. In light of the substantial similarity of GECC's activities and risk profile to that of a similarly sized BHC, the enhanced prudential standards adopted by the Federal Reserve are similar to those that apply to large BHCs, including capital requirements, capital-planning and stress-testing requirements, liquidity requirements, risk-management and risk-committee requirements, and reporting requirements. In light of the plan announced and in the process of execution by General Electric, parent company of GECC, to substantially shrink GECC's systemic footprint and retain only those business lines that support General Electric's core industrial businesses, the final order provides for application of enhanced prudential standards in two phases. Effective January 1, 2016, GECC must comply with risk-based capital and leverage requirements, the LCR rule, and related reporting requirements. Additional requirements come into effect on January 1, 2018.

Emergency Lending Authority

On November 30, 2015, the Federal Reserve approved a final rule updating its procedures for emergency lending under Section 13(3) of the Federal Reserve Act. The Dodd-Frank Act limits the Federal Reserve's authority to engage in emergency lending to programs and facilities with "broad-based eligibility" which have been established with the approval of the Secretary of the Treasury. The Dodd-Frank Act also prohibits lending to entities which are insolvent and imposes certain other limitations. The rule provides greater clarity regarding the Federal Reserve's implementation of these and other statutory requirements.

5.1.2 Dodd-Frank Act Stress Tests and Comprehensive Capital Analysis and Review

Section 165(i) of the Dodd-Frank Act requires two types of stress tests. First, the Federal Reserve must conduct annual supervisory stress tests of BHCs with \$50 billion or more in total consolidated assets, U.S. IHCs of FBOs with \$50 billion or more in U.S. non-branch assets, and nonbank financial companies designated by the Council. Second, financial companies with more than \$10 billion in total consolidated assets regulated by a primary federal financial regulatory agency must conduct annual company-run stress tests, and BHCs with \$50 billion or more in total consolidated assets and nonbank financial companies designated by the Council must also conduct semiannual company-run stress tests. In March 2015, the Federal Reserve released the results of 2015 annual DFAST and the CCAR (see Section 4.11.1).

For the first time in 2015, certain financial institutions with total consolidated assets between \$10 and \$50 billion were required to disclose the results of their Dodd-Frank Act company-run stress tests. Results were disclosed between June 15 and June 30. These tests are not conducted by the federal banking agencies, and the agencies do not make public statements about the results.

In November 2015, the Federal Reserve issued a final rule to modify its capital plan and stress testing rules effective January 1, 2016. For BHCs with more than \$10 billion but less than \$50 billion in total consolidated assets and savings and loan holding companies with total consolidated assets of more than \$10 billion, the final rule modifies certain mandatory capital action assumptions in the stress test rules. It also delays the application of the company-run stress test requirements to savings and loan holding companies until January 1, 2017. For BHCs with total consolidated assets of \$50 billion or more and state member banks subject to the Federal Reserve's advanced approaches capital requirements, the final rule delays the use of the SLR for one year and indefinitely defers the use of the advanced approaches risk-based capital framework in the capital plan and stress test rules. For BHCs that have total consolidated assets of \$50 billion or more, the final rule also removes the tier 1 common capital ratio requirement and modifies certain mandatory capital action assumptions. The FDIC and OCC similarly revised their respective rules in 2014 to modify the timing of the stress tests.

In January 2016, the OCC and Federal Reserve released supervisory scenarios for the 2016 DFAST. The FDIC released its stress test scenarios in February 2016. The Federal Reserve also issued instructions to firms participating in 2016 CCAR. Financial institutions are required to use the supervisory scenarios to in both the stress test conducted as part of CCAR and those required by the Dodd-Frank Act. Financial institutions are also required to use at least one BHC defined stress scenario and a BHC baseline scenario as part of CCAR. The severely adverse supervisory scenario for DFAST and the CCAR exercise features a countercyclical element: as described in the 2013 policy statement on scenario design, when prevailing economic conditions are sufficiently strong, as measured by the unemployment rate, the scenario's severity, as measured by the increase in unemployment rate, is increased. In this year's stress test, the unemployment rate increased 5 percentage points to a level of 10 percent unemployment; the scenarios used in the annual stress tests since 2012 had featured increases of 4 percentage points.

5.1.3 Resolution Plans and Orderly Liquidation Authority

Under the framework of the Dodd-Frank Act, resolution under the U.S. Bankruptcy Code is the statutory first option in the event of the failure of a financial company. Section 165(d) of the Dodd-Frank Act requires nonbank financial companies designated by the Council for supervision by the Federal Reserve and BHCs—including FBOs that are, or are treated as, BHCs—with total consolidated assets of \$50 billion or more to report periodically to the Federal Reserve, the FDIC, and the Council with plans—also referred to as living wills—for their rapid and orderly resolution under the U.S. Bankruptcy Code in the event of material financial distress or failure. The Federal Reserve and the FDIC review each plan and may jointly determine that a plan is not credible or would not facilitate an orderly resolution of the company under the U.S. Bankruptcy Code. If the Federal Reserve Board of Governors and the FDIC Board of Directors make such a joint determination, the agencies must notify the company of the deficiencies in its plan, and the company must resubmit its plan with revisions that address the deficiencies jointly identified by the Federal Reserve and FDIC, including any proposed changes in business operations and corporate structure. The company must also explain why it believes that the revised plan is credible and would result in an orderly resolution under the U.S. Bankruptcy Code.

If a firm fails to adequately remediate its identified deficiencies, the Federal Reserve and the FDIC, acting jointly, may impose more stringent capital, leverage, or liquidity requirements, or restrictions on growth, activities, or operations of the firm, or its subsidiaries. If, following a two-year period beginning on the date of the imposition of such requirements, a firm still has failed to adequately remediate any deficiencies, the Federal Reserve and the FDIC, in consultation with the Council, may jointly require the firm to divest certain assets or operations to facilitate an orderly resolution of the firm in bankruptcy.

In April 2016, the Federal Reserve and FDIC jointly determined that each of the 2015 resolution plans of Bank of America, Bank of New York Mellon, JP Morgan Chase, State Street, and Wells Fargo was not credible or would not facilitate an orderly resolution under the U.S. Bankruptcy Code, the statutory standard established in the Dodd-Frank Act, and notified these firms of their deficiencies. In assessing the 2015 resolution plans, the agencies evaluated a number of areas, and key among them were seven elements: capital, liquidity, governance mechanisms, operational capabilities, legal entity rationalization, derivatives and trading activities, and responsiveness. The agencies issued joint notices of deficiencies to the five firms detailing the deficiencies in their plans and the actions the firms must take to address them. Each firm must remediate its deficiencies by October 1, 2016. If a firm has not done so, it may be subject to more stringent prudential requirements, as described above.

The Federal Reserve and FDIC also jointly identified weaknesses in the 2015 resolution plans of Goldman Sachs and Morgan Stanley that the firms must address, but did not make joint determinations regarding the plans. The FDIC determined that the plan submitted by Goldman Sachs was not credible or would not facilitate an orderly resolution under the U.S. Bankruptcy Code, and identified deficiencies. The Federal Reserve identified a deficiency in Morgan Stanley's plan and found that the plan was not credible or would not facilitate an orderly resolution under the U.S. Bankruptcy Code.

Neither agency found that Citigroup's 2015 resolution plan was not credible or would not facilitate an orderly resolution under the U.S. Bankruptcy Code, although the agencies did identify weaknesses that the firm must address.

In addition, the agencies issued guidance to the eight firms for the development of their July 1, 2017 plan submissions. The 2017 plan of each firm is expected to satisfactorily address the vulnerabilities discussed in the guidance, and the agencies will evaluate the plans under the statutory standard.

In March 2015, the Federal Reserve and the FDIC delivered feedback letters to three large FBOs (BNP Paribas, HSBC Holdings plc, and The Royal Bank of Scotland plc) regarding their 2014 resolution plan submissions. In July 2015, the Federal Reserve and the FDIC provided feedback to three nonbank financial companies (American International Group, Inc. (AIG), Prudential Financial, Inc., and GECC) regarding their initial resolution plans. These six organizations submitted their 2015 plans before the December 31, 2015 deadline set by the agencies.

Also in July 2015, the Federal Reserve and the FDIC provided guidance to 119 firms that file their resolution plans in December of each year. Twenty-nine of the more complex firms were required to file either full or tailored resolution plans that take into account guidance identified by the agencies. Ninety firms with limited U.S. operations were permitted to file plans that focus on material change to their 2014 resolution plans, actions taken to strengthen the effectiveness of those plans, and, where applicable, actions to ensure any subsidiary insured depository institution is adequately protected from the risk arising from the activities of nonbank affiliates of the firm. The agencies also released an updated tailored resolution plan template intended to facilitate the preparation of tailored resolution plans.

In November 2015, ISDA relaunched the ISDA Universal Resolution Stay Protocol. The 2015 Protocol ensures cross-border derivatives and securities financing transactions are captured by stays on cross-default and early termination rights in the event a counterparty enters into resolution. These stays would facilitate a resolution under either the Orderly Liquidation Authority or the U.S. Bankruptcy Code by helping to address some of the cross-border uncertainty and contagion risks in both regimes.

In February 2016, the FDIC and the SEC proposed a joint rule to establish procedures for the FDIC to appoint the Securities Investor Protection Corporation (SIPC) as trustee of a broker-dealer placed into a Title II receivership and providing for satisfaction of customer claims against the covered broker-dealer. The proposed rule clarifies how the customer protections of the Securities Investor Protection Act will be integrated with the other provisions of Title II, the role of the FDIC as receiver and SIPC as trustee for the covered broker-dealer, and the administration of claims in the receivership of a covered broker-dealer.

5.1.4 Insurance

FIO, the Federal Reserve, and state insurance regulators are the U.S.-based members of the International Association of Insurance Supervisors (IAIS). FIO's director, three state insurance regulators, one member of the Federal Reserve's senior staff, in addition to supervisors from other jurisdictions, serve on the IAIS's Executive Committee.

Through service on the IAIS's Financial Stability and Technical Committee, FIO, the Federal Reserve, state insurance regulators, and the NAIC have participated extensively in the process of evaluating insurers for potential identification by the IAIS and the FSB as global systemically important insurers (G-SIIs) and in developing the policy measures to be applied to G-SIIs. The FSB, which was tasked by the G-20 to identify G-SIIs, delegated to the IAIS the development of a methodology to identify G-SIIs and the development of policy measures applicable to G-SIIs. On November 3, 2015, the FSB, after consultation with the IAIS and national authorities, identified an updated list of nine G-SIIs. The 2015 G-SII list included the three U.S.-based insurers that were on the G-SII lists in both 2013 and 2014.

In November 2015, the IAIS issued two public consultations related to the IAIS's G-SII work. The first consultation proposed revisions to the methodology to identify G-SIIs to ensure, among other things, an appropriate treatment of all types of primary insurance, reinsurance and other financial activities of global insurers. The second consultation is part of an effort by the IAIS to update and improve upon the IAIS's concept of non-traditional non-insurance activities and products, which are an important part of the methodology, as well as the determination of the basic capital requirement (BCR) and higher loss absorbency (HLA) requirement to G-SIIs.

The FSB also called upon the IAIS to develop several separate capital standards. The IAIS finalized the first such standard in 2014—a straightforward BCR that applies to all G-SII group activities, including non-insurance activities. In October 2015, the IAIS also developed an initial version of the HLA requirements for G-SIIs. The BCR and HLA standards were both subsequently endorsed by the FSB. The IAIS is also developing a more risk-sensitive group-wide global insurance capital standard (ICS) that, if adopted by the IAIS and implemented, would replace the BCR as the foundation for HLA for a G-SII, and would apply to a broader cohort of internationally active insurance groups (IAIGs). The FIO, the Federal Reserve, state insurance regulators, and the NAIC have participated significantly in IAIS committees and working groups involved with the development of the BCR, HLA, and ICS. This includes annual iterations of field test exercises that involve the collection and analysis of data from volunteer IAIGs, including some of the largest U.S.-based insurance groups.

FIO, the Federal Reserve, state insurance regulators, and the NAIC are members of the IAIS Financial Crime Task Force, which is developing an issues paper that would lead to the development of global standards for cybersecurity.

Since 2012, FIO, state insurance regulators, the NAIC, the European Commission, and the European Insurance and Occupational Pensions Authority have participated in an EU-U.S. Insurance Project to increase mutual understanding and enhance cooperation among insurance authorities in the EU and the United States. In November 2015, the Steering Committee held its third public forum dedicated to the topics of group supervision and transatlantic cooperation. The forum reported on the progress of the EU-U.S. Insurance Project on group supervision, focusing on supervisory colleges and the Own Risk and Solvency Assessment (ORSA). The EU-U.S. Insurance Project in November 2015 also released reports regarding group supervision and ORSA.

Under Title V of the Dodd-Frank Act, FIO has the authority to assist the Secretary of the Treasury in negotiating “covered agreements” in conjunction with the U.S. Trade Representative (USTR). A covered agreement is a written bilateral or multilateral agreement between the United States and one or more foreign governments, authorities, or regulatory entities regarding prudential measures with respect to the business of insurance or reinsurance.

In November 2015, Treasury and USTR jointly consulted with Congress regarding the intention to initiate negotiations to enter into a covered agreement with the EU. Treasury and USTR advised Congress that a covered agreement with the EU would level the regulatory playing field for U.S.-based insurers and reinsurers operating there, and further confirm that the existing U.S. insurance regulatory system serves the goals of insurance sector oversight, policyholder protection, and national and global financial stability. U.S. and EU representatives met in February 2016 to begin negotiating a covered agreement. During this initial meeting, both sides agreed to move forward efficiently and expeditiously and affirmed their good faith pursuit of a covered agreement relating to group supervision, exchange of confidential information between supervisory authorities, and reinsurance supervision including collateral. Additionally, both sides agreed to meaningful stakeholder consultation and engagement throughout the negotiations. Talks continued in May 2016 at the conclusion of which U.S. and EU representatives expressed commitment to pursuit of an agreement that will improve regulatory and supervisory treatment for insurers and reinsurers operating on both sides of the Atlantic.

By statute, FIO also assists the Secretary of the Treasury with administration of the Terrorism Risk Insurance Program (TRIP). Title I of the Terrorism Risk Insurance Program Reauthorization Act of 2015 requires that Treasury collect data concerning terrorism risk insurance coverage and issue several reports and new rules as part of the implementation process. In October 2015, Treasury released a required report regarding the process for certifying an “act of terrorism” under TRIP. In March 2016, Treasury announced the commencement of data collection for 2016 from participating insurers concerning their experience under TRIP. Also, in April 2016, Treasury sought public comment on a proposed revision to the TRIP regulations that would add rules concerning, among other things, data collection and the certification process.

State insurance regulators, through the NAIC, continue work on updating the NAIC’s insurance financial solvency framework and refining existing NAIC accounting, actuarial, reporting, valuation, and risk-based capital standards. All 50 states, the District of Columbia, and Puerto Rico have adopted key amendments to the Insurance Holding Company System Regulatory Act, including provisions requiring the submission of a new enterprise risk report. In addition, revisions to the model act are being adopted by states to clarify their legal authorities to act as group-wide supervisor for certain IAIGs. States continue to enact new and updated NAIC model laws related to the Solvency Modernization Initiative, including the Risk Management and Own Risk and Solvency Assessment Model Act (requiring the ORSA filing), and the revised Standard Valuation Law to implement principle-based reserving, both of which have been adopted in a majority of states.

The states, through the NAIC, are moving toward establishing a more consistent regulatory framework for life insurance affiliated captive reinsurance transactions entered into after 2014 relating to certain term and universal life insurance products. This framework provides for the public disclosure of the reserves and assets related to those transactions. This year, state insurance regulators, through the NAIC, continued the implementation of the framework and further enhanced the supplemental disclosure. In addition, the NAIC is currently studying the regulatory-related incentives that encourage insurers to engage in variable annuity reinsurance transactions with captives and formulating potential adjustments to the NAIC solvency framework required by the accreditation program. A quantitative impact study is currently underway to determine the adjustments that are necessary to be made to the solvency framework.

Under the 2011 revisions to the NAIC Credit for Reinsurance Model Law and Regulation, reinsurers from a qualified jurisdiction are eligible to be certified for reduced reinsurance collateral requirements. The majority of states have adopted the model law revisions, which now covers approximately 66 percent of direct insurance premiums written across all lines of business in the U.S. The NAIC's Financial Regulation Standards and Accreditation Committee is currently considering making the certified reinsurer provisions a uniform accreditation standard required for all NAIC accredited jurisdictions.

In addition to continuing to enact changes to the insurance solvency framework, state insurance regulators have also focused on cybersecurity at insurance companies, and, in 2014, the NAIC established a cybersecurity task force to coordinate such efforts. Through this task force, the NAIC developed and adopted "Principles for Effective Cybersecurity Insurance Regulatory Guidance," which promote uniform standards, accountability, and access to necessary information while protecting consumers. The NAIC developed and adopted a "Roadmap for Cybersecurity Consumer Protections" that will be used to guide drafting efforts for the Insurance Data Security Model Law. A draft of that model law was exposed for comment in March 2016. The NAIC also reviewed and updated cybersecurity examination standards in the NAIC Financial Examiner's Handbook to incorporate concepts from the NIST Cybersecurity Framework and similar enhancements are expected to be made to the NAIC Market Conduct Examiner's Handbook this year. The NAIC also adopted a new Cybersecurity and Identity Theft Insurance Coverage Supplement to the Property and Casualty Annual Statement to gather information about the insurers selling cybersecurity insurance products and the market for such products. The first filings of this supplement were due on April 1, 2016.

