Financial Stability Report

May 2019

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

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Note: This report generally reflects information that was available as of April 19, 2019.

Purpose

This report presents the Federal Reserve Board's current assessment of the resilience of the U.S. financial system. By publishing this report, the Board intends to promote public understanding and increase transparency and accountability for the Federal Reserve's views on this topic.

Promoting financial stability is a key element in meeting the Federal Reserve's dual mandate for monetary policy regarding full employment and stable prices. As we saw in the 2007–09 financial crisis, in an unstable financial system, adverse events are more likely to result in severe financial stress and disrupt the flow of credit, leading to high unemployment and great financial hardship. Monitoring and assessing financial stability also support the Federal Reserve's regulatory and supervisory activities, which promote the safety and soundness of our nation's banks and other important financial institutions. Information gathered while monitoring the stability of the financial system helps the Federal Reserve develop its view of the salient risks to be included in the scenarios of the stress tests and its setting of the countercyclical capital buffer (CCyB).[1]

The Board's *Financial Stability Report* (FSR) is similar to those published by other central banks and complements the annual report of the Financial Stability Oversight Council (FSOC), which is chaired by the Secretary of the Treasury and includes the Federal Reserve Board Chair and other financial regulators.

[1] More information on the Federal Reserve's supervisory and regulatory activities is available on the Board's website; see the *Supervision and Regulation Report* (https://www.federalreserve.gov/supervisionreg/supervision-and-regulation-report.htm) as well as the webpages for Supervision and Regulation (https://www.federalreserve.gov/supervisionreg.htm) and Payment Systems (https://www.federalreserve.gov/paymentsystems.htm). Moreover, additional details about the conduct of monetary policy are also on the Board's website; see the *Monetary Policy Report* (https://www.federalreserve.gov/monetarypolicy/mpr_default.htm) and the webpage for Monetary Policy (https://www.federalreserve.gov/monetarypolicy.htm).

Framework

A stable financial system, when hit by adverse events, or "shocks," continues to meet the demands of households and businesses for financial services, such as credit provision and payment services. In contrast, in an unstable system, these same shocks are likely to have much larger effects, disrupting the flow of credit and leading to declines in employment and economic activity.

Consistent with this view of financial stability, the Federal Reserve Board's monitoring framework distinguishes between shocks to and vulnerabilities of the financial system. Shocks, such as sudden changes to financial or economic conditions, are typically surprises and are inherently difficult to predict. Vulnerabilities tend to build up over time and are the aspects of the financial system that are most expected to cause widespread problems in times of stress. As a result, the framework focuses primarily on monitoring vulnerabilities and emphasizes four broad categories based on research.[2]

1. Elevated **valuation pressures** are signaled by asset prices that are high relative to economic fundamentals or historical norms and are often driven by an increased willingness of investors to take on risk. As such, elevated valuation pressures imply a greater possibility of outsized drops in asset prices.

2. Excessive **borrowing by businesses and households** leaves them vulnerable to distress if their incomes decline or the assets they own fall in value. In the event of such shocks, businesses and households with high debt burdens may need to cut back spending sharply, affecting the overall level of economic activity. Moreover, when businesses and households cannot make payments on their loans, financial institutions and investors incur losses.

3. Excessive **leverage within the financial sector** increases the risk that financial institutions will not have the ability to absorb even modest losses when hit by adverse shocks. In those situations, institutions will be forced to cut back lending, sell their assets, or, in extreme cases, shut down. Such responses can lead to credit crunches in which access to credit for households and businesses is substantially impaired.

4. **Funding risks** expose the financial system to the possibility that investors will "run" by withdrawing their funds from a particular institution or sector. Many financial institutions raise funds from the public with a commitment to return their investors' money on short notice, but those institutions then invest much of the funds in illiquid assets that

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[2] For a review of the research literature in this area and further discussion, see Tobias Adrian, Daniel Covitz, and Nellie Liang (2015), "Financial Stability Monitoring," *Annual Review of Financial Economics*, vol. 7 (December), pp. 357–95.

are hard to sell quickly or in assets that have a long maturity. This liquidity and maturity transformation can create an incentive for investors to withdraw funds quickly in adverse situations. Facing a run, financial institutions may need to sell assets quickly at "fire sale" prices, thereby incurring substantial losses and potentially even becoming insolvent. Historians and economists often refer to widespread investor runs as "financial panics."

These vulnerabilities often interact with each other. For example, elevated valuation pressures tend to be associated with excessive borrowing by businesses and households because both borrowers and lenders are more willing to accept higher degrees of risk and leverage when asset prices are appreciating rapidly. The associated debt and leverage, in turn, make the risk of outsized declines in asset prices more likely and more damaging. Similarly, the risk of a run on a financial institution and the consequent fire sales of assets are greatly amplified when there is significant leverage involved.

It is important to note that liquidity and maturity transformation and lending to households, businesses, and financial firms are key aspects of how the financial system supports the economy. For example, banks provide safe, liquid assets to depositors and long-term loans to households and businesses; businesses rely on loans or bonds to fund investment projects; and households benefit from a well-functioning mortgage market when buying a home.

The Federal Reserve's monitoring framework also tracks domestic and international developments to identify near-term risks—that is, plausible adverse developments or shocks that could stress the U.S. financial system. The analysis of these risks focuses on assessing how such potential shocks may play out through the U.S. financial system, given our current assessment of the four areas of vulnerabilities.

While this framework provides a systematic way to assess financial stability, some potential risks do not fit neatly into it because they are novel or difficult to quantify. For example, cybersecurity and developments in crypto-assets are the subject of monitoring and policy efforts that may be addressed in future discussions of risks.[3] In addition, some vulnerabilities are difficult to measure with currently available data, and the set of vulnerabilities may evolve over time. Given these limitations, we continually rely on ongoing research by the Federal Reserve staff, academics, and other experts to improve our measurement of existing vulnerabilities and to keep pace with changes in the financial system that could create new forms of vulnerabilities or add to existing ones.

Federal Reserve actions to promote the resilience of the financial system

The assessment of financial vulnerabilities informs Federal Reserve actions to promote the resilience of the financial system. The Federal Reserve works with other domestic agencies

[3] This report does not currently report a standard set of metrics for determining the cyber resiliency of systems that are deemed to be critical to maintaining U.S. financial stability. Nonetheless, the Federal Reserve is using the available information and working with the relevant domestic agencies to develop resiliency expectations and measures.

directly and through the FSOC to monitor risks to financial stability and to undertake supervisory and regulatory efforts to mitigate the risks and consequences of financial instability.

Actions taken by the Federal Reserve to promote the resilience of the financial system include its supervision and regulation of financial institutions—in particular, large bank holding companies (BHCs), the U.S. operations of certain foreign banking organizations, and financial market utilities. Specifically, in the post-crisis period, for the largest, most systemically important BHCs, these actions have included requirements for more and higher-quality capital, an innovative stress-testing regime, new liquidity regulation, and improvements in the resolvability of such BHCs.

In addition, the Federal Reserve's assessment of financial vulnerabilities informs the design of stress-test scenarios and decisions regarding the CCyB. The stress scenarios incorporate some systematic elements to make the tests more stringent when financial imbalances are rising, and the assessment of vulnerabilities also helps identify salient risks that can be included in the scenarios. The CCyB is designed to increase the resilience of large banking organizations when there is an elevated risk of above-normal losses and to promote a more sustainable supply of credit over the economic cycle.

Overview

This report reviews conditions affecting the stability of the financial system by analyzing vulnerabilities related to valuation pressures, borrowing by businesses and households, financial leverage, and funding risk. It also highlights several near-term risks that, if realized, could interact with such vulnerabilities.

Investor appetite for risk appears elevated by several measures, and the debt loads of businesses are historically high. However, the financial sector appears resilient, with low leverage and limited funding risk. Despite volatility in financial markets late last year, our assessment of each of the four vulnerability categories is little changed since the November 2018 FSR.[4]

Our view on the current level of vulnerabilities is as follows:

1. **Asset valuations.** Valuation pressures remain elevated in a number of markets, with investors continuing to exhibit high appetite for risk, although some pressures have eased a bit since the November 2018 FSR.

2. **Borrowing by businesses and households.** Borrowing by businesses is historically high relative to gross domestic product (GDP), with the most rapid increases in debt concentrated among the riskiest firms amid signs of deteriorating credit standards. In contrast, household borrowing remains at a modest level relative to incomes, and the debt owed by borrowers with credit scores below prime has remained flat.

3. **Leverage in the financial sector.** The largest U.S. banks remain strongly capitalized, and the leverage of broker-dealers is substantially below pre-crisis levels. Insurance companies appear to be in relatively strong financial positions. Hedge fund leverage appears to have declined over the past six months.

4. **Funding risk.** Funding risks in the financial system are low. Estimates of the outstanding total amount of financial system liabilities that are most vulnerable to runs, including those issued by nonbanks, remain modest relative to levels leading up to the financial crisis. Short-term wholesale funding continues to be low compared with other liabilities, and the ratio of high-quality liquid assets to total assets remains high at large banks.

[4] The data for the November 2018 FSR closed on October 31. All references in this document to changes in data "since the previous FSR" signify changes since that date.

1. Asset Valuations

Overall, asset valuations and risk appetite remain somewhat elevated

Asset valuations remain high relative to their historical ranges in several major markets, suggesting that investor appetite for risk is elevated. Compared with the previous FSR, valuation pressures have eased slightly. Equity prices relative to forecast earnings remain above the median value over the past 30 years. Spreads on high-yield corporate bonds over benchmark rates are inversely related to valuations and are low relative to their historical range. However, spreads on leveraged loans over benchmark rates have widened since the previous FSR and now are above the median value over the past 20 years. Prices have been growing faster than rents in commercial and residential real estate for the past several years, although price increases in residential real estate have recently slowed somewhat.

Table 1 shows the size of the asset classes discussed in this section. The largest asset classes are those for residential real estate, equities, and commercial real estate (CRE).

Table 1. Size of Selected Asset Markets

Item	Outstanding (billions of dollars)	Growth, 2018 (percent)	Average annual growth, 1997–2018 (percent)
Residential real estate	33,945	5.3	5.5
Equities	30,476	-7.8	7.8
Commercial real estate	18,409	-.1	7.1
Treasury securities	15,566	7.8	7.5
Investment-grade corporate bonds	5,712	4.9	8.6
Cropland	2,523	2.2	5.7
High-yield and unrated corporate bonds	1,256	-4.1	6.5
Leveraged loans*	1,147	20.1	15.8
Price growth (real)			
Commercial real estate**		-1.4	2.0
Residential real estate***		2.4	2.1

Note: The data extend through 2018:Q4. Growth rates are measured from Q4 the year immediately preceding the period through Q4 of the final year of the period. Equities, real estate, and cropland are at market value; bonds and loans are at book value.

* The amount outstanding shows institutional leveraged loans and generally excludes loan commitments held by banks. For example, lines of credit are generally excluded from this measure. Average annual growth of leveraged loans is from 2000 to 2018:Q4, as this market was fairly small before then.

** One-year growth of commercial real estate prices is from Dec. 2017 to Dec. 2018, and average annual growth is from Jan. 1998 to Dec. 2018. Both growth rates are calculated from value-weighted nominal prices deflated using the consumer price index.

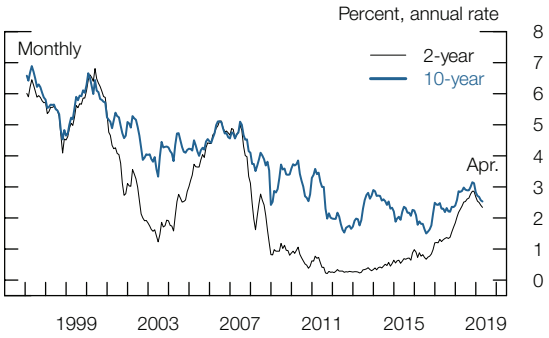
*** One-year growth of residential real estate is from Dec. 2017 to Dec. 2018, and average annual growth is from Jan. 1997 to Dec. 2018. Nominal prices are deflated using the consumer price index.

Source: For leveraged loans, S&P Global Market Intelligence, Leveraged Commentary & Data; for corporate bonds, Mergent, Inc., Corporate Fixed Income Securities Database; for cropland, Department of Agriculture; for residential real estate price growth, CoreLogic; for commercial real estate price growth, CoStar Group, Inc., CoStar Commercial Repeat Sale Indices (CCRSI); for all other items, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

In Treasury markets, yields and term premiums are low

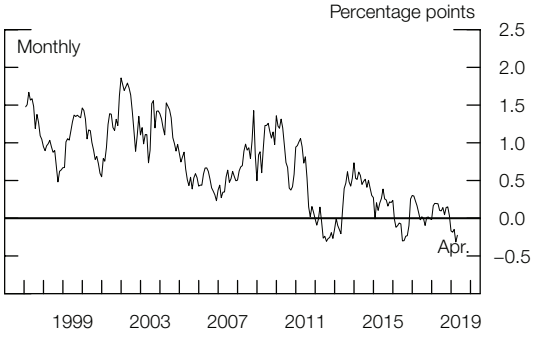
Since the previous FSR, yields have fallen for longer-dated Treasury securities (figure 1-1). Treasury term premiums capture the difference between the yield investors require for holding longer-term Treasury securities—whose realized returns are more sensitive to risks from future inflation or volatility in interest rates than shorter-term securities—and the expected yield from rolling over shorter-dated ones. Estimates of Treasury term premiums are near the lowest level of the past 20 years, and an increase in term premiums, if not accompanied by a strengthening of the economic outlook, could put downward pressure on valuations in a variety of markets (figure 1-2). Forward-looking measures of Treasury market volatility derived from options prices are also low by historical standards (figure 1-3).

1-1. Yields on Nominal Treasury Securities



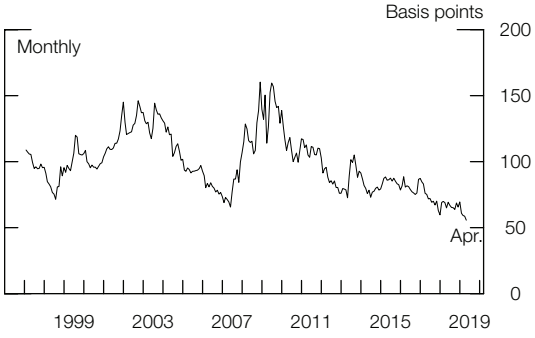
Source: Federal Reserve Board, Statistical Release H.15, "Selected Interest Rates."

1-2. Term Premium on 10-Year Nominal Treasury Securities



Source: Department of the Treasury; Wolters Kluwer, Blue Chip Financial Forecasts; Federal Reserve Bank of New York; Federal Reserve Board staff estimates.

1-3. Option-Implied Volatility on the 10-Year Swap Rate



Source: Barclays PLC, Barclays Live.

