



Financial Stability Report

October 2023

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM



The Federal Reserve System is the central bank of the United States. It performs five key functions to promote the effective operation of the U.S. economy and, more generally, the public interest.

The Federal Reserve

- **conducts the nation's monetary policy** to promote maximum employment and stable prices in the U.S. economy;
- **promotes the stability of the financial system** and seeks to minimize and contain systemic risks through active monitoring and engagement in the U.S. and abroad;
- **promotes the safety and soundness of individual financial institutions** and monitors their impact on the financial system as a whole;
- **fosters payment and settlement system safety and efficiency** through services to the banking industry and the U.S. government that facilitate U.S.-dollar transactions and payments; and
- **promotes consumer protection and community development** through consumer-focused supervision and examination, research and analysis of emerging consumer issues and trends, community economic development activities, and administration of consumer laws and regulations.

To learn more about us, visit www.federalreserve.gov/aboutthefed.htm.

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Purpose and Framework

This report presents the Federal Reserve Board’s current assessment of the stability of the U.S. financial system. By publishing this report, the Board intends to promote public understanding by increasing transparency around, and creating accountability for, the Federal Reserve’s views on this topic. Financial stability supports the objectives assigned to the Federal Reserve, including full employment and stable prices, a safe and sound banking system, and an efficient payments system.

A financial system is considered stable when banks, other lenders, and financial markets are able to provide households, communities, and businesses with the financing they need to invest, grow, and participate in a well-functioning economy—and can do so even when hit by adverse events, or “shocks.”

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 are inherently difficult to predict, while vulnerabilities, which are the aspects of the financial system that would exacerbate stress, can be monitored as they build up or recede over time. As a result, the framework focuses primarily on assessing vulnerabilities, with an emphasis on four broad categories and how those categories might interact to amplify stress in the financial system.¹

More on the Federal Reserve’s Monitoring Efforts

See the [Financial Stability](#) section of the Federal Reserve Board’s website for more information on how the Federal Reserve monitors the stability of the U.S. and world financial systems.

The website includes:

- a more detailed look at our [monitoring framework](#) for assessing risk in each category;
- more data and research on related topics;
- information on how we coordinate, cooperate, and otherwise take action on financial system issues; and
- [public education resources](#) describing the importance of our efforts.

1. **Valuation pressures** arise when asset prices are high relative to economic fundamentals or historical norms. These developments are often driven by an increased willingness of investors to take on risk. As such, elevated valuation pressures may increase the possibility of outsized drops in asset prices (see Section 1, [Asset Valuations](#)).

¹ For a review of the research literature in this area, see Tobias Adrian, Daniel Covitz, and Nellie Liang (2015), “Financial Stability Monitoring,” *Annual Review of Financial Economics*, vol. 7 (December), pp. 357–95.

2. Excessive **borrowing by businesses and households** exposes the borrowers to distress if their incomes decline or the assets they own fall in value. In these cases, businesses and households with high debt burdens may need to cut back spending, affecting economic activity and causing losses for investors (see Section 2, [Borrowing by Businesses and Households](#)).
3. Excessive **leverage within the financial sector** increases the risk that financial institutions will not have the ability to absorb losses without disruptions to their normal business operations when hit by adverse shocks. In those situations, institutions will be forced to cut back lending, sell their assets, or even shut down. Such responses can impair credit access for households and businesses, further weakening economic activity (see Section 3, [Leverage in the Financial Sector](#)).
4. **Funding risks** expose the financial system to the possibility that investors will rapidly withdraw their funds from a particular institution or sector, creating strains across markets or institutions. 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 those funds in assets that are hard to sell quickly or have a long maturity. This liquidity and maturity transformation can create an incentive for investors to withdraw funds quickly in adverse situations. Facing such withdrawals, financial institutions may need to sell assets quickly at "fire sale" prices, thereby incurring losses and potentially becoming insolvent, as well as causing additional price declines that can create stress across markets and at other institutions (see Section 4, [Funding Risks](#)).

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 spread through the U.S. financial system, given our current assessment of vulnerabilities.

While this framework provides a systematic way to assess financial stability, some potential risks may be novel or difficult to quantify and therefore are not captured by the current approach. Given these complications, we 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 directly and through the Financial Stability Oversight Council 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 the aftermath of the 2007–09 financial crisis, these actions have included requirements for more and higher-quality capital, an innovative stress-testing regime, and new liquidity regulations applied to the largest banks in the United States. In addition, the Federal Reserve’s assessment of financial vulnerabilities informs decisions regarding the countercyclical capital buffer (CCyB). 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 U.S. financial system by analyzing vulnerabilities related to valuation pressures, borrowing by businesses and households, financial-sector leverage, and funding risks. It also highlights several near-term risks that, if realized, could interact with these vulnerabilities.

A summary of the developments in the four broad categories of vulnerabilities since the May 2023 *Financial Stability Report* is as follows:

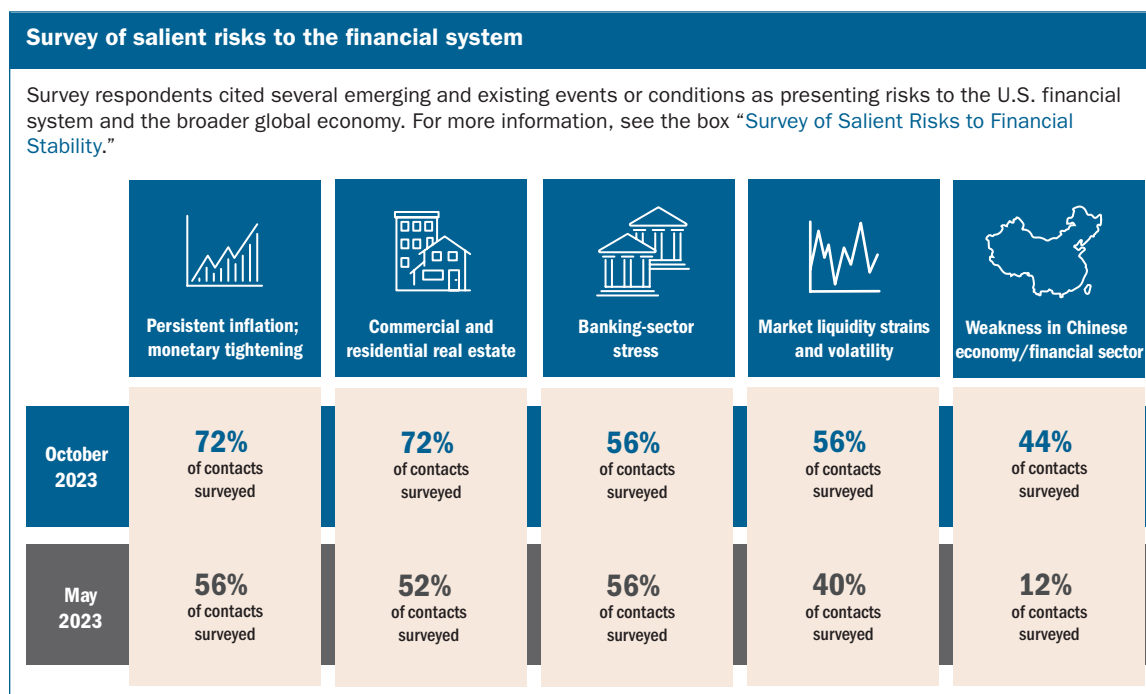
Overview of financial system vulnerabilities			
 <p>Asset valuations</p>	 <p>Borrowing by businesses and households</p>	 <p>Leverage in the financial sector</p>	 <p>Funding risks</p>
<ul style="list-style-type: none"> • Equity price-to-earnings ratios reached elevated levels. • Risk premiums in corporate bond markets remained near the middle of their historical distributions. • Prices of residential and commercial properties remained high relative to fundamentals. 	<ul style="list-style-type: none"> • The ratio of total private debt to gross domestic product (GDP) continued to edge down and remained close to its historical average. • The business debt-to-GDP ratio remained high, but debt issuance by the riskiest companies continued to be subdued. Firms' ability to service their debt remained solid despite declining interest coverage ratios. • Household debt was at modest levels relative to GDP and concentrated among prime-rated borrowers. 	<ul style="list-style-type: none"> • The banking system remained sound and resilient, as risk-based capital ratios remained close to average levels over the past decade. • Nonetheless, high interest rates continued to depress the fair value of longer-maturity, fixed-rate assets that, for some banks, were sizable. • Leverage remained high at the largest hedge funds. • Broker-dealer leverage remained near historically low levels. 	<ul style="list-style-type: none"> • Most domestic banks maintained high levels of liquid assets and stable funding. • However, a subset of banks continued to face funding pressures, reflecting concerns over uninsured deposits and other factors. • Structural vulnerabilities persisted at money market funds, some other mutual funds, and stablecoins. • Liquidity risks for life insurers remained elevated as the share of illiquid and risky assets continued to edge up.

1. **Asset valuations.** Equity prices grew faster than expected earnings, pushing the forward price-to-earnings ratio into the upper ranges of its historical distribution. Risk premiums in corporate bond markets narrowed somewhat and remained near the middle of their historical distributions. Prices of residential and commercial properties remained high relative to fundamentals (see Section 1, [Asset Valuations](#)).
2. **Borrowing by businesses and households.** Balance sheets of many nonfinancial businesses and households remained solid. Growth of business debt continued to decline through the first half of the year, although business debt remained high when measured relative to gross domestic product (GDP) or business assets. Measures of the ability of firms to service their debt remained strong. Household debt remained at modest levels relative to GDP, with most of that debt owed by households with strong credit histories or considerable home equity (see Section 2, [Borrowing by Businesses and Households](#)).
3. **Leverage in the financial sector.** The banking sector remains sound and resilient overall, and most banks continued to report capital levels well above regulatory requirements. That said, the increase in interest rates over the past two years has contributed to declines in the fair value of longer-maturity, fixed-rate assets that, for some banks, were sizable. Outside the banking sector, available data suggest that hedge fund leverage remained somewhat elevated, especially for the largest hedge funds. Leverage at life insurance companies remained near the middle of its historical range, while broker-dealer leverage remained historically low (see Section 3, [Leverage in the Financial Sector](#)).
4. **Funding risks.** Most domestic banks have ample liquidity and limited reliance on short-term wholesale funding; nevertheless, some banks continued to face funding strains, likely owing to vulnerabilities associated with high levels of uninsured deposits and declines in the fair value of assets. The Bank Term Funding Program (BTFP) helped mitigate these strains. Structural vulnerabilities remained in other short-term funding markets. Prime and tax-exempt money market funds (MMFs), as well as other cash-investment vehicles and stablecoins, remained vulnerable to runs. Bond and loan funds that hold assets that can become illiquid during periods of stress remained susceptible to large redemptions. Life insurers continued to rely on a higher-than-average share of runnable liabilities (see Section 4, [Funding Risks](#)).

This report also discusses potential near-term risks based in part on the most frequently cited risks to U.S. financial stability as gathered from outreach to a wide range of researchers, academics, and market contacts conducted from August through early October (discussed in the box [“Survey of Salient Risks to Financial Stability”](#)). The two most frequently cited topics in this survey—the risk of persistent inflationary pressures leading to a more restrictive monetary policy stance and the potential for large losses on commercial real estate (CRE) and residential real

estate—were mentioned by three-fourths of all survey participants, up from one-half of all participants in the previous survey. Risks associated with the reemergence of banking-sector stress and risks associated with market liquidity strains and volatility continued to feature prominently. Additionally, in the most recent survey, respondents were increasingly attentive to risks posed from economic weakness in China as well as from fiscal debt sustainability in advanced economies. Note that data and survey results for this report closed on October 4, 2023 and do not reflect the escalation of geopolitical tensions following the attack on Israel.

In addition, the Federal Reserve is working to understand the risks that climate change may pose to individual banking organizations and the financial system. The box “[An Approach to Assessing Climate-Related Financial Risks](#)” contains information on some steps the Federal Reserve has taken to collect data to better understand climate-related risks to financial institutions and financial markets.



1 | Asset Valuations

Asset valuation pressures rose to a notable level

Since the May 2023 report, valuations in equity markets increased modestly from an already high level even as yields on Treasury securities increased substantially. Corporate credit spreads edged down and were somewhat below their historical averages. Liquidity in Treasury markets remained challenged. While trading conditions largely recovered from the notable strains seen following Silicon Valley Bank's failure, they could again deteriorate in the face of further negative shocks.

Property prices remain elevated relative to fundamentals. In the market for residential real estate, house prices started increasing again in recent months and prices relative to rents remained near all-time highs. In the market for CRE, rental income relative to property prices remained low from a historical perspective, despite recent declines in property values. Fundamentals in the market for office properties were especially weak, as vacancy rates have risen and rent growth slowed. Farmland prices were historically elevated relative to rents, reflecting higher crop prices and limited inventories of land.

Table 1.1 shows the sizes of the asset markets discussed in this section. The largest asset markets are those for residential real estate, equities, Treasury securities, and CRE.

Treasury yields increased substantially and now stand at the highest levels in the past 15 years

Yields on Treasury securities moved notably higher since the May report and now stand close to their highest levels over the past decade and a half (figure 1.1). A model-based estimate of the nominal Treasury term premium—a measure of the compensation that investors require to hold longer-term Treasury securities rather than shorter-term ones—increased but remained low relative to its long-run history (figure 1.2). Interest rate volatility implied by options remained elevated by historical norms, reflecting, in part, uncertainty about the economic outlook and the path of monetary policy (figure 1.3).

Equity market valuation pressures remained notable

Valuations in equity markets increased modestly from an already high level since the May report. The pace of equity price increases exceeded that of expected earnings, and the forward price-to-earnings ratio rose to a level further above its historical median (figure 1.4).

Table 1.1. Size of selected asset markets

Item	Outstanding (billions of dollars)	Growth, 2022:Q2–2023:Q2 (percent)	Average annual growth, 1997–2023:Q2 (percent)
Residential real estate	56,301	-1.2	6.4
Equities	53,457	15.0	8.2
Treasury securities	24,772	6.5	8.4
Commercial real estate	24,003	2.5	6.4
Investment-grade corporate bonds	7,369	5.3	8.0
Farmland	3,288	8.1	5.7
High-yield and unrated corporate bonds	1,667	-6.0	6.4
Leveraged loans ¹	1,394	-1.5	13.0
Price growth (real)			
Commercial real estate ²		-3.9	3.3
Residential real estate ³		-1.3	2.7

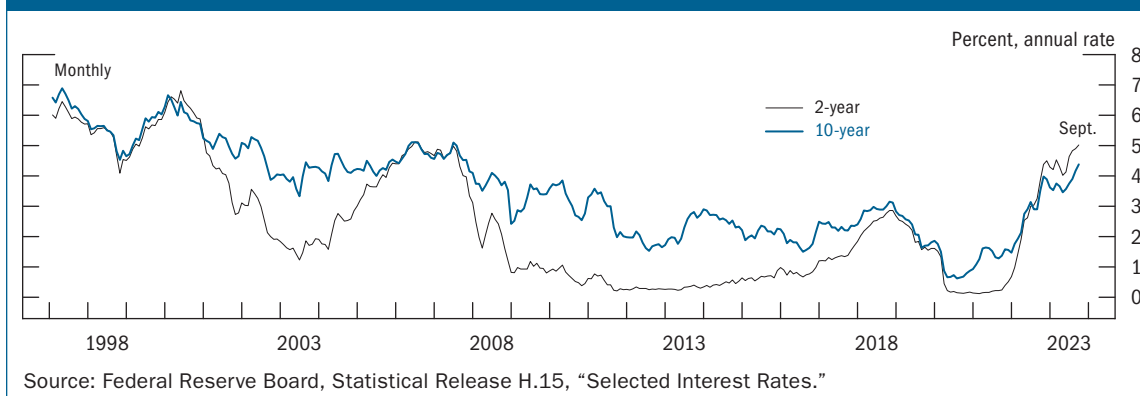
Note: The data extend through 2023:Q2. Growth rates are measured from Q2 of the year immediately preceding the period through Q2 of the final year of the period. Equities, real estate, and farmland are at nominal market value; bonds and loans are at nominal book value.

¹ 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 2001 to 2023:Q2, as this market was fairly small before then.

² One-year growth of commercial real estate prices is from June 2022 to June 2023, and average annual growth is from June 1999 to June 2023. Both growth rates are calculated from equal-weighted nominal prices deflated using the consumer price index (CPI).

³ One-year growth of residential real estate prices is from June 2022 to June 2023, and average annual growth is from June 1998 to June 2023. Nominal prices are deflated using the CPI.

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

Figure 1.1. Nominal Treasury yields rose substantially in the third quarter of 2023

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

Figure 1.2. An estimate of the nominal Treasury term premium increased but remained relatively low

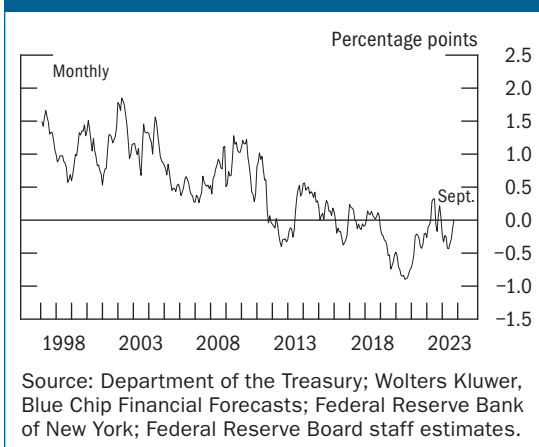
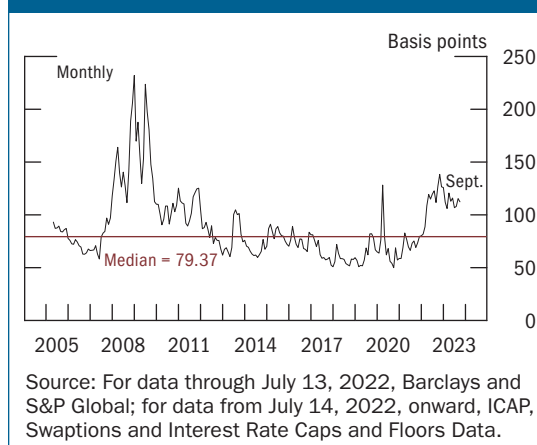


Figure 1.3. Interest rate volatility remained elevated by historical norms



The difference between the forward earnings-to-price ratio and the real 10-year Treasury yield—a measure of the additional return that investors require for holding stocks relative to risk-free bonds (the equity premium)—declined since the May report to levels well below historical norms (figure 1.5).² Equity market volatility continued to decline from the elevated levels reached earlier this year and currently stands slightly above its historical median (figure 1.6).

Figure 1.4. The price-to-earnings ratio of S&P 500 firms increased to levels further above its historical median

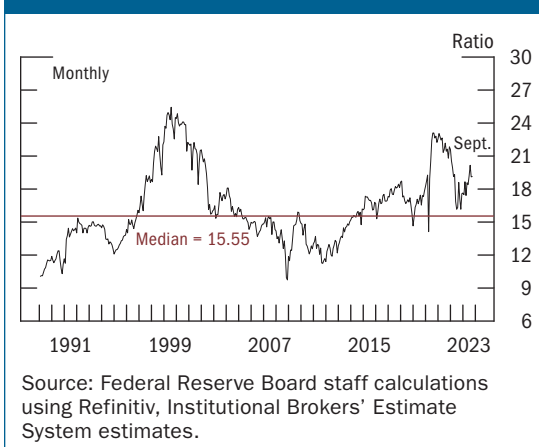
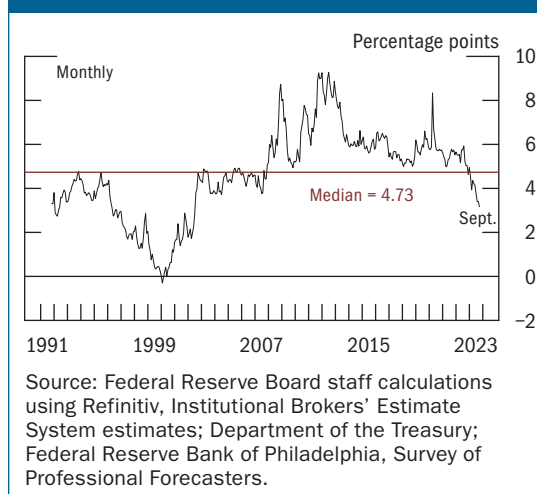
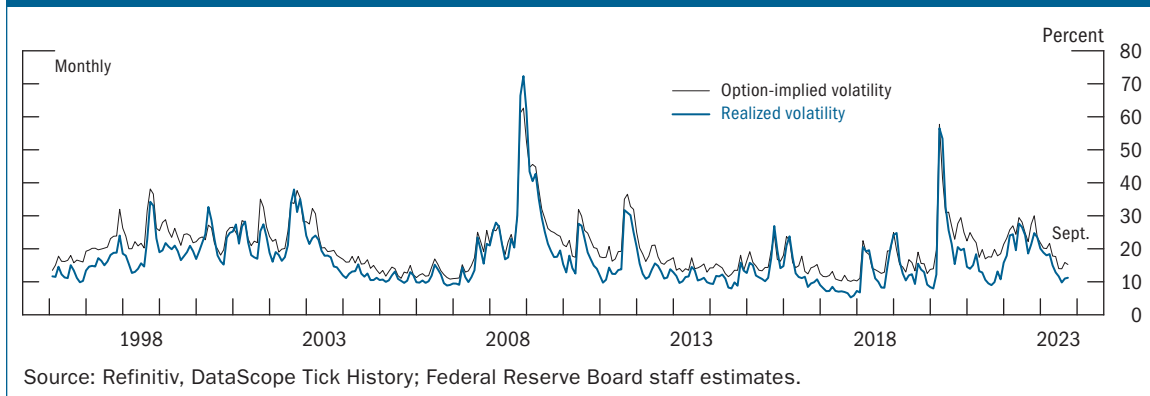


Figure 1.5. An estimate of the equity premium fell further below its historical median



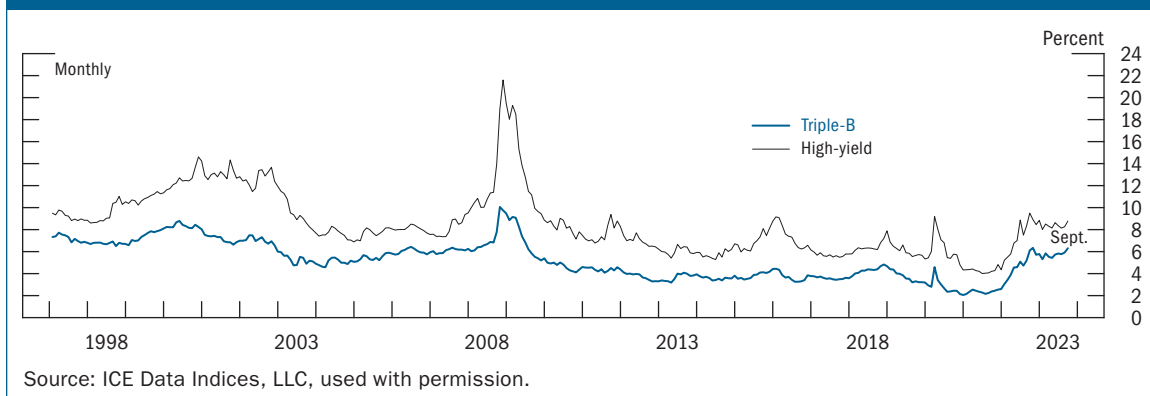
² This estimate is constructed based on expected corporate earnings for 12 months ahead. Alternative measures of the equity premium that incorporate longer-term earnings forecasts suggest more elevated equity valuation pressures.

