ANNUAL REPORT 2023

FSOC

Financial Stability Oversight Council

Financial Stability Oversight Council

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

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

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

The voting members are:

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

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

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

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

Statutory Requirements for the Annual Report

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

1) the activities of the Council;
2) significant financial market and regulatory developments, including insurance and accounting regulations and standards, along with an assessment of those developments on the stability of the financial system;
3) potential emerging threats to the financial stability of the United States;
4) all determinations made under Section 113 or Title VIII and the basis for such determinations;
5) all recommendations made under Section 119 and the result of such recommendations; and
6) recommendations—
   a) to enhance the integrity, efficiency, competitiveness, and stability of United States financial markets;
   b) to promote market discipline; and
   c) to maintain investor confidence.

Approval of the Annual Report

This annual report was approved by the voting members of the Council on December 14, 2023.

Abbreviations for Council Member Agencies and Member Agency Offices

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

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1 Member Statement

The Honorable Mike Johnson
Speaker of the House
United States House of Representatives

The Honorable Hakeem Jeffries
Democratic Leader
United States House of Representatives

The Honorable Kamala D. Harris
President of the Senate
United States Senate

The Honorable Charles E. Schumer
Majority Leader
United States Senate

The Honorable Mitch McConnell
Republican Leader
United States Senate

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

Janet L. Yellen
Secretary of the Treasury
Chairperson, Financial Stability Oversight Council

Jerome H. Powell
Chair
Board of Governors of the Federal Reserve System

Michael J. Hsu
Acting Comptroller of the Currency
Office of the Comptroller of the Currency

Rohit Chopra
Director
Consumer Financial Protection Bureau

Gary Gensler
Chair
Securities and Exchange Commission

Martin J. Gruenberg
Chairman
Federal Deposit Insurance Corporation

Rostin Behnam
Chairman
Commodity Futures Trading Commission

Sandra L. Thompson
Director
Federal Housing Finance Agency

Todd M. Harper
Chairman
National Credit Union Administration

Thomas E. Workman
Independent Member Having Insurance Expertise
Financial Stability Oversight Council

2 Executive Summary

The Council was established by the Dodd-Frank Act in 2010 and was charged with the collective responsibility to monitor and promote U.S. financial stability. Financial stability can be defined as the financial system being resilient to events or conditions that could impair its ability to support economic activity, such as by intermediating financial transactions, facilitating payments, allocating resources, and managing risks. This annual report summarizes the Council's assessment of current vulnerabilities that contribute to financial stability risks, the Council's recommendations for mitigating vulnerabilities across a variety of asset classes, institutions, activities, and developments, and the 2023 activities of the Council and member agencies to reduce and respond to risks and lessen vulnerabilities facing the financial system.

This year, vulnerabilities in the banking sector that increased risks to financial stability were exposed. While fundamentally resulting from poor risk management practices and a heavy reliance on uninsured deposits, the failure of two regional banks in Spring 2023 underscored that activities of non–global systemically important banks can pose a risk to financial stability. As Silicon Valley Bank (SVB) and Signature Bank were failing in early March, other regional banks with similar business models, like First Republic Bank, also experienced larger than normal uninsured deposit outflows. Concern then mounted about the risk of additional regional bank failures. This potential contagion could have impaired the ability of households and businesses to manage their immediate financial obligations and in turn had the potential to cause significant disruptions to economic activity. Together, the Treasury, FDIC, and the Federal Reserve responded immediately with decisive actions to strengthen public confidence in the U.S. banking system and protect the U.S. economy (see **Box C: The Spring 2023 Turmoil and Policy Response**). Through the successful and timely resolution of the failed banks, the use of the systemic risk exception,[1] and the establishment of the Bank Term Funding Program, the systemic risk of contagion from these events was successfully mitigated.

Reviews of the events by federal and state regulators have yielded lessons about the ways in which banking supervision and resolution preparedness can be enhanced. These include improving data and the monitoring of uninsured deposits and depositor composition, proposals for long-term debt requirements, enhancing resolution planning guidance and requirements under the Dodd-Frank and Federal Deposit Insurance Acts, changing supervisory risk identification frameworks, and strengthening the processes and culture of supervision.

In a dynamic, innovative financial system such as that of the U.S., risks that have been well understood for quite some time can manifest in new and unexpected ways. Bank runs are not new, but the speed with which deposits flowed out of some banks in early March was unprecedented. Prior bank runs, such as those that occurred in 2008, took place over a week or more. In contrast, in March, SVB and Signature Bank depositors withdrew over 20 percent of their deposits in one day, forcing immediate closure of the banks and spurring concerns of contagion. These rapid withdrawals were exacerbated by the highly concentrated depositor base, technological advances in digital banking, and the increasing speed of information transmission through social media (see **Box F: Speed of Financial Transactions and Information Transmission**). The contours of these recent failures provide important lessons for managing and responding to run risk going forward.

Despite the regional bank stress in the Spring, the U.S. banking system remains resilient overall. U.S. banks continue to have sound levels of regulatory capital and healthy levels of profitability while maintaining ample liquidity buffers. In particular, the global systemically important banks have maintained risk-based capital positions within the range exhibited in the last decade, and experienced deposit inflows during the turmoil in the Spring. However, banks continue to face challenges as interest rates increased further in 2023, leading to market value losses on some bank assets and contributing to rising funding costs. Among some regional and community banks, funding risk and exposure to commercial real estate (CRE) continue to be vulnerabilities.

In 2023, the major drivers of economic conditions have been persistently high inflation and increasing interest rates. In January 2023, the year-over-year change in the Personal Consumption Expenditure price index was 5.4 percent, and through the first half of the year, the Federal Reserve's Federal Open Market Committee (FOMC) continued its tightening of monetary policy to bring inflation down. Inflation has decreased to 3.4 percent in September, but this is still well above the 2 percent target that the FOMC has set for price stability. The U.S. economy continued to grow at a solid pace through the third quarter of 2023, with real gross domestic product (GDP) growth at an annualized rate of 3.1 percent over the first three quarters of the year and 4.9 percent in the third quarter of 2023. The labor market, while showing signs of cooling, remains strong, with the unemployment rate remaining below 4 percent and the pace of non-farm payroll employment growth averaging 240,000 jobs per month for the first ten months of 2023.

Most financial market participants surveyed expect that in 2024, real GDP growth will slow to below 2 percent, the labor market will soften slightly, and inflation will continue to fall.[2] As always, there is much uncertainty around these forecasts. This uncertainty may be heightened now as market participants and forecasters assess a high-inflation and high–interest rate environment with which the U.S. has had little modern experience. Additionally, the U.S. economy is evolving structurally amid the rise of hybrid work, the transition to less fossil fuel use, the accelerating use of artificial intelligence (AI), and other technology-related developments. There is also the potential for new shocks, including geopolitical events, to impact U.S. economic conditions.

Monetary policy tightening and uncertainty related to evolving economic conditions have contributed to increasing interest rates across the yield curve in 2023. Longer-term Treasury yields fell in response to the banking turmoil early this year but trended up strongly throughout the second and third quarter. As the FOMC raised the effective federal funds overnight rate by 100 basis points in 2023, yields on 10-year U.S. Treasuries rose to their highest level since 2007 in mid-October before partially retracing. While volatility of Treasury yields was elevated in 2023, market liquidity measures remained within range and markets functioned well. In particular, the Treasury market exhibited resilience in the Spring (see **Box D: Treasury Market Resilience During March 2023**). Since the beginning of 2023, the forward rates on U.S. Treasuries have increased, suggesting that market participants have increased their assessment of the probability that interest rates may remain higher for longer. These expectations as well as increasing term premia have contributed to the overall increase in rates and volatility.

The financial system has remained resilient amid the notable increase in interest rates this year, as solid economic conditions have supported continued strength in household and business balance sheets, as well as the strong performance of consumer and corporate credit. However, additional increases in market interest rates would further increase debt servicing costs for those borrowers with variable-rate debt or who need to refinance existing debt, as well as reduce the value of existing fixed-income instruments. Moreover, banks have tightened their lending standards in all loan categories, citing a desire to improve their capital and liquidity positions, increased concerns about deposit outflows, and reduced tolerance for risk, as well as uncertainty about the economic outlook. In addition, refinancing risk of CRE loans is elevated due to the sizeable amount of upcoming maturities in 2024. These factors can lead to potential financial stability risks if they result in financial distress among financial institutions and investors that spills over into other financial institutions and the broader system.

Similarly, the evolving participation of nonbank financial institutions (NBFIs) in the provision of financial services is an important area to monitor for vulnerabilities and potential risks to the broader financial system. NBFIs have long been a feature of the U.S. financial system and include institutions as diverse as investment funds, insurance companies, and central counterparties (CCPs), many of which are regulated or overseen by member agencies. As activities migrate to new entrants and existing business models evolve over time, the Council will continue to assess and respond to potential risks posed by evolving nonbank activities. This year's report includes a discussion of the potential risks related to the increasing role of nonbank mortgage servicers and the rapid increase in private credit. To enable the Council to more nimbly respond to the evolving landscape, in November 2023, the Council issued final versions of a new analytic framework for financial stability risks and updated guidance on the Council's nonbank financial company determinations process. The new analytic framework details the vulnerabilities and transmission channels that most commonly contribute to risks to financial stability. It also explains the range of authorities the Council may use to address any particular risk, including interagency coordination, recommendations to regulators, or the designation of certain entities. The use of these tools will be driven by the risk that has been identified, and the Council does not prioritize the use of one type of tool over another.

This year, for the first time, the Council has identified the use of AI in financial services as an emerging vulnerability in the financial system. AI has the potential to spur innovation and drive efficiency, but its use in financial services requires thoughtful implementation and supervision to manage potential risks. The use of AI, including machine learning, in financial services has been growing over time. This use may be poised to accelerate due to the broad introduction of generative AI tools early this year. Generative AI models use large datasets to identify patterns that allow the generation of new content including text, software code, images, and other media. Many AI approaches[3] present "explainability" challenges that make it difficult to assess the suitability and reliability of AI models and to assess the accuracy and potential bias of AI output. In addition, the reliance of AI systems on large datasets and third-party vendors introduces operational risks related to data controls, privacy, and cybersecurity.

In addition to monitoring emerging risks such as AI, the Council's continued monitoring of cybersecurity risk and climate-related financial risk is equally important, particularly in light of the growing number of cybersecurity incidents and climate-related events. Cybersecurity incidents, whether from ransomware, malware attacks, denial-of-service attacks, or data breaches, can impair the operations of individual financial institutions and impose losses on customers and counterparties. In addition to the technological aspects of cybersecurity, institutions must address the human element: the potential for insider threats and social engineering. This vulnerability interacts with other operational risks related to the use of third-party service providers. Regulatory line of sight into these third-party vendors and expertise in cybersecurity are critical for the supervisory community.

The vulnerability of the financial system to the physical components of climate risk can involve the manifestation and amplification of traditional credit, market, and operational risks. In this year's report, the Council highlights the effects of physical climate risk on the pricing and availability of property and casualty (P&C) insurance, which has implications for the functioning of residential real estate markets. The increasing frequency and severity of extreme weather can affect the solvency of insurers and the cost and availability of coverage for homeowners and businesses. In 2023, many insurance companies have raised their premiums or withdrawn from markets completely, most notably in high-risk geographic markets such as California, Florida, and Louisiana. These changes in the P&C insurance market could affect mortgage markets and house prices and could potentially generate larger economic spillover effects.

The Council has removed the LIBOR-related vulnerability from this year's report following the progress made in transitioning to more robust alternative reference rates. June 2023 marked the completion of a successful transition from the use of LIBOR to more robust alternative reference rates, including the Secured Overnight Funding Rate (SOFR) recommended by the Alternative Reference Rate Committee (ARRC). This transition follows a decade of collaborative work by the Council, the ARRC, and other private sector participants. Without adequate preparation, the cessation of LIBOR would have caused widespread disruptions to the financial system. This successful transition involved large and complex efforts across and within diverse financial institutions and markets. The same type of preparation and financial industry collaboration will be necessary to ensure a smooth transition in 2024 to T+1 settlement on securities and ensure that the financial stability benefits of faster settlement will be realized.

Section 3 of the report includes detailed discussions of the 14 financial stability vulnerabilities the Council has identified for 2023, and Council recommendations to address them. The vulnerabilities are grouped into three broad categories: Financial Risks; Financial Institutions; and Financial Market Structure, Operational Risk, and Technological Risk. In addition, the report includes several box topics that provide additional context for the assessment of financial stability vulnerabilities. The remainder of the Executive Summary provides a high-level overview of these financial stability vulnerabilities, some key recommendations, key Council Activities this year, and Box A: Global Economic Conditions.

Financial Risks

Section 3.1 Financial Risks includes vulnerabilities related to Commercial Real Estate, Residential Real Estate, Corporate Credit, Short-Term Funding Markets, Digital Assets, and Climate-Related Risk. In addition, Section 3.1 includes Box B: Household Finance.

Vulnerabilities or shocks in the real estate and corporate credit sectors can directly affect the flow of credit to households and businesses. Conversely, economic conditions can affect the performance of these assets and transmit financial stress to the holders of mortgage and corporate debt. These sectors also act as a nexus for a variety of financial institutions, connecting banks and nonbanks, such as government-sponsored enterprises, investment funds, and insurance companies.

Elevated interest rates, high costs, weakness in central business district CRE conditions, and potential structural changes in demand for office space have heightened concerns about CRE. Maturing loans and expiring leases amid weak demand for office space have the potential to strain office sector conditions further, which could cause stress to spread beyond this sector. The Council recommends that supervisors, financial institutions, and investors continue to closely monitor CRE exposures and concentrations, and to track market conditions. They should also continue to evaluate loan portfolios' resilience to potential stress, ensure adequate credit loss allowances, assess CRE underwriting standards, and review contingency planning for a possibly protracted period of rising loan delinquencies.

In addition, the Council recommends supervisors and financial institutions continue to monitor residential real estate exposures and ensure the adequacy of credit loss allowances. Federal and state agencies should enhance or establish information-sharing protocols to enable collaboration and communication in response to potential increased credit risk in residential real estate and mortgage servicing. The increasing role of nonbank mortgage companies is tightly integrated with other residential real estate vulnerabilities. The Council supports recent actions by FHFA, the Government National Mortgage Association (Ginnie Mae), and state regulators to strengthen oversight of nonbank companies involved in the servicing of residential mortgages. The Council recommends that, where possible, relevant federal agencies and state regulators continue to coordinate closely to collect data, identify risks, and take additional steps available to them within their authorities to address the potential risks of nonbank mortgage companies.

Higher interest rates and slowing economic growth have increased nonfinancial corporate credit risk. If credit quality significantly worsens, a potential wave of debt defaults could lead to large redemptions at investment funds with significant liquidity mismatches and in turn disrupt bond market functioning. Moreover, such defaults may also have a cascading effect across broader financial markets. The Council recommends that member agencies continue to monitor levels of nonfinancial business leverage, trends in asset valuations, and implications of the potential for a sustained period of higher interest rates for the entities they regulate in order to assess and reinforce the ability of the financial sector to manage severe simultaneous losses. The Council also supports enhanced data collection on nonbank lending to nonfinancial businesses to provide additional insight into the potential risks associated with the rapid increase in private credit.

Short-term funding markets support financial market liquidity and the implementation of monetary policy, and provide financing for businesses, financial intermediaries, state and local governments, and the federal government. Among the major lenders in short-term funding markets are money market funds (MMFs). The Council supports the SEC's finalized rule reducing structural vulnerabilities in MMFs to make these funds more resilient, liquid, and transparent. The Council will continue to monitor short-term funding market conditions for potential vulnerabilities that may warrant additional action and recommends that member agencies bolster efforts to make these markets more resilient, including efforts to increase the resilience of investment vehicles with similarities to MMFs. Where lack of data prevents close monitoring, Council members should develop proposals to collect the necessary data. The Council supports efforts to examine and consider ways to improve counterparty risk management in the non-centrally cleared bilateral repo (NCCBR) market given the reported prevalence of zero haircuts on collateral. Additional data on dealers' margining practices, including but not limited to the use of haircuts, could also improve the Council's ability to monitor risks and evaluate options, such as minimum haircuts on repo collateral, in these markets.

While the nascent crypto-asset market is not significant in its size or broad connection to the traditional financial system, distress in that market has the potential to transmit to traditional financial firms. This year, Council members have addressed risks posed by the crypto-asset ecosystem through agency statements, guidance, and rulemaking and the Council recommends that agencies continue to enforce existing rules and regulations. In its 2022 *Report on Digital Asset Financial Stability Risks and Regulation*, the Council outlined two gaps in the regulation of crypto-asset activities in the United States: (1) the regulation of spot markets for crypto-assets that are not securities and (2) the regulation of stablecoins. The Council reiterates its recommendations from last year's Annual Report that Congress pass legislation to close each of these regulatory gaps. As the Council has previously noted, the Council remains prepared to consider steps available to it to address risks related to stablecoins in the event comprehensive legislation is not enacted.

Climate-related impacts and events continue to impose significant costs on the public and the economy. The Council recommends state and federal agencies continue to coordinate to identify, prioritize, and procure data necessary for monitoring climate-related financial risks, including via the Council's working groups. The Council also recommends that state and federal agencies continue to coordinate on developing a robust framework to identify and assess climate-related financial risks, including by iteratively identifying a preliminary set of risk indicators.

Financial regulators should continue to promote consistent, comparable, and decision-useful disclosures that allow investors and financial institutions to better incorporate climate-related financial risks in their investment and lending decisions. Physical climate risk and its intersection with commercial and residential real estate vulnerabilities remains a primary area of interest for the Council. Given the critical role of real estate in the economy and the financial system and how it affects the remits of multiple Council member agencies, the Council recommends that agencies collaborate on analysis related to the intersection of physical risk, real estate, and insurance in particular.

Financial Institutions

Section 3.2 Financial Institutions includes vulnerabilities related to the Banking System, Investment Funds, Central Counterparties, and the Insurance Sector. In addition, Section 3.2 includes Box C: The Spring 2023 Banking Turmoil and Policy Responses.

The banking system is critical to the supply of credit and financial services to households and businesses and is central to the stability of the U.S. financial system. The banking sector faces a challenging environment, including higher interest rates and concerns about the economic outlook and credit quality. In addition, there are key lessons to be learned from the turmoil in the Spring that can contribute to reducing financial stability risks emanating from this sector. The

Council supports member agencies' efforts to examine how recent events can inform potential modifications to the regulatory framework for regional banks. The Council recommends that banking supervisors, including credit union supervisors, continue to ensure that banks maintain adequate capital and liquidity, sound interest rate risk management practices, and well-developed operational resilience plans.

Given the stress in the CRE market, particularly within the office sector, and as valuations of other types of CRE appear quite elevated, the Council recommends that banking supervisors closely monitor the performance of CRE loans. The Council also recommends that banking agencies continue monitoring bank exposures to NBFIs, including assessing how banks manage their exposure to leverage or liquidity mismatch in the nonbank financial sector.

The Council supports member agencies' plans to review whether capital measures appropriately reflect an institution's ability to absorb losses and agencies' proposed measures to improve resolvability at large, complex, or interconnected banks, such as by requiring long-term debt and improved resolution plans. The Council encourages efforts to complete the Basel III reforms to further enhance the resilience of the banking system.

In addition, the Council recommends that banking agencies closely monitor uninsured deposit levels and depositor composition and collect additional data as necessary. The Council supports efforts to reexamine banks' existing deposit insurance systems and credit unions' share insurance systems, to promote financial stability while mitigating moral hazard and excessive risk taking.

Investment funds of all types play a critical role as intermediaries in the U.S. financial system, promoting economic growth through efficient capital formation and providing vital funding to businesses across the economy. The Council supports the initiatives by the SEC and other agencies to address risks in hedge funds, including data collection improvements for Form PF. The Council will continue to review the findings of the Hedge Fund Working Group (HFWG) as they are developed and recommends that the SEC and other relevant regulators consider whether additional steps should be taken to address vulnerabilities related to these funds. The Council also supports the SEC's continued engagement regarding potential reforms of open-end funds, including the liquidity framework enhancements proposed in late 2022 that govern open-end fund liquidity risk management, swing pricing, and fund reporting. The Council looks forward to reforms that robustly address the financial stability risks from SEC-registered open-end funds. The Council recommends that both state and federal regulators consider requirements for greater transparency and more detailed and timely regulatory reporting by collective investment funds (CIFs) that would enable both banks and regulators to better understand market trends and monitor for potential risks. Additionally, the Council encourages state and federal regulators to consider whether any reforms in the CIF market would be appropriate to mitigate these risks, particularly given the proposed changes to open-end funds.

CCPs are pivotal entities in the U.S. financial system, with responsibility for overseeing the fulfillment of outstanding financial agreements between CCP member buyers and sellers of cash securities and derivatives. While this central clearing of agreements serves as a safeguard against the transmission of stress through counterparty defaults, it also concentrates risk. The Council supports the CFTC, Federal Reserve, and SEC's continued efforts to enhance their oversight over CCPs designated by the Council as systemically important financial market utilities (FMUs). It is important for the relevant agencies to consistently assess whether the current CCP standards effectively mitigate threats to financial stability arising from both default and nondefault losses. A key consideration includes balancing counterparty and liquidity risks. Regulatory bodies overseeing clearing members should continue evaluating the liquidity risk management practices and capabilities of these firms. It is crucial for supervisory agencies to work alongside, and strengthen information sharing agreements with, the FDIC to facilitate resolution planning and improve resolvability for CCPs. The Council also supports continued monitoring and assessment of interconnections among CCPs, their clearing members, and other financial institutions. Lastly, the Council urges regulators to continue advancing recovery and resolution planning for FMUs and systemically important CCPs. Coordination in designing and executing supervisory stress tests for these entities should also remain a priority.

The U.S. is the world's largest single-country insurance market, with U.S. insurers providing valuable risk-pooling services to the economy through life and health (L&H) insurance and P&C insurance products. Trends in the L&H sector may raise concerns related to (1) growth of private credit and alternative asset investments to support policyholder obligations, (2) growth in risk appetite for CRE exposures and increased proportion of lower credit quality in corporate bond portfolios, (3) growth of the use of offshore reinsurance, which is intended to facilitate risk transfer of capital-intensive legacy blocks and to build capacity in insurers' balance sheets through release of reserves and opportunistic evaluation of liabilities, and (4) the growing influence of new entrants in life insurance, such as private equity and other alternative asset management firms. The Council recommends that FIO, along with the National Association of Insurance Commissioners (NAIC), work with member agencies to evaluate the potential impact of these trends on systemic risk and associated financial stability considerations. The Council supports FIO's work on these issues, as well as NAIC's efforts to advance its macroprudential initiative and supervisory considerations for insurers that are owned by, or in strategic arrangements with, private equity firms or other alternative asset managers.

Financial Market Structure, Operational Risk, and Technological Risk

Section 3.3 Financial Market Structure, Operational Risk, and Technological Risk includes vulnerabilities related to the Treasury Market, Cybersecurity, the Use of AI in Financial Services, and Third-Party Service Providers. In addition, Section 3.3 includes Box D: Treasury Market Resilience During March 2023, Box E: The Successful Implementation of Alternative Reference Rates, Box F: The Speed of Financial Transactions and Information Transmission, Box G: Quantum Computing, and a closer look at the ransomware attack on third-party service provider ION in Box H: ION Case Study.

The U.S. Treasury market plays a critical role in funding the federal government and implementing monetary policy. In addition, as the deepest and most liquid market in the world, the Treasury market serves as a risk-free asset benchmark supporting the broader financial system. While the Treasury market showed resilience to stress in 2023, a history of other disruptions to market functioning demands continued focus on improving resilience for the future. The Council supports the work of the Interagency Working Group on Treasury Market Surveillance (IAWG), particularly in the area of data transparency, and recommends that member agencies continue to make progress on studying and implementing policies to improve the resilience of the Treasury market. The Council is also supportive of Treasury's efforts to implement Treasury buybacks for liquidity support and cash management purposes. The Council believes buybacks can reduce Treasury market vulnerabilities by improving Treasury market liquidity and can also alleviate some intermediation capacity constraints.

Cybersecurity risk is pervasive throughout the economy, and reducing cyber vulnerability is particularly critical within the financial system. Ransomware, malware, denial-of-service attacks, and data breaches can disrupt the operations of financial institutions, including those that are systemically important. The Council recommends that the Financial and Banking Information Infrastructure Committee (FBIIC), the Financial Services Sector Coordinating Council, and the Financial Services Information Sharing and Analysis Center continue to promote information sharing related to cyber risk and undertake additional work to assess and mitigate cyber-related financial stability risks. The Council encourages FBIIC to continue working closely with federal and state agencies, the Department of Homeland Security, law enforcement, and industry partners to conduct regular cybersecurity exercises that take into account interdependencies with other non-financial sectors. In addition, the Council recommends that member agencies carefully consider how to share information among themselves, including confidential supervisory information and classified information to the extent legally permissible.

The use of AI by financial sector firms has been growing in recent years. AI has the potential to increase innovation and efficiency, but it may also pose risks to financial stability. The Council recommends monitoring the rapid developments in AI, including generative AI, to ensure that oversight structures keep up with or stay ahead of emerging risks to the financial system while facilitating efficiency and innovation. To support this effort, the Council recommends financial institutions, market participants, and regulatory and supervisory authorities further build expertise and capacity to monitor AI innovation and usage and identify emerging risks. The Council notes existing requirements and guidance may apply to AI. The Council also supports the international effort by the G7 Cyber Expert Group to coordinate cybersecurity policy and strategy across the eight G7 jurisdictions and address how new technologies, such as AI and quantum computing, affect the global financial system.

Financial institutions rely on third-party service providers for an array of services including videoconferencing, core processing functions, banking platforms, data storage, and cloud services. The Council supports the ongoing collaboration of member agencies to examine and address the risks posed by third-party service providers and the services they provide to the financial system. Member agencies continue to enhance their supervisory programs for cyber-related controls in key areas such as core processing, payment services, and cloud computing.

The Council supports continued risk identification associated with service providers' roles in the financial sector and their potential impacts on financial stability. The Council also recommends that federal banking regulators continue to coordinate third-party service provider examinations, work collaboratively with states, and identify additional ways to support information sharing among state and federal regulators. Toward that end, the Council also supports the ongoing work of the Cloud Executive Steering Group and its focus on closing gaps identified in Treasury's February 2023 white paper entitled *The Financial Services Sector's Adoption of Cloud Services*.

To further enhance third-party service provider information security and address other critical regulatory challenges, the Council recommends that Congress pass legislation that ensures that the FHFA, NCUA, and other relevant agencies have adequate examination and enforcement powers to oversee third-party service providers that interact with their regulated entities.

Council Activities

The Council, as charged by the Dodd-Frank Act, works to identify risks to U.S. financial stability, promote market discipline, and respond to emerging threats to the financial stability of the U.S. financial system. It serves as a vital forum for collaboration, discussion, risk analysis, and policy formulation among the U.S. financial stability and regulatory community.

The Council took important actions in November 2023 to improve its ability to address risks to financial stability and to provide greater public transparency. The Council issued a new analytic framework for financial stability risks and updated guidance on its nonbank financial company determinations process. The Council's new Analytic Framework for Financial Stability Risk Identification, Assessment, and Response (Analytic Framework) offers a detailed public explanation of how the Council monitors, assesses, and responds to potential risks to financial stability, whether they come from widely conducted activities or from individual firms. The Analytic Framework represents the first time that the Council has detailed the vulnerabilities and transmission channels that most commonly contribute to risks to financial stability irrespective of the source of the risk. The Analytic Framework also explains the range of authorities the Council may use to address any particular risk, which include interagency coordination, recommendations to regulators, or the designation of certain entities. The updated Guidance on Nonbank Financial Company Determinations (Nonbank Designations Guidance), which replaces the 2019 Guidance, sets forth the Council's procedures for considering whether to designate a nonbank financial company for Federal Reserve supervision and prudential standards under section 113 of the Dodd-Frank Act.[4] The Nonbank Designations Guidance provides a transparent process and significant opportunities for engagement with both a nonbank financial company under review and its existing regulators.

In 2023, the Council also advanced its four priorities to address risks and vulnerabilities in the financial system: (1) nonbank financial intermediation, (2) Treasury market resilience, (3) climate-related financial risk, and (4) digital assets.

The Council continues to evaluate the vulnerabilities posed by nonbank financial institutions. The Council's HFWG has developed a risk-monitoring system to assess hedge fund–related risks to U.S. financial stability. In addition, the Council's Nonbank Mortgage Servicing Task Force, a working group including staff from member agencies and other government agencies such as the Department of Housing and Urban Development, is facilitating interagency coordination and additional market monitoring of the risks that nonbank mortgage servicers pose to U.S. financial stability.

Enhancing the resilience of the Treasury market is a continuing priority for the Council. The Council supports ongoing efforts across the Treasury Department and through the IAWG to strengthen the Treasury market. The Council's work through the HFWG also informs the IAWG's assessment of how funds' leverage affects the Treasury market.

Climate-related financial risk remains another key priority for the Council. The Council's Climate-related Financial Risk Committee (CFRC) serves as an active forum for interagency information sharing, coordination, and capacity building. In July 2023, the CFRC issued a staff progress report to provide an update on efforts by the Council and member agencies to advance the recommendations in the Council's 2021 *Report on Climate-Related Financial Risk*. Among its other efforts, the CFRC is developing a robust framework to identify and assess climate-related financial risk, and it is also identifying a preliminary set of risk indicators for banking, insurance, and financial markets. In addition, the CFRC has identified the intersection of physical risk, real estate, and insurance as a particular priority for future analysis. The Council also established the external Climate-related Financial Risk Advisory Committee (CFRAC), which is composed of members from a wide range of backgrounds and provides the Council with information on and analysis of climate-related financial risks from a broad array of perspectives. The CFRAC hosted its first three meetings in 2023.

Following its October 2022 *Report on Digital Asset Financial Stability Risks and Regulation*, the Council established a Digital Asset Working Group (DAWG) that met regularly throughout 2023 to facilitate information sharing and conduct analysis on digital asset–related risks and market developments. The DAWG functions as an important venue for member agencies to monitor and discuss developments in the evolving digital assets ecosystem.

In addition to its efforts on its four priorities, the Council has served as an important venue for members to discuss potential risks affecting the U.S. banking system, both before and after the events in the Spring. The Council has continued to bring together federal and state financial regulators to monitor and evaluate conditions in the banking sector and the financial system more broadly.

For more information on the Council's priorities and activities in 2023, please refer to **Section 4.1: Council Activities.**

Box A: Global Economic Conditions

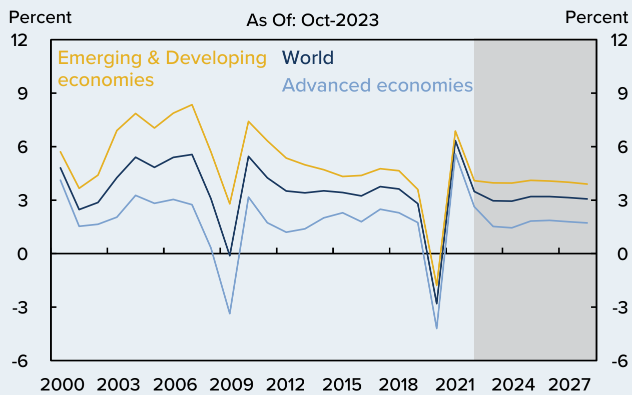
Global growth is slowing due to the significant tightening of monetary policy by most central banks in response to ongoing elevated inflationary pressures and due to near completion of the post-pandemic recovery in both services and supply chains. In advanced economies, the European Central Bank and the Bank of England raised their policy rates through the summer and communicated that their monetary policy would likely need to remain restrictive for some time, to help ensure that inflation returns to targeted levels on a sustained basis. Other central banks, such as the Bank of Canada and the Reserve Bank of Australia, paused policy rate hikes earlier this year, but they indicated that additional policy tightening might be necessary to bring inflation down in a timely manner. In emerging market economies (EMEs), particularly Latin American EMEs, many central banks began raising their policy rates earlier than their counterparts in advanced economies. Many major EME central banks paused rate hikes some time ago and have left rate hikes on hold against a backdrop of easing domestic inflation. A few EMEs have even begun to cut policy rates.

High interest rates are filtering through the financial system and are increasing pressures on banks, both directly, through higher costs of funding, and indirectly, by increasing credit risk. Banks in advanced economies have significantly tightened lending standards, curtailing the supply of credit for corporations and CRE investors. Surveys suggest that banks in the United States and Europe considerably restricted access to credit in the first three quarters of 2023, and they are expected to continue to do so in coming months.

Global headline inflation remains elevated but is abating, largely reflecting declines in food and energy prices. Following the buildup of gas inventories in Europe and weaker-than-expected demand in China, energy and food prices have dropped substantially from their 2022 peaks. Together, the normalization of supply chains and the tightening of monetary policy have contributed to a steady decline in headline inflation in most countries. Core inflation, however, has weakened more gradually and remains well above historical averages. Its persistence reflects the pass-through of past shocks into core inflation, tight labor markets, and stickier-than-expected services inflation. Overall, the International Monetary Fund (IMF) predicts that global inflation will moderate to a still-elevated 5.8 percent in 2024, well above the pre-pandemic (2017–19) level of 3.5 percent.

Turning to growth, the IMF expects global growth to remain subdued by historical standards at just below 3 percent in 2024 (**see Figure A.1**). The balance of risks to this outlook is tilted to the downside, stemming from a possible flare-up in inflation and a further weakening of Chinese economic activity. Tight labor markets and a potential increase in energy and food prices, due to extreme weather shocks or an escalation of Russia's war against Ukraine for example, could push up inflation more and risk de-anchoring longer-term inflation expectations. Also, a deeper-than-expected contraction in Chinese activity or deepening concerns about financial stability in China could weigh negatively on financial markets, weakening global confidence and trade.

A.1 Global Economic Outlook



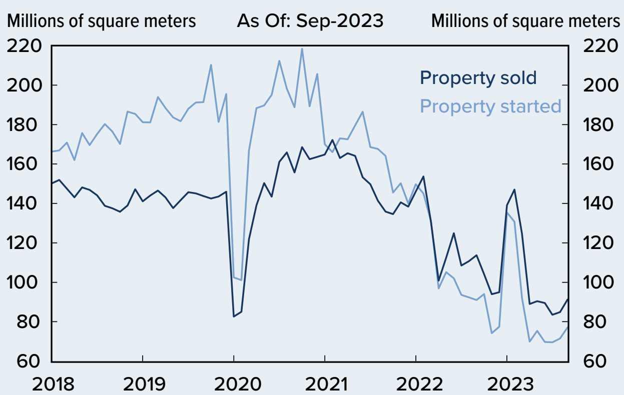
Notes: Real gross domestic product. Gray bars signify IMF forecasts.

Sources: IMF World Economic Outlook, Haver Analytics

In Europe, the economic outlook has notably weakened. The European economy has proven to be remarkably resilient to the energy crisis caused by Russia's unprovoked war on Ukraine. This resilience has been due to a combination of pent-up demand coming out of the pandemic and fiscal supports to aid households and firms. However, these supports are now fading, and the economy faces mounting headwinds from high inflation and tighter monetary policy. Indeed, credit growth has notably slowed amid tightening credit standards and weakening loan demand. The European economy has largely stagnated over the past year, and incoming activity and sentiment indicators continue to point to weakness ahead.

In China, an initial burst of growth early in the year that followed the country's decision to abandon its "zero-Covid" policies has quickly faded. The slowdown in China has been driven in large part by an ongoing correction in the property sector as authorities attempt to rein in financial vulnerabilities following years of strong credit growth. Consequently, Chinese real estate activity has plummeted, with the numbers of property starts and sales falling to roughly half their pre-pandemic levels in mid-2023 (see **Figure A.2**).

A.2 Chinese Real Estate Indicators

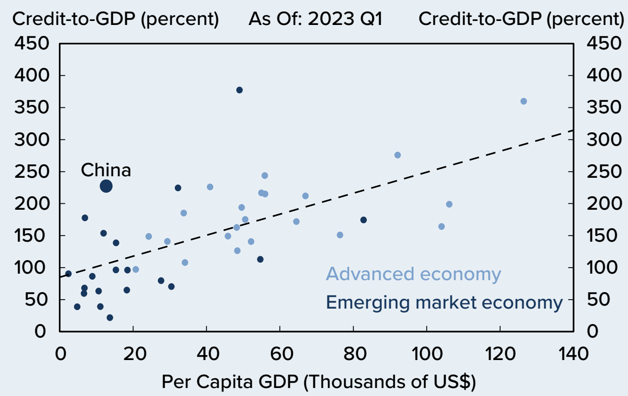


Note: Data are seasonally adjusted.

Sources: National Bureau of Statistics of China, Haver Analytics

The Chinese property sector had been an engine of growth and was fueled by a rapid rise in leverage among property developers, local governments, state-owned enterprises, and households. By the end of 2022, nonfinancial debt in China soared to more than 200 percent of gross domestic product (GDP), a level far higher than is typical among economies with comparable levels of development (see **Figure A.3**). Chinese authorities face the challenging task of deflating property prices without triggering broader financial stresses in China's economy. While the global repercussions of China's slowdown have thus far been limited, a sharp deterioration in financial conditions in China could have more significant effects.

A.3 Credit-to-GDP, Relative to Income



Note: Credit-to-GDP data are as of Q1 2023. Per capita GDP data are as of 2022. The dotted line represents the best linear fit.

Sources: Bank for International Settlements, World Bank

3 Vulnerabilities, Significant Market Developments, and Council Recommendations

3.1 Financial Risks

3.1.1 Commercial Real Estate

Commercial real estate (CRE) loans totaled almost $6 trillion as of the second quarter of 2023, and CRE represents a significant portion of the assets of many financial institutions.[5] Banks hold a significant market share of CRE loans at 50 percent, with the rest held by various financial institutions such as insurance companies, holders of commercial mortgage-backed securities (CMBS), and debt funds. CRE is the largest loan category among almost one-half of U.S. banks, and more than one-quarter of U.S. banks have CRE loan portfolios that are large relative to the capital they hold.[6] The Council has identified certain market vulnerabilities related to CRE lending, a key function of the financial sector. In 2023, the CRE market faced a rise in vacancy rates and declines in value for some property types, elevated interest rates, heightened CRE loan maturities, inflation in property operating costs, and an increase in CRE loan delinquencies.

While the CRE market is heterogeneous and different dynamics can prevail across various market sectors, signs of stress emerged in 2023 and the market outlook is challenging. In many major U.S. cities, the office vacancy rate is at a multiyear high as the shift toward hybrid work arrangements in many industries following the COVID-19 pandemic reduced demand for office space. Office property values have therefore fallen. In the multifamily and industrial sectors, easing of demand from strong levels and a large increase in supply pushed the U.S. vacancy rate higher in 2023. CRE also experienced headwinds from issues affecting all types of properties, such as high interest rates, elevated inflation, tighter credit conditions, and possible economic slowdown.

High interest rates increase refinancing costs for borrowers and can lead to decreasing property values across CRE sectors. If the decline in property value is significant relative to the time of financing, then the borrower may not be qualified to refinance the loan at maturity without an additional injection of equity. Thus, the loan may need to be restructured or entered into default, causing losses for the lender. As losses from a CRE loan portfolio accumulate, they can spill over into the broader financial system. Sales of financially distressed properties can reduce market values of nearby properties, lead to a broader downward CRE valuation spiral, and even reduce municipalities' property tax revenues. In addition, widespread CRE distress can contribute to tightening credit availability. Banks with high exposures to CRE loans that also face other credit or interest rate–related losses may be particularly vulnerable to CRE loan distress.

CRE Loan Performance

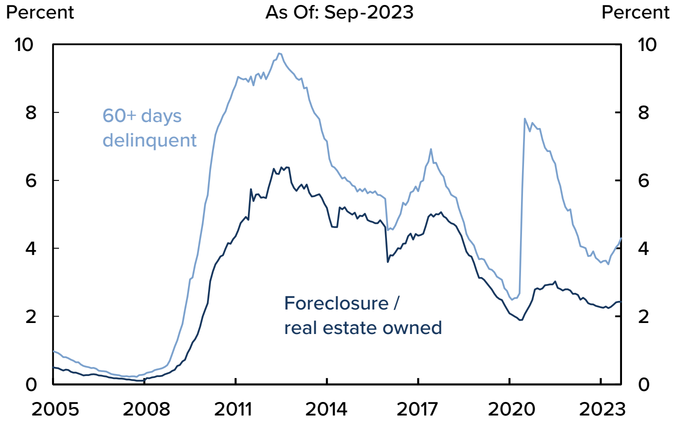
Weakening in CRE credit quality through the second quarter of 2023 may have signaled a shift in the credit environment. The delinquency rate on CRE loans held by U.S. banks, which is a lagging indicator, was modest at 0.81 percent in the second quarter of 2023, but it is up from 0.74 percent in the second quarter of 2022.[7] Also, while the delinquency rate on conduit CMBS has fallen sharply from highs reached during the COVID-19 pandemic, it has trended upward in recent months. After reaching its post-pandemic low of 3.5 percent in April 2023, the conduit CMBS delinquency rate increased to 4.3 percent by September 2023 (see **Figure 3.1.1.1**).[8]

The conduit CMBS delinquency rate in the hotel and lodging sector remained elevated at 4.8 percent as of September 2023 but has steadily improved from a COVID-19 pandemic peak of 20.5 percent in January 2021. In the office sector, the delinquency rate has risen over the last year, increasing from 2.3 percent in September 2022 to 4.4 percent in September 2023 (see **Figure 3.1.1.2**).

CRE Property Sectors

While CRE performance is heterogenous across property sectors and geographies, some CRE property sectors face substantial challenges. The office sector faces the most severe challenges because demand for office space has been weak, particularly in the largest U.S. office markets. During the COVID-19 pandemic, net absorption of office space turned negative for the first time in a decade as commercial office space that was vacated or supplied by new construction exceeded what was leased or absorbed by tenants. Net absorption of office space remained soft through the second quarter of 2023, and the U.S. office vacancy rate rose from 12.1 percent in the second quarter of 2022 to 13.1 percent in the second quarter of 2023 (see **Figure 3.1.1.3**). Major metropolitan areas have been particularly impacted, and the vacancy rate for the largest 20 U.S. markets increased from 13.2 percent in the second quarter of 2022 to 14.2 percent in the second

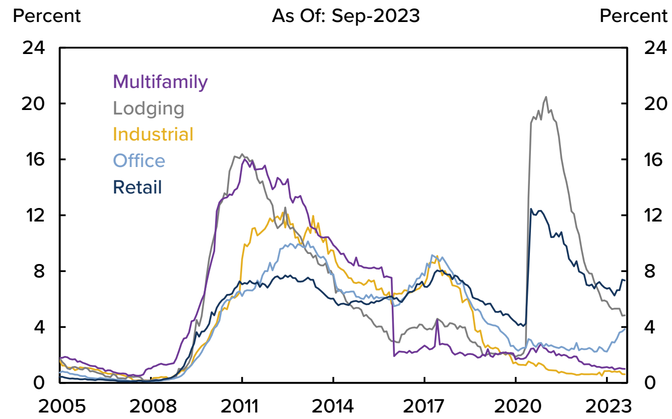
3.1.1.1 Conduit CMBS Delinquency and Foreclosure Rates



Note: 60+ Days Delinquent includes Foreclosure/Real Estate Owned.

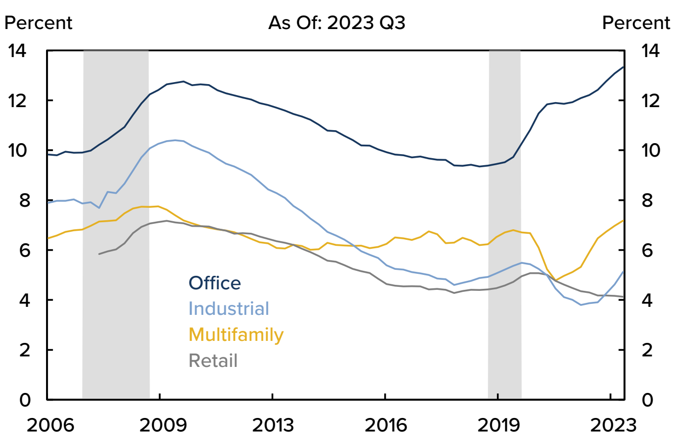
Sources: JPMorgan, Trepp

3.1.1.2 Conduit CMBS Delinquency Rates by Property Type



Sources: JPMorgan, Trepp

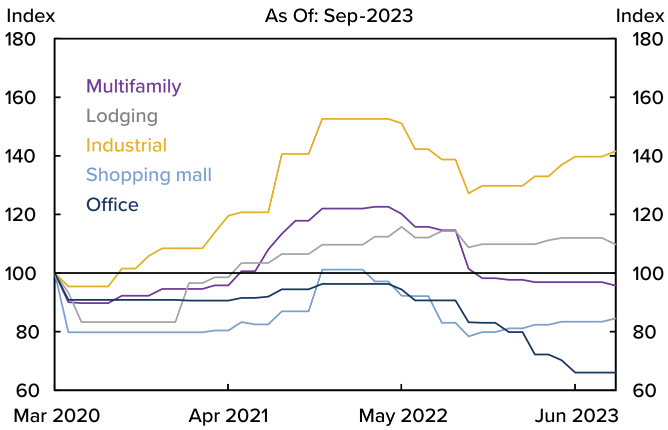
3.1.1.3 Vacancy Rates by Property Type



Note: Gray bars signify NBER recessions.

Sources: CoStar, Haver Analytics

3.1.1.4 Commercial Property Price Indexes



Note: Data are monthly indexed to 100 as of March 2020.

Source: Green Street Advisors, LLC

quarter of 2023.[9] The vacancy rate for other U.S. markets increased to 8.5 percent from 8.0 percent over this same period. The prices of office properties have deteriorated much more than those of other major property types in recent quarters, with an index of office property prices more than 30 percent below its pre-pandemic level as of September 2023 (see **Figure 3.1.1.4**).

The decline in office property demand may take time to stabilize as tenants navigate remote-work decisions and adjust how much space they need. In addition, a slow return to densely populated urban office centers could reduce the desirability of office properties located there and even nearby retail space. This may be especially true for older, less-desirable office spaces with fewer amenities. Studies conducted by CRE industry observers and market participants have explored the concept of converting unused office space to multifamily units. Conversion of such space has increased in recent years, but challenges include economic feasibility, zoning restrictions, and the need for nearby residential amenities. Additionally, amid this structural shift in the office property sector, softening economic conditions could lead to more stress.

As a substantial volume of office property loans mature over the next few years, weak demand for office space, soft rents, and declines in office property values will create high refinancing risks. Without equity injection from the borrower, many office properties may not meet lenders' underwriting criteria for cash flow or valuation. Properties with a large share of their leases expiring into soft market conditions and with financing maturing in a high-rate environment could be particularly challenged. Some banks may prefer loan modification to foreclosure in order to avoid increased default rates and potentially having to manage office properties while they await sale.

Meanwhile, the vacancy rate in the industrial property sector, mostly warehouse and distribution centers, increased in 2023 after benefiting from strong demand for space in 2022. Despite the increase in vacancy rates, industrial property values were up 42 percent from March 2020 and 2 percent from one year earlier, and the construction of new space remained brisk.

In the multifamily sector, the vacancy rate increased 1.6 percentage points, from 5.3 percent in the second quarter of 2022 to 6.9 percent in the second quarter of 2023.[10] Multifamily property values were down 4 percent from March 2020 and down 16 percent from one year earlier. The pace of multifamily construction, which typically brings to market the most modern amenities, remains high. This is particularly true in some U.S. sunbelt markets that have experienced recent population inflows. Completions of multifamily units were up 15 percent in September 2023 on a year-over-year basis, and the number of multifamily units under construction was up 10.9 percent from a year earlier. Meanwhile, multifamily starts and permits appeared to be slowing on a year-over-year basis.[11] Many of these markets reported strong rent growth in 2022, but growth has slowed in recent quarters.