5.1.5 Federal Mortgage-related Settlements

Since the Council's last annual report, federal agencies reached additional significant settlements with financial institutions relating to mortgage practices and the sale of mortgage securities.

In April 2016, the Department of Justice (DOJ), along with the NCUA and other federal and state partners, announced a \$5.6 billion settlement with Goldman Sachs related to its conduct in the packaging, securitization, marketing, sale, and issuance of RMBS. The settlement required payment of a \$2.4 billion civil penalty and \$1.8 billion in other relief for underwater homeowners, distressed borrowers and affected communities, including the largest commitment in any RMBS agreement to provide financing for affordable housing. Goldman Sachs also paid \$875 million to settle claims with other federal and state entities, including \$575 million to settle claims with the NCUA.

In February 2016, the DOJ announced that Morgan Stanley agreed to pay a \$2.6 billion penalty to resolve claims related to the marketing, sale, and issuance of RMBS it issued in 2006 and 2007. This settlement constitutes the largest component of a set of resolutions with Morgan Stanley entered by members of the RMBS Working Group, which have totaled approximately \$5 billion. As part of the agreement, Morgan Stanley acknowledged in writing that it failed to disclose critical information to prospective investors about the quality of the mortgage loans underlying its RMBS and about its due diligence practices. In conjunction with this agreement, Morgan Stanley also agreed to pay \$550 million and \$22.5 million, respectively, to the states of New York and Illinois.

In February 2016, Wells Fargo announced in a filing with the SEC that it had reached a \$1.2 billion agreement in principle with the DOJ and the Department of Housing and Urban Development (HUD) to resolve claims that its FHA loan certifications violated the False Claims Act. Because the settlement is not finalized, DOJ and HUD have not yet announced the settlement.

In February 2015, DOJ and 19 states and the District of Columbia announced a \$1.4 billion settlement with S&P to resolve claims related to inflated ratings that it issued for RMBS and collateralized debt obligations (CDOs) from 2004 to 2007 that misrepresented the securities' true credit risks. Half of the settlement amount constitutes a penalty to be paid to the federal government and is the largest penalty of its type ever paid by a ratings agency, while the remaining half will be divided among the states and the District of Columbia.

5.2 Financial Infrastructure, Markets, and Oversight

5.2.1 Over-the-Counter Derivatives Reform

The SEC, the CFTC, and the federal banking agencies continue to implement Title VII of the Dodd-Frank Act, which establishes a comprehensive new regulatory framework for swaps and security-based swaps.

Security-Based Swaps

In February 2015, the SEC adopted Regulation SBSR. Regulation SBSR provides for the reporting of security-based swap information to registered security-based swap data repositories (SBSDRs) and the public dissemination of security-based swap transaction, volume, and pricing information by registered SBSDRs. Regulation SBSR contains provisions that address the application of the regulatory reporting and public dissemination requirements to cross-border security-based swap activity, as well as provisions for permitting market participants to satisfy these requirements through substituted compliance. Concurrently, the SEC also adopted new rules governing the SBSDR registration process, duties, and core principles and amending several of its existing rules and regulations in order to accommodate SBSDRs. To further implement Title VII, in August 2015, the SEC issued rules to establish a process for the registration (or withdrawal from registration) of security-based swap dealers and major security-based swap participants with the SEC. In February 2016, the SEC adopted rules governing how security-based swaps that involve dealing activity in the United States should be counted in a foreign entity's security-based swap dealer *de minimis* threshold calculations. With these rules, the SEC has completed its rulemaking relating to the *de minimis* thresholds and their application to U.S. and foreign dealers. In April 2016, the SEC adopted rules implementing a comprehensive set of business conduct standards and chief compliance officer requirements for security-based swap dealers and major security-based swap participants.

Margin Rules for Non-Cleared OTC Derivatives

In October 2015, the federal banking agencies, the FHFA, and the Farm Credit Administration (the prudential regulators) released their final rule establishing capital and margin requirements for swap and security-based swap dealers and major swap and security-based swap participants regulated by one of the agencies. The final rule establishes minimum margin requirements for swaps and security-based swaps that are not cleared through a clearinghouse. The margin requirements mandate the exchange of initial and variation margin for non-cleared swaps and non-cleared security-based swaps between covered swap entities, their affiliates, and certain counterparties. The amount of margin will vary based on the relative risk of the non-cleared swap or non-cleared security-based swap as determined by initial margin models, if approved by the prudential regulators, or standardized initial margin amounts. The agencies also issued an interim final rule exempting from margin requirements certain non-cleared swaps and non-cleared security-based swaps used for hedging purposes by commercial end-users and certain other counterparties.

In December 2015, the CFTC adopted its final rule establishing initial and variation margin requirements on non-cleared swaps for swap dealers and major swap participants for which there is no prudential regulator. The CFTC rule is similar to the rules adopted by the prudential regulators and the framework being developed in the EU. In May 2016, the CFTC separately adopted a rule for application of its margin requirements to cross-border transactions.

The prudential regulators and the CFTC also adopted and sought comment on respective interim final rules implementing the Business Risk Mitigation and Price Stabilization Act of 2015, which exempts from the margin rules for non-cleared swaps certain swaps for which a counterparty qualifies for an exemption or exception from clearing under Dodd-Frank.

5.2.2 CCPs: Ongoing Domestic and International Regulatory Initiatives

Regulators are actively working on domestic and international work streams related to CCPs, a number of which are highlighted here.

In February 2015, CPMI-IOSCO published quantitative disclosure standards, which are intended to enable stakeholders to compare CCP risk controls and to better understand and assess the risks of participating in CCPs. By January 2016, all U.S. systemically important CCPs published their first set of quarterly quantitative disclosures, which include data on their clearing transactions and financial resources. CCPs have been publishing public qualitative disclosures regarding implementation of the Principles for Financial Market Infrastructures (PFMI) at least biennially since 2013.

In February 2016, the CFTC and the European Commission announced a common approach to the supervision of CCPs operating in the EU and the United States, representing an important step forward in harmonizing CCP regulatory standards internationally. Under this common approach, the European Commission and CFTC agreed on a substituted compliance regime for certain regulatory requirements adopted by the CFTC in March 2016. The SEC continues to work with the European Commission on a common approach with respect to CCPs under its jurisdiction.

In addition, the CFTC continues to review recovery and wind down plans submitted in the past year by the systemically important CCPs under its jurisdiction. The SEC staff is working on a recommendation for the Commission to adopt a rule on the standards for the systemically important clearing agencies under its jurisdiction, including requirements for the development of recovery and wind down plans.

Staff working groups of the Council's FMU Committee have held several targeted sessions on default risk management, liquidity risk management, risk management governance, and resolution planning to promote interagency engagement on potential risks associated with CCPs and potential policy responses. Committee staff continues to review CCP risk management and the interconnections between CCPs and their clearing members and the broader financial system. This includes assessing the level and breadth of transparency that should be provided into CCP risk management, including the risk models used to calculate margin requirements for each type of transaction and into stress testing methodologies and assumptions, so that stakeholders can assess the adequacy of a CCPs risk management practices and of its financial and liquidity resources. In addition, domestic regulators continue to engage internationally in stocktaking and assessment efforts regarding stress testing, margin, adequacy of financial resources, CCP contributions of own capital, loss allocation and other recovery tools, and resolution planning. Regulators will continue to review and evaluate the effectiveness of current risk management standards and practices across these areas.

5.2.3 Money Market Mutual Fund Reform

In July 2014, the SEC adopted significant structural reforms for the regulation of MMFs, building upon the reforms adopted by the SEC in March 2010. The reforms are intended to make MMFs less susceptible to runs that could threaten financial stability and harm investors. Several of these reforms went into effect in April 2016, and the remaining reforms will go into effect in October 2016.

5.2.4 Operational Risks for Technological Systems and Cybersecurity

In December 2015, the CFTC proposed Regulation AT, a series of risk controls, transparency measures and other safeguards to enhance the safeguards for automated trading on U.S. designated contract markets (DCMs). The proposed regulations focus on automation of order origination, transmission and execution, and the risks that may arise from such activity. Principal elements of Regulation AT for market participants and clearing futures commission merchants include: registration of certain entities not otherwise registered with the Commission; new algorithmic trading procedures for trading firms and clearing firms, including pre-trade and other risk controls; testing, monitoring, and supervision requirements for automated trading systems; and requirements that certain persons submit compliance reports to DCMs regarding their ATs. Principal elements for DCMs include: new risk controls for Direct Electronic Access provided by DCMs; transparency in DCM electronic trade matching platforms; and new risk control procedures, including pre-trade risk controls, compliance report review standards, self-trade prevention tool requirements, and market-maker and trading incentive program disclosure and related requirements.

In December 2015, the CFTC also proposed amendments to its system safeguards testing rules for DCMs, SEFs, SDRs, and in a separate proposal, for derivatives clearing organizations. The amendments would specify and define the types of cybersecurity testing essential to fulfilling system safeguards testing obligations, including vulnerability testing, penetration testing, controls testing, security incident response plan testing, and enterprise technology risk assessment and would clarify a number of other rule provisions. The proposal would also add new provisions applicable to covered DCMs and all SDRs instituting minimum frequency requirements for conducting the essential types of cybersecurity testing and requirements for performance of certain tests by independent contractors.

Regulators continue work to develop mechanisms to evaluate and report on the ability of supervised financial institutions to effectively manage the various safety and soundness risks posed by the use of information technology at the entities and their significant vendors. In June 2015, the Federal Financial Institutions Examination Council (FFIEC), on behalf of its members, published the Cybersecurity Assessment Tool (CAT) to help institutions identify their risks and determine their cybersecurity preparedness across five domains: Cyber Risk Management and Oversight; Threat Intelligence and Collaboration; Cybersecurity Controls; External Dependency Management; and Cybersecurity Incident Management and Resilience. The CAT provides a repeatable process for institutions to measure their cybersecurity preparedness over time. It incorporates cybersecurity-related principles from within the *FFIEC IT Examination Handbook* and key concepts from the NIST Cybersecurity Framework. Institutions of all sizes may use the CAT to perform a self-assessment and inform their risk management strategies. A number of the member agencies are in the process of using the CAT to support their bank examination process to benchmark and assess financial institutions' cybersecurity efforts.

The FFIEC on behalf of its members also published new and updated booklets within the *FFIEC IT Examination Handbook*. These updates included substantial revisions to the Management Booklet to reflect the importance of incorporating technology operations management into an institution's enterprise risk management system. The Business Continuity Planning Booklet was updated to include a new appendix that communicates expectations regarding components of an effective third-party risk management program and highlights the importance of incorporating technology service providers' business continuity plans into

the institution's overall resilience planning. Additionally, the FFIEC, on behalf of its members also published several statements to inform institutions of threat trends and risk mitigation steps to address destructive malware, compromised credentials, and cyber attacks involving extortion.

5.2.5 Accounting Standards

In January 2016, the Financial Accounting Standards Board (FASB) issued an Accounting Standards Update (ASU) on recognition and measurement of financial instruments and financial liabilities. The amended standard requires certain equity investments to be measured at fair value, with changes in fair value recognized in net income. It also simplifies the impairment assessment of equity investments without readily determinable fair values by requiring a qualitative assessment to identify the impairment. The ASU further provides that, for a liability measured at fair value under the fair value option for financial instruments, the portion of the total change in the fair value of the liability resulting from a change in the instrument-specific credit risk ("own credit risk") will no longer be reflected in net income but, instead, will be presented separately in other comprehensive income. The amended standard modifies a number of reporting requirements with regard to the disclosure of fair value of assets and of the methods used to estimate that fair value, as well as with regard to their presentation on the balance sheet. Finally, the amended standard requires the separate presentation of financial assets and financial liabilities by measurement category and form of financial asset in the statement of financial position or the accompanying notes to the financial statements.

In February 2016, the FASB issued an ASU that improves the financial reporting of leasing activities and increases transparency and comparability among organizations that engage in such activities. The principal change the ASU makes to existing U.S. GAAP is the recognition by lessees of lease assets and lease liabilities on the balance sheet for most of those leases previously classified as operating leases, which have not been reflected on the balance sheet. The ASU retains a distinction between finance leases and operating leases for lessees, which is substantially similar to the distinction between capital leases and operating leases in existing GAAP. As a result, the effect of leases in a lessee's income statement and statement of cash flows is largely unchanged from current accounting. The accounting applied by a lessor under the ASU generally is comparable to the treatment under existing GAAP. The FASB's leases project began as a joint project with the International Accounting Standards Board (IASB) and many of the ASU's requirements are the same as those in the IASB's January 2016 leasing standard.

5.3 Mortgage Transactions, Housing, and Consumer Protection

5.3.1 Mortgage Transactions and Housing

State banking supervisors, through the Conference of State Bank Supervisors (CSBS), are evaluating industry feedback on the Proposed Regulatory Prudential Standards for Nonbank Mortgage Servicers that CSBS published in March 2015. The proposed prudential standards contemplate a set of baseline standards for all nonbank mortgage servicers and enhanced prudential standards for large, complex firms. Agencies that are active in supervising or setting standards for nonbank mortgage servicers, including state banking supervisors, the FHFA, and the CFPB, are engaged in regular efforts to coordinate these supervisory matters.

In October 2015, the CFPB issued a final rule to amend its Regulation C, which implements the Home Mortgage Disclosure Act (HMDA). Among other measures, the rule revises the tests for determining which financial institutions and housing-related credit transactions are covered under HMDA, requires the reporting of new data points identified in the Dodd-Frank Act, and better aligns the requirements of Regulation C to existing industry data standards, to the extent practicable.

In January 2016, the FHFA adopted a final rule revising its regulations governing FHLB membership. The revisions prevent circumvention of the statute’s membership restrictions by ineligible entities using captive insurers as conduits for FHLB membership by defining “insurance company” to exclude captive insurers. The final rule did not adopt provisions in the proposed rule which would have required an institution to hold at least one percent of its assets in home mortgage loans (and ten percent on an ongoing basis where applicable) as a condition of remaining a member. FHFA concluded in its final rule that, as 98 percent of current members would likely be in compliance with the proposed requirements, compliance burdens of these eligibility requirements would outweigh the benefits.

5.3.2 Consumer Protection

Among its authorities, the CFPB may supervise certain nonbank entities, including mortgage companies, private education lenders, payday lenders, “larger participants” of a market for other consumer financial products and services, and any nonbank covered person that the CFPB has reasonable cause to determine is engaging or has engaged in conduct that poses risks to consumers with regard to the offering or provision of consumer financial products or services. The CFPB has issued a series of larger-participant rulemakings for specific markets, which establish the scope of the CFPB’s nonbank supervision authority in those markets.

In June 2015, the CFPB published a final rule to define a market for automobile financing and define certain nonbank covered persons as larger participants in this market. Under the rule, a nonbank covered person is a larger participant in the market for automobile financing if the entity has at least 10,000 aggregate annual originations. Automobile financing is defined to include grants of credit for purchasing an automobile, refinancing of these credit obligations, and the purchasing or acquiring of these obligations. The rule also defines automobile leases and the purchasing or acquiring of automobile leases as automobile financing but does not include automobile title lending or the securitization of automobile loans or leases.

In June 2015, the OCC, Federal Reserve, FDIC, CFPB, FHFA, and the NCUA jointly issued a final rule that (1) established the minimum requirements laid out in Dodd-Frank to be applied by participating states in the registration and supervision of appraisal management companies (AMCs); (2) required federally regulated AMCs to meet the same applicable minimum Dodd-Frank requirements (other than registering with the state); and (3) required the reporting by participating states of certain AMC information to the Appraisal Subcommittee of the FFIEC.

Starting in April 2015, the FFIEC agencies began incorporating the Interagency Examination Procedures for the Truth in Lending Act (TILA) and the Real Estate Settlement Procedures Act (RESPA), developed by the FFIEC, into their respective examination guidance. These procedures reflected certain CFPB amendments to Regulation X and Z, mostly related to the integrated mortgage disclosure requirements under TILA and RESPA, which came into effect on October 3, 2015.

5.4 Data Scope, Quality, and Accessibility

5.4.1 Data Scope

Data scope refers to the breadth and depth of information available to supervisors and market participants. Supervisors need data about diverse markets, institutions, and products to conduct financial stability analysis. Those data must cover financial activities that cut across regulatory boundaries. Those data also must be detailed, to enable supervisors to monitor and assess risks. Regulators took several steps in 2015 to expand the scope of data collections and identify areas that need to be improved.

Treasury Market Data

In July 2015, officials, including the CFTC, Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York (FRBNY), the SEC, and Treasury, released a joint staff report reporting on the events surrounding the exceptionally volatile trading that occurred in the U.S. Treasury market on October 15, 2014. The report noted significant gaps in timely official access to market data for Treasury cash securities. On January 19, 2016, the Treasury issued an RFI seeking public comment on the evolving structure of the U.S. Treasury market. The RFI stated that there is a need for more comprehensive official sector access to data regarding the Treasury market. It sought comment on whether additional reporting of Treasury cash security market transaction data to the public would also be beneficial and included questions regarding the appropriate level, timing, and granularity of any such reporting. Given that Treasury market activity crosses multiple regulatory agencies and market sub-segments, with substantial cross market activity noted between secondary trading of Treasury benchmarks in the cash market and Treasury futures contracts, the RFI sought comment on how transmission protocols, data standards, and identifiers might be structured to facilitate data integration, information sharing, and cooperative data analysis while limiting the associated reporting burden.