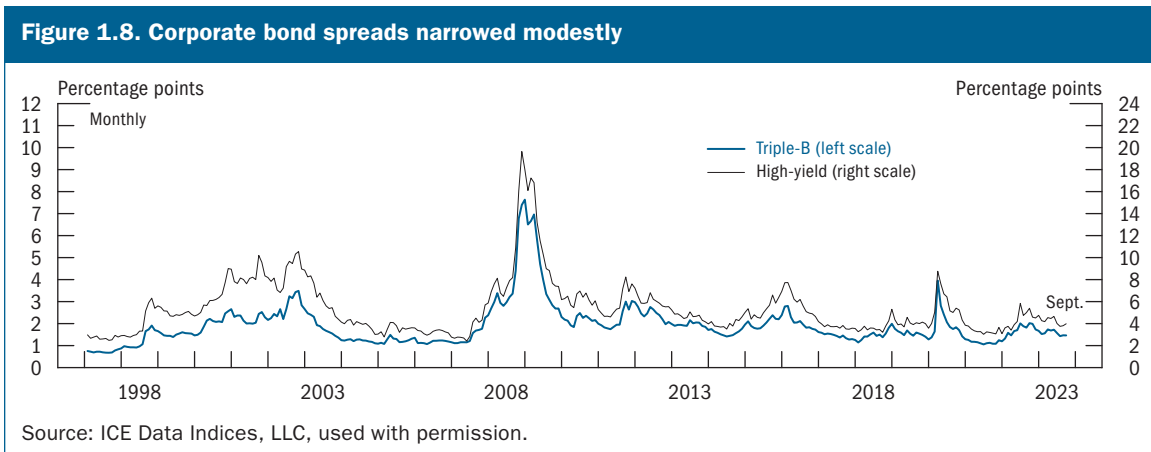
Figure 1.6. Volatility in equity markets stood slightly above its historical median

Spreads in corporate debt markets narrowed modestly

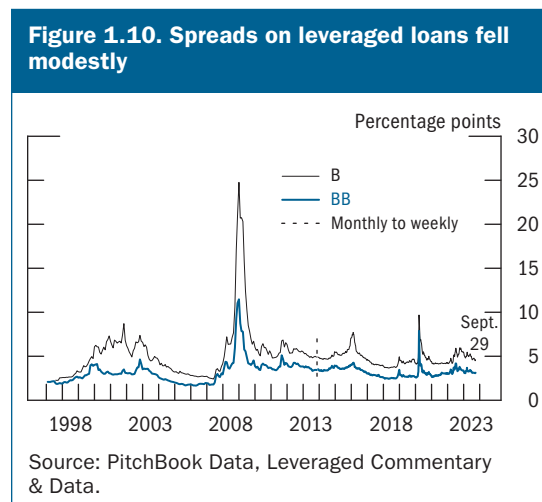
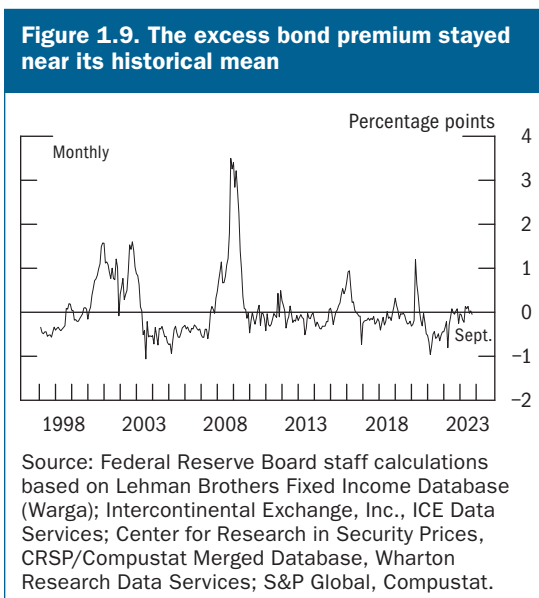
Yields on corporate bonds rose since the May report and remain above the median of their historical distributions, as yields on comparable-maturity Treasury securities also increased (figure 1.7). Corporate bond spreads, measured as the difference in yields between corporate bonds and comparable-maturity Treasury securities, narrowed modestly and currently stand a bit below their historical median (figure 1.8). However, the excess bond premium—a risk premium measure that captures the gap between corporate bond spreads and expected credit losses—remained near its historical mean (figure 1.9). The trailing 12-month default rate for all corporate bonds edged up over the past year but stands well below its historical median. For speculative-grade corporate bonds in particular, the trailing 12-month default rate moved up more over the same time period and stands at about its historical median.

Valuations in leveraged loan markets were little changed from the previous report. The average spread on leveraged loans above their benchmark rates in the secondary market fell modestly

Figure 1.7. Corporate bond yields rose above their historical medians



and remained near its average over the past decade (figure 1.10). The trailing 12-month loan default rate increased further since the last report and stands well above its historical median since the Great Recession, but the year-ahead expected default rate declined moderately.



Market liquidity stayed near the lower end of its historical range

Market liquidity refers to the ease and cost of buying and selling an asset. Low liquidity can amplify the volatility of asset prices and result in larger price moves in response to shocks. In extreme cases, low liquidity can threaten market functioning, leading to a situation in which participants are unable to trade without incurring a significant cost.

Treasury market liquidity is important because of the key role these securities play in the financial system. Various measures of market liquidity, such as market depth, suggest that while Treasury market liquidity was largely in line with expectations given interest rate volatility, it remained below historical norms (figures 1.11 and 1.12). This low level of market depth could indicate that liquidity providers are being particularly cautious, and liquidity may be less resilient than usual.

In other markets, liquidity conditions were little changed since the previous report and present a more mixed picture. In corporate bond markets, bid-ask spreads remained well below pandemic levels, suggesting ample liquidity, while in equity markets, depth in the S&P 500 futures markets stayed at below-average levels (figure 1.13).

Figure 1.11. Treasury market depth remained below historical norms

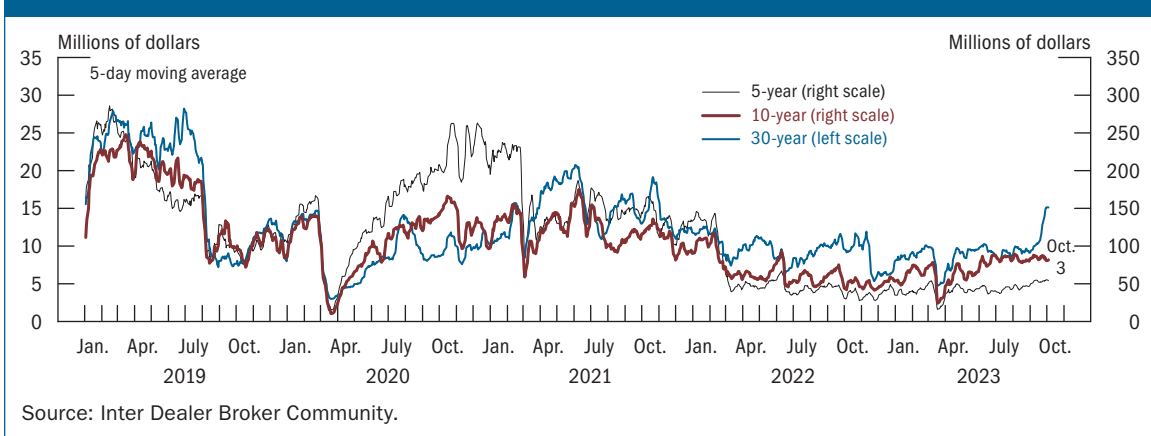


Figure 1.12. On-the-run market depth improved in recent months but remained below historical norms

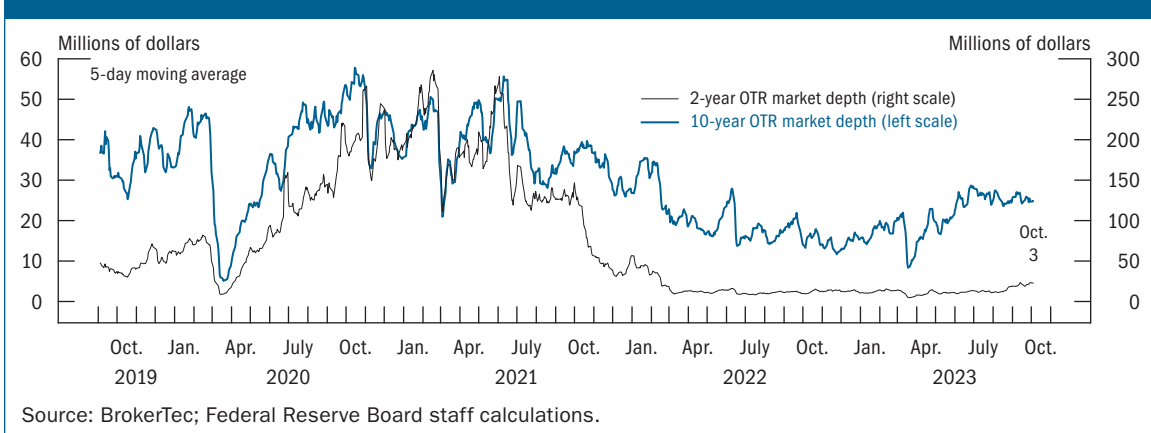
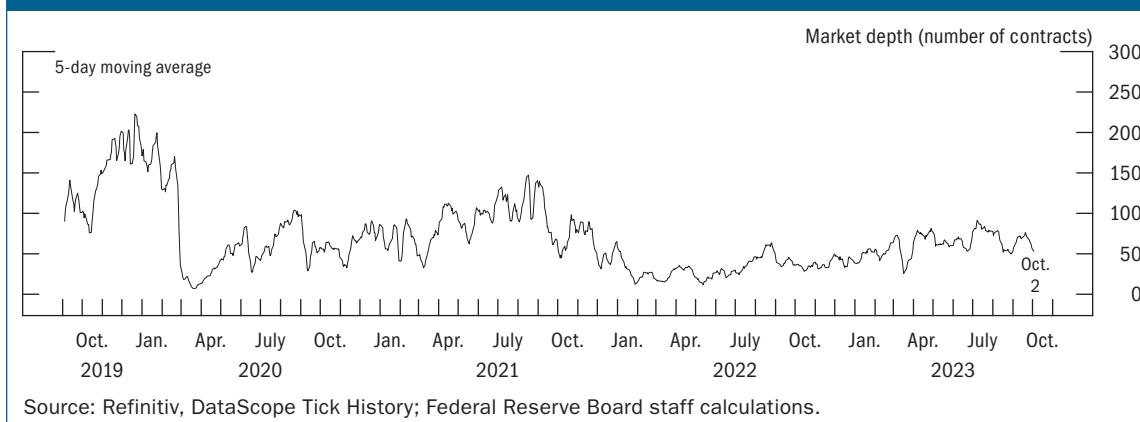
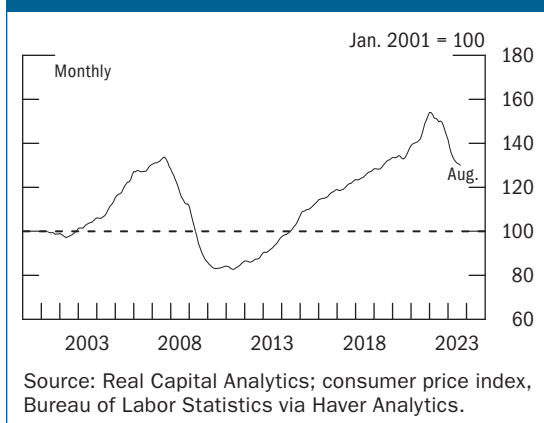
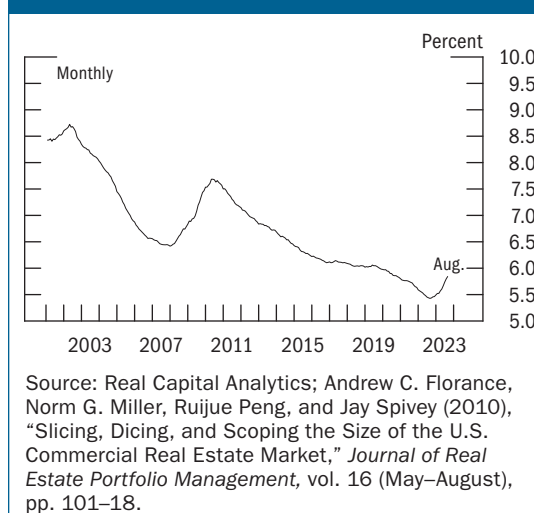


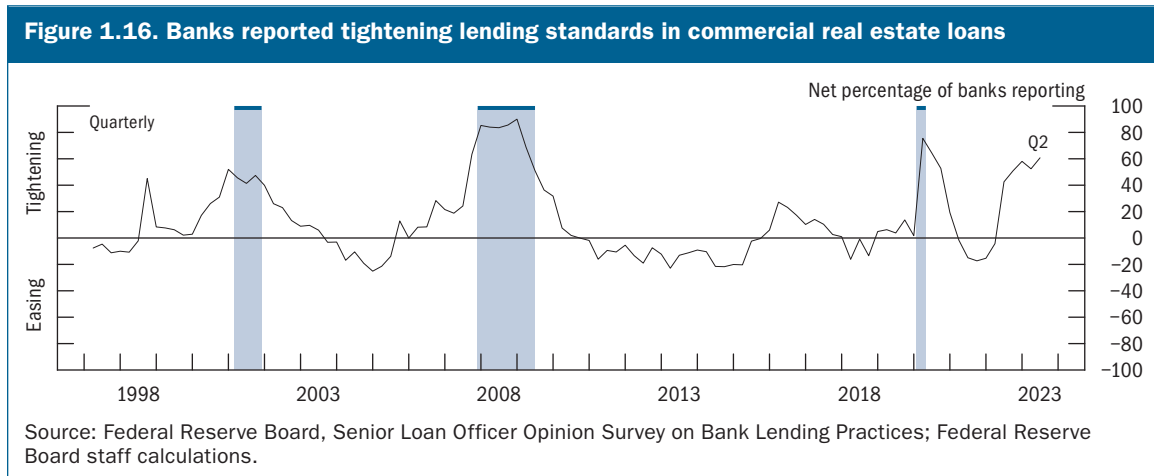
Figure 1.13. A measure of liquidity in equity markets remained below average

Commercial real estate valuations remained elevated, even as prices continued to decline

Aggregate CRE prices measured in inflation-adjusted terms continued declining through August (figure 1.14). Capitalization rates at the time of property purchase, which measure the annual income of commercial properties relative to their prices, have increased modestly from recent historically low levels but have not increased as much as real Treasury yields, suggesting that prices remain high relative to rental income (figure 1.15). CRE valuations are particularly elevated for the

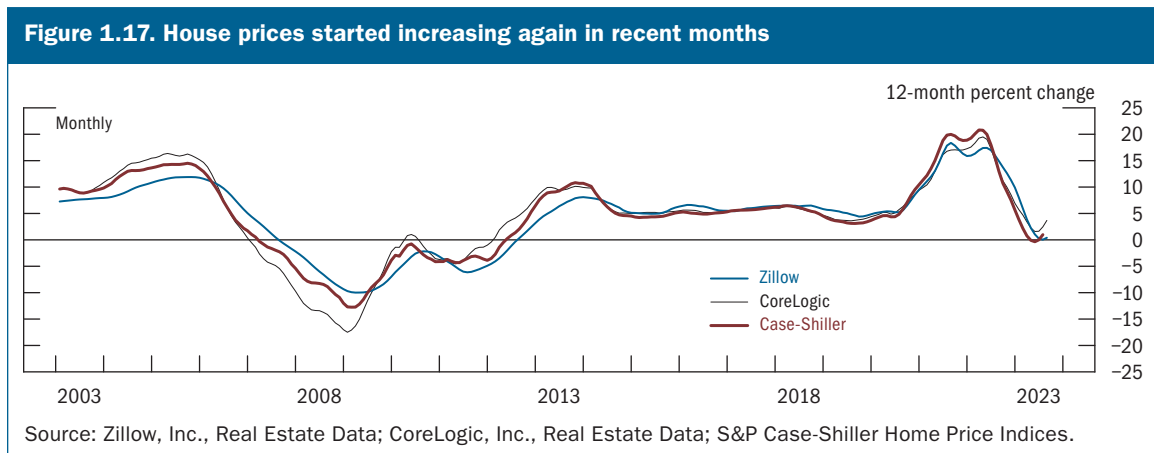
Figure 1.14. Commercial real estate prices, adjusted for inflation, continued to decline**Figure 1.15. Income of commercial properties relative to prices continued to grow but remained well below historical norms**

office sector, where fundamentals are especially weak for offices in central business districts, with vacancy rates increasing further and rent growth declining since the May report. In the April and July 2023 Senior Loan Officer Opinion Survey (SLOOS), banks reported weaker demand and tighter standards for all CRE loan categories over the first half of 2023 (figure 1.16).



House prices started increasing again in recent months, and valuations remained high

Since the last report, valuations in residential real estate markets increased from already elevated levels. House prices, after holding steady earlier this year, started rising again in recent months (figure 1.17). A model of house price valuation based on prices relative to owners'



equivalent rent and the real 10-year Treasury yield suggests that valuations in housing markets were increasingly stretched (figure 1.18). Moreover, the median price-to-rent ratio measured across a wide distribution of geographical areas remained close to its previous peak in the mid-2000s (figure 1.19). That said, credit conditions for borrowers remained considerably tighter than in the early 2000s.

Figure 1.18. Model-based measures of house price valuations remained historically high

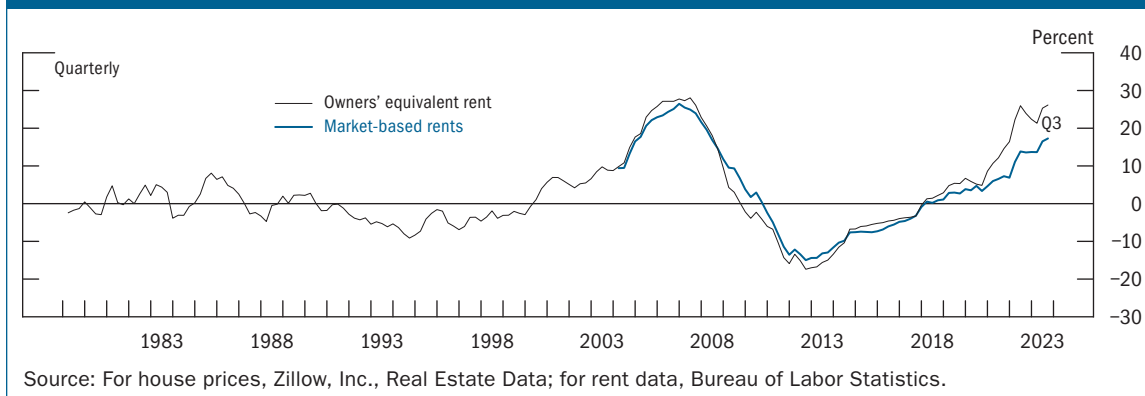
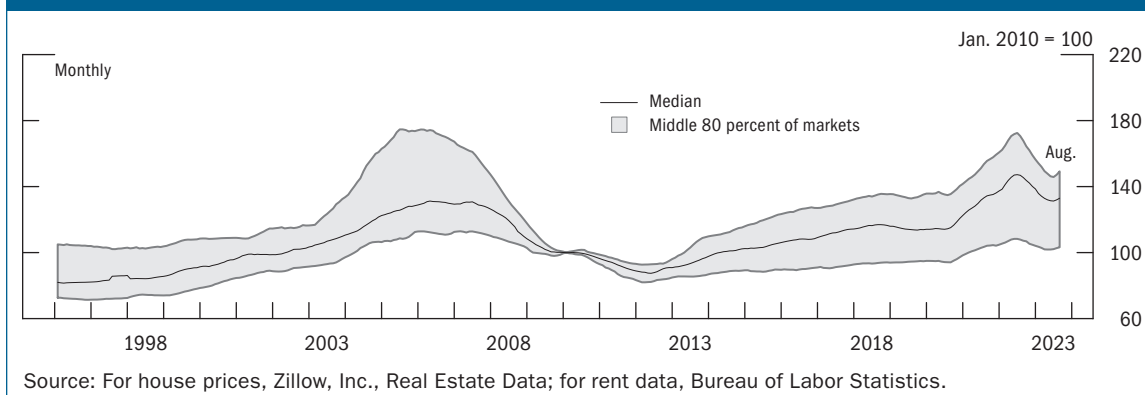


Figure 1.19. House price-to-rent ratios remained elevated across geographic areas



Farmland valuations remained elevated

Farmland prices increased since the May report, reaching values near the peak of their historical distribution (figure 1.20). Similarly, the ratios of farmland prices to rents remained historically high (figure 1.21). These high valuations were driven by strong agricultural commodity prices, limited inventory of farmland, and significant increases in cropland revenues that had more than offset higher operating costs.