The retail sector has been supported by low amounts of construction over the last decade and robust consumer spending. The retail vacancy rate remained low in 2023, except in the shopping mall subsector, which has been impacted by changing consumer preferences, including the expansion of online shopping. The vacancy rate in the shopping mall subsector increased for the sixth consecutive year and is more than twice the vacancy rate in the rest of the retail sector, driven in large part by underperformance in lower-tier and obsolete malls. Property values for shopping malls were down 15 percent from March 2020 but were up 2 percent on a year-over-year basis.

Recommendations

Elevated interest rates, high costs, and potential structural changes in demand for CRE have heightened concerns about CRE. Maturing loans and expiring leases amid weak demand for office space have the potential to strain office sector conditions further, which could cause stress to spread beyond this segment of the CRE market. The Council recommends that supervisors, financial institutions, and investors continue to closely monitor CRE exposures and concentrations, and to track market conditions. They should also continue to evaluate loan portfolios' resilience to potential stress, ensure adequate credit loss allowances, assess CRE underwriting standards, and review contingency planning for a possibly protracted period of rising loan delinquencies. In this context, the banking agencies published in July 2023 a *Policy Statement on Prudent Commercial Real Estate Loan Accommodations and Workouts*, which noted that accommodations and workouts are often in the best interest of borrowers and lenders.

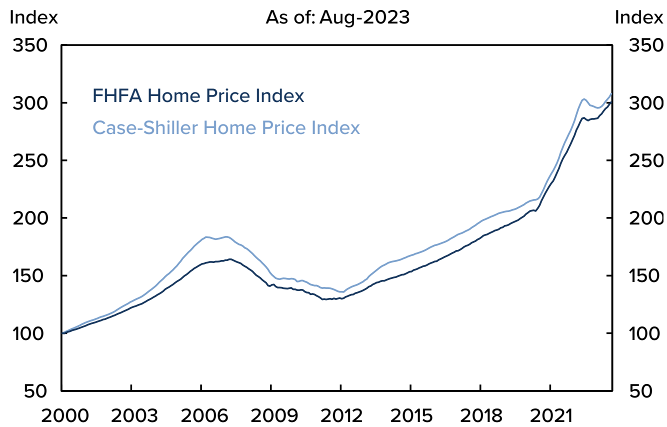
Interlinkages between financial intermediaries that are active in the CRE market, including banks, insurance companies, REITs, and private lenders, could amplify financial stress in the sector. These linkages may develop if intermediaries have simultaneous exposures to CRE as direct mortgage lenders, investors in CMBS or property, or lending to other CRE investors. The Council recommends that member agencies continue to collaborate to better understand the interlinkages between financial institutions exposed to the CRE market and to ensure that they are taken into account in risk management and contingency planning.

3.1.2 Residential Real Estate

The size of the total mortgage market, at approximately $12 trillion outstanding unpaid principal balances,[12] coupled with memories of the 2007–09 financial crisis underscores the importance of vigilant monitoring of the residential finance system. The mortgage-backed securities (MBS) market is the second deepest and second-most-liquid market in the United States and a central component of the financial system. A breakdown in the components of the mortgage market, or the broader economic factors that underpin housing demand, could be transmitted throughout the residential finance system and into other financial markets, with significant financial stability implications.

The housing market vulnerabilities of 2022 remained in 2023, primarily stemming from the continuation of elevated mortgage interest rates. However, supply-and-demand factors caused the direction of house prices, which had previously been declining, to increase midway through the year. Home buyers experienced low inventory of existing homes for sale, extended

3.1.2.1 House Price Indexes



Note: Seasonally adjusted. Indexed to 100 as of Jan-2000.

Sources: S&P CoreLogic Real Estate Data, FHFA, Haver Analytics

wait times for new construction, high home prices, and mortgage interest rates above 20-year highs. As a result, the volume of home sales and mortgage originations contracted relative to 2022, and the elevated interest rate environment continued to discourage refinances. Still, delinquencies on existing mortgages remained low despite the elevated interest rates. MBS valuations reached new lows in the Fall of 2023. The decline in MBS values weighed on bank balance sheets and other investors who purchased MBS during the pandemic, when rates were very low. Market segments discussed in the following sections appear stable yet are vulnerable to weakening economic conditions.

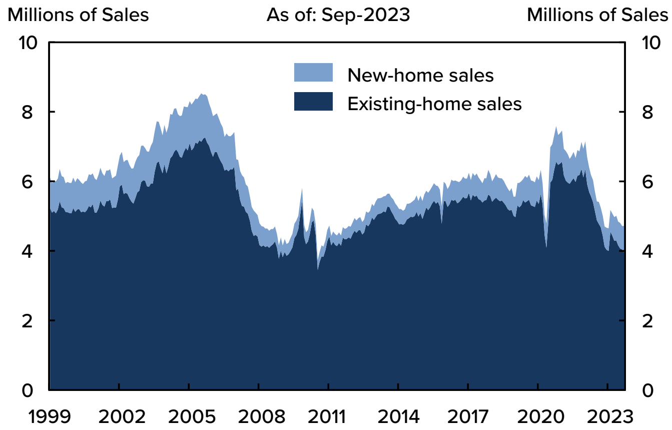
Housing Markets

This year, housing markets were characterized by high house prices, elevated mortgage rates, and low sales volume. In 2023, national house price indexes recovered from moderate declines seen in the second half of 2022. From March 2020 through August 2023, the FHFA national house price index rose by 46 percent and the CoreLogic Case-Shiller national house price index rose by 43 percent. Increases in house prices have slowed this year, however, as the indices increased by just 5.6 percent and 2.6 percent, respectively, through August (see **Figure 3.1.2.1**). Some forecasters have predicted a potential housing market downturn, but sales prices have continued to defy those expectations. Mortgage rates increased from around 6.5 percent at the beginning of 2023 to 7.3 percent as of the end of September.[13]

The pandemic period's low mortgage interest rates, coupled with high household savings, helped drive home purchases to levels not seen since before 2008 and fueled record-setting refinancing volumes during that time. This year, home sales declined, and refinancing activity was minimal. Many borrowers who purchased or refinanced homes during the last couple of years were not interested in moving or refinancing out of their low-interest-rate mortgages. Therefore, the housing stock available for sale has been particularly low. House price growth is largely supported by a constrained existing housing inventory.

The shortage of existing housing available for sale fueled the increase in demand for new construction in the first half of 2023. The National Association of Home Builders/Wells Fargo Housing Market Index (HMI) rose for the first seven months of 2023, then receded in August and September.[14] The HMI survey reports that builders reduced prices and offered other incentives to bolster sales during the second half of 2023.[15] Meanwhile, homebuilders continued to experience a shortage of construction workers and materials. Despite frictions in the newly built home market, as of September 2023, the share of new home sales to all home sales increased to 16 percent,[16] which is above the historical average of approximately 10 percent (see **Figure 3.1.2.2**).

3.1.2.2 New- and Existing- Home Sales



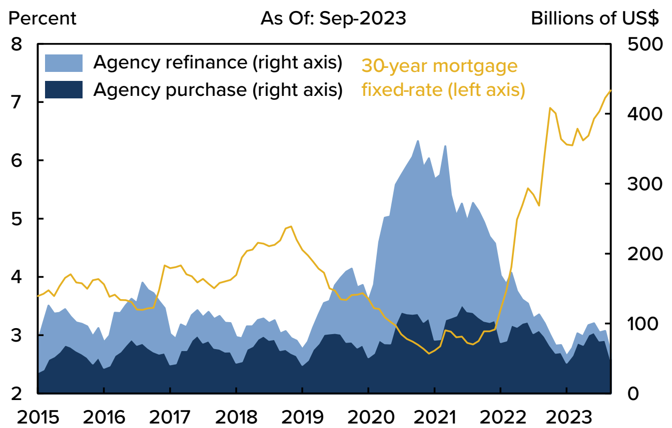
Note: Seasonally adjusted annual rate

Sources: U.S. Census Bureau, National Association of Realtors, Haver Analytics

Primary Mortgage Market

High interest rates coupled with low housing inventory for sale led to fewer home sales and lower origination volumes. Origination volume of agency loans totaled $201 billion in the third quarter of 2023, down 22.4 percent from the third quarter of 2022 (see **Figure 3.1.2.3**). As mortgage rates approached 20-year highs, refinancing volume declined to historic lows during 2023 as borrowers' potential savings from refinancing diminished.

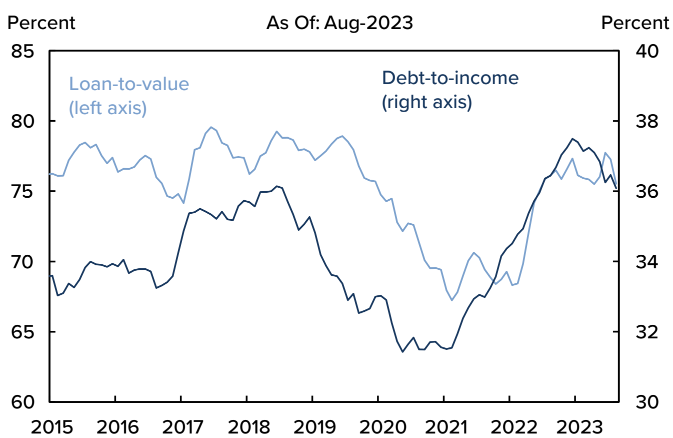
3.1.2.3 Residential Purchase and Refinance Levels



Sources: Fannie Mae, Freddie Mac, Ginnie Mae, Recursion

Aggregate credit risk measures on the 2023 loan originations were consistent with the high percentage of purchase mortgages relative to refinance mortgage originations this year. Relative to the 2021 originations, when refinances last peaked, the average debt-to-income (DTI) ratios and loan-to-value (LTV) ratios were higher (see **Figure 3.1.2.4**). Purchase borrowers are generally higher-risk than refinancing borrowers because they tend to have higher DTI and LTV ratios. However, the DTI ratio of newly originated purchase mortgages in 2023 declined relative to 2022 purchase originations, while the FICO score at origination and LTVs were similar among purchase mortgages since 2022. Among all outstanding mortgage vintages, credit performance remained strong, owing to a tight labor market and considerable levels of home equity. For example, 89 percent of all outstanding loans have mark-to-

3.1.2.4 Average DTI and LTV Ratios at Origination



Note: Weekly averages.

Source: Black Knight

market LTVs of 80 percent or less, due to accumulated house price appreciation and amortization.[17]

The Mortgage Bankers Association (MBA) mortgage delinquency rate increased slightly from the second quarter to the third quarter of 2023, rising from its all-time lowest reading since the MBA's National Delinquency Survey began in 1979.[18] Early-stage delinquencies drove this slight uptick while later-stage delinquencies remained at their lowest level since the first quarter of 2020.[19] Foreclosures remained low and below pre-pandemic levels, owing to borrowers' ability to sell their property into a low-inventory market. For a deeper discussion of household balance sheets and loan performance, see **Box B: Household Finance.**

Secondary Mortgage Market

MBS valuations weighed on bank balance sheets and other investors who purchased MBS during the pandemic. Approximately 80 percent of outstanding MBS remained priced below par in the to-be-announced mortgage market throughout 2023. Most of these MBS were issued at a premium in the period of quantitative easing during the COVID-19 pandemic, and if unhedged since issuance, they have experienced notable mark-to-market losses since quantitative tightening began. These mark-to-market losses contributed to the bank failures this year. With approximately $6.4 trillion of generic agency MBS with coupons of 4 percent or less, one path back to par requires loan terminations.[20]

Loan terminations are either voluntary prepayments (such as a sale of the home rate refinances), cash-out refinances, or involuntary prepayments (where the issuer or guarantor of the MBS ultimately purchases the loan out of the pool at par due to delinquency). Loan terminations return principal at par to investors and enable them to reinvest at today's higher rates. The loss mitigation pipeline can take months and place financial and liquidity stress on mortgage servicers. Although prepayments and delinquencies are at historic lows in 2023, higher delinquency rates associated with cyclical economic factors like unemployment could test mortgage servicers' resilience and benefit MBS investors with involuntary prepayments in below-par securities.

Nonbank Mortgage Companies

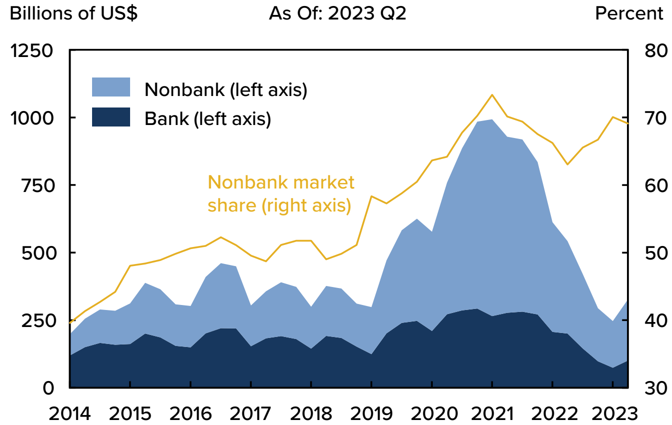
Nonbank mortgage originators and servicers continued to gain market share from banks over the last 10 years, with the share of nonbank originations and servicing at record highs. Nonbanks service over half of all mortgages, with a servicing share of 54 percent as of the second quarter of 2023, compared with 20 percent in 2013.[21] Additionally, the concentration of nonbank mortgage servicers as a percentage of top servicers grew substantially over the same time period as the number of nonbank servicers in the top 20 doubled from 6 in 2013 to 12 in 2023.[22]

Nonbank single-family mortgage origination continued to grow to historic levels, with nonbanks originating approximately 70 percent of loans in the first half of 2023, compared with 42 percent in 2014 (see **Figure 3.1.2.5**). Nonbanks have remained the top 3 originators since the second quarter of 2021.[23] Nonbank originator concentration has also increased, with nonbanks making up 7 of the 10 largest originators as of the second quarter of 2023, compared with 2 nonbanks in the top 10 in 2013.[24]

In contrast to the bank lending and servicing model, nonbank mortgage companies lack access to deposits for short term financing. Though their business models vary, most nonbank mortgage originators rely on short-term wholesale funding, the majority of which is uncommitted lines that can be quickly pulled in times of stress. In addition, nonbanks do not have access to liquidity backstops that could provide bridge funding if traditional lending lines tighten or close. Many nonbank mortgage companies have limited capital and loss-absorbing capacity while retaining less liquid mortgage-servicing rights. Servicer financial strength concerns may arise if a high percentage of Federal Housing Administration loans securitized in Ginnie Mae MBS become delinquent over a long period because of the uncapped advance obligation of the servicer for these loans. Mortgage servicers could face acute liquidity strains in the event of widespread delinquencies. In some cases, servicers have an obligation to make payments to the investor, regardless of whether the borrower makes a mortgage payment, and they must repurchase the mortgage out of its MBS pool at par. During this period, the mortgage servicer must also continue making insurance payments while paying taxes and occasionally homeowners' association fees. During a crisis, widespread delinquencies could threaten the viability of nonbank mortgage servicers, due to the length of time[25] that nonbank mortgage servicers must forward these payments on behalf of nonpaying borrowers before the relevant mortgage guarantor reimburses them.

The rapid rise in interest rates significantly slowed mortgage originations, adversely

3.1.2.5 Mortgage Origination Volumes



Note: Includes top 100 originators.

Source: Inside Mortgage Finance

impacting earnings for nonbanks due to their monoline business model. Inflationary pressures have begun to put pressure on household incomes, which could result in increased borrower delinquencies and strain on servicers of loans that require payments to investors even when borrowers are delinquent. Given nonbanks' large market share, stress for these nonbanks could lead to larger systemic issues if financing obligations are not met or if they fail in their obligations to advance payments. In addition, consumer harm could result from ineffective loan servicing if nonbank servicers fail.

Efforts to strengthen the nonbank mortgage sector are ongoing. One such example is the enhanced minimum seller/servicer financial eligibility requirements effective as of the end of the third quarter of 2023. Nonbanks that originate or service loans for the Federal National Mortgage Association or the Federal Home Loan Mortgage Corporation (Fannie Mae or Freddie Mac, collectively referred to as the Enterprises), or for the Government National Mortgage Association (Ginnie Mae), are subject to these enhanced requirements. The requirements include comprehensive liquidity requirements, heightened governance standards for the largest nonbanks, and, for Ginnie Mae issuers, a risk-based capital ratio. In addition, state regulators continue to adopt enhanced financial condition, corporate governance, and risk management requirements for nonbank mortgage servicers through model regulatory prudential standards. State regulators finalized these prudential standards in 2021 to ensure that nonbank mortgage servicers maintain the financial capacity, governance, and risk management practices to adequately serve consumers and investors and simultaneously enhance market stability. Given the multistate operations of most nonbank mortgage firms, the states that have adopted the prudential standards effectively cover 98 percent of the nonbank mortgage market by loan count, including, but not limited to, the 50 largest nonbank mortgage servicers.

Property Insurance Developments

The Enterprises and other financial institutions require homeowners to have property insurance, which serves to preserve the collateral for mortgage loans.[26] Some properties, if located in a flood zone, are required to have flood insurance as well. Other properties, such as condos, are insured by master policy coverage. When property insurance is unavailable or not sufficiently available, loans become ineligible for delivery to the Enterprises.

Once a loan has been delivered to an Enterprise, mortgage servicers are responsible for making sure that all required property insurance coverage is maintained at all times to protect the Enterprise's interest in the mortgage loan. A servicer routinely tracks the presence of property and flood insurance to make sure every mortgage has the appropriate level of required insurance. If a mortgage is found to have a lapse or gap in insurance, the servicer notifies the borrower to remedy the situation. If the servicer cannot obtain evidence of acceptable property or flood insurance for a property securing a mortgage loan, the servicer must obtain lender-placed insurance.

Climate-related impacts and events are expected to increase the risk of property damage and loss. See **Section 3.1.6: Climate-Related Financial Risks** for a more in-depth discussion of the important role that property insurance plays in absorbing losses stemming from physical risks. In 2023, multiple insurers announced their intent to leave or implement a pause on writing new policies in large markets including Florida, California, and Louisiana, due to the increased risk of natural disasters. These announcements portend the unfortunate reality that more and more borrowers will be faced with renewal concerns or difficulty obtaining affordable initial insurance policies when they buy a home. As coverage becomes inaccessible or prohibitively expensive in a given location, home values may decline there, and fewer loans in the area may be originated or eligible for acquisition by the Enterprises.

FHFA and the Enterprises believe that the increasing occurrence of hurricanes, wildfires, or other climate-related disasters in a region may reduce ownership appeal over time, thus lowering home prices, creating other negative impacts on the local economy and hurting the Enterprises' financial outcomes. According to the Enterprises, climate-related disasters have yet to cause significant losses. The Enterprises' loss exposure is mitigated by having a diverse book of business among different regions, as well as specific insurer eligibility and minimum coverage requirements. However, FHFA and the federal banking agencies recognize that several factors, such as the growing threat of floods or fires in various parts of the country, changing weather patterns affecting heavily populated geographic areas, and insurers' decisions not to renew policies in these regions, may increase the Enterprises' and other financial institutions' exposure to disaster risk.

These events have prompted FHFA to instruct the Enterprises to assess the potential risks associated with borrowers securing and maintaining property insurance.

Recommendations

With elevated interest rates and the potential for a softening of the housing market if economic conditions were to weaken, the Council recommends supervisors and financial institutions continue to monitor residential real estate exposures and ensure the adequacy of credit loss allowances. Federal and state agencies should enhance or establish information-sharing protocols to enable collaboration and communication in response to potential increased credit risk in residential real estate and mortgage servicing. The Council acknowledges the changing economic environment and encourages member agencies to review and evaluate existing loss mitigation options of their regulated entities, including assessing the affordability and sustainability of available home retention solutions, such as forbearance, foreclosure alternatives, and modifications, in a higher interest rate environment. The results of such a review should inform supervisory responses by member agencies.

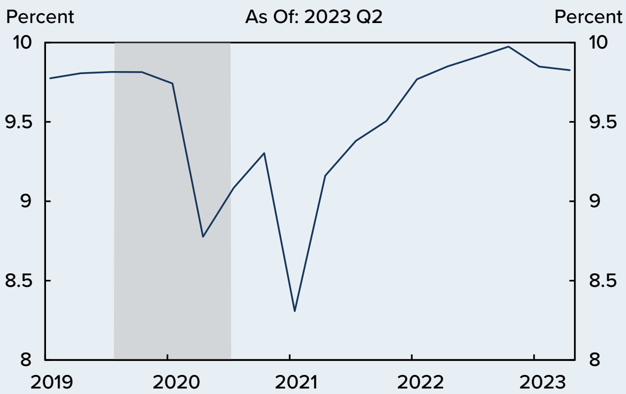
The Council supports recent actions by FHFA, Ginnie Mae, and state regulators to strengthen oversight of nonbank companies involved in the servicing of residential mortgages. The Council recommends that, where possible, relevant federal agencies and state regulators continue to coordinate closely to collect data, identify risks, and take additional steps available to them within their authorities to address the potential risks of nonbank mortgage companies. The Council's Nonbank Mortgage Servicing Task Force should also identify options to enhance the resilience of the sector and to mitigate the risks associated with the failure of one or more large, complex nonbank mortgage servicers. In addition, relevant agencies and regulators should ensure that the largest and most complex nonbank mortgage companies are prepared should delinquencies and foreclosures increase or if there is a need for the orderly transfer of servicing rights. The Council also recommends that relevant federal agencies and state regulators continue to enhance or establish information-sharing protocols to enable collaboration and communication in responding to distress at a mortgage servicer.

Box B: Household Finance

Overall consumer financial health improved during the first years of the COVID-19 pandemic, which can be largely attributed to the substantial assistance programs. Stimulus payments, debt forbearance, and payment moratoriums combined with spending reductions led to an improvement in most consumer balance sheets, as evidenced by the decline in credit card debt and delinquencies and the increase in liquid savings.

Since 2022, the positive trends in consumer financial health have started to reverse. Nevertheless, overall consumer financial health today is no worse than in 2019 by most measures. Liquid savings remain higher than 2019 levels, household net worth rose by 37 percent between 2019 and 2022,[27] and household debt servicing ratios and overall consumer delinquencies remain relatively low. However, savings are falling, overall nominal consumer debt balances are at an all-time high,[28] and credit card and auto loan delinquencies are on the rise. Additionally, the recent increase in interest rates has pushed household debt service payments as a percent of disposable income to pre-pandemic levels (see **Figure B.1**).[29] These trends, along with the resumption of student loan repayment, may strain certain households and increase the likelihood of financial distress, particularly for lower-income or highly leveraged households.

B.1 Debt Servicing to Disposable Income Ratio



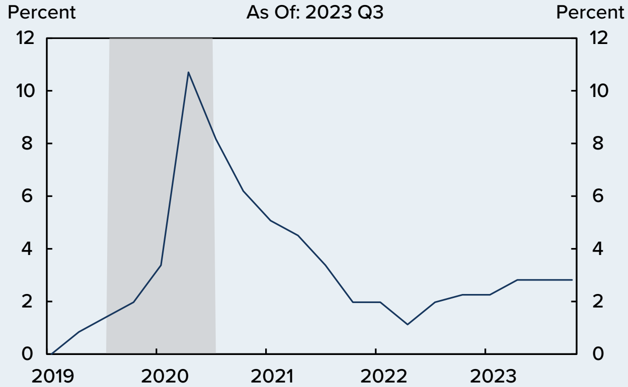
Note: Gray bars signify NBER recessions.

Sources: Federal Reserve Board, Haver Analytics

Household Income and Liquid Savings

Household weekly real earnings increased dramatically during the pandemic but then slowed in 2021 and 2022 as inflation increased (see **Figure B.2**). As inflation moderated in 2023, real earnings increased slightly, and as of the second quarter of 2023, real earnings were 2.8 percent higher than the 2019 level.

B.2 Change in Mean Weekly Real Earnings



Notes: CPI-adjusted dollars (1982-1984), seasonally adjusted. Gray bars signify NBER recessions.

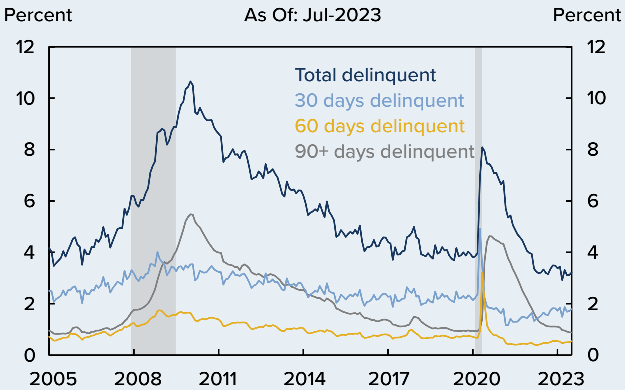
Sources: Bureau of Labor Statistics, Haver Analytics

While real earnings improved in 2023, high inflation can put strain on households to meet their debt obligations, reduce liquidity buffers, and reverse the improvements in financial health experienced during the pandemic. According to data from the JPMorgan Chase Institute, median cash balances in checking and savings accounts grew by 60 percent as a result of the pandemic era Economic Impact Payments (EIP).[30] However, over the two years since the third EIP wave, households have drawn down their cash balances. By April 2023, cash balances were just over 10 percent higher than 2019 levels.

Mortgages and Home Equity Loans

Mortgage delinquency rates remain near two-decade lows as homeowners have benefited from near historically low unemployment, low fixed–interest rate mortgages, and increased home equity. The July 2023 overall delinquency rate of 3.2 percent was approximately flat compared to last year and significantly down from both the May 2020 pandemic peak of 8.1 percent and the June 2019 pre-pandemic figure of 4.2 percent. Similarly, rates for 30-, 60-, and 90-day-plus delinquencies spiked in early to mid-2020 but have since returned to or fallen below pre-pandemic levels as borrowers have emerged from their COVID-related forbearance plans (see **Figure B.3**). Serious delinquency rates (90+ days late on monthly payments) for home equity loans and lines of credit were lower than pre-pandemic levels, reaching 0.7 percent as of September 2023.[31]

B.3 National Mortgage Delinquency Rates



Note: Gray bars signify NBER recessions.

Sources: Black Knight, Haver Analytics

The increase in mortgage interest rates could present risks for some borrowers. Consumers who fall behind on their monthly mortgage payments may have fewer loss mitigation options when interest rates are high. Current loss mitigation options may rely on extending amortization and deferral of past-due amounts, resulting in borrowers paying a higher mortgage payment. An economic shock, such as an increase in the unemployment rate, could lead to increased delinquencies, magnifying the issue.

Higher mortgage interest rates and home prices have decreased housing affordability overall. Moreover, high rates of rent growth have made it more difficult for current renters to save for downpayments to purchase a home. The combination of these two factors is particularly problematic for low-to-moderate-income borrowers, further decreasing housing affordability among these households. See **Section 3.1.2: Residential Real Estate** for a discussion of housing market conditions.

Credit Card Debt

After declining rapidly in 2020 and staying low through 2021, credit card debt per cardholder increased faster than inflation in 2022 and has continued to do so in 2023. Average real credit card debt increased from $4,500 in the first quarter of 2022 to roughly $5,500 in the second quarter of 2023. Rising credit card balances combined with rising interest rates mean higher monthly payments for those with variable-rate revolving debt. Low-income renters have experienced rapid increases in credit card balances as a higher proportion of their income goes to paying increasing rents.[32] This rise in credit card debt suggests the improvement households experienced during the pandemic is coming to an end and could be a sign of trouble ahead for some borrowers. Credit card delinquencies decreased significantly at the onset of the pandemic but have been increasing since mid-2021 and are now at pre-pandemic levels. Of particular concern is the fact that the transition from current to 30+ days delinquency has steadily increased, reaching 7.2 percent in the second quarter of 2023, a transition rate not seen in over a decade.[33]

Auto Loans

Consumers with auto loans are showing strain from payment burdens related to higher interest rates and elevated automobile prices. During the height of the pandemic, delinquency rates dropped to significant lows of 2.75 percent for 30-day delinquency and 1.1 percent for 60-day delinquency. However, as of the first quarter of 2023, average delinquency rates rose above pre-pandemic levels of 4.1 percent for 30-day and 1.75

Box B: Household Finance (continued)

percent for 60-day, according to the CFPB Consumer Credit Panel. This rise was driven largely by subprime borrowers.

Student Loans

At the beginning of 2023, student loan debt totaled $1.75 trillion, of which 96.7 percent is federally owned. Prior to the start of the pandemic and nearly 10 years after the Great Recession ended, delinquency rates for these federal student loans remained stubbornly high, especially for loans owned by the Department of Education. Of the 20.4 million federally owned loan accounts in active repayment as of December 31, 2019, 3.2 million (15.7 percent of the total) were at least 31 days past due. In addition, 2.8 million government-owned accounts were in forbearance and 7.7 million were in default.[34]

At the beginning of the pandemic, the federal government cast a wide safety net under the federally owned portfolio, suspending interest accrual, pausing payments on loans in active repayment, and halting involuntary collection of defaulted loans. Due to a series of administrative actions, the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) protections were extended through August 2023.[35] These measures reduced the delinquency and default rates to zero for federally owned loans during that time. During this period, 60-day delinquency rates for nonstudent loan obligations declined significantly, by nearly 2 percentage points for consumers with student loans, according to a CFPB analysis of consumer credit data.[36] However, the percentage of student loan borrowers delinquent on nonstudent loan debt rose above pre-pandemic levels by early 2022 and has continued to rise, reaching 8 percent by the first quarter of 2023.

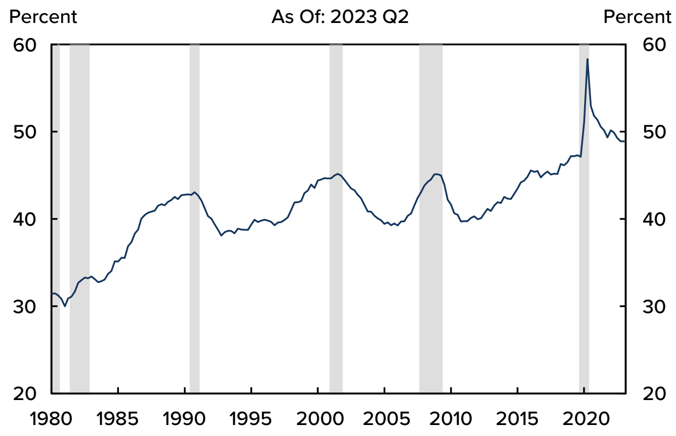
In October 2023, the payment pause ended for upwards of 30 million consumers, including an estimated 7 to 8 million student loan borrowers who left school during the pandemic and are entering repayment for the first time.[37] The Department of Education has fast-tracked the implementation of a new income-driven repayment plan that will provide lower monthly payments for many borrowers.[38] In addition, borrowers who miss payments or make late or partial payments will not have a delinquency reported to credit-reporting agencies for the 12-month period that ends September 30, 2024.[39] The protection from negative credit reporting, which may mask student loan delinquencies, may help some consumers remain current on their credit cards, car loans, and other non–student loan obligations.[40]

3.1.3 Corporate Credit

Nonfinancial corporate credit markets play an important role in supporting business investment, and when functioning well, they facilitate efficient capital formation and allow investors to direct capital to fund economic growth. U.S. credit markets have grown significantly since the 2007–09 financial crisis, and nonfinancial corporate debt as a percentage of gross domestic product (GDP) remains elevated relative to pre-pandemic levels, despite having fallen from its 2020 peak (see **Figure 3.1.3.1**). Financial stability risks can arise when unexpected financial or economic events negatively affect firms' ability to service or refinance their debt and the financial sector cannot absorb losses from associated downgrades and defaults. If widespread, difficulties in servicing or refinancing outstanding debt can also adversely affect the overall health of the economy, while an associated reduction in investor risk appetite can lead to significant declines in asset prices.

Corporate fundamentals remain solid overall, though recent trends have moderately deteriorated because businesses face notably higher borrowing costs and profit margins have been pressured by slowing economic growth and elevated inflation. While the interest coverage ratio for all publicly traded firms in the United States, as measured by the median ratio of earnings before interest and taxes to interest expenses, has trended lower in recent quarters, firms' ability to service their debt obligations remained solid overall, supported in part by strong earnings growth (see **Figure 3.1.3.2**). That said, corporate earnings growth has slowed in recent quarters, with second-quarter earnings for S&P 500 Index firms having decreased by 4.1 percent year-over-year. Market expectations for a "soft landing" in the United States have risen because growth has proven more resilient than feared, though lower-income consumers continue to pull back on discretionary spending as a larger portion of their income goes toward covering essential living expenses, like food and shelter (see **Box B: Household Finance)**. A sharper-than-expected decline in economic activity could make it more challenging for

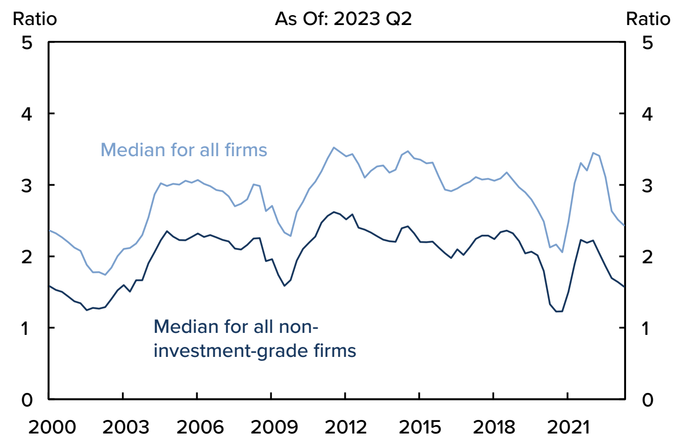
3.1.3.1 Nonfinancial Corporate Debt as a Percentage of GDP



Note: Gray bars signify NBER recessions.

Sources: Federal Reserve, Haver Analytics

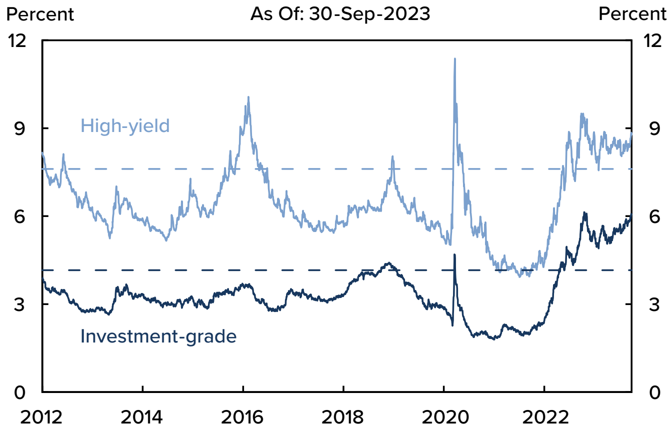
3.1.3.2 Interest Coverage Ratios



Notes: Federal Reserve Board staff calculations; the interest coverage ratio is calculated as earnings before interest and taxes divided by interest payments of nonfinancial publicly-traded firms. Firms with leverage less than 5 percent and interest payments less than $500,000 are excluded.

Sources: S&P Global, Compustat, Federal Reserve Board of Governors

3.1.3.3 Corporate Bond Yields



Note: Dotted lines represent 20-year average.

Sources: ICE Data Indices, LLC, FRED

some firms to continue servicing their debt obligations. This is particularly true of firms with below-investment-grade credit ratings, whose interest coverage ratios remain below their historical median levels.

Corporations have largely managed to weather this challenging environment thus far. However, lower-rated firms with higher leverage and a greater share of floating-rate liabilities on their balance sheets, such as issuers in the leveraged loan market, have come under greater stress than their higher-rated peers, given the faster transition to a higher-funding-cost environment. Meanwhile, the growth in the private credit market has garnered increased attention in the financial press. Private credit is a relatively opaque segment of the broader financial market that warrants continued monitoring. Despite its accelerating growth, private credit still represents a relatively small portion of the U.S. economy and also presents limited liquidity transformation risks. However, the extent to which the private credit market poses financial stability risks remains uncertain. Furthermore, private credit funds can pose their own distinct risks. For example, private credit funds may lend to borrowers with risk profiles that differ from those to whom traditional corporate credit providers typically lend and, as a result, may have correspondingly different exposure to default risk. Similar to traditional corporate credit providers, an unexpected rate of default may have a cascading effect across broader financial markets, the impact of which may be more or less pronounced depending on the nexus private credit funds share with other market participants, such as fund investors, other investment funds managed by shared investment advisers, and various counterparties, as well as market participants that may be invested in other levels of a particular company's capital structure.

Corporate Bond Markets

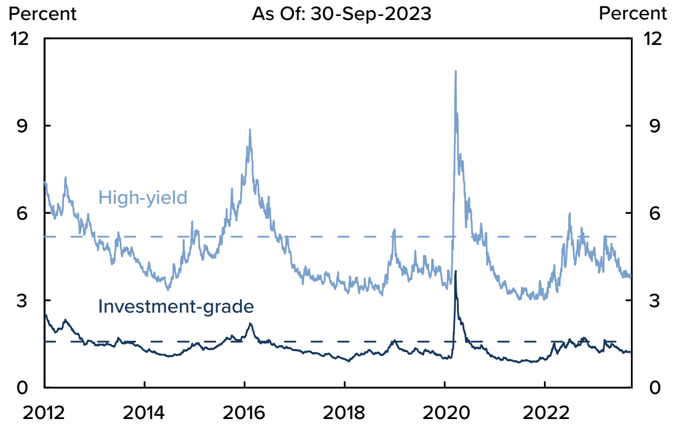
Corporate bond yields have risen markedly over the last two years, with both investment-grade and high-yield bond yields well above their 20-year averages (see **Figure 3.1.3.3**). Yields on comparable-maturity Treasury securities have also risen by several percentage points following the onset of the Federal Reserve's Federal Open Market Committee hiking cycle in March 2022, resulting in corporate bond spreads remaining near their historical average levels (see **Figure 3.1.3.4**). While borrowing costs on newly issued bonds have risen, the increase in firms' interest expenses should be manageable because investment-grade companies took advantage of historically low interest rates to raise record amounts of debt in 2020 and high-yield companies did the same in 2021, extending the maturity of their debt outstanding and thus mitigating near-term refinancing risks.

Lower refinancing needs and higher interest rate volatility have contributed to a slowdown in corporate bond issuance over the last two years (see **Figure 3.1.3.5**). Additionally, the broad slowdown in merger-and-acquisition (M&A) activity has contributed to lower volumes in the high-yield and leveraged loan markets. Given increasing corporate fundamental headwinds and more restrictive interest rates, market analysts are largely expecting corporate default rates to increase over the next 18 months (particularly for lower-rated issuers in the high-yield market) but remain below levels that are typically experienced during severe recessions.

Leveraged Loan Markets

The outlook is less sanguine in leveraged loan markets, where below-investment-grade issuers are more vulnerable to higher rates due to the floating-rate structure of their debt. These companies may struggle to make payments if macroeconomic conditions deteriorate and their debt service burden increases, especially if they do not hedge their interest rate exposure. Also, the credit quality of leveraged loans has started to deteriorate in recent quarters, as evidenced by the volume of credit rating downgrades surpassing the volume of upgrades and the large portion of the lowest-quality loans on negative outlook. Leveraged loan default activity has increased from historical lows (see **Figure 3.1.3.6**), and some market analysts expect default rates in the leveraged loan market to surpass those in the high-yield bond market over the next 18

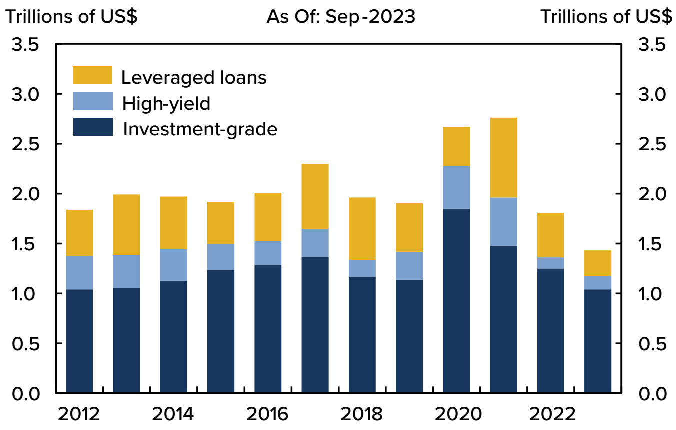
3.1.3.4 Corporate Bond Spreads



Note: Dotted lines represent 20-year average.

Sources: ICE Data Indices, LLC, FRED

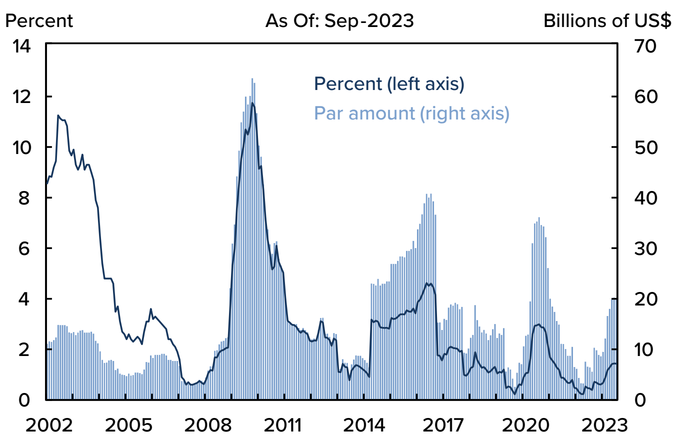
3.1.3.5 Gross Issuance of Corporate Debt



Notes: Investment-grade and high-yield include all nonconvertible corporate debt, MTNs, and Yankee bonds, but they exclude all issues with maturities of one year or less and CDs. Leveraged loans include institutional and pro rata loans. 2023 figures are through September.

Sources: Refinitiv, SIFMA, LCD Pitchbook

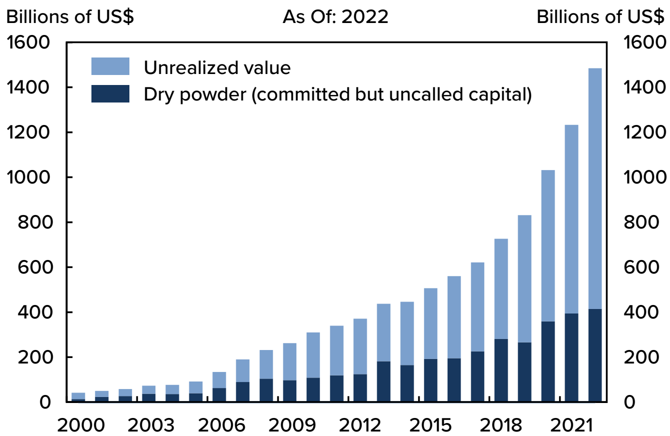
3.1.3.6 Leveraged Loan Default Rates



Note: Par amount and percent of Morningstar LSTA Index Loans in payment default or bankruptcy.

Source: LCD PitchBook

3.1.3.7 Global Private Debt AUM



Source: Preqin

months, given the more immediate transmission of higher borrowing costs. Despite the expected increase, default rates are expected to remain below levels that would pose a systemic risk. At the same time, year-to-date new leveraged loan issuance is running significantly below average historical levels, hindered by higher interest rates, fewer leveraged buyouts and M&A deals, and greater market volatility. Also, as discussed in the next section, private credit is a growing segment of nonfinancial business lending and provides a source of financing that is an alternative to high-yield bonds and bank-originated leveraged loans.

Nonbank Private Credit

Private credit, defined for the purposes of this report as direct lending by nonbank institutions to businesses, has grown significantly as an asset class, driven in part by the retreat of banks from certain lending activities since the 2007–09 financial crisis. Global private credit funds have experienced substantial growth in recent years, with estimated assets under management (AUM) of $1.5 trillion as of year-end 2022, up from $500 billion at year-end 2015 (see **Figure 3.1.3.7**). There has been strong demand for private credit from institutional investors, who typically receive higher yields for assuming greater credit and liquidity risk in this market. At the same time, private credit has been attractive from a borrower's standpoint because businesses can benefit from private credit's faster execution, greater flexibility and accessibility, and limited disclosure requirements relative to bank lending and the public markets.

The level of opacity in private credit markets can make it challenging for regulators to assess the buildup of risks in the sector. Private credit funds form the largest class of lenders in the space, followed by business development companies. Investor redemption risks in this space appear low because most private credit funds have a closed-end structure and typically lock up the capital of their institutional and high-net-worth investors for extended periods. While an economic downturn could increase funding pressures and cause defaults to rise, the private credit market still represents a modest portion of the overall commercial lending sector, despite the sector's recent growth.

Recommendations

Higher interest rates and slowing economic growth have increased nonfinancial corporate credit risk. If credit quality significantly worsens, a potential wave of debt defaults could lead to large redemptions at investment funds with significant liquidity mismatches[41] and in turn disrupt bond market functioning. Moreover, such defaults may also have a cascading effect across broader financial markets. The Council recommends that member agencies continue to monitor levels of nonfinancial business leverage, trends in asset valuations, and implications of the potential for a sustained period of higher interest rates for the entities they regulate in order to assess and reinforce the ability of the financial sector to manage severe simultaneous losses. The Council encourages entities exposed to corporate credit risk to review their risk-rating methods in light of the uncertain economic environment and, if applicable, assess the adequacy of their allowance for credit losses. The Council also supports enhanced data collection on nonbank lending to nonfinancial businesses to provide additional insight into the potential risks associated with the rapid increase in private credit.

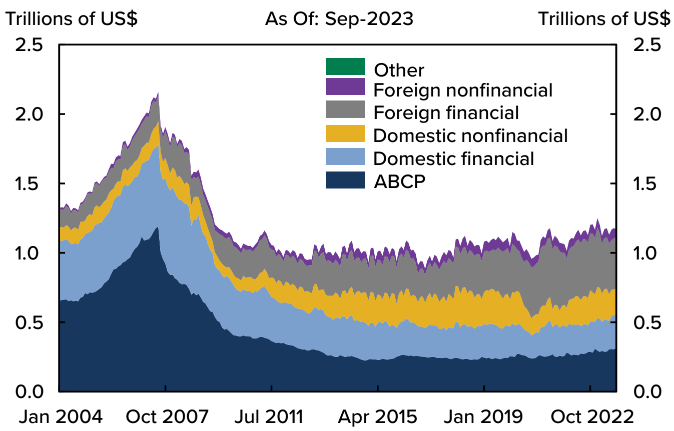
3.1.4 Short-Term Funding Markets

Short-term wholesale funding markets provide essential financing for businesses, financial intermediaries, state and local governments, and the federal government. These markets are critical for implementing monetary policy and supporting financial market liquidity. They are also highly interconnected with systemically important financial institutions that borrow and lend in these markets. In addition, some key intermediaries in these markets perform significant liquidity and maturity transformation and are vulnerable to runs. These features contribute to fragilities in the short-term funding markets that can affect financial stability.

Unsecured Lending

Commercial paper (CP) is an important source of unsecured short-term funding used by both nonfinancial and financial firms. Negotiable certificates of deposit (NCDs) provide a means for banks to obtain short-term unsecured funding in capital markets. As investors tend to buy and hold CP and NCDs to maturity, demand for secondary-market liquidity in these instruments is usually low, and dealers face little incentive to intermediate and support secondary markets. Therefore, when demand for liquidity rises sharply, as happened during the "dash for cash" in March 2020, these markets cannot accommodate large volumes of sales requests from investors. At the same time, financial institutions that depend on these markets as a source of funding may be unable to obtain new funding as these short-term instruments mature. This creates a channel for financial instability between the institutions seeking funding and the institutional investors providing the funds, thus contributing to the fragility of the short-term funding markets. Amid the market disruptions in March 2020, as investor demand for CP plummeted, particularly for terms beyond four days, the Federal Reserve established a Commercial Paper Funding Facility to ensure that firms were able to roll over their CP. This episode illustrated the vulnerability of these funding markets and the importance of ensuring that they function properly during market stress.

