FSOC

Financial Stability Oversight Council

2024 ANNUAL REPORT

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 6, 2024.

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

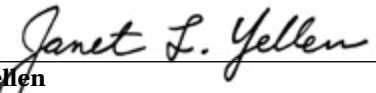
The Honorable Hakeem Jeffries
Democratic Leader
United States House of Representatives

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

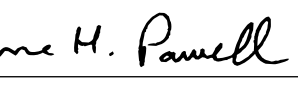
The Honorable Charles E. Schumer
Majority Leader
United States Senate

The Honorable Mitch McConnell
Republican Leader
United States Senate

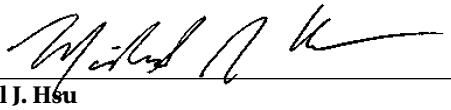
In accordance with Section 112(b)(2) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, for the reasons outlined in the annual report, I believe that additional actions, as described below, should be taken to ensure financial stability and to mitigate systemic risk that would negatively 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



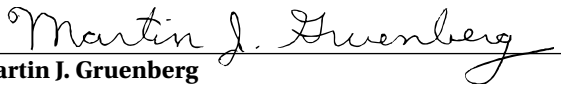
Jerome H. Powell
Chair
Board of Governors of the Federal Reserve System



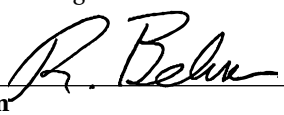
Michael J. Hsu
Acting Comptroller of the Currency
Office of the Comptroller of the Currency

Rohit Chopra
Director
Consumer Financial Protection Bureau

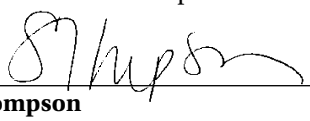
Gary Gensler
Chair
Securities and Exchange Commission



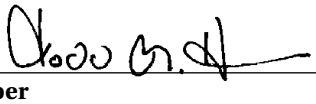
Martin J. Gruenberg
Chairman
Federal Deposit Insurance Corporation



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

Congress established the Council 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. To that end, the Council reports to Congress each year on potential and emerging threats to financial stability and makes recommendations to enhance the integrity, efficiency, competitiveness, and stability of domestic financial markets; to promote market discipline; and to maintain investor confidence. This report presents the Council's assessment of the most salient risks to U.S. financial stability, provides the Council's recommendations for mitigating those risks, and summarizes the activities of the Council and member agencies to address current and potential threats to U.S. financial stability.

The Council's Analytic Framework for Financial Stability Risk Identification, Assessment, and Response (Analytic Framework) interprets financial stability to mean "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."[1] A financial system as vibrant and diverse as the United States' will have similarly diverse risks—a fact demonstrated by the topics in this report, which range from real estate to digital assets. This year, the Council has identified financial vulnerabilities in 14 areas divided into three broad categories: financial risks, financial institutions, and market structure or other operational or technological factors.

The U.S. economy has continued to grow at a solid pace in 2024, even as inflation has come down substantially. Real gross domestic product (GDP) rose 2.3 percent in the first half of 2024, following a robust 3.2 percent rise over the four quarters of 2023. The labor market remains strong, though recent data suggest some cooling in employment growth. The unemployment rate was 4.1 percent in October. Inflation has eased significantly from its mid-2022 peak and is trending toward the Federal Open Market Committee's (FOMC's) target. The FOMC kept the effective federal funds rate flat for the first half of 2024 but began easing in September.

Financial asset prices rose in 2024, but valuations of some assets are elevated relative to fundamentals. For instance, the Standard & Poor's (S&P) 500 index rose by more than 20 percent in 2024 through September, and its price-to-forward earnings ratio stands above typical historical levels. Corporate bond risk spreads remained narrow over the same period. Bond markets have experienced strong returns, with the Bloomberg Barclays U.S. Aggregate Bond Index increasing by around 4 percent for the year through September 30, 2024.

Household finances showed continued resilience in 2024, as many have benefited from the rising stock market and house prices in recent years. But pockets of weakness have begun to emerge for lower-income households. Post-pandemic inflation and the associated rise in interest rates have increased costs. Some consumer loan delinquency rates are rising and now match or exceed pre-pandemic levels.

Global economic activity slowed through the first half of 2024, and unemployment rates crept up in some countries amid tight financial conditions. Overall, the International Monetary Fund (IMF) expects global growth to remain at 3.2 percent in the coming years, below the historical (2000–19) annual average of 3.8 percent. As inflation has moderated, central banks in most advanced foreign economies also have been easing monetary policy this year. These relatively weaker global economic conditions could weigh on conditions domestically, though many other factors are at play.

Against this backdrop of stable economic growth, the financial sector overall performed well and is supporting credit provision. Nonetheless, financial risks in some areas are elevated. For example, commercial real estate (CRE) credit conditions in the banking sector are weakening, and leverage in private funds and insurance companies is growing. As highlighted by several high-profile adverse events this year, operational risks, like cybersecurity and third-party risks, remain significant.

The remainder of this Executive Summary provides an overview of vulnerabilities to financial stability identified by the Council and associated recommendations to address those vulnerabilities as well as a summary of Council activities over the past year.

Vulnerabilities and Recommendations

The Council has identified financial vulnerabilities in 14 areas in this report. At a high level, these risks to U.S. financial stability are similar to last year. However, some of the vulnerabilities have evolved in consequential ways, as described below.

Financial Risks

Commercial Real Estate

Signs of increasing CRE credit risk became more evident in 2024, with a continued rise in vacancies, slower rent growth, and increased borrowing costs. These pressures on borrowers have led to increased delinquencies, loan losses, and provision expenses for banks.

Office properties remain the most concerning subsector, with vacancy rates reaching 10-year highs due to structural changes in office use related to remote work. Office properties in large urban metro areas are experiencing the most stress, suggesting the larger financial institutions likely to hold these loans may face particularly elevated risks. However, these banks generally have much lower exposure relative to their capital and allowance levels, suggesting they may be positioned to absorb higher losses.

Prices of commercial mortgage-backed securities (CMBS) also reflect the weakness in the CRE market. A AAA-rated tranche of a private label CMBS experienced a loss in May (discussed in **Box B: Losses to AAA-Rated Commercial Mortgage-Backed Securities**), which marked the first loss experienced by a CMBS tranche originally rated AAA since the global financial crisis (GFC).

Risks to the multifamily subsector have also emerged this year. Multifamily property values have fallen significantly from their highs, with elevated vacancy rates and significant increases in supply in some markets. Higher expenses and slowing revenues are weighing on net operating income and, in some cases, may negatively affect borrowers' ability to repay. Properties in markets with an oversupply or notable shares of rent-regulated units, where rising costs have outpaced rent growth, are especially at risk.

In light of these risks, the Council recommends that regulators continue to focus on the financial industry's ability to withstand CRE stress from declines in property prices and loan quality. Exposure among CRE industry participants can also be interconnected, which could cause added stress. Therefore, the Council recommends that member agencies ensure that financial institutions continue to monitor these correlated risks in their risk management and contingency planning.

Residential Real Estate

Housing prices remain high relative to household incomes, and growth in house prices continues to outpace income growth. A low supply of housing has been an important contributor to higher prices. Estimates of the U.S. housing stock shortage—single-family and multifamily combined—range from 1.5 million to 5.5 million units, as population growth has continuously outpaced net additions to the housing stock for many years.

Nonbank mortgage companies (NMCs) present a transmission mechanism through which a shock might be spread and amplified to the financial sector. As mortgage servicers, NMCs conduct a wide range of loan administration duties for borrowers, guarantors, insurers, and investors. NMCs owned the servicing rights on 54 percent of all mortgage balances in 2022 and serviced mortgages collateralizing over 60 percent of all agency-backed securities and over 80 percent of securities in Government National Mortgage Association (Ginnie Mae) programs in 2023. Stress in the nonbank mortgage sector could lead to disorderly servicing transfers; a stressed nonbank mortgage servicer may fail to apply collections properly, make required advances, mitigate losses, or perform other servicing activities.

In its Report on Nonbank Mortgage Servicing, released in May of this year, the Council made recommendations to enhance the resilience of the nonbank mortgage servicing sector, drawing on existing authorities of state and federal regulators and encouraging Congress to address the risks identified in the report. The Council fully

reaffirms the recommendations in that report, in addition to its other recommendations related to residential real estate.

Corporate Credit

Corporate fundamentals have remained resilient overall, due in part to positive earnings growth and moderate debt growth. Private credit, defined for the purposes of this report as direct lending by nonbank financial institutions to businesses, has grown rapidly in recent years. The private credit market has become an increasingly important source of funding for small and mid-size firms and only limited information on these firms' nonbank borrowing is available to regulators or the public. In addition, the opaque nature of private credit lenders makes it difficult for regulators to assess risk management practices and the build-up of risks in the sector. Rising interconnections with banks and insurance companies, limited transparency around private credit valuations, and increased retail investor participation in the industry via semi-liquid investment vehicles may indicate expanding risks and are areas of focus for the Council. The Council supports enhanced data collection on private credit to provide additional insight into the potential risks associated with the rise in private credit.

Short-Term Funding Markets

Short-term funding markets are a large, complex part of the U.S. financial system, playing a critical role in implementing monetary policy and supporting financial market liquidity. However, these markets have experienced bouts of heightened volatility during periods of market stress and have historically been vulnerable to runs. Accordingly, the Council has worked to strengthen the resilience of short-term funding markets and support orderly market functioning during periods of heightened market stress.

The money market fund (MMF) industry has changed substantially over the last several years. In August 2023, the SEC finalized amendments to MMF rules to improve MMFs' resilience during times of market stress. Although total assets at prime institutional MMFs have declined in anticipation of the implementation of these reforms, prime retail MMFs continue to receive inflows; total assets in prime retail MMFs stood at a record $813 billion in August 2024, while prime institutional assets under management fell to a seven-year low of $350 billion. In addition to these shifts, and in contrast to the previous several years, MMF investments have increasingly moved out of the Federal Reserve's Overnight Reserve Repurchase Agreement Facility (ON RRP). As private sector repo rates began trading above the ON RRP rate, ON RRP balances fell from their peak of over $2.5 trillion in 2023 to less than $0.5 trillion by mid-2024.

In addition to MMFs, other short-term investment vehicles (STIVs) warrant monitoring. Some types of STIVs have a significantly larger share of assets invested in credit-sensitive assets relative to U.S. prime institutional MMFs and operate with a stable net asset value (NAV). The Council will continue to assess and monitor the vulnerabilities from other STIVs, considering what actions may be appropriate to address potential vulnerabilities. Where lack of data prevents effective monitoring of financial stability risks, Council members should consider where it may be appropriate to collect the necessary data regarding STIVs and primary and secondary market transactions for short-term funding instruments.

Digital Assets

Though the market value of the crypto-asset ecosystem remains small compared with traditional financial markets, it has continued to grow. As of July 2024, the total global market value of crypto-assets was just under $2 trillion, while the S&P 500's market cap was $48 trillion. However, the listing of new crypto-asset exchange traded products (ETPs) has made crypto-assets more available to investors. The total market value for spot crypto-asset ETPs has reached close to $80 billion since the SEC approved the listing and trading of several crypto-asset ETPs in January. Connections to the broader financial system, especially via stablecoins, also warrant continued attention.

As the Council has stated over the last several years, stablecoins continue to represent a potential risk to financial stability because they are acutely vulnerable to runs absent appropriate risk management standards. This run risk is amplified by issues related to both market concentration and market opacity. First, the stablecoin market is heavily concentrated, with a single firm hold-

ing around 70 percent of the sector's total market value. Given that firm's market dominance, if it continues to grow, its failure could disrupt the crypto-asset market and create knock-on effects for the traditional financial system. Second, stablecoin issuers operate outside of, or in noncompliance with, a comprehensive federal prudential framework. Although a few are subject to state-level supervision requiring regular reporting, many provide limited verifiable information about their holdings and reserve management practices. This opacity poses a challenge for effective market discipline and increases the risk of fraud. Regulatory requirements for reserves, capital, and reporting would help mitigate these risks.

The Council recommends that Congress pass legislation creating a comprehensive federal prudential framework for stablecoin issuers to address run risk, payment system risks, market integrity, and investor and consumer protections, including for entities that perform services critical to the functioning of the stablecoin arrangement. However, as the Council noted previously, if comprehensive federal legislation is not enacted, Council members remain prepared to consider steps available to them to address risks related to stablecoins.

Additionally, many crypto-asset market firms and issuers remain outside of, or in noncompliance with, the U.S. financial regulatory framework. As such, the crypto-asset spot market may continue to experience significant fraud and manipulation. The Council recommends that Congress pass legislation that provides federal financial regulators with explicit rulemaking authority over the spot market for crypto-assets that are not securities.