Figure 1.20. Farmland prices stayed near historical highs

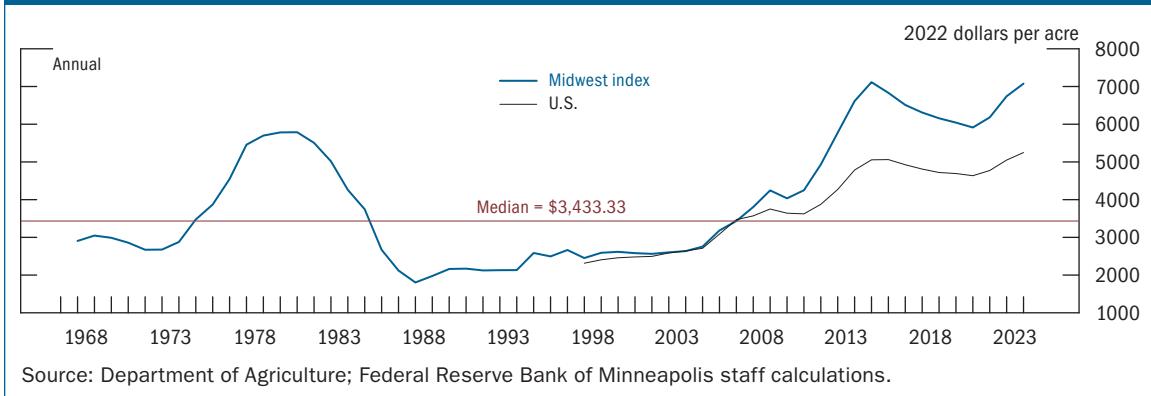
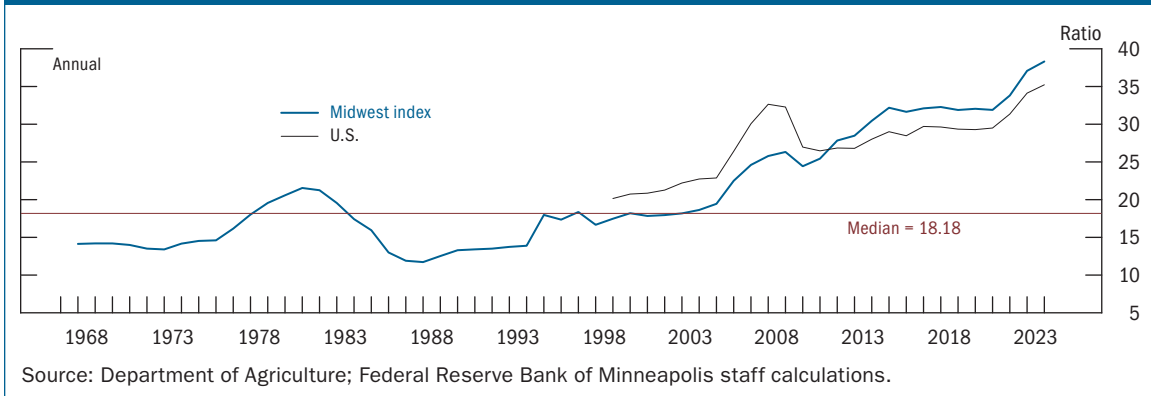


Figure 1.21. Farmland prices grew faster than rents



2 | Borrowing by Businesses and Households

Vulnerabilities from business and household debt remained moderate

Balance sheets of many nonfinancial businesses and households remained solid, with vulnerabilities at moderate levels. That said, there are increasing signs that higher interest rates are beginning to strain some borrowers.

For businesses, both the business debt-to-GDP ratio and gross leverage remained at high levels, although they were significantly lower than the record highs reached at the onset of the pandemic. Interest coverage ratios (ICRs)—defined as the ratio of earnings before interest and tax to interest expense—moved down in the most recent data but remain solid, suggesting that firms, overall, have sufficient cash flows to cover rising borrowing costs. Indicators of household vulnerabilities, including the household debt-to-GDP ratio and the aggregate household debt service ratio, remained at modest levels. An economic downturn resulting in lower business earnings and household incomes could weaken the debt service capacities of smaller, at-risk businesses with already low ICRs as well as particularly indebted households.

Table 2.1 shows the amounts outstanding and recent historical growth rates of forms of debt owed by nonfinancial businesses and households as of the second quarter of 2023. The combined total debt of nonfinancial businesses and households grew more slowly than nominal GDP in recent quarters, leading to a decline in the debt-to-GDP ratio, which is now at the level that prevailed over most of the past decade (figure 2.1). The drop in the overall ratio was driven in equal parts by declines in both the household and business debt-to-GDP ratios (figure 2.2).

Business debt vulnerabilities remain moderate relative to historical levels

Overall vulnerabilities from nonfinancial business debt increased slightly since the May report but remained moderate overall. While measures of leverage remained high, debt growth continued to decline. Firms' ability to service their debt, as measured by ICRs, edged down a bit in the most recent data but remained solid owing to resilient earnings. However, risky borrowers' ability to service their debt burdens has started to show signs of weakness, as would be expected in a rising interest rate environment, and could become further strained if corporate earnings fall due to a sharper-than-expected slowdown in economic activity.

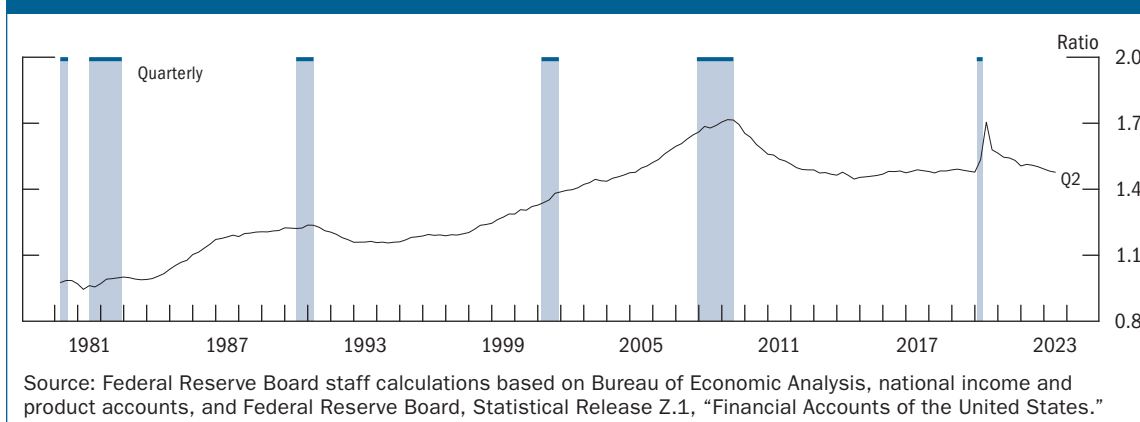
Table 2.1. Outstanding amounts of nonfinancial business and household credit

Item	Outstanding (billions of dollars)	Growth, 2022:Q2–2023:Q2 (percent)	Average annual growth, 1997–2023:Q2 (percent)
Total private nonfinancial credit	39,915	3.7	5.5
Total nonfinancial business credit	20,335	3.6	5.9
Corporate business credit	13,003	3.2	5.4
Bonds and commercial paper	7,720	2.3	5.5
Bank lending	2,101	8.7	4.5
Leveraged loans ¹	1,358	3.2	13.1
Noncorporate business credit	7,332	4.2	6.9
Commercial real estate credit	2,971	5.4	6.2
Total household credit	19,580	3.8	5.1
Mortgages	12,850	4.1	5.1
Consumer credit	4,943	5.3	5.4
Student loans	1,765	1.2	8.0
Auto loans	1,533	6.1	5.4
Credit cards	1,225	11.5	3.5
Nominal GDP	26,799	6.1	4.6

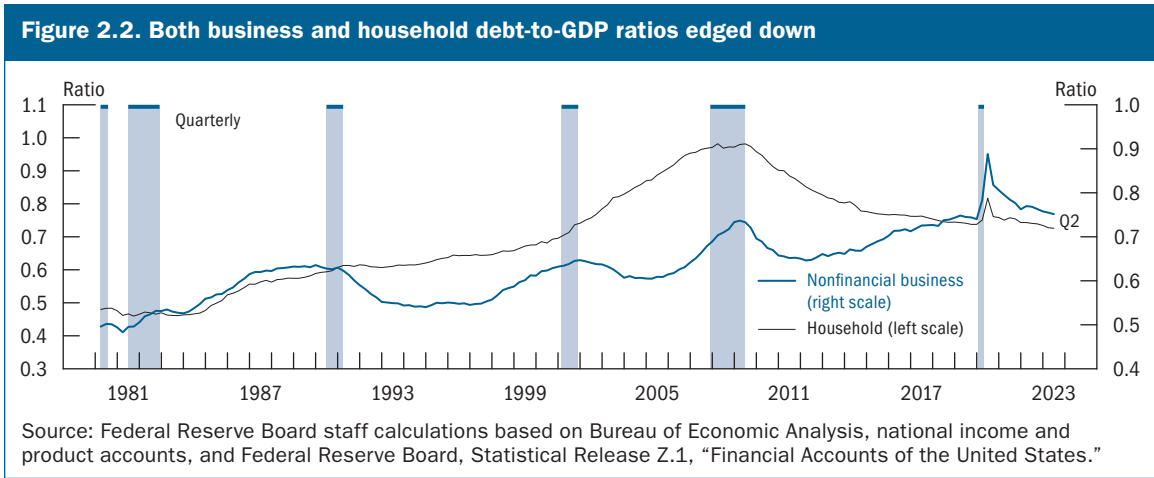
Note: The data extend through 2023:Q2. Outstanding amounts are in nominal terms. Growth rates are measured from Q2 of the year immediately preceding the period through Q2 of the final year of the period. The table reports the main components of corporate business credit, total household credit, and consumer credit. Other, smaller components are not reported. The commercial real estate (CRE) row shows CRE debt owed by both nonfinancial corporate and noncorporate businesses as defined in Table L.220: Commercial Mortgages in the “Financial Accounts of the United States.” Total household-sector credit includes debt owed by other entities, such as nonprofit organizations. GDP is gross domestic product.

¹ 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. Average annual growth of leveraged loans is from 2001 to 2023:Q2, as this market was fairly small before then.

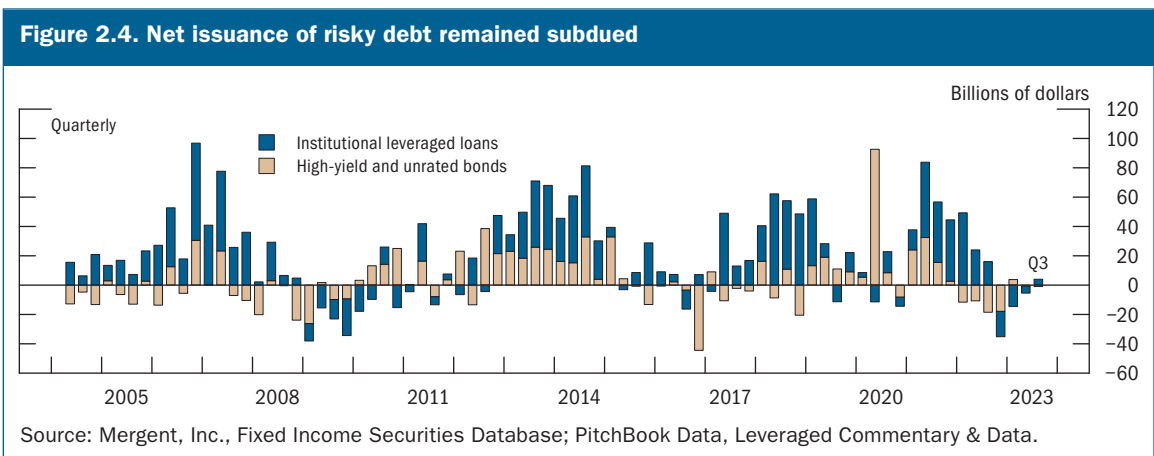
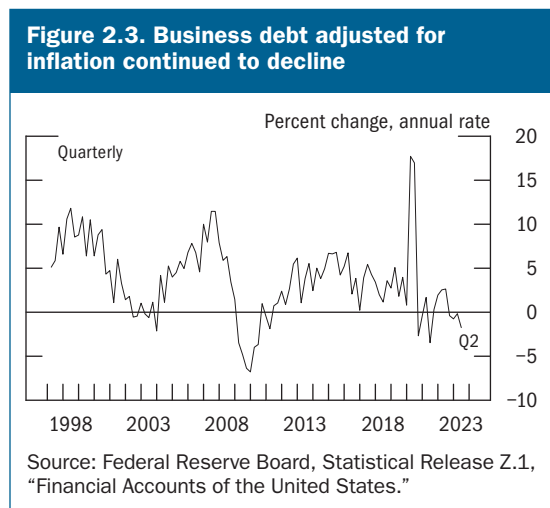
Source: For leveraged loans, PitchBook Data, Leveraged Commentary & Data; for GDP, Bureau of Economic Analysis, national income and product accounts; for all other items, Federal Reserve Board, Statistical Release Z.1, “Financial Accounts of the United States.”

Figure 2.1. The total debt of businesses and households relative to GDP declined further

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.”



The growth of nonfinancial business debt adjusted for inflation declined over the past year (figure 2.3), and net issuance of risky debt—defined as the difference between issuance of high-yield bonds, unrated bonds, and leveraged loans minus retirements and repayments—remained subdued as firms repaid existing leveraged loans at a faster pace than new loans were issued (figure 2.4). The net issuance of high-yield and unrated bonds was also subdued through the third quarter of 2023.



Gross leverage—the ratio of debt to assets—of all publicly traded nonfinancial firms remained high by historical standards (figure 2.5). Net leverage—the ratio of debt less cash to total assets—continued to edge up among all large publicly traded businesses and remained high relative to its history. Meanwhile, firms’ ability to service their debt remained solid overall, despite some emerging signs of weakness among riskier firms. The median ICR has been steadily declining from its peak reached during the post-pandemic earnings boom and inched down further in Q2 (figure 2.6). The decline partially reflects modest pass-through of higher interest rates to firms’ borrowing costs, because most of the debt issued by large firms carries fixed rates.³ Corporate earnings remained solid for the first half of 2023. However, signs of stress in debt servicing and deterioration in credit quality are emerging for the most vulnerable and lowest-rated firms as elevated borrowing costs begin to weigh on interest expenses.⁴

Figure 2.5. Gross leverage of large businesses remained at high levels by historical standards

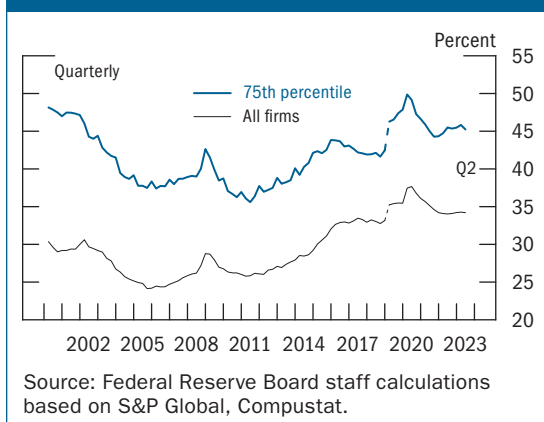
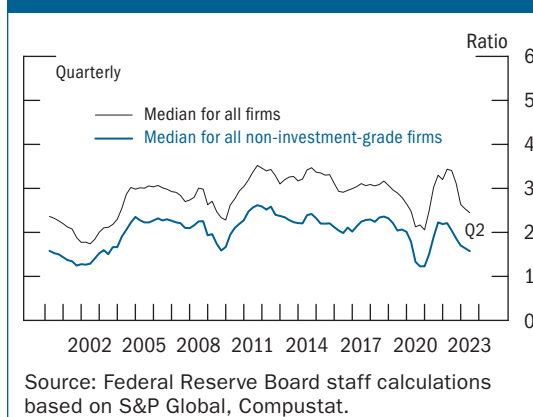


Figure 2.6. Firms’ ability to service their debt, as measured by the interest coverage ratio, continued to decline from post-pandemic highs



The credit performance of outstanding corporate bonds remained solid, but signs of deterioration have emerged since the May report. The volume of downgrades and defaults remained low, but realized defaults and market expectations of defaults over the next year have been trending up in recent months as pressures from rising interest rates and economic uncertainty mount. More than half of investment-grade bonds outstanding continued to be rated in the lowest category of the investment-grade range (triple-B). If a large share of these bonds were downgraded, debt cost would increase when the bonds need to roll over, putting pressure on firms’ balance sheets.

³ Only about 5 percent of outstanding bonds rated triple-B and 1 percent of outstanding high-yield bonds are due within a year.

⁴ While these firms represent a large share of the number of publicly traded firms (85 percent), their debt constitutes only 35 percent of the total debt in the sector.

Small and middle-market firms that are privately held—which have less access to capital markets and primarily borrow from banks, private credit and equity funds, and sophisticated investors—account for roughly 60 percent of outstanding U.S. debt. Available data for these firms indicate that vulnerabilities inched up as higher interest rates started to reduce earnings and raise debt service costs.⁵ Since the last report, leverage for these firms increased slightly following several quarters of post-pandemic declines and is currently roughly in line with leverage levels among publicly traded firms. The ICR for the median firm in this category declined notably but remained at a high level, above that of publicly traded firms.

The credit quality of outstanding and newly issued leveraged loans remained solid through the first half of 2023 but continued to show some signs of deterioration. The volume of credit rating downgrades exceeded the volume of upgrades over this period, and default rates have continued to inch up from their historic lows reached in 2021 (figure 2.7). The share of newly issued loans to large corporations with debt multiples—defined as the ratio of debt to earnings before interest, taxes, depreciation, and amortization—greater than 4 has fallen to its lowest level in the past decade, suggesting limited investor tolerance for riskier loans (figure 2.8). As noted, a potential slowdown in earnings growth posed by the less favorable economic outlook combined with rising

Figure 2.7. Default rates on leveraged loans inched up from historically low levels

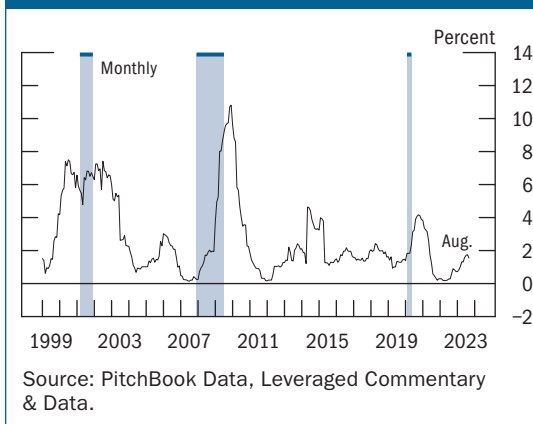
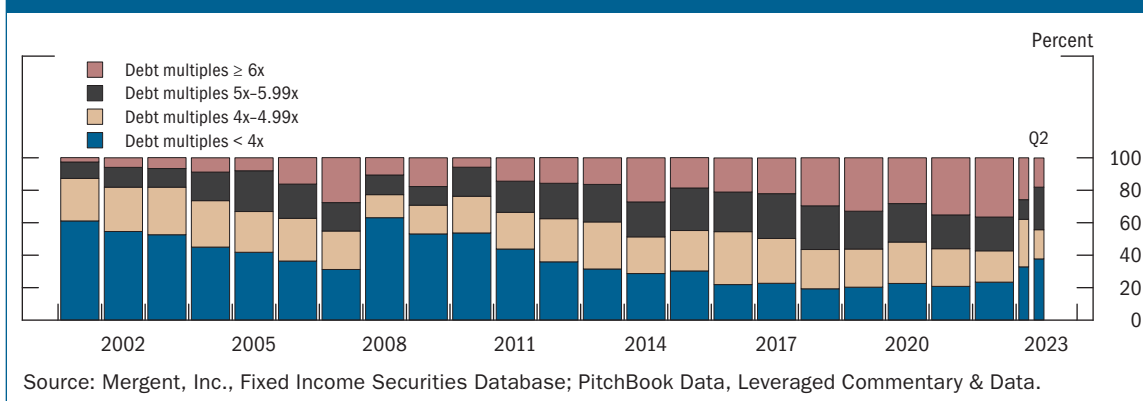


Figure 2.8. New leveraged loans with debt multiples less than 4 continued to rise



⁵ An important caveat is that the data on smaller middle-market firms are not as comprehensive as those on large firms.