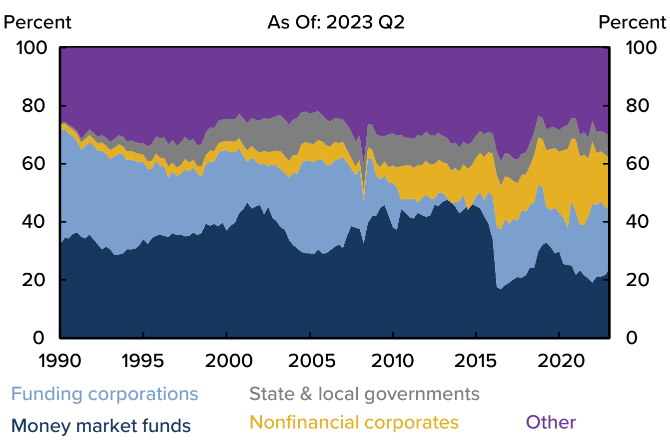
3.1.4.1 CP Outstanding by Issuer Type



Notes: Not seasonally adjusted. Domestic includes CP issued in the U.S. by entities with foreign parents. ABCP represents Asset-Backed Commercial Paper.

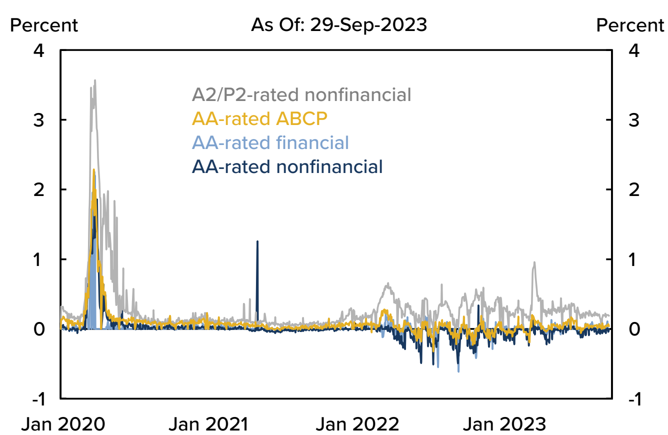
Sources: Federal Reserve, Haver Analytics

3.1.4.2 CP Investors



Sources: Federal Reserve, Haver Analytics

3.1.4.3 One-Month CP Interest Rate Spreads



Note: Spread to 1-Month Overnight Index Swap (OIS) rate.

Sources: Federal Reserve, Refinitiv, Haver Analytics

The amount of CP outstanding has remained relatively stable over the past year and remains well below levels observed in 2007 and 2008 (see **Figure 3.1.4.1**). Foreign financial firms continue to be the most active issuers in the CP market, accounting for 37 percent of CP outstanding as of September 2023. The CP investor base remains diverse, with money market funds (MMFs) accounting for 23 percent of the market, funding corporations accounting for 21 percent, and nonfinancial corporations accounting for 18 percent as of June 30, 2023 (see **Figure 3.1.4.2**). CP spreads, which can signal stress in short-term funding markets, widened notably for lower-rated issuers in the aftermath of the failure of Silicon Valley Bank (SVB) (see **Figure 3.1.4.3**). That said, spreads remained well below levels observed in the 2007–09 financial crisis and in March 2020, and spreads returned to normal ranges in the two weeks following SVB's failure.

Secured Lending

The repurchase agreement (repo) market is an important source of collateralized short-term funding, and repo markets play a critical role in Treasury market liquidity and monetary policy implementation.[42] Repos allow one firm to sell a security to another firm with a simultaneous promise to buy the security back at a later date, often the next day, at a specified price.[43] The repo market consists of two main segments:

1. Tri-party repo, in which settlement occurs within the custodial accounts of a clearing bank.
2. Bilateral repo, which typically refers to all activity not settled within the tri-party system.

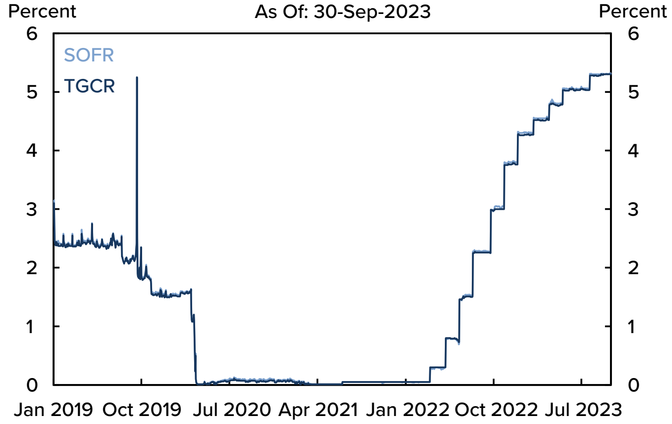
Bilateral Treasury repo includes transactions cleared through the Fixed Income Clearing Corporation (FICC) and those that are not centrally cleared. Large bank-affiliated securities dealers serve as significant intermediaries in the repo market by borrowing from cash lenders, such as MMFs, and lending to entities that employ leverage, such as hedge funds. Dealers also borrow in the repo market to finance their own securities holdings. In addition, large banks may access repo markets in times of stress to obtain cash without liquidating assets.

Stress in repo markets may affect financial stability, given the size of the market and the prominent roles played by large financial institutions. Firms reliant on overnight or short-term repo financing may be vulnerable to funding shocks, particularly during times of market stress, and they may transmit stress to other repo market participants and broader short-term funding markets. For example, MMFs and open-end funds, which are net lenders in the repo market, may pull back from the market during periods of market stress to raise cash to meet redemptions. At the same time, leveraged investors, such as hedge funds and mortgage real estate investment trusts, may face a sudden tightening in financing terms or be unable to roll over financing. As a result, leveraged investors may be forced to sell assets quickly, which can depress asset prices, lead to a further tightening in financing terms, and force further deleveraging. Episodes of stress in repo markets in September 2019 and March 2020 highlighted how supply-and-demand imbalances in the repo market can quickly transmit or amplify stress in the financial system.

Over the past year, repo market rates rose commensurate with the increases in the Federal Reserve's target range for the policy rate. In the overnight Treasury repo market, Secured Overnight Funding Rate (SOFR) and the Tri-Party General Collateral Rate (TGCR) have generally been equal to or slightly below the rate on the Federal Reserve's overnight reverse repo facility (ON RRP) (see **Figure 3.1.4.4**).

As of June 30, 2023, repo borrowing totaled \$6.8 trillion, of which non–Federal Reserve borrowing represented \$4.5 trillion (see **Figure 3.1.4.5**).[44] Repo trading volumes have grown over the past year, as measured by volumes used to compute SOFR, especially following the March 2023 banking stress (see **Figure 3.1.4.6**). Similarly, the total volume at FICC's sponsored repo service, which is a subset of SOFR repo volumes, has increased

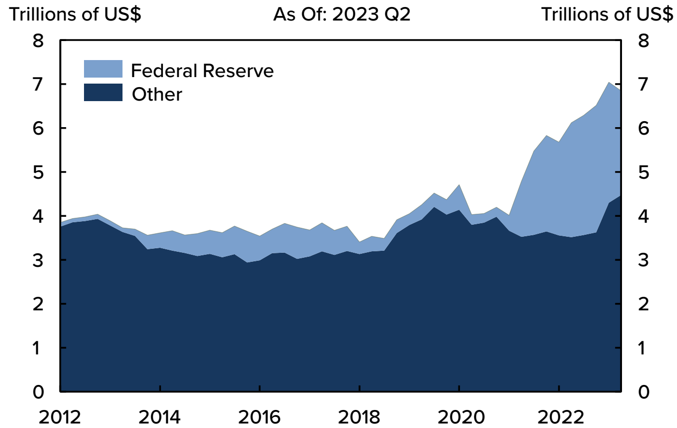
3.1.4.4 Repo Rates



Notes: TGCR = Tri-party General Collateral Rate; SOFR = Secured Overnight Financing Rate

Source: Federal Reserve Bank of New York

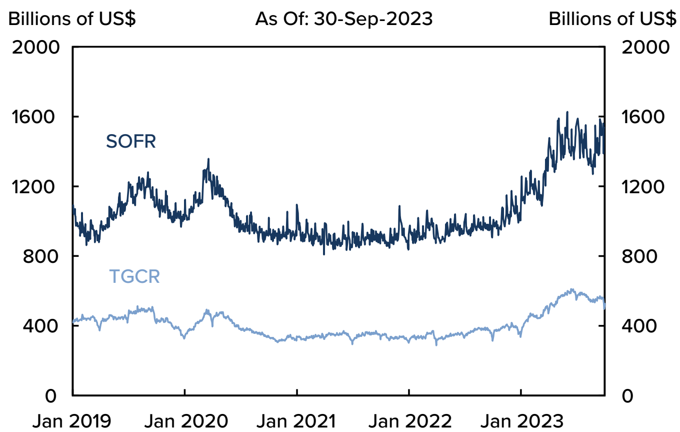
3.1.4.5 Repo Borrowing Outstanding



Note: Federal Reserve repo borrowing primarily consists of ON-RRP facility.

Sources: Federal Reserve, Haver Analytics

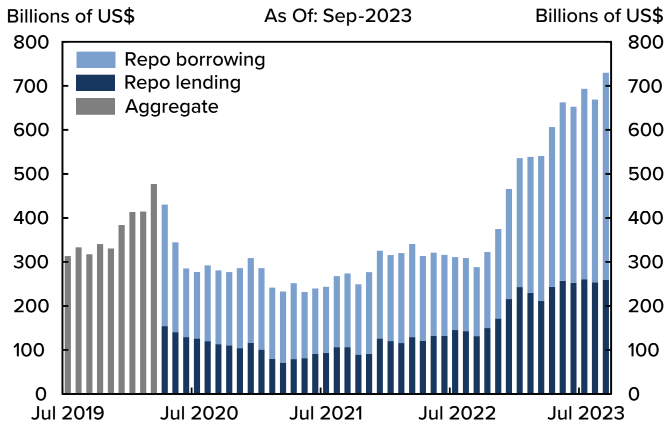
3.1.4.6 Repo Volumes



Notes: TGCR = Tri-Party General Collateral Rate; SOFR = Secured Overnight Financing Rate

Source: Federal Reserve Bank of New York

3.1.4.7 Sponsored Repo Activity



Notes: Average daily volume of sponsoring members. Breakdown of repo lending and repo borrowing unavailable prior to April 2020.

Source: DTCC

markedly over the past year, with average daily volumes exceeding $730 billion in September 2023 (see **Figure 3.1.4.7**).[45] The increased volumes at FICC's sponsored repo service can largely be attributed to a growth in borrowing volumes, which rose from approximately $160 billion in September 2022 to $470 billion in September 2023. The growth in sponsored repo borrowing is consistent with rising hedge fund net repo demand, as is typical in the cash-futures basis trade (see **Section 3.3.2: Investment Funds**).[46]

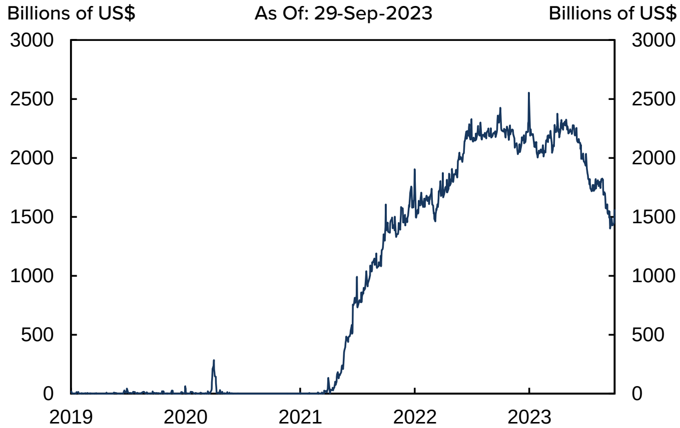
Less is known about the non-centrally cleared bilateral repo (NCCBR) market, which was estimated by the OFR to stand at approximately $2 trillion.[47] In January 2023, the OFR published a Notice of Proposed Rulemaking to establish an ongoing collection of NCCBR transaction-level data, which should, for the first time, provide regulators with timely insight into this market. The OFR estimates that the rule, which the OFR expects to finalize in 2024, should cover over 90 percent of NCCBR market volume.

Since the 2007–09 financial crisis, some repo markets, particularly the tri-party segment, have undergone structural changes that have streamlined some repo operations and reduced counterparty credit risk.[48] However, counterparty credit risk is still significant in the NCCBR market. Dealers can mitigate counterparty credit risk by requiring a haircut, which requires their counterparties to provide extra collateral that serves as a cushion to offset losses if a counterparty defaults. For many years, tri-party haircuts for Treasury collateral typically have been 2 percent. Dealers have required counterparties to provide collateral worth 2 percent more than the cash the dealer lends. Recent data show that for NCCBR, dealers frequently require very low or even zero haircuts.[49] It is possible that some repos have zero haircuts because other transactions between the dealer and the same counterparty can be netted or because the counterparty has other accounts with the dealer that have positive equity balances.

The Federal Reserve operates the ON RRP, which places a floor under overnight interest rates by providing an investment alternative for eligible counterparties when overnight repo rates fall below the rate offered at the ON RRP.[50] MMFs continue to be the most active users of the ON RRP, accounting for 95 percent of ON RRP volume as of September 30, 2023. Usage of the ON RRP peaked at over $2.5 trillion in late 2022 and began steadily declining in the Spring of 2023 as MMFs invested in higher-yielding short-term assets amid a surge in the supply of such assets, including Treasury bills (see **Figure 3.1.4.8**).

Looking ahead, an expected increase in the supply of U.S. Treasury securities to private sector investors may require greater reliance on repo financing. Accordingly, helping to ensure robust and smooth functioning in repo markets will be critical to maintaining liquidity in the market for Treasury securities and other financial markets. To achieve this end, the SEC proposed changes that would enhance risk management for central counterparties (CCPs) clearing Treasury securities and would require direct participants to centrally clear all repo and certain cash transactions in Treasuries in which they are counterparties. If adopted as proposed, these rule changes could reduce counterparty risk and result in a smaller NCCBR market.

3.1.4.8 ON RRP Balance



Sources: Federal Reserve Bank of New York, Haver Analytics

The Role of Money Market Funds and Other Short-Term Investment Vehicles in Short-Term Funding Markets

MMFs, which had a combined $6.2 trillion of assets under management (AUM) as of September 30, 2023, are major lenders in the short-term funding markets and contribute to funding market vulnerabilities by performing liquidity and maturity transformation (see **Section 3.2.2: Investment Funds**). In both 2008 and 2020, prime MMFs experienced heavy redemptions that contributed to dislocations in the short-term funding markets, and in 2020, strains among tax-exempt MMFs contributed to stress in tax-exempt funding markets. These events led to extraordinary policy responses in 2008, when the Federal Reserve established liquidity facilities and the Treasury provided a temporary guarantee of MMFs, and in 2020, when the Federal Reserve again established facilities to stabilize short-term funding markets.

In August 2023, the SEC issued amendments under the Investment Company Act of 1940 (Investment Company Act) to address problems that had been experienced by certain MMFs in connection with the economic shock at the onset of the COVID-19 pandemic in March 2020.[51] Specifically, the amendments were designed to reduce the risk of investor outflows from MMFs during periods of market stress by removing the ability of MMFs to temporarily suspend redemptions and by removing the tie between liquidity fees and weekly liquid asset thresholds. Also, the amendments will increase the minimum liquidity requirements for MMFs to provide a more substantial liquidity buffer in the event of rapid redemptions. To address concerns about redemption costs and liquidity, the amendments generally will require institutional prime and institutional tax-exempt MMFs to impose liquidity fees when daily net redemptions exceed 5 percent of net assets. The amendments will also require any nongovernment MMF to impose discretionary liquidity fees if the MMF's board determines that imposing a fee is in the best interests of the fund.

Other Short-Term Investment Funds

Other short-term investment funds operating as lenders in the short-term funding markets include dollar-denominated non-U.S.-domiciled MMFs (so-called offshore MMFs), bank-sponsored short-term investment funds (STIFs), local government investment pools, private liquidity funds, and ultrashort bond funds.[52] These vehicles share many characteristics with MMFs: a lack of federal deposit insurance, engagement in liquidity and maturity transformation, and the potential to contribute to fragilities in the short-term funding markets. Additionally, some of these fund types have experienced large outflows in times of financial stress.

Similar to prime MMFs, these vehicles are permitted to invest in assets with credit risk, such as CP. As with MMFs, these features could lead the investment vehicles to liquidate positions or otherwise withdraw from key funding markets in certain stress conditions, contributing to disruptions like those in 2008 and 2020.

Additionally, some of these vehicles promise investors a stable net asset value (NAV), which may further increase structural vulnerabilities in these funds. While these vehicles are typically limited in the amount of credit risk they can take, the market value of a fund's shares may fall below the stable NAV if the underlying assets lose value. The rising possibility of losses in a stable-NAV fund may prompt investor concerns and redemptions that can cause a fund to sell assets to meet redemptions, potentially straining markets for short-term instruments.[53]

Collectively, these vehicles have more than $1.9 trillion in assets, including significant exposures to unsecured debt instruments that contribute to vulnerabilities. Bank-sponsored STIFs had at least $310 billion in June 2023, according to sponsoring banks.[54] Local government investment pools had assets of at least $576 billion, according to Fitch Ratings. Ultrashort bond funds had assets of at least $323 billion, according to Morningstar. Private liquidity funds, for which reporting is lagged, had assets of $320 billion as of March 31, 2023, according to the SEC's Form PF Statistics report. Offshore MMFs that invest in private dollar-denominated instruments had assets of $385 billion, according to CraneData.

Recommendations

The Council supports efforts by financial regulators to strengthen the resilience of short-term funding markets and support orderly market functioning during periods of heightened market stress. The SEC finalized a rule reducing structural vulnerabilities in MMFs to make the funds more resilient, liquid, and transparent. The Council will continue to monitor short-term funding market conditions for potential vulnerabilities that may warrant additional action and recommends that member agencies bolster efforts to make these markets more resilient, including efforts to increase the resilience of investment vehicles with similarities to MMFs. Where lack of data prevents close monitoring, Council members should develop proposals to collect the necessary data. Examples of such measures are the OFR's efforts to improve collection and transparency of NCCBR market data and the SEC's adoption of Rule 10c-1a, which will promote market transparency and efficiency by requiring the reporting of certain information about securities lending transactions.

The Council supports efforts to examine and consider ways to improve counterparty risk management in the NCCBR market given the reported prevalence of zero haircuts on collateral. Additional data on dealers' margining practices, including but not limited to the use of haircuts, could also improve the Council's ability to monitor risks and evaluate options, such as minimum haircuts on repo collateral, in these markets.

3.1.5 Digital Assets[55]

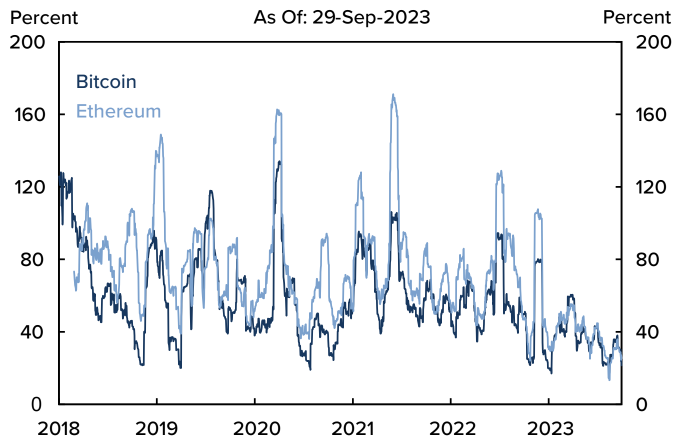
In October 2022, the Council published its *Report on Digital Asset Financial Stability Risks and Regulation*.[56] The Digital Asset Report detailed several vulnerabilities of the crypto-asset ecosystem that may impact traditional financial institutions connected to the crypto-asset sector.

Many of the vulnerabilities identified in the Digital Asset Report were visible this year. While the crypto-asset market is not significant in its size or its connections to the traditional financial system, some traditional financial firms were affected by shocks in the crypto-asset market. At the same time, some traditional financial institutions appear to remain interested in exploring potential efficiencies of distributed or shared ledger technology (DLT), which is the technology underpinning the crypto-asset ecosystem, separate from speculative assets. For example, some institutions are exploring DLT for post-trade settlement, payment systems, and banking infrastructure like SWIFT.

Vulnerabilities Inside the Crypto-Asset Ecosystem

In its Digital Asset Report, the Council noted that financial stability vulnerabilities may arise from crypto-asset price volatility (see **Figure 3.1.5.1**), the market's high use of leverage, the level of interconnectedness within the industry,[57] operational risks,[58] and the risk of runs on crypto-asset platforms and stablecoins.[59] Vulnerabilities may also arise from token ownership concentration,[60] cybersecurity risks, and the proliferation of platforms acting outside of or out of compliance with applicable laws and regulations. For example, as

3.1.5.1 Thirty-Day Volatility for Selected Digital Assets



Source: Bloomberg, L.P.

reflected in recent crypto-asset related sanctions and anti–money laundering cases, crypto-assets remain susceptible to misuse by terrorist organizations and other sanctioned individuals' efforts to move funds in support of illicit activities.[61]

Interactions among crypto-asset vulnerabilities can amplify shocks within the crypto-asset ecosystem, which was the case with Curve Finance[62] this year. As with many crypto-assets, Curve Finance's native token, CRV,[63] experienced price volatility, losing over half of its value in one year.[64] On July 30, 2023, the price received a further shock after it was reported that $73.5M worth of crypto-assets were stolen in a hack of Curve Finance.[65] CRV lost almost 30 percent of its value in the days following the hack.[66] At the time of the incident, 47 percent of the circulating supply of CRV was used to back loans, according to public reports.[67] The drop in CRV's price reportedly put over $100 million worth of loans taken out by Curve Finance's founder at risk of being liquidated on other decentralized finance (DeFi) platforms.[68] Given that DeFi protocols sell underlying collateral in the market if a user is unable to maintain their position, platforms holding CRV as collateral were at risk of experiencing significant losses if the loans liquidated and the price of CRV continually declined. While the DeFi protocols holding CRV as collateral have remained stable and Curve Finance has been able to recover a majority of the funds stolen in the July hack, this sequence of events highlights how the aforementioned vulnerabilities within the crypto-asset ecosystem can interact and potentially result in financial losses.

Investor and Consumer Protection

Speculative crypto-assets and related services may pose a range of investor protection and market integrity concerns. As the Council has previously noted, many crypto-asset firms may be acting outside of or out of compliance with applicable law and may also lack sufficient risk governance and control frameworks. This increases the potential for fraud, illicit finance, sanctions evasion, operational failures, liquidity and maturity mismatches, and risk to investors and consumers, as well as contagion within the crypto-asset market.

In the crypto-asset ecosystem, it is common for crypto-asset platforms to be structured as vertically integrated entities that offer multiple types of products and services like issuance, trading, asset management, custody, and brokerage services. In traditional finance, these products and services are usually offered by entities that are separately registered and regulated. Such vertically integrated entities may not be in compliance with applicable laws and regulations. Additionally, many of these crypto-asset entities are centrally controlled, even when purporting to operate as a decentralized protocol. The provision of multiple types of products and services through one entity or a group of affiliated entities can create conflicts of interest that could cause investor and market harm.[69] Potential vulnerabilities arising out of vertical integration, as well as the lack of regulatory compliance and oversight, include the absence of transparency with regard to corporate structure and key function holders, conflicts of interest, inappropriate use of clients' funds, and market manipulation.

To address these issues, regulators have undertaken rulemaking to strengthen existing investor and consumer protections. The SEC has proposed rule changes to expand the scope of the current custody rule for investment advisers to include a broader array of client assets, including crypto-assets that are not funds or securities.[70] The SEC has also reopened the comment period on proposed amendments to the definition of "exchange" under Securities Exchange Act of 1934 (Exchange Act) Rule 3b-16. As part of the reopening, the SEC provided supplemental information regarding trading systems for crypto-asset securities, including DeFi systems, that already are included in the exchange definition and those that would be included in the proposed definition.[71] CFTC staff issued an advisory on clearing of crypto-assets by derivatives clearing organizations this year.[72] States have also taken action. For example, the New York State Department of Financial Services (NYDFS) published guidance clarifying its expectations for New York–based virtual currency businesses regarding the custody of customer assets.[73]

Council members have also brought actions against entities and persons violating applicable federal and state laws. At the state level, for example, a multistate task force composed of 10 state securities regulators issued orders alleging state securities law violations in relation to a firm's staking rewards programs.[74] Federal agencies, specifically the SEC and CFTC, have continued to bring enforcement actions due to fraud, manipulation, and failure to register with the appropriate agency, among other types of misconduct. In fiscal year 2023, the CFTC brought 47 actions charging a wide range of violations, including fraud, manipulation, failure to register, failure to supervise, and lack of adequate know your customer and anti-money laundering controls. The defendants in these actions included, among others, digital asset trading platforms, the operators of DeFi protocols, and a digital asset lending platform.[75] The allegations in these cases exemplify the consumer and investor risks that arise from using unregistered platforms. The SEC brought actions this year against companies for operating as unregistered exchanges, broker-dealers, and clearing agencies.[76] The SEC also charged entities with the unregistered offer and sale of securities, including the offer and sale of securities in connection with staking and lending programs.[77] Both the SEC and the CFTC have brought charges related to a firm's failure to comply with anti–money laundering laws.[78]

Interconnections Between the Crypto-Asset Ecosystem and Traditional Finance

The crypto-asset market experiences a higher level of volatility than does the traditional finance system and is also prone to shocks that may impact traditional financial institutions that partner or otherwise interact with the crypto-asset market.[79] Such shocks may include the collapse of fraudulent schemes, cybersecurity issues, technology-related disruptions, and governance or decision-making breakdowns, among other events.

Banking

In January and February 2023, the FDIC, OCC, and Federal Reserve issued joint statements on crypto-asset risks to banking organizations and liquidity risks related to the crypto-asset market.[80] The statements noted, among other things, that the stability of deposits placed by crypto-asset-related entities may be influenced by vulnerabilities in the crypto-asset sector.

The risks faced by banks that maintain a high concentration of deposit accounts for crypto-asset-related entities were visible during the March 2023 bank stress, when California-based Silvergate Bank announced its voluntary liquidation.[81] In the last quarterly report it filed in 2022, Silvergate noted that substantially all of its deposits were derived from crypto-asset customers.[82] However, depositors withdrew over $8 billion (68 percent of Silvergate's deposits) as stress within the crypto-asset market was exacerbated by the shock of the collapse of crypto-asset trading platform FTX.[83] On January 4, 2023, Judge John Dorsey, the presiding official in the FTX bankruptcy, also ordered the seizure of FTX's funds held at Silvergate. Silvergate's SEC filings show that in response to the outflow, it secured a $4.3 billion advance from the Federal Home Loan Bank (FHLB) of San Francisco. To pay back the FHLB and address remaining liquidity issues posed by the decline in deposits, Silvergate sold assets at a loss. In a March 1 SEC filing, Silvergate disclosed that it might be unable to continue as a going concern.[84] Silvergate began the process of self-liquidation on March 8.[85]

The disruption created by Silvergate's self-liquidation made evident the potential for further knock-on effects arising from interconnections between the crypto-asset ecosystem and traditional finance. On March 9, Silicon Valley Bank (SVB) experienced a deposit run and was closed by the California Department of Financial Protection and Innovation the next day, March 10. Signature Bank also experienced a run and was closed by the NYDFS on March 12. The NYDFS noted in its report that in the case of Signature Bank, the percentage of crypto-asset customer withdrawals on March 10 was relatively proportional to the percentage of crypto-asset customers in the deposit base overall. The NYDFS also noted that the perceived public association between Signature and the crypto-asset ecosystem, as well as the timing of SVB's failure and Silvergate's voluntary liquidation, were factors in Signature's failure.[86] Separately, the FDIC noted in its internal review that the root cause of Signature's failure was poor management, including its failure to understand the risks associated with its reliance on crypto-asset industry deposits and its vulnerability to contagion from the crypto-asset industry turmoil that occurred in late 2022 and into 2023.[87] According to the FDIC's report, crypto-asset-related deposits represented 23.5 percent of total deposits at Signature Bank as of September 30, 2022.[88]

In addition to showing the effects the crypto-asset market could have on the traditional financial system, the March bank stress revealed how the interconnections between the crypto-asset and banking sectors, as well as concentration risk, can cause stress in the crypto-asset market. Hours after SVB closed on March 10, Circle Internet Financial LLC (Circle), the issuer of the stablecoin USDC, revealed that $3.3 billion (approximately 8 percent) of the reserves purportedly backing USDC were held at SVB.[89] The news sparked a run on USDC, with $1.6 billion of USDC redemptions occurring on the same day as Circle's announcement. Coinbase and Binance announced that the platforms would temporarily pause conversions between USDC and U.S. dollars as well.[90] Over the weekend after SVB's closure, USDC temporarily lost its 1-to-1 peg with the dollar, with the value of USDC falling as low as $0.89. By March 15, Circle reported that crypto-asset market participants redeemed some $3 billion of USDC. Circle's problems triggered MakerDAO's DAI stablecoin to depeg over the weekend as well.[91] DAI, a stablecoin backed by other crypto-assets, relied on USDC for approximately 52 percent of the collateral supporting its circulating stablecoins.[92]

To help ensure the safety and soundness of the banking system as banks explore crypto-asset related activities, the Federal Reserve announced a novel-activities supervision program in August 2023. The program will be integrated into the Federal Reserve's existing supervisory process to help address risks of novel activities related to crypto-assets, DLT, and complex technology-driven partnerships with nonbanks.[93]

Stablecoins

The Council has previously noted that interconnections between the financial system and the crypto-asset trading markets that are created by stablecoins could serve as conduits for contagion to traditional financial institutions. A stablecoin's impact on the financial system depends on the scale of the stablecoin. For example, if a stablecoin were to scale significantly, a run on the stablecoin could lead to fire sales of the traditional assets backing the stablecoin like bank deposits, MMFs, Treasury securities, and commercial paper (CP).[94] The President's Working Group on Financial Markets (PWG), FDIC, and OCC have also published an assessment of the risks related to stablecoins (2021 PWG Report).[95] In the 2021 PWG Report, the PWG, FDIC, and OCC noted that the failure of stablecoins to maintain a stable value could expose stablecoin users to unexpected losses and lead to stablecoin runs that damage financial stability.[96] The 2021 PWG Report also flagged that disruptions to the payment chain that allow stablecoins to be transferred among users could lead to a loss of payments efficiency and, depending on the extent to which stablecoins are used, undermine functioning in the broader economy.[97] Like the Council's Digital Asset Report, the 2021 PWG Report detailed systemic concerns related to the potential risk of stablecoin arrangements to rapidly scale.[98]

In addition to these issues, some stablecoin issuers do not provide adequate or accurate information about their asset holdings and rights of redemption.[99] A lack of information about these holdings and issuers' reserve management practices may pose a challenge for accurate market analysis of the impact of a stablecoin issuer's holdings, as well as a risk of fraud if the extent of the stablecoin's reserves is misrepresented. The lack of information on reserves can contribute to outsize market reactions to news about an issuer, which can manifest in outsize volatility and potential losses. Regulatory requirements for reserves, capitalization, and reporting may mitigate some of these risks.[100] Like the traditional payment system, stablecoins, if used as a payment instrument, may pose credit risk, liquidity risk, operational risk, risks arising from ineffective system governance, and settlement risk.[101]

Recent Developments

Tokenization

Tokenization, the process of digitally representing an existing reference asset on a ledger, involves linking a digital token's price to the value of its reference asset. Tokenization that occurs on blockchains, a type of DLT, aspires to introduce DLT into clearing and settlement processes, as well as payment systems.[102] This year, some firms have offered tokenized products, including digital forms of securities.[103] To date, the current uses of tokenized traditional assets are limited in their size and impact.[104] The overall value of tokenized markets is also small relative to the crypto-asset market and the traditional financial system.[105]

The projects announced this year reportedly seek to improve efficiency in settlement and payment, often by removing intermediaries, promoting transparency, and embedding features like programmability, and automaticity. At the same time, these projects may present some risks. For blockchain-based tokenized assets, these risks include cybersecurity, privacy, market integrity, operational, and intermediation risks, as well as consumer protection, illicit-finance, and safety and soundness concerns.[106] If the market for tokenized assets grows, these risks could introduce financial stability vulnerabilities into the traditional financial system. The magnitude of these risks could vary, however, depending on the blockchain's design such as permissioned vs. permissionless, and consensus mechanism, among other things.

Tokenized assets present novel legal and regulatory considerations. The economic reality of a tokenization structure will determine the applicable U.S. law, including whether a product or an instrument is a security subject to the existing federal securities laws, a commodity or derivative subject to the Commodity Exchange Act (CEA), and/or another type of asset subject to existing federal and state laws. There are also remaining ownership issues pertaining to a token holder's rights to the underlying asset and/or to the issuer's assets in the event of a breach of contract or bankruptcy.

Recommendations

As indicated above, Council members are enforcing existing rules and regulations applicable to crypto-asset activities. Council members have also addressed risks posed by the crypto-asset ecosystem through agency statements, guidance, and rulemaking. The Council recommends that agencies continue to enforce existing rules and regulations.

In last year's Annual Report as well as the Council's 2022 *Report on Digital Asset Financial Stability Risks and Regulation*, the Council outlined two gaps in the regulation of crypto-asset activities in the United States: (1) the regulation of spot markets for crypto-assets that are not securities and (2) the regulation of stablecoins. The Council recommended that Congress pass legislation to close each of these regulatory gaps. The Council reiterates its recommendations from last year's Report. The Council urges Congress to pass legislation that provides federal financial regulators with explicit rulemaking authority over the spot market for crypto-assets that are not securities. Congress should also pass legislation that would create a comprehensive prudential framework for stablecoin issuers that would also address the associated market integrity, investor and consumer protection, and payment risks. As the Council has previously noted, the Council remains prepared to consider steps available to it to address risks related to stablecoins in the event comprehensive legislation is not enacted.

3.1.6 Climate-Related Financial Risks

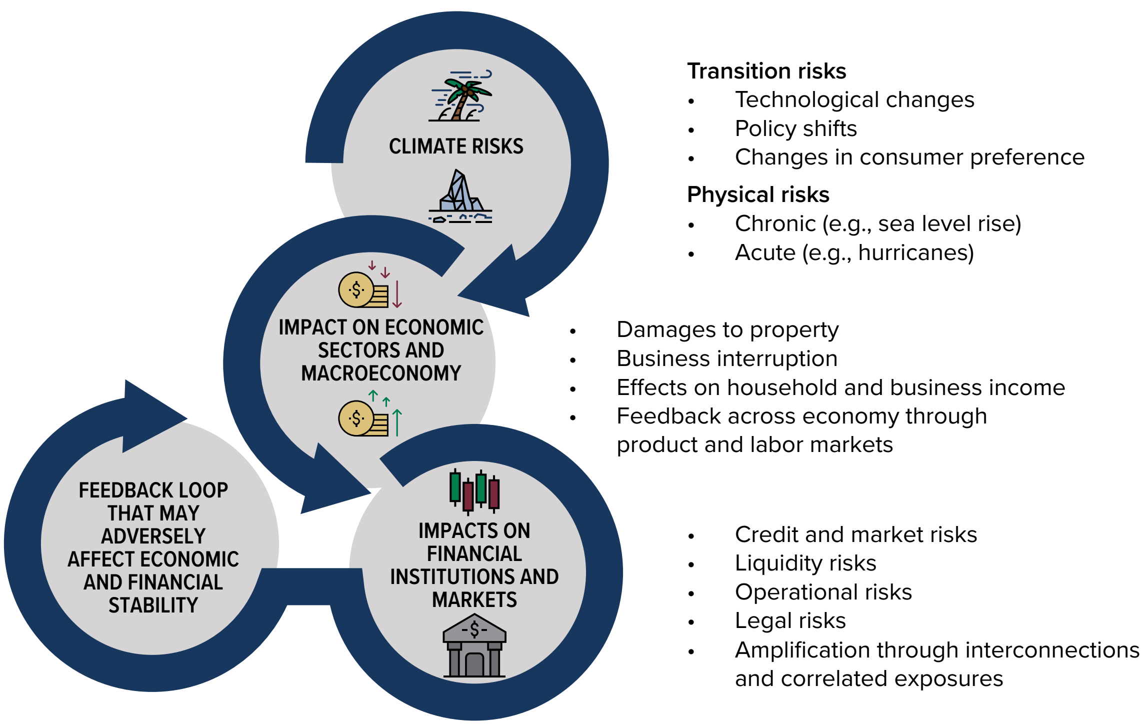
In October 2021, for the first time, the Council identified climate change as an emerging and increasing threat to U.S. financial stability.[107] Broadly speaking, climate-related financial risks are grouped into two categories: physical risks and transition risks.

Physical risks generally refer to the possibility of harm to people and property that can arise from acute climate-related weather events such as droughts, floods, wildfires, heat waves, and windstorms (including hurricanes), many of which are forecasted to increase in frequency and severity; or from chronic changes over time, such as higher average temperatures, changes in precipitation patterns, sea level rise, persistent drought, degradation of arable land, and ocean acidification. Transition risks generally refer to the possibility of stresses to certain institutions or sectors that may arise from changes that cause a shift toward a lower greenhouse gas (GHG) economy, including changes in law and policy, changes in consumer and business sentiment, and technological advances. The impacts of transition risks may result in added costs for some firms and communities, even as they potentially reduce the overall risk associated with unmitigated climate change. In addition, if the transition toward a lower-GHG economy is delayed or disorderly, the impact on firms, market participants, individuals, and communities is more likely to be disruptive.

Climate-related financial risk can manifest as and amplify traditional risks, such as credit, market, liquidity, operational, compliance, reputational, and legal risks. Climate-related risks may be combined with other stresses, such as financial crises or pandemics. Climate-related risks may also compound nonlinearly with other types of shocks. For example, the joint impact of a physical climate shock and a pandemic occurring simultaneously could be 50 percent larger than the sum of the impacts of the individual shocks,[108] have a longer-lived effect, and be propagated via global networks.[109] Given the Council's focus on the financial stability of the system as a whole, it is important to consider a systemwide approach: combining individual firm and market risk assessments by taking into account interconnections and spillovers, which may amplify the financial effects on individual firms. A systemwide approach may also highlight possible trade-offs and the need to balance them. Actions individual firms take to protect themselves may lead to unexpected losses at other firms or hinder objectives related to low- and moderate-income community development, including fair access to credit. For example, more frequent extreme weather events in low-income communities may cause damage to physical business assets located there. If firms consequently choose to move out of the area, the resulting job losses could create economic instability in those communities.[110] This example makes it clear the Council must analyze and gain an understanding of the transmission channels through which climate risk may affect the financial system as a whole (see **Figure 3.1.6.1**).

Given the wide variety of transmission channels through which climate-related financial risks

3.1.6.1 Transmission Channels Linking Climate Risks to Financial Stability



Source: Figure created by FSOC

could negatively affect the economy, the possibility that climate-related risk could amplify traditional risks, and the potential for feedback loops between physical risks and transition risks, work is underway to better understand and quantify the potential impacts of climate risks on financial institutions and markets. Council member agencies are improving their understanding of the specific channels through which climate-related impacts can manifest as financial risks, and the staff-level Climate-related Financial Risk Committee (CFRC) continues to work to build capacity, address data gaps, and improve methodological approaches to risk monitoring (see **Section 4.1: Council Activities**).

Recent Developments in Physical Risk, Housing, and Property Insurance Markets

As noted in the Council's 2021 *Report on Climate-Related Financial Risk* and the Council's 2022 *Annual Report*, climate-related impacts and events are imposing significant costs on the public and the economy.[111] Through September 2023, the United States experienced 24 confirmed weather and climate disaster events in which losses exceeded $1 billion, up from an annual average of 8.1 events per year between 1980 and 2022 and also up from a recent five-year annual average of 18.0 events from 2018 to 2022.[112]

The effects of physical risk on real estate remains a primary area of interest. Climate-related events may cause damage that can reduce the value of real estate, which could affect households and owners of commercial real estate (CRE), and such events can also increase the probability of default and associated loss.[113] As markets factor these risks into pricing, real estate (and real estate investment products) exposed to physical risk could lose market value, even without direct damage. Households with lower socioeconomic status are more likely to face greater climate risk,[114] which could further exacerbate the disparities in housing values already experienced in some regions such as low- or moderate-income areas or majority-minority census tracts, thus eroding generational wealth. Additionally, climate risk might increase the costs associated with housing such as insurance premiums and the frequency and cost of repairs, further exacerbating the homeownership challenges for low-income and majority-minority communities.

American homeowners may be increasingly aware of these risks. According to a recent survey by Redfin, nearly half (48.7 percent) of all people who moved in the last year in the U.S. believe that home values in their destination area will be affected by the increasing frequency and severity of climate-related impacts or events over the next 10 years.[115] Despite this awareness, Redfin's analysis of net migration data from the Census Bureau and county-level climate-risk scores show that the aggregate net inflow of people to the geographies most prone to flooding, extreme heat, and wildfires has increased over the past two years.[116] A survey of the literature conducted by FHFA suggests that some of these climate-related risks are reflected in real estate pricing, though effects may be temporary after a natural disaster and may depend on a variety of factors, including type of natural disaster and information available to purchasers.[117]

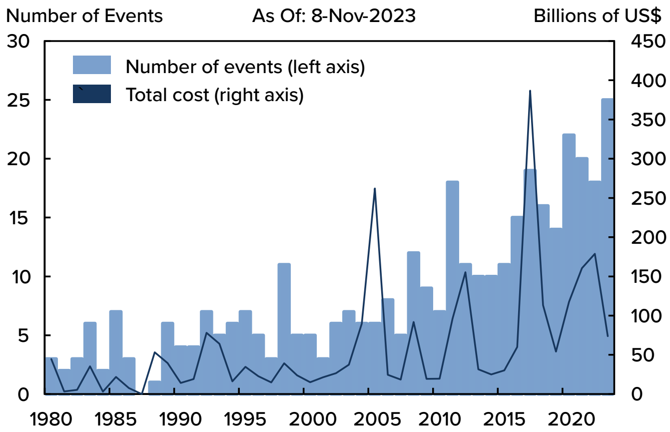
Role of Insurance

Insurers play an important role in the financial system by absorbing losses stemming from physical risks. However, the increasing frequency and severity of extreme weather could affect the solvency of insurers.[118] It could also affect the cost and availability of coverage for homeowners and businesses, which could have implications for financial stability. See **Section 3.1.2: Residential Real Estate, Property Insurance Developments** for a discussion of how changes in property insurance market coverage could affect mortgage markets.

In response to rising insured losses, some insurers are requesting significant rate increases, increasing policy exclusions, avoiding renewals in unprofitable markets, and implementing higher deductibles in areas with significant exposure to climate-related impacts and events.[119] These increases in premiums and changes in market coverage are affecting the affordability and availability of insurance coverage.[120,121]

In some cases, government-sponsored or private residual insurance alternatives have stepped in where private insurance coverage is insufficient, but these programs may also be forced to raise rates to remain solvent, affecting the availability and affordability of insurance.[122] Ultimately, an increasing number of properties may become

3.1.6.2 Billion-Dollar Weather and Climate Events



Source: NOAA National Centers for Environmental Information (NCEI)

uninsurable due to the increasing frequency and severity of climate-related events (see **Figure 3.1.6.2**) and the associated changes in insurance policies' structure, pricing, and availability. Already, 12 percent of homeowners have chosen to forgo home insurance.[123,124]

The first half of 2023 saw several high-profile developments in the insurance sector, including property and casualty (P&C) insurers withdrawing from certain high-risk markets. P&C insurers are facing profitability pressures, which they attribute to increased loss severity, higher reinsurance premiums, and some states' regulatory restrictions on rate changes,[125] combined with increasing frequency and severity of weather-related events.[126] In the first half of 2023, property catastrophe reinsurers raised rates in the United States between 20 percent and 50 percent.[127] In the first 6 months of 2023, the U.S. P&C industry recorded a $24.5 billion net underwriting loss,[128] which almost eclipsed 2022's annual net underwriting loss of $26.9 billion. The net underwriting loss of 2022 was the highest since 2011.

In response to these profitability pressures, many P&C insurers are withdrawing from certain high-risk markets, increasing premiums for both residential real estate, commercial real estate, or both.[129] Commercial property insurance premiums rose 20.4 percent in the first quarter of 2023, a record rise in quarter-over-quarter growth driven by inflation and natural-catastrophe risk,[130] and 18.3 percent in the second quarter of 2023.[131] In California, the top 35 individual homeowners insurance carriers collectively accounted for 87.6 percent of the $12.46 billion in homeowners direct premiums written in California in 2022. At least 19 of 35 intend to reduce their California homeowners coverage through new-business moratoriums, market exits, or new restrictions on specific exposures.[132] This includes large insurers Allstate Corporation and State Farm Insurance, both of which announced that they will no longer underwrite new homeowners, condominium, and commercial P&C policies in California.[133] Increases in premiums, cancellations, and restrictions are not limited to California. In a survey of Louisiana residents, 17 percent of policyholders said their home insurer canceled their coverage last year.[134] In Florida, 15 companies have stopped writing new policies in the last 18 months.[135] American International Group (AIG) also announced in June that it was reducing its homeowners insurance business in 200 ZIP Codes across the United States, including in New York, Delaware, Florida, Colorado, Montana, Idaho, and Wyoming.[136]

In states where private insurance is becoming unaffordable and government-sponsored or private residual insurance alternatives exist, homeowners are increasingly reliant on such residual plans, which generally provide some basic coverage for eligible properties but may offer coverage that is more limited than the policies it is replacing. The number of policies and dollar amounts of premiums in residual markets have increased in recent years.[137] For example, the count of policies in force within California's FAIR plan increased 107 percent, from 159,095 in September 2019 to 330,108 in September 2023. To put this increase in context, since 2018, California's FAIR plan has increased from about 1.5 percent to about 3.5 percent of the residential market.[138] Over the same period, the residual insurer in Florida experienced a 234 percent increase in the count of policies in force from 421,332 to 1,407,805, and the residual insurer in Louisiana experienced a 278 percent increase in the count of policies in force from 37,255 to 140,912.[139]

Higher insurance costs could drive homeowners to underinsure against growing climate-related risks. Some homeowners without mortgages may even choose to go entirely without coverage. Where losses are uninsured or underinsured through private or residual markets, they have the potential to spill over into other parts of the financial system and real economy. In the event of an extreme climate-related disaster, insurance companies take the first loss net of deductibles if the specific peril is covered. Damages to underinsured properties adversely affect borrowers, particularly those who are unable to absorb the resulting losses. In the 12 states that allow nonrecourse mortgages, borrowers may default on their mortgage if they lack the funds to repair their home following a disaster, presenting negative financial consequences for banks that lend in those states. Any resulting defaults could push losses into other parts of the financial system, including originators, mortgage servicers, securities purchasers, and providers of risk mitigation products. Even if a property is mortgage-free and there is no direct link to a financial institution, uninsured properties can result in lower property values and affect collateral valuation.

There are government programs that may help individuals, families, or businesses that lack insurance to cover their losses; however, these funds are typically limited and may not be sufficient to return the property to its pre-disaster condition.[140] In cases where local, state, or federal government programs provide additional assistance, more frequent payouts of this aid could create strain on these programs and ultimately lead to a greater burden on the taxpayer to cover losses. Given the potential for increased expenses associated with increasingly frequent and severe climate-related events and the growing issues with availability and affordability of traditional insurance in some disaster-prone markets, the losses associated with these events could be borne by individual homeowners and the mortgagees, as discussed more fully in **Section 3.1.2: Residential Real Estate** (see **Property Insurance Developments**).