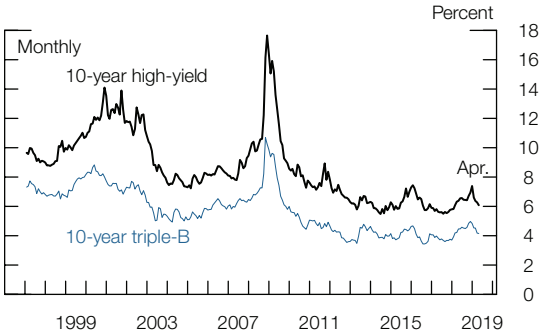
Spreads on high-yield corporate bonds remain low, while spreads on leveraged loans have widened somewhat from very low levels

The drop in Treasury yields since October has been accompanied by declines in corporate bond yields, which remain at low levels compared with history (figure 1-4). However, spreads on corporate bonds over comparable-maturity Treasury securities, which reflect the extra compensation investors require to hold debt that is subject to default or liquidity risks, are at levels similar to those observed in the previous FSR (figure 1-5). High-yield corporate bond spreads, in particular, are a fair bit below their 20-year median. However, investor appetite

for corporate bonds seems to have decreased moderately in recent months. The excess bond premium, which is measured as the gap between bond spreads and expected credit losses and is inversely related to investor risk appetite, is above the low levels observed in recent years and has increased since the previous FSR (figure 1-6).[5]

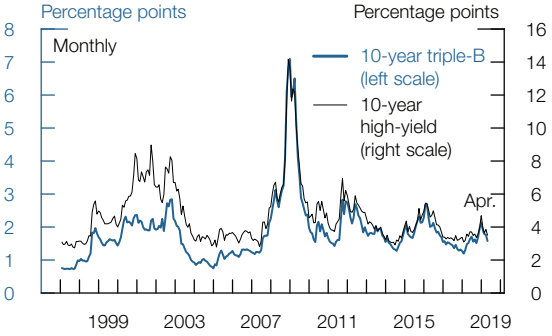
Interest rate spreads on newly issued leveraged loans, which widened substantially late last year, reversed part of those increases in the first quarter (figure 1-7). Spreads on lower-rated leveraged loans are above both their historical median and their levels in the previous FSR. Lending standards and loan covenants generally remain weak, reflecting high investor demand for leveraged loans in recent years (see the box "Vulnerabilities Associated with Elevated Business Debt").

1-4. Corporate Bond Yields



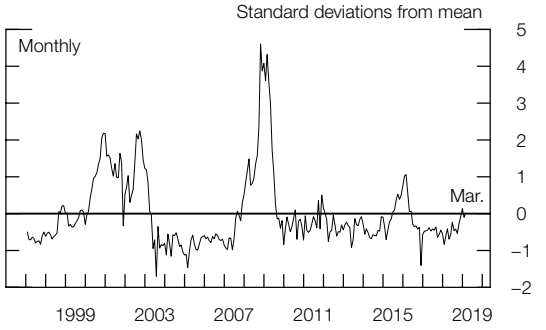
Source: ICE Data Indices, LLC, used with permission.

1-5. Corporate Bond Spreads to Similar-Maturity Treasury Securities



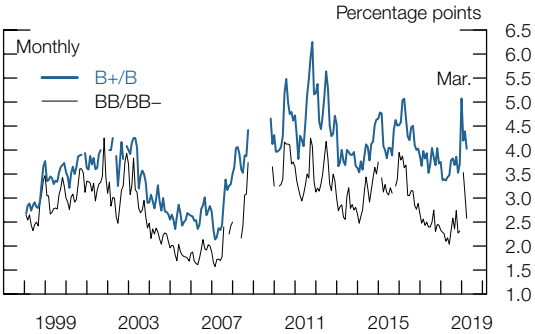
Source: ICE Data Indices, LLC, used with permission; Department of the Treasury.

1-6. Corporate Bond Premium over Expected Losses



Source: Federal Reserve Board staff calculations based on Lehman Brothers Fixed Income Database (Warga); Intercontinental Exchange, Inc., ICE Data Services; Center for Research in Security Prices, CRSP/Compustat Merged data, Wharton Research Data Services; S&P Global Market Intelligence, Compustat.

1-7. Spreads on Newly Issued Institutional Leveraged Loans



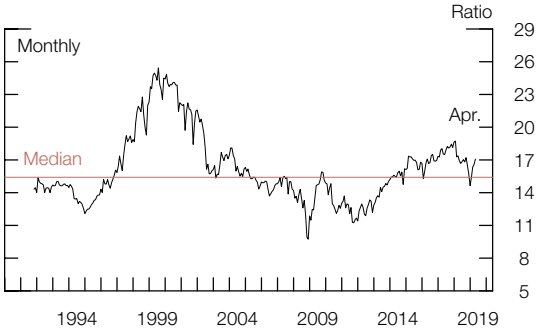
Source: S&P Global, Leveraged Commentary & Data.

[5] For a description of the excess bond premium, see Simon Gilchrist and Egon Zakrajšek (2012), "Credit Spreads and Business Cycle Fluctuations," *American Economic Review*, vol. 102 (June), pp. 1692–720.

Equity market prices relative to forecast earnings appear somewhat elevated

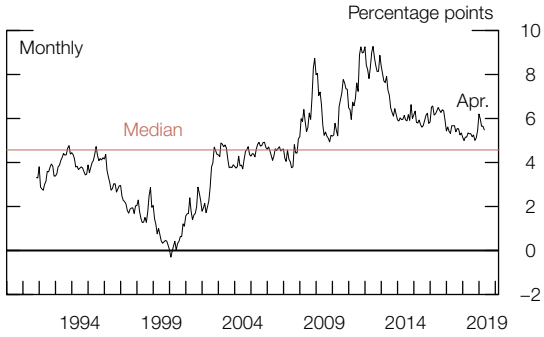
Over the past couple of years, equity prices have been generally high relative to forecast earnings. The S&P 500 forward price-to-earnings ratio dropped significantly over the last two months of 2018, but it subsequently reversed this decline and is now slightly above both its October level and its median value over the past 30 years (figure 1-8). The gap between the forward earnings-to-price ratio and the 10-year real Treasury yield, a rough measure of the premium investors require for holding equities, is still low relative to its range over the post-crisis period but is slightly higher than it was in the previous FSR (figure 1-9). This premium, however, is well above the low levels seen during the dot-com era. Both realized and option-implied equity market volatility spiked in December and have declined since (figure 1-10). The option-implied volatility measure, which in part reflects expectations about market volatility in the next month, is low by historical standards.

1-8. Forward Price-to-Earnings Ratio of S&P 500 Firms



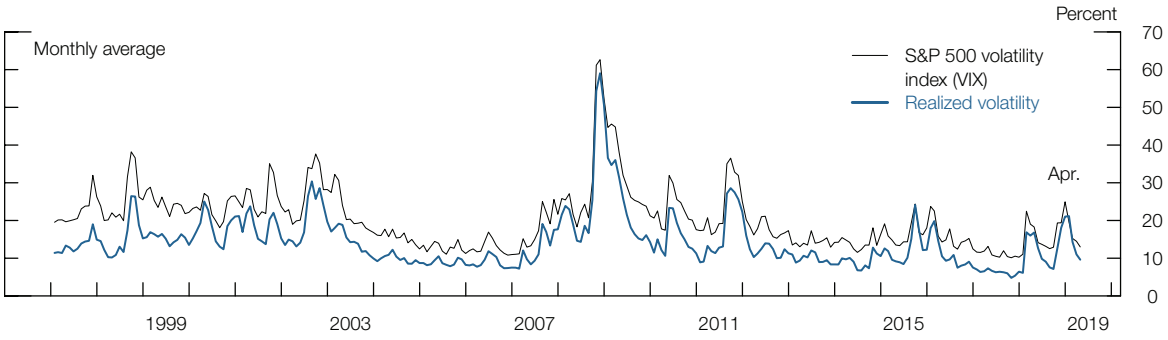
Source: Federal Reserve Board staff calculations using Refinitiv (formerly Thomson Reuters), IBES Estimates.

1-9. Spread of Forward Earnings-to-Price Ratio of S&P 500 Firms to 10-Year Real Treasury Yield



Source: Federal Reserve Board staff calculations using Refinitiv (formerly Thomson Reuters), IBES Estimates; Department of the Treasury; Survey of Professional Forecasters.

1-10. S&P 500 Return Volatility

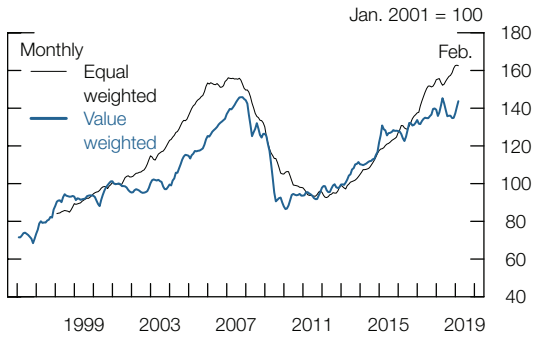


Source: Bloomberg Finance LP.

Commercial real estate prices are high relative to rents . . .

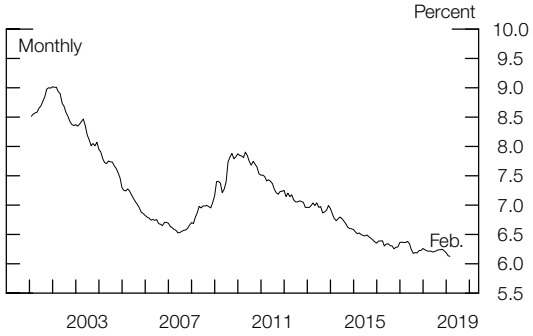
CRE prices have increased substantially over the past seven years, though prices for large commercial properties are similar to one year ago (figure 1-11). However, rents, in real terms, have been stagnant over the past year for most CRE sectors. Capitalization rates, which measure annual rent income relative to prices for recently transacted commercial properties, have been declining steadily since 2010 and are at historically low levels (figure 1-12). Spreads of capitalization rates over yields on 10-year Treasury securities, which are a rough measure of the premium that investors require for holding CRE over very safe alternative investments, have trended down over the past few years and are now at post-crisis lows, although well above the low levels seen in the mid-2000s (figure 1-13). Data from the Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS) indicated that CRE lending standards at banks had tightened a bit over the fourth quarter of 2018, which may suggest a modest reduction in risk appetite on the part of lenders (figure 1-14).

1-11. Commercial Real Estate Prices (Real)



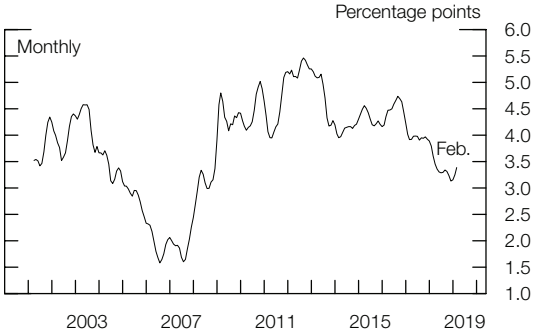
Source: CoStar Group, Inc., CoStar Commercial Repeat Sale Indices (CCRSI); Bureau of Labor Statistics consumer price index via Haver Analytics.

1-12. Capitalization Rate at Property Purchase



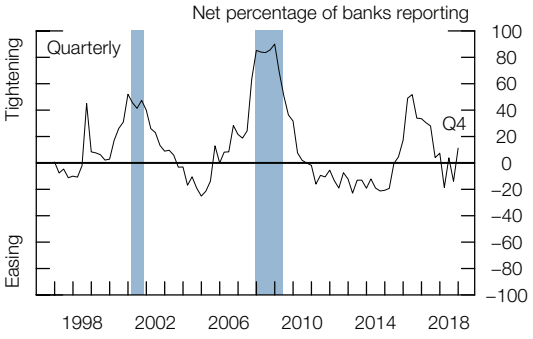
Source: Real Capital Analytics; Andrew C. Florance, Norm G. Miller, Ruijue Peng, and Jay Spivey (2010), "Slicing, Dicing, and Scoping the Size of the U.S. Commercial Real Estate Market," *Journal of Real Estate Portfolio Management*, vol. 16 (May–August), pp. 101–18.

1-13. Spread of Capitalization Rate at Property Purchase to 10-Year Treasury Yield



Source: Real Capital Analytics; Andrew C. Florance, Norm G. Miller, Ruijue Peng, and Jay Spivey (2010), "Slicing, Dicing, and Scoping the Size of the U.S. Commercial Real Estate Market," *Journal of Real Estate Portfolio Management*, vol. 16 (May–August), pp. 101–18.

1-14. Change in Bank Standards for CRE Loans

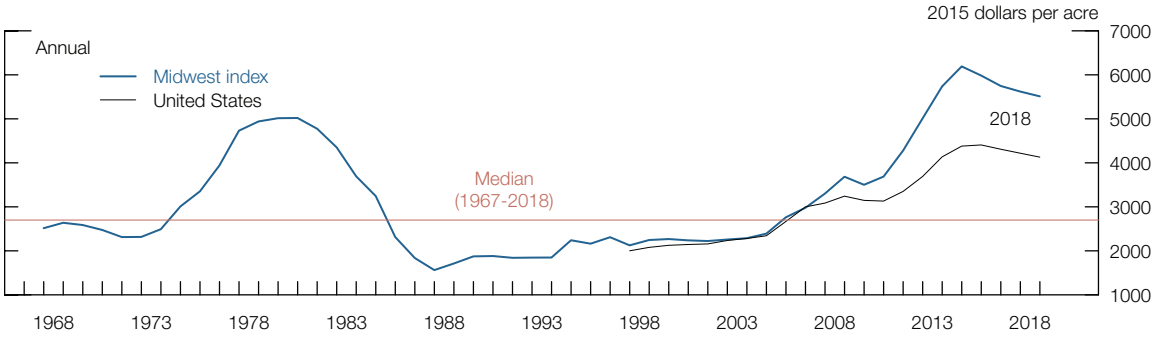


Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices; Federal Reserve Board staff calculations.

. . . farmland prices are elevated relative to rents and income but are trending down somewhat . . .

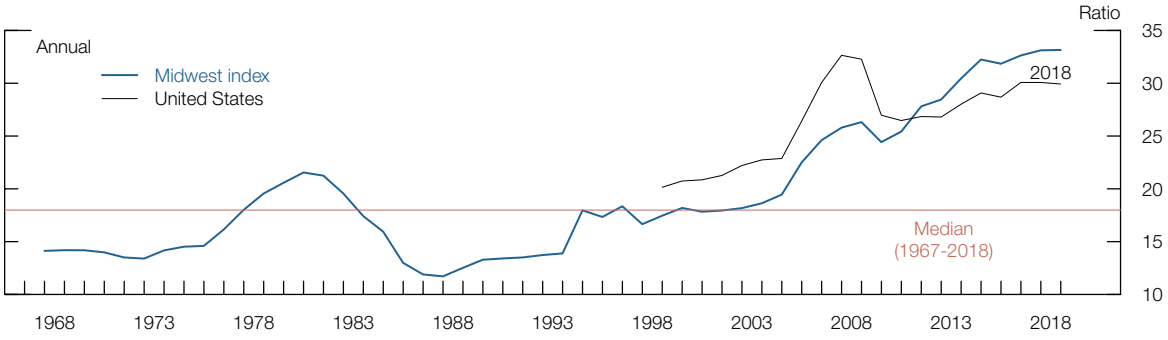
Farmland prices nationally and in several midwestern states have been trending down from their recent peaks but remain high by historical standards (figure 1-15). Moreover, farmland rents have decreased faster than prices, pushing price-to-rent ratios even higher in recent years (figure 1-16). Net farm income remains well below the high levels seen in the early years of the decade, mostly reflecting low agricultural commodity prices.

1-15. Cropland Values



Source: Department of Agriculture.

1-16. Cropland Price-to-Rent Ratio

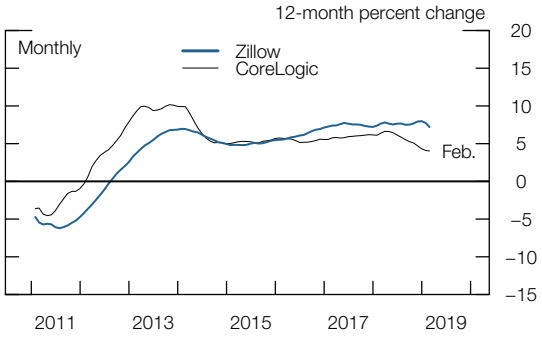


Source: Department of Agriculture.