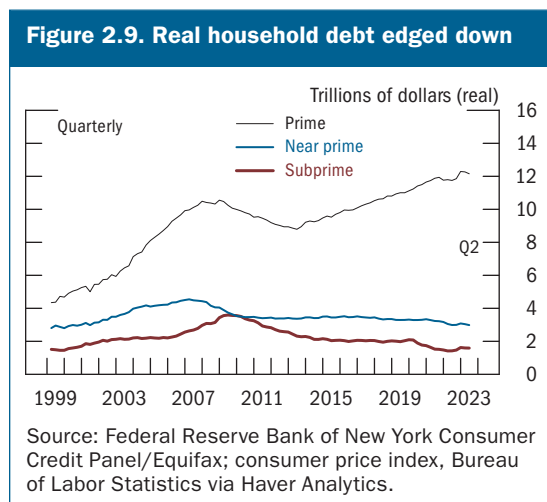
interest rates could put pressure on the credit quality of outstanding leveraged loans, as their floating debt service costs would increase.

Delinquencies at small businesses edged up, but credit quality remained solid

Credit quality for small businesses remained relatively solid, though delinquency rates continued to edge up in recent months from relatively low levels. Borrowing costs increased in the first half of 2023 to levels not seen since prior to the Great Recession. In addition, the share of small businesses that borrow regularly declined since the beginning of the year, according to the National Federation of Independent Business Small Business Economic Trends Survey, and was somewhat low relative to historical levels. The share of firms reporting unmet financing needs remained quite low. Loan originations for small businesses remained in line with pre-pandemic levels.

Vulnerabilities from household debt remained moderate

Household balance sheets remained strong overall. Many households that purchased homes or refinanced when interest rates were low continued to benefit from lower interest rate payments, strengthening their current financial position. That said, some borrowers, especially those with newly originated debt as interest rates have increased over the past year and a half, remained financially stretched and more vulnerable to future shocks.



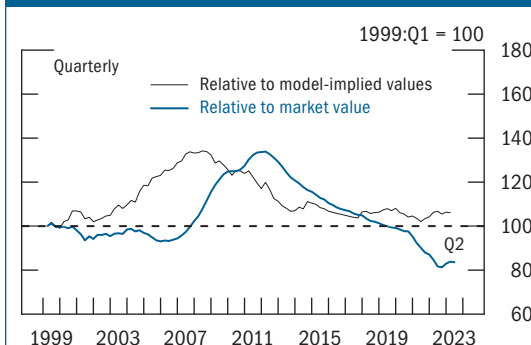
Outstanding household debt adjusted for inflation ticked down in the second quarter, with the decline in the most recent data broad based across the credit score distribution (figure 2.9). The ratio of total required household debt payments to total disposable income (the household debt service ratio) increased slightly since the May report. Nonetheless, the ratio remained at modest levels after reaching a historical low in the first quarter of 2021 amid credit card paydowns with low interest rates at the time. Higher interest rates over the past year have only partially passed through to household interest

expenses because, except for credit card debt, only a small share of household debt is subject to floating rates. For most other types of household debt, rising interest rates increase borrowing costs only for new loan originations.

Mortgage credit risk remained generally low

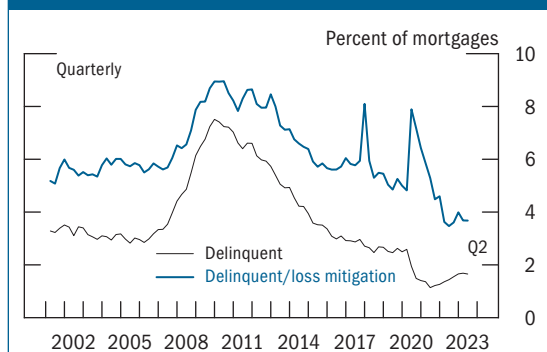
Mortgage debt, which accounts for roughly two-thirds of total household debt, grew a bit more slowly than GDP over the past four quarters. Estimates of housing leverage when measuring home values as a function of rents and other market fundamentals remained flat and significantly lower than their peak levels before 2008 (figure 2.10, black line). The overall mortgage delinquency rate was essentially unchanged in the most recent data after edging up from the historically low levels reached in 2021, and the share of mortgage balances in loss-mitigation programs remained low (figure 2.11). A very low share of borrowers had negative home equity in the most recent data through June 2023 (figure 2.12).

Figure 2.10. A model-based estimate of housing leverage was flat



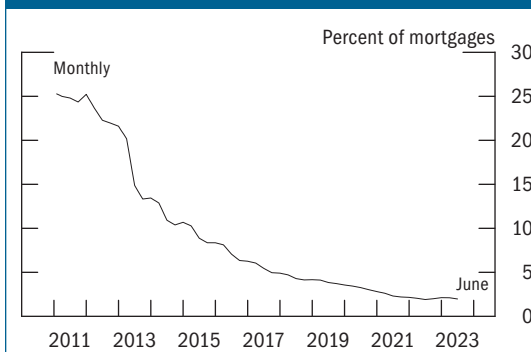
Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax; Zillow, Inc., Real Estate Data; Bureau of Labor Statistics via Haver Analytics.

Figure 2.11. Mortgage delinquency rates remained near historically low levels



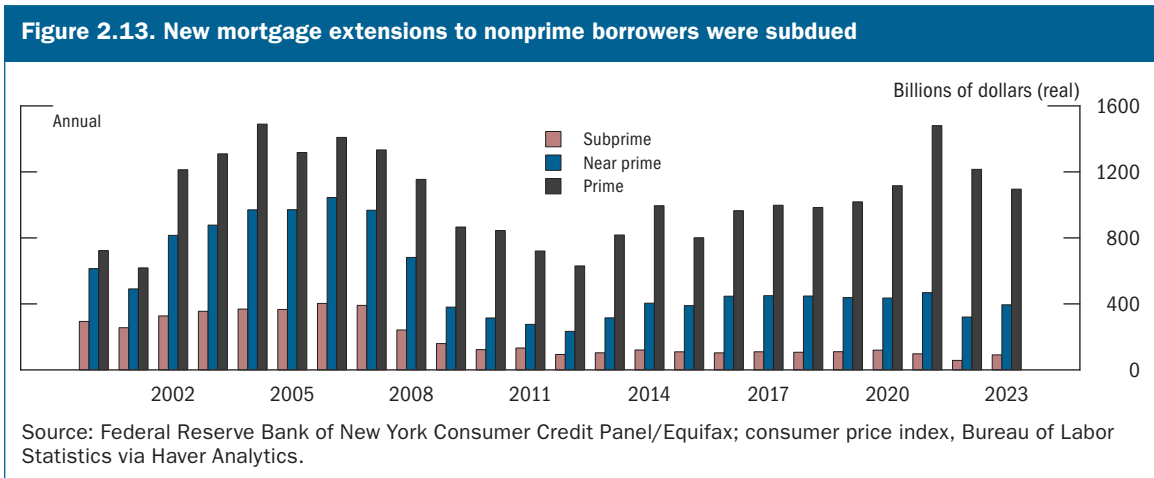
Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

Figure 2.12. Very few homeowners had negative equity in their homes

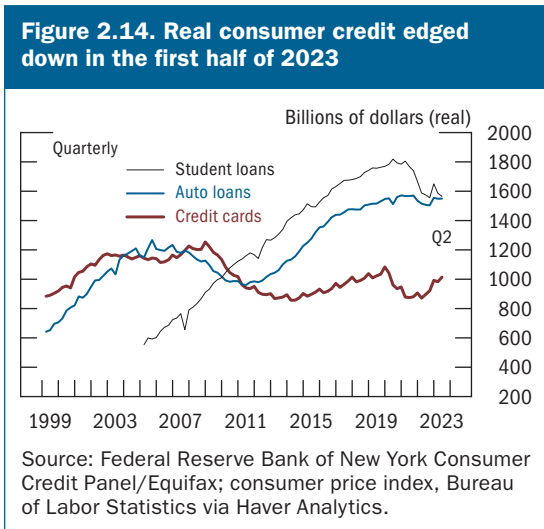


Source: CoreLogic, Inc., Real Estate Data.

New mortgage extensions, which have been skewed heavily toward prime borrowers over the past decade, continued to decline sharply in 2023 as mortgage rates remained elevated (figure 2.13). The early payment delinquency rate—the share of balances becoming delinquent within one year of mortgage origination—continued to rise from its 2020 low, likely reflecting increasing strains associated with higher interest expenses on newly originated mortgages.



Credit risk of outstanding household debt remained generally low, but borrowers with low credit scores continued showing signs of stress



Consumer debt—which accounts for the remaining one-third of household debt and consists primarily of student, auto, and credit card loans—edged down in real terms since the last report (figure 2.14) and, in nominal terms, increased at a slightly slower pace than nominal GDP. However, delinquency rates on newly issued consumer loans rose, particularly among borrowers with low credit scores, as interest rates continued to rise.

Real auto loan balances ticked up for prime borrowers but declined modestly for near-prime and subprime borrowers (figure 2.15).

Smoothing through the quarter-to-quarter

variation over the first half of 2023, the share of auto loan balances in loss mitigation moved sideways and remained roughly in line with its historical median. Those in delinquent status also remained essentially flat, although at a level above the historical median (figure 2.16). That said, the aggregate delinquency rates mask a much sharper rise in auto loan delinquency rates for subprime borrowers in the second quarter of 2023, which increased to a level that was elevated relative to where it stood pre-pandemic.

Figure 2.15. Real auto loans outstanding ticked up for prime borrowers

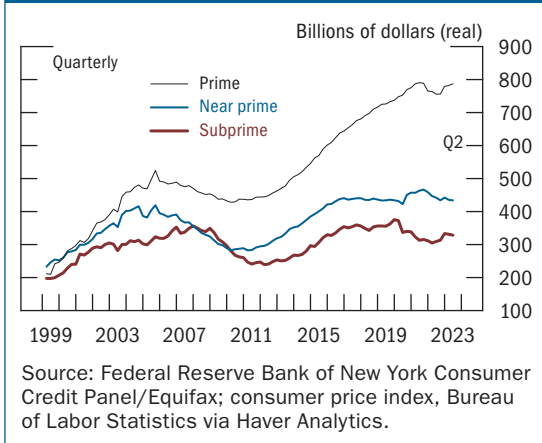
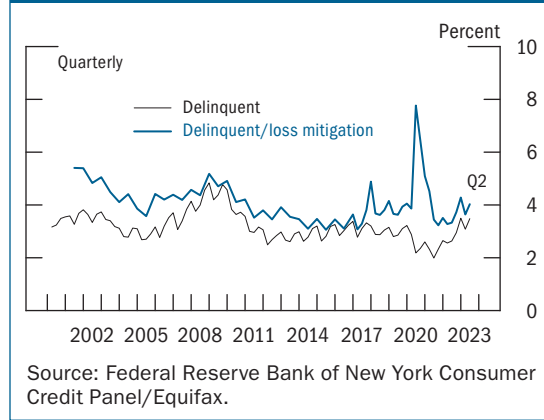


Figure 2.16. Auto loan delinquencies remained at levels above their historical median



Aggregate real credit card balances continued to increase over the first half of the year, and the increases were broad based across the credit score distribution (figure 2.17). Rates paid on these balances increased in line with short-term interest rates over the past year. However, delinquency rates have continued to increase over the same period (figure 2.18).

After rising rapidly for more than a decade, student loan debt, after adjusting for inflation, began to decline with the onset of the pandemic. Student loan repayments, which had been on hold since March 2020, are set to resume in October.

Figure 2.17. Real credit card balances rose in the first half of 2023

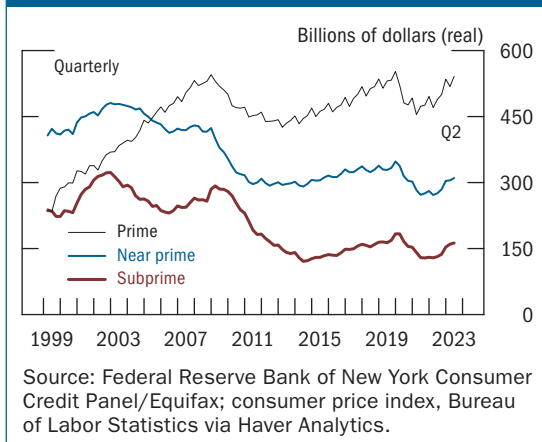
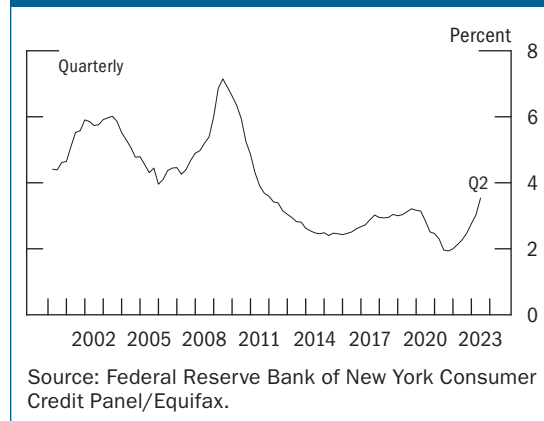


Figure 2.18. Credit card delinquencies increased further in the first half of 2023



3 | Leverage in the Financial Sector

While the overall banking system remains sound, declines in the fair value of assets at some banks remained sizable and leverage at some nonbanks continued to be somewhat elevated

Measures of regulatory capital for banks increased over the first half of the year and remained solid. Nevertheless, declines in the fair value of fixed-rate assets have been sizable relative to the regulatory capital at some banks, especially for a subset of large (but non-global systemically important) banks and regional banks. Outside the banking sector, leverage at broker-dealers stayed near historically low levels, but limited capacity or willingness of broker-dealers to inter-mediate in Treasury markets during periods of stress remained a concern for liquidity in these markets. Hedge funds continued to operate with somewhat elevated leverage, and their exposures are difficult to monitor due to lags in existing data.

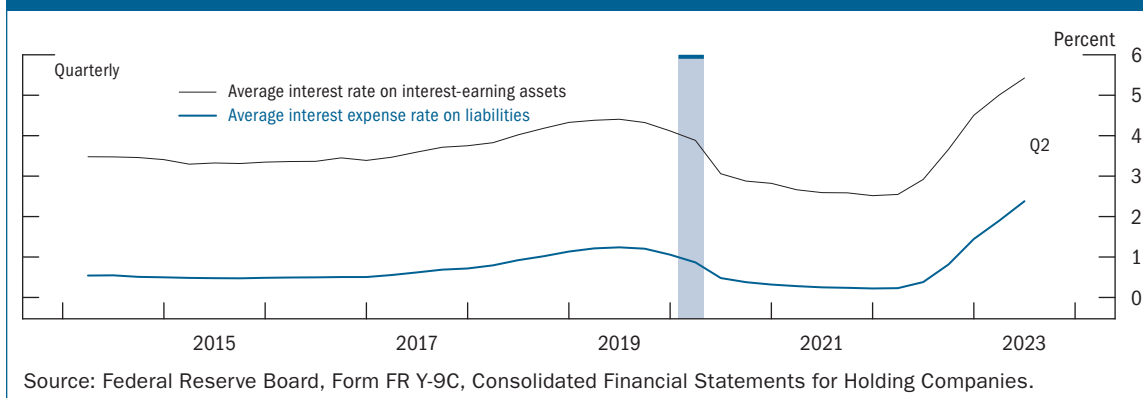
Table 3.1 shows the sizes and growth rates of the types of financial institutions discussed in this section.

Item	Total assets (billions of dollars)	Growth, 2022:Q2–2023:Q2 (percent)	Average annual growth, 1997–2023:Q2 (percent)
Banks and credit unions	25,865	1.4	6.0
Mutual funds	18,850	6.1	8.2
Insurance companies	12,447	5.4	5.4
Life	9,269	4.7	5.4
Property and casualty	3,178	7.5	5.5
Hedge funds ¹	9,094	-6.0	8.2
Broker-dealers ²	5,471	8.0	4.7
Outstanding (billions of dollars)			
Securitization	13,441	6.4	5.6
Agency	11,954	7.0	6.0
Non-agency ³	1,486	2.2	3.6
<p>Note: The data extend through 2023:Q2 unless otherwise noted. Outstanding amounts are in nominal terms. Growth rates are measured from Q2 of the year immediately preceding the period through Q2 of the final year of the period. Life insurance companies' assets include both general and separate account assets.</p> <p>¹ Hedge fund data start in 2012:Q4 and are updated through 2022:Q4. Growth rates for the hedge fund data are measured from Q4 of the year immediately preceding the period through Q4 of the final year of the period.</p> <p>² Broker-dealer assets are calculated as unnetted values.</p> <p>³ Non-agency securitization excludes securitized credit held on balance sheets of banks and finance companies.</p> <p>Source: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; Federal Reserve Board, "Enhanced Financial Accounts of the United States."</p>			

Bank profitability remained robust amid further declines in the fair value of some assets held on banks' balance sheets

Amid the considerable increase in interest rates over the past year and a half, the overall banking sector remained profitable. Net interest margins, which measure banks' yield on their interest-earning assets after netting out interest expenses, remained relatively constant in the aggregate, reflecting higher interest income on floating-rate loans coupled with interest expense on many deposits that remained well below market rates (figure 3.1). However, pressures to raise deposit rates to compete with higher-yielding alternatives to bank deposits as well as banks shifting to more expensive alternative sources of funding may continue to affect profit margins for some banks.

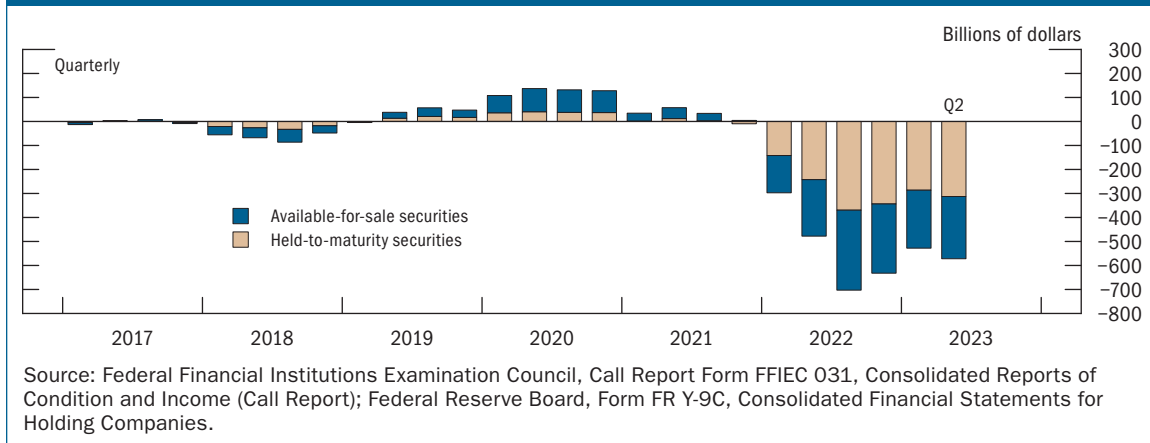
Figure 3.1. Banks' average interest rate on interest-earning assets remained significantly above the average expense rate on liabilities



Higher interest rates also substantially affected the fair value of banks' existing holdings of fixed-rate assets over this period. At the onset of the coronavirus pandemic, when longer-term interest rates were low relative to current levels and banks experienced sizable inflows of deposits, banks invested heavily in fixed-rate long-duration securities—primarily U.S. Treasury securities and agency-guaranteed mortgage-backed securities. As interest rates rose over the past year and a half, the fair value of these securities declined. As of the end of the second quarter of 2023, banks had declines in fair value of \$248 billion in available-for-sale (AFS) portfolios and \$310 billion in held-to-maturity portfolios (figure 3.2).

Policy interventions by the U.S. Department of the Treasury, the Federal Reserve, and the Federal Deposit Insurance Corporation played a key role in mitigating the stresses in the banking system that emerged in March. Since then, a number of banks continued to reduce their holdings of securities, but declines in the fair value of bank securities holdings remained large relative to historical norms.

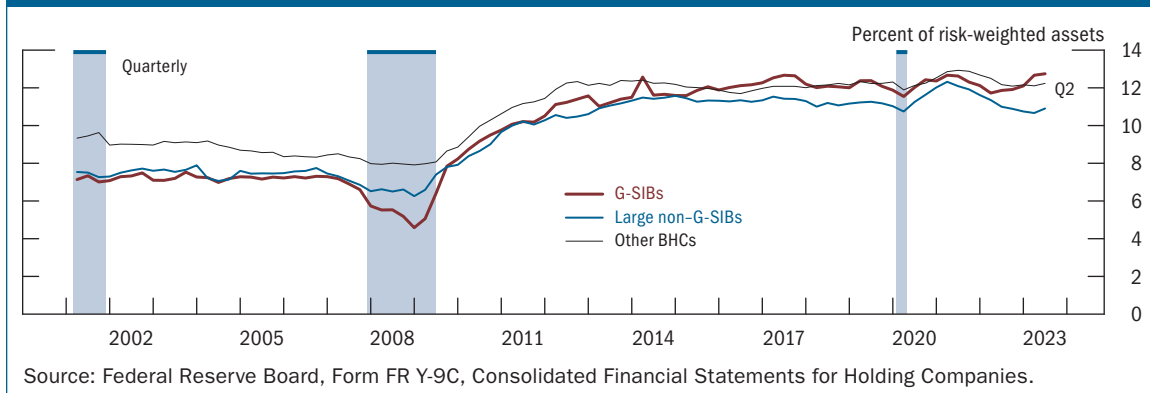
Figure 3.2. The fair values of banks' securities portfolios declined in the second quarter of 2023 as interest rates rose



Banks' risk-based capital increased, but tangible common equity remained below its average over the past decade

The common equity Tier 1 (CET1) ratio—a regulatory risk-based measure of bank capital adequacy—increased during the second quarter of the year across all bank categories and stood around the median of its range since the end of the Great Recession (figure 3.3). Globally systemically important banks (G-SIBs) increased their CET1 ratios in the first half of the year as they cut back on stock repurchases.