Securities Financing Data Collections

In 2014, the OFR, Federal Reserve System, and SEC launched voluntary data collection pilots in the repo and securities lending markets. The first data collection pilot covering dealers' bilateral repo activity took place in the first quarter of 2015. Participating firms provided snapshots of their bilateral repo books during three nonconsecutive business days. The second data collection pilot covering securities lending activity was completed in the first quarter of 2016. Potential permanent bilateral repo data and securities lending data collections may be considered, and these permanent collections may require firms to use the LEI, as well as other data standards as they become available. Further, any permanent collections would be designed in a way that facilitates appropriate and secure sharing of data with other officials, given the role of repo and securities lending in connecting sub-segments of financial markets. It is anticipated that appropriately aggregated statistics would be made available to the public.

SEC Asset Management Proposals

On May 20, 2015, the SEC proposed significant new reporting requirements for mutual funds and other registered investment companies. The proposal would require most registered investment companies to report monthly portfolio information in a machine-readable format, similar to existing requirements for MMFs. Under the proposal, the SEC's current reporting Forms N-Q and N-SAR, which are required to be filed semi-annually, would be replaced by new monthly reporting on Form N-PORT and annual reporting on Form N-CEN. Form N-PORT would collect information on fund portfolios, including assets and liabilities, certain risk measures, and investments, including repo agreements, securities on loan and reinvestment of cash collateral from securities on loan, and the terms of derivatives contracts. Form N-CEN would collect census-type information for registered investment companies, such as arrangements with third-party service providers and information regarding securities lending activities and ETFs. The SEC also proposed to amend Form ADV to enhance reporting for separately managed accounts by registered investment advisers. (Separately managed accounts are portfolios of assets or securities directly owned by investors and managed by professional investment firms.) Additional proposed rules to enhance liquidity disclosure requirements and derivatives risk management were also proposed by the SEC in 2015, with added reporting requirements for investment companies on Forms N-PORT and N-CEN.

5.4.2 Data Quality

LEI

The LEI is a globally sanctioned system that assigns a unique alphanumeric code to individual entities that engage in financial transactions. Once LEIs are linked to robust organizational hierarchies, this will allow more robust analyses of data—by entity and across multiple entities—which is critical for regulators who monitor and analyze risks in the financial system, and for private sector risk managers who seek to understand and address risks impacting their individual firms.

As of December 31, 2015, more than 410,000 LEIs have been issued in 195 countries by 27 operational issuers that have been approved to issue LEIs. Approximately half of these have been issued by the sole operational issuer in the United States, and approximately a quarter have been issued to U.S.-based entities. The total number of LEIs issued represents a 24 percent increase from 2014 year-end and has been largely driven by the use of the LEI in derivatives reporting, which is mandated by key regulatory authorities in the United States, Europe, and other jurisdictions worldwide. LEIs are required to be renewed annually in order to ensure the integrity of the LEI reference data; the governing bodies of the global LEI system have been working to increase the rate of compliance with this requirement. The SEC's proposed new asset management reporting requirements and the CFPB's final rule on mortgage lending both include LEI reporting.

Reporting of Derivatives Data

Promoting transparency in derivatives markets continues to be a major priority for global regulators, including members of the Council. The CFTC and OFR continued to harmonize derivatives data reported to U.S. SDRs. In December 2015, CFTC staff issued a request for comment on a draft technical specification for 120 swap data elements.

As discussed above, in 2015, the SEC adopted Regulation SBSR—Reporting and Dissemination of Security-Based Swap Information ([see Section 5.2.1](#)).

Further, global regulators, including the CFTC, OFR, and SEC, worked to harmonize derivatives data reporting across jurisdictions to facilitate global aggregation of these data. Through the Working Group for Harmonization of Key OTC Derivatives Data Elements of the CPMI-IOSCO, regulators issued consultation documents on the Unique Product Identifier (UPI), Unique Transaction Identifier (UTI), and the first set of prioritized data elements (other than UPI and UTI) for global harmonization. The UPI and UTI are being designed to identify each OTC derivatives product and each transaction involving an OTC derivatives product which is reported to a trade repository. These codes will help facilitate the communication of data about OTC derivatives products and transactions in standardized formats and facilitate aggregation and sharing of OTC derivatives data within and across jurisdictions.

Mortgage Data Standards

In October 2015, the CFPB revised reporting requirements under HMDA. Under the revisions, HMDA data collection will include a ULI for each mortgage loan application, origination, or purchase reported. The revisions require an LEI for the reporting entity and the ID of the loan originator assigned by the Nationwide Multistate Licensing System & Registry. Broader use and adoption of a ULI may allow regulators to follow a single loan through its lifecycle. The ability to better understand the market players associated with individual mortgage transactions may help regulators monitor mortgage financing.

5.4.3 Data Accessibility

In 2015, Council member agencies explored best practices in data sharing and reporting efficiency. Several basic elements of data management were discussed which, if addressed through interagency collaboration, could better facilitate data sharing and reporting efficiency. These included streamlining the process for creating data sharing agreements; harmonizing naming conventions and definition of data elements; linking and sharing metadata (data about the data); and greater upfront coordination on data collection.

The recently released Treasury RFI on Treasury markets sought comment on use of data standards, transmission, and identifiers to facilitate data sharing and analysis, given the range of regulatory and official engagement in Treasury markets (see Section 5.4.1). Further, plans for the OFR, Federal Reserve System, and SEC to undertake consideration of a permanent collection on securities financing would include the use of data standards and development of a metadata catalog to facilitate the appropriate sharing of those data with other officials and the public, securely and appropriately.

In December 2015 Congress amended sections of the Commodity Exchange Act and Securities Exchange Act to remove the indemnification requirements for data sharing by swap and security-based swap data repositories, which should foster the ability to share these data.

5.5 Council Activities

5.5.1 Determinations Regarding Nonbank Financial Companies

One of the Council's statutory authorities is to subject a nonbank financial company to supervision by the Federal Reserve and enhanced prudential standards if the company's material financial distress—or the nature, scope, size, scale, concentration, interconnectedness, or mix of its activities—could pose a threat to U.S. financial stability. As noted above, the Council's authority to make these determinations is an important tool to help mitigate potential threats posed by these companies to U.S. financial stability. The Dodd-Frank Act sets forth the standard for the Council's determinations regarding nonbank financial companies and requires the Council to take into account 10 specific considerations when evaluating those companies. To further inform the public of the Council's framework and processes for assessing nonbank financial companies, in 2012 the Council issued a final rule and interpretive guidance following three separate requests for public comment. In February 2015, the Council adopted supplemental procedures regarding its nonbank financial company designation procedures that, among other things, increase public transparency regarding the Council's actions and create additional opportunities for engagement with companies under active consideration and with designated companies during the Council's annual reevaluations of previous designations.

Under Section 113 of the Dodd-Frank Act, the Council is required at least annually to reevaluate each previous determination and rescind any determination if the company no longer meets the statutory standards. In 2015, the Council completed its second annual reevaluations of the determinations regarding each of AIG, GECC, and Prudential Financial and, in March 2016, completed its first annual reevaluation of the determination regarding MetLife. The Council did not rescind any of its determinations; however, on March 30, 2016, the U.S. District Court for the District of Columbia rescinded the Council's determination regarding MetLife. The government has filed a notice of appeal. The Council's supplemental procedures with respect to nonbank financial company determinations provide the public with additional information regarding the process for the Council's annual reevaluations of determinations. As of the date of this report, three nonbank financial companies are subject to final determinations by the Council, and the Council has voted not to advance five nonbank financial companies to Stage 3 of the Council's three-stage process

for evaluating nonbank financial companies. Since the Council's last annual report, the Council has not advanced any nonbank financial companies to Stage 3 or made a proposed or final determination regarding any nonbank financial company.

5.5.2 Risk Monitoring and Regulatory Coordination

The Dodd-Frank Act charges the Council with responsibility to identify risks to U.S. financial stability, promote market discipline, and respond to emerging threats to the stability of the U.S. financial system. The Council also has a duty to facilitate coordination among member agencies and other federal and state agencies regarding financial services policy and other developments.

The Council regularly examines significant market developments and structural issues within the financial system. This risk monitoring process is facilitated by the Council's Systemic Risk Committee (SRC), which is composed primarily of member agency staff in supervisory, monitoring, examination, and policy roles. The SRC serves as a forum for member agency staff to identify and analyze potential risks which may extend beyond the jurisdiction of any one agency.

The OFR plays an important role in the Council's monitoring activities. In 2015, the OFR reported regularly to the Council on developments in financial markets and on the development of monitoring tools. In its 2015 Financial Stability Report, the OFR assessed financial system vulnerabilities and resilience. The OFR also routinely assists and advises the Council on data activities, notably on best practices for data collection and secure data sharing.

5.5.3 Asset Management Analysis

Building on work begun in 2014, the Council analyzed potential financial stability risks that may arise from certain asset management products and activities. Based on this work, the Council identified areas of potential financial stability risk and, in April 2016, publicly issued a written update regarding its views.

5.5.4 Operations of the Council

The Dodd-Frank Act requires the Council to convene no less than quarterly. In 2015, the Council held a total of nine meetings, including at least one each quarter. The meetings bring Council members together to discuss and analyze market developments, threats to financial stability, and financial regulatory issues. Although the Council's work frequently involves confidential supervisory and sensitive information, the Council is committed to conducting its business as openly and transparently as practicable. Consistent with the Council's transparency policy, the Council opens its meetings to the public whenever possible. The Council held a public session at three of its meetings in 2015.

Approximately every two weeks, the Council's Deputies Committee, which is composed of senior representatives of Council members, convenes to discuss the Council's agenda and to coordinate and oversee the work of the SRC and the four other functional committees. The other functional committees are organized around the Council's ongoing statutory responsibilities: (1) to consider, make, and review determinations that nonbank financial companies shall be supervised by the Federal Reserve and be subject to enhanced prudential standards, pursuant to Section 113 of the Dodd-Frank Act; (2) to conduct analyses, review, and provide recommendations to the Council related to the designation of FMUs or payment, clearing, and settlement activities as systemically important, pursuant to Section 804 of the Dodd-Frank Act; (3) to identify potential gaps in regulation that could pose risks to U.S. financial stability and to support the Council in consulting and providing recommendations on the development by the Federal Reserve of heightened prudential standards for nonbank financial companies and large, interconnected BHCs;

(4) to identify risks to, and respond to emerging threats to, the stability of the U.S. financial system; and (5) to provide support on data-related matters, including identifying data and information gaps, facilitating information sharing and coordination among members, and providing direction to the OFR. In 2015, the Council adopted charters for the Nonbank Financial Companies Designations Committee; the Financial Market Utilities and Payment, Clearing and Settlement Activities Committee; the Regulation and Resolution Committee; the Systemic Risk Committee; and the Data Committee.

In 2015, the Council adopted its sixth budget.

5.5.5 Section 119 of the Dodd-Frank Act

Section 119 of the Dodd-Frank Act provides that the Council may issue non-binding recommendations to member agencies on disputes about the agencies' respective jurisdiction over a particular BHC, nonbank financial company, or financial activity or product. (Certain consumer protection matters, for which another dispute mechanism is provided under Title X of the Act, are excluded.) To date, no member agency has approached the Council to resolve a dispute under Section 119.

6

Potential Emerging Threats and Vulnerabilities

6.1 Ongoing Structural Vulnerabilities

Previous versions of the Council's annual report have identified a number of structural vulnerabilities in the U.S. financial system. These include risk-taking incentives of large, complex, interconnected financial institutions; concentration of activities and exposures in CCPs; reliance on less stable, short-term funding markets; continued use of reference rates which are not sufficiently derived from observable transactions and which may be susceptible to manipulation; and challenges to data quality, collection, and sharing. While regulators and market participants have made progress in mitigating the risks posed by these vulnerabilities, the vulnerabilities themselves remain. Going forward, these vulnerabilities will need to be closely monitored, and additional action by regulators and market participants is needed.

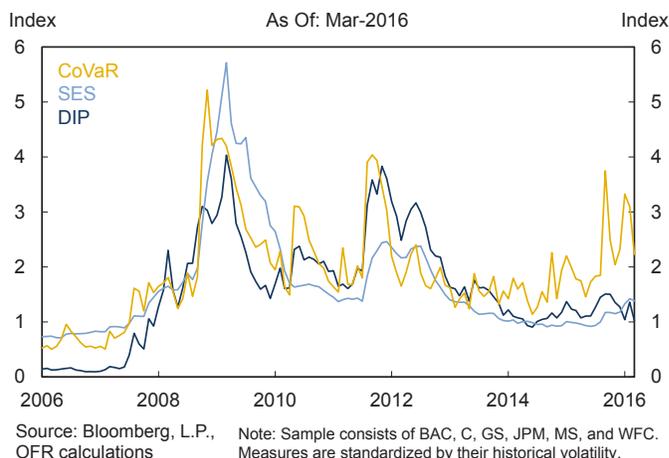
Risk-Taking Incentives of Large, Complex, Interconnected Financial Institutions

Since the financial crisis, the largest BHCs have reduced leverage and become better prepared to manage draws on liquidity, significantly improving their resilience. Much of this improvement can be attributed to implementation of the Dodd-Frank Act and other financial regulatory reforms. In addition, the largest BHCs that operate in the United States continue to be subject to both company-run and supervisory stress testing as well. Over the last year, financial regulators have continued to work to address risks posed by large, complex, interconnected financial institutions. The Federal Reserve finalized a rule requiring that G-SIBs increase their holdings of common equity tier 1 capital relative to RWAs and proposed standards for mandatory long-term debt and total loss-absorbing capacity for these firms (see Section 5.1.1).

Meaningful steps have been made in recovery and resolution planning as well. The Dodd-Frank Act requires certain companies to periodically submit resolution plans to the Federal Reserve and FDIC. Each plan must describe the company's strategy for rapid and orderly resolution under the U.S. Bankruptcy Code in the event of material financial distress or failure of the company. The Federal Reserve and FDIC continue to implement this authority and provide guidance to these firms. Another area of progress is the November 2015 relaunch of the ISDA Resolution Stay Protocol, which now covers securities financing transactions. These stays are intended to give regulators time to facilitate an orderly resolution of a troubled bank (see Section 5.1.3).

In addition to structural vulnerabilities, cyclical factors can further exacerbate risks for such firms. Though the largest BHCs are much safer than they were at the outset of the financial crisis, these institutions have faced some challenges in the current economic environment. The relatively flat yield curve has continued to put pressure on large BHCs' NIMs (Chart 4.11.4) and credit risk associated with both syndicated lending to energy sector firms (see Box F) and CRE lending (see Section 4.5.3) has grown.

6.1.1 Systemic Risk Measures



Market-based systemic risk measures provide useful metrics for assessing how the largest BHCs' contributions to various dimensions of systemic risk have changed over time (**Chart 6.1.1**). Distress Insurance Premiums (DIPs), which measure the market value of insuring the debts of a portfolio of firms against system-wide distress, and Systemic Expected Shortfall (SES), which projects the propensity for firms to be under-capitalized when the system as whole is in distress, remained near their post-crisis lows. However, average Conditional Value-at-Risk (CoVaR), which measures tail losses to the financial system given that a particular firm is in distress, moved up sharply in the fall of 2015, reflecting higher equity market volatility and lower bank equity returns.

The Council remains focused on the potential threats large, complex, interconnected institutions may pose for financial stability. These financial institutions should continue to be robustly monitored given their size, concentration of activities, and innovations of new products and activities that have potentially systemic implications.

Central Counterparties

As noted in last year's annual report, CCPs enhance financial stability and increase market resilience by improving transparency, imposing robust risk management and margin standards on clearing members, expanding multilateral netting, and facilitating the orderly management of counterparty credit losses. To maximize these benefits, U.S. and foreign regulators have encouraged, and in some cases required, that standardized derivatives, such as plain vanilla U.S. interest rate swaps, be cleared through CCPs. Because of the very large volume of transactions cleared through CCPs, it is critical that the CCPs themselves be highly resilient to potential stress.

Regulators continue to analyze the potential for the failure of one or more clearing members, each of which may be a member of multiple CCPs, and which may provide essential services (such as liquidity provision or settlement or

custody services) to multiple CCPs, to exacerbate the transmission of stress among financial institutions or markets. Such analysis will help regulators better understand the extent and implications of such interconnections.

Given CCPs' importance to the global financial system, CCPs must maintain credible plans for recovery and wind-down. U.S. regulators have begun to review recovery plans of designated CCPs. It will be important for authorities to further analyze the potential procyclical effects of certain recovery tools, as well as examine the ability of each CCP to operate its own default management processes in an environment in which other CCPs or market participants may also be under stress.