Recommendations

The Council welcomes continuing actions to improve the availability of data for assessing climate-related financial risks, such as FIO's proposed data collection from large writers of homeowners insurance on their underwriting metrics and related insurance policy information and the OFR's work on the Joint Analysis Data Environment.[141] The Council recommends state and federal agencies continue to coordinate to identify, prioritize, and procure data necessary for monitoring climate-related financial risks, including via the Council's working groups.[142]

The Council supports efforts to improve assessments of climate-related financial risks and vulnerabilities, including the Federal Reserve's pilot climate scenario analysis exercise and the final interagency *Principles for Climate-Related Financial Risk Management for Large Financial Institutions* issued by the Federal Reserve, FDIC, and OCC. The Council recommends that state and federal agencies continue to coordinate on developing a robust framework to identify and assess climate-related financial risks, including by iteratively identifying a preliminary set of risk indicators.[143]

Financial regulators should continue to promote consistent, comparable, and decision-useful disclosures that allow investors and financial institutions to better incorporate climate-related financial risks in their investment and lending decisions. Examples include proposed rules from the SEC to enhance and standardize climate-related disclosures for investors and the updated Climate Risk Disclosure Survey from the National Association of Insurance Commissioners.

The Council recommends enhanced coordination of data and risk assessment through the CFRC. Given the critical role of real estate in the economy and the financial system and how it affects the remits of multiple Council member agencies, the Council recommends that agencies collaborate on analysis related to the intersection of physical risk, real estate, and insurance in particular.

3.2 Financial Institutions

3.2.1 U.S. Banking System

The U.S. banking system remains resilient overall, despite the Spring 2023 turmoil. U.S. banks continue to have sound levels of regulatory capital and healthy levels of profitability while maintaining ample liquidity buffers. There are, however, pockets of vulnerability that warrant close monitoring, given increases in interest rates. Some banks with large fair-value declines in their securities portfolios also have above-average reliance on uninsured deposits for funding. Meanwhile, many regional and community banks have significant concentrations of commercial real estate (CRE), which potentially are vulnerable to negative trends in the office market and an erosion in high multifamily property valuations.

Between 2020 and 2021, U.S. banks experienced a large increase in insured and uninsured deposits, partly supported by COVID-19-related government relief programs. In search of yield in a low-interest-rate environment, many banks invested much of these deposit inflows to build up concentrations in long-term fixed-rate assets such as Treasuries and mortgage-backed securities (MBS). The rapid increase in interest rates during 2022 caused meaningful declines in the fair value of these long-duration assets, which are not fully reflected in regulatory capital ratios but are closely monitored by financial markets. Banks are typically positioned to manage this aspect of interest rate risk because the majority of bank deposits are "sticky"[144] and do not earn market interest rates. However, some banks also had an outsize reliance on uninsured deposits, which are more sensitive to changes in bank credit quality. Partly due to this, those banks experienced unprecedented withdrawals of deposits in just a few days. Ultimately, the mismanagement of interest rate and liquidity risk was the key vulnerability behind the failures of Silicon Valley Bank (SVB) and Signature Bank in March 2023, and of First Republic Bank in May 2023.[145]

The Spring 2023 turmoil posed systemic risk to the financial system because after the closure of SVB on March 10, other regional banks experienced outsize deposit outflows and the risk of additional regional bank failures increased. Meanwhile, deposit flows into certain global systemically important banks (G-SIBs) grew. The spreading contagion could have impaired the ability of many more businesses and households to manage their near-term financial obligations, and the cascading effects of those payment delays could have caused significant disruptions in the economy. The policy responses from the Treasury, the FDIC, and the Federal Reserve, including the use of the systemic risk exception to protect depositors of the two banks that failed in March and the establishment of the Bank Term Funding Program (BTFP) by the Federal Reserve, were successful at mitigating contagion to the financial system. Following the March 2023 events, banks increased their cash holdings and borrowing capacity to cover potential depositor withdrawals, increased their usage of Federal Home Loan Bank (FHLB) advances, and accessed the BTFP. These steps helped to stabilize liquidity and maintain confidence in the banking system (see **Box C: The Spring 2023 Turmoil and Policy Responses**).

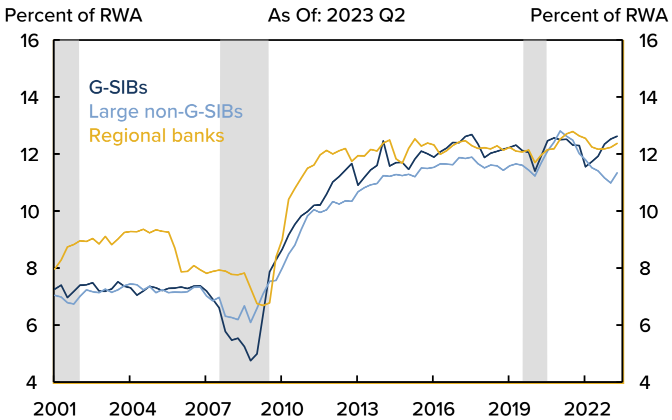
Unlike in the 2007–09 financial crisis, bank profits in 2023 have remained robust, and the credit quality of banks' assets remains sound. Detailed regulatory data for large banks suggest that average loan-to-value ratios in both commercial and residential real estate portfolios are low. Data from the April and July 2023 Senior Loan Officer Opinion Survey (SLOOS) indicate that banks continued to tighten lending standards on commercial and industrial (C&I) and CRE loans in the first half of 2023, amid concerns about the economic outlook and loan performance.[146] In response to a set of special questions in the SLOOS about the current level of lending standards, banks reported that, on balance, such standards are currently 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. Consistent with reported credit standards, loan delinquency rates have so far remained low. However, delinquency rates for consumer and CRE loans, especially those backed by office properties, increased in the first half of 2023 and banks reportedly expect them to continue to increase.

During the financial turmoil that occurred in the banking sector this past Spring, the credit union system generally remained well capitalized and stable. Relative to other depository institutions, credit unions tend to have smaller amounts of uninsured deposits, which meant that the threat of a material deposit flight within the system was less severe. Credit unions also have more modest amounts of CRE lending, which mitigated risk exposures. That said, credit unions have not been immune to challenging economic conditions over the past year, including the sharp rise in interest rates, which augmented liquidity stresses. However, credit unions have access to liquidity through the NCUA Central Liquidity Facility, which acts as a shock absorber to contain or avert liquidity crises before they escalate.

3.2.1.1 G-SIBs and Large Non-G-SIBs[147]

Banks with greater than $250 billion in assets account for more than 60 percent of U.S. banking assets.[148] Large banks play a critical role in the U.S. financial system by performing essential banking functions, such as providing credit to retail and commercial borrowers, helping firms raise capital or hedge risk, and providing asset management and custody services. Moreover, these banks play a critical role in the global financial system by facilitating payments on a global scale and clearing large volumes of transactions in repo markets. As such, their resilience and stability are of paramount importance for both the U.S. and the global economy.

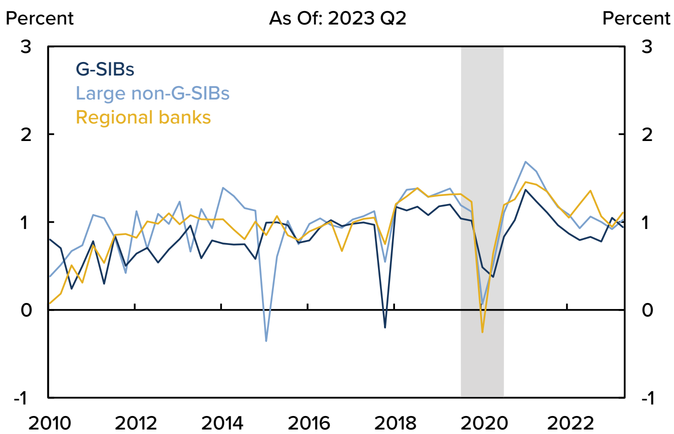
3.2.1.1.1 Common Equity Tier 1 Ratios



Notes: Tier 1 common capital is used as the numerator of the CET1 ratio prior to 2014:Q1 for G-SIBs and large complex BHCs, and prior to 2015:Q1 for large noncomplex and other BHCs. The denominator is risk-weighted assets (RWA). Shaded areas indicate NBER recessions.

Sources: FR Y-9C, Haver Analytics

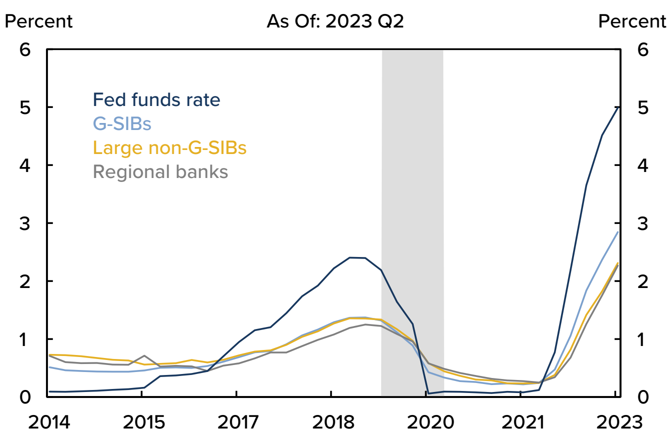
3.2.1.1.2 Return on Assets



Note: Gray bars signify NBER recessions.

Sources: FR Y-9C, Haver Analytics

3.2.1.1.3 Bank Funding Rates



Note: Gray bars signify NBER recessions.

Sources: FR Y-9C, Haver Analytics

Bank Capital and Profitability

Large banks continue to maintain sound levels of capital, and their risk-based capital positions are within the range observed in the last decade (see **Figure 3.2.1.1.1**). In the case of G-SIBs, the Common Equity Tier 1 Capital (CET1) ratio has trended up since early 2022 and is now on par with the highest levels observed in more than 20 years. These higher capital levels at G-SIBs reflect more stringent requirements that resulted from the 2022 Federal Reserve Stress Tests and, in some cases, a higher G-SIB capital surcharge.

While the effect of higher interest rates on bank profits is complex, large banks continue to maintain healthy levels of profitability, and their return on assets (ROA) remains in line with the average level observed in the last decade (see **Figure 3.2.1.1.2**). Large banks saw a boost in profitability during 2022, as the interest rates they earned on variable-rate assets and new investments increased faster than interest rates on deposits. However, in 2023, large banks have had to significantly boost their deposit rates to offset competitive pressures from higher interest rates on alternative investments (see **Figure 3.2.1.1.3**). This increase in deposit rates has reversed some of the previous increase in banks' profitability.

Credit Quality and Lending Standards

Overall, large banks' credit quality remained solid in the second quarter of 2023 as delinquency rates across various loan categories remained low (see **Figure 3.2.1.1.4**). Recent levels of loan provisioning also suggest that banks do not expect a material deterioration in credit quality in the near future, but banks have been increasing their provisions (see **Figure 3.2.1.1.5**). According to the July 2023 SLOOS, large banks also continued to report a tightening of lending standards across all loan categories, which could reduce loan originations further this year. Because the office sector is distressed and valuations of other types of CRE appear quite elevated, the performance of CRE loans should be closely monitored.

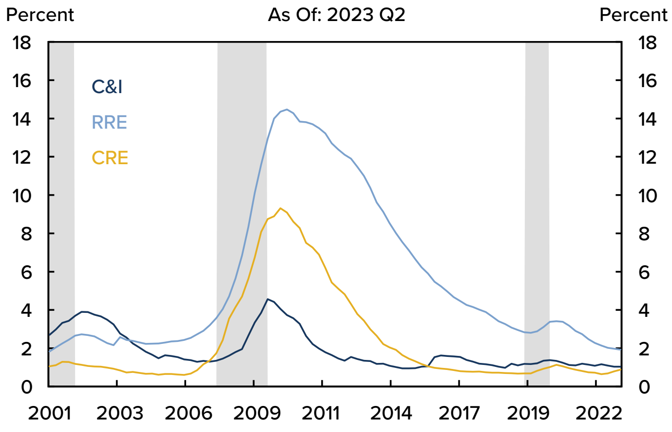
Liquidity and Funding

G-SIBs' and other large banks' overall liquidity positions exhibited a modest decline during the second quarter of 2023 but remain sound as they continue to hold large amounts of liquid assets. This decline in liquidity reflects both a reduction in reserves and the loss of market value of banks' securities portfolios due to higher interest rates. While most banks experienced an outflow of deposits during the Spring 2023 turmoil, with some deposits leaving the banking system entirely while others redeposited into G-SIBs, these deposit flows moderated in the second quarter of 2023 (see **Figure 3.2.1.1.6**), partly reflecting the joint policy responses by bank regulatory agencies and the ongoing smooth adjustment to higher interest rates. Large banks have been able to manage this second quarter of decline because of the ample liquidity buffers they had going into this period and due to the inflow of deposits from smaller banks partially offsetting deposit outflows.

3.2.1.2 Regional Banks[149]

Despite their smaller size compared to large banks and G-SIBs, regional banks play a critical role in the U.S. financial system by performing a host of traditional banking functions. These include providing deposits, mortgages, and CRE loans, in addition to

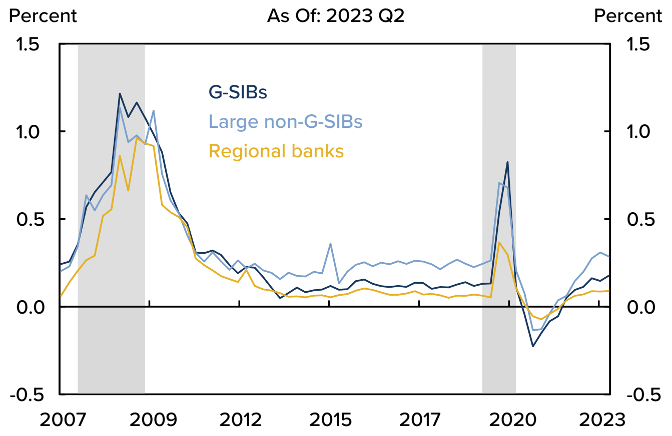
3.2.1.1.4 Delinquency Rates on Selected Loans



Notes: Includes all loans in foreign and domestic offices. Gray bars signify NBER recessions.

Sources: FR Y-9C, Haver Analytics

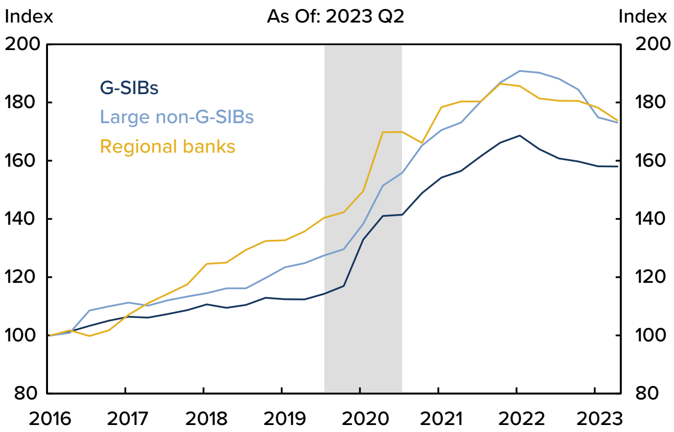
3.2.1.1.5 Ratios of Provisions to Total Loans



Note: Gray bars signify NBER recessions.

Sources: FR Y-9C, Haver Analytics

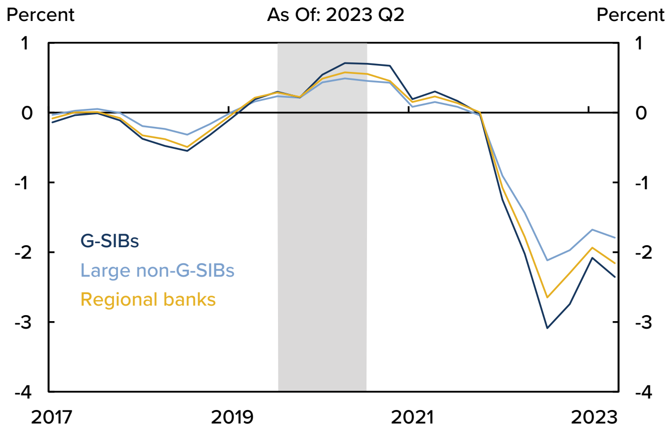
3.2.1.1.6 Total Deposit Growth (2016Q1 = 100)



Notes: Domestic deposits; indexed to 100 as of Q2 2016. Gray bars signify NBER recessions.

Sources: Call Report, Haver Analytics

3.2.1.2.1 Unrealized Gains (Losses) on AFS and HTM Securities



Notes: AFS and HTM are securities designated as available for sale or held to maturity, respectively; values shown as a percent of total assets. Gray bars indicate NBER recessions.

Sources: FR Y-9C, Haver Analytics

commercial and industrial loans. As a result, the resilience and stability of these companies is of paramount importance to the structure and functioning of the domestic U.S. economy. The stresses in the banking sector that emerged in Spring 2023 raised concerns about some regional banks, although conditions have calmed since. This turmoil also highlighted the need to closely monitor uninsured deposit levels and further enhance resolution planning and preparedness capabilities to mitigate similar stresses in the future.

Although it fundamentally resulted from poor risk management and heavy reliance on uninsured deposits, the failure of three regional banks in Spring 2023 underscored that even non-G-SIBs may pose risks to financial stability. The Spring turmoil also highlighted the need for additional data that would allow agencies to closely monitor not only uninsured deposit levels but also the composition and pricing of those deposits and to further enhance resolution planning and preparedness capabilities to mitigate similar crises in the future.

Bank Capital and Profitability

CET1 ratios at regional banks are near the upper end of the range established during the last decade. However, taking into account unrealized losses on long-duration assets leads to significant reductions in market-adjusted capitalization for many regional banks.[150] These relatively low market-adjusted levels of capital make those banks vulnerable to further increases in rates. **Figure 3.2.1.2.1** shows that regional and large non-G-SIB banks have higher amounts of unrealized losses (as a share of total assets) compared to G-SIBs. With regard to profitability, ROAs at regional banks remain in line with the average level observed in the last decade. However, further increases in funding costs and declines in lending volumes could put downward pressure on bank profitability.

Liquidity and Funding

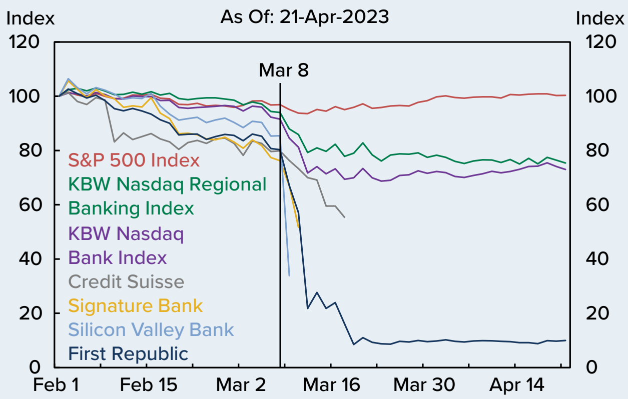
Funding risk is a salient vulnerability that is being monitored closely because regional banks tend to fund themselves via traditional deposits and thus can be reliant on uninsured deposits or other credit-sensitive deposits. The sudden failure of both SVB and Signature Bank raised concerns about the solvency of some banks with this type of funding structure, resulting in the risk of contagion to other depository institutions and damage to the broader banking system. Indeed, regional banks with characteristics similar to those of SVB and Signature Bank saw notable deposit outflows as households and businesses were concerned about maintaining access to accounts they routinely use to make payments. A number of regional banks experienced notable deposit outflows on March 10 and in the following days, including First Republic Bank, an institution supervised by the FDIC with $213 billion in assets at the end of 2022, which ultimately failed on May 1. This concern over broader contagion led to sizable declines in bank stock prices (see **Box C: The Spring 2023 Turmoil and Policy Responses, Figure C.1**).

Credit Risks[151]

Delinquencies for most loan categories remain at or below pre-pandemic levels; however, regional banks tend to have a greater concentration of CRE loans. In particular, risks for loans backed by nonfarm nonresidential CRE properties have increased as hybrid work arrangements have reduced demand for office space (see **Section 3.1.1: Commercial Real Estate**). A sustained reduction in demand for office space suppresses the income potential for these properties and their prices, lowering the collateral values of office properties and retail properties that surround them. Compared to large banks, regional banks tend to carry higher exposures to all CRE loans, which could translate into greater losses in the event of a drop in CRE valuations. Higher interest rates also put pressure on a borrower's ability to repay debt and the ability of a property to generate cash flow.

Box C: The Spring 2023 Turmoil and Policy Responses

C.1 Bank Stock Prices and Stock Indexes



Note: Data are indexed daily to 100 as of Feb 1, 2023.

Source: Bloomberg, L.P.

On the afternoon of Wednesday, March 8, 2023, Silicon Valley Bank (SVB), an institution supervised by the Federal Reserve with $209 billion in assets at the end of 2022, announced a $1.8 billion loss on securities sales, along with its intent to raise $2.25 billion in equity capital and $15 billion in debt. These announcements led to a loss of confidence in the bank, as reflected in the sharp decline in SVB's stock market price and unprecedented deposit withdrawals from customers, totaling $42 billion in a single business day on Thursday, March 9. On the morning of Friday, March 10, with the bank expecting as much as $100 billion in additional deposit withdrawals, the Department of Financial Protection and Innovation of the State of California declared SVB insolvent, took possession of the bank, and appointed the FDIC as receiver.

Following the announcement of SVB's closure on March 10, Signature Bank, an institution supervised by the FDIC with $110 billion in assets at the end of 2022, suffered a run of 20 percent of deposit balances. On Sunday, March 12, Signature Bank was closed by the New York State Department of Financial Services (NYDFS) when it became clear that the bank did not have sufficient liquidity to meet mounting wire requests. The speed and magnitude of the runs on deposits at SVB and Signature Bank generated broader concerns about the resilience of banks with a large concentration of uninsured deposits and significant declines in the fair value of fixed-rate assets in a rising-rate environment. Concerns over broader contagion led to sizable declines in bank stock prices (see **Figure C.1**) and notable deposit outflows. In contrast, the largest banks saw significant deposit inflows.

In response to the market turmoil in early March 2023, the Federal Reserve, together with the FDIC and the Treasury, took decisive actions to reduce stress across the financial system by supporting financial stability and minimizing the effects on businesses, households, taxpayers, and the broader economy.

Specifically, on Sunday, March 12, the Federal Reserve, the FDIC, and the Treasury announced two actions designed to support all bank depositors and the continued flow of credit to households and businesses. After receiving a recommendation from the boards of the FDIC and the Federal Reserve, and after consulting with the President, the Secretary of the Treasury approved a systemic risk exception (SRE), enabling the FDIC to complete its resolution of Signature Bank and SVB in a manner that protected both insured and uninsured depositors. Depositors were given full access to their accounts on the Monday following the announcement. In contrast to depositors, shareholders and certain unsecured debt holders were not protected, and senior management at these banks was removed. Signature Bank was successfully resolved and sold one week after its failure, and SVB was successfully resolved and sold two weeks after its failure. The losses to the Deposit Insurance Fund arising from actions taken under the SRE to protect the uninsured depositors, later estimated by the FDIC to be $16.3 billion, will not be borne by taxpayers and will be recovered by a special assessment on banks, as required by law. Remaining losses of $2.4 billion from insured deposits will be recovered through regular deposit insurance assessments.[152]

At the same time, on Sunday, March 12, with approval from the Secretary of the Treasury, the Federal Reserve announced the establishment of the Bank Term Funding Program (BTFP), making additional funding available to eligible depository institutions. The BTFP offers loans of up to one year in length to federally insured depository institutions (including banks, savings associations, and credit unions) and to U.S. branches and agencies of foreign banks that are eligible for primary credit. New loans can be requested under the BTFP until at least March 11, 2024. To borrow from the BTFP, eligible institutions can pledge any collateral eligible for purchase by the Federal Reserve in open-market operations, such as U.S. Treasury securities, U.S. agency securities, and U.S. agency mortgage-backed securities (MBS) that were owned by the borrower as of March 12, 2023. The BTFP extends loans against the par value of eligible collateral, equal to the face amount of the securities, without giving effect to any declines in fair value. With approval of the Treasury Secretary, Treasury has committed to make available up to $25 billion from the Exchange Stabilization Fund as a backstop for the BTFP. The Federal Reserve does not anticipate that it will be necessary to draw on these backstop funds.

Following the acute banking stresses in early March and the announcements on March 12, primary credit extended through the discount window increased from less than $5 billion to more than $150 billion during the first week and then quickly fell back to about $70 billion. Meanwhile, credit extended through the BTFP increased steadily by smaller increments and stabilized in a range between $70 billion and $80 billion.

The Federal Reserve is prepared to address any liquidity pressures that may arise. It is also committed to helping ensure that the U.S. banking system continues to perform its vital roles of ensuring that depositors' savings remain safe and providing access to credit to households and businesses in a manner that promotes strong and sustainable economic growth. Additional funding sources like the BTFP bolster the capacity of the banking system to safeguard deposits and help ensure the ongoing provision of money and credit to the economy. This additional funding to eligible depository institutions will continue to serve as an important backstop against further bank stresses and support the flow of credit.

In international markets, Credit Suisse came under renewed pressure, and on Sunday, March 19, UBS agreed to merge with it. The merger included a deal that involved the write-off of a certain type of contingent capital instrument, and it also involved liquidity support and loss sharing from the Swiss government. On Sunday, March 19, the Federal Reserve, together with the Bank of Canada, Bank of England, Bank of Japan, European Central Bank, and Swiss National Bank, announced measures to mitigate the effects of strains on global funding markets via the standing U.S. dollar liquidity swap line arrangements. The network of swap lines among these central banks is a set of available standing facilities and serves as an important liquidity backstop to ease strains in global funding markets, thereby helping mitigate the effects of such strains on the supply of credit to U.S. households and businesses. To improve the swap lines' effectiveness in providing U.S. dollar funding, these central banks agreed to increase the frequency of seven-day maturity operations from weekly to daily through the end of April 2023. Despite all these efforts, problems lingered at certain banks. First Republic Bank, an institution supervised by the FDIC with $213 billion in assets at the end of 2022, experienced notable deposit outflows between March 10 and March 16; outflows moderated over the ensuing weeks but resumed when First Republic Bank reported first-quarter earnings. The California Department of Financial Protection and Innovation took possession of First Republic Bank before markets opened on Monday, May 1, and appointed the FDIC as receiver, which sold the bank on the same day.[153]

Lessons Learned

A common theme in the failures of SVB, Signature Bank, and First Republic Bank was poor interest rate and liquidity risk management, in the context of rapid growth and concentration of risk. However, the failure of these institutions demonstrates the need to strengthen supervision and assess current regulatory standards. Supervision of these firms was not sufficiently forceful and urgent, even when supervisors identified critical vulnerabilities that threatened these individual firms. The federal banking agencies are also considering numerous regulatory changes, and several of those proposed rulemakings are detailed in **Section 4.2.1: Enhanced Capital and Prudential Standards and Supervision**.[154]

Another lesson from these bank failures is that highly concentrated deposits, widespread social media use, and easy access to digital banking technology enable depositors to instantly spread solvency concerns about a bank and make immediate deposit withdrawals, which may have fundamentally increased the speed of bank runs.

A third lesson is that banking agencies did not take sufficient steps to adequately monitor uninsured deposits to effectively anticipate the associated risks because, in part, supervisors had very little timely comprehensive information on those uninsured deposits.

Lastly, based on multiple federal and state internal reviews, a fourth lesson learned is that supervisors need to improve the effectiveness of the oversight program along several dimensions.[155] These include shifting the culture of supervision toward a greater focus on inherent risk by challenging bankers' risk judgments with a precautionary perspective.

Enhancing Resolution Preparedness

The regional bank failures in the Spring of 2023 were successfully resolved without bailouts of shareholders or bondholders, using longstanding tools under the Federal Deposit Insurance (FDI) Act, such as bridge depository institutions. Resolution costs were borne entirely by the banking industry and not the taxpayers. In addition, excess costs to the Deposit Insurance Fund (DIF) arising from the protection of uninsured deposits at both SVB and Signature Bank will be recovered by the FDIC via a special assessment.[156]

Nevertheless, the failures of three large U.S. regional banks demonstrate the risks that banks, even those that are not G-SIBs, can pose to financial stability. Federal banking regulators have proposed a series of rulemakings and guidance to enhance resolution planning and preparedness, particularly for large insured depository institutions. This includes three complementary proposals:

1. An interagency proposal among the Federal Reserve, FDIC, and OCC to require long-term debt at certain insured depository institutions (IDIs) to serve as a gone-concern resource that can provide additional loss protection for depositors (including the DIF) and general unsecured creditors, among others, in resolution.
2. A comprehensive revision and improvement to the requirements for IDIs to submit resolution plans and information to the FDIC for the IDIs' resolution under the FDI Act.[157]
3. Further refinements to guidance to large foreign and domestic banking groups for the development of resolution plans under Title I of the Dodd-Frank Act.

Finally, the FDIC published a comprehensive study to address the broader questions about the role of deposit insurance to promote financial stability and prevent bank runs, as well as to examine additional policies and tools that may complement changes to deposit insurance coverage.[158]

Recommendations

The banking system faces a challenging environment that includes higher interest rates and concerns about the economic outlook and credit quality. The Council recommends banking supervisors, including credit union supervisors, continue to ensure that banks maintain adequate capital and liquidity, sound interest rate risk management practices, and well-developed operational resilience plans. The Council supports the continued use of stress testing in large bank holding companies (BHCs) and G-SIBs to assess risks, noting that banking agencies and financial institutions should ensure that their stress-testing methodologies adequately account for plausible tail risks, given the current economic environment. The Council also encourages efforts to complete the Basel III reforms to further enhance the resilience of the banking system. Because the office sector is distressed and valuations of other types of CRE appear quite elevated, the Council recommends that banking supervisors closely monitor the performance of CRE loans. The Council also recommends that banking agencies continue monitoring bank exposures to nonbank financial institutions (NBFIs), including assessing how banks manage their exposure to leverage or liquidity mismatch in the nonbank financial sector.

The recent bank failures underscore the importance of effective prudential supervision to identify risks and ensure that supervised institutions take the steps needed to adequately mitigate identified risks in a timely fashion. The Council also supports member agencies' efforts to review and strengthen their supervisory processes and culture. As described in reports by the Federal Reserve, FDIC, OCC, and states, it is important for supervisors to evaluate risks rigorously and consider a broader range of potential vulnerabilities posed by the activities of the supervised institution. The Council supports banking agencies' efforts to improve the agility of supervision to be more responsive to institution-specific risks, while also recognizing the benefits associated with adjusting the supervisory approach based on varying risk profiles across the banking sector.

The Council supports member agency efforts to examine how recent events can inform potential modifications to the regulatory framework for regional banks. The Council is encouraged by member agencies' review of existing liquidity and interest rate management rules and guidance for banks. It supports member agencies' plans to review whether capital measures appropriately reflect an institution's ability to absorb losses. The Council also supports proposed measures to improve resolvability at large, complex, or interconnected banks, such as by requiring long-term debt and improved resolution plans. In addition, the Council is supportive of regulators' assessment of incentive compensation requirements for bank leadership to ensure they are appropriately aligned with risk management obligations at supervised institutions.

The Council also supports efforts to reexamine the existing deposit and share insurance systems to promote financial stability while mitigating moral hazard and excessive risk taking. In May, the FDIC issued a report on the current deposit insurance system that includes several options for reform of the system, and the Council commends the FDIC for its engagement on this critical issue. The Council also supports additional work by agencies to consider approaches to help ensure that appropriate liquidity is available to financial institutions when needed.

The Council recommends that banking agencies closely monitor uninsured deposit levels and depositor composition and collect additional data as necessary. The Council also recommends that banking agencies monitor banks' reliance on uninsured deposits or other credit sensitive deposits to further enhance resolution planning and preparedness capabilities and mitigate future stresses in the banking sector.

3.2.2 Investment Funds

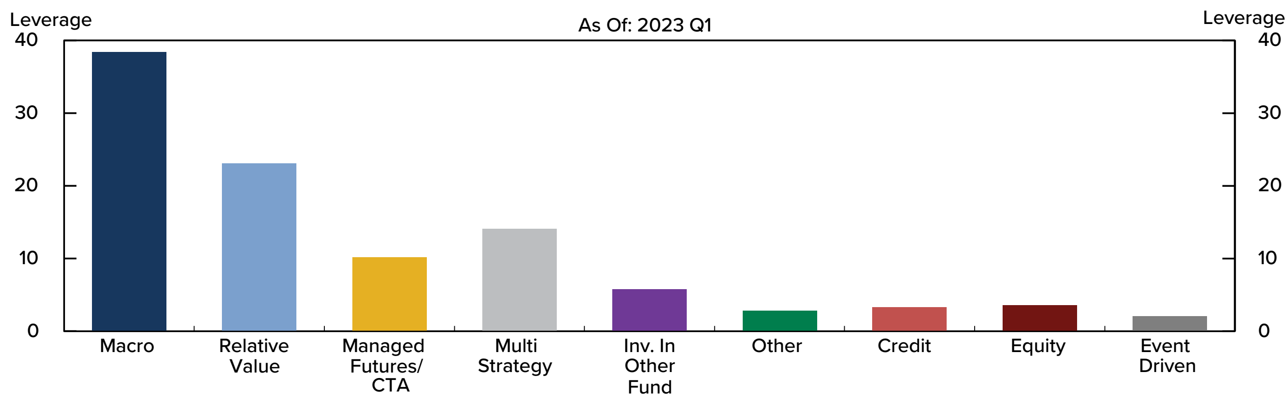
Investment funds play a critical intermediary role in the U.S. financial system, promoting economic growth through efficient capital formation and providing vital funding to the U.S. economy. While recognizing these benefits, the Council has identified certain vulnerabilities related to investment funds, whose assets have increased significantly over the past decade. More specifically, the Council has identified potential risks to financial stability stemming from the use of leverage by certain hedge funds and the liquidity and maturity transformation that money market funds (MMFs), open-end mutual funds, and collective investment funds engage in.

Hedge Funds

Hedge funds continue to play a prominent role in certain U.S. financial markets. During the past five years, the hedge fund industry has grown from $7.5 trillion as of the first quarter of 2018 to $9.5 trillion as of the first quarter of 2023.[159] Hedge funds' use of on- and off-balance sheet leverage to enhance returns can increase systemic risks by potentially magnifying losses in a market downturn.[160] The effects of such loss magnification can contribute to market dislocations if a distressed fund liquidates its positions in a disorderly manner. Additionally, the effects can be transmitted to the fund's counterparties if the distressed fund is unable or unwilling to meet margin or collateral calls.

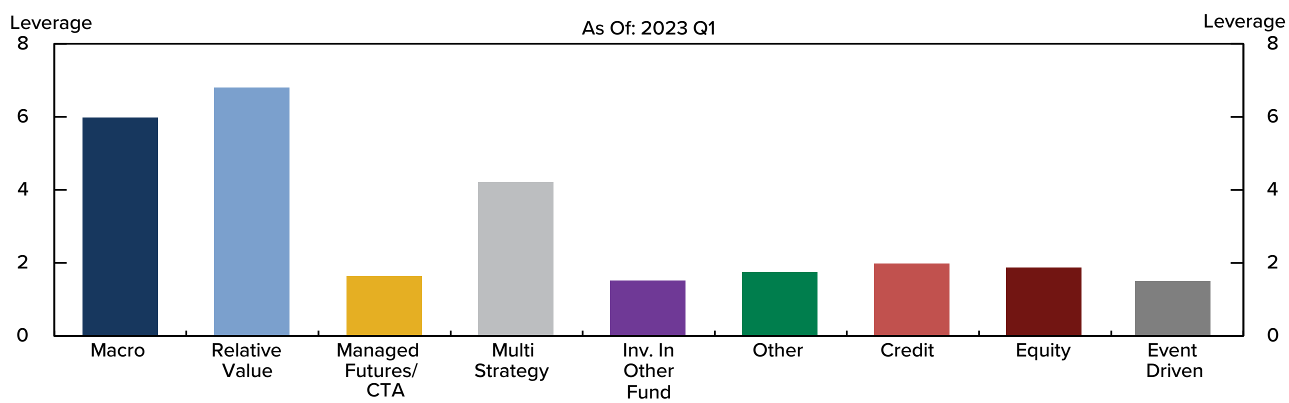
At the aggregate level, hedge fund leverage appears modest. As of the first quarter of 2023, the median gross notional exposure (GNE) to net asset value (NAV) ratio for qualifying hedge funds stood at 2.0x, and the median gross asset value (GAV) to NAV ratio stood at 1.1x.[161] However, the amount and type of leverage that funds use varies among asset classes and with the underlying volatility of the assets. Relative value, global macro, and multi-strategy funds typically use more leverage than other types of funds. In the first quarter of 2023, relative-value strategy funds reported an asset weighted average GNE/NAV ratio of 23.1x and a GAV/NAV ratio of 5.8x, global macro strategy funds reported a GNE/NAV ratio of 38.4x and a GAV/NAV ratio of 5.1x, and multi-strategy funds reported a GNE/NAV ratio of 14.1x and a GAV/NAV ratio of 3.6x (see **Figures 3.2.2.1** and **3.2.2.2**). In addition, leverage is concentrated among a small number of large multi-strategy, relative value, and macro hedge funds. According to the SEC's Form PF Statistics report, 25 funds accounted for 57 percent of

3.2.2.1 Hedge Fund Leverage Ratios: GNE/NAV



Source: SEC Private Fund Statistics Report

3.2.2.2 Hedge Fund Leverage Ratios: GAV/NAV

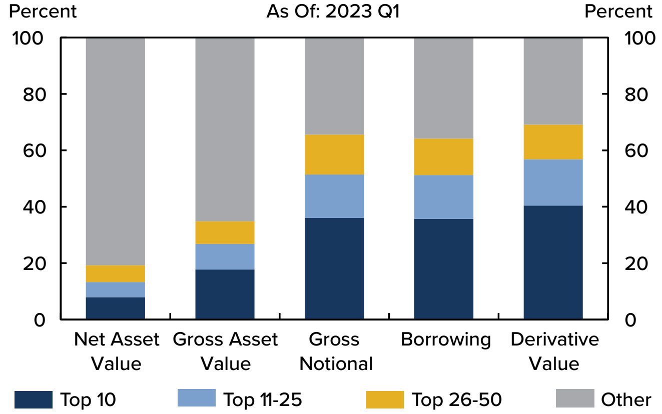


Source: SEC Private Fund Statistics Report hedge fund derivatives value and 51 percent of hedge fund borrowing in the first quarter of 2023 (see **Figure 3.2.2.3**).

Leveraged funds are highly interconnected with the broader financial system. The types of leverage that such funds use include secured financing transactions (such as repo and securities lending) and derivatives (which may be either centrally or bilaterally cleared). Hedge funds typically obtain this funding from U.S. and foreign G-SIBs, and fund distress can lead to material counterparty losses, as was evident in Archegos's failure[162] in March 2021. The aggregate level of hedge fund borrowing has increased significantly in recent years. As of the first quarter of 2023, hedge fund borrowing totaled $3.8 trillion, up from $2.6 trillion five years prior. The recent growth in borrowing has been driven primarily by repo borrowing, which nearly doubled from $780 billion as of as of the first quarter of 2018 to $1.4 trillion as of the first quarter of 2023. Over this same period, prime brokerage borrowing grew from $1.4 trillion to $1.7 trillion.[163]

Based on the Treasury market disruptions in March 2020, the Council's Hedge Fund Working Group (HFWG) has been examining the risks associated with haircutting practices in the non-centrally cleared bilateral repo (NCCBR) market. The working group found that relative value and other leveraged funds commonly obtain Treasury repo funding with low or zero haircuts. These favorable funding terms allow funds to take large and highly leveraged positions in the Treasury market that can amplify the effects of exogenous macroeconomic and financial shocks and provide a channel through which such shocks can spill over into other financial entities, such as the funds' counterparties. The effect of this channel was evident in what transpired in the Treasury market in March 2020 as a result of the COVID-19 shock. That shock led to an unusually large demand for liquidity by market participants, including, but not limited to, leveraged hedge funds. When the COVID-19 shock disrupted the historical relationship between the prices of Treasury futures contracts and the underlying cash bonds, basis-trading funds sought to rapidly unwind their positions

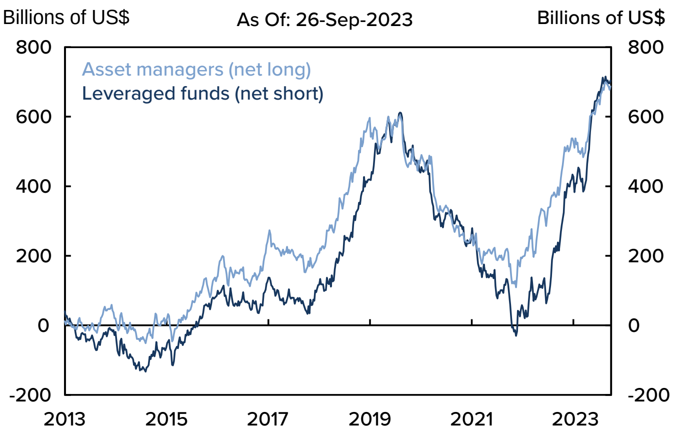
3.2.2.3 Hedge Fund Industry Concentration



Note: Values represent the aggregate industry concentration of top hedge funds sorted by each category.

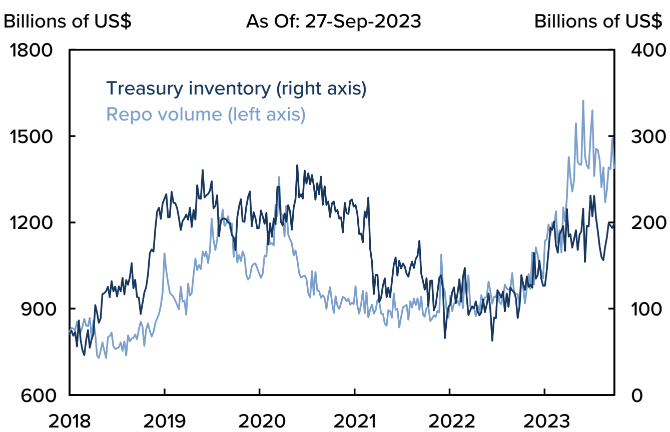
Source: SEC Private Fund Statistics Report

3.2.2.4 Treasury Futures Positioning



Sources: CFTC, Haver Analytics

3.2.2.5 Repo Volumes & Primary Dealer Treasury Inventory



Notes: Overnight Treasury repo volume includes published volumes for SOFR; Treasury inventory excludes FRNs and TIPs.

Sources: Federal Reserve Bank of New York, Haver Analytics

against the backdrop of the unusually large demand for liquidity. [164]

Over the same period, qualifying hedge funds' presence in short-term funding markets and the U.S. Treasury market have also markedly increased as the Treasury cash-futures basis trade has become more attractive.[165] That trade relies on a long cash Treasury position and a short position in the Treasury futures contract. Hedge funds have increased their net short Treasury futures positions, with the notional amount outstanding rising to over $700 billion in September 2023 (see **Figure 3.2.2.4**).[166] The pace and level of the recent increase is comparable to that observed from April 2018 to March 2020. At the same time, repo volumes and primary dealers' inventories of Treasury securities have risen considerably over the past year, which may indicate that dealers are warehousing the increased issuance of Treasury securities in the repo market and facilitating the Treasury cash-futures basis trade (see **Figure 3.2.2.5**). Form PF data, which are reported with a longer lag, show a similar increase in funds' Treasury exposures and repo borrowing. Although hedge funds' contribution to the March 2020 dysfunction was likely exacerbated by the unique infrastructure and operational challenges associated with the rapid shift to remote work, a disorderly unwinding of leveraged funds' cash-futures basis positions in the current economic environment could pose a risk to financial stability if fund liquidations impair market functioning, as they did in March 2020.[167]

The HFWG has also identified gaps in the availability of data related to hedge funds, and Council member agencies continue to make progress in addressing those gaps. In August 2022, the SEC and the CFTC proposed amendments to Form PF, the primary regulatory data source on the private fund industry. In May 2023, the SEC announced a new requirement that certain advisers to hedge funds make timely reports of information about events that indicate significant distress at a fund. This reporting requirement enhances the SEC's ability to assess possible risks emanating from distressed hedge funds in a timelier fashion. Also, the OFR is continuing to develop its NCCBR data collection (see **Section 3.1.4: Short-Term Funding Markets**). These data will shed light on an important source of leverage for hedge fund Treasury trades, including the basis trade, and they will close an important data gap. The currently available data on the tri-party and cleared repo market segments do not fully reflect the activities of funds engaged in the basis trade.

Finally, the HFWG continues to coordinate its work with the Interagency Working Group on Treasury Market Surveillance (IAWG) and is considering policy options to mitigate the identified risks that complement other agencies' proposals, such as the SEC's central-clearing proposal.

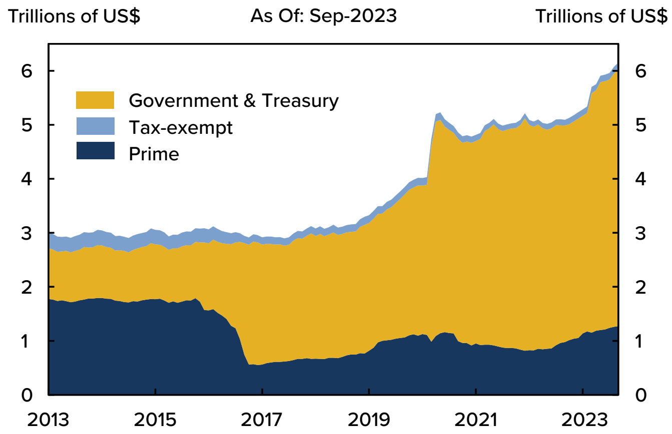
Money Market Funds

MMFs serve as intermediaries between investors seeking daily liquidity with limited principal volatility and entities with short-term funding needs. There are three main MMF types:

1. Government and Treasury MMFs, which invest in obligations of the U.S. government and federal agencies and repos backed by government securities.
2. Prime MMFs, which primarily invest in a variety of taxable short-term corporate and bank debt securities, as well as repos and asset-backed CP.
3. Tax-exempt MMFs, which primarily invest in obligations of state and local governments and pay interest that is generally exempt from federal income tax for individual taxpayers.

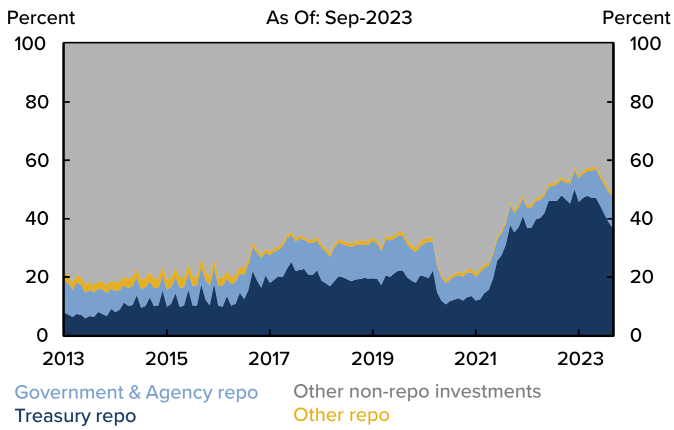
As of September 30, 2023, U.S. MMF assets totaled $6.2 trillion, up 21 percent from a year earlier (see **Figure 3.2.2.6**). As in previous monetary policy tightening cycles, investors this year have reallocated toward MMFs as cash management vehicles because MMFs' yields are more sensitive to changes in policy rates compared with bank deposit rates.[168] Prime MMFs, which experienced sizable inflows in the second half of 2022 and early

3.2.2.6 MMFs Total Net Assets by Fund Type



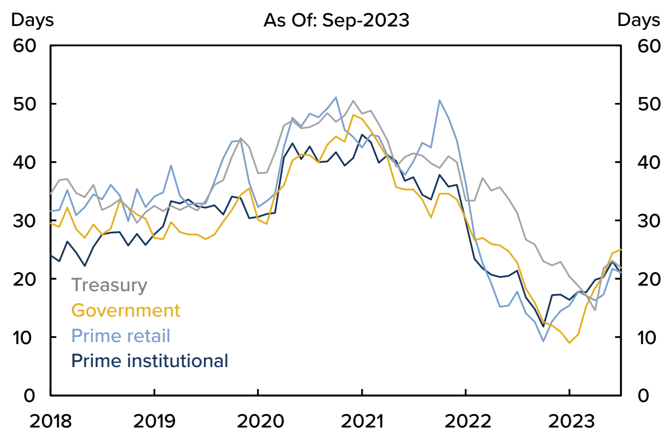
Sources: SEC Form N-MFP, OFR Analysis

3.2.2.7 MMFs Asset Composition



Sources: SEC Form N-MFP, OFR Analysis

3.2.2.8 MMF Weighted Average Maturity



Sources: SEC Form N-MFP, OFR Analysis

2023, experienced modest outflows during the March 2023 banking stress as investors reallocated toward less credit-sensitive products such as Government and Treasury MMFs. Flows into prime MMFs have since resumed, totaling $297 billion over the 12 months ended September 30, 2023.[169] Prime MMF assets, which now stand at $1.3 trillion, are at their highest level since 2016.