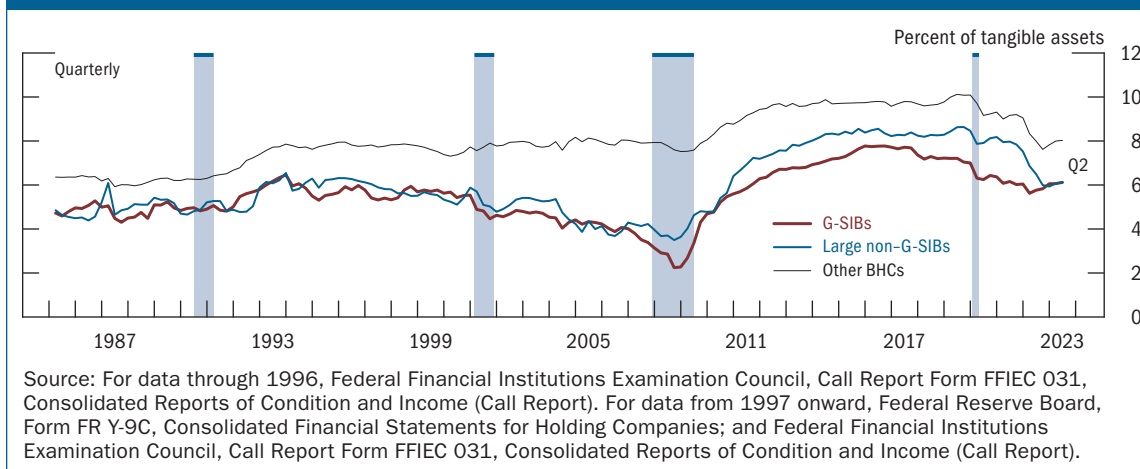
Figure 3.3. Banks' risk-based capital ratio remained near the median level since the Great Recession



An alternative measure of bank capital is the ratio of tangible common equity to total tangible assets. The tangible common equity ratio has similarities to the CET1 ratio in that both exclude intangible items such as goodwill from the measurement of capital, but there are also important differences between the two. In contrast with CET1, the tangible common equity ratio does not

account for the riskiness of assets, but it does include fair value declines on AFS securities for all banks. The tangible common equity ratio edged up across all bank categories in the first half of the year, especially at G-SIBs (figure 3.4). Nonetheless, it remained at a level well below its average over the past decade, partly due to a substantial drop in tangible equity from declines in fair value on Treasury and agency-guaranteed mortgage-backed securities in AFS portfolios.

Figure 3.4. The ratio of tangible common equity to tangible assets increased for banks of all categories



On July 27, 2023, the Federal Reserve Board, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation requested comment on a proposal to increase the strength and resilience of the banking system.⁶ The proposal would modify large bank capital requirements to better reflect underlying risks and increase the consistency of how banks measure their risks. The changes would implement the final components of the regulatory reforms introduced in response to the Great Recession. Additionally, following the banking turmoil in March 2023, the proposal seeks to further strengthen the banking system by applying a more stringent set of capital requirements to a broader set of banks, specifically those with more than \$100 billion in assets.

Banks' vulnerability to future credit losses appeared to be moderate

Aggregate credit quality in the nonfinancial sector remained solid, and loan delinquency rates remained low overall. However, the quality of outstanding loans worsened in some sectors, as the delinquency rates for consumer and CRE loans—especially those backed by office

⁶ See Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, and Office of the Comptroller of the Currency (2023), "Agencies Request Comment on Proposed Rules to Strengthen Capital Requirements for Large Banks," joint press release, July 27, <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20230727a.htm>.

properties—increased in the first half of 2023. Additionally, borrower leverage for bank commercial and industrial (C&I) loans increased over the same period (figure 3.5). Data from the April and July 2023 SLOOS indicated that banks continued to tighten lending standards on C&I and CRE loans in the first half of 2023 amid concerns about the economic outlook and loan performance (figure 3.6; see also figure 1.16).⁷ In response to a set of special questions about the level of lending standards, banks reported that, on balance, levels of lending standards were on the tighter end of their historical ranges for all loan categories. Meanwhile, banks reported that demand for most categories of loans continued to weaken.

Figure 3.5. Borrower leverage for bank commercial and industrial loans increased

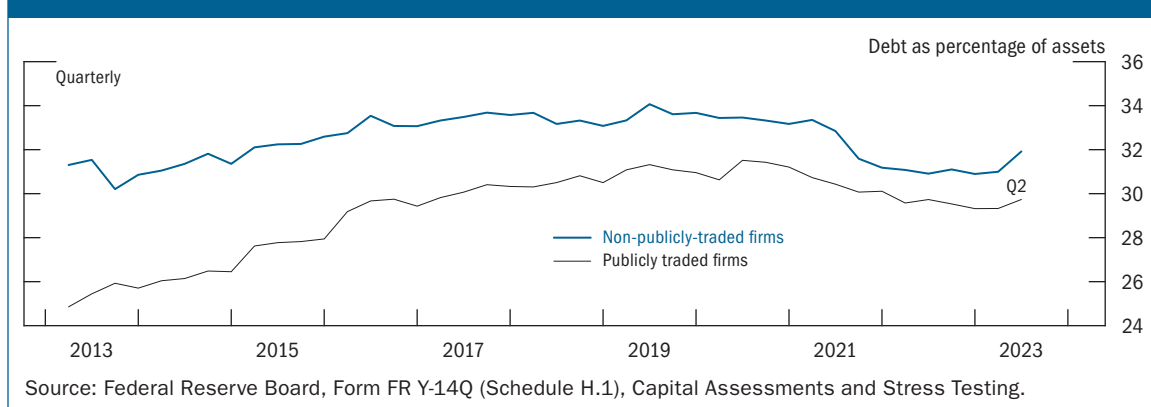
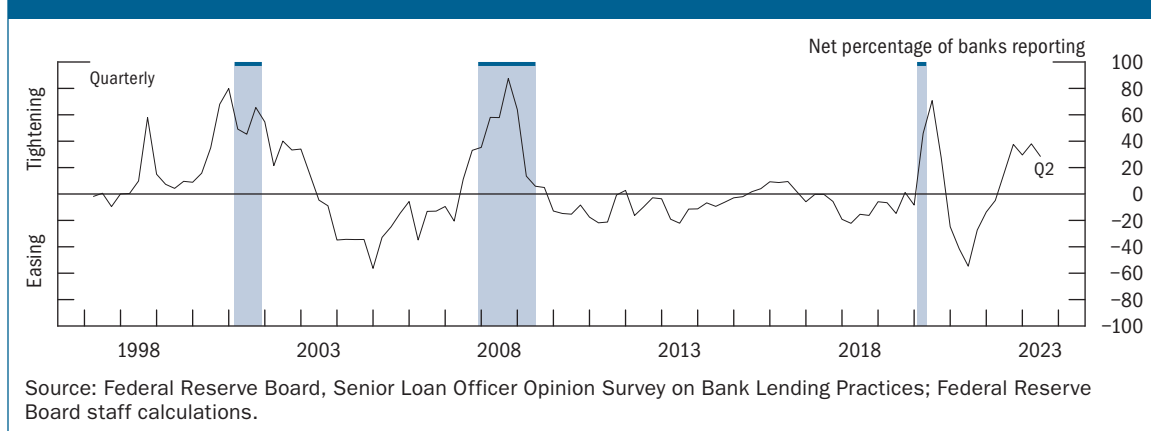


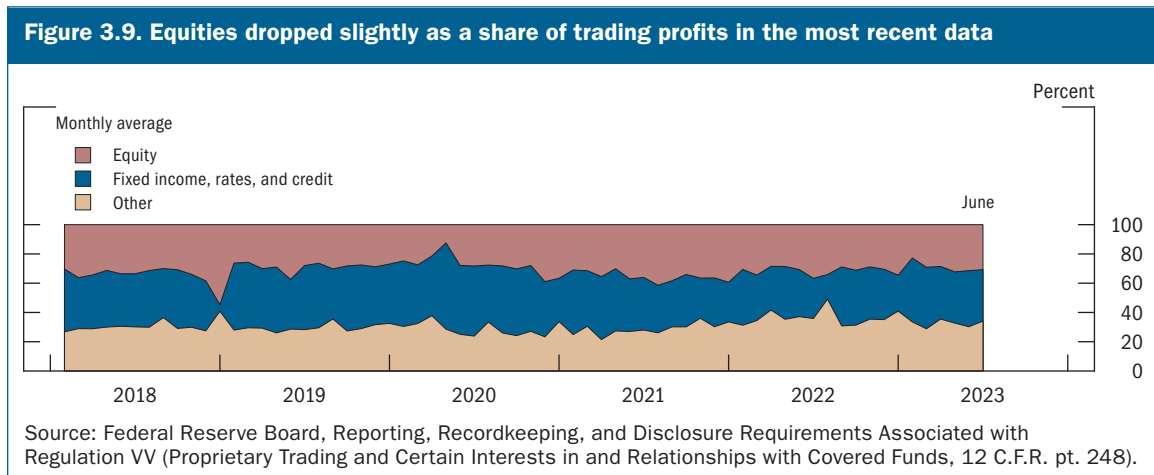
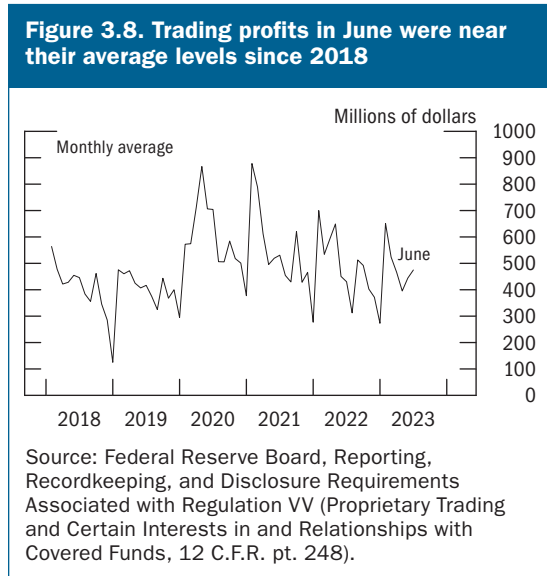
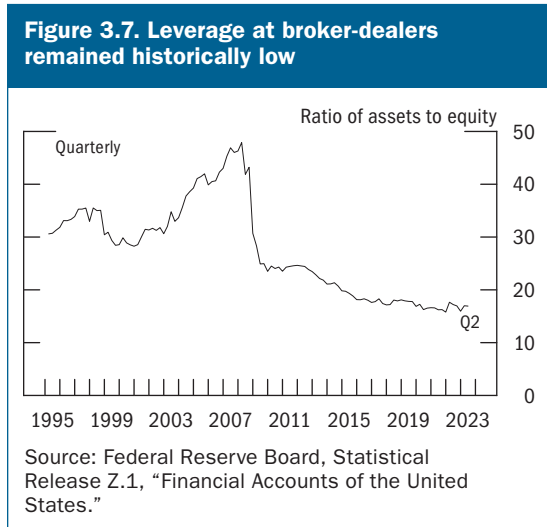
Figure 3.6. Banks reported tightening lending standards in commercial and industrial loans



⁷ The SLOOS is available on the Federal Reserve Board's website at <https://www.federalreserve.gov/data/sloos.htm>.

Leverage at broker-dealers remained low

Broker-dealer leverage ratios remained largely flat over the first half of 2023 at near historically low levels (figure 3.7). Dealers’ equity growth has generally kept up with the growth of their assets, boosted in part by solid trading profits (figures 3.8 and 3.9). Net secured borrowing of primary dealers increased slightly since the May report, consistent with an increase in net securities positions. Primary dealer Treasury market activities, including market making and repurchase agreements, increased during the first half of 2023.

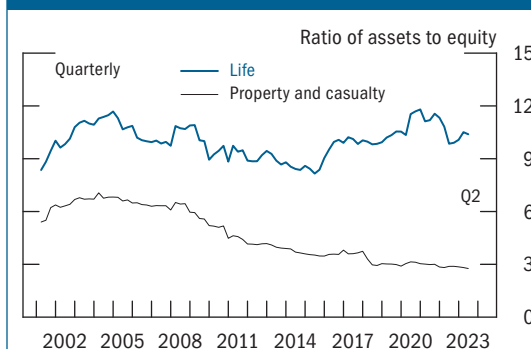


In the September 2023 Senior Credit Officer Opinion Survey on Dealer Financing Terms (SCOOS), which covered the period between mid-May 2023 and mid-August 2023, dealers reported that terms under which they facilitated securities and derivatives transactions were largely unchanged for most types of clients.⁸ Additionally, some dealers continued to report that they had increased the resources and attention they devoted to managing their concentrated credit exposure to other dealers and other financial intermediaries over the past three months.

Leverage at life insurers edged up but remained near the middle of its historical range

While leverage at property and casualty insurers stayed low relative to historical norms, leverage at life insurers remained near the middle of its historical range and well below its pandemic peak despite increasing slightly, on net, since the previous report (figure 3.10). Life insurers continued to allocate a high percentage of assets to risky instruments, such as leveraged loans, high-yield corporate bonds, privately placed corporate bonds, and alternative investments. Moreover, insurance companies are large holders of commercial mortgage-backed securities (CMBS), and they also have material exposures to commercial mortgages. A significant correction in commercial property values could lead to credit losses by insurance companies, putting pressure on their capital positions.

Figure 3.10. Leverage at life insurance companies remained near the middle of its historical range



Source: Generally accepted accounting principles data from 10-Q and 10-K filings accessed via S&P Global, Capital IQ Pro.

Leverage at hedge funds continued to be somewhat elevated

Comprehensive data collected by the Securities and Exchange Commission (SEC) indicate that measures of leverage averaged across all hedge funds remained above their historical norms in the first quarter of 2023. These somewhat elevated levels hold true for both average on-balance-sheet leverage (blue line in figure 3.11)—which captures financial leverage from secured financing transactions, such as repurchase agreements and margin loans, but does not capture leverage embedded through derivatives—as well as for average gross leverage of hedge funds

⁸ The SCOOS is available on the Federal Reserve Board's website at <https://www.federalreserve.gov/data/scoos.htm>.

(black line in figure 3.11)—a broader measure that incorporates off-balance-sheet derivatives exposures. Leverage at the largest funds was significantly higher, with the average on-balance-sheet leverage of the top 15 hedge funds by gross asset value rising in the first quarter of 2023 to about 17-to-1 (figure 3.12). These high levels of leverage were facilitated, in part, by low haircuts on Treasury collateral in some markets where many hedge funds obtain short-term financing.⁹ More recent data from the September 2023 SCOOs suggested that the use of financial leverage by hedge funds remained largely unchanged between mid-May 2023 and mid-August 2023 (figure 3.13).

Figure 3.11. Leverage at hedge funds remained somewhat elevated

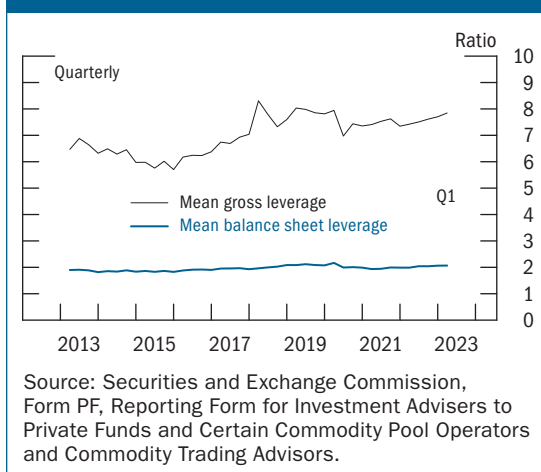


Figure 3.12. Leverage at the largest hedge funds increased

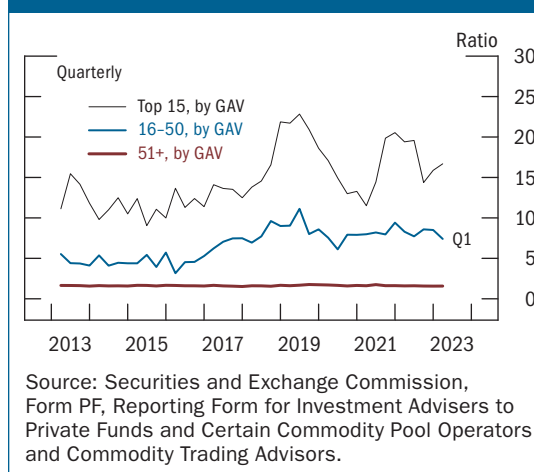
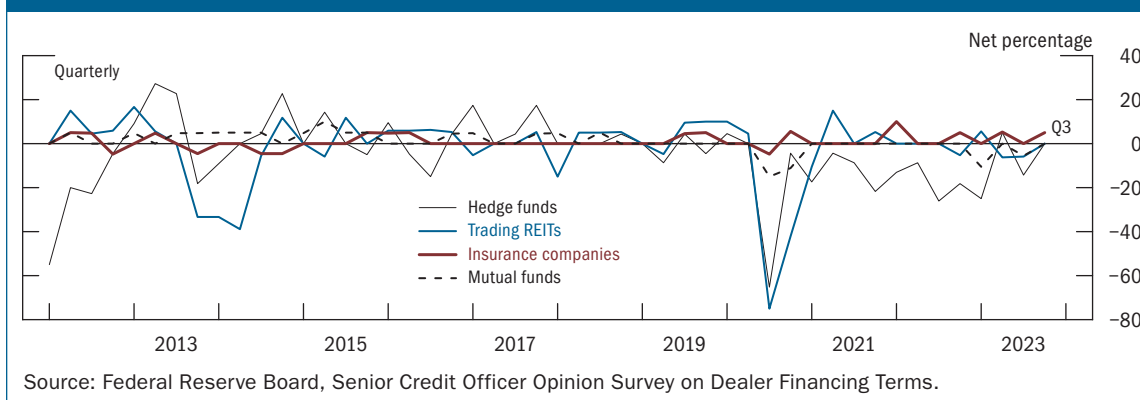


Figure 3.13. Dealers indicated that the use of leverage by hedge funds remained largely unchanged

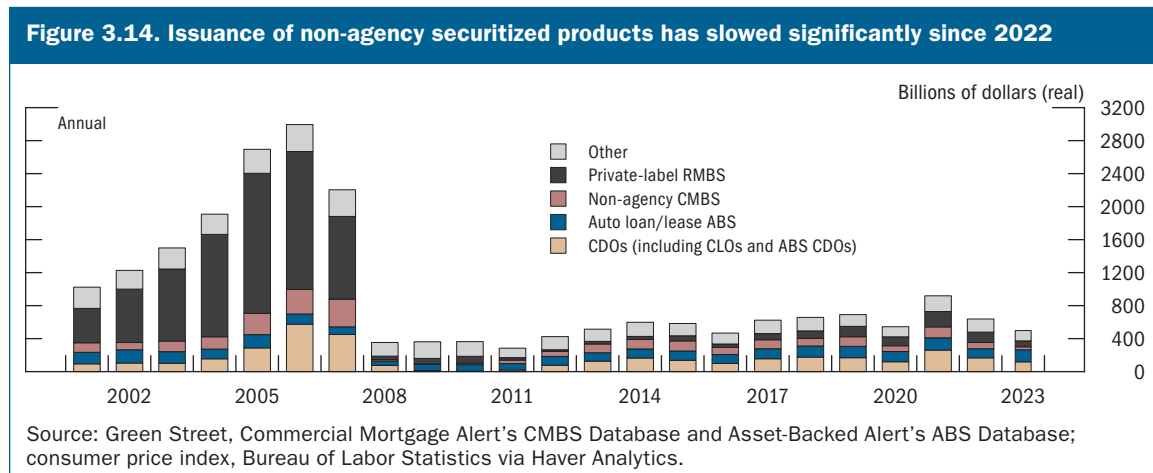


⁹ Ayelen Banegas and Phillip Monin (2023), “Hedge Fund Treasury Exposures, Repo, and Margining,” FEDS Notes (Washington: Board of Governors of the Federal Reserve System, September 8), <https://doi.org/10.17016/2380-7172.3377>.

Data from the Commodity Futures Trading Commission (CFTC) Traders in Financial Futures report showed that leveraged funds' short Treasury futures positions increased notably since the beginning of the year. In the past, high levels of short positions in Treasury futures held by leveraged funds coincided with hedge fund activities in Treasury cash-futures basis trades—trades that involve the sale of a Treasury future and the purchase of a Treasury security, funded by repurchase agreement, deliverable into the futures contract—and several indicators suggest that the trade likely gained in popularity recently as well. The data from the CFTC Traders in Financial Futures report suggest that the recent growth of the trade could be, in part, attributed to increased demand from asset managers—including mutual funds, pension funds, and other investor types—for exposure to interest rates in the futures market. Because the basis trade is often highly leveraged, a funding shock or heightened volatility in Treasury markets could force leveraged funds to abruptly unwind their positions at potentially distressed prices. This deleveraging could amplify initial disruptions in Treasury markets, possibly impairing market liquidity and market functioning. However, recent SCOOS surveys suggest that these risks are likely mitigated by tighter financing terms applied to hedge funds by dealer counterparties over the past several quarters.