. . . and house prices have been rising, but less so in recent months

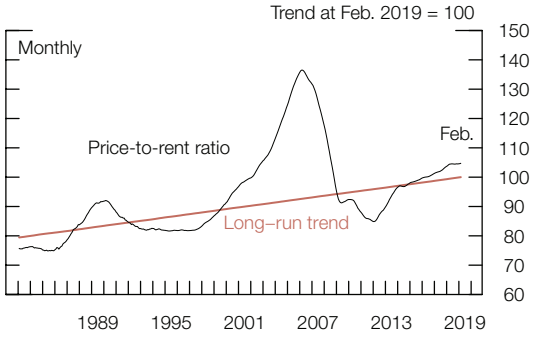
House prices have risen substantially since 2012, although house price increases have slowed materially in the past year (figure 1-17). The aggregate house price-to-rent ratio is higher than its long-run historical trend that includes the effect of carrying costs, but this implied gap is not very large and is far below the extraordinary levels observed in the run-up to the financial crisis (figure 1-18). House price-to-rent ratios vary significantly across regional markets, but the price-to-rent ratios for metropolitan areas at the high end of the distribution are much lower than they were just before the 2008 financial crisis (figure 1-19).

1-17. Growth of Nominal Prices of Existing Homes



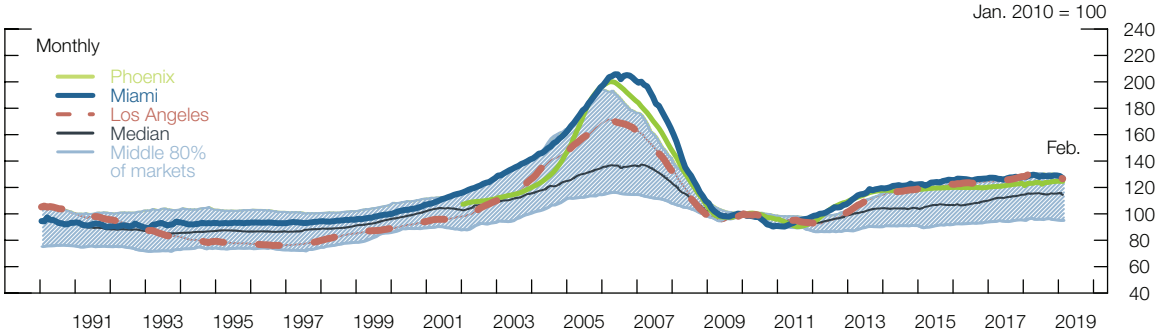
Source: CoreLogic; Zillow.

1-18. Housing Price-to-Rent Ratio



Source: For house prices, CoreLogic; for rent data, Bureau of Labor Statistics.

1-19. Selected Local Housing Price-to-Rent Ratio Indexes



Source: For house prices, CoreLogic; for rent data, Bureau of Labor Statistics.

2. Borrowing by Businesses and Households

Business-sector debt relative to GDP is historically high, whereas borrowing by households remains at a modest level relative to incomes

Overall, vulnerabilities stemming from total private-sector credit have remained at a moderate level relative to the past several decades. However, growth in business debt has outpaced GDP for the past 10 years, with the most rapid growth in debt over recent years concentrated among the riskiest firms. Although debt-financing costs are low, the elevated level of debt could leave the business sector vulnerable to a downturn in economic activity or a tightening in financial conditions. In contrast, the household debt-to-GDP ratio continued to decline, and the growth of household credit has been concentrated among prime-rated borrowers.

Table 2 shows the current volume and recent and historical growth rates of various forms of debt owed by businesses and households.

Table 2. Outstanding Amounts of Business and Household Credit

Item	Outstanding (billions of dollars)	Growth, 2018 (percent)	Average annual growth, 1997–2018 (percent)
Total private nonfinancial credit	30,871	3.4	5.6
Total business credit	15,243	3.7	5.7
Corporate business credit	9,759	3.0	5.0
Bonds and commercial paper	6,240	1.4	5.7
Bank lending	1,520	11.4	3.3
Leveraged loans*	1,090	20.1	15.8
Noncorporate business credit	5,485	4.9	7.2
Commercial real estate	2,401	5.6	6.3
Total household credit	15,628	3.2	5.5
Mortgages	10,337	2.8	5.7
Consumer credit	4,018	4.9	5.3
Student loans	1,569	5.3	9.7
Auto loans	1,155	3.7	5.1
Credit cards	1,055	3.1	3.5
Nominal GDP	20,891	5.2	4.2

Note: The data extend through 2018:Q4. Growth rates are measured from Q4 the year immediately preceding the period through Q4 of the final year of the period. The table reports the main components of corporate business credit, total household credit, and consumer credit. Other, smaller components are not reported. The commercial real estate (CRE) row shows CRE debt owed by both corporate and noncorporate businesses. Total household-sector credit includes debt owed by other entities, such as nonprofit organizations. GDP is gross domestic product.

* Leveraged loans included in this table are an estimate of the leveraged loans that are made to nonfinancial businesses only and do not include the small amount of leveraged loans outstanding for financial businesses. The amount outstanding shows institutional leveraged loans and generally excludes loan commitments held by banks. For example, lines of credit are generally excluded from this measure. The average annual growth rate shown for leveraged loans is computed from 2000 to 2018:Q4, as this market was fairly small before 2000.

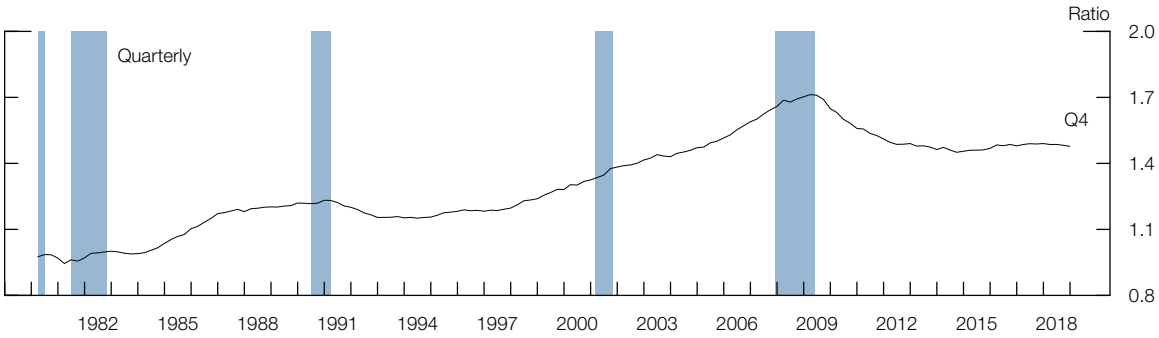
Source: For leveraged loans, S&P Global, Leveraged Commentary & Data; for GDP, Bureau of Economic Analysis, national income and product accounts; for all other items, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

Total private credit has advanced roughly in line with economic activity . . .

Total private-sector credit—that is, credit to businesses and households—has been expanding at a pace similar to that of nominal GDP for about the past half-decade, and this pattern continued in the second half of 2018 (figure 2-1). Accordingly, its ratio relative to GDP has remained roughly flat at levels similar to those in mid-2005, before the period of most rapid credit growth from 2006 to 2007.

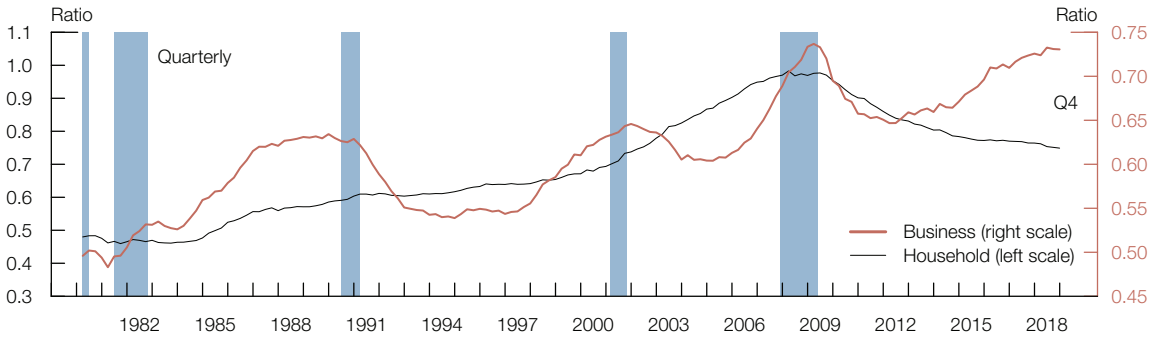
Debt owed by the business sector, however, has expanded more rapidly than output for the past several years, pushing the business-sector credit-to-GDP ratio to historically high levels. At the same time, debt owed by households has been growing more slowly than GDP, resulting in a gradual decline in the household credit-to-GDP ratio (figure 2-2).

2-1. Private Nonfinancial-Sector Credit-to-GDP Ratio



Source: Federal Reserve Board staff calculations based on Bureau of Economic Analysis, national income and product accounts, and Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

2-2. Business- and Household-Sector Credit-to-GDP Ratios

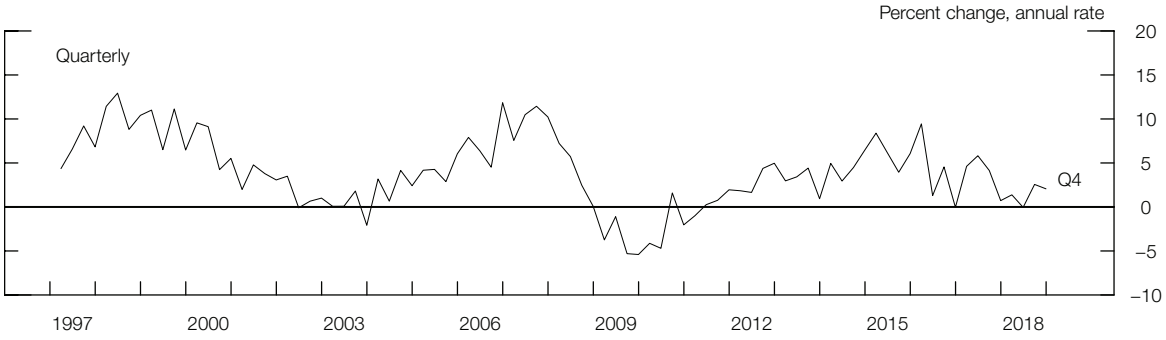


Source: Federal Reserve Board staff calculations based on Bureau of Economic Analysis, national income and product accounts, and Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

. . . but debt owed by businesses is historically high, and risky debt issuance has picked up recently

After growing faster than GDP through most of the current expansion, total business-sector debt relative to GDP stands at a historically high level. That said, in 2018, total business-sector debt grew a bit below its average pace since 2013 (figure 2-3). The sizable growth in

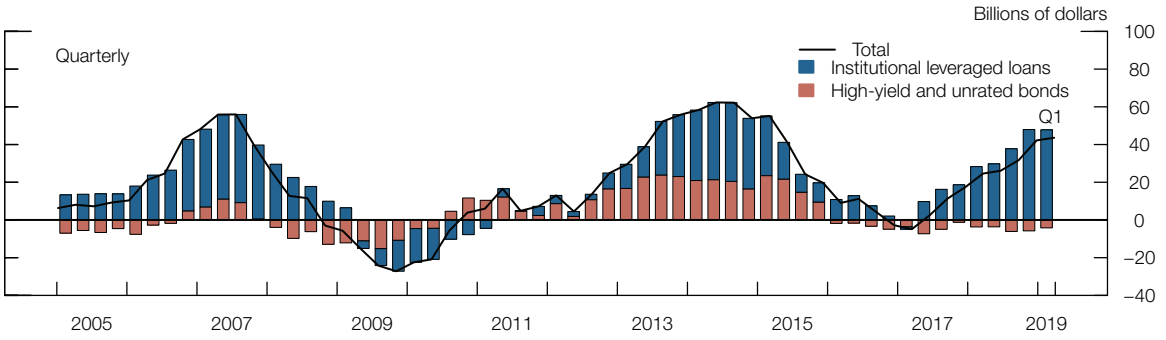
2-3. Growth of Real Aggregate Debt of the Business Sector



Source: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

business debt over the past seven years has been characterized by large increases in risky forms of debt extended to firms with poorer credit profiles or that already had elevated levels of debt. While growth in these riskier forms of debt slowed to zero in late 2016, it has rebounded more recently, with leveraged loan net issuance more than offsetting a modest decline in issuance of high-yield and unrated bonds (figure 2-4). Issuance of leveraged loans continued at a solid pace in the first quarter of 2019, though refinancing activity has decreased because of the somewhat elevated spreads. A more in-depth treatment of financial stability concerns associated with the historically high level of business debt can be found in the box "Vulnerabilties Associated with Elevated Business Debt."

2-4. Net Issuance of Risky Business Debt



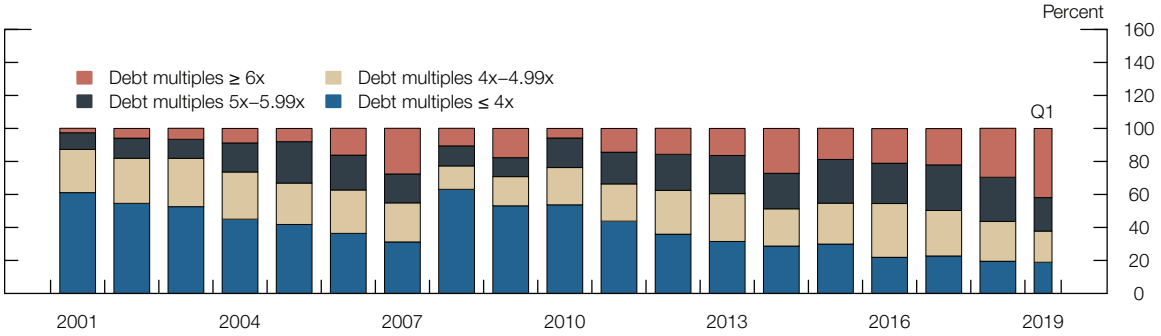
Source: Mergent, Fixed Income Securities Database (FISD); S&P Global, Leveraged Commentary & Data.

Moreover, credit standards for some business loans appear to have deteriorated further . . .

Credit standards for new leveraged loans appear to have deteriorated further over the past six months. The share of newly issued large loans to corporations with high leverage—defined as those with a ratio of debt-to-EBITDA (earnings before interest, taxes, depreciation, and amortization) above 6—increased in the second half of last year and the first

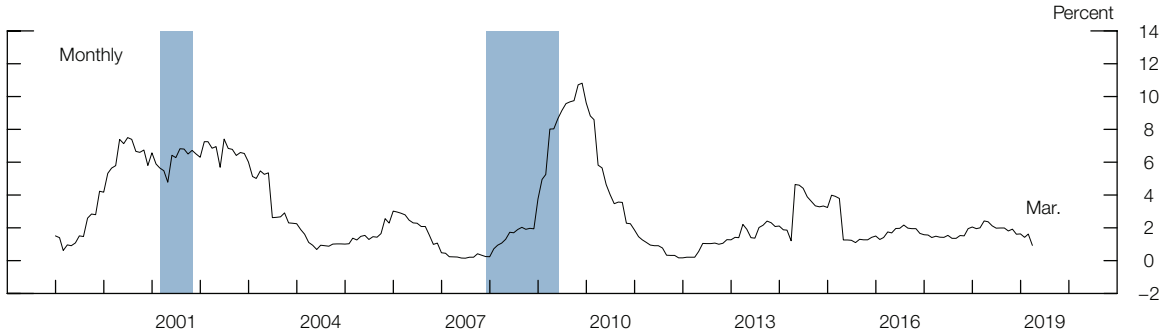
quarter of this year and now exceeds previous peak levels observed in 2007 and 2014, when underwriting quality was poor (figure 2-5). This apparent deterioration in credit standards notwithstanding, the credit performance of leveraged loans has remained solid, in part reflecting the relatively strong economy. The default rate on leveraged loans edged down in the most recent data to a level near the low end of its historical range (figure 2-6).

2-5. Distribution of Large Institutional Leveraged Loan Volumes, by Debt-to-EBITDA Ratio



Source: S&P Global, Leveraged Commentary & Data.