The asset composition of MMFs continued shifting toward repo in early 2023. MMFs' repo investments peaked at $3.4 trillion, or 58 percent of total assets in May 2023, before falling to approximately $2.9 trillion, or 48 percent of assets, as of September 30, 2023 (see **Figure 3.2.2.7**). MMF investment in the Federal Reserve's overnight reverse repo facility (ON RRP) peaked at over $2.3 trillion at year-end 2022 and has since declined to approximately $1.5 trillion, or 24 percent of assets, as of September 30, 2023.[170] At the same time, MMFs have started extending the weighted average maturity (WAM) of their portfolios from historically low levels. Nevertheless, WAMs remain well below their 2020–21 highs (see **Figure 3.2.2.8**).

MMFs provide liquidity to investors by offering redemptions on demand. As discussed in **Section 3.1.4: Short-Term Funding Markets**, the liquidity mismatch in certain funds can incentivize investors to be the first to redeem during periods of market stress. This first-mover advantage can lead to runs on certain MMFs and dislocations in short-term funding markets, as was evident at the onset of the COVID-19 pandemic. In August 2023, the SEC issued amendments to certain rules that govern MMFs under the Investment Company Act that are designed to reduce the risk of investor runs on MMFs during periods of market stress (see **Section 4.3.4: Securities and Asset Management**).

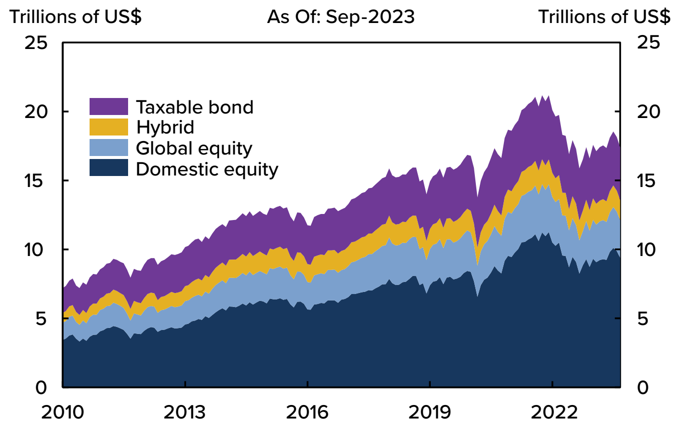
Open-End Funds: Mutual Funds and Exchange-Traded Funds

Open-end funds allow daily redemptions; however, some types of open-end funds may invest in assets that may not be easily liquidated, resulting in a potential structural liquidity mismatch. In times of market stress, this mismatch can contribute to and amplify stress in the U.S. financial system. In these periods, open-end-fund investors may have an incentive to redeem quickly to avoid further losses, to obtain cash in times of uncertainty, or to obtain a potential first-mover advantage by avoiding anticipated trading costs and dilution associated with other investors' redemptions. Significant investor outflows could lead to an increased volume of underlying asset sales, which in turn could stress asset values and lead to large price declines, possibly leading to further redemptions and additional asset sales. During periods of market stress, this liquidity spiral could amplify price declines, lead to significant investment losses for other investors, and potentially impair market functioning.

Mutual funds continue to be prominent investors in equity and fixed-income markets, with assets under management (AUM) totaling $18.1 trillion as of September 2023 (see **Figure 3.2.2.9**). Although U.S. mutual funds have seen investor outflows of approximately $784 billion for the twelve months ended September 30, these funds remain important investors in the U.S. markets. Equity mutual funds continued to record sizable outflows in late 2022 and 2023 (totaling $545 billion for the twelve months ended September 30, 2023), while bond mutual funds saw outflows of $122 billion and hybrid funds saw outflows of $117 billion over the same period (see **Figure 3.2.2.10**). Bank loan funds, which hold assets that often take longer to settle asset sales than the redemption period offered, experienced steady outflows totaling $28 billion (or 29 percent of net assets) during the 12 months ended September 30, 2023.[171]

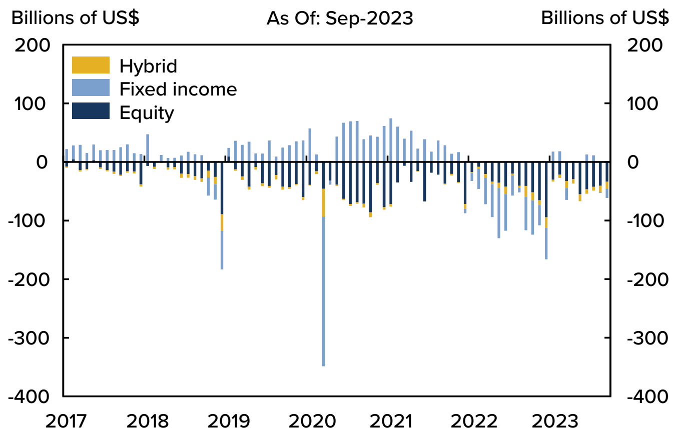
Exchange-traded funds (ETFs) have continued to rise in popularity in 2023, and ETF AUM totaled $7.1 trillion as of September 2023, compared with $3.7 trillion in September 2018 and only $1.5 trillion in September 2013 (see **Figure 3.2.2.11**). The growth of the ETF industry has been supported by both capital appreciation and investor inflows, and inflows into ETFs totaled $524 billion for the twelve months ended September 30 (see

3.2.2.9 Mutual Fund AUM



Sources: ICI, Haver Analytics

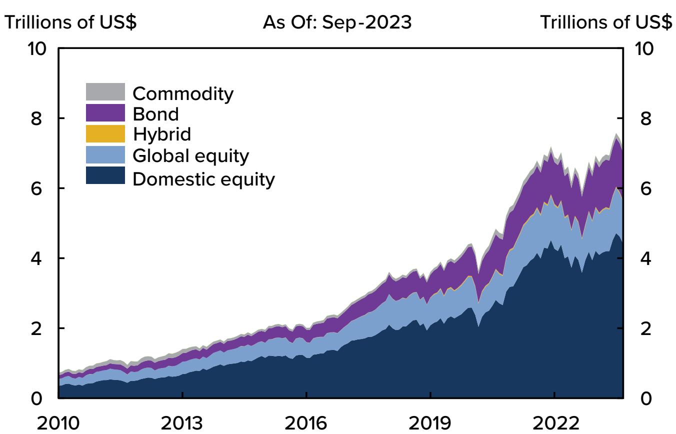
3.2.2.10 Monthly Mutual Fund Flows



Note: Net fund flows.

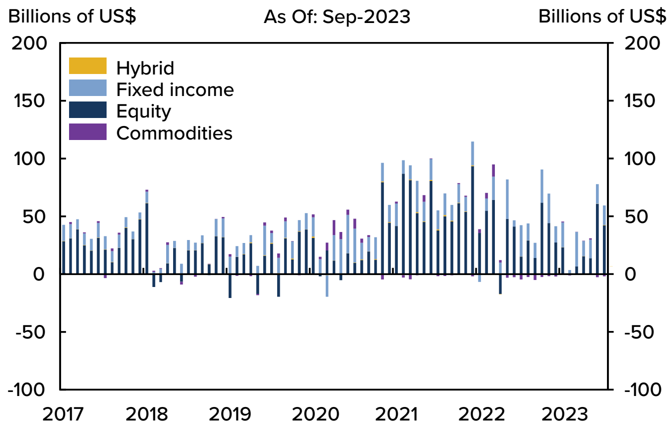
Sources: ICI, Haver Analytics

3.2.2.11 ETF AUM



Sources: ICI, Haver Analytics

3.2.2.12 Monthly ETF Fund Flows



Note: Net fund flows

Sources: ICI, Haver Analytics

Figure 3.2.2.12). Investors continued to reallocate assets away from actively managed mutual funds toward passively managed ETFs, which often have lower management fees compared with mutual funds and provide intraday liquidity for a wide range of investors. This trend is particularly well pronounced in the equity fund sector, and aggregate equity ETF inflows totaled $330 billion for the twelve months ended September 30, 2023. Bond ETFs also recorded sizable inflows of $207 billion through September 30, 2023.

To enhance open-end fund resilience in periods of market stress, in November 2022, the SEC proposed amendments to better prepare open-end funds for stressed conditions and to mitigate the dilution of shareholders' interests. The rule and form amendments would enhance how funds manage their liquidity risks, and would also require mutual funds to implement more consistent liquidity measurement and management practices and provide more timely and detailed reporting of fund information. The proposed amendments are designed to make mutual fund liquidity management practices more attuned to severe market stress events, address perceived "liquidity mismatch" in mutual funds, and reduce the potential "dilutive" effect on nontransacting shareholders when mutual funds purchase and sell portfolio holdings in response to shareholder inflows and outflows. The proposed rules, if adopted as proposed, would limit fund manager discretion in liquidity classifications; potentially modify the investment liquidity classification, likely with fewer investments classified as highly liquid and more classified as illiquid; and potentially make it more difficult for fund sponsors to offer certain investment strategies in open-end fund structures that offer daily liquidity to shareholders.

Collective Investment Funds

Collective investment funds (CIFs) are bank- and trust-administered funds that hold pooled assets of bank fiduciary accounts. CIFs typically are limited to common trust funds for personal trusts and collective investment trusts offered to tax-qualified retirement plans.[172] In addition, some CIFs are short-term investment funds (STIFs), which, like many MMFs, invest in high-quality, short-term debt instruments and seek to maintain a stable NAV. While there are limited data on the size of the entire CIF industry, estimates (based on a limited subset of sponsors that file FDIC call reports) put it at more than $4 trillion as of year-end 2022 (see **Figure 3.2.2.13**).[173]

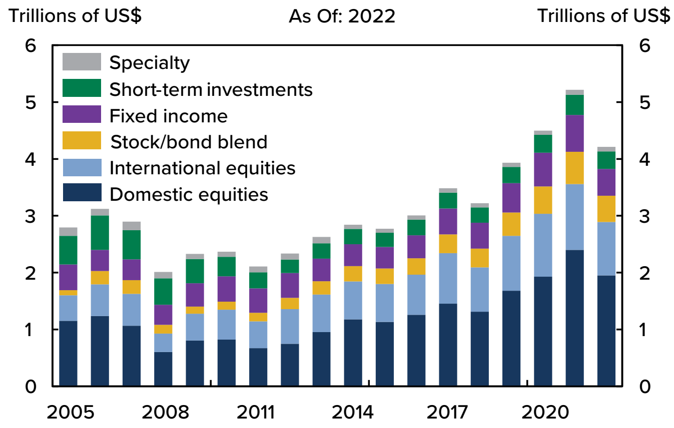
CIFs are pooled investment vehicles that are managed collectively in accordance with a common investment strategy. To the extent that CIFs are managed in accordance with investment strategies similar to those used to manage open-end funds, they may have liquidity, leverage, and investment risks that are similar to those of open-end funds and may also present similar financial stability risks. The Council has previously recognized that open-end funds can create risks to financial stability. For example, in 2022, the Council's Open-end Fund Working Group presented findings that open-end funds were significant contributors to the financial system disruptions experienced in March 2020.

CIF AUM has grown in recent years, largely as investment options in qualified retirement plans, especially 401(k)s and other participant-directed plans, have expanded. The funds may be growing in part due to their different cost structure, which is based on their different regulatory requirements.[174] For example, compared to open-end funds, CIFs face fewer restrictions on illiquid assets and the use of leverage and have more limited requirements to make disclosures to their investors. Potential new open-end fund regulations, including the open-end minimum-liquidity requirements discussed above, could increase the difference in regulatory cost and structure between CIFs and open-end funds.

Pension Funds

Defined benefit (DB) pension plans promise a regular retirement income based on factors such as age, tenure, and final salary. To fund these promises, plan sponsors invest in and set aside financial assets such as fixed income, equity, and alternative investments, including

3.2.2.13 Collective Investment Funds AUM: by Sector



Note: Limited to funds managed by institutions reporting CIF and CIT assets on Call Report Form RC-T.

Source: FFIEC Call Report

hedge funds, private equity (PE), real assets, and private credit. When plan assets exceed the present value of future liabilities, a plan is said to be fully funded.

DB plans continue playing an important but declining role in the U.S. retirement system. DB plan assets totaled $11.3 trillion in the second quarter of 2023, amounting to 42 percent of total retirement assets.[175] Only 21 percent of DB assets are in private-sector DB plans, with the remainder in state, local, and federal DB plans.[176]

Interest rate changes affect the present value of pension assets and liabilities by influencing the discount rate used to value pension plans' long-term liabilities. Recent interest rate rises have substantially lowered the present value of these promised benefits. Private and public plans use differing discounting methodologies, with private plans using lower and more conservative discount rates.

Private and public plans also differ in their investment allocations. State and local DB pension funds tend to have more aggressive investment allocations, often with a significant exposure to alternative investments including PE and private credit. Private DB plans tend to invest more conservatively with a heavier allocation to debt securities.

Debt investments are especially attractive to private plan sponsors considering eventually terminating the plan or entering into a pension risk transfer (PRT) transaction with an insurer. In a PRT transaction, the insurer assumes the plan's pension payment obligations in exchange for a fixed one-time payment. By doing this, the pension plan also transfers to the insurer plan risks such as market value fluctuations, interest rate risk, and longevity risk. This also permits the plan to lessen or eliminate premium payments to the Pension Benefit Guaranty Corporation. PRTs have become increasingly attractive to pension plans in recent years, and PRT sales hit a record high of $16.2 billion in the second quarter of 2023.[177] PRT assets, which totaled $258 billion as of the second quarter of 2023, represent approximately 2 percent of total retirement fund assets.[178]

Recommendations

The Council supports the initiatives by the SEC and other agencies to address risks in hedge funds, including data collection improvements for Form PF. The Council also supports the ongoing work of the relevant banking supervisors to improve banks' counterparty credit risk management practices with respect to hedge funds. The Council will continue to review the findings of the HFWG as they are developed. The Council recommends that the SEC and other relevant regulators consider whether additional steps should be taken to address these vulnerabilities.

The Council supports the SEC's continued engagement regarding potential reforms of open-end funds, including the liquidity framework enhancements proposed in late 2022 that govern open-end fund liquidity risk management, swing pricing, and fund reporting. The Council looks forward to reforms that robustly address the financial stability risks from SEC-registered open-end funds.

In July 2023, the SEC finalized reforms for MMFs that increase the minimum liquidity requirements for these funds, prohibit the use of temporary redemption gates, and institute a mandatory liquidity fee framework for institutional non-governmental MMFs. The Council supports the SEC's efforts to improve the resilience and transparency of MMFs and strengthen short-term funding markets. The Council will continue to monitor initiatives relating to MMF reforms. These reforms will be considered in the broader context of regulatory efforts to strengthen short-term funding markets and support orderly market functioning.

The Council recommends that both state and federal regulators consider requirements for greater transparency and more detailed and timely regulatory reporting by CIFs that would enable both banks and regulators to better understand market trends and monitor for potential risks. Additionally, the Council encourages state and federal regulators to consider whether any reforms in the CIF market would be appropriate to mitigate these risks, particularly given the proposed changes to open-end funds.

The Council encourages pension regulators and the Financial Accounting Standards Board (FASB) to improve the quality, timeliness, and depth of pension financial statements and portfolio holdings disclosures.

3.2.3 Central Counterparties

Following the 2007–09 financial crisis, there has been a notable increase in the use of central counterparties (CCPs). This positions CCPs as pivotal entities within the global financial framework. Central clearing involves the engagement of parties in a financial agreement, which leads to the creation of two corresponding contracts with the CCP, wherein the CCP acts as the buyer to the seller and the seller to the buyer. These contracts effectively offset each other, with the CCP assuming responsibility for overseeing the fulfillment of outstanding agreements. While central clearing serves as a safeguard against potential defaults among counterparties that might jeopardize financial stability, it also concentrates risk.

Consequently, despite the substantial advantages CCPs offer in terms of market efficiency and standardization of contracts, CCPs also introduce prospective hazards into the financial system. The inability of a CCP to meet its obligations stemming from either the default of one or more clearing members or losses due to operational failures has the potential to strain both the remaining CCP members and, on a broader scale, the entire U.S. financial system. The magnitude of strain exerted on the financial system hinges on various factors, including the size of the CCP, the resources available to the CCP to cover obligations, and the CCP's level of interdependence with other financial institutions.

In the event of a member default, CCP risk management frameworks are structured to utilize a variety of resources to cover the defaulting member's liabilities. A CCP reduces settlement risks by netting offsetting transactions between multiple counterparties, and it reduces financial risk by:

- requiring initial margin deposits and the exchange of variation margin deposits among clearing members,
- providing independent and standardized valuation of open positions and collateral on deposit,
- monitoring the creditworthiness of the clearing member firms, and
- establishing a mutualized default fund that can be used to cover losses that exceed a defaulting member's collateral on deposit.

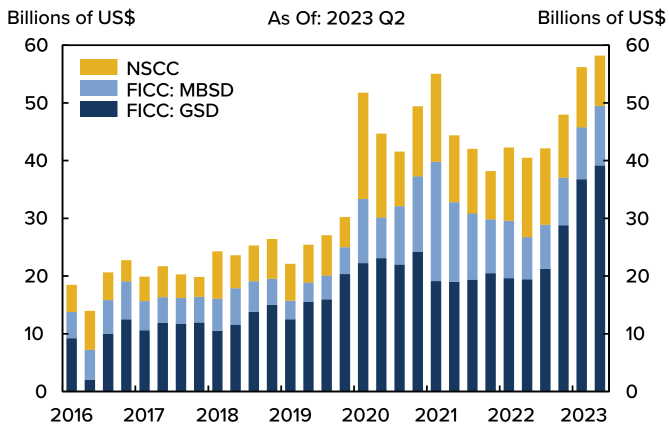
An integral aspect of a CCP's risk management framework involves collecting initial margin and default fund contributions from members and monitoring the ongoing creditworthiness of its clearing members. These measures are in place to safeguard the CCP, should a clearing member lack the ability to satisfy its clearing obligations and thus be declared in default. It is customary for CCPs to adapt their initial margin requirements in accordance with shifts in market dynamics. For instance, heightened price volatility might prompt a CCP to raise initial margin requirements. Other significant elements within a CCP's risk management strategy are the mark-to-market of all cleared positions and the exchange of variation margin, which takes place at least daily. This margin counterbalances alterations in existing exposures that stem from and account for fluctuations in market prices.

In cases when a clearing member defaults, CCPs implement their predefined default procedures, which often involve liquidating the defaulting member's positions and using the member's posted collateral to offset any losses that might be incurred from the liquidation. If losses from a clearing member's default surpass the defaulter's available resources, the CCP can turn to its mutualized default fund to cover those losses and then levy special assessments on its clearing members if default fund resources are exhausted. However, the use of some of these tools in the case of a systemic stress event may have knock-on effects and potentially material adverse impacts on financial stability.

U.S. CCPs

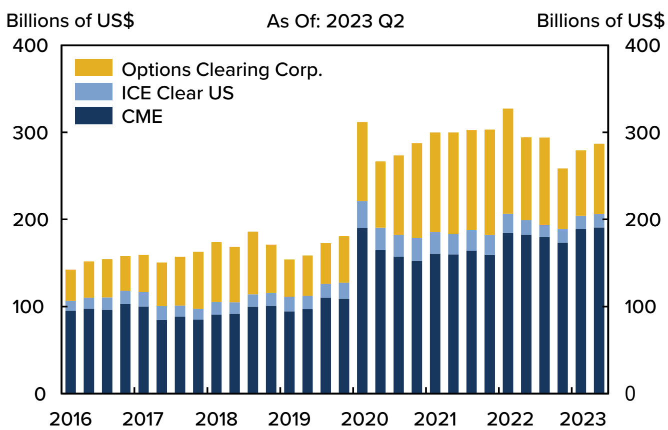
In the United States, the Fixed Income Clearing Corporation (FICC)[179] and the National Securities Clearing Corporation (NSCC), which are subsidiaries of the Depository Trust & Clearing Corporation (DTCC), are the providers of clearing services

3.2.3.1 DTCC Clearing Fund Requirements



Sources: PFMI Quantitative Disclosures, Clarus Financial Technology

3.2.3.2 Initial Margin: U.S. Exchange-Traded Derivatives



Notes: Initial margin required as reported in quantitative disclosures; includes house and client accounts.

Sources: PFMI Quantitative Disclosures, Clarus Financial Technology

for cash securities. Required contributions to the FICC's Mortgage-Backed Securities Division (MBSD) and NSCC's clearing funds, which spiked at the onset of the COVID-19 pandemic, remained elevated through the second quarter of 2023 relative to pre-pandemic levels, though both have come down from prior highs. Notably, required contributions to the FICC's Government Securities Division (GSD) have increased since the second quarter of 2022 as Treasury yields have risen, and Federal Reserve monetary policy has increased rates. As of June 30, 2023, clearing fund requirements across DTCC's three clearing services totaled $57.9 billion, up $17.7 billion from June 30, 2022 (see **Figure 3.2.3.1**).

Most U.S. exchange-traded derivatives are cleared through the Chicago Mercantile Exchange (CME), ICE Clear U.S., and the Options Clearing Corporation. CME provides clearing services for swaps, futures, and options on futures; ICE Clear U.S. provides clearing services for futures and options on futures; and the Options Clearing Corporation mainly provides clearing services for exchange-traded equity options transactions. The initial margin posted against exchange-traded remains elevated relative to pre-pandemic levels, with the margin at Options Clearing Corporation, CME, and ICE Clear U.S. totaling $287 billion, though it is down $7.4 billion from June 30, 2022 (see **Figure 3.2.3.2**).

Within the cleared-swaps markets, most U.S. dollar interest rate swaps (IRS) are cleared through London-based LCH Ltd. or CME, while most credit default swaps (CDS) are cleared through ICE Clear Credit or Paris-based LCH SA. The required initial margin for IRS and CDS totaled $325 billion as of June 30, 2023, up $25 billion from the prior year (see **Figure 3.2.3.3**). Most of the increase is attributable to increased interest rate volatility as central banks increased target rates. This can be observed through increased initial margin account breach likelihoods seen at IRS CCPs, where the variation margin payment in a day is greater than the initial margin held against the account, which is indicative of a possible need to increase the margin held against the account (see **Figure 3.2.3.4**).

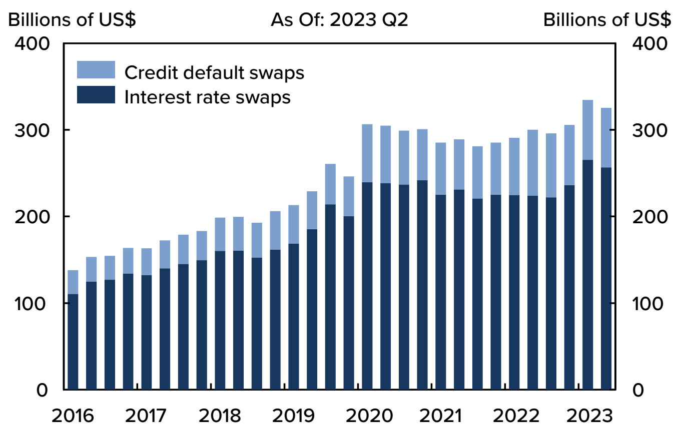
CCP-Related Market Events

Bank estimates of CCP default probability, as reported in the Federal Reserve's Comprehensive Capital Analysis and Review (CCAR), provide indicators of the adequacy of CCP stress management.[180] These estimates, which are uncertain, spiked at the onset of the pandemic before declining through mid-2021. However, the default estimates have again been on the rise for a variety of CCPs, including those with significant exposure to commodity markets.

The recent rise in risk perceptions may be, in part, a response to the serious stresses that occurred on the London Metal Exchange (LME), which is a CCP not registered in the United States. On March 8, 2022, the LME suspended trading in the nickel market following unprecedented price increases in the 3-month nickel contract. LME did this because there were serious concerns about market participants' ability to meet margin calls, raising the significant risk of multiple defaults.[181]

This incident highlighted several risk factors that apply to CCPs more generally. Operating business as usual can have pro-cyclical effects, both through elevated margin calls and forced asset sales. There can also be hidden concentration risk: members can split their positions among multiple CCPs and may also have entered into uncleared OTC bilateral contracts, which limits the ability of

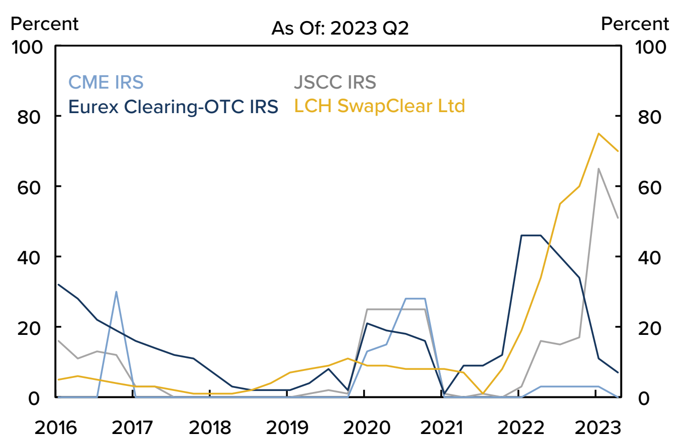
3.2.3.3 Initial Margin: Centrally Cleared OTC Derivatives



Notes: Initial margin required as reported in quantitative disclosures; includes house and client accounts. Interest rate swaps margin includes LCH Ltd. and CME. CDS margin includes CME, ICC, ICEU, and LCH SA. CME and ICEU ceased clearing CDS in March 2018 and October 2023, respectively.

Sources: PFMI Quantitative Disclosures, Clarus Financial Technology

3.2.3.4 Initial Margin Account Daily Breach Likelihood at IRS Central Counterparties



Notes: Eurex is a Germany-based derivatives clearing organization registered with the CFTC. JSCC is a Japan-based clearinghouse exempt from registration with the CFTC as a derivatives clearing organization.

Sources: PFMI Quantitative Disclosures, Clarus Financial Technology a given CCP to fully assess the concentration risk posed by its members. A related issue is that CCP members often have cross-default agreements with other CCPs, which specify that a default at one of them triggers a default at all of them. These arrangements can contribute to systemic risk by exacerbating price moves when the positions of a defaulting member have to be liquidated.

CCP Resolution

While historical instances of CCP failures have been infrequent, the possibility of future CCP failure demands thorough resolution planning and readiness to ensure the continuous operation of essential functions and the preservation of U.S. financial stability. Consequently, the Council has designated five CCPs, CME, FICC, NSCC, ICE Clear Credit, and Options Clearing Corporation, as systemically important financial market utilities (FMUs), due to their potential to jeopardize financial stability if they were to fail or experience disruptions in their functioning. These systemically important CCPs have taken measures, overseen by regulators, to bolster their preparedness to manage extreme-stress scenarios, such as engaging in recovery and orderly wind-down planning. The failure of these plans, if activated, could create serious financial stability concerns for the United States.

Additionally, 13 CCPs from 10 different jurisdictions, including 3 from the U.S - CME, ICE Clear Credit, and Options Clearing Corporation - are considered to be systemically important CCPs in more than one jurisdiction (SI>1 CCPs). Regulators have taken steps for these SI>1 CCPs to enhance their preparedness for a potential resolution event, such as setting up crisis management groups with cooperation agreements to support resolution planning and resolvability assessments. Regulators continue to consider the need for dedicated resources and tools for CCP resolution and have contributed to a Financial Stability Board (FSB) consultation report on the topic. Additionally, the SEC and CFTC have proposed revisions to their recovery and wind-down plan rules that would require additional information to aid the FDIC in resolution planning and improve resolvability for these institutions. These measures and further engagement between regulators on information sharing could enhance readiness for a potential CCP resolution event.

It is particularly important for regulators to have a more complete picture of clearing members' exposures among different CCPs, to help the regulators assess concentration risks. Additionally, the existence of cross-default agreements among market participants creates potential spillover effects in which a member's default at one CCP can lead to it being declared in default at multiple CCPs. The magnitude of these spillover effects can, in certain cases, only be assessed by substantial cooperation and sharing of information among different jurisdictions.

Recommendations

CCPs can reduce the risk that bilateral defaults may impact the stability of the financial system. Given the interconnected and international nature of financial markets, CCP oversight requires coordination among national agencies, international counterparts and standards-setting bodies. The Council supports the CFTC, Federal Reserve, and SEC's continued efforts to enhance their oversight over CCPs designated by the Council as systemically important FMUs. It is important for the relevant agencies to consistently assess whether the current CCP standards effectively mitigate threats to financial stability arising from both default and nondefault losses. For each contract that is cleared, CCPs replace bilateral risk between market participants with a direct exposure between each of those participants and the CCP, and that exposure is collateralized by requiring those market participants to provide cash and other eligible collateral. Consequently, CCPs mitigate credit risk in the financial system but create liquidity risk, with potentially pro-cyclical effects. Regulatory bodies overseeing clearing members should continue evaluating the liquidity risk management practices and capabilities of these firms. It is crucial for supervisory agencies to work alongside and strengthen information-sharing agreements with the FDIC to facilitate resolution planning and improve resolvability for CCPs.

The Council supports continued monitoring and assessment of interconnections among CCPs, their clearing members, and other financial institutions. CCPs need to be fully capable of managing risks stemming from abrupt volatility, and participants should be prepared to meet their liquidity needs for handling higher margin calls during stressful periods. Additionally, cross-default agreements create a potential for the default of one CCP's member to spill over into other CCPs, including those in other jurisdictions and time zones. Therefore, it is important to encourage greater transparency of clearing members' clearing obligations across CCPs.

Council member agencies should continue to collaborate with international counterparts and standards-setting bodies to identify and address any areas of concern, including potential threats or risks to financial stability that could be related to or mitigated through CCPs. The Council supports ongoing engagement with foreign regulators to address the potential inconsistencies in regulatory requirements or supervision that might negatively impact U.S. financial stability. This collaborative approach should extend to overseeing and regulating systemically important CCPs and determining appropriate resources for resilience, recovery and resolution for such institutions. Coordination in designing and executing supervisory stress tests for these entities should also remain a priority.

3.2.4 Insurance Sector

The U.S. is the world's largest single-country insurance market, with a 44 percent share of global direct insurance premiums written as of year-end 2022.[182] The U.S. insurance industry has shown positive year-over-year growth in direct premiums written since 2013. Following a 10 percent increase in 2022, net premiums, annuity considerations, and deposits for the life and health (L&H) sector increased by 11 percent during the first half of 2023. Similarly, property and casualty (P&C) sector direct premiums written increased 9 percent in 2022, followed by a 10 percent gain over the first half of 2023. Inflationary pressures, combined with market volatility and monetary tightening, affected the financial performance of the L&H and P&C sectors in 2022 and continued to do so through the first half of 2023. In 2022, the L&H and P&C sectors combined experienced a contraction in surplus for the first time since 2008, largely driven by unrealized capital losses on equity securities and other investments that are marked-to-market in statutory accounting.[183] With the L&H sector's investments composed of longer-duration assets to support long-tailed liabilities, the rapid rise in rates in 2022 led to decreased valuations of fixed-income securities. In addition to declining equity valuations, the P&C sector was adversely affected by increased loss severity from claims inflation, natural and climate-related catastrophes, and higher reinsurance costs. The P&C sector's loss ratio stood at a 10-year high for 2022 and has continued to deteriorate into 2023. The first half of 2023 saw continued downward pressure on the L&H sector's capital and surplus from asset valuation issues, while the P&C sector's surplus recovered somewhat as unrealized losses abated; nonetheless, the industry's combined capital and surplus remained below the year-end 2021 level.

Despite the challenges presented over the last two years, the two sectors continued to maintain the financial strength to support their policyholder and financial commitments. However, recent solvency and liquidity issues at other financial institutions have heightened focus on insurers' liquidity risk management, asset/liability management, and capital management, particularly in the L&H sector. The many structural changes occurring in the L&H sector, including the involvement of large asset management companies and private equity (PE) firms, evolving investment strategies, reliance on nontraditional funding sources, and life insurers' increasing use of offshore reinsurance, warrant increased supervisory focus.

Interest Rate Implications

Book of Business

Rising interest rates have different implications for new business versus in-force business. For in-force business with guaranteed rates, a rapidly rising yield environment means portfolio yields supporting the in-force business will lag behind new business that can be offered at current higher yields. If the difference between in-force yield and new-business yield is sufficient to overcome barriers such as contractual provisions, market value adjustments, surrender fees, and tax implications, then some lines of businesses at life insurers may see customer attrition and increased policy surrenders due to preferential yields on noninsurance or new-money products offered by competitors. In the life insurance market, such a trend in consumer behavior is termed a lapse. These dynamics are similar to those experienced by banks in a rising-interest-rate environment, except that most insurance products have contractual provisions that reduce the likelihood of large systemic lapses. At the present time, there is a larger-than-average volume of writers of fixed annuities whose policies are no longer in the surrender charge period and could be most at risk of policyholder fund withdrawals. Conversely, new sales of interest-sensitive products are increasing, which could offset liquidity issues with new premiums coming into the business. These dynamics of in-force versus new business are being closely monitored in light of sudden changes in the rate environment in the life insurance industry.

Investments

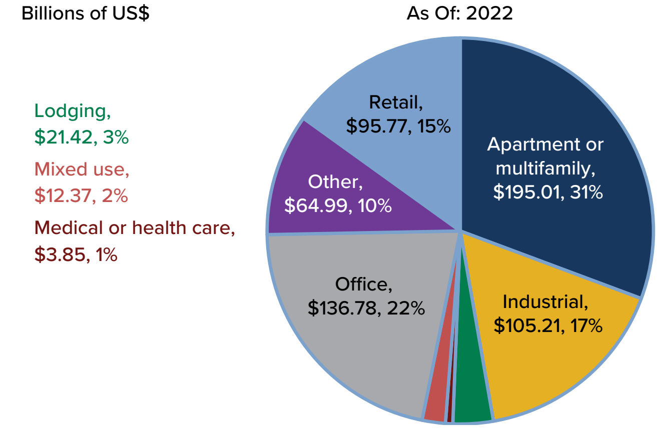
Rising interest rates have numerous potential impacts on insurers' investment portfolios. While the interest rate environment affects both P&C and L&H insurers, the L&H insurance sector is more sensitive to interest rate risk than the P&C sector, due to its longer-term bond holdings and the long-tailed nature of its liabilities, some of which also carry guaranteed returns. On the asset side, the pace of interest rate increases after March 2022 resulted in significant realized and unrealized losses in the fixed-income portfolios of a majority of U.S. insurers by the end of 2022, with some larger life insurers exhibiting negative interest rate maintenance reserves (IMR) as a result of the effects of realized losses from rising rates. However, the general ability of insurers to hold fixed-income investments to maturity may allow them to avoid some degree of realized losses on investments. Also, statutory accounting generally does not penalize unrealized losses on most fixed-income securities or negatively affect insurers' statutory capital position.[184]

Similarly, a higher-interest-rate environment evokes concerns over exposures to rate-sensitive investments and credit risk. The changes in the macroeconomic environment, including rising interest rates, higher-than-average inflation, and consumer trends such as more work-from-home policies, have led to lower occupancy rates that have significantly slowed the commercial real estate (CRE) transaction market. L&H insurers have meaningful exposure to CRE via mortgage loans, mortgage-backed securities (MBS), and direct equity investments. The risks of CRE exposures are mitigated by a greater weight toward higher-quality CRE mortgages and securities, a lower overall CRE weight in investment portfolios, and repositioning toward segments such as industrial and multifamily from office and retail. Maturity walls looming[185] amid rising-rate environments, with a need for close monitoring of implications due to refinancing risks, are an area of concern for this sector. Although the majority of life insurers' commercial mortgages remain in good standing, unrealized losses and impairments are on the rise.[186] Insurance exposures are also well diversified among property types and geographies (see **Figure 3.2.4.1**).[187] Although as of year-end 2022, life insurers' share of uninsured commercial mortgages held in office was approximately 22 percent, the insurers have reduced their exposures to offices and retail relative to total year-end 2022 holdings.[188]

In the corporate bond markets, trends continue to indicate a rise in investment holdings of public BBB-rated corporate bonds in life insurer portfolios, relative to the pre-pandemic period (See **Figure 3.2.4.2**). In contrast to public corporate bond exposures, trends in private corporate bond markets indicate life insurers may have rotated some allocations into higher-quality private corporate credits in 2022, relative to 2021. Nevertheless, in a period of a rapid rise in interest rates together with headline inflationary risks and late-credit-cycle economics, such trends in allocations to lower-quality public credits may expose some of these portfolios to elevated risks of credit migration and default.

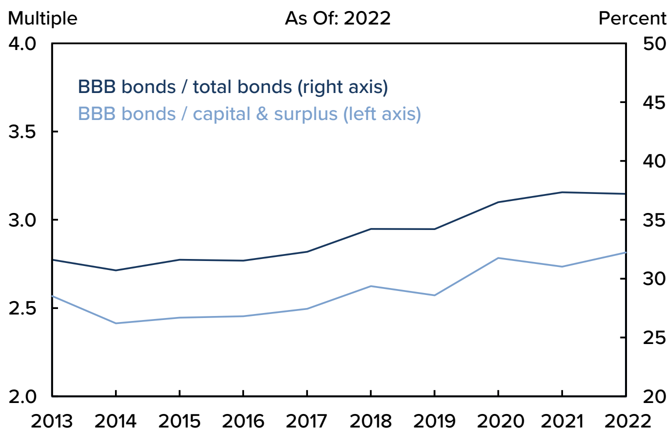
The landscape of L&H sector investment portfolios has been changing for a number of years. Because insurers are shifting away from traditional investments toward alternative and other nontraditional investments to enhance yields, their investment portfolios reflect increased allocations to relatively illiquid investments such as bank loans, private-label securities, and other structured securities like collateralized loan obligations (CLOs) and other asset-backed securities. Additionally, allocations to affiliated investments have been growing. With the exception of 2018, the L&H sector has expanded its holdings of affiliated cash and investments each year over the last 10 years. Due to the more illiquid nature of affiliated holdings, significant growth in them

3.2.4.1 Insurance Sector CRE Exposure by Property Type



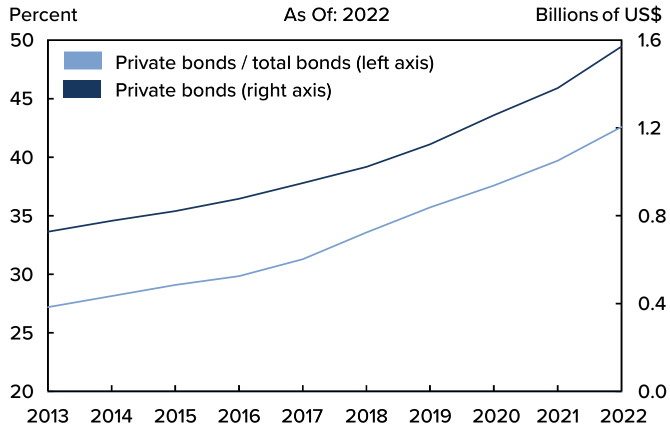
Source: S&P Capital IQ

3.2.4.2 L&H Insurance Sector BBB-Rated Bond Exposure



Source: S&P Capital IQ

3.2.4.3 L&H Insurance Sector Private Credit Exposure



Source: S&P Capital IQ

may have the potential to adversely affect an insurer's liquidity and capital base.

Asset Management Involvement, Including Private Equity

The influence of PE firms and other alternative asset managers in the L&H insurance sector continues to grow. Today, the PE-owned L&H insurance market encompasses some of the largest providers of fixed annuities and pension risk transfers in the sector. A substantial amount of assets is also held by PE-owned or PE-affiliated offshore life reinsurance entities that mostly reinsure U.S. business. PE-owned reinsurers are significant sources of reinsurance for U.S.-domiciled affiliates and unaffiliated U.S. insurers.

Private Debt

The past decade's ultra-low-interest-rate environment led to the emergence of private debt as a new frontier for institutional credit investors in search of yield and as the next strategic growth area for many PE firms (See **Figure 3.2.4.3**). Private debt offers investors the potential for excess spread return, generated by exposure to increased liquidity and complexity risk. For PE credit businesses, an L&H insurance entity can play an important role in establishing and growing such businesses' private debt ecosystems while also providing exposure to underlying demographic trends in the retail channel. As large institutional investors, L&H insurers' typical cash flow patterns enable PE private debt managers to scale quickly. The PE-owned or PE-managed L&H insurance vehicle can also be a significant source of fee-related earnings.

If done using a balanced and measured approach, with appropriate regulatory oversight and insurer risk management, these investment activities could help to diversify insurer portfolios, provide better yields, and reduce the duration mismatch in insurer balance sheets. Those outcomes could support insurer resilience and the long-term interests of annuitants and policyholders. However, a greater and still increasing concentration of such assets on the books of insurers also elevates liquidity and complexity risks and raises questions about the quality of assets that are increasingly composing surplus and backing policyholder obligations.

Cross-Border Reinsurance

The growth of the segment of L&H insurance liabilities supported by Bermuda reinsurers is leading to an increased dependency on offshore capital to support the U.S. L&H insurance market, while introducing complexities into group structures. An increasing amount of U.S. L&H business has been moving offshore, often with PE involvement, to reinsurers in other jurisdictions. This trend continued in 2022. Several motivating factors for this growing trend have been reported, including tax advantages and accounting rules more favorable than those under U.S. insurance statutory accounting. U.S. business being reinsured offshore has intensified recently, with a concentration observed in Bermuda. Life insurance and annuity reserves transferred offshore rose to $0.8 trillion at year-end 2022, amounting to about 40 percent of the $2 trillion in total reserves ceded. PE-backed reinsurers accounted for 35.3 percent of all of the cedant life and annuity reserve credits and modified coinsurance reserves associated with reinsurance arrangements at year-end 2022.[189]

In cross-border reinsurance transactions, the U.S. ceding insurer or cedent transfers risk to a reinsurer, thereby reducing the U.S. insurer's reserves, releasing surplus capital, and potentially lowering risk-based capital (RBC) requirements. Additionally, some types of reinsurance, such as modified coinsurance, may not be arm's-length transactions. Such arrangements may also involve affiliated offshore reinsurers, making the balance sheets of life and annuity companies less transparent. If those assets and liabilities had remained in the United States, they would potentially have revealed additional stresses to capital. Because of the complexity and opacity of offshore affiliated reinsurance, regulators and policymakers remain focused on its use, with the aim of making sure that U.S. policyholders and annuitants are protected.

In response to life liabilities being reinsured to other jurisdictions and not entirely captured in the leverage metrics analyzed, the National Association of Insurance Commissioners (NAIC) and state regulators are addressing a variety of concerns related to the increasing number of U.S. insurance companies that are owned by PE firms. The NAIC has adopted 13 primary regulatory considerations applicable to PE-owned insurers.[190] Though not exclusive to PE-owned insurers, the list of 13 considerations intends to examine the evaluation of affiliate investment arrangements, including the use of offshore reinsurers and sidecar vehicles.[191] Moreover, the influence of PE firms is extending to the behaviors of traditional insurers that are acting in similar fashion to keep pace by establishing offshore captive reinsurers, buying private credit providers, and moving into illiquid or more complex assets in search of yield.

The NAIC Macroprudential Initiative

In view of the current macroeconomic backdrop and the foregoing discussion of recent developments in the insurance sector, it is important to assess and monitor the progress the NAIC has made on its Macroprudential Initiative (MPI), which was developed in 2017. In particular, there are five key areas being implemented by the NAIC and the states: (1) liquidity risk, (2) capital stress testing, (3) recovery and resolution, (4) counterparty exposure and concentration, and (5) a catch-all or "Other" category.[192] The current environment demonstrates the need for the states to constantly evaluate the adequacy and effectiveness of their tools and their preparedness to identify and address potential events and circumstances that may cause or expand financial stress. For example, the ongoing transformation in the L&H sector is presenting new regulatory challenges as insurers divest subsidiaries or legacy blocks of businesses through sales or reinsurance risk transfer transactions to new entrants, such as PE firms, that utilize business models that differ from traditional ones in the insurance space. Another area of focus is on increased investment allocations by insurers to complex structured securities, such as CLOs, and assessing whether regulators have the proper tools, as well as a supervisory and capital framework, in place to effectively protect policyholders from insurers' investment risk.

Property & Casualty (P&C) Insurance

See **Section 3.1.2: Residential Real Estate, Property Insurance Developments** for a discussion of how changes in P&C insurance market coverage could affect mortgage markets. Refer to **Section 3.1.6: Climate-Related Financial Risks, Role of Insurance** for a complementary discussion of the important role insurance plays in absorbing losses stemming from physical risks.

Recommendations

The macroeconomic environment and structural changes occurring in the L&H sector present challenges for both insurers and regulators. The transformational trends in the L&H sector discussed above may raise concerns related to (1) growth of private credit and alternative assets to support policyholder obligations, (2) growth in risk appetite for CRE exposures and increased proportion of lower credit quality in corporate bond portfolios over the last decade, (3) growth in the use of offshore reinsurance, which is intended to facilitate risk transfer of capital-intensive legacy blocks and to build capacity in insurers' balance sheets through release of reserves and opportunistic evaluation of liabilities, and (4) the growing influence of new entrants in life insurance, such as private equity and other alternative asset management firms. Such regulatory challenges suggest the need to enhance supervisory, credit analysis, risk management, and capital frameworks to ensure that policyholders are protected from attendant heightened risks. Liquidity stress, counterparty risk, credit risk, and ratings migration could arise in a period of rapidly rising rates or deteriorating economic conditions or from the failure of one or more offshore reinsurers. The Council recommends that FIO, along with the NAIC, work with member agencies to evaluate the potential impact of these trends on systemic risk and associated financial stability considerations. The Council supports FIO's work on these issues, as well as NAIC's efforts to advance its macroprudential initiative and supervisory considerations for insurers that are owned by, or in strategic arrangements with, private equity firms or other alternative asset managers.

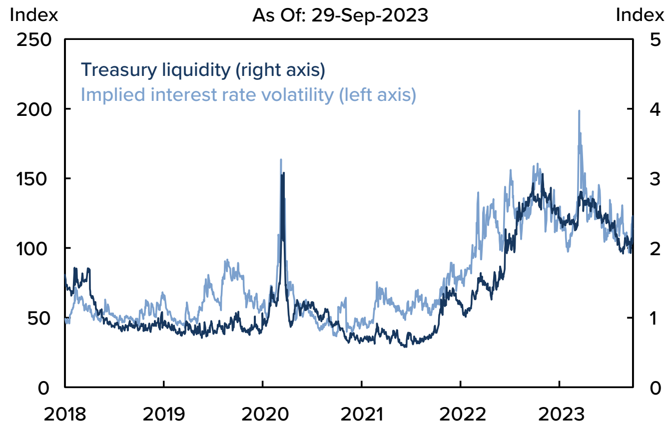
3.3 Financial Market Structure, Operational Risk, and Technological Risk

3.3.1 Treasury Markets

The Treasury market plays a critical role in financing the federal government, supporting the broader financial system, and implementing monetary policy. The Treasury market remains the deepest and most liquid market in the world and a central component of the financial system. Daily trading volumes averaged around $750 billion in 2023, but secondary-market liquidity was nevertheless challenged at times by heightened rate volatility and macro uncertainty, most notably amid the regional banking concerns in March (see **Figure 3.3.1.1**). The Treasury market successfully weathered this market shock, and liquidity has since improved (see **Box D: Treasury Market Resilience During March 2023**). Liquidity conditions remained relatively stable over the summer, when increased term premium led to a significant rise in nominal yields. Nevertheless, periodic bouts of volatility continue to illustrate the need to consider policies that enhance Treasury market resilience (see **Figure 3.3.1.2**).