Regulators continue to analyze a range of possible risks arising from or related to the potential failure of one or more clearing members, each of which may be a member of multiple CCPs, and may provide essential services (such as liquidity provision or settlement or custody services) to multiple CCPs. These include the extent to which such failures may transmit stress among financial institutions or markets and whether there are transferees that will accept transfer of the positions of non-defaulting customers of the defaulting member(s), reducing the likelihood of a liquidation of customer positions that could potentially exacerbate stressful conditions. Such analysis will help regulators to better understand the extent and implications of interconnections among members, CCP resilience, and access to clearing services and help ensure the success of reforms to mandate greater use of central clearing.

Internationally, greater implementation of the risk management standards in the CPMI-IOSCO PFMI across regulatory regimes is critical to enhancing the safety and efficiency of CCPs and financial stability more broadly. Material differences between jurisdictions' standards could potentially result in regulatory arbitrage by market participants or lead to an unlevel playing field between CCPs. U.S. regulators have substantially implemented the G-20's central clearing mandate and have implemented standards related to CCP risk management and resilience. Domestic and foreign regulators should continue to monitor implementation of the PFMI by systemically important CCPs globally. Further, all regulators should continue work to promote robust standards for CCP resilience both domestically and internationally.

Recent rules establishing minimum margin requirements for non-cleared swaps were a positive step in improving the resilience of the financial system. These rules reduce counterparty risk for non-cleared swaps and provide an incentive to move non-cleared swaps to CCPs. As these new rules are implemented, regulators will need to continue to closely supervise CCPs' processes for approving new products for clearing.

Short-Term Wholesale Funding

Repo Markets

As noted by the Council in prior years, the tri-party repo market has seen a significant reduction in counterparty risk exposure. More work is needed, however, to extend post-crisis reforms to the settlement of GCF repo transactions. In addition, the risk of fire sales of collateral by creditors of a defaulted broker-dealer remains a significant risk to financial stability. Lastly, there are important data gaps that need to be filled to assist policymakers' understanding of the aggregate repo market, including the interdependencies of various firms and market participants. In particular, greater visibility into many key characteristics of the bilateral repo market's size, composition, concentration, pricing, and risk profile would greatly assist regulators and supervisors in assessing potential areas of concern.

MMFs and STIFs

MMFs and other cash management vehicles—particularly those that offer a stable NAV—have the potential to suffer from runs, which could undermine investor confidence, trigger redemptions across funds, and impair access to credit in short-term lending markets. In recent years, the SEC and OCC have adopted important reforms of MMFs and STIFs that seek to address these risks. Regulators are monitoring MMF reforms as they are implemented, and it is critical that they continue to do so in order to understand the extent to which any material risks may remain. Regulators should also continue to examine whether regulatory gaps exist for other cash management vehicles, as well as whether additional data is needed to better understand such gaps and the risks that they pose.

Reliance on Reference Rates

Regulators, benchmark administrators, and market participants made continued progress over the past year in strengthening the governance of interest rate benchmarks and developing alternative reference rates.

Post-crisis reforms have improved the resilience of LIBOR by subjecting the rate and its administrator to more direct oversight, eliminating many little-used currency/tenor pairings, and embargoing the submissions of individual banks for a three-month period. These and other ongoing reforms have reduced some of the incentives for market participants to attempt to manipulate the benchmark. However, because the volume of unsecured wholesale lending has declined markedly, it is difficult to firmly root LIBOR submissions in a sufficient number of observable transactions. This development makes LIBOR more susceptible to manipulation, and poses the risk that it may not be possible to publish the benchmark on an ongoing basis if transactions decline further. Therefore, continued vigilance by regulators is necessary to ensure that newly created governance structures, oversight mechanisms, and methodology changes are effective.

Because of these concerns, the ARRC has focused on identifying alternative near risk-free reference rates that will more accurately meet the needs of some market participants, particularly for contracts that are unrelated to measures of bank credit. The transition to new benchmarks must be carefully managed to minimize market confidence risks that could arise.

Data Gaps and Challenges to Data Quality, Collection, and Sharing

The financial crisis exposed gaps in the coverage, quality, and accessibility of data available to regulators. While Council members have made progress in filling some of these gaps, much work remains. These gaps, if left unaddressed, can obscure an emerging threat to financial stability and impair both regulators and market participants' ability to respond effectively. In particular, important gaps remain in wholesale funding markets, asset management activities, and banking and market making taking place outside the regulatory perimeter.

Regulators face challenges monitoring and understanding developments across financial markets, as each agency's data, information, and analysis is focused primarily on the entity types or market segments for which it has regulatory purview. As markets continually evolve and financial transactions cross regulatory boundaries, data sharing and analysis among regulators, both at home and abroad, remains imperative.

Regulators need better mechanisms to quickly share, link, and integrate data which cut across different types of institutions and markets. International cooperation on data standards and data sharing is also essential to reduce variations in data collections across national boundaries, and authorities have still not yet achieved the goal of cross-border aggregation of derivatives data. Wider adoption of LEI will also facilitate data accessibility, sharing, and analysis, and enhanced entity hierarchy data under LEI (i.e., data on the parents and subsidiaries of legal entities) would facilitate its role in enabling authorities and the public to develop a more complete picture of complex financial institution's structures.

6.2 Cybersecurity: Vulnerabilities to Attacks on Financial Services

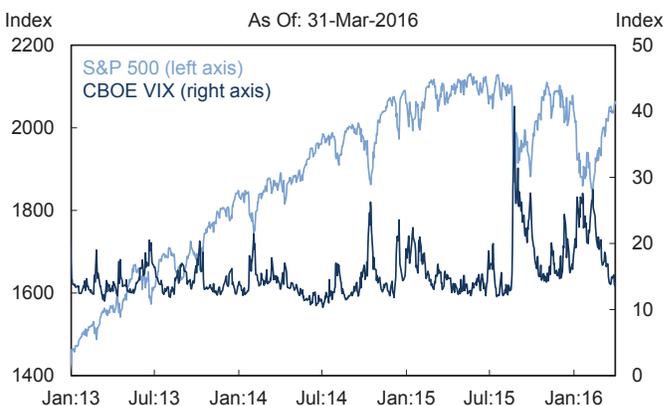
Malicious actors continue to attempt to exploit cyber-related vulnerabilities for a variety of purposes, whether at a financial firm or the government, such as the 2014 intrusion into the Office of Personnel Management. Financial firms have made significant investments in cybersecurity over the past several years, with many maintaining cutting-edge cybersecurity capabilities. These investments have been critical to reducing both firm-specific and system-wide cybersecurity vulnerabilities within companies and across the industry. Along with preparing for more routine incidents, companies should prepare for worst-case scenarios, including those that may be highly unlikely but extremely costly.

Worst-case scenario incidents include the threat posed by destructive malware. For example, the widely-reported 2014 cyber-attack against Sony Pictures Entertainment has highlighted the potential impact of a significant malware attack and serves as a reminder of the potential implications of a significant cybersecurity incident for companies. This attack destroyed systems and wiped out data, along with the public posting of unreleased movies and confidential emails in order to damage and shame a U.S. company and its personnel.

Unfortunately, Sony is not the only organization to experience cyber-attacks which attempt to destroy or degrade systems. At the same time the Sony attack was gripping the United States, Germany's Federal Office for Information Security released a report describing a cyberattack against a German steel mill which resulted in catastrophic physical damage to equipment. Media reports indicate that in 2013, banks and television stations in South Korea experienced a significant cyber-attack which froze computer terminals, and in 2012, Saudi Aramco experienced a destructive malware attack that destroyed computers. Media reporting also cited a February 2014 destructive malware incident against Las Vegas Sands Corporation which disrupted business operations.

Destructive malware attacks represent a unique threat in that they are both infrequent and yet potentially catastrophic. Financial institutions, working with government agencies, should understand this risk and take steps to improve cybersecurity, engage in information sharing efforts, and prepare to respond to, and recover from, a major incident. These preparations should include consideration of the technical impacts, appropriate response mechanisms, business implications, and possible effect on the financial system.

6.3.1 Equity Prices and Volatility



Source: Capital IQ

6.3.2 Crude Oil Prices and Volatility



Source: Bloomberg, L.P., Energy Information Administration, Haver Analytics

6.3 Asset Price Declines and Increasing Volatility

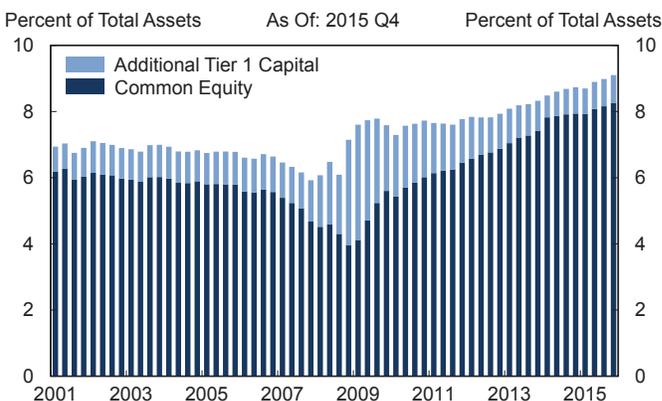
Volatility increased and market prices declined in a number of important asset classes during the last year. After reaching historic highs above 2,100 in May 2015, the S&P 500 equity index lost more than 10 percent of its value in late August and fluctuated over a wide range in the first quarter of 2016 (**Chart 6.3.1**). U.S. equity markets and equity-related futures markets experienced particularly high price volatility on August 24, 2015 (**see Box G**). In fixed income markets, corporate credit spreads, which increase when loan and bond market values fall relative to comparable-maturity Treasuries, moved upward considerably during the second half of 2015. In late 2015 and early 2016, spreads for high-yield bonds and leveraged loans reached levels comparable to those seen during the European and U.S. sovereign debt-related turmoil of 2011 and 2012 (**see Section 4.3**). Energy prices moved sharply lower in the second half of 2014 and remained low throughout 2015. As energy prices have moved downward, price volatility has spiked (**Chart 6.3.2**).

Though volatility is a feature of all financial markets, prolonged periods of elevated volatility, particularly when combined with downward movement in asset valuations, can pose risks to financial stability. Market participants that are highly leveraged or hold concentrated and inadequately hedged exposures to affected market segments may need to raise additional capital or debt to cover losses or, in extreme cases, may default. Direct losses from recent price declines and elevated volatility have been most pronounced in the energy and metals sectors, where the protracted decline in oil and natural gas prices and global growth concerns have put significant pressure on firm balance sheets. While direct losses are expected to be contained, some financial sector firms can be expected to incur meaningful losses as a result of the recent uptick in price volatility in the energy sector and elsewhere (**see Box F**).

Potentially more concerning is the risk that reasonable and prudent actions taken by individual firms or market infrastructures to protect themselves from the effects of anticipated future asset price changes could, in aggregate, contribute to volatility and further declines in prices. There are several mechanisms through which such adverse feedback loops can arise. In collateralized lending arrangements, haircuts are often higher when there is greater uncertainty about the future value of the collateral. Larger haircuts effectively increase the cost of holding collateral, potentially putting downward pressure on collateral valuations. Similarly, initial margin requirements for derivatives trades are typically tied to estimates of the current volatility of the transactions in question. As volatility increases and margin requirements grow, market participants must either fund additional collateral or limit their derivative trading. More broadly, concerns about the elevated credit risk of firms adversely affected by asset market price volatility can induce lenders to curtail their exposures to such firms, resulting in higher funding costs. Higher funding costs, in turn, make it more difficult for borrowers to weather the effects of unfavorable asset price movements, as some marginal firms are unable to refinance existing debt as interest expenses exceed the levels required for solvency.

The likelihood that appropriate risk-management tools might contribute to adverse feedback loops depends, to a great extent, on whether sufficiently prudent standards are applied prior to the onset of heightened volatility. Employing conservative risk-management practices during times of low volatility helps to ensure that market participants have sufficient resources in place to manage volatility when it arrives, obviating the need to dramatically curtail activity during times of stress. The Federal Reserve's CCAR BHC stress tests use more severe scenarios about shocks to the unemployment rate and other macroeconomic conditions when currently prevailing values of those variables

6.3.3 Aggregate Tier 1 Capital Ratio at Domestic BHCs



Source: FR Y-9C

are more benign. Similarly, new rules promulgated by the CFTC and prudential regulators in 2015 require that dealers incorporate periods of significant financial stress when calculating initial margin requirements for swaps that are not centrally cleared. These examples illustrate how risk-management systems can be constructed to maintain strong standards over a wide range of economic conditions.

As a result of reforms undertaken after the global financial crisis, the U.S. financial system is now much better prepared to cope with asset price volatility than it was in the years preceding the crisis. The ratio of banks' tier 1 capital to total assets has grown steadily since the financial crisis (**Chart 6.3.3**) and, by this measure, the nation's banking system is much less leveraged than it was in the first half of the last decade. If anything, balance sheet capital ratios likely understate improvements in bank capital adequacy over time. Capital ratios before and during the financial crisis were overstated because they failed to account for important off-balance-sheet risk exposures with significant embedded leverage such as structured investment vehicles (SIVs) or ABS CDOs which have since moved back onto bank balance sheets, matured, or been wound down. Following a similar pattern, U.S. broker-dealer leverage, measured as total assets over equity, stood at 17 as of year-end 2015, less than half its 2007 peak.

Box F: Implications of Lower Commodity Prices

Oil and metal prices continued to fall throughout 2015, reaching lows not seen since 2004. These moves have had significant repercussions across financial markets, as currencies, equities, and credit assets linked to the price of these commodities have fallen in value.

Impact on U.S. and Global Growth

The IMF estimates that the recent further decline in oil prices, as well as in prices of other commodities, should support demand in the majority of advanced economies that are net commodity importers. In contrast, the IMF estimates that average commodity exporter growth rates will be almost 1 percentage point lower in 2015–2017 than in 2012–2014.

In the United States, lower commodity prices should continue to support consumer spending; the Energy Information Administration estimates that lower gasoline prices saved the average household \$660 last year compared to 2014. However, cuts in capital expenditures at energy and mining firms are expected to weigh on U.S. investment. Furthermore, states with economies heavily reliant on these industries, such as North Dakota, Louisiana, and Alaska, have seen job losses.

U.S. Financial Institutions

U.S. banks have seen increasing credit risk in the oil and gas sector and have increased reserves against potential losses. According to the 2015 SNC Review, oil and gas related credits were in the initial stage of a downturn; as such, they contributed to the heightened credit risk noted in the SNC portfolio, as 11.0 percent of special mention and worse credits were related to oil and gas. Excluding oil and gas credits, special mention and worse credits would be approximately 100 basis points lower. Nonaccruals increased 16 percent, driven by oil and gas credits. Overall, oil and gas related

credits represent 7 percent of the total SNC commitments. Federal banking regulators have criticized 15 percent of oil and gas loans, up from 3.6 percent in 2014.

Market pressure has increased on banks with significant loan book exposure to the energy and mining sectors. Energy exposures at the six largest U.S. banks appear manageable, with total energy loans as a percent of tier 1 capital ranging from 15 to 40 percent. Furthermore, these firms appear to have well-diversified portfolios across industries, and their exposures to the energy sector as a percent of total loans ranges from 3.5 to 8 percent. However, some regional banks in areas of the country which are heavily reliant on the oil and gas sector could face larger indirect losses given reductions in employment. U.S. banks also have exposure to European lenders which, in some cases, have comparatively large commodity exposures.

According to the March 2016 Senior Credit Officer Opinion Survey on Dealer Financing Terms, a large fraction of primary dealers say they have at least “somewhat significant” exposures to oil, mainly through lines of credit and term loans, but also through cleared and non-cleared derivatives. Since mid-2014, many (but not a majority of) such dealers said that their exposures have declined somewhat by lowering risk limits or allowing positions to roll off.

The overall effect of oil price declines on the insurance industry’s investment portfolios is likely to be modest, given that the industry’s bond and stock exposure to the oil and gas sector accounts for only about 4 percent of total cash and invested assets, and its exposure to oil-exporting countries (an overlapping measure) totals only about 3 percent. Indirect exposures through other entities that are in some way tied to oil prices are quite small.

Domestic Credit Markets

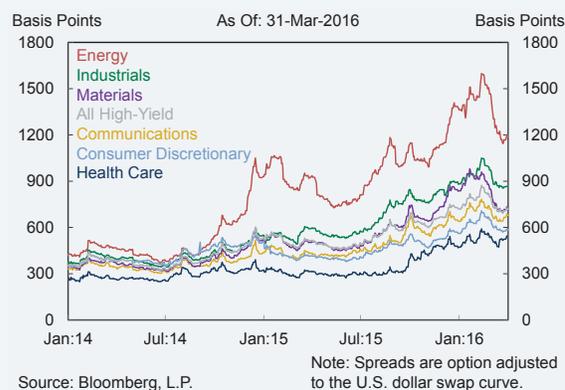
After rebounding somewhat in the first half of the year, high-yield energy credits continued to deteriorate alongside falling oil prices (**Chart F.1**). Energy and metals and mining makes up about 20 percent of the high-yield bond market and about 7 percent of the leveraged loan market. Spreads for non-commodity related credits increased as managers reduced exposure to risky assets.