Issuance of non-agency securities by securitization vehicles remained subdued

Non-agency securitization issuance—which increases the amount of leverage in the financial system—was relatively subdued after a notable slowdown since 2022 amid weak demand for loans that are used as collateral in securitization deals (figure 3.14).¹⁰ Credit spreads on major

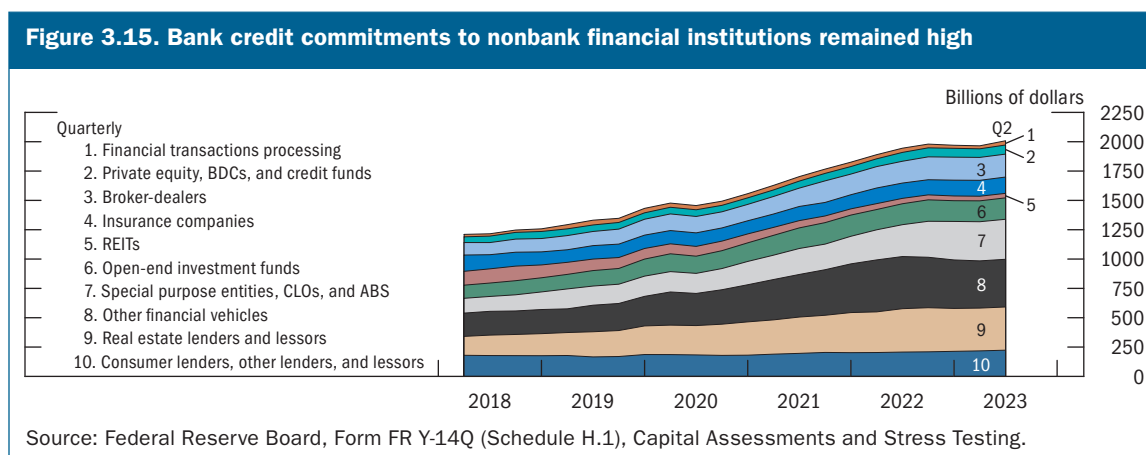


¹⁰ Securitization allows financial institutions to bundle loans or other financial assets and sell claims on the cash flows generated by these assets as tradable securities, much like bonds. By funding assets with debt issued by investment funds known as special purpose entities (SPEs), securitization can add leverage to the financial system, in part because SPEs are generally subject to regulatory regimes, such as risk retention rules, that are less stringent than

securitized products generally narrowed since the last report but remained relatively wide compared with historical norms. Measures of credit performance across securitized products backed by riskier loan collateral indicated signs of credit deterioration. Specifically, loan delinquency rates in below-prime consumer asset-backed securities deals and leveraged loan downgrades in collateralized loan obligations increased. Loan delinquency rates in non-agency CMBS deals remained relatively low, on average, but rose for deals backed by office properties.

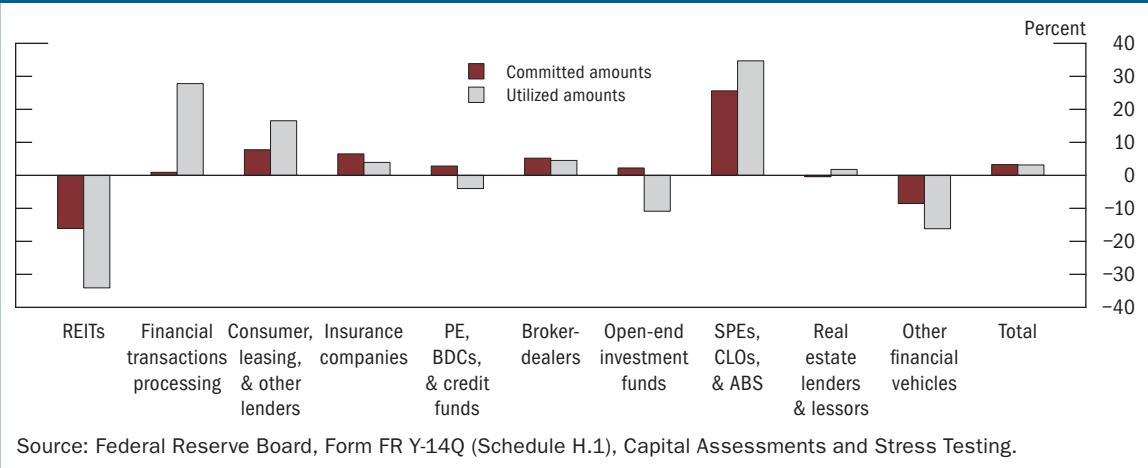
Bank lending to nonbank financial institutions remained high

Bank lending to nonbank financial institutions (NBFIs), which can be informative about the amount of leverage used by NBFIs and shed light on their interconnectedness with the rest of the financial system, resumed growing in the second quarter of 2023 (figure 3.15). The year-over-year growth rate in committed amounts was largely due to loans to special purpose entities and securitization vehicles, which grew about 25 percent at the end of the second quarter of 2023 (figure 3.16). Utilization rates on credit lines to NBFIs remained steady and averaged about 50 percent of total committed amounts. Delinquency rates on banks' lending to NBFIs have been lower than delinquency rates for the nonfinancial business sector since the data became available in 2013. Because NBFIs rely primarily on their bank credit lines to meet their liquidity needs, loan commitments can experience sudden, correlated drawdowns. These drawdowns could be material relative to banks' available buffers of high-quality liquid assets (HQLA) and thus could generate liquidity pressures at large banks during times of financial stress. More generally, information on NBFIs' alternative funding sources, and the extent to which those sources may be fragile, is limited, and this lack of data could mask additional vulnerabilities in the financial sector.



banks' regulatory capital requirements. Examples of the resulting securities include collateralized loan obligations (predominantly backed by leveraged loans), asset-backed securities (often backed by credit card and auto debt), CMBS, and residential mortgage-backed securities.

Figure 3.16. Aggregate credit commitments to nonbank financial institutions increased over the past year but varied across sectors



4 | Funding Risks

The banking industry maintained a high level of liquidity overall, but some banks continued to face funding pressures; meanwhile, structural vulnerabilities persisted in other sectors engaged in liquidity transformation

The banking industry overall maintained a high level of liquidity since the May report. Funding risks for most banks remained low, and large banks that are subject to the liquidity coverage ratio (LCR) continued to maintain ample levels of HQLA given the risk of their funding structures. That said, banks that came under stress and experienced large deposit outflows in March continued to face funding pressure. Since March, volatility has abated and deposit outflows have largely stabilized—owing, in part, to actions by the Department of the Treasury, the Federal Reserve, and the Federal Deposit Insurance Corporation—but these banks nonetheless continued to face challenges navigating changes in depositor behavior, higher funding costs, and reduced market values for investment securities.

Prime MMFs and other cash-investment vehicles remained vulnerable to runs and, hence, contributed to the fragility of short-term funding markets. In addition, some cash-management vehicles, including retail prime MMFs, government MMFs, and short-term investment funds, maintained stable net asset values (NAVs) that make them susceptible to sharp increases in interest rates. The market capitalization of the stablecoin sector continued to decline, but the sector remained vulnerable to liquidity risks like those present in other vehicles that attempt to substitute for cash. Some open-end bond mutual funds continued to be susceptible to large redemptions because they must allow shareholders to redeem every day even though the funds hold assets that can face losses and become illiquid amid stress. Life insurers continued to face liquidity risk owing to heavy reliance on nontraditional liabilities in combination with an increasing share of illiquid and risky assets on their balance sheets.

Overall, estimated runnable money-like financial liabilities increased 3.4 percent to \$20.3 trillion (75 percent of nominal GDP) over the past year. As a share of GDP, runnable liabilities continued their post-pandemic decline but remained above their historical median (table 4.1 and figure 4.1).

Most banks maintained high levels of liquid assets and stable funding

Aggregate liquidity in the banking system appeared ample even as HQLA measured relative to total assets decreased among most banks over the past year (figure 4.2). These declines in HQLA were driven by reductions in holdings of central bank reserve balances and by declines

Table 4.1. Size of selected instruments and institutions

Item	Outstanding/total assets (billions of dollars)	Growth, 2022:Q2–2023:Q2 (percent)	Average annual growth, 1997–2023:Q2 (percent)
Total runnable money-like liabilities ¹	20,384	3.4	4.6
Uninsured deposits	6,659	-15.6	11.5
Domestic money market funds ²	5,372	18.7	5.6
Government	4,463	11.4	15.1
Prime	798	88.9	1.1
Tax exempt	112	13.5	-1.7
Repurchase agreements	4,344	22.7	5.2
Commercial paper	1,418	18.0	3.0
Securities lending ³	805	.6	7.0
Bond mutual funds	4,403	-3.2	8.1

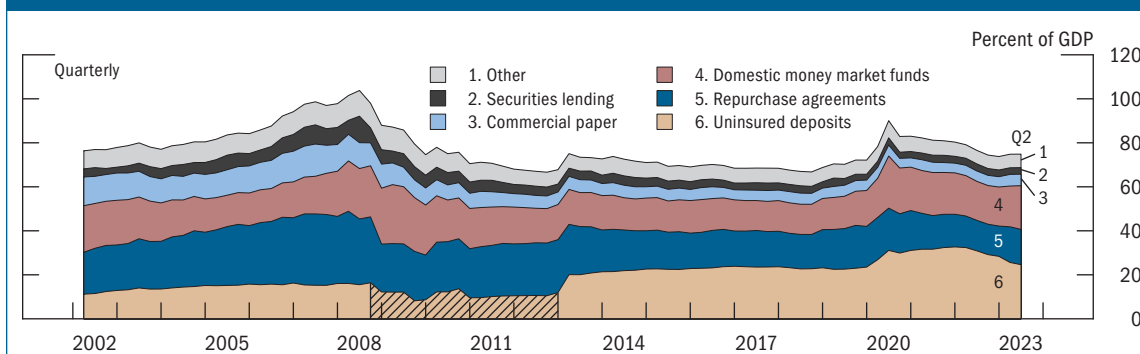
Note: The data extend through 2023:Q2 unless otherwise noted. Outstanding amounts are in nominal terms. Growth rates are measured from Q2 of the year immediately preceding the period through Q2 of the final year of the period. Total runnable money-like liabilities exceed the sum of listed components. Unlisted components of runnable money-like liabilities include variable-rate demand obligations, federal funds, funding-agreement-backed securities, private liquidity funds, offshore money market funds, short-term investment funds, local government investment pools, and stablecoins.

¹ Average annual growth is from 2003:Q1 to 2023:Q2.

² Average annual growth is from 2001:Q1 to 2023:Q2.

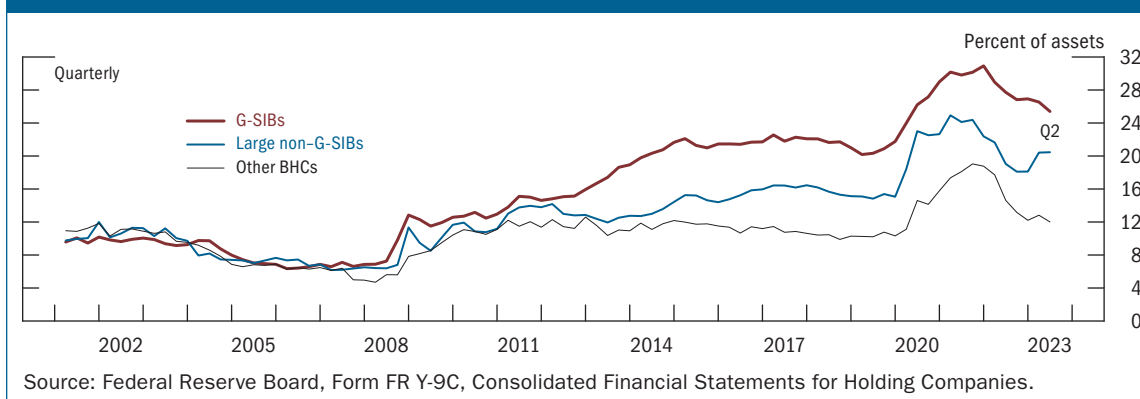
³ Average annual growth is from 2000:Q1 to 2023:Q1. Securities lending includes only lending collateralized by cash.

Source: Securities and Exchange Commission, Private Funds Statistics; iMoneyNet, Inc., Offshore Money Fund Analyzer; Bloomberg Finance L.P.; Securities Industry and Financial Markets Association: U.S. Municipal Variable-Rate Demand Obligation 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 Z.1, "Financial Accounts of the United States"; Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income (Call Report); Morningstar, Inc., Morningstar Direct; DeFiLlama.

Figure 4.1. Ratios of runnable money-like liabilities to GDP edged down but remained above their historical medians

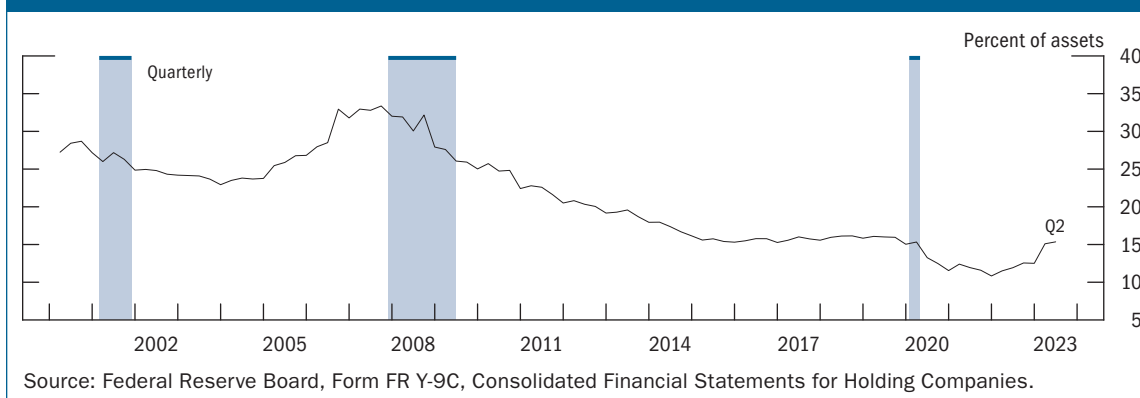
Source: Securities and Exchange Commission, Private Funds Statistics; iMoneyNet, Inc., Offshore Money Fund Analyzer; Bloomberg Finance L.P.; Securities Industry and Financial Markets Association: U.S. Municipal Variable-Rate Demand Obligation Update; Risk Management Association, Securities Lending Report; 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 Z.1, "Financial Accounts of the United States"; Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income (Call Report); gross domestic product, Bureau of Economic Analysis via Haver Analytics; DeFiLlama.

Figure 4.2. The amount of high-quality liquid assets held by most banks continued to decrease in the first half of 2023



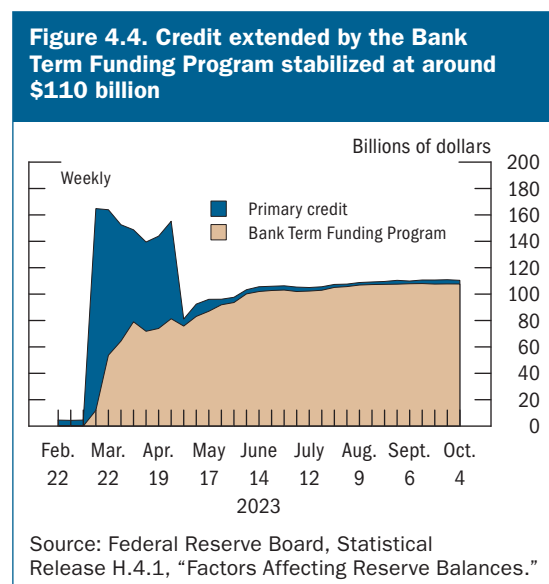
in the market values of securities as interest rates increased. Aggregate central bank reserve balances held by banks remained above \$3 trillion, significantly higher than pre-pandemic levels. And despite the recent declines, U.S. G-SIBs continued to hold more HQLA than required by their LCR—the requirement that ensures banks hold sufficient HQLA to fund estimated cash outflows for 30 days during a hypothetical stress event. Moreover, banks’ reliance on short-term wholesale funding remained low (figure 4.3).

Figure 4.3. Banks’ reliance on short-term wholesale funding remained low



As interest rates increased throughout 2022, higher-paying alternatives to bank deposits became more attractive to businesses and households and, as a result, core deposits began flowing out of the banking sector. The pace of outflows accelerated temporarily in the wake of the March 2023 stresses in the banking system and, within the banking sector, deposits at some midsize banks were moved to the largest banks. Deposit flows have since stabilized across all bank groups and market sentiment has improved, but many of the vulnerabilities that came to light because of the bank stresses persist for a subset of large banks (outside of the G-SIBs) and regional banks. At the same time, some banks also increased their reliance on wholesale funding

sources, which are typically more expensive and less stable than retail deposits. As competition for deposits intensified, financial markets continued to signal concerns over banks with high levels of uninsured deposits, high reliance on wholesale funding, and significant declines in the fair value of securities.



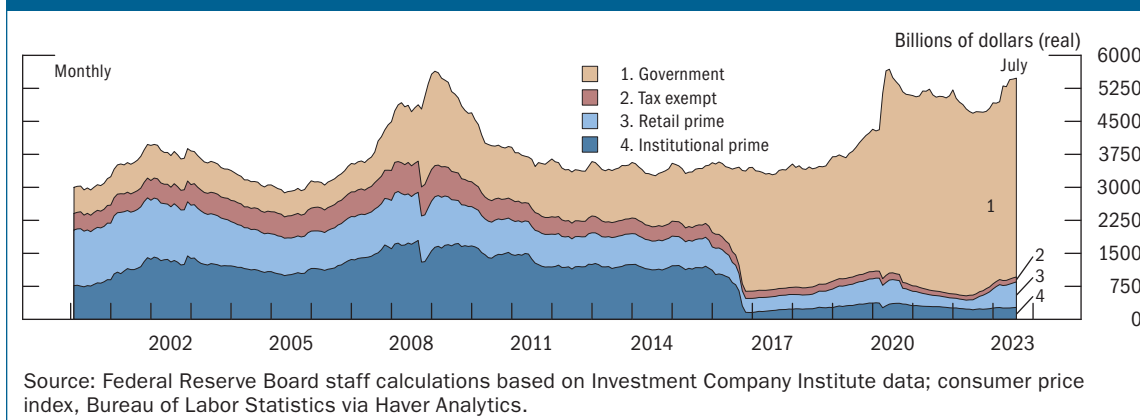
The BTFP was created during the acute phase of the banking stresses and offers loans of up to one year to eligible depository institutions against high-quality securities at par value, thereby eliminating an institution’s need to quickly sell those securities should depositors suddenly withdraw their funding. The facility helped reassure depositors that banks can meet their customers’ needs and contributed to the stabilization of deposit flows. Since its inception, the amount of credit extended by the BTFP increased steadily and has stabilized at around \$110 billion (figure 4.4).

Structural vulnerabilities remained at some money market funds and other cash-management vehicles

In the immediate aftermath of the failures of Silicon Valley Bank and Signature Bank, prime MMFs experienced a jump in redemptions. Although outflows from prime MMFs eased after a few days, the episode illustrated again that these funds remain a prominent vulnerability due to their susceptibility to large redemptions during episodes of financial stress and the significant role they play in short-term funding markets. Since the May report, assets under management (AUM) in prime MMFs offered to the public increased \$100 billion, driven mostly by inflows into retail prime funds (figure 4.5).

On July 12, 2023, the SEC voted to adopt amendments to rules that govern MMFs.¹¹ The key elements of the reforms make dynamic liquidity fees mandatory for institutional prime and tax-exempt funds, eliminate temporary gates and redemption fees linked to liquid asset levels with the intent of removing incentives for investors to run preemptively, and increase a fund’s daily liquid asset and weekly liquid asset requirements. On net, the reforms represent significant

¹¹ See Securities and Exchange Commission (2023), “SEC Adopts Money Market Fund Reforms and Amendments to Form PF Reporting Requirements for Large Liquidity Fund Advisers,” press release, July 12, <https://www.sec.gov/news/press-release/2023-129>.

Figure 4.5. Growth in money market funds was concentrated in retail prime funds

progress in making prime and tax-exempt MMFs more resilient, although these funds remain vulnerable to runs in periods of significant stress.

Other cash-management vehicles, including dollar-denominated offshore MMFs and short-term investment funds, also invest in money market instruments, engage in liquidity transformation, and are vulnerable to runs. Since the May report, estimated aggregate AUM of these cash-management vehicles remained around \$1.8 trillion. Currently, between \$0.6 trillion and \$1.5 trillion of these vehicles' AUM are in portfolios like those of U.S. prime MMFs, and large redemptions from these vehicles also have the potential to destabilize short-term funding markets.¹²

Many cash-management vehicles—including retail and government MMFs, offshore MMFs, and short-term investment funds—seek to maintain stable NAVs that are typically rounded to \$1.00. When short-term interest rates rise sharply or portfolio assets lose value for other reasons, the market values of these funds may fall below their rounded share prices, which can put the funds under strain, particularly if they also have large redemptions.