The debt limit served as an additional source of strain during 2023. On January 19, the Treasury began using extraordinary measures to continue meeting the federal government's obligations. Over time, increasingly binding constraints on issuance led to a precipitous decline in the balance of the Treasury General Account (TGA), from $456 billion on January 19 to only $23 billion just before the Fiscal Responsibility Act of 2023 became law on June 3. The latter figure is far below Treasury's prudent policy level, which equates to a level of cash generally sufficient to cover at least one week of outflows (both net fiscal outflows and the gross volume of maturing marketable debt) from the TGA. Meanwhile, some investors reduced, or avoided adding to, their exposure in securities that might be at risk for delayed payment. For example, in late May, short-dated cash management bill auctions stopped-out at discount rates as high as 6.20

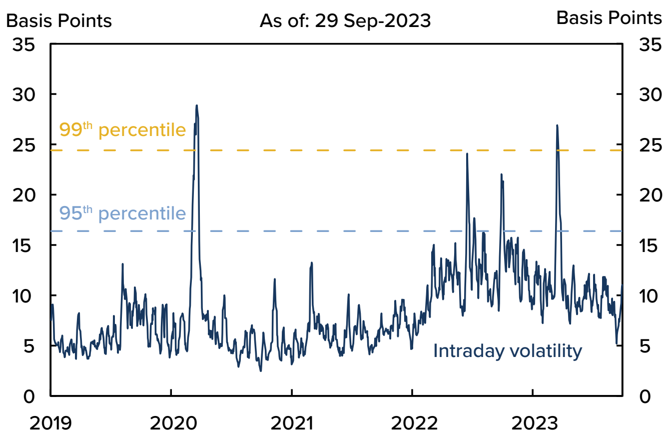
3.3.1.1 Interest Rate Volatility & Treasury Liquidity Indexes



Notes: Implied interest rate volatility = MOVE Index; Treasury liquidity = Bloomberg US Govt Securities Liquidity Index.

Source: Bloomberg, L.P.

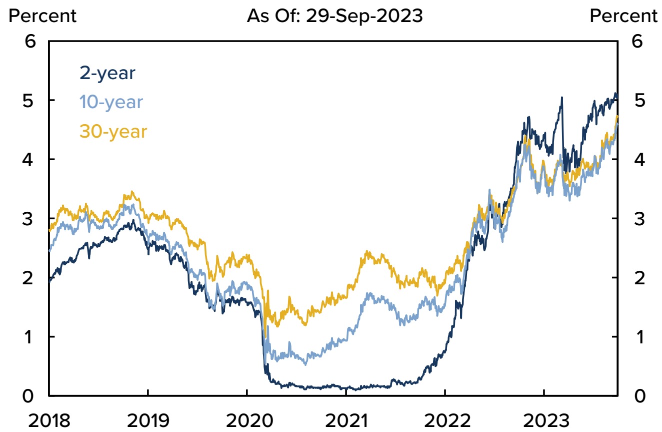
3.3.1.2 Intraday Volatility for 10-Year Treasury Yields



Notes: 5-day moving average. Intraday volatility calculated as daily high yield minus daily low yield on 10-year Treasury notes. Percentiles based on January 2005–September 2023.

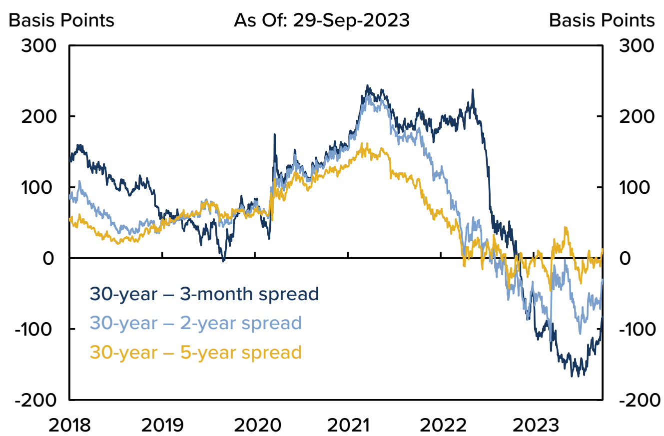
Source: Bloomberg, L.P.

3.3.1.3 U.S. Treasury Yields



Source: U.S. Department of the Treasury

3.3.1.4 U.S. Treasury Curve Spreads



Source: U.S. Department of the Treasury

percent, which was more than 100 basis points above prevailing SOFR levels at the time. These periodic debt limit impasses also leave Treasury more at risk from a potential interruption in market access, whether resulting from natural disasters or emerging threats such as potential cyberattacks.

Over the subsequent three months between June 5 and August 31, Treasury borrowed on net from private market participants a total of $1.2 trillion, of which $1.0 trillion was in bills, both to meet the government's obligations and to rebuild the balance of the TGA. When evaluating FY 2023 as a whole, Treasury's net privately held marketable borrowing needs increased by nearly $900 billion year-over-year, from $1.8 trillion to $2.7 trillion. Much of this borrowing was achieved through issuance of $1.7 trillion in Treasury bills, thereby capitalizing on the growing market demand for short-dated, high-quality liquid assets. Looking to the years ahead, projections for Treasury's borrowing needs in FY 2024–25 have also increased by a cumulative $1 trillion since October 2022, according to the median primary dealer estimate from Treasury's quarterly refunding survey.

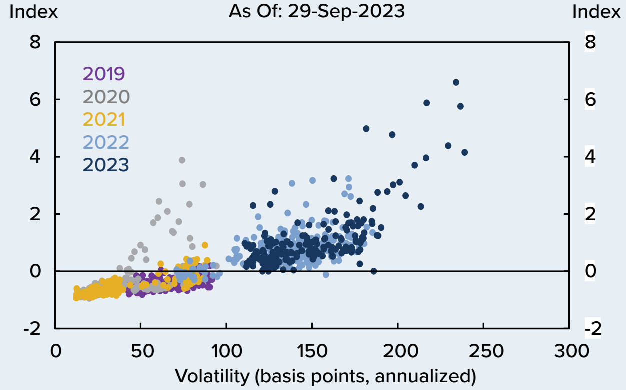
During FY 2023, nominal Treasury yields increased by 81 basis points in the 2-year and 94 basis points in the 30-year (see **Figure 3.3.1.3**). The Treasury yield curve, which was inverted at the start of the year, steepened as long-term Treasury yields rose more than short-term yields (see **Figure 3.3.1.4**). In aggregate, debt service costs on Treasury securities increased by $237 billion year-over-year.

Box D: Treasury Market Resilience During March 2023

In March 2023, the Treasury market experienced a significant shock in volatility that was driven by regional banking concerns, which sparked broader financial market stress and a sharp repricing of market-implied monetary policy expectations. For example, two-year nominal yields declined over 100 basis points over a three-business-day period starting on Thursday, March 9, when worries began to emerge regarding Silicon Valley Bank (SVB). Volatility in short-end yields persisted for several weeks, as swaption-implied volatility in the 2-year Treasury spiked to levels above what prevailed during the COVID-19 crisis. Long-end yields also experienced significant volatility, though not as severe as the volatility experienced by short-end yields.

Amid the spike in volatility, Treasury market liquidity conditions were challenged as bid-ask spreads widened, market depth declined, and price impact increased. However, when adjusting for volatility, the decline in liquidity measures did appear broadly in line with recent history (see **Figure D.1** and **D.2**). There did not appear to be other factors, such as reduced market functioning, amplifying the decline in liquidity conditions. Moreover, market participants generally noted that the market continued to function and trading was orderly. This contrasts with the disruption in market functioning that occurred in March 2020, at the onset of the COVID-19 pandemic, when liquidity conditions deteriorated more notably when adjusted for volatility.

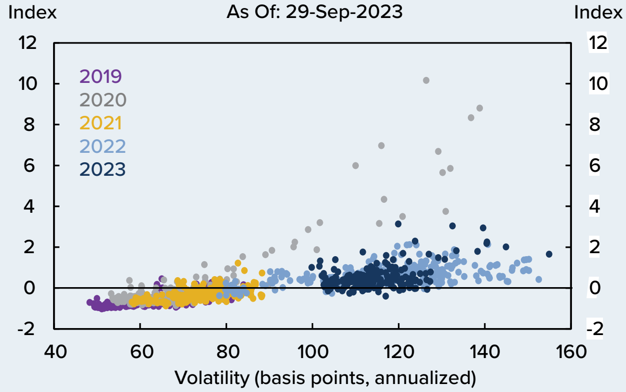
D.1 U.S. Treasury (UST) Liquidity Index vs. Implied Volatility: 2-Year Tenor



Notes: UST Liquidity Index is based on the average of 3-year rolling z-scores for bid-ask spreads, depth, and price impact; volatility is implied by 3-month into 2-year swaptions.

Sources: U.S. Department of Treasury, Bloomberg L.P.

D.2 U.S. Treasury (UST) Liquidity Index vs. Implied Volatility: 10-Year Tenor



Notes: UST Liquidity Index is based on the average of 3-year rolling z-scores for bid-ask spreads, depth, and price impact; volatility is implied by 3-month into 10-year swaptions.

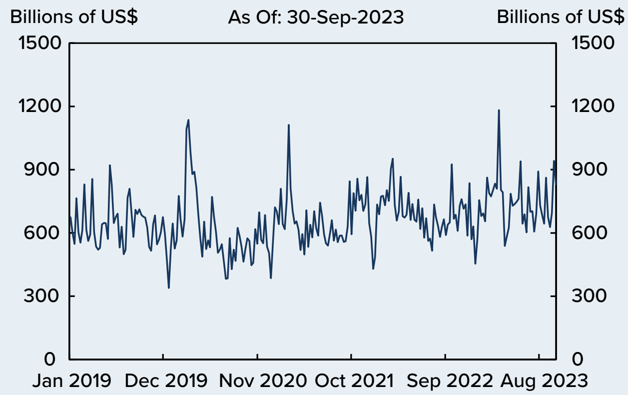
Sources: U.S. Department of Treasury, Bloomberg L.P.

Box D: Treasury Market Resilience During March 2023 (continued)

The Treasury market was also remarkably resilient, considering the tremendous amount of activity that cleared through the market during this period. According to Trade Reporting and Compliance Engine (TRACE) data, weekly average daily trading volumes in the secondary market reached record levels since the data collection began in 2017 (see **Figure D.3**). In addition, principal trading firms (PTFs) increased their share of activity during the period of volatility, potentially helping the market absorb this latest shock. In previous periods of market stress, PTF share has increased in some cases (such as October 2014) and decreased in others (most notably, March 2020) (see **Figure D.4**).

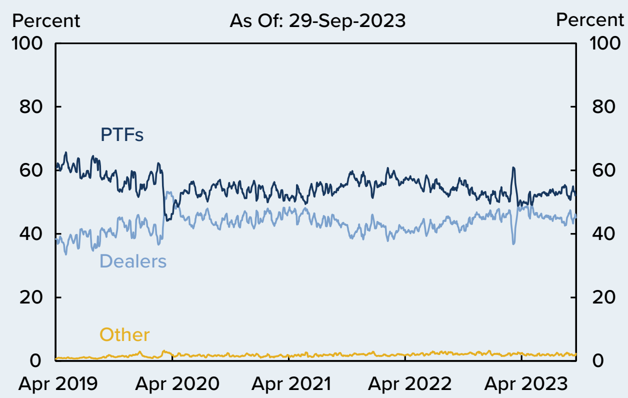
Overall, this latest event was an example of how the Treasury market can remain resilient and be a source of stability, rather than an amplifier of market shocks. However, as seen in the recent past, the Treasury market may still be vulnerable during other types of market events. The official sector can therefore draw important lessons by comparing and contrasting how and why the Treasury market functioned differently during different market shocks. For example, it can study why PTF liquidity provision was more resilient this March than in March 2020, and why end-users and intermediaries may respond differently. These lessons should help inform the official sector about how to appropriately calibrate policies to improve Treasury market resilience across a wide range of potential market shocks.

D.3 Total TRACE U.S. Treasury Average Daily Volume by Week



Source: FINRA

D.4 Daily Share of Participant Activity in the Interdealer Electronic Market



Note: Activity based on TRACE U.S. Treasury interdealer electronic market volume over the last five days.

Source: FINRA

Treasury Market Resilience

Despite heightened market volatility for most of 2023, the Treasury market has continued to show resilience, even when liquidity conditions were most challenged during the regional banking concerns in March 2023. The Treasury market's resilience over the last year further supports the assertion that the market remains the deepest and most liquid market in the world. However, it is important that the official sector continues to make progress in its efforts to improve Treasury market resilience, given the critical role of the Treasury market.

In November 2023, the Interagency Working Group on Treasury Market Surveillance (IAWG), which includes staff from the Treasury, Federal Reserve, SEC, CFTC, and Federal Reserve Bank of New York (FRBNY), released its third staff progress report in as many years on enhancing Treasury market resilience.[193] The report provides an update on the important steps that the official sector has made toward refining and implementing many of the policies that the member agencies introduced in prior years. These policies have focused on five workstreams:

1. Improving resilience of market intermediation.
2. Improving data quality and availability.
3. Evaluating expanded central clearing.
4. Enhancing trading venue transparency and oversight.
5. Examining the effects of leverage and fund liquidity risk management.

In addition, the report outlines key policy areas where further considerations are ongoing.

There have been important developments related to transparency. For instance:

- in January 2023, the OFR proposed a rule to establish a data collection of non-centrally cleared bilateral repo (NCCBR) transactions;
- in February 2023, the Financial Industry Regulatory Authority (FINRA) replaced its weekly report on aggregate Treasury transaction data with daily and monthly reports that include additional volume and pricing information; and
- in November 2023, FINRA filed with the SEC a proposal to allow FINRA to publicly release in an end-of-day file on-the-run nominal coupon transaction information, with trade size caps on large transactions and a historical file with a six-month lag that includes uncapped trade sizes.

In May 2023, Treasury announced plans to implement a regular program in 2024 for liquidity support buybacks and cash management buybacks. The liquidity support buybacks will provide a regular opportunity for investors to sell back to Treasury off-the-run nominal and TIPS securities across the curve. These buyback operations should improve investor confidence and increase dealers' willingness to intermediate, leading to a more liquid and therefore resilient Treasury market. Cash management buybacks are intended to reduce volatility in Treasury's cash balance and bill issuance, which could also lead to smoother functioning in domestic money markets.

Recommendations

While the Treasury market showed resilience to stress in 2023, the history of other disruptions to market functioning and the critical role of the Treasury market in the financial system demand continued focus on improving resilience for the future. In addition, growth of Treasury debt outstanding could make the Treasury market more vulnerable to shocks, especially if intermediation liquidity provision is not sufficient in meeting liquidity demand during a period of market stress. The Council supports the work of the IAWG, particularly in the area of data transparency, and recommends that member agencies continue to make progress on studying and implementing policies to improve the resilience of the Treasury market.

The Council is also supportive of Treasury's efforts to implement Treasury buybacks for liquidity support and cash management purposes. The Council believes buybacks can reduce Treasury market vulnerabilities by improving Treasury market liquidity.

Box E: Successful Implementation of Alternative Reference Rates

Since 2013, the Council has known that using the LIBOR as a reference rate is a key risk to financial stability, safety and soundness, and market integrity. Council members have worked over the past decade in conjunction with the Alternative Reference Rates Committee (ARRC) and other private sector participants to successfully resolve these risks. With the end of the last remaining representative U.S. dollar (USD) LIBOR rates in June 2023, the final steps in the transition from USD LIBOR to more robust rates, such as the ARRC's recommended replacement, the Secured Overnight Financing Rate (SOFR), have been completed.

In August 2022, the CFTC updated its interest rate swap (IRS) clearing requirement to remove the existing requirement to clear IRS by referencing LIBOR and certain other interbank offered rates. CFTC then fully implemented a new requirement to clear IRS by referencing overnight, nearly risk-free reference rates, including SOFR. The implementation of these new IRS clearing rules was phased in as a way of aligning with changes to IRS clearing mandates in Japan, the United Kingdom (UK), and the European Union. The new rules were fully implemented effective June 30, 2023, to align with the cessation of USD LIBOR. Furthermore, the CFTC approved a made-available-to-trade (MAT) determination for certain USD SOFR overnight index swaps (OIS) and Pound Sterling (GBP) Sterling Overnight Index Average (SONIA) OIS. These swaps are therefore now subject to the trade execution requirement under the Commodity Exchange Act (CEA) section 2(h)(8). Similarly, the UK Financial Conduct Authority (FCA) determined that certain GBP SONIA OIS are subject to the derivatives-trading obligation under article 28 of UK Markets in Financial Instruments Regulation (MiFIR).[194] These actions represent the implementation of the G20 commitment for mandatory exchange trading of liquid swaps for alternative reference rates.

Without adequate preparation, the cessation of LIBOR would have caused widespread disruptions to the financial system. The ARRC estimated that USD LIBOR was used in $223 trillion of financial contracts as of 2021, and it was also used extensively in nonfinancial contracts. Prior to the ARRC's development of more robust contractual fallback language for cash products and the International Swaps and Derivatives Association's (ISDA) development of similar language for uncleared derivatives, many contracts referencing LIBOR did not have workable fallbacks. Widespread adoption of the ARRC and ISDA fallbacks in more recent LIBOR cash products and in derivatives helped to ensure a smooth transition. However, incorporating more robust fallbacks into legacy LIBOR contracts with contractual amendments was difficult or unfeasible, and federal legislation[195] passed in 2022 was needed to address the risk posed by those legacy contracts covered under U.S. law. The legislation established a clear and uniform process, on a nationwide basis, for replacing LIBOR in existing contracts when the terms do not provide for the use of a clearly defined or practicable replacement benchmark rate. The legislation does so without affecting the ability of parties to use any appropriate benchmark rate in a new contract, among other reforms to preclude litigation and address LIBOR references in existing contracts and federal law. The UK FCA has required publication of nonrepresentative "synthetic" versions of LIBOR through September 2024, to provide more time to remediate those legacy contracts that are outside of U.S. law.

Successful transition from LIBOR required identifying an alternative rate that does not share the weaknesses inherent in LIBOR, and it also required making sure that this alternative is sufficiently liquid. The ARRC spent several of its early years analyzing a range of potential markets and rates, and it consulted widely with market participants before it selected SOFR as its recommended benchmark. The ARRC's subsequent efforts to promote the voluntary use of SOFR helped to steadily build liquidity. The move away from LIBOR to SOFR required firms to implement extensive model and technical changes. SOFR is now the dominant interest rate benchmark in derivatives and is referenced in almost all floating-rate capital products and consumer loans. Term SOFR rates, which are based on SOFR derivatives markets, are now used in most business loans.

The end of the last remaining representative LIBOR rates passed without incident, as a result of a decade-long effort to prepare for it. The scale and complexity of that effort should serve as a reminder of the systemic importance of interest rate benchmarks, and of the financial stability risks that can ensue when these benchmarks are used inappropriately. The Council has encouraged market participants to consider the use of SOFR, and Council members have emphasized that derivatives and capital markets should use SOFR, given its robustness. The Council has also endorsed the ARRC's recommendation that the use of Term SOFR rates should be limited to supporting business lending, and the Council strongly welcomes the decision of CME Group (the administrator of the Term SOFR rates) to incorporate the ARRC's recommendations directly into its license agreement for use of these rates.

If market participants wish to use a rate other than SOFR, then they should conduct a comprehensive evaluation before adopting that rate. The Council has previously noted that such an evaluation would, at a minimum, review how fit the alternative rate is for the purpose for which it is being used, ensure that the rate is based on an active market with sufficient transaction volumes, assess how adequately the rate represents the underlying interest in that market, and evaluate the resilience of the rate during times of stress. In conducting its review of potential markets and rates, the ARRC warned that it believed wholesale unsecured borrowing markets were too thin to base a robust rate upon them. The International Organization of Securities Commissions (IOSCO) has now conducted its own review of several credit-sensitive rates and has come to a similar conclusion, asking that the administrators of certain benchmarks based on these markets refrain from stating that they are compliant with IOSCO's Principles for Financial Benchmarks. In light of IOSCO's conclusion, individual institutions using these alternative rates should review whether such rates continue to fit into their internal risk management guidelines, remain appropriate for their business strategies and risk appetites, and are appropriate for their customers.

The LIBOR transition has also underscored the importance of appropriate contractual fallbacks. The Council continues to encourage market participants to include sufficiently robust fallback language wherever interest rate benchmarks are referenced.

3.3.2 Cybersecurity

The complexity and interconnectedness of information technology systems used by U.S. financial-sector firms to support their customers make those companies increasingly vulnerable to cyber incidents. Such incidents include ransomware and other malware attacks, denial-of-service attacks, and data breaches and involve software and hardware that are not created and shipped with secure settings by default. Malicious state actors, legacy systems, and weak security and change management practices can contribute to the exploitation of such vulnerabilities. If firms do not remediate these vulnerabilities, attackers can exploit them and potentially affect the financial services sector's continued operations. That may result in losses to both the firms and their customers, due to disruption of operations, theft, and recovery costs.

Cyber Incident Impacts on Financial Services Sector Stability

A weakness in any aspect of the confidentiality,[196] integrity,[197] and availability[198] (commonly referred to as the CIA triad) of financial systems or data could lead to an incident that could potentially threaten the stability of the U.S. financial system. An incident that causes a loss of customer confidence in the confidentiality, reliability, and safety of their data, assets, and transactions at a financial institution could lead to significant withdrawals of assets, resulting in market losses. Additionally, a cybersecurity incident involving the theft or unauthorized disclosure of sensitive data has privacy implications for consumers and could lead to identity theft and fraud.

A cybersecurity incident could also compromise the integrity of critical data. Accurate and usable data is essential to ensure the stable functioning of financial firms and systems. A cybersecurity incident that corrupts, damages, or alters data on a significant scale could disrupt the functioning of the financial system and cause financial firms to lose their credibility. Additionally, corrupted and unreliable data, especially at a trade repository, depository, clearinghouse, transfer agent, intermediary, or similar system of record, could create uncertainty and possible ownership disputes. Also, market participants could lose confidence and cease trading activities. Therefore, compromised data integrity can have severe consequences and could result in the loss of confidence in financial firms and financial systems.

Finally, an incident that disrupts the availability or operations of financial institutions such as central banks, domestic and international exchanges, Global Systemically Important Banks (G-SIBs), and sovereign and sub-sovereign entities (including U.S. state and local governments, custodian banks, and payment-clearing and settlement systems) could have direct short-term contagion effects, destabilize the U.S. economy and financial system, and cause material disruption of the business and operations of private and publicly traded companies. Also, a disruption resulting in a severe curtailment of the availability of critical services, such as the services of fund administrators, pricing or other data providers, specialty software providers, and cloud service providers, could potentially threaten the stability of the U.S. financial system. Two incidents that occurred in 2023 underline this point.

- As discussed in **Box H: ION Case Study**, a cybersecurity incident earlier this year at a global financial software and data firm disrupted its customers' abilities to process cleared derivatives transactions and prompted many financial institutions to initiate cybersecurity and disaster recovery reviews.
- Additionally, on November 8, 2023, the U.S. broker dealer subsidiary of Industrial and Commercial Bank of China, which provides clearing services for Treasury securities transactions, served as another example of the type of event that has the potential to disrupt the functioning of the financial system. The event itself was not immediately communicated to additional regulators or industry participants outside of the core affected parties (e.g., small investment management firms and trade, clearance and settlement venues). The first Core Executive Response Group (CERG) meeting was not called until nearly 12 hours after the ransomware attack was identified and started impacting processing. This raises a number of issues related to timing, impact, awareness, escalation, and cross industry coordination

that need to be reassessed to improve incident responsiveness.

Foreign Conflicts

The health of the global financial services ecosystem depends on the ability of the sector to operate seamlessly among the many existing financial centers. Attacks on any of these centers, without appropriate mitigation or response management, may result in operational risks cascading through the entire global system. Active engagement with international partners in order to better understand the challenges that may affect normal operations can help prevent systemwide disruptions of U.S. financial systems and the U.S. economy as a whole.

The Treasury's Office of Cybersecurity and Critical Infrastructure Protection (OCCIP) serves as both the co-chair and the co-secretariat for the G7 Cyber Expert Group (CEG), as well as the Sector Risk Management Agency for the financial services sector. These functions serve the goal of enabling stronger domestic and international financial cybersecurity and resilience. To increase information sharing, OCCIP hosts both classified and unclassified threat briefings for members of the Financial and Banking Information Infrastructure Committee (FBIIC) and Financial Services Sector Coordinating Council (FSSCC) on various threats targeting the financial services sector. Additionally, OCCIP has produced a "Lessons Learned" series to discuss best practices to support cybersecurity resilience in the financial sector. These programs have helped public- and private-sector financial institutions adopt a heightened cybersecurity posture by focusing on key all-hazard threats.

In its war against Ukraine, Russia has thus far focused its cyber warfare attacks on Ukraine itself. However, there has been an increase in the number of cyberattacks against the United States by pro-Russian groups.[199,200] There have been few successful cyberattacks against the U.S. financial system or its international partners, and any disruption caused by these attacks has proven to be negligible.[201] U.S. cyber defenses were bolstered by the Department of Homeland Security (DHS) Cybersecurity and Infrastructure Security Agency (CISA) "Shields Up" program and the ongoing efforts of the G7 CEG. In June 2023, hacking groups Killnet, Anonymous Sudan, and REvil threatened to attack European financial institutions over the two days following the issuance of the threat.[202] Shortly after that, Killnet, a Russian hacktivist group, claimed to have conducted a cyberattack on the European Investment Bank.[203]

Russia is not the only foreign government seeking to disrupt the U.S. financial sector to achieve geopolitical goals. China is a prevalent actor in this space, often using the financial sector as a vehicle for gathering information. For example, in May 2023, Microsoft reported that Chinese threat actor VOLT TYPHOON had been operating since mid-2021.[204] China was targeting critical communications infrastructure linking the United States and Asia. CISA, the National Security Agency (NSA), the Federal Bureau of Investigation (FBI), and the Five Eyes partners subsequently published a Joint Cybersecurity Advisory to help security practitioners identify and remediate the threat.[205]

Ransomware

Ransomware is a constant and costly threat as ransomware attacks on financial firms continue to grow in scope, scale, and volume.[206,207] Ransomware as a service (RaaS) is a cybercriminal business model that has contributed to the increase in ransomware attacks, due to the distribution of out-of-the-box software packages to affiliates. RaaS attackers only need to possess minimal technical skills and knowledge to be able to encrypt, exfiltrate, and use data as leverage in blackmail schemes.[208,209] RaaS has helped more cybercriminals deploy ransomware attacks by making the technology needed for such attacks more accessible and by providing a revenue-sharing model and anonymity.[210] In October 2023, the Joint Ransomware Task Force issued a new #StopRansomware Guide.[211]

As financial firms have sought to strengthen their security controls to mitigate the risk of data encryption, data exfiltration, and operational disruptions from ransomware events, many such firms have also turned to cyber insurance as a tool to mitigate financial losses from ransomware attacks.[212] Financial services firms with cyber insurance have been more likely to recover encrypted data than those without cyber insurance.[213]

The White House–led Counter Ransomware Initiative (CRI) has worked to increase the resilience of CRI partners, disrupt cybercriminals' activities, counter illicit finance, build private sector partnerships, and cooperate globally to address ransomware.[214] This work has been carried out under the auspices of five working groups: resilience (co-led by Lithuania and India), disruption (led by Australia), counter illicit finance (led by the United Kingdom and Singapore), public-private partnership (led by Spain), and diplomacy (led by Germany).[215] This demonstrates the scale and scope of the international response to this issue.

Insider Threats

Insider threats continue to be a significant concern to the financial sector that can lead to financial loss, operational disruption, reputational damage, and regulatory fines.[216] The motives for malicious insider threats can be financial gain and personal use, plus emotional issues (grievances or the desire to be respected) and political and ideological objectives.[217,218,219] However, financial institutions also must account for the fact that a lack of cybersecurity training, compromised accounts, and poor software design and configuration can lead to unintentional insider threat incidents caused by unwitting employees or customers.[220,221] Also, with the increase in attacks involving malicious insiders, social engineering attacks targeting unmalicious and accidental insiders remain common. As a result, the financial sector has paid more attention to developing insider threat mitigation programs, often mirroring the core components of the National Institute of Standards and Technology (NIST) Cybersecurity Framework: Identify, Protect, Detect, Respond, and Recover.[222,223] As explained in the Securities Industry and Financial Markets Association (SIFMA) Insider Threat Best Practices Guide, "every component in an insider threat mitigation program should have a distinctly human element. While external cybersecurity threats can often be prevented or detected primarily with technological tools, those tools are insufficient to prevent many insider threats. In many cases, the only signals of an impending insider attack are commonly exhibited human behaviors that foreshadow the attacker's intent."[224] Thus, protecting against insider threats requires a holistic approach that involves "technology, legal advice, policy development, physical security, risk awareness and training, and counterintelligence resources."[225]

Recommendations

Maintaining and improving the cyber resilience of the financial system requires continuous assessment of cyber vulnerabilities and close coordination across firms and governments within the U.S. and internationally. The Council recommends the FBIIC, FSSCC, and Financial Services Information Sharing and Analysis Center (FS-ISAC) continue to promote information sharing related to cyber risk and undertake additional work to assess and mitigate cyber-related financial stability risks.

The Council supports the ongoing partnerships between state and federal agencies and private firms, including FBIIC, the FSSCC, and FS-ISAC. Sharing timely and actionable cybersecurity information can reduce the risk of cybersecurity incidents that could potentially affect the financial services sector's continued operations and mitigate the impacts of those that do occur. In light of the disruptive ransomware attacks on financial services firms that occurred over the last year, the Council recommends that the relevant government agencies conduct a thorough review of those cyber incidents to gain a greater understanding of the potential vulnerabilities that led to the incidents and the processes that firms and agencies took to respond to and contain them. The Council encourages FBIIC to continue working closely with federal and state agencies, DHS, law enforcement, and industry partners to conduct regular cybersecurity exercises that take into account interdependencies with other non-financial sectors. The Council recommends that member agencies carefully consider how to share information among themselves, including confidential supervisory information and classified information to the extent legally permissible.

The Council supports the domestic efforts of the FBIIC Technology Working Group, which examines how financial institutions are using emerging technologies such as AI that may introduce new cyber vulnerabilities into critical financial services infrastructure. The Council also supports the G7 Cyber Expert Group's international efforts to help financial institutions better understand cybersecurity risks and improve the cyber resilience of the financial system through preparedness, a consensus understanding of the threat landscape, and a shared approach to mitigating risk.

Box F: Speed of Financial Transactions and Information Transmission

Technological advances have long fueled innovation and evolution in financial markets.[226] In 2023, there have been several technological developments related to the speed of financial transactions and information transmission that offer the promise of significant benefits to the financial system, households, and businesses. As the SEC's rulemaking to shorten the standard securities transaction settlement cycle indicates, speed can reduce risk in the financial system and increase economic efficiency. Peer-to-peer payment services provide consumers with convenient digital services, and the availability of instant retail payments offers an opportunity for financial institutions to provide new and more convenient services to their customers. However, to help ensure the full realization of these benefits, financial market participants and regulators must assess and mitigate the potential risks of a transition to increasing speed of transactions and information transmission. In the case of faster securities settlement, coordination among financial market participants across a variety of functions will be critical to a successful transition. The move to faster payments via growing use of peer-to-peer payment services may drive a need for increased risk management related to fraud detection and consumer protection. Widespread social media use increases the speed of information transmission and, as evidenced by this Spring's banking system turmoil (see **Section 3.2.1: Banking System**), may increase the potential for contagion across institutions or markets and thus may require new dimensions of risk monitoring and liquidity assumptions.

The Transition to T+1 Securities Settlement

The SEC recently adopted rule changes to shorten the standard settlement cycle for most broker-dealer transactions from two business days after trade date (T+2) to one (T+1).[227] The T+1 standard settlement date is scheduled to take effect on May 28, 2024. To give an indication of the size of the markets that may be affected by the rule, Depository Trust & Clearing Corporation (DTCC) entities processed approximately $2.5 quadrillion of securities in 2022, including $2.1 trillion cleared daily by National Securities Clearing Corporation (NSCC) in broker-to-broker transactions for over 50 exchanges and trading venues. [228] The NSCC plays a prominent role in providing clearance, settlement, and central clearing (CCP) services for nearly all broker-to-broker equity and corporate and municipal debt trades and other equity trading venues. Shortening the standard settlement cycle can promote investor protection, reduce risk, and increase operational and capital efficiency.

First, shortening the standard settlement cycle to T+1 will result in a reduction in the number and total value of unsettled trades that exist at any point in time. Assuming that trading volume remains constant, shortening the standard settlement cycle to T+1 should also decrease the total market value of all unsettled trades in the U.S. clearance and settlement system. For example, holding average dollar volumes constant, the aggregate notional value of unsettled transactions is estimated to fall from nearly $88 billion to approximately $44 billion at the NSCC. This reduction in the number and total value of unsettled securities transactions should result in a reduction in market participants' overall exposure to market risk that arises from such transactions.

Second, shortening the standard settlement cycle to T+1 should reduce a CCP's exposure to credit, market, and liquidity risk arising from its obligations to its participants, promoting the stability of the CCP and thereby reducing the potential for systemic risk to transmit through the financial system. Reducing these risks to the CCP should enable the CCP to reduce the overall size of the financial resources that it requires of its participants. This should lower costs to the CCP's participants and potentially to their customers as well. Also, in periods of market stress, liquidity demands imposed by the CCP on its participants, such as in the form of intraday margin calls, can produce procyclical effects that reduce overall

Box F: Speed of Financial Transactions and Information Transmission (continued)

market liquidity. Reducing the CCP's liquidity exposure by shortening the settlement cycle can help limit this potential for procyclicality, enhancing the ability of the CCP to serve as a source of stability and efficiency in the national clearance and settlement system.

The lessons learned highlighted in **Box E: Successful Implementation of Alternative Reference Rates** could prove instructive in underscoring the importance of preparation, industry coordination, contingency planning, and implications for institutional risk management.

To prepare for the transition to T+1, market participants will need to adjust their operations and business practices to ensure timely settlement in a T+1 environment. Issuers, asset managers, broker-dealers, global custodians, vendors, service bureaus, transfer agents, exchanges, clearing firms, buy-side firms, and depositories are among the market participants who will be impacted by the transition.[229] Market participants may need to adjust their business practices to address potential mismatches between the T+1 settlement cycle for U.S. securities transactions and settlement cycles in different markets, such as the standard T+2 settlement cycle for foreign exchange transactions. Some market participants have already taken significant steps toward identifying the industry requirements and timelines for moving to a T+1 settlement cycle and have made substantial progress in terms of planning such a move. SEC staff and other U.S. authorities are conducting monitoring and oversight to ensure a successful transition in May 2024.

Peer-to-Peer Payments Services

Recent trends in payments and deposits pose new risks and opportunities for consumers. As the desire for the speed and convenience of sending payments digitally has grown, so too has consumers' adoption of online payment methods. Consumers utilize peer-to-peer (P2P) payments services for a variety of purposes, such as sending gifts, splitting a restaurant check, or paying rent. Total P2P dollar volume, across banks and nonbanks, quadrupled between 2018 and 2022.[230] Last year, transaction volume among all service providers was estimated at approximately $893 billion, and is forecasted to reach nearly $1.6 trillion by 2027.[231] Over three-quarters of U.S. adults have used at least one type of payment app.[232] Younger consumers' adoption of these services is especially prevalent.[233]

Nonbank payment companies are heavily reliant on banks and can thus be exposed to heightened risk from individual bank failures or broader banking industry stress. Nonbank P2P platforms do not have direct access to the payments system, so they partner with banks to settle transactions on behalf of customers using their apps to transfer funds. Nonbank payment companies must also maintain permissible investments that meet or exceed the aggregate amount of all their outstanding money transmission obligations for regulatory purposes, and funds deposited at a bank are considered permissible investments.[234] A nonbank payment company may have sizeable deposit balances, as a reserve, operating account, or other type of account, to cover these obligations. However, all the nonbank company's corporate deposits at a bank are subject to the deposit insurance limit of $250,000 in aggregate, putting a substantial portion of the company's deposits at risk if its bank were to fail.

Innovations in Interbank Retail Payment Systems

On July 20, 2023, the Federal Reserve implemented the FedNow® Service, a new interbank payment system to support smaller-value (commonly referred to as "retail") instant payments. Instant payments are those that are conducted in real time, any time of the day, any day of the week, with immediate funds availability for receivers. A similar service, RTP®, operated by The Clearing House, was implemented in 2017. The FedNow Service and the RTP network augment other innovations in legacy retail payment systems that have been implemented in recent years to speed up retail payment transactions, including the implementation of same-day settlement of automated clearing house payments.

The FedNow Service and the RTP network are examples of the global wave of new instant-payment systems that support the growing demand for fast and convenient transaction capabilities needed in today's digital economies. Using this infrastructure, which may be gradually adopted by banks and credit unions of all sizes across the country in the coming years, financial institutions will be able to provide new services for instant payments to their consumer and businesses customers. Compared with some other countries, instant-payment systems in the United States are nascent, and it will likely take several years for the over 9,000 financial institutions in this country to implement new instant-payments infrastructure.

The Speed of the Spring 2023 Bank Runs

The bank runs in March 2023 were the fastest in recent history.[235] The 1984 failure of Continental Illinois and the 2008 failures of Washington Mutual and Wachovia took place over 7–15 business days. These failures involved deposit outflows of 30 percent of deposits from Continental Illinois, 10 percent from Washington Mutual, and 4 percent from Wachovia. In contrast, Silicon Valley Bank and Signature Bank failed with outflows of 20 percent within 1 day; and First Republic Bank lost nearly 60 percent of its deposits in 5–7 business days. [236] Regulatory reviews have noted the role of advances in digital banking technology and the transmission of information through social media as factors affecting the speed of these bank runs.[237] While the failure of these institutions was fundamentally the result of inadequate risk management, the speed of the deposit outflows exacerbated concerns related to contagion to other regional banks. This experience highlights the importance of understanding the potential impact of technological advances in assessing and mitigating classic risks, such as a bank run.

3.3.3 The Use of Artificial Intelligence in Financial Services

Artificial intelligence (AI) is a set of technologies that has been around for decades. However, its use in financial services has increased in recent years, thanks to more advanced algorithms, increased volumes of data, data storage and processing power improvements, and cost reductions among many of these dimensions. AI has the potential to increase efficiency and innovation, but it also introduces certain risks. Monitoring these rapidly emerging technologies will continue to be increasingly important, given the potential risks and benefits of their use in the financial services system.

There are a variety of definitions of AI, which generally entail machines doing things previously thought to require human intelligence.[238] For example, one type of AI is machine learning, which focuses on the ability of computers to learn from provided data without being explicitly programmed how to solve for a particular task. Given this broad definition of AI, it is not surprising that there is significant variety in AI methodologies and uses and that there is not always a stark difference between AI and more traditional quantitative modeling. For instance, some regression analysis techniques that have been used for decades could arguably be considered a form of AI.

AI offers potential benefits, such as reducing costs and improving efficiencies, identifying more complex relationships, and improving performance and accuracy. Financial institutions currently use AI for various tasks, including fraud prevention and detection, customer service, document review, and retail credit underwriting. Some institutions use AI extensively, while others take a more limited approach. Even within a single institution, AI may be used to varying degrees in different areas.

The use of AI, however, can introduce certain risks, including safety-and-soundness risks like cyber and model risks. Other potential risks include consumer compliance risks, which can be exacerbated by certain characteristics of many AI approaches, such as difficulty in explaining the model or understanding how it functions. Some AI approaches operate as "black boxes," which can create challenges in explaining how the technology produces its output. This lack of "explainability" can make it difficult to assess the systems' conceptual soundness, increasing uncertainty about their suitability and reliability. A particular concern is the possibility that AI systems with explainability challenges could produce and possibly mask biased or inaccurate results. This could affect, but not be limited to, consumer protection considerations such as fair lending. While there are a variety of techniques to address explainability challenges, they have their own strengths and weaknesses. It is the responsibility of financial institutions using AI to address the challenges related to explainability and monitor the quality and applicability of AI's output, and regulators can help to ensure that they do so. In addition, specific requirements to prevent discrimination or bias that apply to tools, models, or processes used in consumer compliance also apply to AI. This is an important consideration because without proper design, testing, and controls, AI can lead to disparate outcomes, which may cause direct consumer harm and/or raise consumer compliance risks. Errors and biases can become even more difficult to identify and correct as AI approaches increase in complexity, underscoring the need for vigilance by developers of the technology, the financial sector firms using it, and the regulators overseeing such firms.

When using AI, the underlying data can impact results in different ways than when using more traditional quantitative methods. This is because of the high volume of data typically involved when using AI and because data often play a more significant role in driving the model specification. Determining which variables are to be included and how they are included in traditional quantitative modeling is typically determined by a human prior to data analysis. Data used for AI may come from a wider variety of sources and may be less structured, such as a collection of documents instead of a formal dataset. With AI, data may also have to be processed at higher frequencies. Thus, data controls like data quality, suitability, security, privacy, and timeliness are vital to sound AI use. Additionally, given AI's designed ability to identify complex relationships, some AI models can be overfit, which means they may adhere too closely to the data on which they were trained and may not apply well or generalize to new conditions.

Controls on the use of internal and external data are important when using data for any type of quantitative modeling, but they can be of particular concern when it comes to using AI. For models that are internally built and run, it is important to establish controls on the provenance of and legal permission to use the data used to train the model. When receiving data from or sharing data with external parties, data controls[239] are critical to protecting sensitive customer or business data provided to seed[240] models established and run by a third-party.

Generative AI, which has captured broad attention in 2023 within the financial services sector, is a machine learning model that is trained on large data sets and is capable of rendering human-like text, software code, images, sound, video, and other media. These models identify patterns in large datasets and use those patterns to generate new content. An example is generative language models that produce narratives in response to queries. Generative AI is a rapidly emerging AI that can introduce opportunities as well as risks for financial sector firms, particularly in data security, consumer protection, and other areas of regulatory compliance.

There can also be complicating factors related to the use of generative AI. For example, generative AI can produce output that is erroneous or flawed but that is still in the form of a convincing narrative or presentation. Given the possibility that such "hallucinations" may appear in output that is nuanced, assessing the performance of output may not be straightforward and may require an expert to properly evaluate the output's accuracy. Also, certain generative AI may not produce consistent responses over time, even when posed the same or similar prompts. With some generative AI models, users may not know the sources used to produce output or how such sources were weighted, and a financial institution may not have full understanding of or control over the dataset being used, meaning that employing proper data governance may not be possible.

In January 2023, the National Institute of Standards and Technology (NIST) released the AI Risk Management Framework (AI RMF 1.0). In collaboration with the private and public sectors, NIST developed the framework to better manage AI-associated risks to individuals, organizations, and society. The framework is intended for voluntary use and to improve the ability to incorporate trustworthiness considerations into the design, development, use, and evaluation of AI products, services, and systems. In March, NIST launched the Trustworthy and Responsible AI Resource Center, which will facilitate implementation of and international alignment with the AI RMF 1.0.

Existing requirements and guidance also apply to AI, despite the rapid development and evolution of the technology. These include general risk management requirements that would apply to any technology used by financial institutions, plus domain-specific use cases like fair lending that already have established rules to which AI (and any other approach used) must conform. Additionally, President Biden issued an Executive Order[241] on October 30 that established new standards to enhance the safe, secure, and trustworthy development of AI in various aspects of society. Monitoring the rapid developments in AI, including generative AI, will be essential to helping ensure that oversight structures keep up with or stay ahead of risks posed by AI adoption, while facilitating efficiency and responsible innovation that promotes benefits and minimizes risks.

Recommendations

Financial institutions have rapidly adopted innovative technologies in recent years, and the use of AI in financial services has increased. The Council recommends monitoring the rapid developments in AI, including generative AI, to ensure that oversight structures keep up with or stay ahead of emerging risks to the financial system while facilitating efficiency and innovation. To support this effort, the Council recommends financial institutions, market participants, and regulatory and supervisory authorities further build expertise and capacity to monitor AI innovation and usage and identify emerging risks. The Council notes existing requirements and guidance may apply to AI. These include general risk management requirements that would apply to any technology used by financial institutions and to domain-specific use cases like fair lending that already have established rules to which AI must conform. The Council also supports the G7 Cyber Expert Group's international efforts to coordinate cybersecurity policy and strategy across the eight G7 jurisdictions and address how emerging technologies, such as AI and quantum computing, affect the global financial system.

Box G: Quantum Computing

The stable functioning of a financial institution heavily depends on the confidentiality, integrity, and availability of the institution's internal information and the information the institution receives from its counterparties. Firms' operational systems employ cybersecurity protocols to securely transmit, store, and process sensitive data. For the most part, such protocols rely on public-key cryptographic schemes based on mathematical problems that are believed to be impossible to solve in a reasonable period of time by current conventional computers. Such protocols secure data against adversaries with limited conventional computer power. However, computers constructed based on quantum mechanics, so-called quantum computers, could potentially solve these mathematical problems significantly faster and thus pose a critical threat to current encryption mechanisms and underlying data.

Unlike conventional computer systems that store and process information in the form of a standard bit[242] that corresponds to binary information, quantum computers consist of quantum bits, or qubits, as basic units of quantum information. There are several proposed technologies for the physical realization of qubits. However, the main challenge has proven to be the ability to assemble many qubits that can preserve their quantum mechanics properties while reliably processing information. In addition to its ability to break public-key cryptography, an ideal quantum computer is theoretically capable of significantly higher performance on well-known optimization and search problem algorithms, when compared with conventional computers. Such advancement in computational complexity and computing power has the potential to transform some of the financial sector's major functions, including high-frequency trading, risk analysis, stress testing, portfolio optimization, fraud prevention, and derivative pricing.

Recently, there has been a surge in both public and private investment in quantum technology.[243] China leads public investment with $15.3 billion, followed by the European Union, which plans to spend $7.2 billion. On the private-investment side of quantum technology, the United States leads the way, followed by the United Kingdom. According to a 2022 global survey of the adoption rate of quantum computing by firms, 74 percent of Fortune 500 companies have begun adopting quantum computing or have plans to do so within one year.[244] More than 70 percent of these firms have quantum computing budgets exceeding $1 million per year. According to the National Institute of Standards and Technology (NIST), developing a functioning quantum computer or hybrid computer is no longer considered a long-term feat, as a computer capable of cracking public-key cryptography can be developed within 10 years.[245] While it takes time for firms to inventory assets and assess which could be the most vulnerable to threats posed by quantum computing, firms need to be able to handle impending threats as soon as possible, and they should be immediately concerned with data exfiltration. In addition, there are at least three factors that make this a vulnerability worth addressing for some firms today:

1. The number of years that information should remain protected.
2. The number of years required to effectively migrate all systems to a quantum-safe cryptography scheme.
3. The potential for cyberattackers to steal encrypted data and decrypt them later with quantum computing.

Not only are financial institutions required to protect their customers' personally identifiable information for substantial periods of time, efforts to effectively migrate legacy systems are also time consuming. There is also concern that cyberattackers will steal conventionally encrypted data today in hopes of decrypting them with quantum computing in the future. Given the previously referenced concerns about integrity of and confidence in critical data to maintain financial firms' credibility, and recognizing that protecting critical data may involve more than complying with requirements to protect personally identifiable information, the scope of legacy systems to be addressed may expand significantly. Such an undertaking would require the development and deployment of hardware and software solutions and the establishment of broadly accepted standards.