Over the past year, energy companies were able to rely on existing hedges and efficiency gains to remain current on their debt. Recently however, default rates have begun to pick up; 9.7 percent of par of high-yield energy bonds and 22.1 percent of par of metals and mining high-yield bonds have defaulted over the past year, compared to 3.2 percent for the total high-yield market. Rating agencies have already downgraded or put on negative ratings watch a number of corporates in the energy and metals and mining sectors. As of the end of March, 71 percent of the \$64 billion of bonds trading at distressed levels is from the energy and metals and mining sectors as market participants anticipate future defaults if oil prices remain low (**Chart F.2**). This compared to \$16 billion of bonds trading at distressed levels at the beginning of 2015. As a result of losses on this debt, some funds have faced heavy redemptions while others have been forced to close.

Foreign Exchange and Sovereign Debt

Many emerging market countries are heavily reliant on oil revenues. As oil prices have fallen, revenue earned from state-owned oil companies has also fallen. In order to fill fiscal deficits caused by the loss of oil revenue, governments have pulled at least \$46.5 billion from sovereign-wealth funds. Tumbling commodity prices have also resulted in a weakening of a number of oil exporters' currencies, such as the Russian ruble, Azerbaijan manat, and the Colombian peso.

F.1 Selected Sector High-Yield Spreads



F.2 Expected Year-Ahead Defaults of Oil Firms



Box G: Equity Market Volatility on August 24, 2015

On Monday, August 24, 2015, the U.S. equity markets and equity-related futures markets experienced unusual price volatility, particularly during the period surrounding the 9:30 a.m. opening of regular trading hours. As indicated in a SEC staff research note, in contrast to the Flash Crash on May 6, 2010, broad market prices did not “flash crash”—defined as a sudden and extreme price decline that is unexplained by the arrival of new information and soon reversed. Prior to 9:30 on August 24, broad market prices already had declined by 5 percent, and the most active equity-related futures products had reached their limit down levels. At 9:30, the equity markets opened for regular trading hours at broad market price levels that were consistent with the pre-9:30 trading. The broad market then absorbed an intense surge in market-order selling (with volume as much as 4 to 8 times higher in many ETPs and other securities) with a relatively small price decline of 2 percent and soon recovered.

SEC staff identified some significant issues that occurred on August 24. First, in the opening minutes of trading, a significant minority of ETPs experienced what could be described as a breakdown in arbitrage—they traded at substantial discounts to the underlying indexes they were designed to track. Second, many of these ETPs which experienced extreme volatility also triggered a large number of trading halts under the Limit Up/Limit Down (LULD) Plan. Often, these discounts occurred because trading in the ETP halted while trading continued in the underlying index; pre-halt ETP prices then diverged significantly from the more recently updated index price. These trading halts helped prevent the irrational prices that occurred during the 2010 Flash Crash (such as executions at prices of one penny). After the halts, the ETPs did not resume trading in an orderly fashion, but traded in ways that often triggered additional LULD halts. More than 80 percent

of the LULD halts on August 24 occurred in ETPs, and most of these were repeat halts in the same symbols and occurred when prices were recovering upward.

Notably, although a significant minority of ETPs experienced severe volatility and multiple LULD halts on August 24, the majority of ETPs experienced levels of volatility consistent with broad market prices, and 80 percent of ETPs did not experience a single LULD halt.

6.4 Risk-Taking in a Low-Yield Environment

Last year, the Council detailed potential vulnerabilities associated with increased risk-taking stemming from a low-yield environment. Over the past 12 months, global long-term interest rates have continued to fall further.

The slope of the U.S. Treasury yield curve, as measured by the spread between 10-year and 2-year Treasury yields, is now at its flattest point since the financial crisis, stressing NIMs at banks, credit unions, and broker-dealers. In addition, the low-rate environment may incentivize insurance companies to boost returns by taking on additional risk. Prolonged periods of low interest rates also reduce the benefits of certain insurance and annuity products, adversely affecting the consumer demand for these products and dampening new sales.

In this low-yield environment, concerns about slowing global growth and falling commodities prices have also brought significant stresses to certain credit markets, which have had a strong impact both on the pricing of risk and the demand for risky assets. Risk-taking in asset classes which have experienced fundamental headwinds, notably U.S. high-yield corporate credit and emerging markets bonds, appears to have moderated over the last year, and these asset classes have experienced mutual fund outflows. In contrast, asset classes which have not seen such stresses, such as CRE and investment grade corporate bonds, have continued to see high levels of debt issuance and relatively strong pricing.

As detailed in [Section 4.3](#), banking regulators continue to note high and increasing credit risk in syndicated lending. However, underwriting standards tightened in 4Q15, and leverage ratios in 2015 on large corporate LBO loans ticked down to 5.7x debt/EBITDA from 5.8x in 2014. Market participants cite regulatory guidance targeting loans with 6.0x or greater leverage as a key driver. Investors are backing away from lower-rated credits. Spreads between BB and B rated leverage loans widened from 150 basis points in June to 335 basis points in mid-February. Emerging markets debt has seen a similar dynamic, as issuance has fallen off and spreads have moved wider as fiscal and current account balances have deteriorated in major emerging market countries.

By contrast, U.S. investment grade debt saw record issuance and moderate spreads, suggesting that corporations were taking advantage of the cheap financing offered by the low-interest rate environment. Leverage in investment grade markets is now back at 2007 levels. CRE has continued to see prices climb and capitalization rates fall. However, the spread of capitalization rates over Treasuries has remained relatively constant over the past two years ([Chart 4.5.11](#)), suggesting that this price increase may be driven, at least in part, by the fall in long-term interest rates.

In December 2015, the Federal Reserve, FDIC, and OCC jointly issued a statement reinforcing existing regulatory guidance on prudent risk management practices for CRE lending. The statement affirms that financial institutions should maintain underwriting discipline and exercise prudent risk-management practices to identify, measure, monitor, and manage the risks arising from CRE lending. Survey respondents to the SLOOS of January 2016 indicated that lending standards for CRE loans of all types tightened during the fourth quarter of 2015.

6.5 Changes in Financial Market Structure and Implications for Financial Stability

Historically, market making activities have been characterized by strong economies of scale owing to the high cost and limited availability of capital and the specialized personnel needed to expedite timely and efficient price discovery, clearing, and settlement in various markets. These types of activities were typically performed by broker-dealers affiliated with large banks. While such dealers continue to be intermediaries in many markets, they are by no means the only market participants able to supply liquidity. Asset managers, proprietary trading firms, hedge funds, and other market participants operating on exchanges or other trade-matching platforms add liquidity by trading into or out of assets when prices move away from fundamentals or arbitrage opportunities arise. Over the years, increasingly automated trading infrastructures have enabled market participants to implement largely autonomous trading strategies determined by computer algorithms. High-frequency traders deploy algorithms which depend on very high-speed communication between their own systems and trade-matching platforms. High-frequency traders, whose trading systems are often physically collocated with automated trade-matching engines, have the capacity to execute trades far more quickly than any process which depends on human input.

Algorithmic, high-frequency, and other forms of automated trading strategies are estimated to account for over two-thirds of trading volume in U.S. cash equities and futures markets, between 60 and 80 percent of trading volume in dollar-euro and dollar-yen FX interdealer markets, and over half of trading volume in the on-the-run U.S. Treasury interdealer market. Participation by alternative liquidity providers deploying automated trading strategies has been abetted by a proliferation of new electronic trading platforms—some sponsored by dealers—which provide efficient and flexible mechanisms for requesting quotes and matching trades. As increasing volumes of swaps trading have moved to SEFs, large asset managers have significantly expanded the scale and frequency of their swaps trading. Automated trading firms, which account for a substantial share of trading in cash equities and futures markets, are also becoming important providers of liquidity in certain fixed income markets, namely interest rate products.

While there is a great degree of substitution for similar risks in the interest rate complex, the same cannot be said for corporate bonds. The corporate bond market has always been fairly fragmented among various types of dealers, both large and small. In recent years, with the proliferation of various sizes and types of corporate debt issuances, this fragmentation has only grown. Because corporate bonds are more heterogeneous in their risk characteristics, they are less amenable to the kind of highly automated, high-frequency trading that has become important in other more homogenous markets like equities. In recent years, new e-trading platforms have facilitated greater non-dealer access to the most actively traded segments of the corporate bond market, though trade sizes on these platforms are relatively small. It is not apparent, especially given the sharp rise in volatility in credit markets over the past few months, that liquidity or market functioning for corporate bonds has been significantly impaired. The Council will continue to monitor these markets for indications of any potential shift in these conditions.

Interest Rate Complex: Different Venues and Products, Similar Risks

The interest rate complex is large, exceeding an estimated \$150 trillion in notional value, and involves many different products that are often used interchangeably by market participants to express a view on future interest rates or as a hedge against interest rate risk. Traded products include: Treasury securities, futures on Treasury securities, Eurodollar futures, options on these futures, interest rate swaps, swaptions (options on interest rate swaps), and MBS. Treasury securities are often used as a substitute for Treasury futures and vice versa. The same can be said for Eurodollar futures and interest rate swaps, as well as related options on each. Because of the homogenous and highly correlated risks associated with each of these products, there is a high degree of interdependency in the pricing and trading of interest rate products. Differences in the extent of automation, regulatory standards and associated barriers to access, and transaction costs have historically

led to fragmented markets in which some market segments primarily involved dealers using manual methods and other segments involved a high proportion of non-dealer intermediaries using automated systems. Over time, the lines between many of these market segments have become blurred, however, leading to mixed markets in which dealers and non-dealers deploying both manual and automated techniques interact directly. The transformation of these markets over time, resulting from technology, regulation, and competitive and cyclical factors, has enabled a greater degree of price discovery, broader participation, and reduction of trading and financing costs for investors and issuers. However, there may be risks and vulnerabilities posed by some of these developments.

Potential Risks and Vulnerabilities

The evolving structure of U.S. financial markets demonstrates the ability of markets to adapt to changing technology and an evolving regulatory landscape. Changes in liquidity dynamics pose a number of important considerations (see **Box H**). Financial markets have generally functioned well as significant changes in market structure have taken place, but the shift in liquidity provision away from traditional market-makers may pose risks.

First, financial regulation is well adapted to an environment in which liquidity primarily flows through large dealers who are typically subject to prudential standards, ongoing supervision, and a range of conduct and risk regulations, including stress testing. Similar prudential standards and ongoing supervision does not exist for proprietary trading firms, hedge funds, and other non-traditional liquidity providers.

Second, the speed and volume of trading in highly automated markets significantly increases operational risks associated with system failures, such as those seen during the Flash Crash in 2010. These operational risks are very hard to predict and manage and may present a significant risk to market functioning.

Finally, mixed markets may give rise to significant signaling errors among firms providing liquidity to investors. One example is “phantom liquidity,” which may give investors a false sense of security about the durability and consistency of liquidity offered in the market. In such a scenario, during normal market periods, liquidity providers who deploy automated trading systems may be willing to provide ample liquidity but may reduce the capacity for market making if a significant rise in volatility were to occur. This may cause price signaling problems for participants with larger liquidity needs facing intermediaries that historically provided large block markets through traditional “voice” markets. Another potential signaling problem can arise when interactions among automated trading systems occasionally lead to excessive, spurious asset price volatility. Market participants often hedge unwanted risk exposures by using derivative instruments that reference an underlying asset, such as a bond. The amount of hedging needed to neutralize the unwanted risk depends, in large part, on the short-term volatility of the underlying asset. A false signal of increasing price volatility could lead to hedging activity that may otherwise not occur. Such hedging activity could lead to an adverse feedback loop that drives volatility higher, leading to even more false price signals. As the character of liquidity provision in key U.S. financial markets continues to evolve, regulators and market participants should work to ensure that financial regulations and risk-management practices continue to evolve as well.

Box H: Perspectives on Fixed Income Market Liquidity

Resilient, well-functioning secondary markets are an important component of financial stability and are critical to the health of primary bond markets, serving as sources of credit and funding for governments and corporations. Liquid markets, where a diversity of buyers meet a diversity of sellers, enable participants to quickly find trading counterparties at prices near current market valuations. Among other benefits, liquid markets help keep transaction costs and other frictions low, and can facilitate efficient price discovery. Although liquidity conditions can vary over time and across markets for a variety of reasons that may have little direct impact on financial stability, market breakdowns, such as that observed in ABS markets during the financial crisis, can pose severe solvency and liquidity challenges. During these times, market participants may be unable to hedge and manage exposures in the market or raise needed financing. A significant amount of recent public discussion among market participants, the official sector, and academia has considered the state of fixed income market liquidity. This section surveys some of the key themes raised in this dialogue from a financial stability perspective.

Healthy Markets Require Healthy Market Participants

The robustness of market liquidity provided by intermediaries depends greatly on their resilience, diversity, and ability to take and manage risk. In recent years, more traditional intermediaries, such as broker-dealers and banks, as well as important elements of market infrastructure such as CCPs and exchanges, have undertaken various efforts to enhance resilience, especially during times of stress. However, challenges and vulnerabilities may still exist, particularly for intermediaries that exist outside of the regulatory perimeter. Many of these efforts, like increases

in bank capital, improved risk management standards, and standardized execution and clearing practices, were the result of heightened regulatory standards developed in coordination with the international community. These and similar efforts have left the financial marketplace significantly more robust than it was during the period prior to the financial crisis. On a macro-level, these reforms have bolstered financial stability. They have helped to mitigate the risk of market breakdowns during periods of heightened price volatility when intermediaries may be less confident in trading at rapidly changing price levels, and have reduced the potential for transmission of risk between markets, particularly when concerns about the viability of key intermediaries act to exacerbate such uncertainty.

During the financial crisis, many intermediaries were unable, or unwilling, to provide liquidity in certain markets. Most notably, in the ABS market, a combination of inadequate models and opacity often made the provision of liquidity prohibitively expensive. Problems in this market were exacerbated by large amounts of forced selling by highly levered market participants, which amplified sharp price declines. The resulting liquidity breakdown was especially problematic for many pass-through vehicles which relied upon an uninterrupted ability to trade mortgage securities, the norm in the years preceding the crisis; entities which were designed to transfer products from buyers to sellers found themselves accumulating inventory of rapidly diminishing value. In the most extreme cases, intermediaries faced bankruptcy and ceased their market making activities or, through inventory liquidation, demanded rather than provided liquidity. Following the crisis, a number of important reforms were implemented by both the public and private sectors to avoid the risk propagations

seen in the lead up to the recession. There is greater pre-trade and post-trade transparency for many fixed income products, which reduces market opacity, and risk-retention practices which help align the incentives of intermediaries and investors.

The Challenge of Assessing Market Liquidity – Evolving Trends in Supply and Demand

The supply and demand for market liquidity, and the ways in which it is provided and managed, is constantly changing. New business practices, technological innovation, and changes in regulation have recently led to significant changes in the way liquidity needs are sourced and managed. Such changes can alter the meaning and relevance of traditional metrics and methods that many use to gauge fixed income market liquidity conditions. Fixed income market monitoring is further complicated by the diversity in market structures across the fixed income space, leading to a similar diversity in market trends.

Given that various fixed income markets differ in their mix of participants, execution methods, and the risk of the underlying products, no single measure can accurately capture the state of fixed income market liquidity. Acknowledging this, a few common metrics are commonly used to gauge relative liquidity conditions over time. In less centralized markets, like corporate bonds and off-the-run Treasuries, liquidity is often sourced from balance sheet inventories. Commentators typically point to declines in primary dealer positions or trade turnover (the ratio of trading volumes to outstanding stocks of securities) as indicators that the supply of market liquidity in these markets has diminished, increasing the cost of matching buyers and sellers (**Charts H.1, H.2**). However, in part, these trends are a result of non-liquidity factors. The decrease in trade turnover is partially explained by a recent increase in bond issuance in the current low-interest rate environment. Changes in market demand have also likely contributed. For example, Treasury holdings by central banks

have increased significantly in recent years, a segment where turnover levels are much lower than average (**Chart H.3**). In addition, long-term forward guidance of monetary policy by global central banks has led to greater certainty about the path of short-term interest rates and may have resulted in less demand or need for trading or hedging. All of these factors may lead to changes to traditional measures of market liquidity, but may not be indicative of a general decrease in liquidity or market stability.

Changes in investor preferences may also have resulted in less demand for market liquidity. Passive investment vehicles, such as index funds and ETFs, have become more important market participants. These vehicles generally rely on lower trading flows compared to market participants that employ active investment strategies. In addition, many investment firms today engage in what is known as “internalization,” where trades are netted within an institution before engaging intermediaries and seeking external market liquidity. Such methods can reduce the apparent demand for liquidity within a market, though trading interest may be unchanged. In addition to these changes in liquidity demand, the means by which liquidity is provided have evolved. More intermediaries are engaged in agency-style trading, which relies on point-in-time matching of buyers and sellers rather than storing purchases and sales in inventory for a period of time. This style of intermediation is similar to that in equity and FX markets where firms generally provide liquidity without holding inventories. More generally, deploying trading technologies and techniques from equity markets which reduce the capital and balance sheet intensity of fixed income trading is likely to become more attractive. This evolution may raise concerns about market liquidity changes, but it may also help reduce transaction costs as it becomes easier to match buyers and sellers within an active marketplace.