Climate-Related Financial Risks

By its nature, climate change occurs on a long timescale relative to financial markets. However, the Council has taken steps to better understand climate-related financial stability concerns and amplification channels. Council member agencies are improving their understanding of how climate change manifests as traditional financial risks. The Council recommends that state and federal agencies continue to coordinate on developing a framework to identify and measure climate-related financial risk, including by iteratively identifying a preliminary set of risk indicators.

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. On average nationwide, homeowners saw double-digit percentage rate increases in 2023, with several states experiencing effective rate increases over 20 percent, though many non-climate-related factors also contributed to this rise. In some cases, residual insurance alternatives or government-sponsored insurance programs such as the National Flood Insurance Program have stepped in where private insurance coverage is insufficient. However, some residual insurance alternatives may incur losses and expenses that exceed earned premiums, potentially affecting the availability and affordability of insurance.

Higher insurance costs could drive homeowners to underinsure against growing climate-related financial risks. Some homeowners without mortgages choose to go entirely without coverage. In 2023, an estimated 12 percent of homeowners did not purchase home insurance due to high costs or a lack of availability. Mortgage defaults from uninsured damages could push losses into other parts of the financial system, including to mortgage originators, mortgage servicers, mortgage-backed securities purchasers, and providers of risk mitigation products. The Council recommends that agencies collaborate on analysis related to how the intersection of physical risk, real estate, and insurance may affect financial stability.

Financial Institutions

Depository Institutions

While risks to financial institutions persist, depository institutions did not experience the acute turmoil in 2024 that they did in the spring of 2023. The U.S. banking and credit union systems as a whole remained resilient, supported by sound levels of regulatory capital, adequate liquidity buffers, and healthy profitability. However, areas of potential vulnerability warrant continued monitoring. Funding costs remain high relative to the previous decade, compressing institutions' net interest margins (NIMs). As in 2023, CRE exposure remains in focus, particularly in the office and multifamily segments of the market. Further, the

performance of certain consumer loans has continued to worsen at banks as well as credit unions, surpassing pre-pandemic benchmarks.

The largest U.S. banks (those with more than $250 billion in assets) are generally well-capitalized and therefore positioned to withstand negative economic shocks without unduly restraining the availability of credit to the economy. Profitability at these banks is roughly in line with levels in the past 10 years, if somewhat lower than in 2023.

Regional banks (defined here as those with between $10 billion and $100 billion in assets) appeared more stable this year than in 2023. However, in early 2024, an earnings announcement by a regional bank briefly led to concerns about the potential for renewed instability in the banking sector. Although market volatility subsided relatively quickly, the episode reinforced the importance of strong liquidity and credit risk management. Since March 2023, banks have been working to enhance access to liquidity, including by establishing access to the discount window and pledging additional collateral. The Council recommends that supervisors encourage institutions to engage in effective liquidity management and planning, including by making sure they can access contingent liquidity facilities. The Council also encourages the banking agencies to finalize a proposal to improve the resilience and resolvability of certain large banking organizations by requiring them to maintain outstanding long-term debt that can provide additional loss protection for depositors, the Deposit Insurance Fund, and general unsecured creditors, among others, in resolution. The Council also encourages efforts to complete the Basel III reforms to further enhance the resilience of the banking system.

One of the core functions of the Federal Home Loan Bank (FHLBank) System is to act as a stable and reliable source of funding for its members, including depository institutions. In November 2023, the Federal Housing Finance Administration (FHFA) published the *FHLBank System at 100: Focusing on the Future Report*. The report emphasizes that while FHLBanks have a role in providing secured advances (loans) to members, they must not be solely relied on by members in periods of broad stress. FHLBanks do not have functional capacity to meet the needs of multiple large members that have significant borrowing needs over a short period.

Some credit unions, like other depository institutions, have found the combination of high rates, rising consumer delinquency rates, and CRE stresses challenging. Nevertheless, credit unions in the aggregate remain resilient and well capitalized. Likewise, the net interest margin for credit unions has remained steady. In certain ways, credit unions' exposure to current economic challenges differs from banks given their distinct portfolios. For instance, credit unions overall are much less exposed to the CRE market than commercial banks of similar size. Further, a much lower portion of their deposits are uninsured, which mitigates the risk of a material deposit flight during times of economic and financial stress.

Investment Funds

The Council has identified vulnerabilities within several categories of investment funds, including hedge funds, open-end funds, and collective investment funds (CIFs).

The hedge fund sector is a large and growing sector of the financial services industry, and hedge funds play a prominent role in a variety of financial markets. During the past five years, the hedge fund industry grew from $6.7 trillion as of the second quarter of 2019 to $9.6 trillion as of the second quarter of 2024, including growth in repo and prime brokerage borrowing.[2] Some hedge funds, such as some relative value and macro-focused funds, use significant leverage to achieve their investment objectives. In addition, leverage metrics for macro and multi-strategy-focused funds have risen considerably over the past several years.

The continued growth of leverage in the Treasury market, including through the basis trade, represents a risk to financial stability. Over the past two years, asset managers have increased their holdings of long Treasury futures, causing futures to trade at a premium to cash Treasury securities. To offset the resulting premium in futures, hedge funds take short positions in Treasury futures hedged with long positions in Treasury securities financed by repo, exposing them to the risks related to a breakdown in historical correlations or adverse funding shocks. A disorderly unwinding of

leveraged positions could pose a financial stability risk if fund liquidations contribute to a disruption in market functioning, as they did in March 2020. The Council supports initiatives by the SEC and other agencies to establish greater transparency in hedge funds, including data collection improvements for Form PF, and supports the ongoing work of the relevant banking supervisors to improve banks' counterparty credit risk management practices with respect to hedge funds.

Some types of open-end funds may invest in assets that may not be easily sold, resulting in a liquidity mismatch that can generate stresses if such investments represent a large portion of the fund's assets relative to net redemptions. During periods of market stress, sales to meet investor outflows could amplify price declines, leading to investment losses and impaired market functioning, potentially amplifying stress for the broader financial system. To enhance open-end fund resilience in periods of market stress, the SEC proposed amendments in 2022 to better prepare open-end funds for stressed conditions and mitigate the dilution of shareholders' interests. These amendments to address first-mover advantages have not yet been finalized, though amendments related to additional fund disclosure were adopted in 2024.

The risks for CIFs may be similar to the risks for open-end funds, depending on the investment strategy of the CIF. CIFs are bank- and trust company-administered funds that may only hold pooled assets of eligible fiduciary accounts. Compared with open-end funds, CIFs face fewer explicit restrictions on illiquid assets and leverage and have less prescriptive reporting requirements. However, their sponsoring banks and trust companies are subject to prudential regulation and oversight, as well as fiduciary duties. Nevertheless, the CIF market is large. Banks and trust companies filing Call Reports reported $5 trillion in CIF assets under management as of year-end 2023, and this represents only a subset of total CIF assets. The Council recommends that both state and federal regulators continue to consider requirements for greater transparency and more detailed and timely regulatory reporting by CIFs. The Council and state and federal regulators should also consider what steps are needed to address financial stability risks from open-end funds and CIFs.

Central Counterparties

Central counterparties (CCPs) engage with the parties in a financial transaction, which leads to the creation of two corresponding contracts with the CCP, wherein the CCP acts as buyer to the seller and seller to the buyer. This role in facilitating contracts makes CCPs key nodes within the global financial system. Consequently, CCPs also introduce potential 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.

Although CCP failures have been historically 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. The Council supports the CFTC's, Federal Reserve's, and SEC's continued efforts to enhance their oversight of the five CCPs designated by the Council as systemically important financial market utilities (FMUs). The 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. These plans are vitally important because the disorderly failure of a systemically important CCP could create serious financial stability concerns for the United States. The Council supports continued focus by the agencies on operational resilience of CCPs including the introduction of stress testing for non-default losses in addition to stress testing for default losses.

Insurance Sector

In the insurance sector, ongoing shifts toward nontraditional assets and liabilities and offshore reinsurance have accelerated over the past year, especially within life insurance. Life insurers' holdings of nontraditional assets, such as private credit, grew more rapidly this year after years of steady growth. The life insurance sector has also been increasing its use of nontraditional liabilities, like greater borrowing from capital markets and from FHLBanks. Finally, life insurers are increasingly using offshore reinsurers due in part

to their less stringent regulatory requirements, tax policies, and accounting conventions.

These changes carry at least two financial stability concerns. First, life insurers have been accumulating balance sheet risks, such as lower-quality investments and state-contingent funding risk. Second, the sector has become more interconnected—both internally and with the rest of the financial system—while increasingly relying on offshore reinsurers, which may have less stringent regulatory and accounting standards. The Council recommends that FIO, the National Association of Insurance Commissioners (NAIC), and state insurance authorities work with member agencies to further evaluate the potential impact of the identified structural changes within the insurance industry on systemic risk and associated financial stability considerations. To better understand possible risks, the Council encourages state insurance authorities and the NAIC to work toward greater disclosure of private market investments and offshore reinsurance in statutory financial reporting, and to consider whether enhancements in supervisory tools and processes related to ratings assessment of, and risk-based capital charges for, such assets should be required.

Financial Market Structure, Operational Risk, and Technological Risk

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. While the market has experienced several episodes of abrupt deterioration in market functioning in the past decade, Treasury market liquidity was resilient through various bouts of interest rate volatility this year.

The history of 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. Continued growth of Treasury debt outstanding makes it important that liquidity provision is sufficient in meeting liquidity demand during periods of market stress. The Council supports the work of the Inter-Agency Working Group for Treasury Market Surveillance (IAWG) and recommends that member agencies continue studying and implementing policies to improve the resilience of the Treasury market, including by improving data quality and availability.

Cybersecurity

Potentially destabilizing cyber incidents continue to play a large role in discussions among federal agencies and private sector groups. Although cyber incidents have not had significant systemic effects thus far, severe incidents at major financial institutions could pose an acute threat to financial stability given the high degree of interconnectedness among global financial institutions and systems.

The number of global cyber attacks has almost doubled since before the COVID-19 pandemic. A significant cyber attack, if successful, has the potential to disrupt operations, challenge access to liquidity, increase the likelihood of bank failures and market dysfunction, and generally erode confidence in the financial system, among other outcomes.

The U.S. financial services sector is more exposed to threats due to ongoing foreign conflicts; cyberwarfare is likely to remain a dimension of major conflicts. The ongoing war in Ukraine, for instance, has led to cyber attacks on the financial services sector of the United States by pro-Russia actors. In addition, regional actors in the Israel-Hamas conflict, including Iran and its proxies, have routinely engaged in cyber attacks against the United States. China has routinely targeted the U.S. financial services sector as an avenue for cyber espionage and intelligence gathering. And in recent years, North Korea has engaged in global cyber operations predominantly against the United States.

Cyber attacks can come in a variety of forms. Ransomware continues to be a prominent threat and has become more frequent in recent years. Insider threats continue to pose a significant risk to the integrity and security of financial institutions. Threat actors have increasingly used technology to spread misinformation, which can undermine confidence in the financial system. Developments in technology can provide new vectors for cyber incidents, with advancements in digital assets, artificial intelligence, and

quantum computing. Cyber insurance can help reduce losses, though there are challenges with the availability of coverage, particularly for catastrophic cyber incidents.

The Council recommends the Financial and Banking Information Infrastructure Committee (FBIIC), Financial Services Sector Coordinating Council (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. Further, the Council encourages the FBIIC to continue working closely with federal and state agencies, the Cybersecurity and Infrastructure Security Agency (CISA), law enforcement, and industry partners to conduct regular cybersecurity exercises that consider interdependencies with other nonfinancial sectors.

The Use of Artificial Intelligence in Financial Services

Council member agencies continue to monitor artificial intelligence (AI) developments in financial services from a microprudential perspective as well as from the broader view of financial stability. While AI has many potential benefits for financial services, it also introduces financial stability concerns. The lack of explainability and the high complexity of AI approaches have the potential to heighten financial instability beyond effects on individual financial actors. Likewise, concentration in models or providers may lead to additional interconnections, herding behavior, and contagion.

The Council recommends member agencies continue to monitor the rapid development of the usage of AI technologies in financial services to ensure oversight structures are updated to address emerging risks to the financial system while facilitating efficiency. The Council supports interagency development of expertise to analyze and monitor potential systemic risks associated with the use of AI in the financial services sector, as well as further interagency discussions on developments in AI and associated financial stability risks. The Council supports efforts led by Treasury, the FBIIC, and the FSSCC to continue cooperation in this area.