Since 2016, NIST has been leading the effort to establish quantum-safe cryptography standards through its Post-Quantum Cryptography Standardization project. In an important step in advancing this effort, the Cybersecurity and Infrastructure Security Agency (CISA), National Security Agency (NSA), and NIST released a fact sheet for quantum-safe algorithms[246] in August 2023 and announced plans for NIST to publish the first set of post-quantum cryptographic standards in 2024. Firms are encouraged to follow NIST developments and can take the following steps for a more efficient migration to these standards and to ensure orderly and robust risk management as quantum computing evolves:

1. Make an inventory of their and their service providers' critical data and internal and external data movements, including the timeline over which information should be protected.
2. Identify and make an inventory of all internal and external standards and cryptographic technologies incorporated into their and their service providers' algorithms, systems, and tools, especially instances of public-key algorithm use in their network.
3. Prioritize internal systems and external services for replacement.
4. Develop a strategic plan for migration.

3.3.4 Third-Party Service Providers

Third-party service providers continue to play a large role in the financial services sector. Financial institutions engage with third parties to provide a range of different services under different types of arrangements. More recently, some financial institutions have entered into third-party relationships with some financial technology (fintech) companies, under increasingly complex structures and features in which the third-party fintech facilitates the provision or distribution of the financial product or service to the end customer.

The use of third parties can offer financial institutions "significant benefits, such as access to new technologies, human capital, delivery channels, products, services, and markets. However, the use of third parties can reduce a financial institution's direct control over activities and may introduce new risks or increase existing risks, such as operational, compliance, and strategic risks," including potential financial stability risk.[247] The Council has identified the financial services sector's reliance on third-party service providers, such as cloud service providers (CSPs), as a potential risk to financial stability because of the significant role these entities serve in the financial sector.

Cloud Service Providers

Financial institutions rely on third-party service providers for, among other things, videoconferencing, collaboration software, core banking platforms, and data storage. Increasingly, many of these services are deployed through cloud solutions. As a result, the Council has identified this reliance on CSPs as a potential risk to financial stability.

According to the most current information from the 2023 Cloud Security Alliance's *State of Financial Services in Cloud* report, 98 percent of financial services sector organizations use some form of cloud computing. That represents a 7–percentage point increase from 2020.[248] Additionally, 59 percent of these organizations store or process regulated banking information within cloud platforms.[249]

As cloud adoption and use are on the rise, there are a variety of cloud security risks posed by these activities. Misconfigurations, for example, are some of the most common causes of security breaches in the cloud. In 2019, Gartner estimated that up to 95 percent of cloud breaches occurred due to human errors such as configuration mistakes.[250] Misconfigurations of cloud systems can lead to insufficient access control measures, improper or inadequate system backup processes, and incorrect or inadequate storage and security of data. Misconfigurations can also be exploited by malicious actors to negatively affect the confidentiality, integrity, or availability of the services used by some or all customers of the CSP. Cloud computing supports an increasing amount of the financial services sector's most critical financial institutions and functions. To address this maturation, Treasury published a white paper on the Financial Services Sector's Adoption of Cloud Services[251] that identified and sought to consider areas for collaboration on cloud services implementation among the financial services sector, regulators, and CSPs. The six thematic challenges identified in the report were as follows:

1. Insufficient transparency to support due diligence and monitoring by financial institutions.
2. Gaps in human capital and tools to securely deploy cloud services.
3. Exposure to potential operational incidents, including those originating at a CSP.
4. Potential impact of market concentration in cloud service offerings on the financial sector's resilience.
5. Dynamics in contract negotiations, given market concentration.
6. International landscape and regulatory fragmentation.

Shortly after the release of the report and in light of the aforementioned challenges, Treasury launched a Cloud Executive Steering Group (CESG) that reports to the Council. The CESG established eight workstreams for public/private partnership. Each workstream is tied to specific gaps identified in the report; for example, one workstream seeks to define what the financial services sector views as cloud concentration risk. By bringing CSPs into the fold with private sector institutions and regulators, stakeholders are collectively working toward a new balance in the shared-risk model, one that places less pressure on cloud customers and asks CSPs to take more responsibility for the security of those customers.

Complex Fintech Partnerships

Some financial institutions are entering into third-party relationships with financial technology firms (fintechs), where the fintech may interact directly with the end customer and serve as the distribution channel in the provision of the financial product or service to the end customer. In such relationships, the financial institution and the fintech may have varying degrees of interaction with the end customers. For example, the financial institution may provide the financial product or service through the fintech, without directly interacting with the end customers. Financial institutions participating in such relationships could potentially face a number of risks, including compliance, financial, operational, and reputational risks. Such arrangements could potentially scale rapidly, potentially posing risks to the stability of the financial system.

Many fintech service providers are not subject to the same compliance requirements as financial institutions, such as requirements related to consumer protection and anti-money laundering. These fintechs therefore may lack the mature compliance systems to help ensure that financial institutions meet their own obligations relative to the financial products or services they provide and the end customer. Financial institutions could potentially be responsible for compliance failures that take place at the fintech, and depending on their visibility into the third party's systems, financial institutions may have limited ability to manage that risk. Similarly, if the fintech does not have strong operational risk management controls but does have access to the financial institution's infrastructure, vulnerabilities at the fintech, such as to cyberattacks, could affect the financial institution or its customers. Certain types of third-party relationships can also lead to increased financial risk, such as potential liquidity risk. For example, in certain complex bank-fintech relationships, in which the fintech distributes the financial services to the end customers, the relationship could serve as a significant source of funding to the financial institution. In such relationships, an unexpected decision by the fintech to transfer deposits to another institution could pose heightened liquidity risk to the financial institution.

Supply Chain

The past year has also continued to highlight the importance of reviewing the resilience of the financial sector's supply chain. As financial institutions continue to expand their reliance on third-party providers, they will remain attractive targets that could allow a threat actor to gain administrative access to the banking system. Financial firms are becoming increasingly attuned to the notion that their supply chains and trusted vendors can introduce vulnerabilities into their networks. In May 2023, CL0P ransomware group exploited a vulnerability in Progress Software's managed file transfer software MOVEit. Progress Software disclosed the attack in June,[252] and in the following months, over 1,000 organizations around the world (including financial institutions) that had used the software were compromised.[253,254] The impact was significant due to the supply chain vulnerabilities that propagated to other organizations. In some cases, third-party vendors who used MOVEit were affected, which resulted in the data and networks of the organizations they served being compromised.[255] In November 2023, the Cybersecurity and Infrastructure Security Agency (CISA), National Security Agency (NSA), and partners released new guidance on the security of the software supply chain.[256] The sector should remain vigilant, thoroughly vet its supply chain, and be ready to respond immediately to new threats.

Recommendations

The Council supports the ongoing collaboration of member agencies to examine and address the risks posed by third-party service providers and the services they provide to the financial system. Member agencies continue to enhance their supervisory programs for cyber-related controls in key areas such as core processing, payment services, and cloud computing.

The Council supports continued risk identification associated with service providers' roles in the financial sector and their potential impacts on financial stability. The Council also recommends that federal banking regulators continue to coordinate third-party service provider examinations, work collaboratively with states, and identify additional ways to support information sharing among state and federal regulators.

Toward that end, the Council also supports the ongoing work of the CESG, and its focus on closing gaps identified in Treasury's February 2023 white paper entitled *The Financial Services Sector's Adoption of Cloud Services*. This work aims to increase the security and transparency of the services and security that the CSPs and third-party vendors are providing to financial sector firms.

The authority to supervise third-party service providers varies among financial regulators. To further enhance third-party service provider information security and address other critical regulatory challenges, the Council recommends that Congress pass legislation that ensures that the FHFA, NCUA, and other relevant agencies have adequate examination and enforcement powers to oversee third-party service providers that interact with their regulated entities.

Box H: ION Case Study

ION Group (ION) is an Ireland-based, privately held global financial software and data firm. ION's product offerings include software used by many futures commission merchants (FCMs) to process cleared derivatives transactions. Its XTP and XTP Clearing software modules (XTP) give FCMs a front-to-back trade processing capability, which includes trade execution, trade matching, trade allocation, trade settlement and clearing, and margin calculation, plus exchange, regulatory, and customer reporting.

On the evening of January 30, 2023, ION became a victim of a LockBit ransomware attack that affected XTP. The next morning, FCMs that were customers of ION and relied upon XTP services were unable to use those services to process cleared derivatives transactions. Most of ION's services were not restored until February 19, 2023. In those intervening three weeks, CFTC staff had daily calls with FCMs, CCPs, exchanges, and ION to monitor ION's mitigation efforts and the varying levels of difficulty related to trade processing experienced by affected FCMs.

In the early hours of the attack, ION hired two vendors to collect, surveil, and diagnose information needed to identify malicious code and to determine if data had been exfiltrated. ION and the vendors concluded that no data had been exfiltrated.

Of the approximately 60 FCMs registered with the CFTC, 16 FCMs used XTP, although the severity of the impact varied across affected FCMs. Without XTP, the FCMs had to manage the following challenges:

1. Trade feeds from exchanges were no longer being received.
2. Trade matching, allocation, settlement, and clearing had to be done manually.
3. Position management, risk management, and margin calculations had to be done manually.
4. Exchange, CCP, regulatory, and customer reporting had to be provided manually.

The CFTC's weekly Commitments of Traders report, which is closely watched by market participants, was also delayed because the disruption affected some clearing members' ability to provide the CFTC with timely and accurate trade data.

As a result of required FCM disaster recovery procedures and planning, effective manual workarounds, and assistance by CCPs (which do not use XTP) in helping FCMs in front-to-back processing, FCMs and market participants met margin obligations in a timely and compliant manner. Although many disruptions occurred during the three weeks following the attack, no defaults occurred.

Following this incident, many CCPs, FCMs, and market participants in the cleared derivatives market space initiated cybersecurity and disaster recovery reviews of their internal and vendor systems and related policies and protocols.

4 Council Activities and Regulatory Developments

4.1 Council Activities

4.1.1 Risk Monitoring and Regulatory Coordination

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

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

Climate-Related Financial Risk

The Council recognizes the critical importance of continuing to assess climate-related risks to the financial system and promote the resilience of the financial system to those risks. In October 2021, the Council published a *Report on Climate-Related Financial Risk*, which recommended the formation of two committees: (1) a staff-level Climate-related Financial Risk Committee (CFRC) and (2) an external Climate-related Financial Risk Advisory Committee (CFRAC).

The CFRC, which began meeting regularly in February 2022, serves as an active forum for interagency information sharing, coordination, and capacity building. In July 2023, the CFRC issued a staff progress report to provide an update on efforts by the Council and member agencies to advance the recommendations in the 2021 climate report. Among its other efforts, the CFRC is developing a robust framework to identify and assess climate-related financial risk, and it is also identifying a preliminary set of risk indicators for banking, insurance, and financial markets. In addition, the CFRC has identified the intersection of physical risk, real estate, and insurance as a particular priority for future analysis.

The CFRAC, which was established by the Council in October 2022, provides the Council with information on and analysis of climate-related financial risks from a broad array of perspectives. The CFRAC's members include stakeholders from a wide range of backgrounds, including the financial services industry, nongovernmental research institutions, climate-related data-and-analytics providers, nonprofit organizations, and academia. Committee members with expertise in climate data and analysis support the Council and its member agencies in their efforts to translate climate-related risks into economic and financial impacts. The CFRAC hosted its first three meetings in 2023.

Nonbank Financial Intermediation

The Council continues to evaluate the vulnerabilities posed by nonbank financial institutions (NBFIs). The Council's Hedge Fund Working Group has developed a risk-monitoring system to assess hedge fund–related risks to U.S. financial stability. In addition, the Council's Nonbank Mortgage Servicing Task Force, a working group including staff from member agencies and other government agencies such as the Department of Housing and Urban Development, is facilitating interagency coordination and additional market monitoring of the risks that nonbank mortgage servicers pose to U.S. financial stability.

Digital Assets

As part of its responsibility to identify emerging risks to U.S. financial stability, the Council has monitored and discussed developments in the evolving crypto-asset ecosystem. In October 2022, the Council published its *Report on Digital Asset Financial Stability Risks and Regulation*, which identified specific financial stability risks and regulatory gaps posed by various types of crypto-assets and provided recommendations to address these risks. The Council's Digital Assets Working Group facilitates information sharing and analysis related to crypto-asset risks and market developments.

4.1.2 Determinations Regarding Nonbank Financial Companies

One of the Council's statutory authorities is to determine that a nonbank financial company will be subject to enhanced prudential standards and supervision by the Federal Reserve if material financial distress at the company, or if the nature, scope, size, scale, concentration, interconnectedness, or mix of activities of the company, could pose a threat to U.S. financial stability. The Dodd-Frank Act sets forth the standard for the Council's determinations regarding nonbank financial companies, and it requires the Council to consider 10 specific considerations and any other risk-related factors that the Council deems appropriate when evaluating those companies.

On April 21, 2023, the Council issued for public comment a new proposed analytical framework for financial stability risks and proposed updated interpretative guidance on the Council's procedures for designating nonbank financial companies for Federal Reserve supervision and enhanced prudential standards.

In November 2023, the Council finalized these two documents, which improve the Council's ability to address risks to financial stability and to provide greater public transparency. The Council's new Analytic Framework for Financial Stability Risk Identification, Assessment, and Response (Analytic Framework), approved by the Council on November 3, 2023, offers a detailed public explanation of how the Council monitors, assesses, and responds to potential risks to financial stability, whether they come from widely conducted activities or from individual firms. The Analytic Framework represents the first time that the Council has detailed the vulnerabilities and transmission channels that most commonly contribute to risks to financial stability irrespective of the source of the risks, and it explains the range of authorities the Council may use to address any particular risk, including interagency coordination, recommendations to regulators, or the designation of certain entities. The updated Guidance on Nonbank Financial Company Determinations (Nonbank Designations Guidance), also approved by the Council on November 3, sets forth the Council's procedures for considering whether to designate a nonbank financial company for Federal Reserve supervision and prudential standards under section 113 of the Dodd-Frank Act. The Nonbank Designations Guidance provides a transparent process and significant opportunities for engagement with both a nonbank financial company under review and its existing regulators.

4.1.3 Operations of the Council

The Dodd-Frank Act requires the Council to convene no less frequently than quarterly. The Council held nine meetings in 2023, including at least two each quarter. The meetings bring Council members together to discuss and analyze market developments, potential threats to financial stability, and financial-regulatory issues. Although the Council's work frequently involves confidential supervisory and sensitive information, the Council is committed to conducting its business as openly and transparently as practicable. Consistent with the Council's transparency policy, the Council opens its meetings to the public whenever possible. The Council held a public session at four of its meetings in 2023. Approximately every two weeks, the Council's Deputies Committee, composed of senior representatives of Council members, convenes to discuss the Council's agenda and to coordinate and oversee the work of the Council's six other staff-level committees: (1) the Systemic Risk Committee; (2) the Financial Market Utilities and Payment, Clearing, and Settlement Activities Committee; (3) the Nonbank Financial Companies Designations Committee; (4) the Regulation and Resolution Committee; (5) the Climate-related Financial Risk Committee; and (6) the Data Committee. As noted in **Section 4.1.1: Risk Monitoring and Regulatory Coordination**, the Council also established its first advisory committee, the Climate-related Financial Risk Advisory Committee, in 2022. The Council adopted its FY 2024 budget in September 2023.

4.2 Safety and Soundness

4.2.1 Enhanced Capital and Prudential Standards and Supervision

On January 26, 2023, the Federal Reserve issued a final rule to implement the Adjustable Interest Rate (LIBOR) Act. The final rule establishes benchmark replacements for contracts governed by U.S. law that reference certain tenors of U.S. dollar LIBOR, the overnight and 1-, 3-, 6-, and 12-month tenors, and that do not have terms that provide for the use of a clearly defined and practicable replacement benchmark rate following the first London banking day after June 30, 2023. The final rule also provides additional definitions and clarifications consistent with the LIBOR Act.

On June 9, 2023, the Federal Reserve, FDIC, and OCC issued final guidance on managing risks associated with third-party relationships. The final guidance offers the agencies' views on sound risk management principles for banking organizations when developing and implementing risk management practices for all stages of the life cycle of third-party relationships. The final guidance states that sound third-party risk management takes into account the level of risk, complexity, and size of the banking organization and the nature of the third-party relationship. The agencies issued this joint guidance to promote consistency in supervisory approaches. It replaces each agency's existing general guidance on this topic and is directed to all banking organizations supervised by the agencies.

On July 28, 2023, the Federal Reserve, FDIC, OCC, and NCUA updated their existing guidance on liquidity risks and contingency planning. The updated guidance highlights that depository institutions should regularly evaluate and update their contingency funding plans. The updated guidance encourages depository institutions to incorporate the discount window as part of their contingency funding plans. Consistent with other contingency funding sources, the guidance reinforces the supervisory expectation that if the discount window is part of a depository institution's contingency funding plans, the depository institution should establish and maintain operational readiness to use the discount window, which includes conducting periodic transactions.

On September 18, 2023, the Federal Reserve, OCC, and FDIC issued a notice of proposed rulemaking that would substantially revise the capital requirements applicable to large banking organizations (those with over $100 billion in total consolidated assets) and banking organizations with significant trading activity. The revisions set forth in the proposal would improve the calculation of risk-based capital requirements to better reflect the risks of these banking organizations' exposures, reduce the complexity of the framework, enhance the consistency of requirements among these banking organizations, and facilitate more effective supervisory and market assessments of capital adequacy. The revisions would include replacing current requirements, which include the use of banking organizations' internal models for credit risk and operational risk, with standardized approaches. The revisions would also include replacing the current market risk and credit valuation adjustment risk requirements with revised approaches. The proposed revisions would be generally consistent with recent changes to international capital standards issued by the Basel Committee on Banking Supervision. The proposal would not amend the capital requirements applicable to smaller, less-complex banking organizations.

On September 19, 2023, the Federal Reserve, OCC, and FDIC issued a notice of proposed rulemaking that would require certain large depository institution holding companies, U.S. intermediate holding companies of foreign banking organizations, and certain insured depository institutions (IDIs) to issue and maintain outstanding a minimum amount of long-term debt. The proposed rule would improve the resolvability of such banking organizations in case of failure, and it could also reduce costs to the Deposit Insurance Fund and mitigate financial stability and contagion risks by reducing the risk of loss to uninsured depositors.

On October 11, 2023, the FDIC issued a notice of proposed rulemaking seeking comment on proposed corporate governance and risk management guidelines that would apply to all insured state nonmember banks, state-licensed insured branches of foreign banks, and insured state savings associations that are subject to Section 39 of the Federal Deposit Insurance Act, with total consolidated assets of $10 billion or more on or after the effective date of the final guidelines.

On October 24, 2023, the Federal Reserve, OCC, and FDIC jointly issued principles that provide a high-level framework for the safe and sound management of exposures to climate-related financial risks. Although all financial institutions, regardless of size, may have material exposures to climate-related financial risks, the principles are intended for the largest financial institutions, those with over $100 billion in total consolidated assets. The principles are intended to support efforts by large financial institutions to focus on key aspects of climate-related financial risk management.

On October 24, 2023, the Federal Reserve, OCC, and FDIC adopted final amendments to their regulations implementing the Community Reinvestment Act of 1977 (CRA) to update how CRA activities qualify for consideration, where CRA activities are considered, and how CRA activities are evaluated.

On November 16, 2023, the FDIC approved a final rule to implement a special assessment to recover the loss to the Deposit Insurance Fund arising from the protection of uninsured depositors, as required by the Federal Deposit Insurance Act, in connection with the systemic risk determination announced on March 12, 2023, following the closures of Silicon Valley Bank (SVB) and Signature Bank. The assessment base for the special assessment is equal to an IDI's estimated uninsured deposits, reported for the quarter that ended December 31, 2022, adjusted to exclude the first $5 billion in estimated uninsured deposits from the IDI, or for IDIs that are part of a holding company with one or more subsidiary IDIs, at the banking organization level. The FDIC will collect the special assessment at a quarterly rate of 3.36 basis points, over eight quarterly assessment periods, which it estimates will result in total revenue of $16.3 billion, the estimated losses attributable to the protection of uninsured depositors at the two failed banks. Because the estimated loss pursuant to the systemic risk determination will be periodically adjusted, and because assessments collected may change due to corrective amendments to the amount of uninsured deposits reported for the December 31, 2022 reporting period, the FDIC retains the ability to cease collection early, extend the special assessment collection period one or more quarters beyond the initial eight-quarter collection period to collect the difference between actual or estimated losses and the amounts collected, and impose a final shortfall special assessment to collect the difference between actual losses and the amounts collected on a one-time basis after the receiverships for SVB and Signature Bank terminate. The final rule will become effective on April 1, 2024, with the first collection for the special assessment reflected on the invoice for the first quarterly assessment period of 2024 (i.e., January 1 through March 31, 2024), with a payment date of June 28, 2024.

4.2.2 Dodd-Frank Act Stress Tests

On June 28, 2023, the Federal Reserve released the results of its annual bank stress test, which demonstrate that large banks are well positioned to weather even a severe recession and continue to lend to households and businesses. The Federal Reserve's stress test is one tool to help ensure that large banks can support the economy during economic downturns. The test evaluates the resilience of large banks by estimating their capital levels, losses, revenues, and expenses under a single hypothetical recession and financial market shock, using banks' data as of the end of last year. All 23 banks tested remained above their minimum capital requirements during the hypothetical recession, despite total projected losses of $540 billion. Under stress, the aggregate common equity risk-based capital ratio, which provides a cushion against losses, is projected to decline by 2.5 percentage points to a minimum of 9.9 percent.

4.2.3 Resolution Planning and Orderly Liquidation

On September 19, 2023, the FDIC issued a notice of proposed rulemaking to revise its current rule that requires the submission of resolution plans by IDIs with $50 billion or more in total assets. The proposal would modify the current rule by revising the requirements pertaining to the content and timing of resolution submissions, as well as interim supplements to those submissions, provided to the FDIC by IDIs with $50 billion or more in total assets. The goal of this proposal is to support the FDIC's resolution readiness in the event of the material distress and failure of these large

IDIs. IDIs with $100 billion or more in total assets will submit full resolution plans, while IDIs with total assets between $50 billion and $100 billion will submit informational filings. The proposed rule would also enhance how the credibility of resolution submissions will be assessed, expand expectations regarding engagement and capabilities testing, and explain expectations regarding the FDIC's review and enforcement of IDIs' compliance with the rule.

On September 19, 2023, the Federal Reserve and the FDIC issued proposed guidance for the 2024 and subsequent resolution plan submissions by certain domestic and foreign banking organizations. The proposed guidance is meant to assist these firms in developing their resolution plans (which the Dodd-Frank Act requires them to submit) and the jointly issued implementing regulation. The scope of application of the proposed guidance would be domestic and foreign triennial full filers, which are Category II and III banking organizations.

4.2.4 Insurance

FIO assists the Secretary of the Treasury in administering the Terrorism Risk Insurance Program (TRIP), created under the Terrorism Risk Insurance Act of 2002, as amended. In June 2023, Treasury published a *Report on Small Insurer Competitiveness in the Terrorism Risk Insurance Marketplace*. In addition to providing updates on the role of small insurers in the terrorism insurance marketplace, the report identifies new insights available from FIO's expanded cyber insurance data collection. The report also shares analysis based upon the use of terrorism risk modeling to evaluate potential impacts on small insurers under TRIP. The report finds that small insurers are important components of the large and diverse U.S. insurance market and are also significant participants in the market for terrorism risk insurance in the United States. The report finds that small insurers' market share of TRIP-eligible lines of insurance has been stable since 2017, with an observed increase in market share in the last two years.

The NAIC adopted a new risk-based capital charge for investments in residual tranches of certain structured securities for year-end 2023; this charge will increase for 2024 unless information is presented by an insurer establishing that such a higher charge is unwarranted on a case-by-case basis. This change is intended to better align the risk level of certain residual tranche investments with the appropriate capital level. Additionally, changes were made to the NAIC Property Risk-Based Capital formula to clarify expectations for companies that seek regulatory approval to use their own models to calculate catastrophe risk-based capital requirements.

NAIC members adopted a new principle-based definition of bonds for inclusion in the NAIC's Accounting Practices and Procedures Manual, to better identify the risk level of certain investments that became more prevalent during the period of prolonged low interest rates. Other changes were made to this same manual clarifying that an invested asset issued by an affiliated entity and held by a reporting insurer, or that includes the obligations of an affiliated entity, is deemed an affiliated investment that must be disclosed in the insurer's Annual Statement.

NAIC members also adopted changes to the Purposes and Procedures Manual of the NAIC Investment Analysis Office to remove financially modeled collateralized loan obligations (CLOs) from filing exemption eligibility and to assign responsibility for modeling the NAIC Designation Categories to the NAIC's Structured Securities Group. This change will provide regulators with more transparency and insight into certain CLO exposures that were previously exempt from filing. Additional updates to the Purposes and Procedures Manual include clarifications that state insurance regulators are permitted to require an insurance company to file with the Securities Valuation Office for an NAIC designation for an affiliated investment. Finally, the NAIC and state regulators have placed increased emphasis on Actuarial Guideline LIII, Application of the Valuation Manual for Testing of Adequacy of Life Insurer Reserve, which is intended to require insurers to file detailed information on their complex investments with the NAIC.

NAIC members adopted the Liquidity Stress Testing Framework used for year-end 2022, which (along with Asset Adequacy Testing) is intended to help regulators evaluate the risks created by rising interest rates.

4.3 Financial Infrastructure, Markets, and Oversight

4.3.1 Climate-Related Financial Risks

On March 25, 2023, the NCUA issued a request for comment on current and future climate and natural disaster risks to federally insured credit unions (FICUs), related entities, their members, and the National Credit Union Share Insurance Fund. The NCUA also sought input on the development of potential future guidance, regulations, reporting requirements, and supervisory approaches for FICUs' management of climate-related financial risks.

On June 27, 2023, FIO released a report entitled *Insurance Supervision and Regulation of Climate-Related Risks* in response to President Biden's Executive Order (EO) on Climate-Related Financial Risk. The report assesses climate-related issues and gaps in the supervision and regulation of insurers. It finds that there are important existing efforts to incorporate climate-related risk into state insurance regulation and supervision. The report, while recognizing the value of those efforts, notes that they are fragmented among states and limited in several critical ways. The report encourages state insurance regulators and the NAIC to build on their progress and makes 20 policy recommendations for improving the supervision of climate-related risks affecting insurers. The report fulfilled the first undertaking to FIO under EO 14030, which called on FIO to "assess climate-related issues or gaps in the supervision and regulation of insurers."

On November 2, 2023, FIO issued a public notice on its intent to proceed with its first-ever data collection from insurers to assess climate-related financial risk to consumers across the United States, while also submitting the data collection request to the Office of Management and Budget (OMB) for approval and public comment. FIO's data collection will obtain previously unavailable insurance data at a ZIP Code level on a consistent, granular, and comparable basis from the largest homeowners insurance providers that collectively underwrite around 70 percent of homeowners insurance premiums nationwide. This nationwide view is critical to understanding how climate-related financial risks impact families and individuals across state markets and the United States, and how these effects could impact the broader financial system. This information collection will enable FIO to advance its statutory mandates and to fulfill the second undertaking for FIO under EO 14030, which called on FIO to "further assess, in consultation with States, the potential for major disruptions of private insurance coverage in regions of the country particularly vulnerable to climate change impacts."

Throughout 2023, the NAIC took steps to provide state insurance regulators with tools to address challenges related to climate risk and resilience. In 2023, the first disclosures aligned with the Task Force on Climate-Related Disclosures (TCFD) were received from insurers as part of the NAIC's revised survey methodology. The NAIC worked with the Society of Actuaries to develop a research report that analyzes the insurer responses; discerns how insurers are identifying, assessing, and managing their climate-related risks; and summarizes the results. The Financial Examiners Handbook (E) Technical Group drafted changes to the Financial Condition Examiners Handbook to specifically address enterprise risk management practices concerning catastrophic risk and to identify the NAIC Climate Disclosure Survey or TCFD as a reference to gather information from insurers. The NAIC has operationalized its Catastrophe Modeling Center of Excellence (COE) to provide state insurance regulators with tools and training regarding catastrophe models. In 2023, the COE produced initial research on model utilization, conducted in-person training in four states/territories, and released the regulator-only virtual training course Catastrophe Modeling 101. In 2022 and 2023, the NAIC worked with Moody's Risk Management Services and the Colorado Division of Insurance to produce a wildfire risk assessment for the state and begin to identify how wildfire exposure correlates with the risk-based cost of coverage throughout the state. This research builds on an earlier paper produced in 2020 by the NAIC to identify how mitigation actions reduce the relative risk, thereby making insurance more affordable and available in some challenging markets.

4.3.2 Digital Assets, Payment Systems, and Technological Innovation

On January 3, 2023, the Federal Reserve, FDIC, and OCC issued a statement on crypto-asset risks to banking organizations. The statement noted that the events of 2022 were marked by significant volatility and the exposure of vulnerabilities in the crypto-asset sector, and it also noted that these events highlight a number of key risks associated with crypto-assets and crypto-asset sector participants that banking organizations should be aware of. These risks include: risk of fraud and scams among crypto-asset sector participants; legal uncertainties related to custody practices, redemptions, and ownership rights, some of which are currently the subject of legal processes and proceedings; inaccurate or misleading representations and disclosures by crypto-asset companies, including misrepresentations regarding federal deposit insurance; other crypto-asset company practices that may be unfair, deceptive, or abusive and may cause significant harm to retail and institutional investors, customers, and counterparties; and significant volatility in crypto-asset markets, the effects of which include potential impacts on deposit flows associated with crypto-asset companies.

On February 23, 2023, the Federal Reserve, FDIC, and OCC issued a statement on the liquidity risks presented by certain sources of funding from crypto-asset-related entities, along with certain effective practices to manage these risks. The statement reminds banking organizations to apply existing risk management principles; it does not create new risk management principles. Banking organizations are neither prohibited nor discouraged from providing banking services to customers of any specific class or type, as permitted by law or regulation.

On March 1, 2023, the NCUA issued a final rule amending Part 748 of its regulations to require a FICU that experiences a reportable cyber incident to report the incident to the NCUA as soon as possible and no later than 72 hours after the FICU reasonably believes that it has experienced such an incident. This notification requirement provides an early alert to the NCUA and does not require a FICU to provide a detailed incident assessment to the NCUA within the 72-hour time frame.

On September 29, 2023, FIO issued a request for comment on questions related to cyber insurance and catastrophic cyber incidents. The comments will inform FIO's work in responding to a recommendation by the U.S. Government Accountability Office that FIO and the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency jointly assess the extent to which the risks to U.S. critical infrastructure from catastrophic cyberattacks warrant a federal insurance response. FIO is also coordinating with the Office of the National Cyber Director on this project.

On October 24, 2023, state bank regulators, in conjunction with the Bankers Electronic Crimes Task Force and U.S. Secret Service, released an updated Ransomware Self-Assessment Tool (R-SAT 2.0). The R-SAT is designed to help financial institutions periodically assess their efforts to mitigate risks associated with ransomware and identify gaps for increasing security. The self-assessment provides executive management and the board of directors with an overview of their institution's preparedness towards identifying, protecting, detecting, responding to, and recovering from a ransomware attack. It may also assist other third parties (such as auditors, security consultants, and regulators) that might review a financial institution's security practices.

On November 7, 2023, the CFPB announced a notice of proposed rulemaking to supervise larger nonbank companies that offer services like digital wallets and payment apps. Driven largely by Big Tech and other large technology firms, digital payment apps and wallets continue to grow in popularity, but many of the companies are not subject to CFPB supervisory examinations. The proposed rule would help ensure that these nonbank financial companies, specifically those larger companies handling more than 5 million transactions per year, adhere to the same rules as large banks, credit unions, and other financial institutions already supervised by the CFPB.

4.3.3 Derivatives, Swap Data Repositories, Regulated Trading Platforms, Central Counterparties, and Financial Market Utilities

On April 14, 2023, the CFTC issued a notice of proposed rulemaking to amend its derivatives clearing organization (DCO) risk management regulations, in order to permit futures commission merchants (FCMs) that are clearing members to treat the separate accounts of a single customer as accounts of separate entities for purposes of withdrawing customer initial margin. The proposal would codify Staff Letter No. 19-17 and establish the conditions under which a DCO may permit such separate account treatment.

On June 30, 2023, the SEC issued a final rule under the Exchange Act that is designed to prevent fraud, manipulation, and deception in connection with effecting any transaction in, or attempting to effect any transaction in, or purchasing or selling, or inducing or attempting to induce the purchase or sale of, any security-based swap.

On July 13, 2023, the CFTC issued a final rule adopting amendments to its rules to require DCOs to establish and consult with one or more risk management committees (RMCs), which will be composed of clearing members and customers of clearing members, on matters that could materially affect the risk profile of the DCOs. In addition, the CFTC adopted minimum requirements for RMC composition and rotation, and it also required DCOs to establish and enforce fitness standards for RMC members. The CFTC also adopted requirements for DCOs to maintain written policies and procedures governing the RMC consultation process and the role of RMC members. Finally, the CFTC adopted requirements for DCOs to establish one or more market participant risk advisory working groups (RWGs) that must convene at least two times per year, and to adopt written policies and procedures related to the formation and role of the RWGs.

On July 28, 2023, the CFTC issued a notice of proposed rulemaking to amend certain regulations applicable to systemically important DCOs and DCOs that elect to be subject to the provisions in the CFTC's regulations. These proposed amendments would, among other things, address certain risk management obligations, modify definitions, and codify existing staff guidance. The CFTC also proposed to amend certain regulations to require DCOs that are not designated as systemically important, and which have not elected to be covered by the CFTC's regulations, to submit orderly Wind-Down plans.

On August 8, 2023, the CFTC issued a final rule amending certain reporting and information regulations applicable to DCOs. The amendments, among other things, update information requirements associated with commingling customer funds and positions in futures and swaps in the same account, revise certain daily and event-specific reporting requirements in the regulations, and codify in an appendix the data fields that a DCO is required to provide on a daily basis under the regulations. In addition, the CFTC adopted amendments to certain delegation provisions in its regulations.

On November 2, 2023, the SEC issued a final rule and forms under the Exchange Act that would create a regime for the registration and regulation of security-based swap execution facilities and address other issues relating to security-based swap execution generally. One of the rules being adopted implements an element of the Dodd-Frank Act that is intended to mitigate conflicts of interest at security-based swap execution facilities and national securities exchanges that trade securities-based swaps.

4.3.4 Securities and Asset Management

On December 16, 2022, the SEC issued a notice of proposed rulemaking to amend its current rules for open-end funds regarding liquidity risk management programs and swing pricing. The proposed amendments are designed to improve liquidity risk management programs to better prepare funds for stressed conditions and improve transparency in liquidity classifications. The amendments are also designed to mitigate dilution of shareholders' interests in a fund by requiring any open-end funds, other than a money market fund (MMF) or exchange-traded fund (ETF), to use swing pricing to adjust the fund's net asset value (NAV) per share to pass on costs stemming from shareholder purchase or redemption activity to the shareholders engaged in that activity. In addition, to help operationalize the proposed swing-pricing requirement, and to improve order processing more generally, the SEC proposed a "hard close" requirement for these funds. Under this requirement, an order to purchase or redeem a fund's shares would be executed at the current day's price only if the fund, its designated transfer agent, or a registered securities-clearing agency receives the order before the pricing time as of which the fund calculates its NAV. The SEC also proposed amendments to reporting and disclosure requirements on Forms N–PORT, N–1A, and N–CEN that apply to certain registered investment companies, including registered open-end funds (other than MMFs), registered closed-end funds, and unit investment trusts. The proposed amendments would require more-frequent reporting of monthly portfolio holdings and related information to the SEC and the public, amend certain reported identifiers, and make other amendments to require the reporting of additional information about funds' liquidity risk management and use of swing pricing.

On December 29, 2022, the SEC issued a notice of proposed rulemaking to amend certain rules of the Regulation National Market System (Regulation NMS) under the Exchange Act to adopt variable minimum pricing increments for the quoting and trading of NMS stocks, reduce the access fee caps, and enhance the transparency of better-priced orders.

On January 3, 2023, the SEC issued a notice of proposed rulemaking to amend the regulation governing the NMS under the Exchange Act, add a new rule designed to promote competition as a means to protect the interests of individual investors, and further the objectives of an NMS. The proposed rule would prohibit a restricted-competition trading center from internally executing certain orders of individual investors at a given price unless the orders are first exposed to competition at that price in a qualified auction operated by an open-competition trading center. The proposed rule would also include limited exceptions to this general prohibition.

On January 20, 2023, the SEC issued a notice of proposed rulemaking to amend existing requirements under the Exchange Act to update the disclosures required for order executions in NMS stocks. First, the SEC proposed to expand the scope of reporting entities that are subject to the rule that requires market centers to make available to the public monthly execution quality reports; the amended rule will encompass broker-dealers with a larger number of customers. Next, the SEC proposed to modify the definition of "covered orders" to include certain orders submitted outside of regular trading hours and certain orders submitted with stop prices. In addition, the SEC proposed modifications to the information required to be reported under the rule, including changes to how orders are categorized by order size and order type. As part of the changes to these categories, the SEC proposed to capture execution quality information for fractional share orders, odd-lot orders, and larger-sized orders. Additionally, the SEC proposed to modify reporting requirements for nonmarketable limit orders to capture more relevant execution quality information for such orders by requiring statistics to be reported from the time such orders become executable. The SEC also proposed to eliminate time-to-execution categories in favor of average time to execution, median time to execution, and 99th-percentile time to execution, each as measured in increments of a millisecond or finer and calculated on a share-weighted basis. In order to better reflect the speed of the marketplace, the SEC proposed that the time of order receipt and time of order execution be measured in increments of a millisecond or finer, and that realized spread be calculated at both 15 seconds and one minute. Finally, the SEC proposed to enhance the accessibility of the required reports by requiring all reporting entities to make a summary report available.

On January 27, 2023, the SEC proposed new rules under the Exchange Act relating to a broker-dealer's duty of best execution. Proposed Regulation Best Execution is intended to enhance the existing regulatory framework concerning the duty of best execution by requiring detailed policies and procedures for all broker-dealers and more robust policies and procedures for broker-dealers engaging in certain conflicted transactions with retail customers, as well as related review and documentation requirements.

On March 6, 2023, the SEC issued a final rule to shorten the standard settlement cycle for most broker-dealer transactions from two business days after the trade date (T+2) to one business day after the trade date (T+1). In addition, the SEC adopted new rules related to the processing of institutional trades by broker-dealers and certain clearing agencies. The SEC also amended certain recordkeeping requirements applicable to registered investment advisers.

On April 5, 2023, the SEC proposed a new rule, a new form, and amendments to existing recordkeeping rules to require broker-dealers, clearing agencies, major security-based swap participants, the Municipal Securities Rulemaking Board, national securities associations, national securities exchanges, security-based swap data repositories, security-based swap dealers, and transfer agents to address cybersecurity risks. The rule would require new policies and procedures, immediate notification of the SEC of the occurrence of any significant cybersecurity incident, reporting to the SEC of detailed information on such an incident, and public disclosures that would improve transparency with respect to cybersecurity risks and significant cybersecurity incidents. In addition, the SEC proposed amendments to existing clearing agency exemption orders to require the retention of records created under the proposed cybersecurity requirements. Finally, the SEC proposed amendments to address the potential availability of substituted compliance to security-based swap dealers and major security-based swap participants in connection with these requirements.

On April 14, 2023, the SEC issued a notice of proposed rulemaking to amend Regulation Systems Compliance and Integrity (Regulation SCI) under the Exchange Act. The proposed amendments would expand the definition of "SCI entity" to include a broader range of key market participants in the U.S. securities market infrastructure, and they would also update certain provisions of Regulation SCI to take into account developments in the markets' technology landscape since the adoption of Regulation SCI in 2014. The proposed expansion would add the following entities to the definition of "SCI entity": (1) registered security-based swap data repositories, (2) registered broker-dealers exceeding an asset or transaction activity threshold, and (3) additional clearing agencies exempted from registration. The proposed updates would amend provisions of Regulation SCI relating to systems classification and lifecycle management, third-party/vendor management, cybersecurity, the SCI review, the role of current SCI industry standards, and recordkeeping and related matters. Also, the SEC requested comment on whether significant-volume alternative trading systems (ATSs) and broker-dealers using electronic or automated systems for trading of corporate debt securities or municipal securities should be subject to Regulation SCI.

On May 5, 2023, the SEC issued a notice of proposed rulemaking to amend certain portions of the Covered Clearing Agency Standards under the Exchange Act to strengthen the existing rules regarding margin with respect to intraday margin and the use of substantive inputs in a covered clearing agency's risk-based margin system. The SEC also proposed a new rule to establish requirements for the contents of a covered clearing agency's recovery and wind-down plan.

On August 1, 2023, the SEC proposed amendments to the rule under the Investment Advisers Act of 1940 (Advisers Act) that exempts certain investment advisers that provide advisory services through the internet from the prohibition on SEC registration. The SEC also proposed related amendments to Form ADV. The proposed amendments are designed to modernize the rule's conditions to account for the evolution of technology and the investment advisory industry since the adoption of the rule.

On August 3, 2023, the SEC issued a final rule amending certain rules that govern MMFs under the Investment Company Act. These amendments are designed to improve the resilience and transparency of MMFs. The amendments will revise the primary rule that governs MMFs to remove a fund board's ability to temporarily suspend redemptions if the fund's liquidity falls below a threshold. In addition, the amendments will remove the tie between liquidity thresholds and the potential imposition of liquidity fees. The amendments will also require certain MMFs to implement a liquidity fee framework that will better allocate the costs of providing liquidity to redeeming investors. In addition, the SEC increased the daily liquid asset minimum requirement to 25 percent and the weekly liquid asset minimum requirement to 50 percent. The SEC also amended certain reporting requirements on Form N–MFP and Form N–CR and made certain conforming changes to Form N–1A to reflect amendments to the regulatory framework for MMFs. In addition, the SEC addressed how MMFs with stable NAVs may handle a negative–interest rate environment, including by adopting amendments that will permit such funds to use share cancellation, subject to certain conditions. Also, the SEC adopted rule amendments to specify how funds must calculate weighted-average maturity and weighted-average life. In addition, the SEC adopted amendments to Form PF concerning the information large liquidity fund advisers must report for the liquidity funds they advise.

On August 4, 2023, the SEC issued a final rule to enhance and standardize cybersecurity risk management, strategy, governance, and incident disclosures by public companies that are subject to the reporting requirements of the Exchange Act. Specifically, the SEC adopted amendments to require current disclosure of material cybersecurity incidents. The SEC also adopted rules requiring periodic disclosures of a registrant's processes to assess, identify, and manage material cybersecurity risks, management's role in assessing and managing material cybersecurity risks, and the board of directors' oversight of cybersecurity risks.

On August 9, 2023, the SEC proposed new rules under the Exchange Act and the Advisers Act to eliminate or neutralize the effect of certain conflicts of interest associated with broker-dealers' or investment advisers' interactions with investors through such firms' use of technologies that optimize, predict, guide, forecast, or direct investment-related behaviors or outcomes. The SEC also proposed amendments to rules under the Exchange Act and Advisers Act that would require firms to make and maintain certain records in accordance with the proposed rules.

On September 14, 2023, the SEC issued final rules under the Advisers Act. The rules are designed to protect investors who directly or indirectly invest in private funds by increasing visibility into certain practices involving compensation schemes, sales practices, and conflicts of interest through disclosure; establishing requirements to address such practices that have the potential to lead to investor harm; and restricting practices that are contrary to the public interest and the protection of investors. These rules are likewise designed to prevent fraud, deception, or manipulation by the investment advisers to those funds. The SEC also adopted corresponding amendments to the Advisers Act books and records rule to facilitate compliance with these new rules and assist SEC examination staff. Finally, the SEC adopted amendments to the Advisers Act compliance rule that affect all registered investment advisers, to better enable SEC staff to conduct examinations.

4.3.5 Accounting Standards

On March 29, 2023, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (FSU) 2023-02 that permits reporting entities to elect to account for their tax equity investments, regardless of the tax credit program from which the income tax credits are received, using the proportional amortization method (PAM) if certain conditions are met. Under PAM, an entity amortizes the initial cost of the investment in proportion to the income tax credits and other income tax benefits received and recognizes the net amortization and income tax credits and other income tax benefits in the income statement as a component of income tax expense (benefit). On August 3, 2023, the FASB issued ASU 2023-04 to amend and add various SEC paragraphs to the Accounting Standards Codification to reflect the issuance of SEC Staff Accounting Bulletin No. 121, which provides SEC staff views regarding the accounting for obligations to safeguard crypto-assets an entity holds for platform users.

4.3.6 Bank Secrecy Act/Anti–Money Laundering Regulatory Reform

On December 16, 2022, the Financial Crimes Enforcement Network (FinCEN) issued a proposed rule regarding access by authorized recipients to beneficial ownership information (BOI) that will be reported to FinCEN pursuant to Section 6403 of the Corporate Transparency Act (CTA). The CTA was enacted into law as part of the Anti-Money Laundering Act of 2020, which is itself part of the National Defense Authorization Act for Fiscal Year 2021. The proposed regulations would implement the strict protocols on security and confidentiality required by the CTA to protect sensitive personally identifiable information reported to FinCEN. The proposed rule explains the circumstances in which specified recipients would have access to BOI and outlines data protection protocols and oversight mechanisms applicable to each recipient category. The disclosure of BOI to authorized recipients in accordance with appropriate protocols and oversight will help law enforcement and national security agencies prevent and combat money laundering, terrorist financing, tax fraud, and other illicit activity, as well as protect national security. The proposed regulations also specify when and how reporting companies can use FinCEN identifiers to report the BOI of entities.

On September 28, 2023, FinCEN issued a proposed rule to amend the BOI reporting rule (Reporting Rule) to extend the filing deadline for certain BOI reports. Under the Reporting Rule, entities created or registered on or after the rule's effective date of January 1, 2024, must file initial BOI reports with FinCEN within 30 days of notice of their creation or registration. This proposed amendment would extend that filing deadline from 30 days to 90 days for entities created or registered on or after January 1, 2024, and before January 1, 2025, to give those entities additional time to understand the new reporting obligation and collect the necessary information to complete the filing. Entities created or registered on or after January 1, 2025, would have 30 days to file their BOI reports with FinCEN, as required under the Reporting Rule.

The Financial Action Task Force (FATF) is the intergovernmental body that sets standards and promotes effective implementation of legal, regulatory, and operational measures for combating money laundering, terrorist financing, the financing of proliferation, and other related threats to the integrity of the international financial system. In collaboration with other international stakeholders, the FATF also works to identify national-level vulnerabilities to protect the international financial system from misuse.

In February 2023, the FATF finalized guidance to strengthen requirements on Recommendation 24, covering transparency and beneficial ownership of legal persons. The FATF also agreed on enhancements to Recommendation 25 on beneficial ownership transparency for trusts and legal arrangements to bring its requirements broadly in line with those for Recommendation 24, thus ensuring a balanced and coherent set of FATF standards on beneficial ownership. Collectively, these efforts seek to improve the ability of law enforcement to trace, report, and seize illicit proceeds, and to make it harder for criminals to exploit opaque legal structures to hide and launder the proceeds of their crimes.

In June 2023, the FATF published a report urging countries to swiftly implement the FATF's Recommendations on virtual assets, which also highlight emerging risks associated with the sector. Also in June 2023, the FATF built on its prior suspension of Russia's membership due to its brutal war against Ukraine by agreeing to additional restrictions on Russia's membership rights.