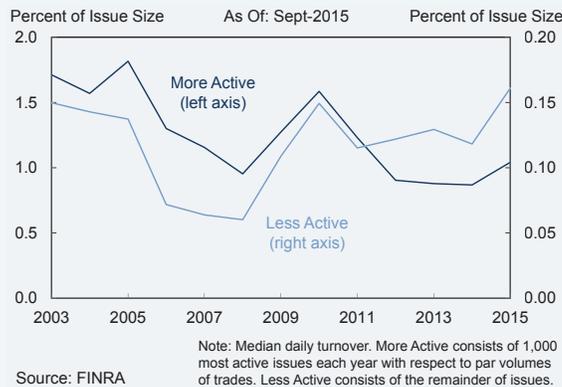
Theoretically, if there were a persistent imbalance of greater demand for and lower supply of liquidity, one would expect to see a sharp rise in

the cost of liquidity over time. One of the most frequently used measures of fixed income liquidity, especially for products traded on centralized exchanges, is the bid/offer spread, the difference between the prices to buy and sell a security for a given trade size. In many fixed income markets, including interest rate swaps, Treasuries, and corporate and high-yield bonds, these costs have fallen dramatically or remained fairly flat over the past decade, indicating positive liquidity trends (Chart H.4). Still, it is important to recognize that measures such as these, which capture market performance under typical conditions, may not be fully representative of market liquidity under severe stress conditions; if increases in measures like these are seen in normal times, it may be a signal of potential market deteriorations during episodes of volatility.

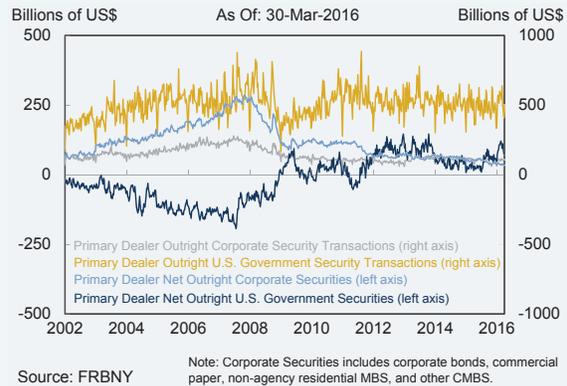
Conclusions

The ability of intermediaries to support market liquidity on a sustainable basis through the business cycle is essential to financial stability. Changes in market regulation since the recession have aimed to help improve market liquidity and stability during both normal and volatile market conditions. In addition, the supply, demand, and methods of provisioning market liquidity have changed dramatically in recent years, which have affected day-to-day market operations. Many frequently cited market metrics point to fixed income market health across a number of products; however, pinpointing the precise level and availability of liquidity is quite difficult. Market participants, regulators, and supervisors should continue to examine the resilience and durability of market liquidity in times of stress.

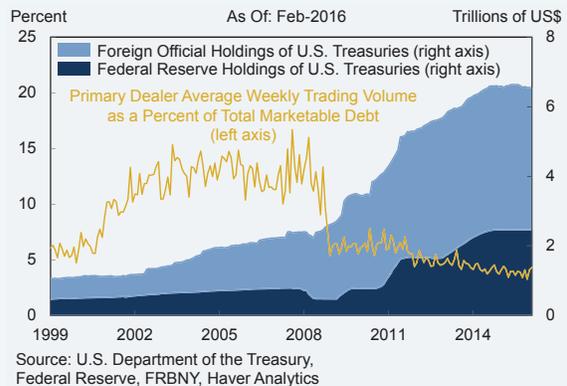
H.1 Corporate Bond Turnover



H.2 Primary Dealer Positions and Transactions



H.3 U.S. Treasury Security Turnover and Official Sector Holdings



H.4 Selected Bid/Offer Spreads



6.6 Financial Innovation and Migration of Activities

The financial system is characterized by frequent, often disruptive, innovations in products and business practices. Such innovation allows market participants to adapt to changing marketplace demands, fully exploit the benefits of new technology, and respond efficiently and creatively to new regulatory constraints. Precisely because innovations are new and potentially disruptive, they merit special attention from financial regulators who must be vigilant to ensure that new products and practices do not blunt the effectiveness of existing regulations or pose unanticipated risks to markets or institutions. Advances in information technology have long been an important catalyst for change in financial services. Marketplace lending, facilitated by online platforms which automate underwriting processes, and distributed ledger systems, facilitated by advances in cryptology and data processing algorithms, currently play a relatively small role in financial markets, but appear poised for substantial near-term growth. Financial regulators should continue to monitor and evaluate the implications of how new products and practices affect regulated entities and financial markets and assess whether they could pose risks to financial stability.

Marketplace Lending

Online marketplace lending refers to the segment of the financial services industry that uses investment capital and data-driven online platforms featuring algorithmic underwriting models to lend either directly or indirectly to consumers and small businesses. This segment initially emerged with companies giving individual, usually retail, investors the ability to provide financing to fund individual borrowers through what was known as a “peer-to-peer” model. However, marketplace lending has since evolved to include funding by institutional investors, such as hedge funds, banks, and insurance companies seeking to provide financing that ultimately is used to fund consumer and small business loans of various types in order to gain access to additional lending channels and favorable rates of return. Marketplace lenders also use public offerings, venture capital, securitizations, and loans from banks as funding sources. While loan origination volumes and the number of marketplace lenders have grown rapidly in recent years, marketplace lending remains a relatively small part of the \$3.3 trillion U.S. consumer lending market.

When individual or institutional investors provide funding, marketplace lending does not involve maturity transformation. Investors cannot withdraw funds before their notes mature, though in some cases limited secondary market trading is available. Therefore, outstanding marketplace loans that are funded by investors should not be susceptible to the sorts of run risks which can arise when there is a mismatch between the duration of funding and loan principal. On the other hand, marketplace lending is an emerging way to extend credit using algorithmic underwriting which has not been tested during a business cycle, so there is a risk that marketplace loan investors may prove to be less willing than other types of creditors to fund new lending during times of stress.

As marketplace lending continues to grow, financial regulators will need to be attentive to signs of erosion in lending standards. In other markets, business models in which intermediaries receive fees for arranging new loans but do not retain an interest in the loans they originate have, at times, led to incentives for intermediaries to evaluate and monitor loans less rigorously. Furthermore, given the rapid rise in the number of marketplace lenders who often compete with traditional lenders for the same borrowers, there is a risk that underwriting standards and loan administration standards of these lenders could deteriorate to spur volumes, which could spill over into other market segments.

Distributed Ledger Systems

A distributed ledger is a transactions database which can be accessed and potentially updated by a number of parties. Under traditional, centralized ledger systems, a single trusted party is responsible for maintaining an accurate database of transactions; this “golden copy” ledger serves as a reference for all other parties. In contrast, under a distributed ledger system, each member of a group is able to maintain its own golden copy ledger, which, after allowing for some delay in the transmission and encoding of new transaction information, is guaranteed to be identical to the ledger instances maintained by all other members of the group. Distributed ledgers are made possible through the application of encryption and algorithms that allow new transactions to be aggregated, encoded, and appended to an existing chain of transactions. These features enable network participants to validate the accuracy of new transactions and prevent the history of transactions from being modified.

Distributed ledger systems may enable market participants to manage many types of bilateral or multilateral transactions without the direct participation of trusted third parties. Proponents of distributed ledger technology believe it could help to significantly improve efficiency by replacing manually intensive reconciliation processes and reduce risks associated with trading, clearing, settlement, and custody services. Distributed ledger systems may mitigate risk and improve resilience in financial networks in a number of ways. Because distributed ledgers can be designed to be broadly accessible and verifiable, they could provide a valuable mechanism for enhancing market transparency. By eliminating the need for some transactions to flow through trusted third parties, distributed ledgers could reduce concentrated risk exposures to those firms and infrastructures. In addition, by improving the speed and accuracy of settlement systems, distributed ledger systems could reduce the counterparty and operational risks which arise when financial assets are exchanged. For example, distributed ledger systems may facilitate the automation of complex, multi-party transactions such as the payment of bonds and insurance coupons through the development of smart contracts.

Like most new technologies, distributed ledger systems also pose certain risks and uncertainties which market participants and financial regulators will need to monitor. Market participants have limited experience working with distributed ledger systems, and it is possible that operational vulnerabilities associated with such systems may not become apparent until they are deployed at scale. For example, in recent months, Bitcoin trade confirmation delays have increased dramatically and some trade failures have occurred as the speed with which new Bitcoin transactions are submitted has exceeded the speed with which they can be added to the blockchain. Similarly, although distributed ledger systems are designed to prevent reporting errors or fraud by a single party, some systems may be vulnerable to fraud executed through collusion among a significant fraction of participants in the system.

Distributed ledger systems have the potential to change the way some asset classes are traded and settled. Financial regulators have often worked with those market infrastructures and firms which facilitate trading and settlement, such as exchanges, dealers, and clearinghouses, to monitor markets and, in some cases, regulate market activity. To the extent that distributed ledger systems ultimately reduce the importance of these types of more centralized intermediaries, regulators will need to adapt to the changing market structure. Furthermore, since the set of market participants which makes use of a distributed ledger system may well span regulatory jurisdictions or national boundaries, a considerable degree of coordination among regulators may be required to effectively identify and address risks associated with distributed ledger systems.

6.7 Global Economic and Financial Developments

Developments in EMEs and Europe pose risks to U.S. firms and markets linked to those regions. A slowing of growth in a number of important economies has put downward pressure on commodities prices and adversely affected some countries' balance sheets. Concerns over the pace of global growth and changes in monetary and currency policies abroad appear to have contributed to considerable volatility in U.S. equity, bond, and currency markets, both last summer and early this year.

China is in the midst of long-term transitions in its economy away from investment toward household consumption, and away from manufacturing toward services. China's households have unusually low consumption rates and China's service sector is underdeveloped relative to other economies. China is the world's second largest economy when measured at market exchange rates and the world's largest importer of commodities. It is also a critical link in global supply chains and is increasingly a source of final demand for other countries' goods and services exports. Consequently, the evolution of China's economy has important economic implications globally. Last summer, a sharp correction in China's stock market and a shift in the manner in which Chinese authorities set the reference rate of its currency value drew increased attention to China's policies and underlying fundamentals.

Persistently low commodity prices, due in large part to oversupply in the oil market and slowing Chinese demand, also poses significant risks for resource rich emerging markets that have relied on high commodity prices to boost growth over much of the last decade. Low commodity prices have weighed heavily on these economies' growth rates, resulting in significant strains in their fiscal positions. In 2015, the economic growth rates of commodity exporters slowed, most notably in Russia and Brazil, and their fiscal balances deteriorated. Commodity exporters with fiscal buffers can use these buffers to enact countercyclical fiscal policies to ease the shock in the short-term, but prolonged commodity price weakness can deplete these buffers, making it critical for governments to enact policies and adjust expenditures to smooth the transition process to a non-commodity driven growth model. For commodity exporters with limited buffers, such as Venezuela, the situation is more acute and has brought on sharp and prolonged recessions and political tensions.

The situation in the euro area has significantly improved since 2012, but domestic demand growth remains modest despite a weaker euro last year and low oil prices. Concerns related to the upcoming United Kingdom referendum on exit from the EU, uncertainty in securing an agreement on Greece, and ongoing geopolitical tension between Russia and Ukraine will likely weigh on sentiment in the coming months. In addition, the substantial increase in immigration from conflict-torn countries has also threatened European cohesion, and the rise of anti-austerity parties in Spain and Portugal has raised concerns over the sustainability of economic policies in euro area periphery economies.

Abbreviations

| | |
|------|---|
| ABCP | Asset-Backed Commercial Paper |
| ABS | Asset-Backed Security |
| AIG | American International Group, Inc |
| AMC | Appraisal Management Company |
| ARRC | Alternative Reference Rates Committee |
| ASU | Accounting Standards Update |
| AUM | Assets Under Management |
| BCBS | Basel Committee on Banking Supervision |
| BCR | Basic Capital Requirement |
| BEA | Bureau of Economic Analysis |
| BHC | Bank Holding Company |
| BIS | Bank for International Settlements |
| BoJ | Bank of Japan |
| C&I | Commercial and Industrial |
| CAT | Cybersecurity Assessment Tool |
| CBO | Congressional Budget Office |
| CCAR | Comprehensive Capital Analysis and Review |
| CCP | Central Counterparty |

| | |
|---------|--|
| CCyB | Countercyclical Capital Buffer |
| CD | Certificate of Deposit |
| CDO | Collateralized Debt Obligation |
| CDS | Credit Default Swap |
| CFPB | Bureau of Consumer Financial Protection |
| CFTC | Commodity Futures Trading Commission |
| CIF | Collective Investment Fund |
| CLO | Collateralized Loan Obligation |
| CMBS | Commercial Mortgage-Backed Security |
| CME | Chicago Mercantile Exchange |
| CMO | Collateralized Mortgage Obligation |
| COSSEC | Corporación Pública para la Supervisión y Seguro de Cooperativas |
| COT | Commitment of Traders |
| Council | Financial Stability Oversight Council |
| CoVaR | Conditional Value-at-Risk |
| CP | Commercial Paper |
| CPMI | Committee on Payments and Market Infrastructures |
| CRE | Commercial Real Estate |
| CSBS | Conference of State Bank Supervisors |
| CSP | Common Securitization Platform |

| | |
|-----------------|---|
| DCM | Designated Contract Market |
| DFAST | Dodd-Frank Act Stress Tests |
| DIP | Distress Insurance Premium |
| Dodd-Frank Act | Dodd-Frank Wall Street Reform and Consumer Protection Act |
| DoJ | U.S. Department of Justice |
| DTCC | Depository Trust & Clearing Corporation |
| EBITDA | Earnings Before Interest, Taxes, Depreciation, and Amortization |
| ECB | European Central Bank |
| EDIF | European Deposit Insurance Fund |
| EDIS | European Deposit Insurance Scheme |
| EME | Emerging Market Economy |
| ETF | Exchange-Traded Fund |
| ETP | Exchange-Traded Product |
| EU | European Union |
| FASB | Financial Accounting Standards Board |
| FBIIC | Financial and Banking Information Infrastructure Committee |
| FBO | Foreign Banking Organization |
| FCF | Third Avenue Focused Credit Fund |
| FDIC | Federal Deposit Insurance Corporation |
| Federal Reserve | Board of Governors of the Federal Reserve System |

| | |
|---------|--|
| FFIEC | Federal Financial Institutions Examination Council |
| FHA | Federal Housing Administration |
| FHFA | Federal Housing Finance Agency |
| FHLB | Federal Home Loan Bank |
| FICO | Fair Isaac Corporation |
| FICU | Federally Insured Credit Union |
| FINRA | Financial Industry Regulatory Authority |
| FIO | Federal Insurance Office |
| FMI | Financial Market Infrastructure |
| FMU | Financial Market Utility |
| FOMC | Federal Open Market Committee |
| FRBNY | Federal Reserve Bank of New York |
| FS-ISAC | Financial Sector Information Sharing and Analysis Center |
| FSB | Financial Stability Board |
| FSOC | Financial Stability Oversight Council |
| FX | Foreign Exchange |
| G-20 | Group of Twenty |
| G-SIB | Global Systemically Important Bank |
| G-SII | Global Systemically Important Insurer |
| GAAP | Generally Accepted Accounting Principles |

| | |
|-------|--|
| GCF | General Collateral Finance |
| GDP | Gross Domestic Product |
| GECC | General Electric Capital Corporation, Inc |
| GO | General Obligation |
| GSE | Government-Sponsored Enterprise |
| HARP | Home Affordable Refinance Program |
| HELOC | Home Equity Line of Credit |
| HLA | Higher Loss Absorbency |
| HMDA | Home Mortgage Disclosure Act |
| HQLA | High-Quality Liquid Asset |
| HUD | U.S. Department of Housing and Urban Development |
| HY | High-Yield |
| IAIG | Internationally Active Insurance Group |
| IAIS | International Association of Insurance Supervisors |
| IASB | International Accounting Standards Board |
| ICE | Intercontinental Exchange |
| ICI | Investment Company Institute |
| ICS | Insurance Capital Standard |
| IFRS | International Financial Reporting Standards |
| IG | Investment Grade |

| | |
|-------|--|
| IHC | Intermediate Holding Company |
| IMF | International Monetary Fund |
| IOER | Interest on Excess Reserves |
| IOSCO | International Organization of Securities Commissions |
| IRA | Individual Retirement Account |
| IRD | Interest Rate Derivative |
| IRS | Internal Revenue Service |
| ISDA | International Swaps and Derivatives Association |
| LBO | Leveraged Buyout |
| LCR | Liquidity Coverage Ratio |
| LEI | Legal Entity Identifier |
| LIBOR | London Interbank Offered Rate |
| LSTA | Loan Syndications & Trading Association |
| LULD | Limit Up/Limit Down |
| M&A | Mergers and Acquisitions |
| MBS | Mortgage-Backed Security |
| MMF | Money Market Mutual Fund |
| MOVE | Merrill Lynch Option Volatility Estimate |
| MREL | Minimum Requirement for Own Funds and Eligible Liabilities |
| MTN | Medium Term Note |