Third-Party Service Providers

Risk centered in third-party service providers continues to be a potential threat to financial stability. These providers often play a critical role in financial institutions' delivery of products and services. State and federal banking regulators have observed an increase in the frequency and complexity of arrangements between banks and non-bank entities such as financial technology companies (fintechs).[3] While third-party service providers can be beneficial for many reasons, such as increasing efficiency or system resiliency, their use may also introduce new risks or amplify existing ones. Indeed, state and federal banking agencies have noted a range of potential safety and soundness, compliance, and consumer protection-related concerns with these arrangements. For example, reliance on a third party may reduce a firm's direct control and oversight of its data or systems and make those functions less transparent to both the firm and its regulators.

Financial regulators have varying degrees of authority to supervise third-party service providers. 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. 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.

Council Activities

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.

In 2024, the Council 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. Specific efforts this year include: (1) enhancing the Systemic Risk Committee (SRC), (2) advancing interagency engagement on assessing the implications of AI to financial stability, (3) publishing the Report on Nonbank Mortgage Servicing, (4) conducting a review of the FMUs previously designated by the Council as systemically important, or designated financial market utilities (DFMUs), and (5) progressing in the analysis of climate-related financial risks.

The SRC supports the Council's efforts in identifying risks and responding to risks and emerging threats to the stability of the U.S. financial system. The committee serves as a forum for staff of all member agencies to convene, facilitate information sharing on recent market events, and monitor developments within financial markets. This year, the SRC has been using the Council's Analytic Framework approved by the Council in November 2023. The SRC used the Analytic Framework to discuss vulnerabilities and transmission channels and build a shared understanding among the member agencies regarding risk priorities and financial sector vulnerabilities. To monitor developments that extend beyond an individual agency's jurisdiction, the SRC has also created additional staff-level workstreams, when appropriate, that report to the SRC or Council's Deputies Committee.

The Council identified the increased use of AI in financial services as a vulnerability last year. The SRC promoted interagency engagement to monitor the rapid developments in AI and understand whether oversight structures are keeping up with emerging risks to the financial system. Additionally, the Council co-hosted a Conference on Artificial Intelligence & Financial Stability,[4] which convened experts with a broad array of perspectives on potential systemic risks arising from AI use. Participants from over 75 organizations from the public and private sectors joined the event, many of whom noted the need to balance the benefits of innovation with proportionate risk management.[5]

On May 10, 2024, the Council released its *Report on Nonbank Mortgage Servicing,* which was drafted by Council member agencies in coordination with Ginnie Mae. The report documents the growth of the nonbank mortgage servicing sector and the critical roles nonbank mortgage servicers play in the mortgage market. It identifies certain key vulnerabilities that can impair servicers' ability to carry out these critical functions and describes how these vulnerabilities could amplify shocks to the mortgage market and pose risks to financial stability. The report includes the Council's recommendations to enhance the resilience of the nonbank mortgage servicing sector by drawing on existing authorities of state and federal regulators and encourages Congress to act to address the identified risks.

The Dodd-Frank Act authorizes the Council to designate an FMU as "systemically important" if the FMU's failure or a disruption to its functioning could create, or increase, the risk of significant liquidity or credit problems spreading among financial institutions or markets and thereby threaten the stability of the U.S. financial system. As part of its periodic review undertaken in 2024, the Council concluded that, based on the designation considerations set forth in the Dodd-Frank Act, the designation of the eight DFMUs remains appropriate.

Assessment of climate-rated financial risks continues to be of critical importance to the Council. The Climate-related Financial Risk Committee (CFRC) is developing a framework to identify and measure climate-related financial risks and continues to iterate on a preliminary set of risk indicators. During meetings of the external Climate-related Financial Risk Advisory Committee (CFRAC), members presented on a range of topics, including how climate drivers could ultimately affect financial stability, how vulnerable communities could be affected by insurance policies that seek to price in climate risks, and methodologies and metrics for assessing transition risks.

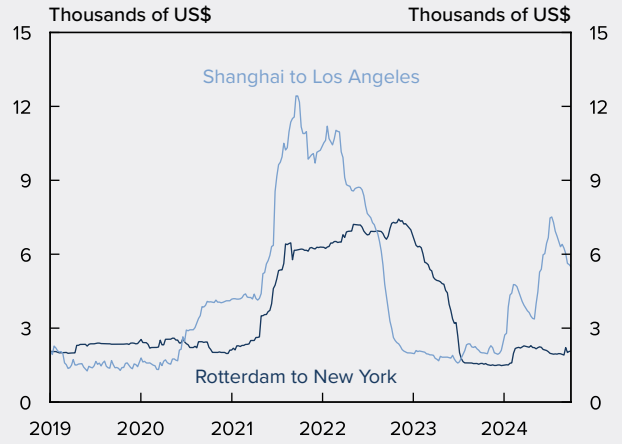
For more information on the Council's priorities and activities in 2024, please refer to **Section 4.1: Council Activities**.

BOX A: Global Economic Conditions

Though resilient over the last two years, global economic activity has been slowing and unemployment rates are creeping up in some countries amid tight financial conditions and elevated, though decelerating, inflation. In Asia, the ailing Chinese property market weighs on consumer spending and manufacturing activity, while Europe's growth rate remains slow, though increasing, following a stagnation in 2023. In response to this weakening growth, easing of labor market conditions, and slowing inflation, central banks in advanced foreign economies (AFEs) have begun easing monetary policy, with the European Central Bank, the Bank of England, and the Bank of Canada cutting policy rates despite above-target inflation at the time of the first rate cut. Conversely, in Japan the central bank raised policy rates in July, as part of its shift toward monetary policy normalization amid above-target inflation. A more hawkish tone in the Bank of Japan's policy, coupled with weaker-than-expected U.S. employment readings, led to a sudden unwinding of yen-financed carry trades and a sharp decline in the Japanese equity market, though the volatility was short lived and has mostly receded, and an appreciation of the Japanese yen. In Latin America, the central bank in Brazil, which started easing policy before its AFE counterparts, has raised rates this year due to concerns about persistently elevated core inflation readings. The vast majority of central banks in emerging Asia have yet to start their easing cycles.

Global inflation developments have been mixed. Although nonfuel commodity prices have cooled, some measures of global shipping costs soared in 2024. Container shipping rates out of Asia jumped in July, reaching about half of their peak levels during the pandemic (see **Figure A.1**). Continued attacks on cargo ships in the Red Sea have lengthened voyages; these attacks, together with an early start of the peak shipping season (likely due to concerns about the resilience of supply chains along with fears about new tariffs), have led to congestion in Asian ports and a shortage of containers.[6] These developments, however, have not spread to other transportation modes and routes. Despite some aviation route disruptions due to Russia's war against Ukraine, container spot prices out of Europe have remained moderate and U.S. import insurance and freight charges that include all modes of transportation have remained flat. Nevertheless, concerns about actual and potential geopolitical risk could continue to affect supply chains and select commodity prices.

A.1 Container Spot Prices



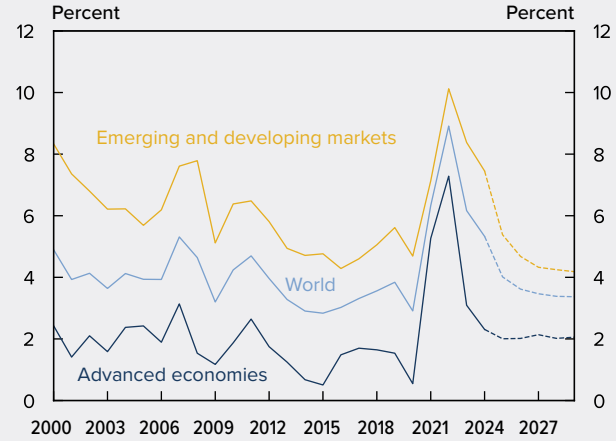
Note: Data as of September 30, 2024.

Source: Drewry Shipping Consultants (Bloomberg).

Moreover, global manufacturing activity has been weak, and other indicators of supply disruptions—such as the Federal Reserve Bank of New York's Global Supply Chain Pressure Index—have remained subdued.[7] Although inflation abroad has declined substantially from its recent peak, the pace of this decline has slowed and is expected to continue slowing (see **Figure A.2**). This moderating decline is both a natural consequence of inflation getting closer to central banks' targets and a consequence of last year's energy price retrenchment no longer exerting downward pressure on prices. Furthermore, some idiosyncratic factors have contributed to an increase in inflationary pressures. These include a run-up in retail food prices in Latin America, higher import prices due to currency depreciations in some foreign economies, and high services inflation—including for shelter prices—in some advanced economies.

BOX A: Global Economic Conditions (continued)

A.2 Global Inflation Rates



Notes: Data as of September 2024. Dashed lines signify IMF forecasts.

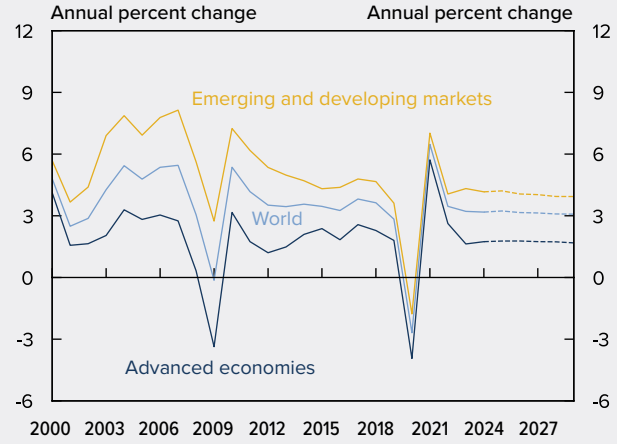
Source: IMF World Economic Outlook (Haver Analytics).

Overall, the International Monetary Fund (IMF) predicts that global inflation will moderate to 3.5 percent by the end of 2025, similar to its pre-pandemic (2017–19) level of 3.5 percent.[8] However, this inflation outlook has significant upside risks. The summer rise in container shipping rates out of Asia could be a harbinger of more widespread and persistent disruptions to global supply chains. Moreover, trade tensions remain elevated following the announcements of tariffs by the United States and the European Union (EU) on Chinese-produced goods. These developments, together with ongoing conflicts in Ukraine and the Middle East, all pose notable risks to global supply chains and energy prices.

At the same time, global growth has slowed. Growth among AFEs has been lackluster, as evidenced by the weak manufacturing activity in Europe. In line with AFEs' sluggish growth, labor markets in these economies have been cooling, with unemployment rates creeping up, though from low levels, even as wage growth remains elevated. In China, growth skidded in the third quarter of 2024 to 4.6 percent year on year, as China announced a fiscal stimulus package to revive their faltering economic growth.[9] This below-target growth occurred as exports retraced some of their hefty gains, the boost from past fiscal stimulus faded, and the ailing property market continued to weigh on household spending. And in Mexico, manufacturing activity has been subdued.[10]

Overall, the IMF expects global growth to remain at 3.2 percent in the coming years (see **Figure A.3**). This forecast is below the historical (2000–19) annual average of 3.8 percent, reflecting low underlying productivity growth. Furthermore, risks to this outlook remain. A harder-than-expected "last mile" of disinflation could weigh on real incomes, delay rate cuts, and adversely affect the balance sheets of households, firms, and governments. An escalation of ongoing conflicts could result in heightened commodity price volatility and supply chain disruptions. China's economy could weaken further due to ongoing issues in the property sector or if the recently announced efforts to bolster the economy do not have their intended effect. Finally, recent elections have highlighted uncertainties about the course of fiscal policy in key foreign economies. These uncertainties could result in a protracted tightening of financial conditions. However, positive indicators include continuing outperformance of the U.S. economy, a strong recovery in investment, and innovation that could lead to stronger productivity growth.

A.3 Growth in Real Global GDP



Notes: Data as of September 2024. Dashed lines signify IMF forecasts.

Source: IMF World Economic Outlook (Haver Analytics).

3 Vulnerabilities, Significant Market Developments, and Council Recommendations

3.1 Financial Risks

3.1.1 Commercial Real Estate

Outstanding mortgage debt in the commercial real estate (CRE) sector totaled $5.9 trillion in the second quarter of 2024, including owner-occupied and nonowner-occupied real estate, multifamily mortgages, and loans backed by acquisition, development, and construction projects.[11] Half of all CRE debt is held by banks, and most banks participate in CRE lending on some level, with smaller banks relying on CRE lending the most. Despite rising borrowing costs, tighter lending conditions, and slower loan growth, bank CRE loans reached a record $3.2 trillion in the second quarter of 2024. Nonbank financial institutions, U.S. government and agency issuers of mortgage debt, insurance companies, pension funds, state and local government funds, and private entities also hold CRE mortgage debt. There are also interconnections across different holders of CRE mortgage debt. For example, banks lend to real estate investment trusts (REITs), other entities, and funds that invest in CRE. Banks, insurance companies, asset managers, hedge funds, private equity companies and other specialized investors also invest in commercial mortgage-backed securities (CMBS) issued by agencies and private entities.