The market value of many stablecoins declined, and they remain vulnerable to runs

The total market capitalization of stablecoins, which are digital assets designed to maintain a stable value relative to a national currency or another reference asset, fell 21 percent since the beginning of 2022 to \$130 billion. While not widely used as a cash-management vehicle by institutional and retail investors or for transactions for real economic activity, stablecoins are important for digital asset investors. They remain structurally vulnerable to runs and lack a

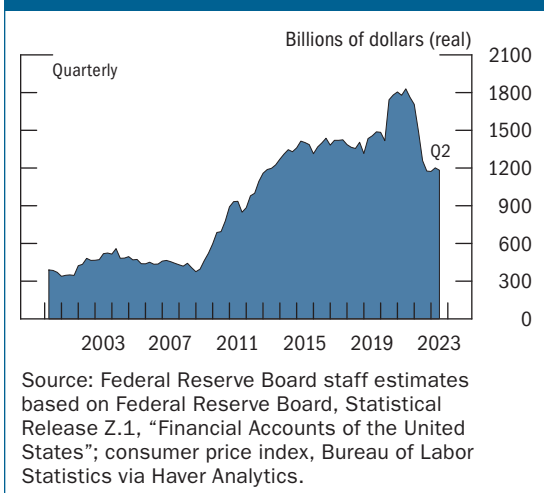
¹² Cash-management vehicles included in this total are dollar-denominated offshore MMFs, short-term investment funds, private liquidity funds, ultrashort bond mutual funds, and local government investment pools.

comprehensive prudential regulatory framework. Moreover, stablecoins could scale quickly, particularly if the stablecoin is supported by access to an existing customer base.

Bond mutual fund asset holdings stabilized, but they remained exposed to liquidity risks

Mutual funds that invest substantially in corporate bonds, municipal bonds, and bank loans may be particularly exposed to liquidity transformation risks, given the relative illiquidity of their assets and the requirement that these funds offer redemptions daily. The total outstanding value of U.S. corporate bonds held by mutual funds remained flat during the first half of 2023 following

Figure 4.6. Corporate bonds held by bond mutual funds stabilized in the first half of 2023



consecutive years of sharp declines, primarily reflecting a fall in bond values associated with higher interest rates (figure 4.6). Mutual fund holdings through the second quarter of 2023 were approximately 13 percent of all U.S. corporate bonds outstanding. Total AUM at high-yield bond and bank loan mutual funds, which primarily hold riskier and less liquid assets, continued declining in recent quarters following sharp decreases in real terms during 2022 (figure 4.7). Bond and loan mutual funds experienced negative returns and notable outflows during most of 2022, but outflows have stabilized in the first half of 2023 (figure 4.8).

Figure 4.7. Assets held by bank loan and high-yield mutual funds continued to decrease in 2023

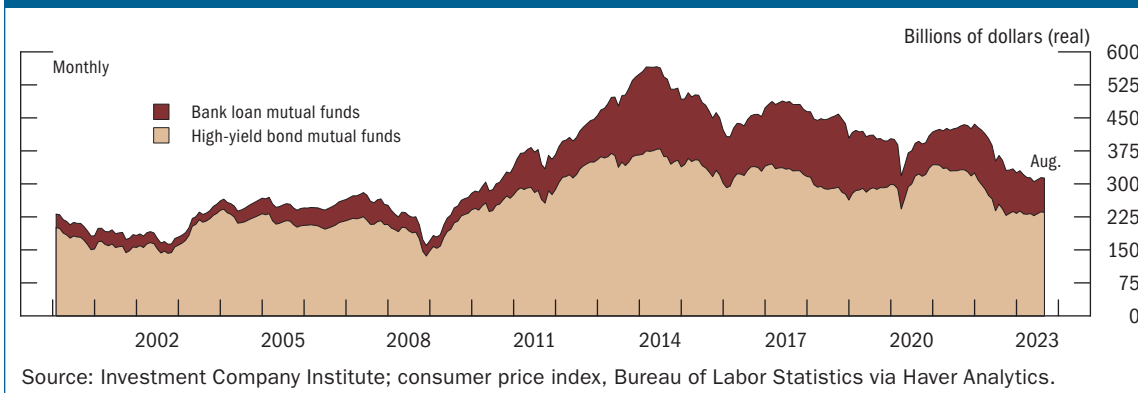
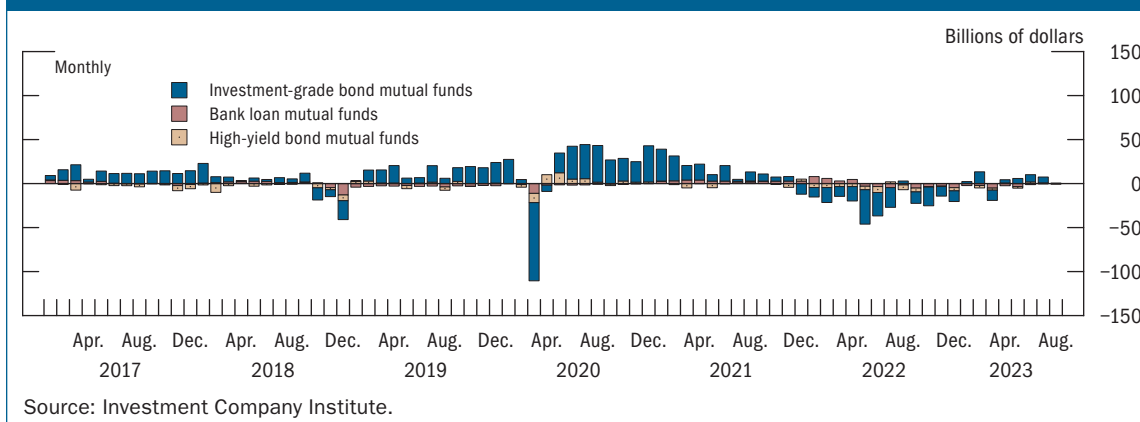


Figure 4.8. The outflows that bond and bank loan mutual funds experienced in 2022 have stabilized

Central counterparties' initial margin levels and prefunded resources remained high, but liquidity risks remain amid elevated volatility

Interest rate volatility rose to elevated levels late last year and stressed some central counterparties (CCPs) that focus on clearing interest rate products. As volatility in rates and other markets retreated from recent highs, CCPs' margin and prefunded resources fell more slowly.¹³ Taken together, higher initial margins and elevated levels of prefunded resources relative to anticipated volatility likely lowered credit risk at CCPs because the amount of resources readily available in case of default by one or more clearing members is likely to be generally higher relative to the market risk of cleared portfolios. However, CCPs continue to face potentially substantial liquidity needs in the event of a default during highly volatile stressed markets. Further, additional liquidity risk remains around the concentration of clients at the largest clearing members, which could make transferring client positions to other clearing members challenging if it were ever necessary.

Life insurers' reliance on nontraditional liabilities remained high

Over the past decade, the liquidity of life insurers' assets steadily declined, and the liquidity of their liabilities slowly increased, potentially making it more difficult for life insurers to meet a sudden rise in withdrawals and other claims. As of 2022, the share of illiquid assets held on life insurers' balance sheets—including CRE loans, less liquid corporate debt, and alternative investments—stood at a historic high (figure 4.9). In addition, they have continued to rely on

¹³ Prefunded resources represent financial assets, including cash and securities, transferred by the clearing members to the CCP to cover that CCP's potential credit exposure in case of default by one or more clearing members. These prefunded resources are held as initial margin and prefunded mutualized resources, which builds the resilience of CCPs to the possible default of a clearing member or market participant.

nontraditional liabilities—including funding-agreement-backed securities, Federal Home Loan Bank advances, and cash received through repurchase agreements and securities lending transactions—which offer some investors the opportunity to withdraw funds on short notice (figure 4.10).

Figure 4.9. Life insurers held more risky, illiquid assets on their balance sheets

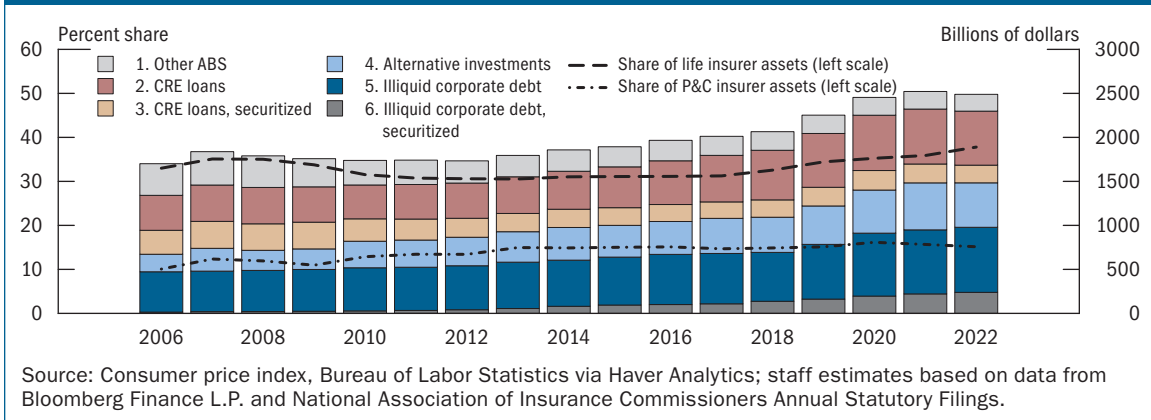
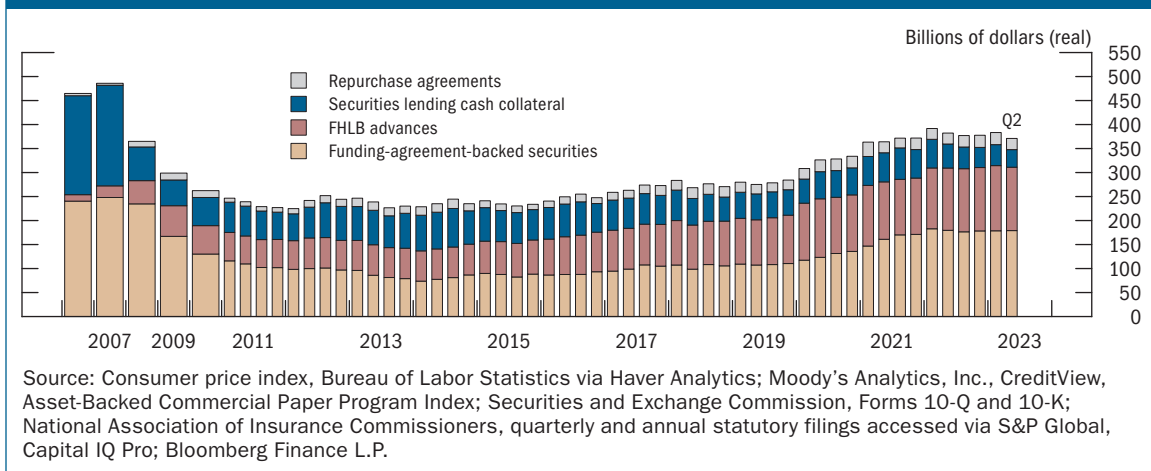


Figure 4.10. Life insurers continued to rely on nontraditional liabilities



5 | Near-Term Risks to the Financial System

The Federal Reserve routinely engages in discussions with domestic and international policymakers, academics, community groups, and others to gauge the set of risks of greatest concern to these groups. As noted in the box “[Survey of Salient Risks to Financial Stability](#),” in recent outreach, contacts were particularly focused on the risk of persistent inflationary pressures leading to a more restrictive monetary policy stance, the potential for large losses on CRE and residential real estate, the reemergence of banking-sector stress, and risks associated with market liquidity strains and volatility. Respondents were increasingly attentive to risks posed from economic weakness in China and high levels of public debt in the U.S. and other advanced economies. Heightened geopolitical tensions continue to pose important risks to global economic activity.

The following discussion considers possible interactions of existing domestic vulnerabilities with several potential near-term risks, including international risks. The box “[Transmission of Stress Abroad to the U.S. Financial System](#),” featured in the May 2023 *Financial Stability Report*, discusses some transmission channels through which shocks originating abroad can transmit back to the U.S. financial system.¹⁴

A significant slowdown in economic growth could pose risks to the financial system and precipitate strains in commercial real estate

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 would likely lead to financial stress and defaults at some firms. Such dynamics may lead to job losses and strains on households, potentially leading to a mild recession. Investor risk appetite and asset prices might decline, and valuations in the office building sector appear particularly vulnerable given the ongoing uncertainty surrounding post-pandemic norms regarding return to work. A correction in office property valuations accompanied by even a mild recession could result in significant losses for a range of financial institutions with sizable exposures, including some regional and community banks and insurance companies. Lenders that experience large losses may reduce their willingness to supply credit to the broader economy, which would further weigh on economic activity. While stress tests suggest the largest banks are well positioned to withstand a severe recession and contraction in CRE markets, other financial institutions with concentrated exposures could be forced to retrench.

¹⁴ See the box “[Transmission of Stress Abroad to the U.S. Financial System](#)” in Board of Governors of the Federal Reserve System (2023), *Financial Stability Report* (Washington: Board of Governors, May), pp. 63–65, <https://www.federalreserve.gov/publications/files/financial-stability-report-20230508.pdf>.

Persistent inflation in the U.S. and other advanced economies could pose risks to the global financial system

Energy prices have increased notably in recent months, leading to renewed cost pressures that businesses might pass on to their customers. Unexpected persistence in inflation from any source could prompt upward revisions to the path of policy rates. A sharp increase in rates could lead to heightened volatility in financial markets, stresses to market liquidity, and an adjustment in asset prices. In the U.S., higher rates and lower real incomes would strain the balance sheets of some households and businesses and, in conjunction with other adverse shocks, could lead to a significant economic slowdown. Collectively, these factors could lead to pronounced losses among financial intermediaries and a consequent reduction in the supply of credit. High interest rates in foreign economies, particularly if they persist, could negatively affect the debt servicing capacity of households, businesses, and governments abroad. This stress could spill over to the U.S. through strains in dollar funding markets, rapid rebalancing of portfolios, and diminished credit provisions by foreign lenders to U.S. entities.

A further slowdown in Chinese growth could worsen financial stresses in China and strain markets worldwide

In China, a further slowdown in economic growth could increase distress among borrowers and worsen financial stresses. Many Chinese firms are struggling to service very high debt burdens, especially in the property sector, and local governments are also facing increasing fiscal strains. Stresses originating from China could spill over to other emerging market economies (EMEs), particularly those that are dependent on trade with China or on credit provided by Chinese entities. The spillovers could result in significant capital outflows from EMEs, where generally heightened debt levels may make these economies more susceptible to external shocks. Given the size of its economy and financial system, financial stresses in China also could strain global markets more broadly through disruptions to economic activity, deterioration of risk sentiment, and possibly a sharp appreciation of the dollar, potentially affecting the U.S.

A worsening of global geopolitical tensions could lead to broad adverse spillovers to global markets

The attack on Israel, in conjunction with Russia's ongoing war against Ukraine, has ratcheted up geopolitical tensions. These tensions pose important risks to global economic activity, including the possibility of sustained disruptions to regional trade in food, energy, and other commodities. Escalation of these conflicts or a worsening in other geopolitical tensions could reduce economic activity and boost inflation worldwide, particularly in the event of prolonged disruptions to supply chains and interruptions in production. The global financial system could be affected by a pull-back from risk-taking, declines in asset prices, and losses for exposed businesses and investors, including those in the U.S.

Box 5.1. Survey of Salient Risks to Financial Stability

As part of its market intelligence gathering, staff from the Federal Reserve Bank of New York solicited views from a wide range of contacts on risks to U.S. financial stability. From August 10 to October 4, the staff surveyed 25 contacts, including professionals at broker-dealers, investment funds, research and advisory firms, and academics (figure A). Several risks that featured prominently in the survey conducted in the spring remained top-of-mind, including the risk of persistent inflationary pressures leading to a more restrictive monetary policy stance, the potential for large losses on CRE and residential real estate, and the reemergence of banking-sector stress (figure B). Contacts continued to express concern over potential market liquidity strains, with some highlighting risks stemming from rising long-term interest rates. Respondents were increasingly attentive to risks posed from economic weakness in China and high levels of public debt in advanced economies. Although geopolitical tensions from both the Russia–Ukraine war and U.S.–China relations featured prominently in the May 2023 report, these risks had slipped out of the top five cited concerns for the current survey, which closed before the attack on Israel. This discussion summarizes the most cited risks from this round of outreach.

Persistent inflation and monetary tightening

Contacts continued to highlight the risk of persistent or reaccelerating inflationary pressures, particularly in the U.S. amid a more resilient economic outlook, that could lead to further monetary policy tightening and volatile market conditions. Some contacts worried that persistent elevated inflation might entrench expectations of higher inflation, which could lead to higher realized inflation and require an even more restrictive monetary policy stance that could either induce or exacerbate a recession.

Commercial real estate

Many contacts saw real estate as a potential trigger for systemic stress, most notably in the commercial sector, where concerns over higher interest rates, declining property prices, and structural shifts in demand for office space may prompt large realized losses. Survey respondents viewed small and regional domestic banks as particularly vulnerable due to their higher concentration of CRE exposures, which could lead to tighter bank lending conditions.

Reemergence of banking-sector stress

Although survey respondents noted the banking sector has stabilized since the period of acute stress earlier this year, many highlighted risks of renewed deposit outflows given that large portions of deposits remain uninsured. Many respondents continued to link risks of reemerging banking-sector stress to potential losses on CRE exposures, particularly among smaller and regional banks.

Market liquidity strains and volatility

Respondents expressed concern over strained liquidity conditions and intermediation capacity in sovereign bond markets during periods of market stress, which could exacerbate volatile trading conditions. Contacts noted these factors could weigh on investor sentiment and risky asset prices while also exposing vulnerabilities among highly levered NBFIs, which could be forced to liquidate assets, putting downward pressure on market prices, potentially tightening financial conditions.

Weakness in the Chinese economy and financial sector

Contacts frequently noted slowing growth in China and highlighted several risks that could emerge from continued economic weakness, including capital flight, which could contribute to a stronger U.S. dollar and put downward pressure on Chinese assets and other Asian financial markets. Respondents also cited that weak growth in China, alongside weakness in Europe, increased the likelihood of a global recession, despite economic resilience in the U.S. Increased foreign exchange market volatility and the implementation of capital controls were also cited as risks.

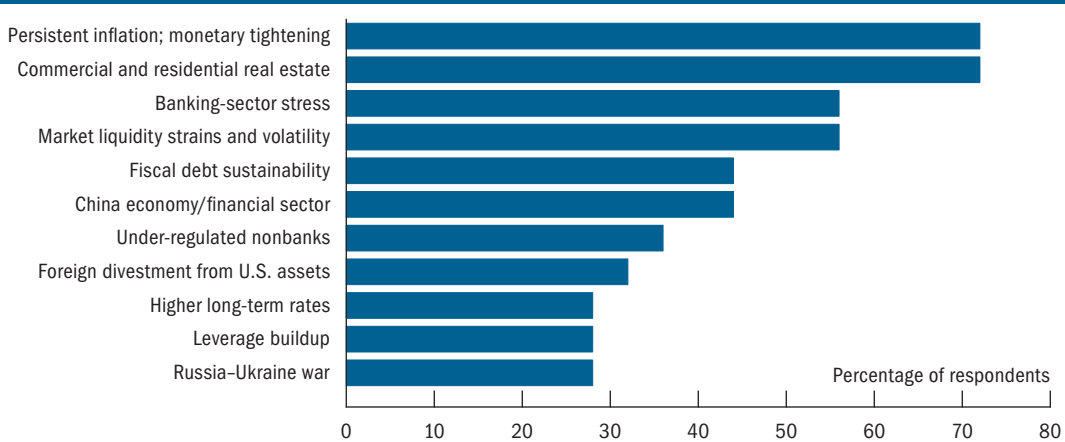
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Box 5.1—continued

Fiscal debt sustainability

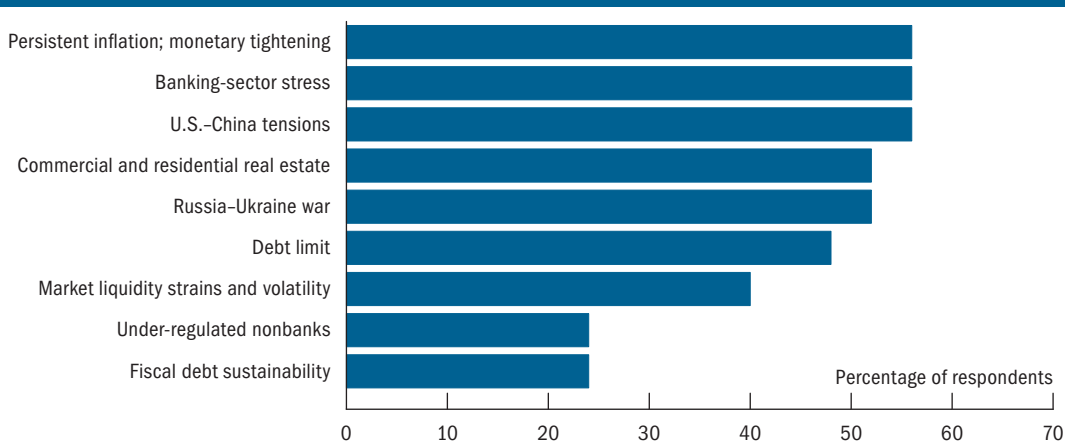
Respondents noted possible risks emanating from higher levels of public debt and wider fiscal deficits in advanced economies, particularly in the U.S., which could drive Treasury market volatility and strain Treasury market liquidity. Higher long-term interest rates and bond term premia were noted as possible effects of expected increases in sovereign bond issuance.