2-6. Default Rates of Leveraged Loans

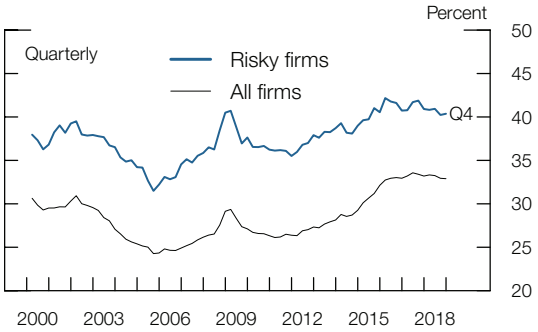


Source: S&P Global, Leveraged Commentary & Data.

. . . and leverage in the business sector is high by historical standards

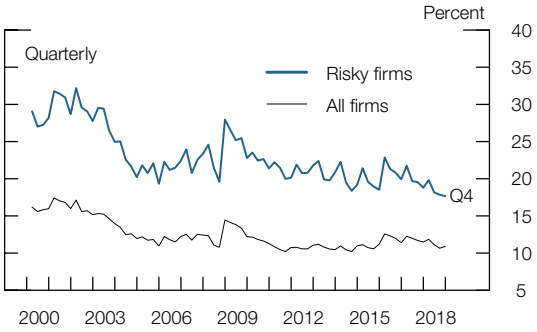
The ratio of debt to assets for all publicly traded nonfinancial firms, including speculative-grade and unrated firms, remains close to its highest level over the past 20 years (figure 2-7). In 2018, the firms with the most rapid increases in their debt loads had riskier financial characteristics—higher leverage, higher interest expense ratios, and lower cash holdings. At the same time, broader corporate credit performance remains favorable amid a strong economy, and, with interest rates low by historical standards, debt service costs are at the lower ends of their historical ranges, particularly for risky firms (figure 2-8).

2-7. Gross Balance Sheet Leverage of Public Nonfinancial Corporations



Source: Federal Reserve Board staff calculations based on S&P Global, Compustat.

2-8. Interest Expense Ratio for Public Nonfinancial Corporations

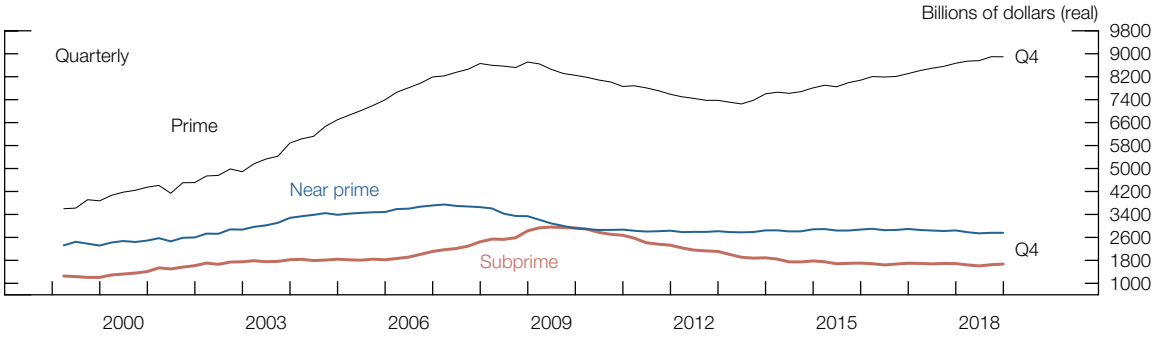


Source: Federal Reserve Board staff calculations based on S&P Global, Compustat.

In contrast, borrowing by households has grown modestly relative to incomes, and debt owed by borrowers with solid credit histories has largely driven this growth

In the household sector, debt has expanded at a slower pace than GDP in the 10 years since the financial crisis, and this trend has continued in the most recent data. In addition, there has been an ongoing shift in the composition of household debt toward borrowers with higher credit scores. Loan balances (adjusted for general price inflation) owed by borrowers with prime credit scores—who account for about one-half of all borrowers and about two-thirds of all balances—continued to grow in the second half of 2018 and now exceed their pre-crisis levels. In contrast, loan balances for the remaining one-half of borrowers with near-prime and subprime credit scores were essentially unchanged over the past several years (figure 2-9).

2-9. Total Household Loan Balances



Source: FRBNY Consumer Credit Panel/Equifax; Bureau of Labor Statistics consumer price index.

Vulnerabilities Associated with Elevated Business Debt

Debt owed by businesses has grown over the long expansion. This growth has pushed nonfinancial business debt—measured as a share of business assets or, more broadly, as a share of gross domestic product—close to the highest levels experienced over the past 20 years. While this situation presents risks, the resilience of institutions at the core of the financial system is much greater than pre-crisis.

Elevated business debt, easy lending standards, and strong risk appetite pose a vulnerability . . .

Although the increase in nonfinancial business debt has been broad based across most sectors of the economy, it has become increasingly concentrated among the riskiest firms. Detailed balance sheet information of publicly traded nonfinancial firms reveals that, over the past two years, the firms with the most rapid increases in their debt loads have higher leverage, higher interest expense ratios, and lower cash holdings.

Alongside these developments, standards and terms on business debt have continued to deteriorate. Although recent data from the Senior Loan Officer Opinion Survey on Bank Lending Practices indicate little change in lending standards for commercial and industrial (C&I) loans, banks had been easing these standards over much of the past two years. The risks associated with leveraged loans have also intensified, as a greater proportion are to borrowers with lower credit ratings and already high levels of debt. In addition, loan agreements contain fewer financial maintenance covenants, which effectively reduce the incentive to monitor obligors and the ability to influence their behavior. The Moody's Loan Covenant Quality Indicator suggests that the overall strictness of loan covenants is near its weakest level since the index began in 2012, and the fraction of so-called cov-lite leveraged loans (leveraged loans with no financial maintenance covenants) has risen substantially since the crisis.

In the bond market, the ratings distribution of nonfinancial high-yield corporate bonds has been roughly stable over the past several years, with the share of high-yield bonds outstanding that are rated deep junk (B3/B- or below) declining slightly from its recent peak level of roughly 30 percent reached in 2016.

In contrast, the distribution of ratings among nonfinancial investment-grade corporate bonds has deteriorated. The share of bonds rated at the lowest investment-grade level (for example, an S&P rating of triple-B) has reached near-record levels. As of the first quarter of 2019, a little more than 50 percent of investment-grade bonds outstanding were rated triple-B, amounting to about $1.9 trillion. A significant weakening in the economic outlook likely would trigger some downgrades of these bonds to speculative-grade ratings and possibly cause some investors to look to sell them rapidly. Given the smaller size of the market for junk debt, a large volume of such sales into a relatively illiquid market could amplify price declines.

. . . that potentially increases the downside risk to broader economic activity

The historically high level of business debt and the recent concentration of debt growth among the riskiest firms could pose a risk to those firms and, potentially, their creditors. The most risky firms are

(continued)

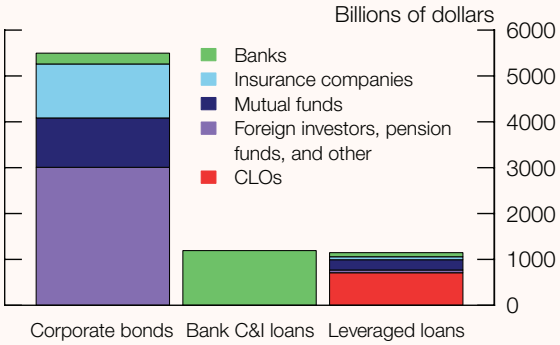
also the ones most likely to be financially constrained. Hence, their investment and employment are particularly vulnerable to a widening in corporate debt spreads and a tightening in lending standards. Even without a sharp decrease in credit availability, any weakening of economic activity could boost default rates and lead to credit-related contractions to employment and investment among these businesses. Moreover, existing research suggests that elevated vulnerabilities, such as excessive borrowing in the business sector, increase the downside risk to broader economic activity.[1]

Exposures of financial institutions to business debt can amplify losses

The degree to which strains among corporate borrowers are amplified by the financial sector during an adverse scenario depends in part upon the exposure of financial institutions to losses from loans to these borrowers and the associated second-round effects of corporate distress.

The largest components of the $9.7 trillion nonfinancial corporate credit outstanding are corporate bonds (about $5.5 trillion), bank C&I loans (about $1.2 trillion), and leveraged loans (about $1.1 trillion).[2] Corporate bonds are held by a range of domestic and international investors and firms; among regulated domestic intermediaries, bonds are primarily held by insurance companies or via mutual funds (see figure).[3] C&I loans, which include the drawn portion of credit lines as well as term loans, are held on bank balance sheets, while leveraged loans are mainly held via mutual funds and in collateralized loan obligations (CLOs). CLOs are securitized products that, in turn, are held by a range of investors. Based on the limited data currently available, investments in CLOs are spread roughly evenly across domestic and foreign banks, insurance companies, mutual funds, and other investors. The largest domestic banks hold about $90 billion. The composition of CLO investors varies substantially by tranche. For example, roughly one-half of the newly issued triple-A-rated CLO tranches are held by foreign and domestic banks, while the more risky tranches are primarily held by asset managers, insurance companies, hedge funds, and structured credit funds.

Corporate Debt, by Type of Debt and Holder



Source: For leveraged loans, S&P Global Market Intelligence, Leveraged Commentary & Data; for all other items, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

(continued on next page)

[1] For evidence linking deteriorating financial conditions to increased downside risk in gross domestic product growth, see International Monetary Fund (2017), "Financial Conditions and Growth at Risk," chapter 3 in *Global Financial Stability Report: Is Growth at Risk?* (Washington: IMF, October), pp. 91–118, https://www.elibrary.imf.org/doc/IMF082/24427-9781484308394/24427-9781484308394/Other_formats/Source_PDF/24427-9781484320594.pdf; and Tobias Adrian, Nina Boyarchenko, and Domenico Giannone (2019), "Vulnerable Growth," *American Economic Review*, vol. 109 (April), pp. 1263–89. For similar evidence on risk to unemployment, see Michael T. Kiley (2018), "Unemployment Risk," Finance and Economics Discussion Series 2018-067 (Washington: Board of Governors of the Federal Reserve System, September), https://doi.org/10.17016/FEDS.2018.067.

[2] These numbers do not directly correspond to those presented in table 2. For corporate bonds, the $6.2 trillion reported in the table includes commercial paper, industrial revenue bonds, and other loans and advances. We have excluded these debt instruments because we do not have detailed data on their institutional holders. Similarly, for bank loans, the $1.5 trillion reported in the table includes mortgage loans in addition to the $1.2 trillion in bank C&I loans.

[3] The large portion at the bottom of the stacked bar for corporate debt in the figure consists mainly of foreign investors, pension funds, and other investors specified in the figure note.

Vulnerabilities Associated with Elevated Business Debt

(continued)

However, key institutions appear resilient . . .

A slowdown in economic activity could result in an increase in default rates, which would lead to elevated credit losses at financial institutions holding corporate debt, especially given the reduced amount of covenant protection on leveraged loans. Higher default rates and losses could also materialize through a sharp repricing of credit risk, which would lead to an increased debt service burden on firms with financing needs.

Among U.S. financial institutions, insurers are the largest investors in corporate bonds. One risk related to insurance companies' exposure to business debt is that credit rating downgrades of corporate bond holdings would lead to higher capital charges, which could prompt insurers to liquidate portions of their portfolios, potentially generating spillover losses to the broader market. Relatedly, a large increase in credit spreads would reduce the market value of those holdings. In addition to being large holders of corporate bonds, insurance firms have also increased their investments in CLO tranches steadily since the crisis, in part because CLOs receive favorable capital treatment for insurance companies. Despite these potential vulnerabilities, insurance companies appear resilient. Regulatory capital ratios for insurance companies remain high, and leverage for both property and casualty insurance firms and life insurance companies is low.

Banks are important sources of funding for businesses and, as a result, face exposure to credit risk through C&I loans, leveraged loans, and CLOs held on their balance sheets. Large banks, in particular, face additional risk given their central role in the leveraged loan market. For example, pipeline risk arises between the time when a bank commits to underwrite a leveraged loan and the time when it sells portions of the loan to nonbank investors. If market sentiment shifts abruptly, resulting in lower investor demand for these loans, the bank may need to hold a larger portion of the loan on its balance sheet than it expected. Finally, banks may also face indirect exposures because they act as lenders to nonbank financial intermediaries that may, in turn, be directly exposed to elevated losses on leveraged loans.

On the whole, banks appear well positioned to deal with these exposures. The annual stress-test exercises stress a range of participating banks' direct and indirect exposures to shocks from the business

(continued)

sector. The tests require that participating banks have sufficient capital to withstand material losses on these exposures and continue lending. In addition, banks' internal liquidity stress tests and the Liquidity Coverage Ratio requirement incorporate protections against draws on credit lines. With regard to leveraged lending, banks have improved their management of the associated risks—reflecting, in part, the 2013 interagency guidance on leveraged lending—even as underwriting standards have deteriorated over the past decade. Moreover, large banks have improved their management of syndication pipelines.

Investors in CLOs, including insurance companies, banks, and other financial intermediaries, face the risk that strains within the underlying loan pool will result in unexpected losses on higher-rated tranches of the CLOs. The extent of these losses depends on the conservatism of the CLO structure—specifically, the amount of subordinate tranches and equity. Moreover, insufficient market liquidity for CLO tranches could amplify these risks. The secondary market is not very liquid even in normal times, and liquidity is likely to deteriorate in times of stress, which could amplify any price declines.

It is hard to know with certainty how today's CLO structures and investors would fare in a prolonged period of stress. Although the average subordination level of triple-A-rated tranches moved up to 35 percent in 2018, underwriting standards for the underlying leveraged loans have deteriorated, as previously described. Compared with the investment vehicles associated with subprime mortgages in the financial crisis, CLOs are structured in a way that avoids run risk. In particular, they do not rely on funding that must be rolled over before the underlying assets mature, in contrast to other securitization vehicles such as asset-backed commercial paper. Moreover, the investor base for CLOs has become more stable than in the past. CLOs are now predominantly held by investors with relatively stable funding. In contrast, before the financial crisis CLO tranches were commonly held by leveraged structured investment vehicles that relied heavily on short-term wholesale funding.

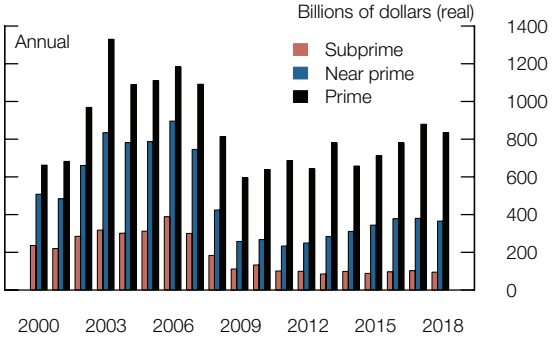
. . . although risks of liquidity strains at mutual funds warrant continued monitoring

Open-end mutual funds and exchange-traded funds that hold bank loans or high-yield bonds permit investors to redeem their shares daily, while the underlying assets can take substantially longer to sell. This mismatch suggests that investors may perceive some incentive to redeem their shares early if they think others are likely to try to do the same. Although widespread redemptions on mutual funds other than money market funds have not materialized during past episodes of stress, a sizable wave of such redemptions during a stress event could depress bond and loan prices, raising the cost of funds to businesses.

Credit risk of outstanding household mortgage debt remains generally low . . .

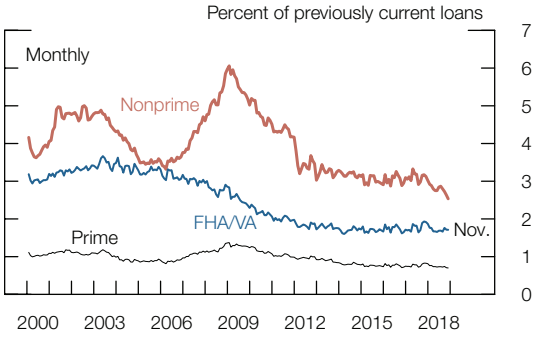
Mortgage debt accounts for roughly two-thirds of total household credit. The general shift in the composition of total household debt toward less-risky borrowers is particularly evident in new mortgage extensions and is broadly consistent with stronger underwriting standards relative to the mid-2000s (figure 2-10).