Signs of CRE stress became more pronounced in 2024 after recovering in 2021 and 2022 following the pandemic. Borrowing costs increased, vacancies for some property types continued to rise, and rent growth slowed for certain property types, all of which negatively affect borrowers' repayment capacity. These dynamics are continuing to play out differently across CRE markets and property sectors. Office properties in large urban metros have experienced the most stress, especially due to changes in work location preferences following the pandemic, while office and other property types in suburban markets have been affected more modestly.

Credit stress has also become more evident in CRE loan performance in 2024. Delinquencies, loan losses, and provision expenses have increased among banks. Large banks, those with assets over $100 billion, have experienced more pronounced credit deterioration, while smaller banks that have heightened risk due to higher concentration in CRE have so far experienced more modest credit deterioration. In addition, CMBS markets also experienced rising delinquencies, increased losses, and a decline in issuance in 2023 and 2024. Similarly, many CRE collateralized loan obligations (CLOs) also faced higher delinquency rates in 2024.

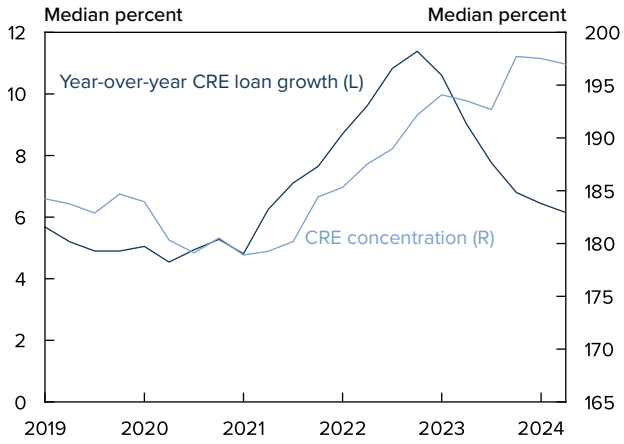
The market outlook for CRE remains challenging, with a substantial volume of office loans and multifamily property loans set to reprice or mature over the next three years.[12] Lower property values and higher debt costs may force CRE borrowers with maturing loans to re-margin either by providing additional collateral or through cash equity injections. In the absence of such equity injections, loans that are set to reprice or mature—especially those with interest-only terms—face potentially challenging refinance or repayment options and increased risk of becoming nonperforming.

The banking system as a whole remains resilient, with most banks experiencing limited stress in their CRE loan portfolios. However, an increase in nonperforming assets could be especially challenging for banks facing liquidity and earnings pressures in the current environment. While CRE loan growth has slowed among banks, banks with high concentrations in this sector continue to present significant risk (see **Figure 3.1.1.1**).

CRE Fundamentals

The forces driving stress in the CRE sector, such as increased borrowing costs, slowing rent growth, weaker net operating income, rising capitalization rates, and declining property values, have played out differently across geographies and property types. Although vacancy rates have continued to rise for many property types (see **Figure 3.1.1.2**), the office sector has experienced the steepest rise in vacancy rates with current vacancy levels exceeding those experienced during the global

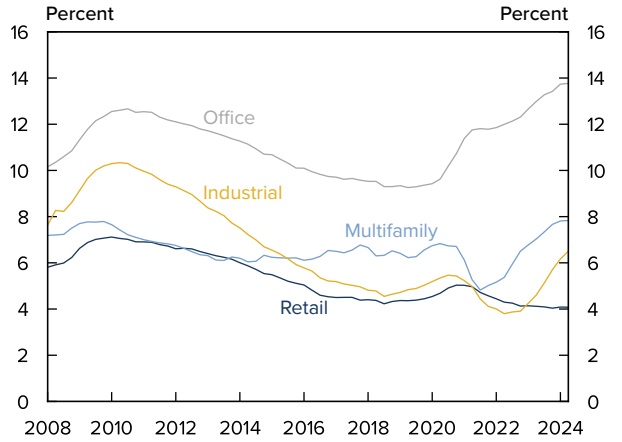
3.1.1.1 CRE Loan Growth and Concentration among FDIC-Insured Institutions



Notes: Data as of 2024:Q2. Commercial mortgage loan growth includes multifamily and nonfarm nonresidential loans but excludes construction loans. CRE concentration is total CRE loans, including construction loans, as a percentage of total capital and the allowance for credit loss.

Source: FDIC.

3.1.1.2 Vacancy Rates by Property Type



Note: Data as of 2024:Q2.

Source: CoStar.

financial crisis (GFC). The rise in remote work has created structural changes in office space use, driving vacancy rates to multicycle highs. The overall office vacancy rate increased from 13.0 percent in the second quarter of 2023 to 13.8 percent in the second quarter of 2024 amid continued negative net absorption, meaning there is a greater amount of space becoming vacant than newly occupied. Although new construction has maintained positive net absorption, older properties are suffering from lack of demand. Office vacancy rates are particularly high in large urban metros, with the vacancy rate in the 20 largest office markets increasing from 14.2 percent to 15.1 percent during the same one-year period.

Net office absorption is expected to remain negative in the coming quarters as tenants continue to reduce or consolidate space as their leases expire. The full effect of this consolidation has yet to materialize, as approximately 45 percent of space leased prior to 2020 has yet to roll over, which may drive up office vacancy rates further.[13] Some obsolete office space has been converted into multifamily units in recent years, but zoning restrictions and concerns about economic feasibility may limit this growth.

Multifamily is also emerging as a risk. The vacancy rate for multifamily properties increased from 7.0 percent in the second quarter of 2023 to 7.8 percent in the second quarter of 2024. The overall vacancy rate is likely at or near its peak, with supply and demand expected to be more balanced in coming quarters. However, some markets have experienced significant increases in supply, particularly the luxury segments of several Sunbelt markets. These markets could take longer to moderate.

Industrial property vacancy rates have also risen from 4.6 percent in the second quarter of 2023 to 6.5 percent in the second quarter of 2024 due to strong supply outstripping modest demand. However, the situation may self-correct within the next 12 months as new construction has slowed substantially.

In contrast with vacancies for other property types, retail vacancies have been largely flat, as new supply has remained low and more in line with demand for space. New construction has focused primarily on build-to-suits, grocery-anchored centers, and smaller spaces. Mall space remains weak, with significantly higher vacancy rates than other retail property types.

Weaker demand for CRE space is also reflected in decelerating rent growth. Rent growth slowed across all major CRE property types throughout 2023 and into 2024. At the same time that rising vacancies and slowing rent growth are dragging down property-level revenue, property-level expenses, including insurance, taxes, and maintenance costs, have increased notably. These slowing revenues and higher expenses are negatively affecting net operating income (NOI) for CRE properties and, in some cases, may negatively affect borrowers' repayment capacity (see

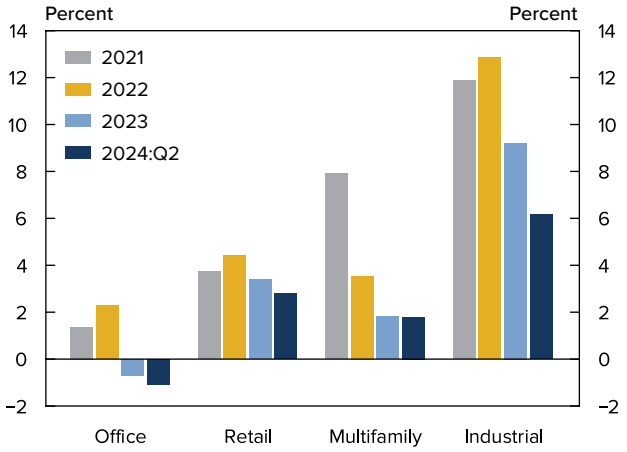
Figure 3.1.1.3). NOI growth for office properties has been negative since 2023 and worsened further in 2024, while NOI growth has slowed for other property types in the past couple of years. Moreover, risk of NOI decline is also elevated for certain multifamily properties, particularly those in markets with an oversupply or that have notable shares of rent-regulated units, where rising costs outpace rent growth. Any softening in NOI poses challenges for loans that mature or reach interest rate reset periods, as borrowers are likely to face higher financing expenses, further stressing borrowers' capacity to repay.

Collateral protection for CRE loans has also weakened, as CRE capitalization rates have risen in response to CRE market stress and a higher interest rate environment. Office property values have declined the most, down approximately 40 percent from pre-pandemic levels, reflecting the higher vacancy rates and weaker rent growth, as well as higher capitalization rates for the office sector (see **Figure 3.1.1.4**). While declines appear more modest for most other property types, all CRE property values have slipped from recent peak levels. For example, although multifamily property values are down only modestly from pre-pandemic levels, they have declined much more acutely from their peak levels in 2022. Depending on timing, these declines in collateral values could influence borrowers' refinancing capabilities.

CRE Credit Conditions

Starting in early 2024, traditional credit metrics, such as provision expenses and loan delinquency and loss rates, began to reflect the credit stress in the CRE markets. The median CRE delinquency rate among banks increased from 0.14 percent in the second quarter of 2023 to 0.28 percent in the second quarter of 2024. However, the aggregate delinquency rate for all CRE loans held by banks was much higher at 1.30 percent. The discrepancy between the median and aggregate delinquency rates reflects the substantial increase in delinquencies among the largest institutions. Banks with total assets over $100 billion reported a median delinquency rate for CRE loans of 1.85 percent in the second quarter of 2024, about four times higher than the median delinquency rate reported by smaller institutions (see **Figure 3.1.1.5**). Most of this discrepancy can be traced to office loans, as the largest institutions were more

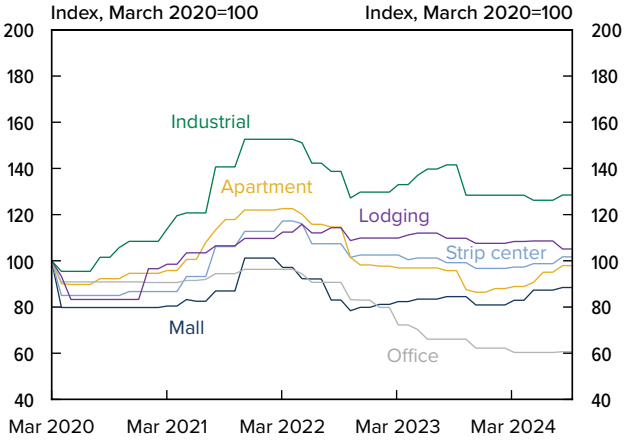
3.1.1.3 Year-Over-Year Change in Net Operating Income by Property Type



Note: Data as of 2024:Q2.

Source: CoStar.

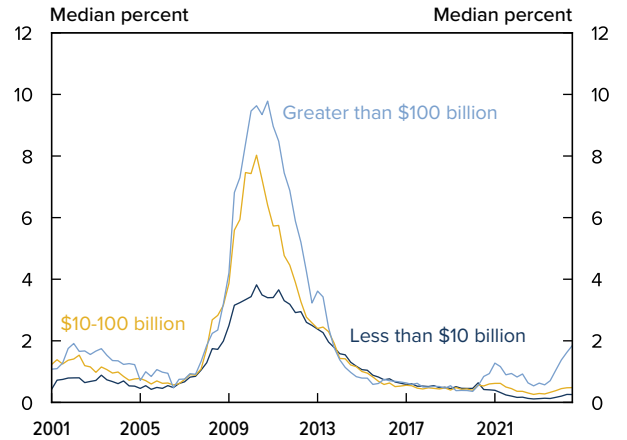
3.1.1.4 Commercial Property Price Indexes by Property Type



Note: Data as of September 2024.

Source: Green Street's Commercial Property Price Index.

3.1.1.5 Bank CRE Delinquency Rates by Asset Size



Notes: Data as of 2024:Q2. Delinquencies include all loans 30+ days past due or on nonaccrual.

Source: FDIC.

likely to have exposure to large urban office properties. Although large banks reported significantly higher CRE delinquency rates, these banks generally have much lower exposure relative to capital and allowance levels. The banks with the highest exposure levels, those with assets between $10 billion and $100 billion, reported a median CRE delinquency rate of 0.48 percent in the second quarter of 2024, up from 0.33 percent for the same period the year before.

Net losses on CRE also increased in 2024, with net loss rates on CRE increasing from 0.11 percent in the first half of 2023 to 0.21 percent in the first half of 2024. As with delinquency rates, net losses are driven by the higher losses reported at the largest banks. Provision expenses also increased in 2024, indicating banks' recognition of a deterioration in credit quality. While it is possible that loan modifications including rate concessions and other adjustments may be helping some borrowers at risk of delinquency remain current, the overall effect on the banking industry of the increase in delinquencies, losses, and provision expenses remains modest. The largest banks, which are reporting the most notable decline in credit quality, have limited exposure to CRE relative to their earnings and capital.