Figure A. Fall 2023: Most cited potential risks over the next 12 to 18 months



Source: Federal Reserve Bank of New York survey of 25 market contacts from August to October.

Figure B. Spring 2023: Most cited potential risks over the next 12 to 18 months



Source: Federal Reserve Bank of New York survey of 25 market contacts from February to April.

Box 5.2. An Approach to Assessing Climate-Related Financial Risks

The Federal Reserve's responsibilities with respect to climate change are narrow but important. These responsibilities are tightly linked to its role in promoting the safety and soundness of individual financial institutions as well as the stability of the financial system. Hence, the Federal Reserve, much like many financial market participants, is working to better understand the risks that climate change may pose to individual banking organizations and the financial system.

A key area of focus is identifying the appropriate data and tools needed to assess climate-related financial risks that could affect the goals mandated to the Federal Reserve by Congress. These efforts focus on the translation of physical and transition risks associated with climate change into financial risks. To do so, climate data need to be processed into a form that can be merged with financial data. In addition, exposures of financial institutions to those risks need to be assessed, which requires analyses of financial institution disclosures. To go beyond exposures of individual institutions, models or scenarios are used to evaluate the transfer of climate-related risks within the financial system and to assess the significance of climate-related risks to financial stability.

Because the effects of climate change are highly uncertain, geographically diffuse, and realized over time, it is important to scrutinize underlying assumptions, consider alternative estimation methodologies, and utilize a wide range of data. Accordingly, a focus of this work is on coordinating with domestic and international groups to develop models and to address data gaps in order to improve financial stability risk assessments.

Measurement of climate-related financial risks to individual financial institutions and to financial markets requires data and methodologies that may be new to financial institutions, market participants, and regulators. Because other regulators face similar challenges, the Federal Reserve is engaging both with Financial Stability Oversight Council members and with international groups, such as the Financial Stability Board, the Basel Committee on Banking Supervision, the Network of Central Banks and Supervisors for Greening the Financial System, and the International Monetary Fund.¹

¹ See, for example, Financial Stability Board (2021), *FSB Roadmap for Addressing Climate-Related Financial Risks* (Basel: FSB, July 7), <https://www.fsb.org/wp-content/uploads/P070721-2.pdf>.

Appendix | Figure Notes

Figure 1.1. Nominal Treasury yields rose substantially in the third quarter of 2023

The 2-year and 10-year Treasury rates are the monthly average of the constant-maturity yields based on the most actively traded securities.

Figure 1.2. An estimate of the nominal Treasury term premium increased but remained relatively low

Term premiums are estimated from a 3-factor term structure model using Treasury yields and Blue Chip interest rate forecasts.

Figure 1.3. Interest rate volatility remained elevated by historical norms

The data begin in April 2005. Implied volatility on the 10-year swap rate, 1 month ahead, is derived from swaptions.

Figure 1.4. The price-to-earnings ratio of S&P 500 firms increased to levels further above its historical median

The figure shows the aggregate forward price-to-earnings ratio of S&P 500 firms, based on expected earnings for 12 months ahead.

Figure 1.5. An estimate of the equity premium fell further below its historical median

The data begin in October 1991. The figure shows the difference between the aggregate forward earnings-to-price ratio of S&P 500 firms and the expected real Treasury yields, based on expected earnings for 12 months ahead. Expected real Treasury yields are calculated from the 10-year consumer price index inflation forecast, and the smoothed nominal yield curve is estimated from off-the-run securities.

Figure 1.6. Volatility in equity markets stood slightly above its historical median

Realized volatility is computed from an exponentially weighted moving average of 5-minute daily realized variances with 75 percent of the weight distributed over the past 20 business days.

Figure 1.7. Corporate bond yields rose above their historical medians

The triple-B series reflects the effective yield of the ICE Bank of America Merrill Lynch (BofAML) triple-B U.S. Corporate Index (COA4), and the high-yield series reflects the effective yield of the ICE BofAML U.S. High Yield Index (H0A0).

Figure 1.8. Corporate bond spreads narrowed modestly

The triple-B series reflects the option-adjusted spread of the ICE Bank of America Merrill Lynch (BofAML) triple-B U.S. Corporate Index (COA4), and the high-yield series reflects the option-adjusted spread of the ICE BofAML U.S. High Yield Index (H0A0).

Figure 1.9. The excess bond premium stayed near its historical mean

The excess bond premium (EBP) is a measure of bond market investors' risk sentiment. It is derived as the residual of a regression that models corporate bond spreads after controlling for expected default losses. By construction, its historical mean is zero. Positive (negative) EBP values indicate that investors' risk appetite is below (above) its historical mean.

Figure 1.10. Spreads on leveraged loans fell modestly

The data show secondary-market discounted spreads to maturity. Spreads are the constant spread used to equate discounted loan cash flows to the current market price. B-rated spreads begin in July 1997. The black dashed line represents the data transitioning from monthly to weekly in November 2013.

Figure 1.11. Treasury market depth remained below historical norms

Market depth is defined as the average top 3 bid and ask quote sizes for on-the-run Treasury securities.

Figure 1.12. On-the-run market depth improved in recent months but remained below historical norms

The data show the time-weighted average market depth at the best quoted prices to buy and sell, for 2-year and 10-year Treasury notes. OTR is on-the-run.

Figure 1.13. A measure of liquidity in equity markets remained below average

The data show the depth at the best quoted prices to buy and sell, defined as the ask size plus the bid size divided by 2, for E-mini S&P 500 futures.

Figure 1.14. Commercial real estate prices, adjusted for inflation, continued to decline

The data are deflated using the consumer price index.

Figure 1.15. Income of commercial properties relative to prices continued to grow but remained well below historical norms

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

Figure 1.16. Banks reported tightening lending standards in commercial real estate loans

Banks' responses are weighted by their commercial real estate loan market shares. The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: March 2001–November 2001, December 2007–June 2009, and February 2020–April 2020. Survey respondents to the Senior Loan Officer Opinion Survey on Bank Lending Practices are asked about the changes over the quarter.

Figure 1.17. House prices started increasing again in recent months

The data extend through August 2023 for Zillow and CoreLogic and July 2023 for Case-Shiller.

Figure 1.18. Model-based measures of house price valuations remained historically high

The values for 2023:Q3 are based on monthly data through July 2023. The data for the market-based rents model begin in 2004:Q1. Valuation is measured as the deviation from the long-run relationship between the price-to-rent ratio and the real 10-year Treasury yield.

Figure 1.19. House price-to-rent ratios remained elevated across geographic areas

The data are seasonally adjusted. Percentiles are based on 19 large metropolitan statistical areas.

Figure 1.20. Farmland prices stayed near historical highs

The data for the U.S. begin in 1997. Midwest index is a weighted average of Corn Belt and Great Plains states derived from staff calculations. Values are given in real terms. The value for 2023 is based on monthly data through July 2023.

Figure 1.21. Farmland prices grew faster than rents

The data for the U.S. begin in 1998. Midwest index is a weighted average of Corn Belt and Great Plains states derived from staff calculations. The value for 2023 is based on monthly data through July 2023.

Figure 2.1. The total debt of businesses and households relative to GDP declined further

The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: January 1980–July 1980, July 1981–November 1982, July 1990–March 1991, March 2001–November 2001, December 2007–June 2009, and February 2020–April 2020. GDP is gross domestic product.

Figure 2.2. Both business and household debt-to-GDP ratios edged down

The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: January 1980–July 1980, July 1981–November 1982, July 1990–March 1991, March 2001–November 2001, December 2007–June 2009, and February 2020–April 2020. GDP is gross domestic product.

Figure 2.3. Business debt adjusted for inflation continued to decline

Nominal debt growth is seasonally adjusted and is translated into real terms after subtracting the growth rate of the price deflator for the core personal consumption expenditures price index.

Figure 2.4. Net issuance of risky debt remained subdued

The data begin in 2004:Q2. Institutional leveraged loans generally exclude loan commitments held by banks. The key identifies bars in order from top to bottom (except for some bars with at least one negative value).

Figure 2.5. Gross leverage of large businesses remained at high levels by historical standards

Gross leverage is an asset-weighted average of the ratio of firms' book value of total debt to book value of total assets. The 75th percentile is calculated from a sample of the 2,500 largest firms by assets. The dashed sections of the lines in the first quarter of 2019 reflect the structural

break in the series due to the 2019 compliance deadline for Financial Accounting Standards Board rule Accounting Standards Update 2016-02. The accounting standard requires operating leases, previously considered off-balance-sheet activities, to be included in measures of debt and assets.

Figure 2.6. Firms' ability to service their debt, as measured by the interest coverage ratio, continued to decline from post-pandemic highs

The interest coverage ratio is earnings before interest and taxes divided by interest payments. Firms with leverage less than 5 percent and interest payments less than \$500,000 are excluded.

Figure 2.7. Default rates on leveraged loans inched up from historically low levels

The data begin in December 1998. 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 with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: March 2001–November 2001, December 2007–June 2009, and February 2020–April 2020.

Figure 2.8. New leveraged loans with debt multiples less than 4 continued to rise

Volumes are for large corporations with earnings before interest, taxes, depreciation, and amortization greater than \$50 million and exclude existing tranches of add-ons and amendments as well as restatements with no new money. The key identifies bars in order from top to bottom.

Figure 2.9. Real household debt edged down

Subprime are those with an Equifax Risk Score less than 620; near prime are 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 2023 dollars using the consumer price index.

Figure 2.10. A model-based estimate of housing leverage was flat

Housing leverage is estimated as the ratio of the average outstanding mortgage loan balance for owner-occupied homes with a mortgage to (1) current home values using the Zillow 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 2.11. Mortgage delinquency rates remained near historically low levels

Loss mitigation includes tradelines that have a narrative code of forbearance, natural disaster, payment deferral (including partial), loan modification (including federal government plans), or loans with no scheduled payment and a nonzero balance. Delinquent includes loans reported to the credit bureau as at least 30 days past due.

Figure 2.13. New mortgage extensions to nonprime borrowers were subdued

Year-over-year change in balances for the second quarter of each year among those households whose balance increased over this window. Subprime are those with an Equifax Risk Score less than 620; near prime are from 620 to 719; prime are greater than 719. Scores were measured

1 year ago. The data are converted to constant 2023 dollars using the consumer price index. The key identifies bars in order from left to right.

Figure 2.14. Real consumer credit edged down in the first half of 2023

The data are converted to constant 2023 dollars using the consumer price index. Student loan data begin in 2005.

Figure 2.15. Real auto loans outstanding ticked up for prime borrowers

Subprime are those with an Equifax Risk Score less than 620; near prime are from 620 to 719; prime are greater than 719. Scores are measured contemporaneously. The data are converted to constant 2023 dollars using the consumer price index.

Figure 2.16. Auto loan delinquencies remained at levels above their historical median

Loss mitigation includes tradelines that have a narrative code of forbearance, natural disaster, payment deferral (including partial), loan modification (including federal government plans), or loans with no scheduled payment and a nonzero balance. Delinquent includes loans reported to the credit bureau as at least 30 days past due. The data for auto loans are reported semiannually by the Risk Assessment, Data Analysis, and Research Data Warehouse until 2017, after which they are reported quarterly. The data for delinquent/loss mitigation begin in the first quarter of 2001.

Figure 2.17. Real credit card balances rose in the first half of 2023

Subprime are those with an Equifax Risk Score less than 620; near prime are from 620 to 719; prime are greater than 719. Scores are measured contemporaneously. The data are converted to constant 2023 dollars using the consumer price index.

Figure 2.18. Credit card delinquencies increased further in the first half of 2023

Delinquency measures the fraction of balances that are at least 30 days past due, excluding severe derogatory loans. The data are seasonally adjusted.

Figure 3.1. Banks' average interest rate on interest-earning assets remained significantly above the average expense rate on liabilities

Average interest rate on interest-earning assets is total interest income divided by total interest-earning assets. Average interest expense rate on liabilities is total interest expense divided by total liabilities. The shaded bar with a top cap indicates a period of business recession as defined by the National Bureau of Economic Research: February 2020–April 2020.

Figure 3.2. The fair values of banks' securities portfolios declined in the second quarter of 2023 as interest rates rose

The figure plots the difference between the fair and amortized cost values of the securities. The sample consists of all bank holding companies and commercial banks.

Figure 3.3. Banks' risk-based capital ratio remained near the median level since the Great Recession

The data are seasonally adjusted by Federal Reserve Board staff. The sample consists of domestic bank holding companies (BHCs) and intermediate holding companies (IHCs) with a substantial U.S. commercial banking presence. G-SIBs are global systemically important banks. Large non-G-SIBs are BHCs and IHCs with greater than \$100 billion in total assets that are not G-SIBs. Before 2014:Q1 (advanced-approaches BHCs) or before 2015:Q1 (non-advanced-approaches BHCs), the numerator of the common equity Tier 1 ratio is Tier 1 common capital. Afterward, the numerator is common equity Tier 1 capital. The denominator is risk-weighted assets. The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: March 2001–November 2001, December 2007–June 2009, and February 2020–April 2020.

Figure 3.4. The ratio of tangible common equity to tangible assets increased for banks of all categories

The data are seasonally adjusted by Federal Reserve Board staff. The sample consists of domestic bank holding companies (BHCs), intermediate holding companies (IHCs) with a substantial U.S. commercial banking presence, and commercial banks. G-SIBs are global systemically important banks. Large non-G-SIBs are BHCs and IHCs with greater than \$100 billion in total assets that are not G-SIBs. Bank equity is total equity capital net of preferred equity and intangible assets. Bank assets are total assets net of intangible assets. The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: July 1990–March 1991, March 2001–November 2001, December 2007–June 2009, and February 2020–April 2020.

Figure 3.5. Borrower leverage for bank commercial and industrial loans increased

The figure shows the weighted median leverage of nonfinancial firms that borrow using commercial and industrial loans from the 24 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 3.6. Banks reported tightening lending standards in commercial and industrial loans

Banks' responses are weighted by their commercial and industrial loan market shares. Survey respondents to the Senior Loan Officer Opinion Survey on Bank Lending Practices are asked about the changes over the quarter. Results are shown for loans to large and medium-sized firms. The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: March 2001–November 2001, December 2007–June 2009, and February 2020–April 2020.

Figure 3.7. Leverage at broker-dealers remained historically low

Leverage is calculated by dividing total assets by equity.

Figure 3.8. Trading profits in June were near their average levels since 2018

The sample includes all trading desks of bank holding companies subject to the Volcker rule reporting requirement.

Figure 3.9. Equities dropped slightly as a share of trading profits in the most recent data

The sample includes all trading desks of bank holding companies subject to the Volcker rule reporting requirement. The “other” category comprises desks trading in municipal securities, foreign exchange, and commodities, as well as any unclassified desks. The key identifies series in order from top to bottom.

Figure 3.10. Leverage at life insurance companies remained near the middle of its historical range

Ratio is calculated as $(\text{total assets} - \text{separate account assets}) / (\text{total capital} - \text{accumulated other comprehensive income})$ using generally accepted accounting principles. The largest 10 publicly traded life and property and casualty insurers are represented.

Figure 3.11. Leverage at hedge funds remained somewhat elevated

Means are weighted by net asset value (NAV). On-balance-sheet leverage is the ratio of gross asset value to NAV. Gross leverage is the ratio of gross notional exposure to NAV. Gross notional exposure includes both on-balance-sheet exposures and off-balance-sheet derivative notional exposures. Options are delta adjusted, and interest rate derivatives are reported at 10-year bond equivalent values. The data are reported on a 2-quarter lag beginning in the first quarter of 2013.

Figure 3.12. Leverage at the largest hedge funds increased

Leverage is measured by gross asset value (GAV) divided by net asset value (NAV). Funds are sorted into cohorts based on GAV. Average leverage is computed as the NAV-weighted mean.

Figure 3.13. Dealers indicated that the use of leverage by hedge funds remained largely unchanged

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

Figure 3.14. Issuance of non-agency securitized products has slowed significantly since 2022

The data from the first and second quarters of 2023 are annualized to create the 2023 bar. RMBS is residential mortgage-backed securities; CMBS is commercial mortgage-backed securities; CDO is collateralized debt obligation; 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; resecuritized real estate mortgage investment conduit (Re-REMIC) RMBS; and Re-REMIC CMBS. The data are converted to constant 2023 dollars using the consumer price index. The key identifies bars in order from top to bottom.

Figure 3.15. Bank credit commitments to nonbank financial institutions remained high

Committed amounts on credit lines and term loans extended to nonbank financial institutions by a balanced panel of 24 bank holding companies that have filed Form FR Y-14Q in every quarter

since 2018:Q1. Nonbank financial institutions 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). BDC is business development company. 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.

Figure 3.16. Aggregate credit commitments to nonbank financial institutions increased over the past year but varied across sectors

2023:Q2-over-2022:Q2 growth rates as of the end of the second quarter of 2023. REIT is real estate investment trust; PE is private equity; BDC is business development company; SPE is special purpose entity; CLO is collateralized loan obligation; ABS is asset-backed securities. The key identifies bars in order from left to right.

Figure 4.1. Ratios of runnable money-like liabilities to GDP edged down but remained above their historical medians

The black striped area denotes the period from 2008:Q4 to 2012:Q4, when insured deposits increased because of the Transaction Account Guarantee program. The “other” category consists of variable-rate demand obligations (VRDOs), federal funds, funding-agreement-backed securities, private liquidity funds, offshore money market funds, short-term investment funds, local government investment pools, and stablecoins. Securities lending includes only lending collateralized by cash. GDP is gross domestic product. Values for VRDOs come from Bloomberg beginning in 2019:Q1. See Jack Bao, Josh David, and Song Han (2015), “The Runnables,” FEDS Notes (Washington: Board of Governors of the Federal Reserve System, September 3), <https://www.federalreserve.gov/econresdata/notes/feds-notes/2015/the-runnables-20150903.html>.

Figure 4.2. The amount of high-quality liquid assets held by most banks continued to decrease in the first half of 2023

The sample consists of domestic bank holding companies (BHCs), intermediate holding companies (IHCs) with a substantial U.S. commercial banking presence, and commercial banks. G-SIBs are global systemically important banks. Large non-G-SIBs are BHCs and IHCs with greater than \$100 billion in total assets that are not G-SIBs. Liquid assets are cash plus estimates of securities that qualify as high-quality liquid assets as defined by the Liquidity Coverage Ratio requirement. Accordingly, Level 1 assets and discounts and restrictions on Level 2 assets are incorporated into the estimate.

Figure 4.3. Banks’ reliance on short-term wholesale funding remained low

Short-term wholesale funding is defined as the sum of large time deposits with maturity less than 1 year, federal funds purchased and securities sold under agreements to repurchase, deposits in foreign offices with maturity less than 1 year, trading liabilities (excluding revaluation

losses on derivatives), and other borrowed money with maturity less than 1 year. The shaded bars with top caps indicate periods of business recession as defined by the National Bureau of Economic Research: March 2001–November 2001, December 2007–June 2009, and February 2020–April 2020.

Figure 4.4. Credit extended by the Bank Term Funding Program stabilized at around \$110 billion

The key identifies series in order from top to bottom.

Figure 4.5. Growth in money market funds was concentrated in retail prime funds

The data are converted to constant 2023 dollars using the consumer price index.

Figure 4.6. Corporate bonds held by bond mutual funds stabilized in the first half of 2023

The data show holdings of all U.S. corporate bonds by all U.S.-domiciled mutual funds (holdings of foreign bonds are excluded). The data are converted to constant 2023 dollars using the consumer price index.

Figure 4.7. Assets held by bank loan and high-yield mutual funds continued to decrease in 2023

The data are converted to constant 2023 dollars using the consumer price index. The key identifies series in order from top to bottom.

Figure 4.8. The outflows that bond and bank loan mutual funds experienced in 2022 have stabilized

Mutual fund assets under management as of August 2023 included \$2,211 billion in investment-grade bond mutual funds, \$313 billion in high-yield bond mutual funds, and \$78 billion in bank loan mutual funds. Bank loan mutual funds, also known as floating-rate bond funds, are excluded from high-yield bond mutual funds.

Figure 4.9. Life insurers held more risky, illiquid assets on their balance sheets

The data are converted to constant 2022 dollars using the consumer price index. Securitized products include collateralized loan obligations for corporate debt, private-label commercial mortgage-backed securities for commercial real estate (CRE), and private-label residential mortgage-backed securities and asset-backed securities (ABS) backed by autos, credit cards, consumer loans, and student loans for other ABS. Illiquid corporate debt includes private placements, bank and syndicated loans, and high-yield bonds. Alternative investments include assets filed under Schedule BA. P&C is property and casualty. The key identifies bars in order from top to bottom.

Figure 4.10. Life insurers continued to rely on nontraditional liabilities

The data are converted to constant 2023 dollars using the consumer price index. FHLB is Federal Home Loan Bank. The data are annual from 2006 to 2010 and quarterly thereafter. The key identifies bars in order from top to bottom.

Box 5.1. Survey of Salient Risks to Financial Stability

Figure A. Fall 2023: Most cited potential risks over the next 12 to 18 months

Responses are to the following question: “Over the next 12–18 months, which shocks, if realized, do you think would have the greatest negative effect on the functioning of the U.S. financial system?”

Figure B. Spring 2023: Most cited potential risks over the next 12 to 18 months

Responses are to the following question: “Over the next 12–18 months, which shocks, if realized, do you think would have the greatest negative effect on the functioning of the U.S. financial system?”

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