2-10. Estimate of New Mortgage Volume to Households



Source: FRBNY Consumer Credit Panel/Equifax; Bureau of Labor Statistics consumer price index.

2-11. Transition Rates into Mortgage Delinquency

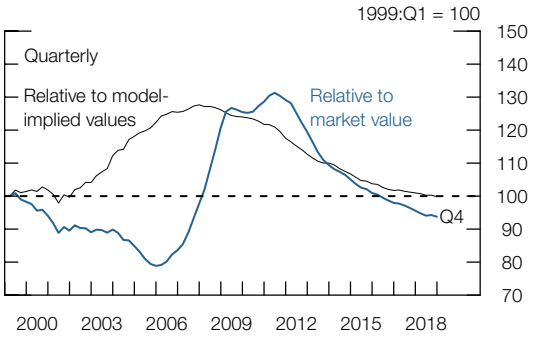


Source: For prime and FHA/VA, Black Knight McDash Data; for nonprime, CoreLogic.

Mortgage loan performance has been solid. The rate at which existing mortgages transition into delinquency has been very low for several years for borrowers who have prime credit scores or whose loans are in programs offered by the Federal Housing Administration and the U.S. Department of Veterans Affairs. In addition, although the data are volatile, the transition rate into delinquency for borrowers with nonprime credit scores showed a marked decline in the most recent data through November and currently stands at the lowest level in the past 20 years (figure 2-11). Delinquency rates for newly originated mortgages, which give us a sense of recent underwriting standards, have also been low.

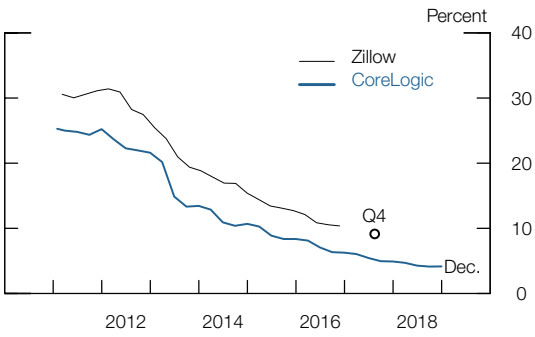
Moreover, estimates of housing leverage, measured relative to market value or a model-implied value, are at the moderate level observed in the relatively calm housing markets of the late 1990s, suggesting that home mortgages are backed by sufficient collateral (figure 2-12). Similarly, the share of outstanding mortgages with negative equity—mortgages where the amount borrowed on a property exceeds the value of the underlying home—has flattened out over the past year at a very low level (figure 2-13).

2-12. Estimates of Housing Leverage



Source: FRBNY Consumer Credit Panel/Equifax; CoreLogic; Bureau of Labor Statistics.

2-13. Estimate of Mortgages with Negative Equity



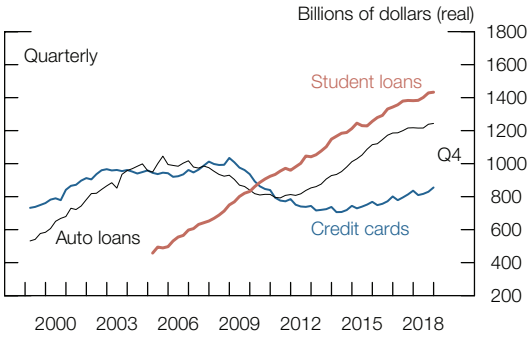
Source: CoreLogic; Zillow.

. . . although some households are struggling with debt

The remaining one-third of total debt owed by households, commonly referred to as consumer credit, consists mainly of balances of student loans, auto loans, and credit card debt (figure 2-14). Table 2 shows that consumer credit rose roughly 5 percent last year and currently stands at about $4 trillion.

Household balances on student loan debt increased modestly in the fourth quarter of last year. Delinquency rates on those loans remain high relative to historical standards, although they have been, on balance, moving sideways in recent years. Although the risks posed to the broader financial system appear limited, as the majority of student loans were issued through government programs, the elevated student loan balances and delinquency rates highlight the challenges associated with debt burdens faced by some households.

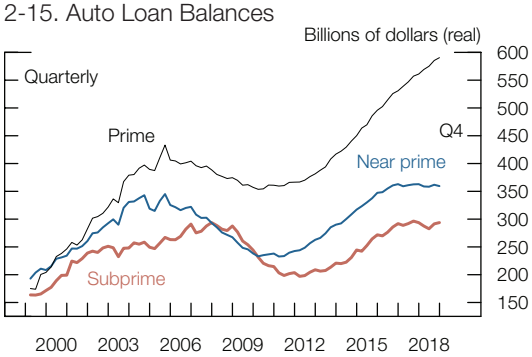
2-14. Consumer Credit Balances



Source: FRBNY Consumer Credit Panel/Equifax; Bureau of Labor Statistics consumer price index.

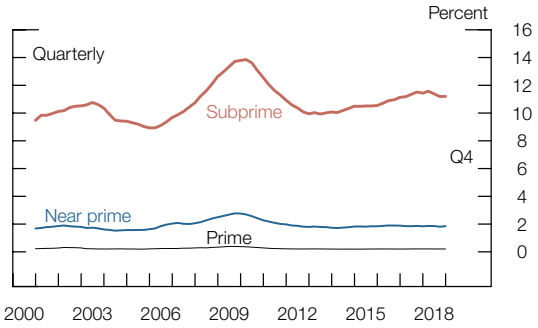
The continued growth in auto loan balances through the fourth quarter does not appear to have been accompanied by an increase in the share issued to riskier borrowers (figure 2-15). Delinquency rates for subprime auto loans were on the rise for the past few years but seem to be stabilizing, albeit at a high level (figure 2-16).

2-15. Auto Loan Balances



Source: FRBNY Consumer Credit Panel/Equifax; Bureau of Labor Statistics consumer price index.

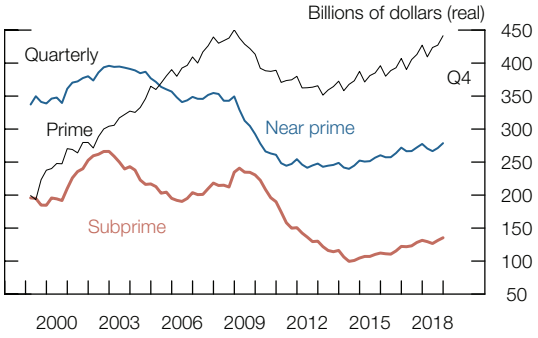
2-16. Auto Loan Delinquency Rates



Source: FRBNY Consumer Credit Panel/Equifax.

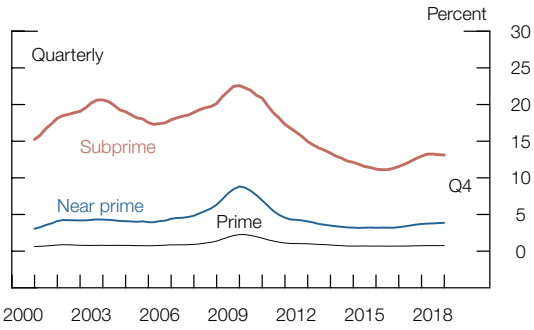
Household balances on credit card debt are up moderately since the November FSR and now stand at about $1 trillion. While credit card debt growth was strongest among borrowers with prime credit scores, both near-prime and subprime borrowers also increased their loan balances moderately (figure 2-17). Credit card balances owed by borrowers with less than prime credit ratings have trended up in recent years but remain well below their average levels in the years before the financial crisis. The delinquency rate for subprime credit card debt appears to have flattened out in recent quarters at a level that is considerably lower than its average over the past 20 years (figure 2-18).

2-17. Credit Card Balances



Source: FRBNY Consumer Credit Panel/Equifax; Bureau of Labor Statistics consumer price index.

2-18. Credit Card Delinquency Rates



Source: FRBNY Consumer Credit Panel/Equifax.

3. Leverage in the Financial Sector

Leverage in the financial sector has remained low

Leverage at financial firms remained low relative to historical levels, as regulatory reforms enacted after the financial crisis continue to support the resilience of key financial institutions. Regulators require that banks—especially the largest banks—meet much higher standards in the amount and quality of capital on their balance sheets and in the ways they assess and manage their financial risks. Leverage at broker-dealers and insurance companies remained low. Meanwhile, hedge fund leverage—which, up to last summer, had been relatively high—appears to have declined over the past six months.

To put the relative size of the types of financial institutions discussed in this section into perspective, table 3 shows the level and growth rates of their total assets over the past year and over the past two decades. Of note, asset holdings of hedge funds and broker-dealers grew at a rapid pace over the past year, while other institutions' asset holdings grew at rates below their longer-term average rates.

Table 3. Size of Selected Sectors of the Financial System, by Types of Institutions and Vehicles

Item	Total assets (billions of dollars)	Growth, 2018 (percent)	Average annual growth, 1997–2018 (percent)
Banks and credit unions	19,200	1.9	5.8
Mutual funds	14,670	-7.7	9.5
Insurance companies	9,850	-2.8	5.6
Life	7,444	-3.9	5.7
Property and casualty	2,406	.7	5.4
Hedge funds*	7,654	11.6	9.1
Broker-dealers	3,359	8.5	5.0
	Outstanding (billions of dollars)		
Securitization	10,249	2.4	5.5
Agency	9,090	2.8	6.0
Non-agency**	1,159	-.9	3.1

Note: The data extend through 2018:Q4. Growth rates are measured from Q4 the year immediately preceding the period through Q4 of the final year of the period. Life insurance companies' assets include both general and separate account assets.

* Hedge fund data start in 2013:Q1 and are updated through 2018:Q2.

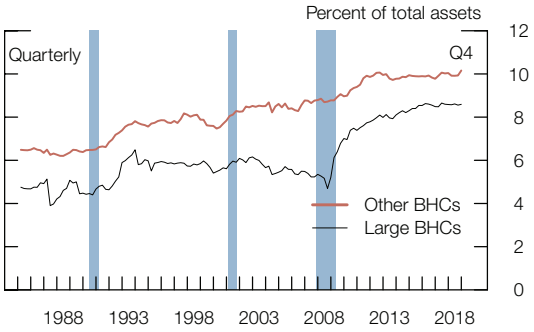
** Non-agency securitization excludes securitized credit held on balance sheets of banks and finance companies.

Source: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; Federal Reserve Board staff calculations based on Securities and Exchange Commission, Form PF, Reporting Form for Investment Advisers to Private Funds and Certain Commodity Pool Operators and Commodity Trading Advisors.

Bank capitalization remained strong, while credit performance improved . . .

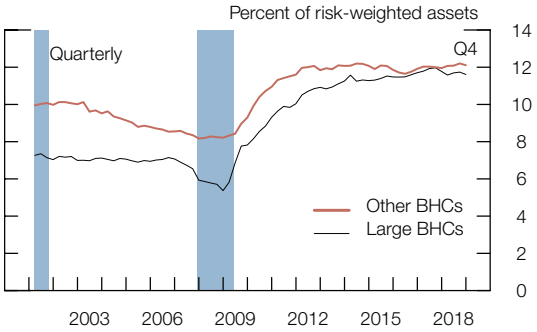
The ratio of tangible bank equity to assets changed little over the fourth quarter of 2018, while the common equity Tier 1 ratio of large banks edged down but remained well above levels seen before the financial crisis (figures 3-1 and 3-2). Buffers designed to conserve capital when capital ratios approach the minimum requirements and surcharges applicable to the largest banks became fully phased-in on January 1, 2019. Meanwhile, the largest banks have paid a sizable share of their profits to their shareholders over the past two years.

3-1. Ratio of Tangible Bank Equity to Assets



Source: Federal Financial Institutions Examination Council, Call Report Form FFIEC 031, Consolidated Reports of Condition and Income for a Bank with Domestic and Foreign Offices.

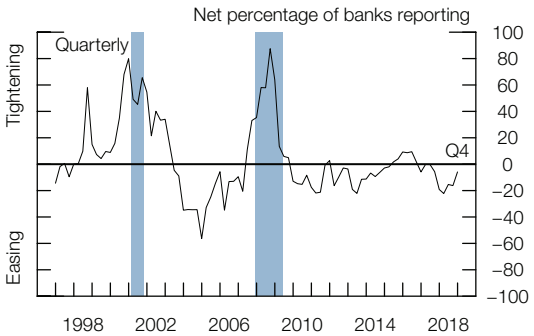
3-2. Common Equity Tier 1 Ratio of Banks



Source: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Holding Companies.

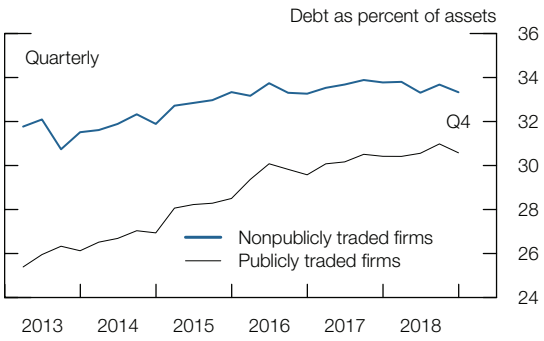
Credit performance of bank loans continued to improve on balance. At the largest banks, delinquency rates have trended down; at all other banks, delinquency rates have remained stable. Banks reported in the SLOOS that their commercial and industrial lending standards changed little in the fourth quarter of 2018 after several quarters of easing, suggesting that banks' standards for such loans remained relatively loose, although they had not decreased further (figure 3-3). Meanwhile, the leverage of firms that borrow from the largest banks stayed high, reflecting the overall upward trend in business leverage in recent years (figure 3-4).

3-3. Change in Bank Lending Standards for C&I Loans



Source: Federal Reserve Board, Senior Loan Officer Opinion Survey on Bank Lending Practices; Federal Reserve Board staff calculations.

3-4. Borrower Leverage for Bank C&I Loans

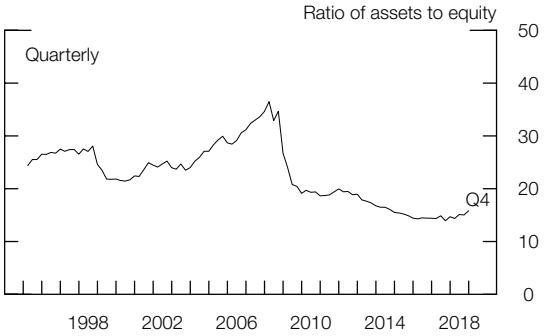


Source: Federal Reserve Board, Form FR Y-14Q (Schedule H.1), Capital Assessments and Stress Testing.

. . . and leverage at broker-dealers and insurance companies stayed low . . .

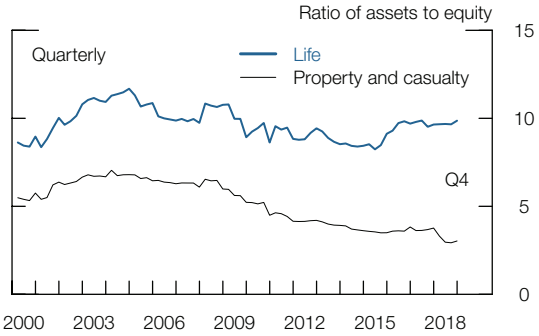
Leverage of broker-dealers edged up since November 2018, the time of the previous FSR, but remains near historically low levels (figure 3-5). At life insurance companies and at property and casualty insurance firms, leverage has also stayed low, although it has been increasing slightly at life insurance companies (figure 3-6).