CMBS credit metrics largely mirror market conditions with a continued increase in office loan delinquencies. The overall delinquency rate increased from 3.90 percent in June 2023 to 5.35 percent in June 2024. However, the delinquency rate for CMBS office loans increased much more steeply, rising from 4.50 percent in June 2023 to 7.55 percent in June 2024. Loan delinquency rates among other property types remained more stable: though delinquency rates for retail and hotel properties remained relatively high, they have declined substantially from peaks reached in 2020 during the height of the pandemic.

Notably, the overall CMBS delinquency rate would rise from 5.35 percent to 6.54 percent if it included loans that were past their maturity date but current on interest payments. A substantial volume of CRE loans will reach maturity over the next year amid relatively higher interest rates and tight CRE lending conditions, which may push delinquency and loss rates higher.

Recommendations

The Council recommends regulators continue to focus on the financial industry's ability to withstand CRE stress from declines in property prices and loan quality. Effective risk management practices, including timely identification of problem loans, are critical to evaluating exposure, monitoring stress, and responding accordingly. The industry's ability to withstand a downturn in CRE conditions depends on proactively providing for adequate allowances for loan losses, responding to changes in market conditions, testing the ability to withstand meaningful stress, and maintaining effective internal risk rating systems.

The Council recognizes the challenging environment and encourages member agencies to review and evaluate existing loss mitigation options of their regulated entities, including prudent accommodations, workouts, and modifications. Many of these concepts are described in the *Interagency Policy Statement on Prudent Commercial Real Estate Loan Accommodations and Workouts* published by the banking agencies in July 2023. The policy statement notes that accommodations and workouts may be in the best interest of borrowers and lenders and should be utilized by financial institutions when appropriate.

Exposures among CRE industry participants can also be interconnected, which could cause added stress. Identifying additional CRE exposures arising from investments in, and other services to, CRE industry participants is an important part of managing risk. For example, in addition to mortgage loans, total CRE exposure may include investments in CMBS and non-mortgage loans to CRE industry participants. The Council recommends that member agencies ensure that financial institutions continue to monitor these correlated risks in their risk management and contingency planning.

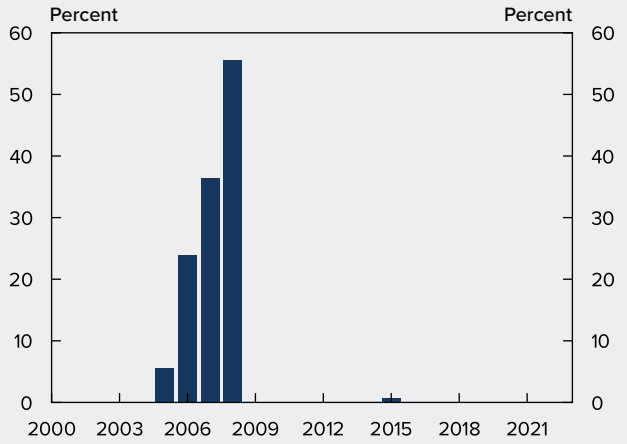
BOX B: Losses to AAA-Rated Commercial Mortgage-Backed Securities

Amid broader strains in the commercial real estate (CRE) sector and office subsector in particular, the senior-most tranche of a private label commercial mortgage-backed security (CMBS) experienced notable losses in 2024. The losses were incurred on a 2015 vintage deal backed by a single New York City office property and represent the only loss experienced by a U.S. CMBS tranche rated AAA at origination and issued after the global financial crisis (GFC) when underwriting standards were tightened (see **Figure B.1**). These losses are also the first ever recorded on a AAA tranche for a CMBS deal backed by a single-asset/single-borrower (SASB), a subsector of the private label CMBS market that has exhibited substantial growth since the pandemic. Individual SASB deals inherently lack diversification by sector, geography, and borrower, which generally characterize other CRE-backed securitization products such as conduit CMBS. SASBs as a class are additionally more concentrated in the office sector than CRE-backed securitization products as a whole and thus, riskier today. By way of comparison, losses on conduit CMBS transactions originated since the GFC have not reached higher than the A tranche.[14]

While SASB deals are often associated with newer properties of the highest quality (sometimes called "trophy" assets), the underlying collateral in the deal that experienced the loss (BWAY 2015-1740) was an older and somewhat lower quality office building. The underlying office property had been under strain for several years prior to the liquidation, as the owners were unsuccessful in replacing the building's primary tenant, leading the property owner to strategically default on the mortgage. Upon subsequent reappraisals, the building's value was reduced by nearly three-quarters relative to its valuation at origination.

Losses on the most senior tranche, originally rated AAA, occurred after the loan collateralizing the deal was liquidated following the sale of the building and after the sale proceeds net of the liquidation expenses fell below the amount required to fully cover amounts owed to bond holders. This led to a 62 percent loss severity on the underlying securitized loan and a 26 percent loss severity on the most senior tranche.[15]

B.1 CMBS Losses by Vintage for Bonds with Original AAA Rating



Note: Data as of July 2024.

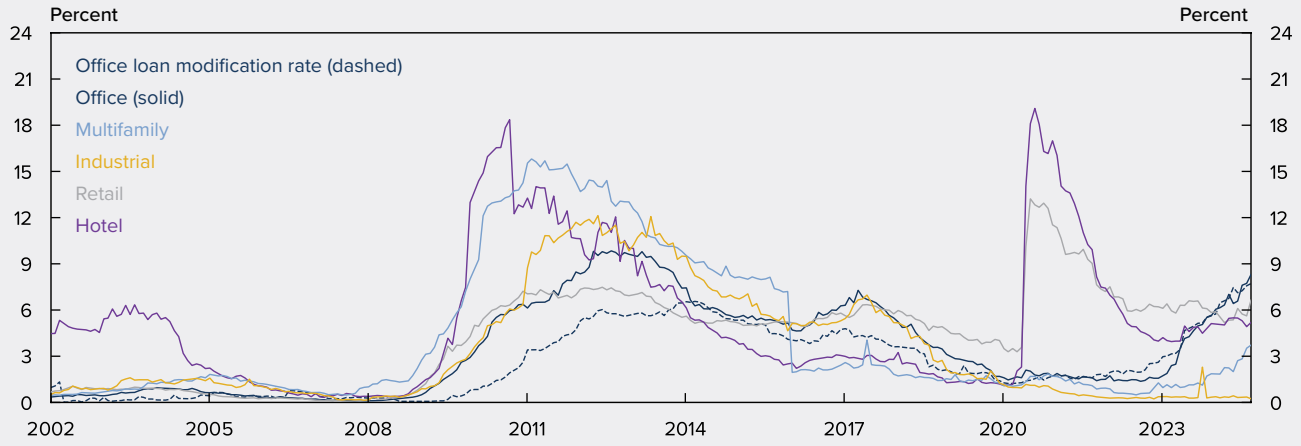
Source: Trepp.

These losses occurred in the context of ongoing weakness in fundamental office property conditions, including higher vacancy, declining rent growth, and declining property values, following reduced demand for office space in the wake of COVID-19. Though valuation indices show that office values have broadly stabilized close to 40 percent below peak levels, some CMBS loans are experiencing more severe declines in value.[16] In 2023 and 2024, reappraisals of office properties backing loans in both SASB and conduit CMBS deals originated between 2013 and 2019, with a concentration in 2013–14, showed an average valuation decline of roughly 52 percent across vintages. In some of the hardest-hit cities like Chicago and San Francisco, declines approached 65 percent.[17]

Likewise, measures of credit performance in private-label CMBS have been weighed down by office property loans (see **Figure B.2**). Office properties continue to dominate collateral of CMBS securities on watchlists and loans transferred to special servicing and serve as the marginal drivers of the increases in 60+ day delinquency measures for private label CMBS.

BOX B: Losses to AAA-Rated Commercial Mortgage-Backed Securities (continued)

B.2 Private Label CMBS 60+ Day Delinquency Rates and Office Loan Modification Rate



Note: Data as of September 2024.

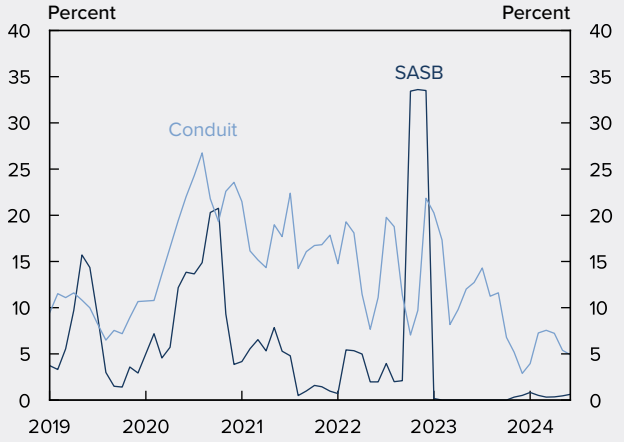
Sources: J.P. Morgan and Trepp.

Office loan modification rates have also risen notably, which has helped keep these 60+ day delinquency rates from rising even higher. CMBS downgrades are dominated by office loans, with 14 percent of SASB office-backed AAA tranches downgraded since their initial rating, compared to 8 percent for all SASB AAA bonds.

This continued weakness in office fundamentals, including the ongoing uncertainty regarding future demand for office space, has contributed to the reduced availability of financing for office properties. From early 2023 until mid-2024, the proportion of office loans included in conduit CMBS deals has declined from about 20–25 percent to under 10 percent, whereas the issuance of office property-backed SASB deals has dropped to zero in recent quarters after peaking at the end of 2022 (see **Figure B.3**). The reduced availability of financing for office buildings is reflected in the lower rate of refinancing success at maturity realized for office loans. For example, the refinancing success rate for all conduit loans as of mid-2024 is close to 70 percent, whereas the rate for office loans in conduit deals is below 50 percent.[18]

Despite the continued challenging conditions for office fundamentals and credit conditions, concerns about additional losses on CMBS AAA

B.3 Office Percent of CMBS Issuance



Notes: Data as of September 2024. Reported as three-month moving average.

Source: CMA (Deutsche Bank).

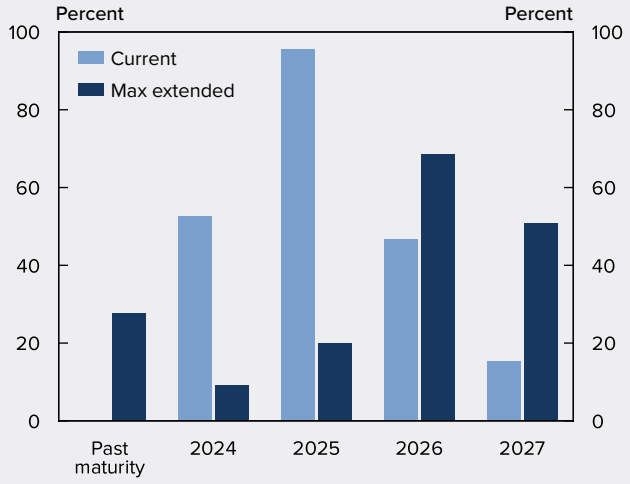
tranches and for SASB securities in particular remain somewhat limited, and the AAA bonds most in focus are those pricing well below par in secondary market trading. For the 2015 New York City CMBS office deal that incurred losses on its AAA tranche, the diminished valuations of the underlying office buildings had lowered the remaining credit support below the AAA tranche, in some cases to less than 25 percent. For context, rating agencies' loan-to-value thresholds for SASB AAA tranches, which ratings agencies calculate differently, range around 50 percent.[19] Further, most of the originally AAA tranches in these SASB

deals have already been downgraded and many to below investment grade.

While many of these bonds viewed as at greater risk are collateralized by office properties, bonds backed by other property types are in focus as well. One example is bonds secured by retail loans, which have been under distress for a number of years following the secular pressures faced by regional malls; however, these bonds have a relatively small presence in the CMBS market. Another example is bonds backed by multifamily mortgages originated in recent years. These bonds have elevated risk, as rental growth outlooks and valuations were highly optimistic at the time of their origination. More broadly, SASB CMBS finance single properties and are therefore subject to the idiosyncratic performance risks of those properties.

Looking ahead, as reappraisals are often triggered when loans approach maturity or are transferred to special servicing, the market will remain attentive to the debt maturity schedules. In particular, they will be focused on loans facing final maturities in which loan extension options have been exhausted (see **Figure B.4**).

B.4 SASB Maturities: Current and Max Extended



Note: Data as of September 2024.