| | |
|--------|--|
| NAIC | National Association of Insurance Commissioners |
| NASAA | North American Securities Administrators Association |
| NAV | Net Asset Value |
| NBER | National Bureau of Economic Research |
| NCUA | National Credit Union Administration |
| NIM | Net Interest Margin |
| NIST | National Institute of Standards and Technology |
| NPL | Non-Performing Loan |
| NSFR | Net Stable Funding Ratio |
| OCC | Office of the Comptroller of the Currency |
| OFR | Office of Financial Research |
| ON RRP | Overnight Reverse Repurchase Agreement |
| ORSA | Own Risk and Solvency Assessment |
| OTC | Over-the-Counter |
| P/B | Price-to-Book |
| P&C | Property and Casualty |
| P/E | Price-to-Earnings |
| PBGC | Pension Benefit Guaranty Corporation |
| PBOC | People's Bank of China |
| PFMI | Principles for Financial Market Infrastructures |

| | |
|-------|---|
| REIT | Real Estate Investment Trust |
| REO | Real Estate Owned |
| Repo | Repurchase Agreement |
| RESPA | Real Estate Settlement Procedures Act |
| RFI | Request for Information |
| RMB | Renminbi |
| RMBS | Residential Mortgage-Backed Security |
| ROA | Return on Assets |
| ROAA | Return on Average Assets |
| ROE | Return on Equity |
| RRP | Reverse Repurchase Operation |
| RWA | Risk-Weighted Asset |
| S&P | Standard & Poor's |
| SAP | Statutory Accounting Principles |
| SBSDR | Security-Based Swap Data Repository |
| SDR | Swap Data Repository |
| SEC | Securities and Exchange Commission |
| SEF | Swap Execution Facility |
| SES | Systemic Expected Shortfall |
| SIFMA | Securities Industry and Financial Markets Association |

| | |
|----------|---|
| SIPC | Securities Investor Protection Corporation |
| SIV | Structured Investment Vehicle |
| SLOOS | Senior Loan Officer Opinion Survey on Bank Lending Practices |
| SLR | Supplementary Leverage Ratio |
| SNC | Shared National Credits |
| SRB | Single Resolution Board |
| SRC | Systemic Risk Committee |
| SRF | Single Resolution Fund |
| SRM | Single Resolution Mechanism |
| SSM | Single Supervisory Mechanism |
| STIF | Short-Term Investment Fund |
| STRIPS | Separate Trading of Registered Interest and Principal of Securities |
| Term RRP | Term Reverse Repurchase Agreement |
| TILA | Truth in Lending Act |
| TIPS | Treasury Inflation-Protected Securities |
| Treasury | U.S. Department of the Treasury |
| TRIP | Terrorism Risk Insurance Program |
| ULI | Universal Loan Identifier |
| UPI | Unique Product Identifier |
| USD | U.S. Dollar |

| | |
|------|---|
| USTR | U.S. Trade Representative |
| UTI | Unique Transaction Identifier |
| VA | U.S. Department of Veterans Affairs |
| VaR | Value-at-Risk |
| VIX | Chicago Board Options Exchange Volatility Index |
| WAM | Weighted-Average Maturity |
| WTI | West Texas Intermediate |

Glossary

1940 Act

The Investment Company Act of 1940 is an act of Congress primarily concerning the regulation of mutual funds, closed-end funds, exchange-traded funds, and business development companies.

Additional Tier 1 Capital

A regulatory capital measure which may include items such as noncumulative perpetual preferred stock and mandatory convertible preferred securities which satisfy the eligibility criteria in the Revised Capital Rule, as well as related surplus and minority interests.

Advanced Approaches Capital Framework

The Advanced Approaches capital framework requires certain banking organizations to use an internal ratings-based approach and other methodologies to calculate risk-based capital requirements for credit risk and advanced measurement approaches to calculate risk-based capital requirements for operational risk. The framework applies to large, internationally active banking organizations—generally those with at least \$250 billion in total consolidated assets or at least \$10 billion in total on-balance sheet foreign exposure—and includes the depository institution subsidiaries of those firms.

Affiliate

In general, a company is an affiliate of another company if 1) either company consolidates the other on financial statements prepared in accordance with U.S. Generally Accepted Accounting Principles, the International Finance Reporting Standards, or other similar standards; 2) both companies are consolidated with a third company on financial statements prepared in accordance with such principles or standards; 3) for a company that is not subject to such principles or standards, consolidation as described above would have occurred if such principles or standards had applied; or 4) a primary regulator determines that either company provides significant support to, or is materially subject to the risks or losses of, the other company.

Asset-Backed Commercial Paper (ABCP)

Short-term debt which has a fixed maturity of up to 270 days and is backed by some financial asset, such as trade receivables, consumer debt receivables, securities, or auto and equipment loans or leases.

Asset-Backed Security (ABS)

A fixed income or other type of security which is collateralized by self-liquidating financial assets that allows the holder of the security to receive payments that depend primarily on cash flows from the assets.

| | |
|--|---|
| Bilateral Repo | A repo between two institutions where settlement typically occurs on a “delivery versus payment” basis. More specifically, the transfer of the collateral to the cash lender occurs simultaneously with the transfer of the cash to the collateral provider. |
| Central Counterparty (CCP) | An entity which interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer, thereby ensuring the performance of open contracts. |
| Clearing Bank | A BHC subsidiary that facilitates payment and settlement of financial transactions, such as check clearing, or facilitates trades between the sellers and buyers of securities or other financial instruments or contracts. |
| Collateral | Any asset pledged by a borrower to guarantee payment of a debt. |
| Collateralized Loan Obligation (CLO) | A securitization vehicle backed predominantly by commercial loans. |
| Commercial Mortgage-Backed Security (CMBS) | A security which is collateralized by a pool of commercial mortgage loans and makes payments derived from the interest and principal payments on the underlying mortgage loans. |
| Commercial Paper (CP) | Short-term (maturity of up to 270 days), unsecured corporate debt. |
| Common Equity Tier 1 Capital | A regulatory capital measure which includes capital with the highest loss-absorbing capacity, such as common stock and retained earnings. |
| Common Equity Tier 1 Capital Ratio | A ratio which divides common equity tier 1 capital by total risk-weighted assets. The ratio applies to all banking organizations subject to the Revised Capital Rule. |
| Common Securitization Platform (CSP) | A common RMBS securitization infrastructure between Fannie Mae and Freddie Mac. |
| Comprehensive Capital Analysis and Review (CCAR) | An annual exercise by the Federal Reserve to ensure that institutions have robust, forward-looking capital planning processes which account for their unique risks and sufficient capital to continue operations throughout times of economic and financial stress. |
| Conditional Value-at-Risk (CoVaR) | The value-at-risk (VaR) of the financial system conditional on institutions being in distress. |

| | |
|-------------------------------------|--|
| Consumer Price Index (CPI) | A monthly index containing data on changes in the prices paid by urban consumers for a representative basket of goods and services. |
| Covered Swap Entity | Any swap dealer or major swap participant registered with the CFTC and any major security-based swap participant registered with the SEC that is a national bank, Federal savings association, Federal branch or agency of a foreign bank, state member bank, bank holding company, savings and loan holding company, foreign banking organization, foreign bank that does not operate an insured branch, state branch or agency of a foreign bank, Edge or agreement corporation, any other FDIC-insured state-chartered bank or savings association, and any affiliate of any of the foregoing |
| Credit Default Swap (CDS) | A financial contract in which one party agrees to make a payment to the other party in the event of a specified credit event, in exchange for one or more fixed payments. |
| Credit Rating Agency | A private company which evaluates the credit quality of debt issuers as well as their issued securities, and provides ratings on the issuers and securities. Many credit rating agencies are Nationally Recognized Statistical Rating Organizations, the largest of which are Fitch Ratings, Moody's Investors Service, and Standard & Poor's. |
| Defined Benefit Plan | A retirement plan in which the cost to the employer is based on a predetermined formula to calculate the amount of a participant's future benefit. In defined benefit plans, the investment risk is borne by the plan sponsor. |
| Defined Contribution Plan | A retirement plan in which the cost to the employer is limited to the specified annual contribution. In defined contribution plans, the investment risk is borne by the plan participant. |
| Distress Insurance Premium (DIP) | A measure of systemic risk which integrates the characteristics of bank size, default probability, and interconnectedness. |
| Dodd-Frank Act Stress Tests (DFAST) | Annual stress tests required by the Dodd-Frank Act for national banks and federal savings associations with total consolidated assets of more than \$10 billion. |
| Duration | The sensitivity of the prices of bonds and other fixed income securities to changes in the level of interest rates. |
| Exchange-Traded Product (ETP) | An investment fund or note whose shares are traded on an exchange. ETPs offer continuous pricing—unlike mutual funds, which offer only end-of-day pricing. ETPs are often designed to track an index or a portfolio of assets. |

| | |
|---------------------------------------|---|
| Federal Funds Rate | The interest rate at which depository institutions lend balances to each other overnight. The FOMC sets a target level for the overnight federal funds rate, and the Federal Reserve Bank of New York then uses open market operations to influence the overnight federal funds rate to trade around the policy target rate or within the target rate range. |
| FICO Score | A measure of a borrower's creditworthiness based on the borrower's credit data; developed by the Fair Isaac Corporation. |
| Financial Market Infrastructure (FMI) | A multilateral system among participating financial institutions, including the operator of the system, used for the purposes of recording, clearing, or settling payments, securities, derivatives, or other financial transactions. Under the Dodd-Frank Act, certain FMIs are recognized as FMUs. |
| Financial Market Utility (FMU) | A Dodd-Frank defined entity, which, subject to certain exclusions, is "any person that manages or operates a multilateral system for the purpose of transferring, clearing, or settling payments, securities, or other financial transactions among financial institutions or between financial institutions and the person." |
| Fire Sale | The disorderly liquidation of assets to meet margin requirements or other urgent cash needs. Such a sudden sell-off drives down prices, potentially below their intrinsic value, when the quantities to be sold are large relative to the typical volume of transactions. Fire sales can be self-reinforcing and lead to additional forced selling by some market participants which, subsequent to an initial fire sale and consequent decline in asset prices, may also need to meet margin or other urgent cash needs. |
| Fiscal Year | Any 12-month accounting period. The fiscal year for the federal government begins on October 1 and ends on September 30 of the following year; it is named after the calendar year in which it ends. |
| Future | A standardized contract traded over exchanges to buy or sell an asset in the future. |
| General Collateral Finance (GCF) | An interdealer repo market in which the Fixed Income Clearing Corporation plays the role of intraday CCP. Trades are netted at the end of each day and settled at the tri-party clearing banks. See Tri-party Repo. |
| Government-Sponsored Enterprise (GSE) | A corporate entity with a federal charter authorized by law, but which is a privately owned financial institution. Examples include the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac). |

| | |
|------------------------------------|--|
| Gross Domestic Product (GDP) | The broadest measure of aggregate economic activity, measuring the total value of all final goods and services produced within a country's borders during a specific period. |
| Haircut | The discount, represented as a percentage of par or market value, at which an asset can be pledged as collateral. For example, a \$1,000,000 bond with a 5 percent haircut would collateralize a \$950,000 loan. The purpose of a haircut is to provide a collateral margin for a secured lender. |
| Held-to-Maturity | An accounting term for debt securities accounted for at amortized cost, under the proviso that the company can assert that it has the positive intent and ability to hold the securities to maturity. |
| High-Quality Liquid Asset (HQLA) | An asset—such as a government bond—which is considered eligible as a liquidity buffer in the U.S. banking agencies' liquidity coverage ratio. High-quality liquid assets should be liquid in markets during times of stress and, ideally, be central bank-eligible. |
| Home Equity Line of Credit (HELOC) | A line of credit extended to a homeowner which uses the home as collateral. |
| Household Debt Service Ratio | An estimate of the ratio of debt payments to disposable personal income. Debt payments consist of the estimated required payments on outstanding mortgage and consumer debt. |
| Household Formation | A measure of housing demand, calculated as the month-to-month change in the number of occupied housing units. |
| Interest Rate Risk Management | The management of the exposure of an individual's or an institution's financial condition to movements in interest rates. |
| Interest Rate Swap | A derivative contract in which two parties swap interest rate cash flows on a periodic basis, referencing a specified notional amount for a fixed term. Typically one party will pay a predetermined fixed rate while the other party will pay a short-term variable reference rate which resets at specified intervals. |
| Large-Scale Asset Purchases | Purchases by the Federal Reserve of securities issued by the U.S. government or securities issued or guaranteed by government-sponsored agencies (including Fannie Mae, Freddie Mac, Ginnie Mae, and the Federal Home Loan Banks) in the implementation of monetary policy. |

| | |
|---------------------------------------|---|
| Legal Entity Identifier (LEI) | A 20-digit alpha-numeric code that connects to key reference information which enables clear and unique identification of companies participating in global financial markets. The LEI system is designed to facilitate many financial stability objectives, including: improved risk management in firms; better assessment of microprudential and macroprudential risks; expedition of orderly resolution; containment of market abuse and financial fraud; and provision of higher-quality and more accurate financial data. |
| Leveraged Buyout (LBO) | An acquisition of a company financed by a private equity contribution combined with borrowed funds, with debt comprising a significant portion of the purchase price. |
| Leveraged Loan | A loan for which the obligor's post-financing leverage as measured by debt-to-assets, debt-to-equity, cash flow-to-total debt, or other such standards unique to particular industries significantly exceeds industry norms. Leveraged borrowers typically have a diminished ability to adjust to unexpected events and changes in business conditions because of their higher ratio of total liabilities to capital. |
| Liquidity Coverage Ratio (LCR) | A standard to ensure that covered companies maintain adequate unencumbered, high-quality liquid assets to meet anticipated liquidity needs for a 30-day horizon under a standardized liquidity stress scenario. |
| Loan-to-Value Ratio | The ratio of the amount of a loan to the value of the asset that the loan funds, typically expressed as a percentage. This is a key metric when considering the level of collateralization of a mortgage. |
| London Interbank Offered Rate (LIBOR) | The interest rate at which banks can borrow unsecured funds from other banks in London wholesale money markets, as measured by daily surveys. The published rate is a trimmed average of the rates obtained in the survey. |
| Major Security-Based Swap Participant | A person that is not a security-based swap dealer and maintains a substantial position in security-based swaps, creates substantial counterparty exposure, or is a financial entity that is highly leveraged and not subject to federal banking capital rules. |
| Maturity Gap | The weighted-average time to maturity of financial assets less the weighted-average time to maturity of liabilities. |
| Money Market Mutual Fund (MMF) | A type of mutual fund which invests in short-term, liquid securities such as government bills, CDs, CP, or repos. |

| | |
|---------------------------------|---|
| Mortgage-Backed Security (MBS) | ABS backed by a pool of mortgages. Investors in the security receive payments derived from the interest and principal payments on the underlying mortgages. |
| Mortgage Servicing Company | A company which acts as an agent for mortgage holders by collecting and distributing mortgage cash flows. Mortgage servicers also manage defaults, modifications, settlements, foreclosure proceedings, and various notifications to borrowers and investors. |
| Municipal Bond | A bond issued by states, cities, counties, local governmental agencies, or certain nongovernment issuers to finance certain general or project-related activities. |
| Net Asset Value (NAV) | An investment company's total assets minus its total liabilities. |
| Net Interest Margin (NIM) | Net interest income as a percent of interest-earning assets. |
| Net Stable Funding Ratio (NSFR) | A liquidity standard to promote the funding stability of internationally active banks, through the maintenance of stable funding resources relative to assets and off-balance sheet exposures. |
| Open Market Operations | The purchase and sale of securities in the open market by a central bank to implement monetary policy. |
| Option | A financial contract granting the holder the right but not the obligation to engage in a future transaction on an underlying security or real asset. The most basic examples are an equity call option, which provides the right but not the obligation to buy a block of shares at a fixed price for a fixed period, and an equity put option, which similarly grants the right to sell a block of shares. |
| Over-the-Counter (OTC) | A method of trading which does not involve an organized exchange. In OTC markets, participants trade directly on a bilateral basis, typically through voice or computer communication and often with certain standardized documentation with counterparty-dependent terms. |
| Prudential Regulation | Regulation aimed at ensuring the safe and sound operation of financial institutions, set by both state and federal authorities. |
| Public Debt | All debt issued by Treasury and the Federal Financing Bank, including both debt held by the public and debt held in intergovernmental accounts, such as the Social Security Trust Funds. Not included is debt issued by government agencies other than the Department of the Treasury. |

| | |
|---|---|
| Real Estate Investment Trust (REIT) | An operating company which manages income-producing real estate or real estate-related assets. Certain REITs also operate real estate properties in which they invest. To qualify as a REIT, a company must have three-fourths of its assets and gross income connected to real estate investment and must distribute at least 90 percent of its taxable income to shareholders annually in the form of dividends. |
| Repurchase Agreement (Repo) | The sale of a security combined with an agreement to repurchase the security, or a similar security, on a specified future date at a prearranged price. A repo is a secured lending arrangement. |
| Residential Mortgage-Backed Security (RMBS) | A security which is collateralized by a pool of residential mortgage loans and makes payments derived from the interest and principal payments on the underlying mortgage loans. |
| Revised Capital Rule | The capital rule which revised the risk-based and leverage capital requirements for U.S. banking organizations, as finalized by the Federal Reserve Board and the OCC in October 2013 (78 FR 62018), and for which the FDIC issued a substantially identical interim rule in September 2013 (78 FR 55340). In April 2014, the FDIC adopted the interim final rule as a final rule with no substantive changes (79 FR 20754). |
| Risk-Based Capital | An amount of capital, based on the risk-weighting of various asset categories, which a financial institution holds to help protect against losses. |
| Risk-Weighted Assets (RWAs) | A risk-based concept used as the denominator of risk-based capital ratios (common equity tier 1, tier 1, and total). The total RWAs for an institution are a weighted total asset value calculated from assigned risk categories or modeled analysis. Broadly, total RWAs are determined by calculating RWAs for market risk and operational risk, as applicable, and adding the sum of RWAs for on-balance sheet, off-balance sheet, counterparty, and other credit risks. |
| Rollover Risk | The risk that as an institution's debt nears maturity, the institution may not be able to refinance the existing debt or may have to refinance at less favorable terms. |
| Run Risk | The risk that investors lose confidence in an institution—due to concerns about counterparties, collateral, solvency, or related issues—and respond by pulling back their funding. |
| Securities Information Processor | A system which consolidates and disseminates equity prices. |
| Securities Lending/Borrowing | The temporary transfer of securities from one party to another for a specified fee and term, in exchange for collateral in the form of cash or securities. |