3-5. Leverage of Broker-Dealers



Source: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

3-6. Leverage of Insurance Companies

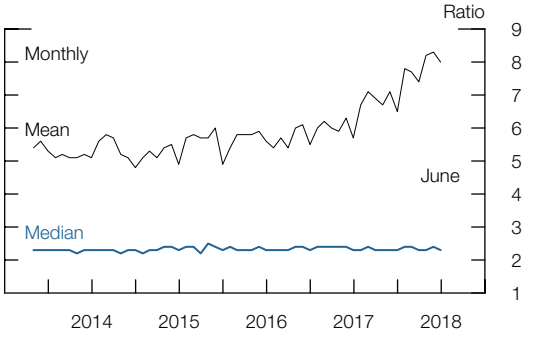


Source: S&P Global Market Intelligence.

. . . while hedge fund leverage appears to have declined modestly after rising significantly earlier in 2018 . . .

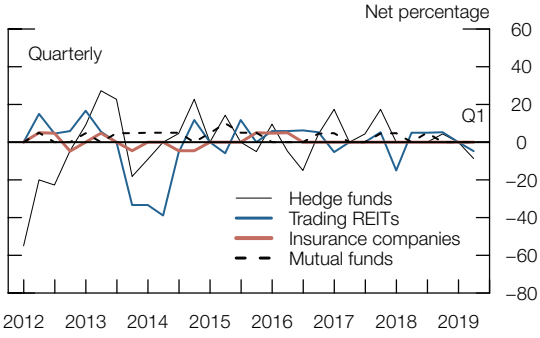
Gross leverage of hedge funds rose steadily over the first part of last year (figure 3-7). However, some indicators of hedge fund leverage, particularly for equity hedge funds, show that leverage decreased at the end of 2018 as equity market volatility rose. In addition, margin debt provided by New York Stock Exchange broker-dealers to fund their clients' equity positions—a measure of leverage that comprises credit extended to both individual and institutional investors including hedge funds—declined over the same period. Meanwhile, in the most recent Senior Credit Officer Opinion Survey on Dealer Financing Terms, or SCOOS, dealers indicated that the use of leverage by hedge funds remained about unchanged over the first quarter of 2019 (figure 3-8).

3-7. Gross Leverage of Hedge Funds



Source: Federal Reserve Board staff calculations based on Securities and Exchange Commission, Form PF, Reporting Form for Investment Advisers to Private Funds and Certain Commodity Pool Operators and Commodity Trading Advisors.

3-8. Change in the Use of Financial Leverage

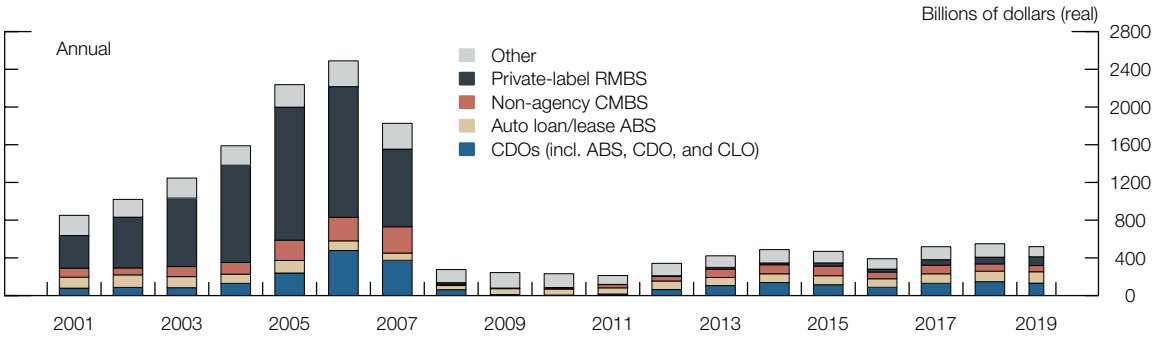


Source: Federal Reserve Board, Senior Credit Officer Opinion Survey on Dealer Financing Terms.

. . . and securitization and borrowing at other nonbank financial firms continued to increase

In a process known as "securitization," financial institutions bundle loans or other financial assets together and sell investors claims on the bundle as securities that can be traded much like bonds. Examples of the resulting securities are collateralized loan obligations (CLOs), asset-backed securities, and commercial and residential mortgage-backed securities (MBS). Issuance volumes of "private label" securities (that is, those for which the security is not guaranteed by a government-sponsored enterprise or by the federal government) have risen in recent years but remain well below the levels seen in the years ahead of the financial crisis (figure 3-9). Of note, CLO issuance has increased rapidly since 2012 and reached a record level in 2018, with these securities funding more than 50 percent of outstanding leveraged loans.

3-9. Issuance of Non-agency Securitized Products, by Asset Class



Source: Harrison Scott Publications, Asset-Backed Alert (ABAlert.com) and Commercial Mortgage Alert (CMAlert.com); Bureau of Labor Statistics, consumer price index via Haver Analytics.

Data on bank lending to nonbank financial institutions (nonbanks) can be informative about the use of leverage by nonbanks and may shed light on how credit losses at nonbanks could be transmitted to banks.[6] Committed amounts of credit from large banks to nonbanks—such as finance companies, asset managers, securitization vehicles, and mortgage real estate investment trusts—continued to increase in the second half of 2018 (figure 3-10).[7] Nonbanks currently use about one-half of the amounts committed in the form of term loans and drawdowns on credit lines.

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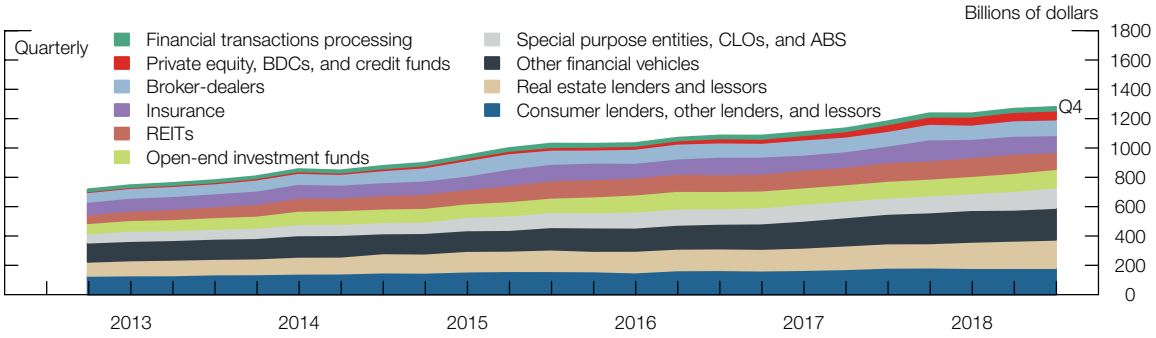
[6] The box "Vulnerabilities Associated with Elevated Business Debt" in the previous section examines this risk in more detail.

[7] Since the November FSR, the definition of nonbank financial firms has been revised and now includes firms from the real estate and rental and leasing sector (sector 53 of the North American Industry Classification System). Because of this revision, total commitment amounts in figure 3-10 are larger than in figure 3-9 of the November FSR. For example, the total commitment amount as of the fourth quarter of 2018 is equal to $1 trillion based on the November FSR definition and equal to $1.3 trillion based on the current definition. Meanwhile, a more refined breakdown of the types of borrowers is used in the new figure. While the November FSR figure included 8 categories of nonbank financial firms, the new figure contains 10 categories.

3-10. Large Bank Lending to Nonbank Financial Firms: Committed Amounts



Source: Federal Reserve Board, Form FR Y-14Q (Schedule H.1), Capital Assessments and Stress Testing.

4. Funding Risk

Vulnerabilities from liquidity and maturity mismatches remain low

The total amount of liabilities that are most vulnerable to runs increased at a pace similar to nominal GDP over the past year and reached $14 trillion (table 4). Money market funds (MMFs) remained less susceptible to runs relative to before the implementation of money market reforms, and life insurers' nontraditional liabilities stayed below pre-crisis levels. Banks continued to rely relatively little on short-term wholesale funding and hold large amounts of high-quality liquid assets, reflecting liquidity regulations introduced after the financial crisis and banks' greater understanding of their liquidity risks.

Table 4. Size of Selected Instruments and Institutions

Item	Outstanding/ total assets (billions of dollars)	Growth, 2018 (percent)	Average annual growth, 1997–2018 (percent)
Total runnable money-like liabilities*	14,157	4.7	3.7
Uninsured deposits	4,834	2.2	11.6
Repurchase agreements	3,539	9.2	5.3
Domestic money market funds**	3,037	6.7	3.6
Commercial paper	996	3.1	2.4
Securities lending***	656	-2.0	7.4
Bond mutual funds	3,822	.3	9.1

Note: The data extend through 2018:Q4, except for securities lending, which extends through 2018:Q3. Total runnable money-like liabilities includes uninsured deposits, repurchase agreements, domestic money market funds, commercial paper, and securities lending as well as several other types of liabilities, which are not listed individually in the table. Securities lending includes only lending collateralized by cash.

* Average annual growth is from 2003:Q1 to 2018:Q4.

** Average annual growth is from 2001:Q1 to 2018:Q4.

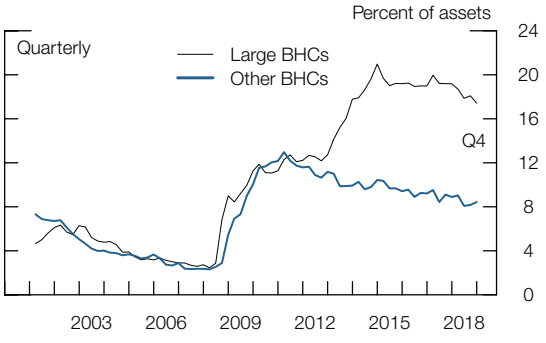
*** One-year growth is from 2017:Q3 to 2018:Q3, and average annual growth is from 2000:Q1 to 2018:Q3.

Source: Securities and Exchange Commission, Private Funds Statistics; iMoneyNet, Inc., Offshore Money Fund Analyzer; Bloomberg Finance LP; Securities Industry and Financial Markets Association: U.S. Municipal VRDO Update; Risk Management Association, Securities Lending Report; DTCC Solutions LLC, an affiliate of the Depository Trust & Clearing Corporation: Commercial Paper data; Federal Reserve Board staff calculations based on Investment Company Institute data; Federal Reserve Board, Statistical Release H.6, "Money Stock and Debt Measures" (M3 monetary aggregate); Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income (Call Report); Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; Morningstar, Inc., Morningstar Direct; Moody's Analytics, Inc., CreditView, ABCP Program Index.

Banks continue to have high levels of liquid assets and stable funding . . .

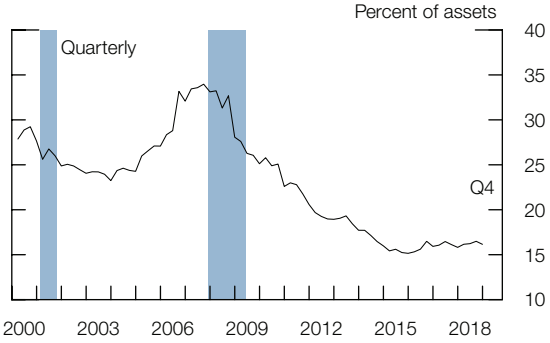
Banks have strong liquidity positions. Liquid assets at large banks continue to far exceed pre-crisis levels and are well above regulatory requirements at most large banks (figure 4-1). The composition of liquid assets has shifted from reserves toward Treasury securities and agency MBS, leading to some increase in duration risk. Meanwhile, short-term wholesale funding, which includes short-term deposits, federal funds purchased, and securities sold under agreements to repurchase, remains close to historical lows as a share of banks' total liabilities (figure 4-2).

4-1. Liquid Assets Held by Banks



Source: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Holding Companies; Federal Reserve Board, Form FR 2900, Report of Transaction Accounts, Other Deposits and Vault Cash; Federal Reserve Board, internal accounting systems.

4-2. Short-Term Wholesale Funding of Banks

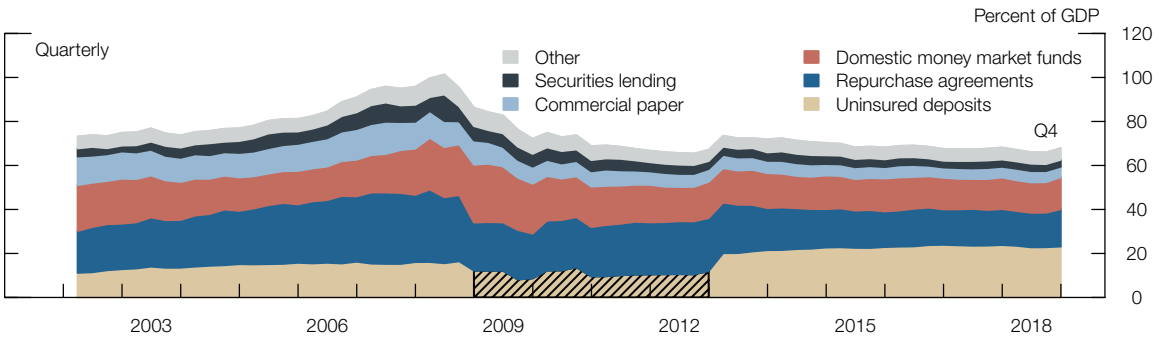


Source: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Holding Companies.

. . . and run risk in short-term funding markets remains substantially below levels seen before the crisis

Runnable money-like liabilities—an aggregate measure of private short-term debt that can be rapidly withdrawn in periods of stress—currently stand at about 70 percent of GDP (figure 4-3). This level is significantly lower than its peak at the start of the financial crisis.

4-3. Runnable Money-Like Liabilities as a Share of GDP, by Instrument and Institution

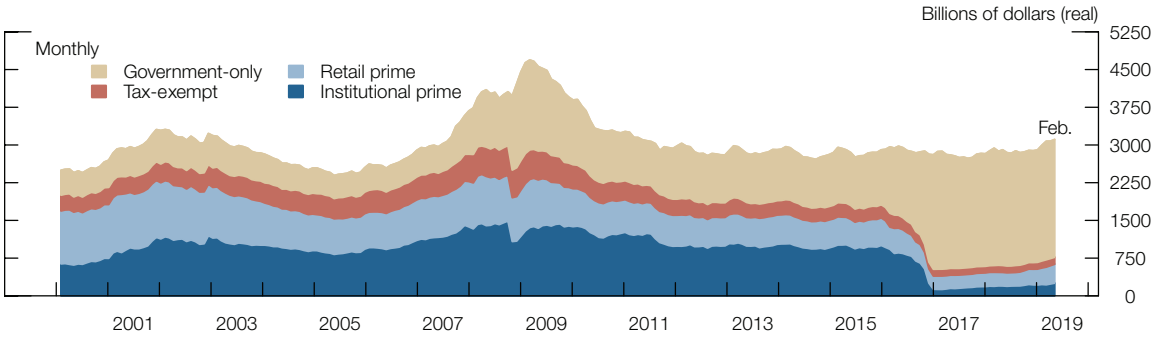


Source: Securities and Exchange Commission, Private Funds Statistics; iMoneyNet, Inc., Offshore Money Fund Analyzer; Bloomberg Finance LP; Securities Industry and Financial Markets Association: U.S. Municipal VRDO Update; Risk Management Association, Securities Lending Report; DTCC Solutions LLC, an affiliate of the Depository Trust & Clearing Corporation: Commercial Paper data; Federal Reserve Board staff calculations based on Investment Company Institute data; Federal Reserve Board, Statistical Release H.6, "Money Stock and Debt Measures" (M3 monetary aggregate); Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income (Call Report); Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; Moody's Analytics, Inc., CreditView, ABCP Program Index; Bureau of Economic Analysis, gross domestic product via Haver Analytics.

Money market funds continue to be less susceptible to runs . . .