Source: Intex (Deutsche Bank).

3.1.2 Residential Real Estate

Residential real estate is a large, important part of the U.S. economy, making up close to 16 percent of U.S. gross domestic product (GDP) through both fixed investment and housing services. Moreover, the single-family mortgage market represents the largest part of residential finance, with approximately $14 trillion in outstanding balances.[20] Financing that activity requires a complex combination of entities that includes financial institutions, government agencies, investors, and insurers.

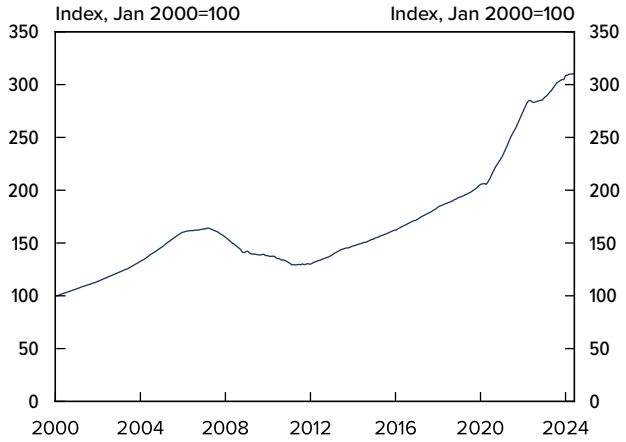
In 2024, residential real estate remained relatively stable. Reasonably low unemployment rates have allowed aggregate serious delinquency rates to remain low. At the same time, accumulated price appreciation has given homeowners high levels of home equity, allowing financially stressed borrowers many alternatives to avoid foreclosure.

However, underlying stresses in housing markets, including rising ownership costs, could pose risks to the financial system. Homeownership costs directly influence the value of homes and possibly the desire to become a homeowner. The U.S. residential finance system is built on intermediation and interconnectedness among financial institutions, government agencies, investors, insurers, and many third-party service providers. Disruptions to any one of these classes of intermediaries can be transmitted up and down the system and into other financial markets, with significant implications for financial stability.

Housing Market

Housing markets today are characterized by low affordability. Prices remain high relative to incomes and house price growth has outpaced household income growth in recent years. The FHFA National Housing Price Purchase-Only Index had a year-over-year growth rate of 5.7 percent in May 2024. In total, from the beginning of 2020, house prices have risen more than 50 percent (see **Figure 3.1.2.1**). Potential homebuyers also face elevated mortgage rates, which throughout 2023 and early 2024 have been at 20-year highs. The 30-year mortgage rate was 6.54 percent as of October 24, 2024, more than 120 basis points lower than the 52-week high rate of 7.79 percent but well above the 3 percent rates that prevailed in 2021.[21] High house prices and interest rates are two

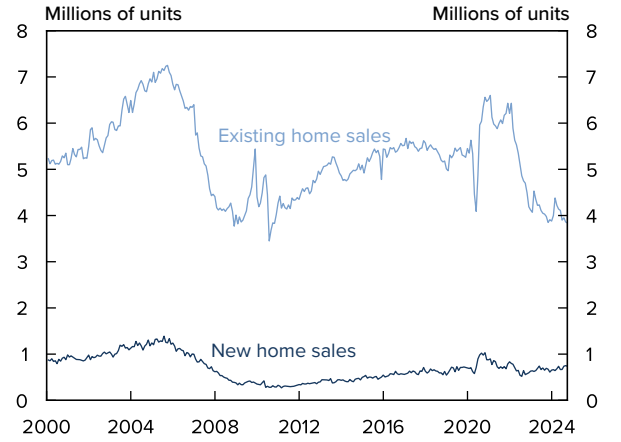
3.1.2.1 House Price Index



Note: Data as of July 2024.

Source: Federal Housing Finance Agency (FRED).

3.1.2.2 New and Existing Monthly Home Sales



Note: Data as of September 2024.

Source: National Association of Realtors (Bloomberg).

factors among many that are contributing to the lowest affordability for homebuyers in decades.

Thus far, home values have remained stable at the national level, but have shown variation in local markets. For example, as of August 2024, the housing market in Austin, TX is experiencing a relatively high inventory of listed homes for sale and declining house values, while the market in Hartford, CT is experiencing a shortage of listings and an appreciation in home values above the national average.[22] However, stability in aggregate home values may not be durable when confronted with increases in listings across the country. Although housing markets with low inventory have seen moderate price appreciation, home purchases have remained low, likely due in part to higher homeownership costs. If the transaction volume of home purchases remains low or declines and the stock of for-sale listings increases, then aggregate home values could decline (see **Figure 3.1.2.2**).

At the same time, the decade-long housing shortage presents unique economic challenges. Population growth has continuously outpaced net additions to the housing stock for many years. Current estimates suggest the U.S. housing stock for single-family and multifamily homes combined has fallen short of demand by anywhere from 1.5 million units to 5.5 million units. Persistent housing supply shortages likely inflate house prices and rents relative to housing markets without supply shortages. Traditional demand side policy tools to reduce rents or financing costs in expensive markets treat the symptom but could exacerbate the shortage, leading to distortions. In addition to promoting new construction, potential solutions to reduce the housing shortage include the renovation of currently uninhabitable properties.

New home construction, both of single-family and multifamily residences, will likely be the primary solution to reducing the housing shortage. However, a measure of home builder sentiment, the National Association of Home Builders/Wells Fargo Housing Market Index, signaled industry contraction during most of 2024. The weak homebuilder confidence is attributable to declining home sales and elevated labor, materials, and construction financing expenses. The share of newly built homes sold remains elevated as homebuyers substitute new construction for existing homes. In 2024, the share of total purchases represented by newly built homes was about 15 percent, well above the 10 percent average that prevailed over the previous decade. If new construction remains weak, the housing shortage may take multiple years to abate.

Property Insurance

The cost of housing has grown for both prospective and existing homeowners, as higher property values have led to higher tax assessments and insurance premiums. In addition, areas prone to climate disasters are facing significant increases in the price of insurance and decreased availability in the primary insurance market. An alternative to the primary insurance market is insurance coverage offered by residual markets, also known as insurers of last resort. The 2022–23 premiums

written on homeowners insurance increased from $126 billion to $143 billion, while the residual market share increased from 4.8 percent to 6.1 percent.[23] While all residual markets are created by state laws, they do not receive public or taxpayer funds. The vast majority are syndicated insurance pools organized as either associations or nonprofit corporations and are comprised of all of the property and casualty (P&C) insurers licensed to do business in the state in which the residual market is located. Residual market insurers generally must charge premiums higher than those in the primary market, and if those premiums are insufficient to cover their claims, then the residual market insurers may make assessments of the insurers doing business within the state. Residual markets are designed to be a temporary solution for homeowners until coverage is offered by primary insurers. As a result, they are not designed to provide a long-term, sustainable solution for overcoming the increasing climate risks.

Homeowners with mortgages are required to maintain property insurance by their mortgagee for basic risks and homeowners with mortgages are typically required to have flood insurance if their property is located in Federal Emergency Management Agency (FEMA) designated flood zones. Condominium associations must also have master policy coverage to insure common areas as required by the mortgagee of the homeowners' mortgage. The condominium master policy coverage is in addition to the homeowner's property insurance on their financed condominium unit. Borrowers may face challenges securing adequate coverage due to availability limitations or affordability concerns, which may lead to a lapse or gap in coverage. Under such circumstances, mortgage servicers are required to obtain lender-placed insurance for households found to have a lapse or gap in insurance. Lender-placed insurance is provided only by a small group of carriers and generally at elevated prices with lesser coverage. Servicers charge homeowners for the cost of the lender-placed insurance.

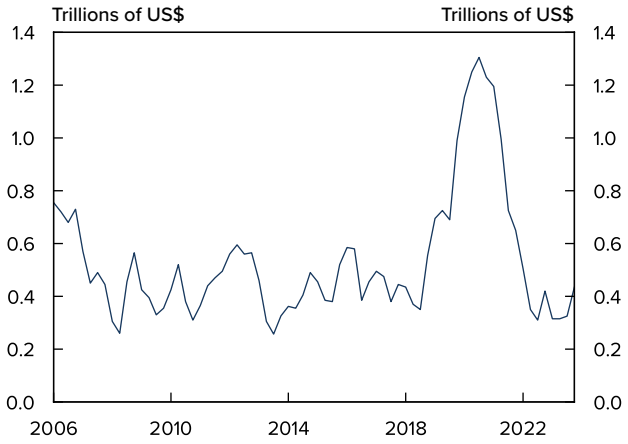
The current trend of costly climate events is expected to become more frequent, severe, and geographically diffuse. In 2023, multiple insurers announced their intent to leave or implement a pause on writing new policies in markets including Florida, California, and Louisiana. These insurers cited multiple motivations, including litigation risk, higher replacement costs, regulatory costs, and the overall increased cost of natural disasters. These announcements highlight that more borrowers are likely to face policy-renewal concerns that hamper their abilities to either remain homeowners or sell their properties. As primary market insurance coverage becomes inaccessible or prohibitively expensive in some states, residual market insurers are rapidly increasing their market share of insured risks in those states. In the absence of risk transfers (for example, through reinsurance, insurance-linked notes, or catastrophe bonds), the climate risk concentration inherent in residual market insurance pools is a known vulnerability. The failure of residual market insurance pools could potentially be transmitted with implications for financial stability. These risks are being monitored by Council member agencies.

Federal regulators have grown concerned that the increasing occurrence of hurricanes and other climate-related disasters may reduce the appeal of homeownership in vulnerable areas over time, thus lowering home prices, contributing to economic decline. To date, climate-related disasters have yet to cause significant losses to the largest mortgage market participants. Mortgagee loss exposure is mitigated by having a geographically diverse book of business, as well as detailed insurer eligibility and minimum-coverage requirements. In the absence of alternative options, insurer decisions not to write new policies or to withdraw from entire markets, as well as any failure of residual market insurers, will transfer disaster risk exposure to the mortgagee.

Primary Mortgage Market

The low mortgage origination volumes in 2024 are consistent with elevated mortgage rates. Mortgages for home purchases continue to represent the majority of originations, as refinance mortgages remain at historical lows. Although mortgage interest rates are a critical determinant of purchasing and refinancing decisions, higher ownership costs or low affordability may have also depressed mortgage originations. Origination volumes peaked at $1.3 trillion in the first quarter of 2021 (see **Figure 3.1.2.3**). Since then, quarterly origination volumes have declined dramatically, decreasing to $435 billion by the second quarter of 2024. Mortgage

3.1.2.3 Mortgage Originations



Note: Data as of 2024:Q2.

Source: Bloomberg.

interest rate declines toward the end of the third quarter of 2024 motivated a slight increase in refinancing. Although additional declines in mortgage interest rates will motivate more refinancings, the majority of outstanding mortgages have interest rates at or below 4 percent and these borrowers are unlikely to refinance.

Mortgage delinquency rates indicate a widening performance gap between conventional loans and Federal Housing Administration (FHA) loans. Although nonperforming conventional loans remained around 1 percent in July and August 2024, nonperforming loans insured by the FHA and securitized by the Government National Mortgage Association (Ginnie Mae) were just over 3 percent and delinquent FHA loans exceeded 10 percent. One potential cause for concern is that loans originating in 2022 have higher delinquency rates and lower interest rates than subsequent origination vintages. August 2024 securities disclosures data indicate that approximately 14 percent of FHA borrowers in the 2022 FHA vintage failed to make their monthly payment. Higher levels of mortgage delinquencies can be financially stressful to mortgage servicers, especially higher delinquencies in Ginnie Mae portfolios, given the more extensive operational and advancing requirements of that program (see **Box C: Nonbank Mortgage Servicing**). Higher delinquencies can increase distressed sales and adversely impact home values, as happened during the global financial crisis (GFC). Closely monitoring and managing mortgage performance is critical to maintaining the health of the mortgage finance system.

Secondary Mortgage Market

The secondary mortgage market serves many functions within the housing finance system. In addition to the buying and selling of standardized mortgage securities, prevailing secondary market prices directly influence mortgage rates for new borrowers. The market for agency mortgage-backed securities (MBS) is highly liquid, with over $9.2 trillion in outstanding balances.[24] Banks are the largest investors in agency MBS. Valuations on outstanding MBS increased during 2024, permitting the partial reversal of prior fair value losses on MBS. However, as long as rates remain above their 2020–21 lows, fair value losses associated with very low coupon MBS will persist. The Bank Term Funding Program permitted eligible depository institutions to pledge MBS and other assets at par value to prevent these institutions from quickly selling those securities during times of stress.[25] The program ceased extending new loans in March 2024 without any apparent impact on the market for MBS, since MBS valuations began strengthening in May and continued strengthening into the second half of 2024. Meanwhile, the runoff of Federal Reserve System Open Market Account holdings of MBS has been largely uneventful given the low supply of new issuance resulting from historically low levels of mortgage originations. As mortgage rates soften, the volume of mortgage originations will likely improve, increasing the supply of new issuance. As MBS investors seek opportunities for higher net-interest margins, demand for newly issued MBS will likely strengthen to meet this additional supply. Under plausible interest rate scenarios, the supply and demand for MBS should remain balanced in the near future.