4.4 Mortgages and Consumer Protection

4.4.1 Mortgages and Housing Finance

On December 27, 2022, the FHFA issued a final rule that establishes a process for Fannie Mae and Freddie Mac to provide advance notice to the FHFA Director before offering new activity to the market and to obtain prior approval from the Director before offering a new product to the market.

On March 13, 2023, the FHFA issued a notice of proposed rulemaking that would amend several provisions in the Enterprise Regulatory Capital Framework (ERCF) for Fannie Mae and Freddie Mac. The proposed rule would include modifications related to guarantees on commingled securities, multifamily mortgage exposures secured by government-subsidized properties, derivatives and cleared transactions, and credit scores, among other items.

On April 26, 2023, the FHFA issued a notice of proposed rulemaking that would address barriers to sustainable-housing opportunities for underserved communities by codifying existing FHFA practices in regulations and adding new requirements related to fair lending, fair housing, and Equitable Housing Finance Plans.

On May 15, 2023, the FHFA issued a Request for Information (RFI) on Fannie Mae and Freddie Mac's single-family pricing framework. The RFI solicits public feedback on the goals and policy priorities that FHFA should pursue in its oversight of the pricing framework. FHFA also sought input on the process for setting the single-family upfront guarantee fees of government sponsored enterprises (GSEs), including whether it is appropriate to continue to link upfront guarantee fees to the ERCF, which was established in 2020 and has a significant impact on the risk-based pricing component of the GSEs' guarantee fees.

On June 8, 2023, the Federal Reserve, OCC, CFPB, FDIC, and NCUA issued proposed interagency guidance with a request for comment on reconsiderations of value of residential real estate. The proposed interagency guidance highlights the risks of deficient residential real estate; outlines applicable statutes, regulations, and existing guidance that govern reconsiderations of value; explains how reconsiderations of value can be incorporated into existing risk management functions; and provides examples of policies and procedures banks may choose to adopt.

On June 21, 2023, the Federal Reserve, OCC, FDIC, NCUA, CFPB, and FHFA issued a notice of proposed rulemaking to implement the quality control standards mandated by the Dodd-Frank Act for the use of automated valuation models (AVMs) by mortgage originators and secondary market issuers in determining the collateral worth of a mortgage secured by a consumer's principal dwelling. Under the proposal, the agencies would require institutions that engage in certain credit decisions or securitization determinations to adopt policies, practices, procedures, and control systems. These requirements are designed to help ensure that AVMs used in these transactions to determine the value of mortgage collateral adhere to quality control standards. Such standards are designed to help ensure a high level of confidence in the estimates produced by AVMs, protect against the manipulation of data, seek to avoid conflicts of interest, require random sample testing and reviews, and help ensure compliance with applicable nondiscrimination laws.

On July 6, 2023, the Federal Reserve, OCC, FDIC, and NCUA, in consultation with state bank and credit union regulators, issued a final policy statement for prudent CRE loan accommodations and workouts. The statement is relevant to all financial institutions supervised by the agencies. This updated policy statement builds on existing supervisory guidance calling for financial institutions to work with creditworthy borrowers during times of financial stress, updates existing interagency supervisory guidance on CRE loan workouts, and adds a section on short-term loan accommodations. The updated statement also addresses relevant accounting-standards changes on estimating loan losses, and it provides updated examples of classifying and accounting for loans modified or affected by loan accommodations or loan workout activity.

On November 7, 2023, the FHFA concluded its review of the FHLBank System and issued its report "FHLBank System at 100: Focusing on the Future". The initiative involved significant stakeholder outreach, a historical review of the role of the FHLBanks, and detailed analysis of the strengths and areas for improvement of the System's current operations and structure to ensure the FHLBanks remain well positioned to fulfill their mission. The report summarizes considerations for the FHLBanks' mission, continued reliability of liquidity, support for housing and community development, and the System's governance and structure. The report further outlines actions FHFA will take and recommendations for congressional consideration.

States continued to adopt new regulatory standards that require nonbank mortgage servicers to maintain the financial capacity, corporate governance, and risk management practices sufficient to adequately serve consumers and investors and simultaneously enhance market stability. In 2023, Montana, North Dakota, and Minnesota signed into law legislation based on the CSBS Model State Regulatory Prudential Standards for Nonbank Mortgage Servicers.

4.4.2 Consumer Protection

On January 12, 2023, the OCC issued version 1.0 of its "Fair Lending" booklet of the Comptroller's Handbook. This booklet, which replaced the booklet of the same titled issued in January 2010, provides information and examination procedures to assist OCC examiners in assessing fair lending risk and evaluating compliance with the Fair Housing Act, Equal Credit Opportunity Act, and Regulation B, the consumer protection regulation that implements the Equal Credit Opportunity Act.

On April 26, 2023, the OCC issued a notice to address the risks associated with overdraft protection programs. This bulletin discussed certain practices that may present heightened risk of violating prohibitions against unfair or deceptive acts or practices. The bulletin also described practices that may assist banks with managing overdraft protection program risks.

On May 11, 2023, the CFPB issued an interim final rule to amend Regulation Z, which implements the Truth in Lending Act, to reflect the enactment of the LIBOR Act and its implementing regulations promulgated by the Federal Reserve. This interim final rule further addresses the planned cessation of most U.S. dollar (USD) LIBOR tenors after June 30, 2023, by incorporating the Federal Reserve–selected benchmark replacement for consumer loans into Regulation Z. This interim final rule makes the terminology from the LIBOR Act and the Federal Reserve's implementing regulation conform to relevant Regulation Z open-end and closed-end credit provisions. The rule also addresses treatment of the 12-month USD LIBOR index and its replacement index, including permitting creditors to use alternative language in change-in-terms notice content requirements for situations in which the 12-month tenor of the LIBOR index is being replaced consistent with the LIBOR Act.

On October 19, 2023, the CFPB issued a proposed rule to establish 12 CFR part 1033, which would implement section 1033 of the Consumer Financial Protection Act of 2010. The proposed rule would require depository and nondepository entities to make available to consumers and authorized third parties certain data relating to consumers' transactions and accounts; establish obligations for third parties accessing a consumer's data, including important privacy protections for that data; provide basic standards for data access; and promote fair, open, and inclusive industry standards.

In 2023, the FDIC issued a number of letters demanding persons or entities cease and desist from making false or misleading representations about the existence of deposit insurance, misusing the name or logo of the FDIC, or knowingly misrepresenting the extent and manner of deposit insurance. Section 18(a)(4) of the Federal Deposit Insurance Act prohibits any person from misusing the name or logo of the FDIC or from engaging in false advertising or making knowing misrepresentations about deposit insurance. The FDIC has observed an increasing number of instances where financial services providers or other entities or individuals, including crypto-asset firms, have misused the FDIC's name or logo or have made false or misleading representations about deposit insurance.

4.5 Data Scope, Quality, and Accessibility

On January 9, 2023, the OFR issued a notice of proposed rulemaking to establish a data collection covering U.S. non-centrally cleared bilateral repo (NCCBR) transactions. The proposed collection would require daily reporting to the OFR by certain brokers, dealers, and other financial companies with large exposures to the NCCBR market. The collected data would be used to support the work of the Council, its member agencies, and the OFR to identify and monitor risks to financial stability.

4.5.1 Data Scope

Global adoption of the Legal Entity Identifier (LEI), which enables the unique and transparent identification of legal entities participating in financial transactions, continues to grow. As of September 30, 2023, more than 2.3 million LEIs have been issued worldwide, with approximately 13 percent having been issued to U.S. entities. The total number of LEIs issued represents a year-to-date increase of 9 percent, which follows a 12 percent increase in 2022. In the United States, the LEI is used in regulatory reporting mandated by the Federal Reserve, CFPB, SEC, CFTC, and OFR, among others.

4.5.2 Data Quality

The Regulatory Oversight Committee

Improving the quality of LEI data is important to building market confidence in the value of the LEI. Therefore, the Council members that are represented on the Regulatory Oversight Committee (ROC), including the Federal Reserve, OCC, CFPB, SEC, FDIC, CFTC, and OFR have directed considerable attention to this challenge.

This past year, Council members continued to contribute to ROC initiatives aimed at improving the quality of Level 2 LEI data, among other elements of LEI reference data. "Level 2 LEI data" are data submitted by a legal entity regarding its "direct accounting consolidating parent" and "ultimate accounting consolidating parent." These data can improve the ability to perform a risk assessment of the counterparties to a transaction.

Additionally, the ROC continued to work closely with the Global Legal Entity Identifier Foundation (GLEIF), which is the not-for-profit organization that maintains the system's operational integrity. Council members contributed to the ROC's analysis of the draft of Part 3 of the LEI standard (ISO 17442), which is being developed under Technical Committee 68 of the International Organization for Standardization (ISO). Part 3 of this standard is what the GLEIF defines as "verifiable LEIs" (vLEIs), which provide automated remote verification of legal entities owning LEIs and cryptographically prove that an LEI is owned by the organization signing with or presenting the credential.

In 2023, the OFR continued to provide Secretariat services to the ROC. As Secretariat, the OFR provides organizational management and communications for the 70+ global regulatory authorities that compose the ROC's membership. Additionally, the OFR partnered with other Council member agencies to establish effective strategies, positions, and decisions for the ROC, especially in recommending adoption of the LEI.

In conducting Secretariat duties for the ROC in 2023, the OFR completed work to establish a new leadership team at the GLEIF. Additionally, as Secretariat, the OFR assisted the Derivatives Data Elements – Industry Representation in conducting an industry analysis of new over-the-counter derivatives data.

Financial Data Transparency Act

The Financial Data Transparency Act (FDTA), passed in 2022 as part of the National Defense Authorization Act, directs federal financial regulatory agencies to implement data standards developed through a joint rulemaking. The rulemaking will establish data standards for data collected by financial regulators and data collected on behalf of the Council, which should create efficiencies of standardization for both government and industry. The data standards will include common identifiers for collections of information, including a common non-proprietary legal entity identifier that is available under an open license for all entities required to report to covered agencies.

In 2023, representatives from the federal agencies initiated analysis of the FDTA to meet the rulemaking timelines. To facilitate this work, agencies established an interagency working group to perform the analysis.

White House National Strategy for Critical and Emerging Technology

In response to the principles set forth in multiple U.S. strategies, the National Security Council's Interagency Policy Committee issued the National Standards Strategy for Critical and Emerging Technology in May 2023.

Several Council member agencies contributed to the strategy, which notes that standards generated and deployed in critical and emerging technology are essential to securing the U.S. financial infrastructure and promoting competitiveness in the rapidly evolving technology landscape. The strategy emphasizes U.S. support for international technical standards and commits to partnering with the private sector to help accelerate standards development to close gaps, promote interoperability, and support innovation.

Ensuring Responsible Development of Digital Assets

Executive Order (EO) 14067 called on Council members to engage in a government-wide effort to consider and report on the global economic and technical implications of digital assets and central bank digital currencies (CBDC). The EO states that standards participation and development should be a central tenet for all government agencies, in order to elevate U.S. engagement with digital assets issues in technical standards bodies and promote development of digital asset and CBDC technologies.

In response, the White House Office of Science and Technology Policy recommended that the U.S. government develop and periodically update a National Digital Assets Research and Development Agenda. Council members, along with various departments and agencies from across government, under the auspices of the Networking and Information Technology Research and Development Program and the National Science Foundation, established a whole-of-government Fast-Track Action Committee (FTAC) to promote international standards and best practices. On January 26, 2023, the FTAC issued a *Request for Information on Digital Assets Research and Development*, and in March 2023, it issued *National Objectives for Digital Assets Research and*

Development. Publishing these documents was the first step toward establishing an evolving National Digital Assets Agenda, as well as guidance and recommendations for responsible research, development, and deployment of digital assets and CBDCs.

5 Select Council Member Agency Publications on Financial and Regulatory Developments

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6 Abbreviations

Advisers Act	Investment Advisers Act of 1940
AFS	Available for Sale
AI	Artificial Intelligence
AI RMF 1.0	AI Risk Management Framework
ARRC	Alternative Reference Rates Committee
ATS	Alternative Trading System
AUM	Assets Under Management
AVM	Automated Valuation Model
BHC	Bank Holding Company
BOI	Beneficial Ownership Information
BTFP	Bank Term Funding Program
C&I	Commercial & Industrial
CARES Act	Coronavirus Aid, Relief, and Economic Security Act of 2020
CBDC	Central Bank Digital Currency
CCAR	Comprehensive Capital Analysis and Review
CCP	Central Counterparty
CD	Certificate of Deposit
CDS	Credit Default Swap
CEA	Commodity Exchange Act
CEG	Cyber Expert Group
CESG	Cloud Executive Steering Group
CET1	Common Equity Tier 1 Capital
CFPB	Consumer Financial Protection Bureau
CFRAC	Climate-related Financial Risk Advisory Committee
CFRC	Climate-related Financial Risk Committee
CFTC	Commodity Futures Trading Commission
CIF	Collective Investment Fund CR
CISA	Cybersecurity and Infrastructure Security Agency
CLO	Collateralized Loan Obligation
CMBS	Commercial Mortgage-Backed Security
CME	Chicago Mercantile Exchange Inc.
COE	Catastrophe Modeling Center of Excellence
Council	Financial Stability Oversight Council
CP	Commercial Paper
CRA	Community Reinvestment Act of 1977
CRE	Commercial Real Estate
CRI	Counter Ransomware Initiative
CSBS	Conference of State Bank Supervisors
CSP	Cloud Service Provider
CTA	Corporate Transparency Act
DAWG	Digital Assets Working Group
DB	Defined Benefit
DCO	Derivatives Clearing Organization
DHS	Department of Homeland Security
DIF	Deposit Insurance Fund
Dodd-Frank Act	Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010
DTCC	Depository Trust & Clearing Corporation
DTI	Debt-to-Income
EME	Emerging Market Economy
ERCF	Enterprise Regulatory Capital Framework
ERISA	Employee Retirement Income Security Act of 1974
ESMA	European Securities and Market Authority
ESTER	Euro Short-Term Rate (also called €STR)
ETF	Exchange-Traded Fund

EO	Executive Order
Exchange Act	Securities Exchange Act of 1934
Fannie Mae	Federal National Mortgage Association
FASB	Financial Accounting Standards Board
FATF	Financial Action Task Force
FBIIC	Financial and Banking Information Infrastructure Committee
FCM	Futures Commission Merchant
FDI Act	Federal Deposit Insurance Act
FDIC	Federal Deposit Insurance Corporation
FDTA	Financial Data Transparency Act of 2022
Federal Reserve	Board of Governors of the Federal Reserve System
FHFA	Federal Housing Finance Agency
FHLB	Federal Home Loan Bank
FICC	Fixed Income Clearing Corporation
FICU	Federally Insured Credit Union
FinCEN	Financial Crimes Enforcement Network
FINRA	Financial Industry Regulatory Authority
Fintech	Financial Technology
FIO	Federal Insurance Office
FMU	Financial Market Utility
FOMC	Federal Open Market Committee
FRBNY	Federal Reserve Bank of New York
Freddie Mac	Federal Home Loan Mortgage Corporation
FS-ISAC	Financial Services Information Sharing and Analysis Center
FSSCC	Financial Services Sector Coordinating Council
FTAC	Fast-Track Action Committee
GAV	Gross Asset Value
GDP	Gross Domestic Product
GHG	Greenhouse Gas
Ginnie Mae	Government National Mortgage Association
GLEIF	Global LEI Foundation
GNE	Gross Notional Exposure
GSD	Government Securities Division
GSE	Government-Sponsored Enterprise
G-SIB	Global Systemically Important Bank
HFWG	Hedge Fund Working Group
HTM	Held-to-Maturity
IAWG	Inter-Agency Working Group for Treasury Market Surveillance
IDI	Insured Depository Institution
IMF	International Monetary Fund
Investment Company Act	Investment Company Act of 1940
IOSCO	International Organization of Securities Commissions
ISDA	International Swaps and Derivatives Association
ISO	International Organization for Standardization
L&H	Life and Health
LEI	Legal Entity Identifier
LME	London Metal Exchange
LTV	Loan-to-Value
M&A	Merger & Acquisition
MBS	Mortgage-Backed Security
MBSD	Mortgage-Backed Securities Division
MMF	Money Market Fund
NAIC	National Association of Insurance Commissioners
NAV	Net Asset Value
NBFI	Nonbank Financial Institution
NCCBR	Non-centrally Cleared Bilateral Repo
NCD	Negotiable Certificates of Deposit
NCUA	National Credit Union Administration
NIM	Net Interest Margin

NIST	National Institute of Standards and Technology
NMDB	National Mortgage Database
NMS	National Market System
NSA	National Security Agency
NSCC	National Securities Clearing Corporation
OCC	Office of the Comptroller of the Currency
OCCIP	Office of Cybersecurity and Critical Infrastructure Protection
OFR	Office of Financial Research
OIS	Overnight Indexed Swap
OMB	Office of Management and Budget
ON RRP	Overnight Reverse Repurchase Agreement Facility
OTC	Over-the-Counter
PAM	Proportional Amortization Method
P&C	Property and Casualty
PRT	Pension Risk Transfer
RaaS	Ransomware as a Service
Repo	Repurchase Agreement
RFI	Request for Information
RMC	Risk Management Committee
ROA	Return on Assets
ROC	Regulatory Oversight Committee
RWA	Risk-Weighted Asset
RWG	Risk Advisory Working Group
S&P	Standard & Poor's
SCI	Systems Compliance and Integrity
SEC	Securities and Exchange Commission
SI>1 CCPs	CCPs Considered Systemically Important in More than One Jurisdiction
SIFMA	Securities Industry and Financial Markets Association
SLOOS	Senior Loan Officer Opinion Survey
SOFR	Secured Overnight Financing Rate
SRC	Systemic Risk Committee
SRE	Systemic Risk Exception
STIF	Short-Term Investment Fund
SVB	Silicon Valley Bank
TCFD	Task Force on Climate-Related Financial Disclosures
TIPS	Treasury Inflation-Protected Securities
TRACE	Trade Reporting and Compliance Engine
Treasury	U.S. Department of the Treasury
TRIP	Terrorism Risk Insurance Program
UK	United Kingdom
UPI	Unique Product Identifier
USD	U.S. Dollar
UTI	Unique Transaction Identifier
vLEI	Verifiable LEI

7 Glossary

Accumulated Other Comprehensive Income (AOCI)

Typically includes unrealized gains and losses in available-for-sale securities, actuarial gains and losses in defined benefit plans, gains and losses on derivatives held as cash flow hedges, and gains and losses resulting from translating the financial statements of foreign subsidiaries.

Affiliate

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

Asset-Backed Commercial Paper

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

Availability

Availability means information should be consistently and readily accessible by authorized parties. This involves properly maintaining hardware, technical infrastructure, and systems that hold and display the information.

Bilateral Repo

A repo between two institutions in which the participants conduct negotiations directly between them or through a broker, and in which the participants must agree on the specific securities to be used as collateral. The bilateral repo market includes both noncleared trades and trades cleared through Fixed Income Clearing Corporation's delivery versus payment repo service.

Bit

A bit, or binary digit, the smallest unit of data that a computer can process and store.

Cash-Futures Basis Trade

The Treasury cash-futures basis trade is a fixed-income arbitrage trading strategy whereby funds try to capture the spread between the implied repo rate and general repo rates over the term of the trade. Entering into this trade involves selling a Treasury futures contract, buying a Treasury security deliverable into that contract with repo funding from dealer intermediaries, and delivering the security at contract expiry.

Central Bank Digital Currencies (CBDCs)

A digital form of central bank money that is widely available to the general public. Central bank money refers to money that is a liability of the central bank. In the United States, there are currently two types of central bank money: physical currency issued by the Federal Reserve and digital balances held by commercial banks at the Federal Reserve.

Central Counterparty (CCP)

An entity that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer, thereby ensuring the performance of open contracts.

Clearing Bank

A bank holding company (BHC) subsidiary that facilitates payment and settlement of financial transactions (such as check clearing) or facilitates trades between the sellers and buyers of securities or other financial instruments or contracts.

Collateral

Any asset pledged by a borrower to guarantee payment of a debt.

Collateralized Loan Obligation (CLO)

A securitization vehicle backed predominantly by commercial loans.

Commercial Paper (CP)

Short-term (maturity of up to 270 days), unsecured corporate debt.

Common Equity Tier 1 Capital (CET1)

A regulatory capital measure that includes capital with the highest loss-absorbing capacity, such as common stock and retained earnings.

Common Equity Tier 1 Capital Ratio

A ratio that divides common equity tier 1 capital by total risk-weighted assets. The ratio applies to all banking organizations subject to the Revised Capital Rule.

Comprehensive Capital Analysis and Review (CCAR)

An annual exercise by the Federal Reserve to help ensure that institutions have robust, forward-looking capital-planning processes that account for their unique risks and sufficient capital to continue operations through times of economic and financial stress.

Confidentiality

Confidentiality is roughly equivalent to privacy. Confidentiality measures are designed to prevent sensitive information from unauthorized access attempts. It is common for data to be categorized according to the amount and type of damage that could be done if it fell into the wrong hands. More or less stringent measures to protect that information can then be implemented according to those categories.

Credit Default Swap (CDS)

A financial contract in which one party agrees to make a payment to the other party in the event of a specified credit event, in exchange for one or more fixed payments.

Crypto-assets

Private sector digital assets that depend primarily on cryptography and distributed ledger or similar technology.

Defined Benefit (DB) Plan

A retirement plan in which the cost to the employer is based on a predetermined formula to calculate the amount of a participant's future benefit. In defined benefit plans, the investment risk is borne by the plan sponsor.

Digital Assets

Two categories of products: (1) central bank digital currencies (CBDCs) and (2) crypto-assets.

Dry Powder

The amount of capital that has been committed to a private capital fund minus the amount that has been called by the general partner for investment.

Duration

The sensitivity of the prices of bonds and other fixed-income securities to changes in the level of interest rates.

Duration gaps

Measures of the sensitivity of banks' equity positions to changes in interest rates.

Emerging Market Economies (EMEs)

Economies generally classified according to their state of economic development, liquidity, and market accessibility. There is no single definition, so this report has grouped economies based on the classifications used by significant data sources such as the MSCI and Standard & Poor's, which include, for example, Brazil, China, India, and Russia.

Federal Funds Rate

The interest rate at which depository institutions borrow overnight from lenders in the federal funds market. The FOMC sets a target range for the level of the overnight federal funds rate. The FRBNY then uses open-market operations to influence the rate so that it trades within the target range.

Financial and Banking Information Infrastructure Committee (FBIIC)

A committee composed of 18 member organizations from across the financial-regulatory community, both federal and state. FBIIC was chartered under the President's Working Group on Financial Markets following September 11, 2001, to improve coordination and communication among financial regulators, enhance the resilience of the financial sector, and promote public-private partnership.

Financial Market Utility (FMU)

An entity, as defined in the Dodd-Frank Act, that, subject to certain exclusions, "manages or operates a multilateral system for the purpose of transferring, clearing, or settling payments, securities, or other financial transactions among financial institutions or between financial institutions and the person."

Fiscal Year (FY)

Any 12-month accounting period. The fiscal year for the federal government begins on October 1 and ends on September 30 of the following year; it is named after the calendar year in which it ends.

Futures Contract

An agreement to purchase or sell a commodity for delivery in the future that (1) specifies a buy or sell price determined at the initiation of the contract, (2) obligates each party to the contract to fulfill the contract at the specified price, (3) is used to assume or shift price risk, and (4) may be satisfied by delivery or offset.

Government-Sponsored Enterprise (GSE)

A corporate entity with a federal charter authorized by law, but which is a privately owned financial institution. Examples include the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac).

Gross Domestic Product (GDP)

The broadest measure of aggregate economic activity, measuring the total value of all final goods and services produced within a country's borders during a specific period.

Gross Notional Exposure (GNE)

The sum of the absolute values of long and short notional amounts.

Initial Margin

Collateral that is collected to cover potential changes in the value of each participant's position (that is, potential future exposure) over the appropriate closeout period in the event the participant defaults.

Integrity

Integrity involves maintaining the consistency, accuracy, and trustworthiness of data over their entire lifecycle. Data must not be changed in transit, and steps must be taken to make sure that data cannot be altered by unauthorized people (for example, in a breach of confidentiality).

Interest Rate Swap (IRS)

A derivative contract in which two parties swap interest rate cash flows on a periodic basis, referencing a specified notional amount for a fixed term. Typically, one party will pay a predetermined fixed rate while the other party will pay a short-term variable reference rate that resets at specified intervals.

Large Hedge Fund Adviser

Advisers that have at least $1.5 billion in hedge fund assets under management.

Legal Entity Identifier (LEI)

A 20-character alphanumeric code that connects to key reference information that enables clear and unique identification of legal entities participating in global financial markets. The LEI system is designed to facilitate many financial stability objectives, including improved risk management in firms, better assessment of microprudential and macroprudential risks, expediting of orderly resolution, containment of market abuse and financial fraud, and provision of higher-quality and more accurate financial data.

Leveraged Loan

Generally, a type of loan that is extended to companies that already have considerable amounts of debt, have a noninvestment-grade credit rating, are unrated, or have post-financing leverage that significantly exceeds industry norms or historical levels. Numerous other definitions of leveraged lending exist throughout the financial services industry.

LIBOR

LIBOR is a rate based on submissions from a panel of banks. LIBOR is intended to reflect the rate at which large, globally active banks can borrow on an unsecured basis in wholesale markets.

Local Government Investment Pools

Local government investment pools typically pool the resources of participating governments and invest in various securities as permitted under state law. By pooling their cash together, participating governments benefit in a variety of ways, including from economies of scale and professional fund management.

Loan-to-Value (LTV) Ratio

The ratio of a loan amount to the value of the asset that the loan funds. The LTV ratio is typically expressed as a percentage and is a key metric when considering a mortgage's collateralization level.

Margin

In the context of clearing activity, collateral that is collected to protect against current or potential future exposures resulting from market price changes or in the event of a counterparty default.

Modified Coinsurance

Modified coinsurance is a type of reinsurance treaty wherein the ceding company retains the assets with respect to policies reinsured and also establishes and maintains reserves on those policies, creating the obligation to render payments to the reinsurer at a later date.

Money Market Mutual Fund (aka Money Market Fund or MMF)

A type of mutual fund that invests in short-term, high-quality, liquid securities such as government bills, CDs, CP, or repos.

Mortgage-Backed Security (MBS)

An asset-backed security backed by a pool of mortgages. Investors in the security receive payments derived from the interest and principal payments on the underlying mortgages.

Mortgage Servicing Company

A company that acts as an agent for mortgage holders by collecting and distributing mortgage cash flows. Mortgage servicers also manage defaults, modifications, settlements, foreclosure proceedings, and various notifications to borrowers and investors.

Municipal Bonds

Bonds issued by states, cities, counties, local governmental agencies, or certain nongovernment issuers to finance certain general or project-related activities.

Net Asset Value (NAV)

An investment company's total assets minus its total liabilities.

Net Interest Margin (NIM)

Net interest income as a percent of interest-earning assets.

Notional Amount

The amount used to calculate payments due on a derivative contract, just as the face amount of a bond is used to calculate coupon payments.

Off-Balance Sheet Leverage

Off-balance sheet leverage, or "synthetic leverage," refers to using instruments (such as derivatives) to create exposures whose value depends on an underlying asset.

Offshore MMFs

Offshore MMFs are similar to U.S. MMFs, but they are domiciled outside the United States; the offshore MMFs considered in this report invest in U.S.-dollar-denominated assets.

On-Balance Sheet Leverage

On-balance sheet leverage, or "financial leverage," refers to borrowing through loans, bonds, repurchase and securities lending agreements, and other securities financing transactions.

Open-Market Operations

The purchase and sale of securities in the open market by a central bank to implement monetary policy.

Operational Resilience

The ability of an entity's personnel, systems, telecommunications networks, activities, or processes to resist, absorb, and recover from or adapt to an incident that may cause harm, destruction, or loss of ability to perform mission-related functions.

Option

A financial contract granting the holder the right (but not the obligation) to engage in a future transaction on an underlying security or real asset. The most basic examples are equity call options, which provide the right (but not the obligation) to buy a block of shares at a fixed price for a fixed period; and equity put options, which similarly grant the right to sell a block of shares.

Over-the-Counter (OTC)

A method of trading that does not involve a registered exchange. An OTC trade could occur on purely a bilateral basis or could involve some degree of intermediation by a platform that is not required to register as an exchange. An OTC trade could, depending on the market and other circumstances, be centrally cleared or bilaterally cleared. The degree of standardization or customization of documentation of an OTC trade will depend on whether the trade is cleared and whether it is traded on a nonexchange platform (and, if so, the type of platform).

Primary Dealer

A financial institution that is a trading counterparty of the FRBNY. Primary dealers are expected to participate in open-market operations conducted by the Federal Reserve and to bid on a pro rata basis in all Treasury auctions at reasonably competitive prices.

Private Liquidity Funds

Private liquidity funds are private funds that seek to generate income by investing in a portfolio of short-term obligations in order to maintain a stable net asset value per unit or minimize principal volatility for investors.

Public Debt

All debt issued by Treasury and the Federal Financing Bank, including both debt held by the public and debt held in intergovernmental accounts, such as the Social Security Trust Funds. Public debt does not include debt issued by government agencies other than Treasury.

Qualifying Hedge Fund

A hedge fund that is advised by a Large Hedge Fund Adviser and that has an NAV (individually or in combination with any feeder funds, parallel funds, or dependent parallel managed accounts) of at least $500 million as of the last day of any month in the fiscal quarter immediately preceding the adviser's most recently completed fiscal quarter.

Real Estate Investment Trust (REIT)

An operating company that manages income-producing real estate or real estate-related assets. Certain REITs also operate real estate properties in which they invest. To qualify as a REIT, a company must have three-fourths of its assets and gross income connected to real estate investment and must distribute at least 90 percent of its taxable income to shareholders annually in the form of dividends.

Regional Banks

Banks with assets between $10 billion and $100 billion and BHCs in category IV from the Federal Reserve's tailoring rule.

Repurchase Agreement (Repo)

The sale of a security combined with an agreement to repurchase the security, or a similar security, on a specified future date at a prearranged price. A repo is a secured lending arrangement.

Risk-Weighted Assets (RWAs)

A risk-based concept used as the denominator of risk-based capital ratios (common equity Tier 1, Tier 1, and total). The total RWAs for an institution are a weighted total asset value calculated from assigned risk categories or modeled analysis. Broadly, total RWAs are determined by calculating RWAs for market risk and operational risk, as applicable, and adding the sum of RWAs for on–balance sheet, off–balance sheet, counterparty, and other credit risks.

Secured Overnight Financing Rate (SOFR)

A broad measure of the cost of borrowing cash overnight, collateralized by Treasury securities. The rate is calculated as a volume-weighted median of transaction-level tri-party repo data, as well as general collateralized financing repo transaction data and data on bilateral Treasury repo transactions.

Securities Lending and Borrowing

The temporary transfer of securities from one party to another for a specified fee and term, in exchange for collateral in the form of cash or securities.

Securitization

A financial transaction in which assets such as mortgage loans are pooled, securities representing interests in the pool are issued, and proceeds from the underlying pooled assets are used to service and repay the securities.

Seed

In AI, a seed is a series of numbers that tells the AI how to generate an output.

Short-term Wholesale Funding

Short-term funding instruments that are not covered by deposit insurance and that are typically issued to institutional investors. Examples include large checkable and time deposits, brokered CDs, CP, Federal Home Loan Bank borrowings, and repos.

Stablecoins

Digital assets that purport to maintain a stable value relative to a national currency or other reference asset or assets.

Swap

An exchange of cash flows with defined terms over a fixed period, agreed upon by two parties. A swap contract may reference underlying financial products across various asset classes, including interest rates, credit, equities, commodities, and foreign exchange.

Swap Dealer (SD)

Any person who (1) holds themselves out as a dealer in swaps, (2) makes a market in swaps, (3) regularly enters into swaps with counterparties as an ordinary course of business for their own account, or (4) engages in any activity causing the person to be commonly known in the trade as a dealer or market maker in swaps. See Section 1a(49) of the Commodity Exchange Act for the definition.

Syndicated Loan

A loan to a commercial borrower in which financing is provided by a group of lenders. The loan package may have a revolving portion, a term portion, or both.

Tri-Party Repo

A repo in which a clearing bank acts as third-party agent to provide collateral management services and to facilitate the exchange of cash against collateral between the two counterparties.

Ultrashort Bond Funds

Ultrashort bond funds are mutual funds that generally invest in fixed-income securities with extremely short maturities (that is, time periods in which they become due for payment). Like other bond funds, ultrashort bond funds may invest in a wide range of securities.

Underwriting Standards

Terms, conditions, and criteria used to determine the extension of credit in the form of a loan or bond.

Variation Margin

Funds that are collected and paid out to reflect current exposures resulting from actual changes in market prices.

Yield Curve

A graphical representation of the relationship between bond yields and their respective maturities.

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9 Endnotes

1 Federal law generally requires that the FDIC resolve failed banks by using the method that would be least costly to the Deposit Insurance Fund (DIF). While insured depositors are made whole, losses may be imposed on uninsured depositors and debt holders. The exception to this requirement is if the Secretary of the Treasury, in consultation with the President, makes an emergency "systemic risk" determination that adherence to the least-cost requirement would have serious adverse effects on economic conditions or financial stability and that an exception would avoid or mitigate such adverse effects. The Secretary's determination must be on the written recommendations of both the FDIC's Board of Directors and the Board of Governors of the Federal Reserve System based on a two-thirds vote of each board. If granted, a systemic risk exception can enable the FDIC to protect uninsured, as well as insured, depositors.

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5 Board of Governors of the Federal Reserve System. *Financial Accounts of the United States – Z.1*. Tables L.219 and L.220 as of Q2 2023. https://www.federalreserve.gov/releases/z1/20230608/z1.pdf.

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21 Inside Mortgage Finance. https://www.insidemortgagefinance.com/.

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23 Ibid.

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26 The Enterprises have longstanding mortgage eligibility guidelines that require every loan sold to them to have the appropriate type(s) and level(s) of property insurance. Guidelines are clearly stated in Freddie Mac's Seller/Servicer Guide, https://guide.freddiemac.com/app/guide/section/8202.1, and in Fannie Mae's Selling Guide, https://selling-guide.fanniemae.com/Selling-Guide/Origination-thru-Closing/Subpart-B7-Insurance/Chapter-B7-3-Property-and-Flood-Insurance/1032998301/B7-3-01-General-Property-Insurance-Requirements-for-All-Property-Types-12-14-2022.htm.

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45 DTCC Solutions LLC, an affiliate of The Depository Trust & Clearing Corporation. This publication includes data licensed from DTCC Solutions LLC, an affiliate of The Depository Trust & Clearing Corporation. Neither DTCC Solutions LLC nor any of its affiliates shall be responsible for any errors or omissions in any DTCC data included in this publication, regardless of the cause and, in no event, shall DTCC or any of its affiliates be liable for any direct, indirect, special or consequential damages, costs, expenses, legal fees, or losses (including lost income or lost profit, trading loses and opportunity costs) in connection with this publication.

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53 The vulnerability of these funds to investor runs is also partly dependent on the composition of the funds' investor base. For example, bank-sponsored STIFs primarily consist of retirement fund assets, and retirement investors may be less likely to make withdrawals during periods of market stress, given retirement plan rules.

54 The $310 billion figure reflects STIF AUM reported on FFIEC call reports. Some state-chartered non-depository institutions offering STIFs are not required to report STIF AUM on FFIEC call reports. However, these institutions may be required by some states to file Call Reports that are not made publicly available.

55 For the purposes of this report, digital assets include central bank digital currencies (CBDCs) and crypto-assets. Definitions and other descriptions used throughout section 3.1.5 of this report do not have any legal effect and create no rights or obligations. Other reports published by the members of the Council may use different definitions or taxonomies.

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58 See Digital Asset Report, p. 43: "Operational vulnerabilities involve key market activities or infrastructure that are likely to be disrupted in a response to a shock, such as a malicious attack or some other unexpected development."

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62 Curve Finance purports to be a DeFi protocol.

63 CRV represents approximately .04 percent of total crypto-asset market value, as of September 25, 2023.

64 As of September 25, 2023, the price of CRV is $0.52, which is down from the Sept. 1, 2022, CRV price of $1.15. CoinMarketCap, CRV. Accessed August 30, 2023, https://coinmarketcap.com/currencies/curve-dao-token.

65 The details surrounding the hack highlight cybersecurity risks associated with protocols in the crypto-asset ecosystem. Several pools on Curve Finance that use Viper programming language, which is similar to Python, contained issues that made some Curve Finance smart contracts vulnerable to reentrancy attacks, where a function is called recursively before a balance is recalculated, allowing an attacker to exploit a vulnerability in a smart contract's code. Viper is a widely used Web3 programming language, so the bug in three of its versions could threaten several other protocols. See Kessler, Sam, Danny Nelson, and Shaurya Malwa. 2023. "Curve Finance Drained of $50M While CRV Token Sinks 12% in Latest DeFi Exploit." CoinDesk (July 30, 2023, updated July 31, 2023). https://www.coindesk.com/business/2023/07/30/curve-finance-exploit-puts-100m-worth-of-crypto-at-risk/.

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95 Ibid.

96 Ibid, p. 12.

97 Ibid, p. 12-13.

98 Ibid, p. 14.

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145 In the case of Signature Bank, high reliance on uninsured deposits and broader concurrent concerns about banks with business related to digital assets were more critical than unrealized losses in the bank's securities portfolio.

146 The survey is available on the Federal Reserve website at https://www.federalreserve.gov/data/sloos.htm.

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150 Regional banks tend to have higher duration gaps—measures of the sensitivity of banks' equity positions to changes in interest rates—than larger banks, meaning that the potential for future rate increases could lead to material fair-value losses on long-duration assets.

151 See the interagency guidance: Office of the Comptroller of the Currency, Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, and National Credit Union Administration. *Prudent Commercial Real Estate Loan Accommodations and Workouts*. Notice, Washington, D.C.: OCC, Federal Reserve, FDIC, NCUA, 88 Federal Register 43115 (July 6, 2023). https://www.federalregister.gov/documents/2023/07/06/2023-14247/policy-statement-on-prudent-commercial-real-estate-loan-accommodations-and-workouts.

152 The exact cost of the resolution of SVB and Signature Bank will be determined when the FDIC terminates the receiverships. The FDIC's current estimated loss is approximately $17.8 billion from the failure of SVB and $0.9 billion from the failure of Signature Bank. See Special Assessment Pursuant to Systemic Risk Determination Final Rule, November 16, 2023, https://www.fdic.gov/news/board-matters/2023/2023-11-16-notational-fr-b.pdf. For earlier estimates and other details, see: FDIC Chairman's testimony from May 18, 2023, https://www.fdic.gov/news/speeches/2023/spmay1723.html#_ftn11, as well as: Federal Deposit Insurance Corporation. "Subsidiary of New York Community Bancorp, Inc., to Assume Deposits of Signature Bridge Bank, N.A., from the FDIC." Press Release, March 19, 2023: FDIC. https://www.fdic.gov/news/press-releases/2023/pr23021.html, and Federal Deposit Insurance Corporation. "First–Citizens Bank & Trust Company, Raleigh, NC, to Assume All Deposits and Loans of Silicon Valley Bridge Bank, N.A., from the FDIC." Press Release, March 26, 2023: FDIC. https://www.fdic.gov/news/press-releases/2023/pr23023.html.

153 For more details, see Federal Deposit Insurance Corporation. "JPMorgan Chase Bank, National Association, Columbus, Ohio Assumes all the Deposits if First Republic Bank, San Francisco, California." Press Release, May 1, 2023: FDIC. https://www.fdic.gov/news/press-releases/2023/pr23034.html.

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155 On September 18, 2023, the Federal Reserve, OCC, and FDIC requested comment on a proposal to increase the strength and resilience of the banking system. The proposal would modify large bank capital requirements to better reflect underlying risks and increase the consistency of how banks measure their risks. Additionally, 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.

156 Federal Deposit Insurance Corporation. *Special Assessment Pursuant to Systemic Risk Determination*. Final Rule, Washington, D.C.: 12 CFR Part 327 FDIC, RIN 3064-AF93 (November 16, 2023). https://www.fdic.gov/news/board-matters/2023/2023-11-16-notational-fr-b.pdf.

157 Certain plans are also required to provide resolution strategies that (1) are not dependent on over-the-weekend sale, (2) contemplate the establishment of a bridge depository institution, and (3) identify franchise components that can be separated and sold, thereby expanding the options available to the FDIC upon a bank's failure.

158 Federal Deposit Insurance Corporation. *Options for Deposit Insurance Reform*. Washington, D.C.: FDIC, 2023. https://www.fdic.gov/analysis/options-deposit-insurance-reforms/report/options-deposit-insurance-reform-full.pdf.

159 Aggregate gross asset value of hedge funds reporting to the SEC on Form PF. SEC Q1 2023 Form PF Statistics Report available at: https://www.sec.gov/files/investment/private-funds-statistics-2023-q1.pdf. SEC Q1 2018 Form PF Statistics Report available at: https://www.sec.gov/divisions/investment/private-funds-statistics/private-funds-statistics-2018-q1.pdf.

160 On-balance sheet leverage, or "financial leverage," refers to borrowing through loans, bonds, repurchase and securities lending agreements, and other securities financing transactions. Off-balance sheet leverage, or "synthetic leverage," refers to using instruments (such as derivatives) to create exposures whose value depends on an underlying asset.

161 SEC Q1 2023 Form PF Statistics Report, available at: https://www.sec.gov/files/investment/private-funds-statistics-2023-q1.pdf.

162 For a more detailed discussion of Archegos, see the Council's *2022 Annual Report*, p. 44 and 81. https://home.treasury.gov/system/files/261/FSOC2022AnnualReport.pdf.

163 SEC Q1 2023 Form PF Statistics Report, available at: https://www.sec.gov/files/investment/private-funds-statistics-2023-q1.pdf; SEC Q1 2018 Form PF Statistics Report, available at: https://www.sec.gov/divisions/investment/private-funds-statistics/private-funds-statistics-2018-q1.pdf.

164 The Treasury cash-futures basis trade is a fixed-income arbitrage trading strategy whereby funds try to capture the spread between the implied repo rate and general repo rates over the term of the trade. Entering into this trade involves selling a Treasury futures contract, buying a Treasury security deliverable into that contract with repo funding from dealer intermediaries, and delivering the security at contract expiry.

165 The term qualifying hedge funds, as defined by the SEC, refers to any hedge fund that is advised by a Large Hedge Fund Adviser and that has an NAV (individually or in combination with any feeder funds, parallel funds, or dependent parallel managed accounts) of at least $500 million as of the last day of any month in the fiscal quarter immediately preceding the adviser's most recently completed fiscal quarter. On the relationship among qualifying hedge funds' activity in short-term funding markets and the U.S. Treasury market and the Treasury cash-futures basis trade, see: Barth, Daniel, and Kahn, R. Jay, "Hedge Funds and the Treasury Cash-Futures Disconnect." OFR WP 21-01, Washington, D.C.: Office of Financial Research, April 2021. https://www.financialresearch.gov/working-papers/files/OFRwp-21-01-hedge-funds-and-the-treasury-cash-futures-disconnect.pdf; and Banegas, Ayelen, Monin, Phillip, and Petrasek, Lubomir. "Sizing Hedge Funds' Treasury Market Activities and Holdings." FEDS Notes. Washington, D.C.: Board of Governors of the Federal Reserve System, October 6, 2021. https://www.federalreserve.gov/econres/notes/feds-notes/sizing-hedge-funds-treasury-market-activities-and-holdings-20211006.html.

166 The growth of funds' net short positioning has been concentrated in the 2-, 5-, and 10-year Treasury futures contracts.

167 See the Council's statement on Nonbank Financial Intermediation, February 4, 2022. https://home.treasury.gov/news/press-releases/jy0587.

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169 Retail investors have driven the recent inflow into prime funds; between September 30, 2022, and September 30, 2023, retail prime MMFs saw inflows of $321 billion while institutional prime MMFs saw outflows of $24 billion.

170 SEC. *Money Market Fund Statistics Report*. September 2023. https://www.sec.gov/files/mmf-statistics-2023-09.pdf.

171 Investment Company Institute. September 2023. https://www.ici.org/research/stats/trends.

172 CIFs are subject to a different regulatory regime than open-end funds. By statute, CIFs are not required to be registered under the federal securities laws. CIFs must be administered by banks acting as fiduciaries, are subject to regulation and prudential oversight by banking regulators, and are limited to eligible bank fiduciary accounts and retirement plans. CIFs are also subject to applicable federal tax law requirements and, to the extent that they hold applicable retirement plan investments, Employee Retirement Income Security Act (ERISA) obligations.

173 These data may significantly underestimate the CIF AUM because uninsured state nonmember trust banks are not required to file publicly available Call Reports and are therefore not included in these figures.

174 CIFs are exempt from federal securities law registration, disclosure, and uniform data-reporting requirements imposed on open-end funds. Federal securities laws also impose other requirements on open-end funds that do not apply to CIFs, although the antifraud provisions of the securities laws still apply to CIF.

175 Board of Governors of the Federal Reserve System. *Financial Accounts of the United States – Z.1*. Table L.117 as of Q2 2023. https://www.federalreserve.gov/releases/z1/.

176 Ibid. Table L.118 as of Q2 2023.

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180 See the discussion of Central Counterparties on p. 87 of Part One: Risks to U.S. Financial Stability: Office of Financial Research. *Annual Report 2023*. Washington, D.C.: OFR, 2023. https://www.financialresearch.gov/annual-reports/files/OFR-AR-2023_web.pdf.

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182 Casanova-Aizpun, Fernando, Loïc Lanci, Roman Lechner, Arnaud Vanolli, and Li Xing. *sigma 3/2023: World Insurance: Stirred, and not Shaken*. Swiss Re Institute, July 10, 2023. https://www.swissre.com/institute/research/sigma-research/sigma-2023-03.html.

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184 Under statutory accounting, most fixed-income securities are carried at book value, and the accounting treatment is similar to that of banks' held-to-maturity investment portfolios and loans. However, in statutory accounting for life insurers, the Interest Maintenance Reserve (IMR) captures the realized capital gains and losses resulting from changes in the general level of interest rates. These gains and losses are amortized into investment income, thereby reducing the volatility of reported earnings and capital. Therefore, upon the sale of long-term fixed-income securities with unrealized losses due to changes in interest rates, the insurer would generally not recognize the full losses. Negative IMR means that net realized interest-related losses are greater than net realized interest-related gains. From the standpoint of reserve adequacy, the inclusion of a negative IMR balance appropriately reduces the investment income in asset adequacy testing. Without the inclusion of negative IMR, reserve inadequacies would potentially not be recognized.

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188 Ibid.

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190 National Association of Insurance Commissioners. "Regulatory Considerations Applicable (But Not Exclusive) to Private Equity (PE) Owned Insurers." Washington, D.C.: NAIC, 2022. https://content.naic.org/sites/default/files/inline-files/List%20of%20MWG%20Considerations%20-%20PE%20Related%20and%20Other.pdf.

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benchmark transition.pdf (europa.eu). See also the Final Compromise text for MiFIR (October 2023), https://www.consilium.europa.eu/en/press/pressreleases/2023/06/29/capital-markets-union-council-and-parliament-agree-on-proposal-to-strengthen-market-data-transparency/.

195 U.S. House of Representatives, Office of the Law Revision Counsel. “United States Code, Title 12 – Banks and Banking, Chapter 55 – Adjustable Interest Rate (LIBOR), Sections 5801-5807.” https://uscode.house.gov/view.xhtml?path=/prelim@title12/chapter55&edition=prelim.

196 Confidentiality is roughly equivalent to privacy. Confidentiality measures are designed to prevent sensitive information from unauthorized access attempts. It is common for data to be categorized according to the amount and type of damage that could be done if it fell into the wrong hands. More or less stringent measures to protect that information can then be implemented according to those categories.

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Industry Implementation Playbook." New York, NY: SIFMA, Revised April 2023. https://www.sifma.org/wp-content/uploads/2022/08/T1_Industry_Implementation_Playbook.pdf.

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