| | |
|------------------------------------|---|
| Securitization | A financial transaction in which assets such as mortgage loans are pooled, securities representing interests in the pool are issued, and proceeds from the underlying pooled assets are used to service and repay the securities. |
| Security-Based Swap Dealer | A person that holds itself out as a dealer in security-based swaps, makes a market in security-based swaps, regularly enters into security-based swaps with counterparties, or engages in any activity causing it to be known as a dealer or market maker in security-based swaps; does not include a person entering into security-based swaps for such person's own account. |
| Short-Term Wholesale Funding | Short-term funding instruments not covered by deposit insurance which are typically issued to institutional investors. Examples include large checkable and time deposits, brokered CDs, CP, Federal Home Loan Bank borrowings, and repos. |
| Supplementary Leverage Ratio (SLR) | Tier 1 capital of an advanced approaches banking organization divided by total leverage exposure. All advanced approaches banking organizations must maintain an SLR of at least 3 percent. The SLR is effective January 1, 2018, and organizations must calculate and publicly disclose their SLRs beginning March 31, 2015. |
| Swap | An exchange of cash flows with defined terms and over a fixed period, agreed upon by two parties. A swap contract may reference underlying financial products across various asset classes including interest rates, credit, equities, commodities, and FX. |
| Swap Data Repository (SDR) | A person that collects and maintains information or records with respect to transactions or positions in, or the terms and conditions of, swaps entered into by third parties for the purpose of providing a centralized recordkeeping facility for swaps. In certain jurisdictions, SDRs are referred to as trade repositories. The Committee on Payments and Settlement Systems and IOSCO describe a trade repository as "an entity that maintains a centralized electronic record (database) of transaction data." |
| Swap Dealer | A person that holds itself out as a dealer in swaps, makes a market in swaps, regularly enters into swaps with counterparties, or engages in any activity causing it to be known as a dealer or market maker in swaps; does not include a person entering into swaps for such person's own account. |
| Swap Execution Facility (SEF) | A term defined in the Dodd-Frank Act as a trading platform which market participants use to execute and trade swaps by accepting bids and offers made by other participants. |
| Swap Future | A futures contract which mimics the economic substance of a swap. |

| | |
|--|---|
| Swaption | An option granting the right to enter into a swap. See Option and Swap. |
| Systemic Expected Shortfall (SES) | A systemic risk indicator which estimates the extent to which the market value equity of a financial firm would be depleted by a decline in equity prices. |
| Tier 1 Capital | A regulatory capital measure comprised of common equity tier 1 capital and additional tier 1 capital. See Common Equity Tier 1 Capital and Additional Tier 1 Capital. |
| Tier 2 Capital | A regulatory capital measure which includes subordinated debt with a minimum maturity of five years and satisfies the eligibility criteria in the Revised Capital Rule. |
| Time Deposits | Deposits which the depositor generally does not have the right to withdraw before a designated maturity date without paying an early withdrawal penalty. A CD is a time deposit. |
| Total Capital | A regulatory capital measure comprised of tier 1 capital and tier 2 capital. See Tier 1 Capital and Tier 2 Capital. |
| Tri-Party Repo | A repo in which a clearing bank acts as third-party agent to provide collateral management services and to facilitate the exchange of cash against collateral between the two counterparties. |
| Underwriting Standards | Terms, conditions, and criteria used to determine the extension of credit in the form of a loan or bond. |
| Value-at-Risk (VaR) | A tool to measure the risk of portfolio losses. The VaR projects the probability and maximum expected loss for a specific time period. For example, the VaR over 10 days and with 99 percent certainty measures the most one would expect to lose over a 10-day period, 99 percent of the time. |
| VIX (Chicago Board Options Exchange Market Volatility Index) | A standard measure of market expectations of short-term volatility based on S&P equity index option prices. |
| Weighted-Average Life | A weighted average of the time to each principal payment in a security. |
| Weighted-Average Maturity (WAM) | A weighted average of the time to maturity on all loans in an asset-backed security. |
| Yield Curve | A graphical representation of the relationship between bond yields and their respective maturities. |

List of Charts

| | | |
|--------|---|----|
| 4.1.1 | Federal Debt Held by the Public..... | 19 |
| 4.1.2 | 10-Year Treasury Yields..... | 19 |
| 4.1.3 | 2-Year Treasury Yields..... | 20 |
| 4.1.4 | Fixed Income Implied Volatility..... | 20 |
| A.1 | Selected Swap Spreads | 21 |
| 4.2.1 | Advanced Economies Real GDP Growth | 23 |
| 4.2.2 | Real GDP Growth | 23 |
| 4.2.3 | Euro Area Real GDP Growth..... | 24 |
| 4.2.4 | Contributions to Japanese GDP Growth | 24 |
| 4.2.5 | Japanese Consumer Price Inflation..... | 24 |
| 4.2.6 | European 10-Year Yields..... | 25 |
| 4.2.7 | Chinese Real GDP Growth..... | 28 |
| 4.2.8 | Chinese Manufacturing and Services Growth | 28 |
| 4.2.9 | Chinese Equity Market (CSI 300 Index) | 28 |
| 4.2.10 | Chinese Credit Growth | 29 |
| 4.2.11 | Components of Chinese Nonbank Credit Growth | 29 |
| 4.2.12 | Credit to the Chinese Nonfinancial Private Sector | 29 |
| 4.2.13 | Gross Capital Flows to EMEs..... | 30 |
| 4.2.14 | Emerging Market Gross Global Bond Issuance..... | 30 |
| 4.2.15 | Emerging Market Bond Spreads..... | 30 |
| 4.2.16 | Change in State and Local Government Tax Revenues..... | 31 |
| 4.2.17 | Long-Term Mutual Fund Flows: Municipal Bonds | 32 |
| 4.2.18 | Municipal Bond Spreads..... | 32 |
| 4.2.19 | Municipal Bond Issuance | 32 |
| C.1 | Municipal Bond Yields | 33 |
| 4.3.1 | Debt to Assets for Nonfinancial Corporations..... | 34 |
| 4.3.2 | Bank Business Lending Standards and Demand..... | 34 |
| 4.3.3 | Covenant-Lite Volume as a Percent of Total Issuance | 34 |
| 4.3.4 | Leveraged Loans: Debt to EBITDA Ratios | 35 |
| 4.3.5 | Noncurrent Commercial and Industrial Loans | 35 |
| 4.3.6 | Corporate Bond Issuance | 35 |
| 4.3.7 | Corporate Credit Spreads..... | 36 |
| 4.3.8 | Rolling 12-Month Default Rate..... | 36 |
| 4.3.9 | Distressed Ratios..... | 36 |
| 4.3.10 | CLO Issuance | 37 |
| 4.3.11 | Leveraged Loan Primary Market by Investor Type | 37 |

| | | |
|--------|--|----|
| 4.4.1 | Household Debt as a Percent of Disposable Personal Income..... | 37 |
| 4.4.2 | Household Debt Service Ratio | 38 |
| 4.4.3 | Share of Household Debt by Delinquency Status..... | 38 |
| 4.4.4 | Components of Consumer Credit | 38 |
| 4.4.5 | 90+ Day Delinquency Rate by Loan Type..... | 39 |
| 4.5.1 | National Repeat Sales Home Price Indices | 39 |
| 4.5.2 | Mortgage Originations and Rates..... | 40 |
| 4.5.3 | Mortgage Delinquency and Foreclosure..... | 41 |
| 4.5.4 | Mortgages with Negative Equity..... | 41 |
| 4.5.5 | Purchase Origination Volume by Credit Score..... | 41 |
| 4.5.6 | Mortgage Originations by Product | 42 |
| 4.5.7 | RMBS Issuance | 42 |
| 4.5.8 | Agency MBS Yield and Spread..... | 42 |
| 4.5.9 | Mortgage Servicing Market..... | 43 |
| 4.5.10 | Commercial Property Price Indices..... | 44 |
| 4.5.11 | CRE Capitalization Rates and Spreads | 44 |
| 4.5.12 | CMBS Issuance | 45 |
| 4.5.13 | CMBS Senior Debt Spreads | 45 |
| 4.6.1 | Nominal U.S. Dollar Trade-Weighted Index..... | 46 |
| 4.6.2 | U.S. Dollar Exchange Rates | 46 |
| 4.6.3 | Change in U.S. Dollar Exchange Rates | 46 |
| 4.7.1 | Returns in Selected Equities Indices | 47 |
| 4.7.2 | S&P 500 Key Ratios..... | 47 |
| 4.7.3 | Equity Market Volatility | 47 |
| 4.8.1 | Commodities | 48 |
| 4.9.1 | Commercial Paper Outstanding | 48 |
| 4.9.2 | Commercial Paper Interest Rates..... | 49 |
| 4.9.3 | Primary Dealer Repo Agreements..... | 50 |
| 4.9.4 | Value of the Repo Market..... | 50 |
| 4.9.5 | Collateral in the Tri-Party Repo Market..... | 51 |
| 4.9.6 | Bilateral Repo Haircuts..... | 51 |
| 4.9.7 | Treasury Tri-Party and GCF Repo Rates | 52 |
| 4.9.8 | Value of Securities on Loan..... | 54 |
| 4.9.9 | Global Securities Lending by Security Type | 54 |
| 4.9.10 | U.S. Securities Lending Cash Reinvestment | 55 |
| 4.10.1 | Normalized Future Prices | 56 |
| 4.10.2 | Market Volatility Indices..... | 56 |
| 4.10.3 | Selected Exchange Open Interest..... | 56 |
| 4.10.4 | Selected Exchange Volume | 57 |
| 4.10.5 | Selected Futures Open Interest..... | 57 |

| | | |
|---------|---|----|
| 4.10.6 | Selected Futures Volume | 57 |
| 4.10.7 | WTI Crude COT | 58 |
| 4.10.8 | 10-Year Treasury Traders in Financial Futures..... | 58 |
| 4.10.9 | CME Rate Swap Futures Open Interest..... | 58 |
| 4.10.10 | OTC Equity Options: Global Notional Outstanding | 59 |
| 4.10.11 | OTC Equity Option Share of All OTC Derivatives..... | 59 |
| 4.10.12 | OTC Equity Options: Global Market Value | 59 |
| 4.10.13 | BHC OTC Equity Option Exposure..... | 60 |
| 4.10.14 | Global OTC Derivatives Market | 60 |
| 4.10.15 | Credit Derivatives Outstanding..... | 60 |
| 4.10.16 | Global Central Clearing Market Share | 61 |
| D.1 | Bilateral Compression Process | 62 |
| D.2 | Currently Available Compression Options | 62 |
| D.3 | Interest Rate Derivative Compression Volume | 63 |
| 4.10.17 | U.S. Central Clearing Market Share..... | 64 |
| 4.10.18 | U.S. On-SEF Trading Share..... | 65 |
| 4.10.19 | U.S. On-SEF Trading Volume | 65 |
| 4.10.20 | Interest Rate Derivatives Market Activity by Currency | 65 |
| 4.11.1 | BHC Total Assets..... | 66 |
| 4.11.2 | Common Equity Tier 1 Ratios | 66 |
| 4.11.3 | Return on Equity and Return on Assets | 66 |
| 4.11.4 | Net Interest Margins..... | 67 |
| 4.11.5 | Litigation Expenses at Selected BHCs..... | 67 |
| 4.11.6 | Loan-to-Asset Ratios | 67 |
| 4.11.7 | Loan Loss Reserves | 68 |
| 4.11.8 | Non-Performing Loans..... | 68 |
| 4.11.9 | Higher-Risk Securities..... | 68 |
| 4.11.10 | Initial and Stressed Tier 1 Common Capital Ratios..... | 69 |
| 4.11.11 | Federal Reserve's Actions in CCAR 2015..... | 69 |
| 4.11.12 | Selected High-Quality Liquid Assets at BHCs | 69 |
| 4.11.13 | Selected Liquid Assets at Standard LCR BHCs | 70 |
| 4.11.14 | Net Stable Funding Ratio at Standard LCR BHCs..... | 70 |
| 4.11.15 | Weighted-Average Duration Gap..... | 70 |
| 4.11.16 | P/B and P/E Ratios of Six Large Complex BHCs..... | 71 |
| 4.11.17 | CDS Spreads of Six Large Complex BHCs | 71 |
| 4.11.18 | Number of Deals by Size of Pro Forma Bank | 71 |
| 4.11.19 | FDIC-Insured Failed Institutions..... | 72 |
| 4.11.20 | Commercial Bank and Thrift Pre-Tax Income..... | 72 |
| 4.11.21 | U.S. Branches and Agencies of Foreign Banks: Assets..... | 72 |
| 4.11.22 | Cash Assets of U.S. Branches and Agencies of Foreign Banks..... | 73 |

| | | |
|---------|--|-----|
| 4.11.23 | U.S. Branches and Agencies of Foreign Banks: Liabilities | 73 |
| 4.11.24 | Credit Union Income | 74 |
| 4.11.25 | Credit Union Deposits | 74 |
| 4.11.26 | Credit Union Net Long-Term Assets | 74 |
| 4.11.27 | Credit Union Investments by Maturity | 75 |
| 4.12.1 | Number of Broker-Dealers and Industry Net Income | 76 |
| 4.12.2 | Broker-Dealer Revenues | 76 |
| 4.12.3 | Broker-Dealer Assets and Leverage | 76 |
| 4.12.4 | Large Broker-Dealer Assets and Leverage by Affiliation | 77 |
| 4.12.5 | Primary Dealer Securities | 77 |
| 4.12.6 | Selected U.S. Financial Holding Companies and Insurers | 78 |
| 4.12.7 | Insurance Industry Net Income | 78 |
| 4.12.8 | Net Yield on Invested Assets | 78 |
| 4.12.9 | Insurance Industry Capital and Surplus | 79 |
| 4.12.10 | Consumer Loans and Leases Outstanding | 79 |
| 4.12.11 | Business Loans and Leases Outstanding | 79 |
| 4.12.12 | Subprime Auto Lending | 80 |
| 4.12.13 | ABS Issuance | 80 |
| 4.12.14 | Selected ABS Spreads | 80 |
| 4.12.15 | Agency REIT Assets and Leverage | 81 |
| 4.12.16 | Agency REIT Price-to-Book Ratio | 81 |
| 4.13.1 | MMF Assets by Fund Type | 82 |
| 4.13.2 | Liquid Asset Shares of Prime MMFs | 83 |
| 4.13.3 | Weighted-Average Maturity of MMFs | 83 |
| 4.13.4 | Net Assets of the Investment Company Industry | 83 |
| 4.13.5 | Monthly Bond Mutual Fund Flows | 84 |
| 4.13.6 | Monthly Equity Mutual Fund Flows | 84 |
| 4.13.7 | Bank Loan Mutual Funds: Annual Flows | 84 |
| 4.13.8 | High-Yield Mutual Funds: Annual Flows | 85 |
| 4.13.9 | Alternative Mutual Funds: Annual Flows | 85 |
| 4.13.10 | Cumulative Equity Fund Flows | 85 |
| 4.13.11 | U.S.-Listed ETP AUM and Count | 87 |
| 4.13.12 | Retirement Fund Assets by Plan Type | 87 |
| 4.13.13 | Public and Private Pension Funding Levels | 88 |
| 4.13.14 | U.S. Private Equity AUM | 90 |
| 4.13.15 | M&A Loan Volume for Private Equity-Backed Issuers | 90 |
| 6.1.1 | Systemic Risk Measures | 110 |
| 6.3.1 | Equity Prices and Volatility | 114 |
| 6.3.2 | Crude Oil Prices and Volatility | 114 |
| 6.3.3 | Aggregate Tier 1 Capital Ratio at Domestic BHCs | 116 |

| | | |
|-----|---|-----|
| F.1 | Selected Sector High-Yield Spreads | 118 |
| F.2 | Expected Year-Ahead Defaults of Oil Firms | 118 |
| H.1 | Corporate Bond Turnover | 125 |
| H.2 | Primary Dealer Positions and Transactions | 125 |
| H.3 | U.S. Treasury Security Turnover and Official Sector Holdings..... | 125 |
| H.4 | Selected Bid/Offer Spreads | 125 |



FINANCIAL STABILITY
OVERSIGHT COUNCIL

1500 PENNSYLVANIA AVENUE, NW | WASHINGTON, D.C. 20220