Mortgage Servicing

Mortgage servicers, including nonbank mortgage servicers, carry out critical servicing functions for the mortgage market. Borrowers, guarantors, insurers, and investors depend on these functions to be carried out in an accurate and timely way. Servicers' responsibilities include collecting borrower payments, distributing those payments, maintaining payment records, and determining available loss mitigation plans for borrowers who do not make their payments. Additionally, under certain circumstances, agency servicing contracts require servicers to advance funds on behalf of

the agencies or repurchase mortgages from the securitization pools. In recent years, the Council has identified potential risks to the financial system arising from vulnerabilities of nonbank mortgage companies (NMCs), which may amplify the effect of a shock to financial stability (see **Box C: Nonbank Mortgage Servicing**).

BOX C: Nonbank Mortgage Servicing Report

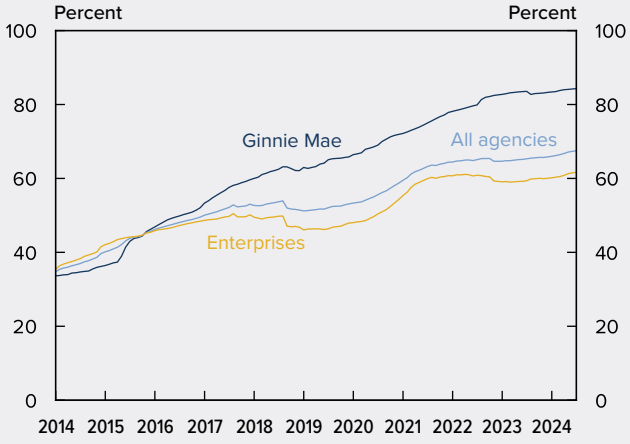
On May 10, 2024, the Council issued its *Report on Nonbank Mortgage Servicing*.[26] The report documented the strengths and vulnerabilities of nonbank mortgage companies (NMCs), identified the transmission channels through which NMCs' vulnerabilities could amplify the effect of a shock to financial stability, and made high-level recommendations to promote greater stability for the mortgage market.

NMCs provide a critical service in the mortgage market through their increased operational capacity as loan originators and servicers. In 2008, NMCs originated 39 percent of mortgages in the United States and owned the servicing rights on only 4 percent of mortgage balances. By 2022, the NMC market share had grown significantly, with NMCs originating approximately two-thirds of U.S. mortgages and owning the servicing rights on 54 percent of mortgage balances.[27] NMCs play an even bigger role in the agency market—in 2023, NMCs serviced mortgages collateralizing over 60 percent of all agency-backed securities and over 80 percent of securities in Government National Mortgage Association (Ginnie Mae) programs (see **Figure C.1**).

NMCs bring both strengths and vulnerabilities to the mortgage market. NMCs have strengthened the market by serving as key mortgage originators and servicers for historically underserved borrowers. Additionally, some NMCs have developed expertise in certain products or operations. Some NMCs have developed technology platforms that have enabled them to originate mortgages more quickly while others specialize in default servicing for nonperforming loans and loss mitigation.

NMCs are also subject to vulnerabilities. Because NMCs are often monoline businesses that specialize in mortgage-related products and services, their profitability can fluctuate substantially with changes in mortgage demand, interest rates, and mortgage defaults relative to other mortgage lenders (see **Figure C.2**). In

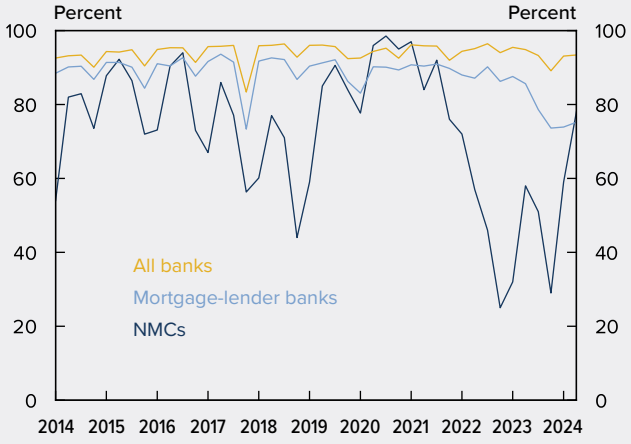
C.1 NMC Share of Agency Servicing



Note: Data as of July 2024.

Source: ICE eMBS.

C.2 Bank and NMC Profitability Over Time



Notes: Data as of 2024:Q2. Profitability is defined as positive pre-tax income in a given quarter for NMCs and positive after-tax income for banks. A mortgage-lender bank is a bank with residential mortgage loans and MBS in excess of 50 percent of total assets.

Sources: Mortgage Bankers Association and FDIC.

BOX C: Nonbank Mortgage Servicing Report (continued)

addition, NMCs' high exposure to mortgage risk means that stress in the mortgage market can simultaneously have adverse effects not only on NMCs' income and balance sheets but also their access to credit. NMCs' reliance on debt that can be repriced, reduced, or canceled in times of stress can lead to significant liquidity risk, which can be exacerbated by the high leverage that some NMCs carry and NMCs' obligations to make servicing advances. As a result of liquidity risks, high leverage, and other vulnerabilities, rating agencies have typically assigned speculative-grade credit ratings to NMCs' debt obligations. Finally, vulnerabilities are similar across NMCs, which can result in certain macroeconomic scenarios leading to stress across the entire sector.

In a stress scenario, NMC vulnerabilities could amplify the effect of a shock to the mortgage market and the broader financial system. Additionally, interconnections in NMC funding providers and subservicing could lead to contagion. With servicing more concentrated in the NMC sector, borrowers may suffer from disruptions in the servicing of their mortgages, and credit guarantors and insurers may experience sizeable losses if vulnerabilities compromise NMCs' abilities to carry out their critical functions. In the event of failure, transferring one or more large NMCs' servicing portfolios to another servicer could be difficult to accomplish in a timely and effective manner as the transfer process can be lengthy and complicated. In addition, it might be difficult to identify another servicer to take over the portfolio in times of stress.

The Council recognizes that state regulators and federal agencies have acted within their authorities to mitigate risks posed by NMCs in recent years, but the combination of various state requirements and limited federal authorities to impose additional requirements do not adequately and holistically address the risks described in this report. The Council remains concerned that stress in the nonbank mortgage sector may lead to disorderly servicing transfers, and stressed nonbank mortgage servicers may fail to apply collections properly, make required advances, provide adequate loss mitigation, or perform other servicing activities.

The Council will continue to monitor the evolution of the risks identified in the report and may take or recommend additional actions to mitigate such risks in accordance with the Analytic Framework for Financial Stability Risk Identification, Assessment, and Response (Analytic Framework) adopted in November 2023, if needed.

Recommendations

With the potential for a softening of the housing market should economic conditions weaken, the Council recommends supervisors and financial institutions continue to monitor residential real estate exposures and the adequacy of credit loss allowances.

It is important for member agencies to review and evaluate existing loss mitigation options of their regulated entities in preparation for whatever credit event might next occur. Such review should include assessing mortgage servicers' capacity to scale management of forbearance, modifications, and other foreclosure alternatives, and manage them in different macroeconomic environments. The results of such a review should inform supervisory responses by member agencies.

The Council also fully reaffirms its recommendations detailed in its *Report on Nonbank Mortgage Servicing* released earlier this year.

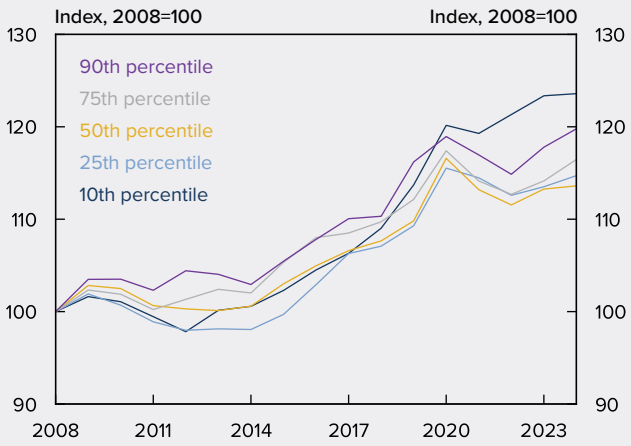
BOX D: Household Finance

Finances of the aggregate household sector strengthened in 2024 amid a relatively healthy labor market and increases in real wages. Household balance sheets benefited from rising share prices and higher residential real estate values (although there are practical impediments to tapping this accumulated home equity). However, household finances show pockets of weakness that merit continued attention. For instance, as of the third quarter of 2024, households have mostly drawn down the higher cash balances associated with pandemic-era stimulus and debt forbearance programs. There has also been some recent cooling in the job market, and job openings have reverted to more typical pre-pandemic levels.[28] Post-pandemic inflation and the associated rise in interest rates have increased costs for households and undermined consumer confidence.[29] Moreover, these higher costs have disproportionately affected younger and lower-income families, who lack financial cushions and are more likely to rent their homes or be first-time homebuyers.[30] Adding to these concerns is an increase in delinquencies on credit card and other consumer loans, which is an early sign of stress on some household budgets. Although this increase may simply reflect pandemic-era changes in underwriting standards,[31] consumer debt portfolios should be closely monitored for signs of emerging stress related to increased costs and other financial burdens. For example, federal student loan payments will not be reported to credit reporting bureaus until the fourth quarter of 2024,[32] so some credit risk may not yet be reflected in consumer credit scores.

Household Incomes, Expenses, and Savings

Real income growth has bolstered household finances. After languishing in the years following the global financial crisis (GFC), earnings rose in real terms across the earnings distribution beginning in 2014 (see **Figure D.1**). While nominal wage growth did not keep pace with price increases in 2021 and 2022, real wage growth resumed in 2023 as inflation began to ease. As of the third quarter of 2024, real wages exceeded 2019 levels. Notably, real wage growth has been stronger for lower-wage earners: the lowest decile of earners has seen net growth of approximately 8.7 percent,[33] compared with 3.1 percent to 5.0 percent growth for higher earning groups. If this pattern continues, it may help to modestly offset the persistent rise in income inequality seen over the last several decades. The personal saving rate held steady over the last year (see **Figure D.2**) despite the reduction

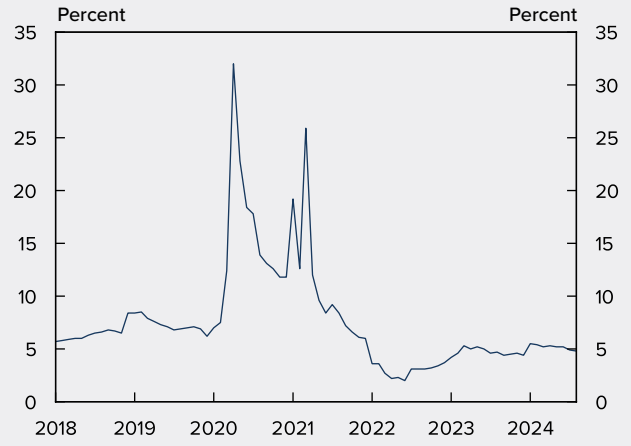
D.1 Real Weekly Earnings by Percentile



Notes: Data as of 2024:Q3. Chart shows quartiles and selected deciles of usual weekly earnings of full-time wage and salary workers by selected characteristics. Data are not seasonally adjusted, expressed as constant dollars, and inflation-adjusted using chain-weighted CPI. Value for 2024 calculated as an annual average using only three quarters of data.

Source: U.S. Bureau of Labor Statistics.

D.2 Personal Saving Rate



Note: Data as of August 2024.

Source: U.S. Bureau of Economic Analysis (FRED).