In 2016, the Securities and Exchange Commission implemented reforms to limit risks associated with prime institutional funds (figure 4-4).[8] As the deadline for implementation approached, assets under management at prime MMFs fell sharply, and many investors in those funds shifted their holdings to government MMFs, which hold securities backed by either the U.S. government or government-sponsored enterprises. Although assets under management at prime MMFs have edged up since then, they remain much lower than pre-reform levels.

4-4. Domestic Money Market Fund Assets

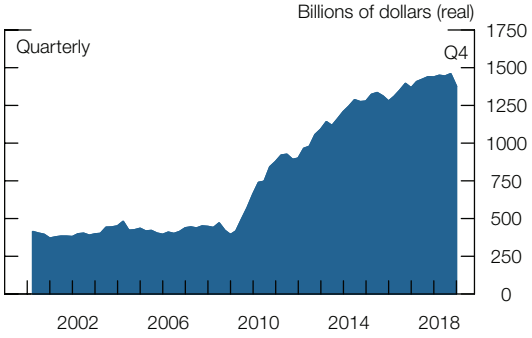


Source: Federal Reserve Board staff calculations based on Investment Company Institute data; Bureau of Labor Statistics, consumer price index via Haver Analytics.

. . . but mutual funds' holdings of corporate debt have grown notably in recent years . . .

U.S. corporate bonds held by mutual funds have more than tripled over the past decade to $1.4 trillion (figure 4-5). Mutual funds are estimated to hold about one-sixth of outstanding corporate bonds, and bank loan funds purchase about one-fifth of newly originated leveraged loans. Total assets under management in high-yield corporate bond mutual funds, which hold primarily riskier corporate bonds, and bank loan funds have more than doubled over the past decade to over $350 billion; these funds' assets declined at the end of 2018 but recovered some early this year (figure 4-6).

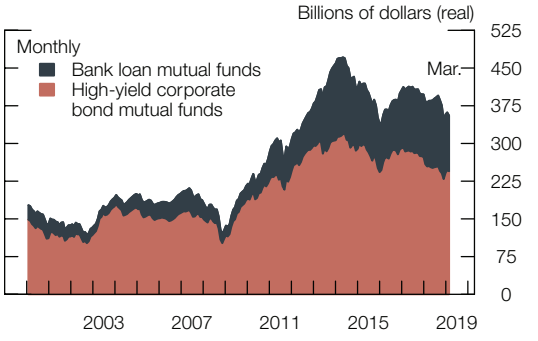
4-5. U.S. Corporate Bonds Held by Mutual Funds



Source: Federal Reserve Board staff estimates based on Federal Reserve Board Statistical Release Z.1, "Financial Accounts of the United States"; Bureau of Labor Statistics, consumer price index via Haver Analytics.

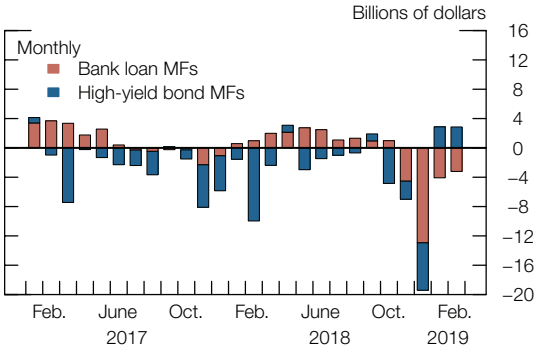
[8] In July 2014, the Securities and Exchange Commission adopted amendments to the rules that govern money market mutual funds to address risks of investor runs. The new rules, which became effective in October 2016, require institutional prime MMFs to value their portfolio securities using market-based factors and sell and redeem shares based on a floating net asset value. The new rule also provided nongovernment MMF boards with tools—liquidity fees and redemption gates—to prevent runs.

4-6. High-Yield Bond and Bank Loan Mutual Fund Assets



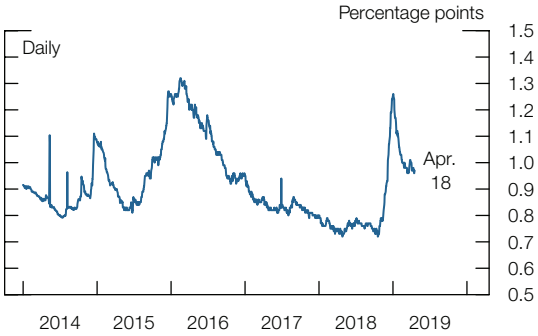
Source: Morningstar, Inc., Morningstar Direct; Bureau of Labor Statistics, consumer price index via Haver Analytics.

4-7. Mutual Fund Net Flows



Source: ICI.

4-8. Bid-Ask Spread in Secondary Market for Syndicated Loans



Source: Refinitiv (formerly Thomson Reuters), LPC LoanConnector.

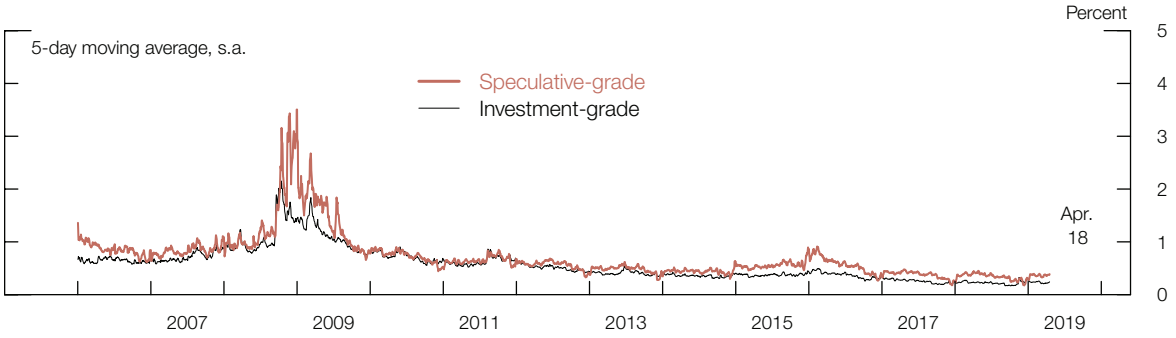
Corporate bond and bank loan mutual funds allow daily redemptions, even though it is significantly more difficult to buy and sell loans and corporate bonds than other assets such as equities and Treasury securities. The mismatch between these mutual funds' promise of daily redemptions and the longer time required to sell bonds or loans may be heightened if liquidity in these markets diminishes in times of stress.[9] Investors concerned by this mismatch may increase their redemptions in such times, potentially putting additional pressure on market functioning.

High-yield bond and bank loan mutual funds experienced large outflows in December, when markets faced heightened volatility. However, high-yield bond mutual fund assets have rebounded some this year, while bank loan mutual funds continue to experience moderate outflows (figure 4-7).

Bid-ask spreads, a commonly used measure of market liquidity, widened in secondary markets for syndicated loans and corporate bonds amid the market turmoil late last year (figures 4-8 and 4-9). During this period of reduced market liquidity, mutual funds were able to meet the higher levels of redemptions without severe dislocations to market functioning. That said, market functioning was likely supported by the strong economic fundamentals and healthy state of the financial system, and a future stress episode with larger redemptions amid weaker economic fundamentals could lead to greater strains.

[9] These effects of liquidity mismatch can be more pronounced for bank loan funds than for bond funds because bank loans have a longer settlement period than corporate bonds, which can further increase the time between the sale of a bank loan and the receipt of cash by the fund.

4-9. Bid-Ask Spread for Corporate Bonds

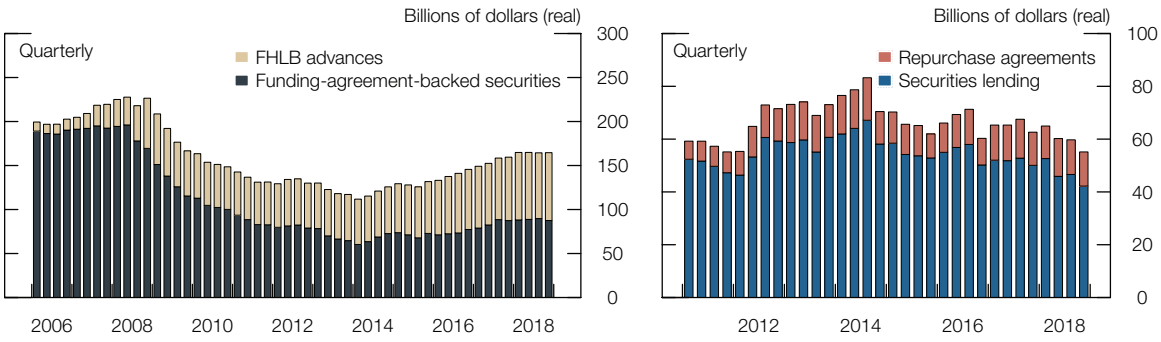


Source: Financial Industry Regulatory Authority.

. . . while life insurers' nontraditional liabilities have stayed below pre-crisis peaks

Life insurance companies' nontraditional liabilities—repurchase agreements, funding agreement–backed securities, and securities lending cash collateral, all of which suffered runs during the financial crisis, as well as Federal Home Loan Bank, or FHLB, advances—have increased over the past few years (figure 4-10). However, the amounts of these nontraditional liabilities declined since the previous FSR and remain below pre-crisis peaks.[10]

4-10. Nontraditional Liabilities of U.S. Life Insurers, by Liability Type



Source: Bureau of Labor Statistics, consumer price index via Haver Analytics; Moody's Analytics, Inc., CreditView, ABCP Program Index; Securities and Exchange Commission, Form 10-Q and 10-K; National Association of Insurance Commissioners, quarterly and annual statutory filings accessed via the S&P Global Market Intelligence Platform; Bloomberg Finance LP.

[10] The data on securities lending and repurchase agreements, or repos, of life insurers are not available for the pre-crisis period. However, the firm American International Group, Inc., or AIG, alone had $88.4 billion in securities lending outstanding at the peak in 2007:Q3. See American International Group, Form 10-Q Quarterly Report for the Quarterly Period Ended September 30, 2007.

Near-Term Risks to the Financial System

As we look forward, developments in domestic and international markets could pose near-term risks to the financial system, with the ultimate effects likely depending on the vulnerabilities of the financial system identified earlier in this report. The Federal Reserve routinely engages with other domestic and international policymakers, academics, community groups, and others in part to gauge the set of risks of particular concern to these groups. The box "Salient Shocks to Financial Stability Cited in Market Outreach" presents the views from a range of financial market analysts. We review the possible interactions of existing vulnerabilities with three broad categories of potential risks identified in these conversations: stresses in Europe; risks emanating from emerging market economies (EMEs), including China; and an unexpected and marked slowing in U.S. economic growth.

Stresses emanating from Europe may pose risks for the U.S. financial system . . .

European economies have notable international financial and economic linkages, and a sharp economic downturn in Europe would affect banks, markets, and the global economy. First, heightened financial market volatility in Europe could spill over to global markets, including the United States, leading to a pullback of investors and financial institutions from riskier assets, which could amplify declines in equity prices and increases in credit spreads. In addition, spillover effects from banks in Europe could be transmitted to the U.S. financial system directly through credit exposures as well as indirectly through the common participation of globally active banks in a broad range of activities and markets. Finally, the consequent U.S. dollar appreciation and weaker global demand in such a scenario would depress the U.S. economy through trade channels, which could reduce earnings of some U.S. businesses, particularly exporters. Such effects could harm the creditworthiness of affected U.S. businesses, particularly those that already have high levels of debt.

Another prominent downside risk in Europe is a "no deal" Brexit, which remains a possible outcome later in the year, even after the European Council granted the U.K. government a further extension of the Brexit deadline until October 31. Brexit calls for a significant reorganization of financial arrangements between U.K. and EU residents, and without a withdrawal agreement, there will be no transition period. Despite extensive preparation and contingency planning by both the public and private sectors, addressing all of the many legal and regulatory details would be challenging. Consequently, a wide range of economic and financial activities could still be disrupted in Europe, which could prompt reactions in global markets as well.

Another near-term risk, which was cited in the November FSR, is elevated tensions between the European Commission and Italy over Italy's budget plan, which had raised the country's borrowing costs and prompted worries about its long-term fiscal sustainability. These concerns have been deferred for now, as Italy and the European Commission agreed on a budget plan for 2019, but Italy still faces longer-run fiscal challenges.

Salient Shocks to Financial Stability Cited in Market Outreach

As part of its market intelligence gathering, Federal Reserve staff conduct outreach to a wide range of market and official-sector contacts to gather their views on risks to U.S. financial stability.[1]

Respondents to outreach during the first quarter of 2019 prominently cited spillovers from trade policy and shocks abroad—particularly from Europe and China—as well as risks emanating from a possible turn in the U.S. business and credit cycles. Of note, the episode of heightened market volatility toward the end of 2018 drew different interpretations across respondents; while some felt that the episode heightened downside growth risks, others characterized the selloff in risky assets as a beneficial correction that would attenuate vulnerabilities and prolong the current business cycle.

Risks from trade are the most cited, and slowing global growth is in focus

Trade tensions were the preeminent risk for respondents in the first quarter of 2019. While U.S.–China trade relations were the focal point, contacts also cited the risk of higher U.S. tariffs on imports of European autos and parts. Market participants were very focused on risks emanating from a generalized slowdown in growth, especially in China and Europe. Several other European risks were cited, including potentially unfavorable political dynamics, the prospect of a "no deal" Brexit, and a return of fiscal tensions in Italy.

On the domestic policy front, contacts viewed various aspects of U.S. monetary policy as potential sources of risk. During outreach at the start of the first quarter of 2019, contacts were focused on risks related to the potential for monetary policy to become overly restrictive; however, at the end of the quarter, some contacts noted the potential for excessive risk-taking, owing in part to a more accommodative monetary policy stance than had been previously anticipated. Many respondents raised concerns that the U.S. economic expansion was in its latter stages. While some respondents to the previous survey in the third quarter of 2018 had worried about the signals from the flat Treasury yield curve, a few contacts in the first quarter of 2019 volunteered that the temporary inversion of the curve—specifically, the temporary inversion between interest rates on the 3-month Treasury bill and the

(continued)

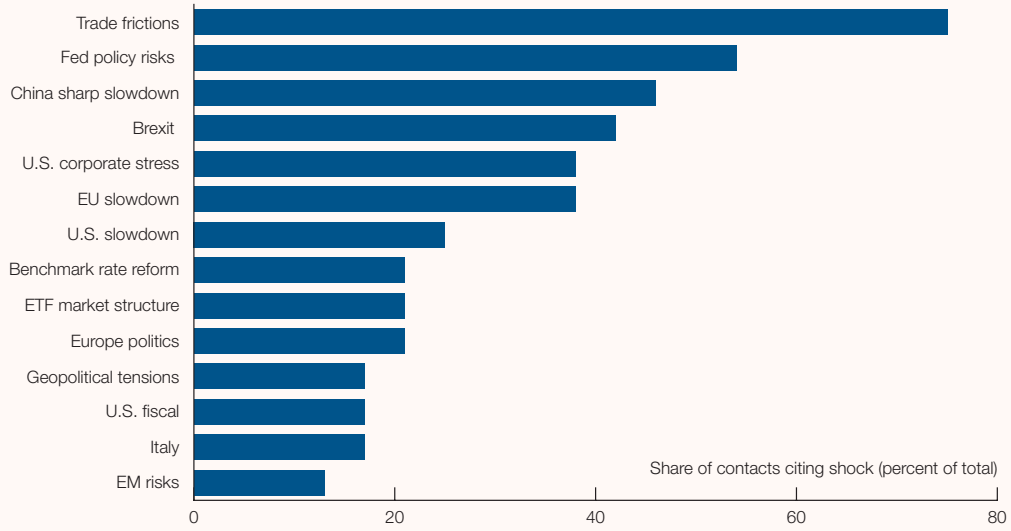
[1] Contacts included analysts and strategists at banks, investment firms, rating agencies, and political risk consultants as well as financial stability experts from central banks, think tanks, and multilateral agencies. The outreach this quarter was conducted in two periods (January and late March).

10-year Treasury note that occurred in late March—was not a cause for concern. Some respondents pointed to the prolonged government shutdown as a potential harbinger of a challenging debt ceiling negotiation that could unsettle markets. Legal and market uncertainties surrounding the transition from contracts based on LIBOR (London interbank offered rate) were also cited by multiple respondents.

U.S. corporate concerns increase, while emerging market concerns recede

In the aftermath of credit market volatility in the fourth quarter, contacts increasingly focused on a turn in the credit cycle that could expose vulnerabilities in U.S. corporate debt markets, including the rapid growth of less-regulated private credit and a weakening of underwriting standards for leveraged loans. Contacts also highlighted the large volume of triple-B-rated corporate bonds and growth in retail participation in corporate credit, although respondents were less focused in the first quarter of this year on stretched credit valuations. Finally, in contrast to the third quarter of last year, only a few contacts mentioned risks emanating from emerging markets other than China, and the cited risks (for example, Argentina's elections and Venezuela's political instability) were not viewed as likely to generate meaningful spillovers to the United States.

Potential Shocks Cited in Market Outreach



Source: Federal Reserve Bank of New York.

. . . and some risks in emerging market economies also could affect the United States

In China, the pace of economic growth has been slowing over the past several years, and a long period of rapid credit expansion has left the nonfinancial sector highly indebted and lenders more exposed in the event of a further slowdown. Against this backdrop, developments that significantly strain the repayment capacity of Chinese borrowers and financial intermediaries—including a further slowdown in growth or a collapse in Chinese real estate prices—could trigger adverse dynamics. Should significant problems arise in China, spillovers could include a broader pullback from risk-taking, declines in world trade and commodity prices, and U.S. dollar appreciation. The effects on global markets could be exacerbated if they deepen the stresses in already vulnerable EMEs. These dynamics could tighten conditions in U.S. financial markets and affect the creditworthiness of U.S. firms, particularly exporters and commodity producers facing weaker demand and lower prices.

That said, some of the potential contributors to near-term risks in EMEs that were cited in the November report are, for now, somewhat less prominent. These contributors include trade tensions and the effects of monetary policy normalization by the Federal Reserve and other advanced-economy central banks.

Market contacts cited the potential for a marked slowdown in economic growth as a salient risk to the financial system

Although most forecasters expect continued expansion, market participants cited the possibility of a marked slowdown in the U.S. economy as a potential risk to financial stability, as highlighted in the box "Salient Shocks to Financial Stability Cited in Market Outreach." Such a slowdown could affect the financial system through the balance sheets of businesses and households and through a decline in asset prices.

If the economy were to slow unexpectedly, profits of nonfinancial businesses would decrease, and, given the generally high level of leverage in that sector, such decreases could lead to financial stress and defaults at some firms. Also, given that valuations are elevated for a number of markets, investor risk appetite and asset prices could decline significantly. In addition to generating losses for the holders of the assets, a decline in asset prices could affect the financial system more generally either by impairing banks' ability to lend or by inducing runs on withdrawable liabilities.

That said, business interest expenses are currently low relative to earnings. Shocks are less likely to propagate to the financial system through the household sector because household borrowing is moderate relative to income, and the majority of household debt is owed by those with higher credit scores. Moreover, U.S. banks generally remain strongly capitalized and hold ample liquidity. The Federal Reserve's most recent stress tests indicate that the largest banks are sufficiently resilient to continue to serve creditworthy borrowers even under

a severely adverse scenario.[11] The broader financial system also has less leverage and funding risk compared with the period leading up to the financial crisis, so the effects of a decline in asset prices are less likely to be amplified through these vulnerabilities.

[11] See Board of Governors of the Federal Reserve System (2018), *Comprehensive Capital Analysis and Review 2018: Assessment Framework and Results* (Washington: Board of Governors, June), https://www.federalreserve.gov/publications/files/2018-ccar-assessment-framework-results-20180628.pdf.

Figure Notes

Figure 1-1
The 2-year and 10-year Treasury yields are the constant-maturity yields based on the most actively traded securities.

Figure 1-2
Term premiums are estimated from a three-factor term structure model using Treasury yields and Blue Chip interest rate forecasts.

Figure 1-3
Implied volatility on the 10-year swap rate 1 year ahead, derived from swaptions.

Figure 1-4
The 10-year triple-B reflects the effective yield of the ICE BofAML 7-to-10-year triple-B U.S. Corporate Index (C4A4), and the 10-year high-yield reflects the effective yield of the ICE BofAML 7-to-10-year U.S. Cash Pay High Yield Index (J4A0).

Figure 1-5
The 10-year triple-B reflects the effective yield of the ICE BofAML 7-to-10-year triple-B U.S. Corporate Index (C4A4), and the 10-year high-yield reflects the effective yield of the ICE BofAML 7-to-10-year U.S. Cash Pay High Yield Index (J4A0). Treasury yields from smoothed yield curve estimated from off-the-run securities.

Figure 1-6
Data are normalized to have a sample mean of 0 and standard deviation of 1.

Figure 1-7
Breaks in the series represent periods with no issuance. Spreads are calculated against three-month LIBOR (London interbank offered rate). The spreads do not include up-front fees.

Figure 1-8
Aggregate forward price-to-earnings ratio of S&P 500 firms. Based on expected earnings for 12 months ahead.

Figure 1-9
Aggregate forward earnings-to-price ratio of S&P 500 firms. Based on expected earnings for 12 months ahead. Real Treasury yields are calculated from the 10-year CPI inflation forecast and the smoothed nominal yield curve estimated from off-the-run securities.

Figure 1-10
Realized volatility estimated from five-minute returns using an exponentially weighted moving average with 75 percent of the weight distributed over the past 20 days.

Figure 1-11
Series deflated using the consumer price index and seasonally adjusted by Board staff.

Figure 1-12
The data are three-month moving averages of weighted capitalization rates in the industrial, retail, office, and multifamily sectors, based on national square footage in 2009.

Figure 1-13
The data are three-month moving averages of weighted capitalization rates in the industrial, retail, office, and multifamily sectors, based on national square footage in 2009.

Figure 1-14
Banks' responses are weighted by their CRE loan market shares. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. CRE is commercial real estate.

Figure 1-15
The data for the United States start in 1997. Midwest index is a weighted average of Corn Belt and Great Plains states. Values are given in real terms.

Figure 1-16
The data for the United States start in 1998. Midwest index is the weighted average of Corn Belt and Great Plains states.

Figure 1-18
Chart shows the log of the price-to-rent ratio. Long-run trend is estimated using data from 1978 to 2001 and includes the effect of carrying costs on the expected price-to-rent ratio. The last value of the trend is normalized to equal 100.

Figure 1-19
Seasonally adjusted. The data for Phoenix start in 2002. Monthly rent values for Phoenix are interpolated from semiannual numbers. Percentiles are based on 19 metropolitan statistical areas.

Figure 2-1
The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. GDP is gross domestic product.

Figure 2-2
The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. GDP is gross domestic product.

Figure 2-3
Nominal debt growth is seasonally adjusted and is translated into real terms after subtracting the growth rate of the price deflator for nonfinancial business-sector output.

Figure 2-4
Total net issuance of risky debt is the sum of the net issuance of speculative-grade and unrated bonds as well as leveraged loans. The data are four-quarter moving averages.

Figure 2-5
The data for 2019 are quarterly. Volumes are for large corporations with earnings before

interest, taxes, depreciation, and amortization (EBITDA) greater than $50 million and exclude existing tranches of add-ons and amendments as well as restatements with no new money.

Figure 2-6

The default rate is calculated as the amount in default over the past 12 months divided by the total outstanding volume at the beginning of the 12-month period. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

Figure 2-7

Gross leverage is the ratio of the book value of total debt to the book value of total assets. Risky firms are firms with positive debt that are either rated as speculative grade by S&P or unrated.

Figure 2-8

Series calculated as the ratio of total interest expenses to earnings before interest, depreciation, and taxes. Risky firms are firms with positive debt that are either rated as speculative grade by S&P or unrated.

Figure 2-9

Near prime are those with an Equifax Risk Score from 620 to 719; prime are greater than 719. Scores are measured contemporaneously. Student loan balances before 2004 are estimated using average growth from 2004 to 2007, by risk score. The data are converted to constant 2018 dollars using the consumer price index.

Box figure: Corporate Debt, by Type of Debt and Holder

Data are taken from 2018:Q4. Corporate bonds are nonfinancial corporate bonds. C&I is commercial and industrial. CLO is collateralized loan obligation. The amount outstanding of leveraged loans shows institutional leveraged loans and generally excludes credit lines and the share of term loans primarily held by banks. Other includes the household sector; nonfinancial corporate and noncorporate business; federal, state, and local governments; federal, state, and local government retirement funds; money market funds; closed-end funds; exchange-traded funds; government-sponsored enterprises (GSEs); agency- and GSE-backed mortgage pools; asset-backed securities issuers; hedge funds; finance companies; real estate investment trusts; broker-dealers; holding companies; and funding corporations.

Figure 2-10

Year-over-year change in balances for the fourth quarter of each year among those households whose balance increased over this window. Near prime are those with an Equifax Risk Score from 620 to 719; prime are greater than 719. Scores were measured a year ago. The data are converted to constant 2018 dollars using the consumer price index.

Figure 2-11

Percent of previously current mortgages that transition from being current to being at least 30 days delinquent each month. The data are three-month moving averages. FHA is Federal Housing Administration; VA is U.S. Department of Veterans Affairs. Prime and nonprime are defined among conventional loans.

Figure 2-12
This measure is estimated as an index of the ratio of the average outstanding mortgage loan balance for owner-occupied homes with a mortgage to (1) current home values using the CoreLogic national house price index and (2) model-implied house prices estimated by a staff model based on rents, interest rates, and a time trend.

Figure 2-13
Estimated share of mortgages with negative equity according to CoreLogic and Zillow. For CoreLogic, the data are monthly. For Zillow, the data are quarterly and, for 2017, are available only for the first and fourth quarters.

Figure 2-14
The data are converted to constant 2018 dollars using the consumer price index.

Figure 2-15
Near prime are those with an Equifax Risk Score from 620 to 719; prime are greater than 719. Scores are measured contemporaneously. The data are converted to constant 2018 dollars using the consumer price index.

Figure 2-16
Delinquency is at least 30 days past due, excluding severe derogatory loans. The data are four-quarter moving averages. Near prime are those with an Equifax Risk Score from 620 to 719; prime are greater than 719. Credit scores are lagged four quarters.

Figure 2-17
Near prime are those with an Equifax Risk Score from 620 to 719; prime are greater than 719. Scores are measured contemporaneously. The data are converted to constant 2018 dollars using the consumer price index.

Figure 2-18
Delinquency is at least 30 days past due, excluding severe derogatory loans. The data are four-quarter moving averages. Near prime are those with an Equifax Risk Score from 620 to 719; prime are greater than 719. Credit scores are lagged four quarters.

Figure 3-1
Bank equity is total equity capital net of preferred equity and intangible assets, and assets are total assets. The data are seasonally adjusted by Board staff. Large bank holding companies (BHCs) are those with greater than $50 billion in total assets. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

Figure 3-2
The data are seasonally adjusted by Board staff. Sample includes banks as of 2018:Q4. Before 2014:Q1, the numerator of the common equity tier 1 ratio is tier 1 common capital for advanced-approaches bank holding companies (BHCs) (before 2015:Q1, for non-advanced-approaches BHCs). Afterward, the numerator is common equity tier 1 capital. Large BHCs are those with greater than $50 billion in total assets. The denominator is risk-weighted assets. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

Figure 3-3
Banks' responses are weighted by their C&I loan market shares. Results are shown for loans to large and middle-market firms. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research. C&I is commercial and industrial.

Figure 3-4
Weighted median leverage of nonfinancial firms that borrow using commercial and industrial (C&I) loans from the 26 banks that have filed in every quarter since 2013:Q1. Leverage is measured as the ratio of the book value of total debt to the book value of total assets of the borrower, as reported by the lender, and the median is weighted by committed amounts.

Figure 3-5
Leverage is calculated by dividing financial assets by equity.

Figure 3-6
The data extend through 2018:Q4. Ratio is calculated as (total assets – separate account assets)/(total capital – accumulated other comprehensive income).

Figure 3-7
Leverage is computed as the ratio of hedge funds' gross notional exposure (including derivative notional exposures and the nominal value of all long and short positions) to net asset value. Data are reported on a three-quarter lag.

Figure 3-8
Net percentage equals the percentage of institutions that reported increased use of financial leverage over the past three months minus the percentage of institutions that reported decreased use of financial leverage over the past three months. REIT is real estate investment trust.

Figure 3-9
The data from the first quarter of 2019 are annualized to create the 2019 bar. CMBS is commercial mortgage-backed securities; CDO is collateralized debt obligation; RMBS is residential-mortgage-backed securities; CLO is collateralized loan obligation. The "Other" category consists of other asset-backed securities (ABS) backed by credit card debt, student loans, equipment, floor plans, and miscellaneous receivables; re-securitized real estate mortgage investment conduit (Re-REMIC) RMBS; and Re-REMIC CMBS. The data are converted to constant 2019 dollars using the consumer price index.

Figure 3-10
Committed amounts on credit lines and term loans extended to nonbank financial firms by a balanced panel of 26 bank holding companies that have filed Form FR Y-14Q in every quarter since 2013:Q1. Nonbank financial firms are identified based on reported North American Industry Classification System (NAICS) codes. In addition to NAICS codes, a name-matching algorithm is applied to identify specific entities such as real estate investment trusts (REITs), special purpose entities, collateralized loan obligations (CLOs), and asset-backed securities (ABS). REITs incorporate both mortgage (trading) REITs and equity REITs. Broker-dealers also include commodity contracts dealers and brokerages and other

securities and commodity exchanges. Other financial vehicles include closed-end investment and mutual funds and financial planning and pension funds.

Figure 4-1

Liquid assets are excess reserves plus estimates of securities that qualify as high-quality liquid assets. Haircuts and Level 2 asset caps are incorporated into the estimate. Large bank holding companies (BHCs) are those with greater than $50 billion in total assets.

Figure 4-2

Short-term wholesale funding is defined as the sum of large time deposits with maturity less than one year, federal funds purchased and securities sold under agreements to repurchase, deposits in foreign offices with maturity less than one year, trading liabilities (excluding revaluation losses on derivatives), and other borrowed money with maturity less than one year. The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

Figure 4-3

The black striped area denotes the period from 2008:Q4 to 2012:Q4 when insured deposits increased because of the Transaction Account Guarantee Program. "Other" consists of variable-rate demand obligations, federal funds, funding-agreement-backed securities, private liquidity funds, offshore money market funds, and local government investment pools. Securities lending includes only lending collateralized by cash. GDP is gross domestic product.

Figure 4-4

The data are converted to constant 2019 dollars using the consumer price index.

Figure 4-5

The data are converted to constant 2018 dollars using the consumer price index through February 2019.

Figure 4-6

The data are converted to constant 2019 dollars using the consumer price index.

Figure 4-7

Monthly data are from Investment Company Institute (ICI) through February 2019.

Figure 4-9

All measures are computed for nondefaulted bonds on the secondary market. 144a bonds are excluded. Bid-ask spread is the difference between trade size weighted-average dealer bid prices and ask prices scaled by the mid price and is seasonally adjusted.

Figure 4-10

The data are converted to constant 2018 dollars using the consumer price index and extend through 2018:Q4. FHLB is Federal Home Loan Bank.

Box figure: Potential Shocks Cited in Market Outreach

Reflects outreach to 24 contacts (banks, investment firms, and official-sector institutions) in 2019:Q1. Reponses were to the following question: "Over the next 12-18 months, which shocks, if realized, do you think would have the greatest negative impact on the functioning of the U.S. financial system?" Each respondent provided at least three shocks.

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