BOX D: Household Finance (continued)

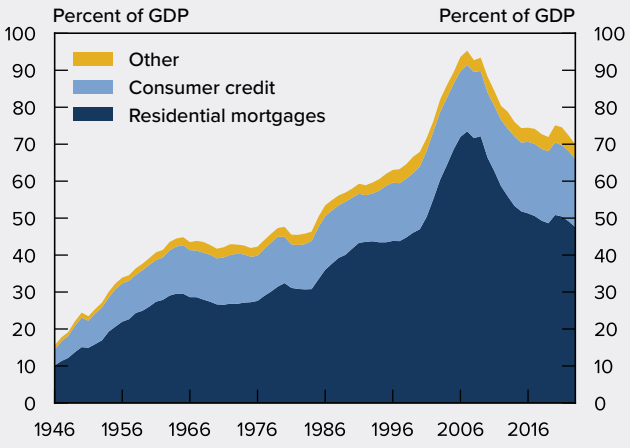
in pandemic-related cash liquidity. However, even with the stable-to-improving picture offered by the aggregate data, many families remain financially insecure. For example, despite the rise in real incomes and net worth across the wealth distribution, 38 percent of households reported difficulty paying their bills and expenses in 2023 (higher than 36 percent from 2022 but below 40 percent from 2019).[34]

Household Debt and Debt Service Burden

Outstanding household debt stood at approximately $19 trillion at the end of 2023, at around 70 percent of gross domestic product (GDP).[35] While this is down from the peak of 95 percent of GDP reached on the eve of the GFC, it remains well above levels seen prior to the start of the housing bubble (see **Figure D.3**). Most of this increase is attributable to residential mortgages, which stood at $13 trillion at the end of 2023 (an additional $1 trillion in residential mortgage debt is owed by non-households). This represented approximately 48 percent of GDP, down from the approximately 73 percent of GDP they represented in 2006, but well above the approximately 32 percent of GDP they represented in 1980.[36] The growth in mortgage debt relative to GDP generally reflects the rise in real home prices and a greater willingness among homeowners to borrow against their home equity.

Consumer debt levels have been relatively static as a share of GDP over the last two decades, standing at $5.0 trillion at the end of 2023. However, the composition of this debt has changed substantially, with an increase in student loans since 2006 being offset by a decline in credit card and other revolving debt.[37] The pandemic and related policy interventions drove a further decline in credit card balances as households cut spending and used a portion of their relief payments to retire debt. Although credit card balances have risen post-pandemic, they have not grown relative to the economy, and revolving debt remains at its lowest level relative to GDP since the early 1990s. At the same time, student debt relief programs have helped to halt the growth in student loans outstanding, returning student debt relative to GDP to levels last seen in 2011. Overall, aggregate debt service burdens rose modestly over the last year but remain well below pre-crisis norms (see **Figure D.4**). Despite the much larger amount of mortgage debt outstanding, the contributions to the total debt service burden from mortgages and consumer debt are similar. Aggregate mortgage debt service burdens reflect the low average fixed rates on outstanding loans. In contrast, consumer debt service burdens reflect the high interest rates charged on credit card balances and the rising rates on recently originated auto and other loans.[38]

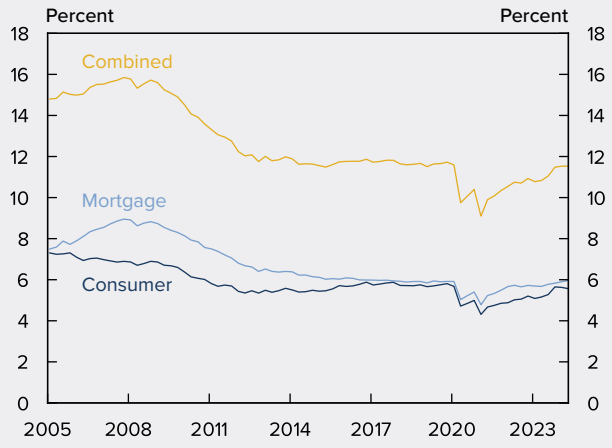
D.3 Household Debt to GDP by Major Categories



Note: Data as of 2023.

Source: Federal Reserve Board.

D.4 Debt Service to Disposable Personal Income by Category



Note: Data as of 2024:Q2.

Source: Federal Reserve Board.

The growth in household debt over the last half-century has been largely funded outside the banking system. Mortgages, consumer debt, and other household debt held on bank balance sheets have hovered around only 25 percent of GDP since the 1960s (see **Figure D.5**). Although private nonbank lenders were active in the subprime mortgage market ahead of the GFC, most loans outside the banking system today are held directly by the U.S. government or funded by government-backed mortgage-backed securities (MBS). This shift toward lenders with a government backstop has facilitated forbearance and other relief programs implemented during the pandemic. While guaranteed MBS provide a reliable source of long-term funding for new mortgages, nonbank lenders are responsible for originating most of these loans, and nonbank servicers are responsible for processing payments and working with delinquent borrowers.[39] See **Box C** and the May 2024 Council Report on Nonbank Mortgage Servicing for a more detailed discussion of these issues.[40]

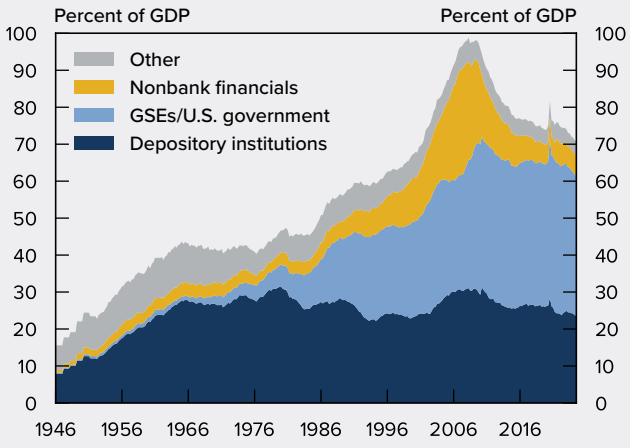
Credit Trends

The share of consumer loan balances that are delinquent is rising and now matches or exceeds pre-pandemic levels.[41] The 90+ day delinquent balance rate for credit cards was 10.93 percent in the second quarter of 2024, up 2.93 percentage points from the year before and up 2.57 percentage points from its pre-pandemic level. In addition, the percentage of credit card holders making only the minimum required payment has returned to pre-pandemic levels.[42] Similar performance trends are apparent in the auto lending market.[43] The 90+ day delinquent balance rate for auto loans was 4.43 percent in the second quarter of 2024, up 0.61 percentage points from the year before but 0.51 percentage points below its pre-pandemic level.

The causes of the deterioration in consumer credit are not yet entirely clear. A contributing factor may be the loosening in underwriting standards during the pandemic due in part to stimulus payments and other interventions inflating credit scores. This likely resulted in loan portfolio segments that are of higher risk on average than they were before the pandemic and accordingly have a higher share of delinquent loans.[44] Borrowers are also facing genuine strains on their budgets from inflation and other factors that may drive additional deterioration. For example, the pandemic era suspension of federal student loan payments ended in September 2023,[45] leading delinquencies to resume, though the identity of individual delinquent borrowers will not be reported to credit bureaus until later in 2024.[46] Once that data become available, there may be an additional adverse impact on borrowers' credit scores and their cost of and access to credit. The additional payment burden on student loan borrowers has not yet led to higher delinquencies on other forms of credit, and student loan borrowers might be less likely to own homes, with a potential lower impact of their delinquencies on financial stability.

Consistent with research indicating lenders reached further down the credit spectrum during the pandemic, the share of borrowers utilizing more than 90 percent of their credit limit also increased. These borrowers are much more likely to fall behind on their payments, and this has

D.5 Household Debt to GDP by Major Holders



Note: Data as of 2024:Q2.

Source: Federal Reserve Board.

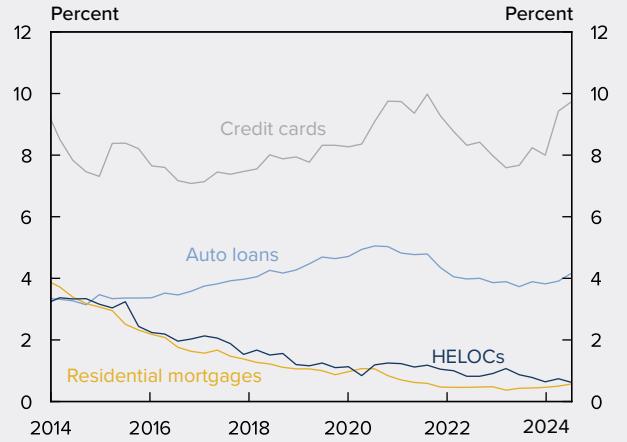
BOX D: Household Finance (continued)

contributed to the overall rise in delinquency. Such borrowers are more likely to be younger and live in low-income areas, potentially reflecting lower credit card limits. Shorter credit histories, lower income levels, and lower credit scores can result in lower lines of credit. If these trends continue and other factors influencing delinquencies remain the same, credit card delinquencies are likely to continue to rise.[47]

In contrast, mortgage delinquency rates remain near three-decade lows, as existing homeowners have benefited from robust employment, low fixed-rate mortgages, and rising home equity.[48] The 90+ day delinquent balance rate for residential mortgages was 0.57 percent in the second quarter of 2024, up slightly from a year ago, but down significantly from its pre-pandemic level of 1.07 percent in the fourth quarter of 2019 (see **Figure D.6**). The 90+ day delinquent balance rate for home equity lines of credit has also declined from its pre-pandemic level, reaching 0.36 percent in the first quarter of 2024.

However, high mortgage rates, home prices, taxes, and insurance premiums present challenges to borrowers and could lead to increasing delinquency rates or foreclosures in the future. Higher interest rates make mortgages less affordable for new borrowers, but they also prevent existing borrowers from taking advantage of loss mitigation programs that rely on modifying delinquent mortgages into a new longer-term loan. As a result, if mortgage rates remain elevated, a larger share of delinquent loans may move toward foreclosure. In addition to mortgage rates, home prices and in particular rents have also increased rapidly over the last several years, which has been especially challenging for low-to-moderate-income households.[49] Moreover, higher insurance premiums in certain areas have increased the cost of housing for both new and existing homeowners. Together, these high costs present risks to household balance sheets. See **Section 3.1.2: Residential Real Estate** for a more detailed discussion of housing market conditions.

D.6 Share of Balances 90+ Day Delinquent by Loan Type



Note: Data as of 2024:Q2.

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

3.1.3 Corporate Credit

Corporate Credit

Well-functioning corporate credit markets play an important role in supporting business investments and help facilitate efficient capital formation that can support economic growth. Financial stability risks can arise when unexpected financial or economic events negatively affect firms' abilities to service or refinance their debt and the financial services 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.

U.S. credit markets have grown significantly since the global financial crisis (GFC) (see **Figure 3.1.3.1**). Private credit, defined for the purposes of this report as direct lending by nonbank institutions to businesses, has grown rapidly as an asset class in recent years, with global private credit fund assets under management (AUM) reaching nearly $1.6 trillion as of December 2023. The private credit market is now on par with the

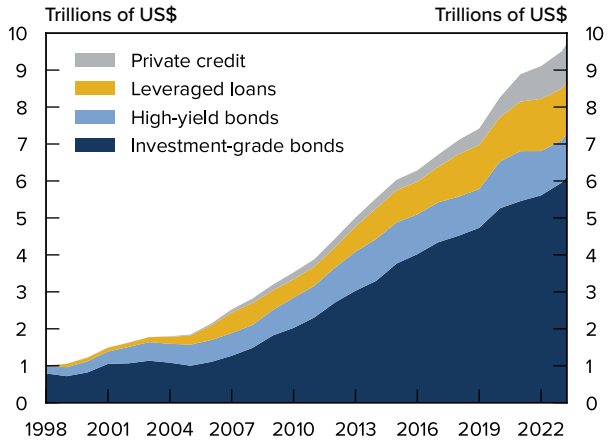
leveraged loan and high yield bond markets in terms of size and provides an additional source of financing for non-investment grade firms. As a percent of gross domestic product (GDP), nonfinancial corporate debt remains near the top of its historical range. However, the nonfinancial corporate debt-to-GDP ratio has fallen recently as the growth in debt decelerated relative to the growth in nominal GDP (see **Figure 3.1.3.2**).

Public Credit Markets

Corporate bond and leveraged loan yields have remained relatively stable over the past two years after rising markedly in 2022. Spreads over Treasuries were near their tightest levels in three years, driven by strong investor demand for credit at attractive yields and expectations for continued economic resilience (see **Figures 3.1.3.3 and 3.1.3.4**). Thus far, corporations for the most part have successfully managed to weather this period of elevated interest rates. 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, are experiencing greater fundamental challenges.

Corporate fundamentals have remained resilient overall, driven by positive earnings growth and limited debt growth. Higher borrowing costs have led to a decrease in aggregate interest coverage ratios, but they remain healthy, and leverage levels are moderate (see **Figures 3.1.3.5 and 3.1.3.6**). Default rates for high yield bonds remain low on a historical basis. While default rates on leveraged loans have risen, they remain well below levels that would pose financial stability risks (see **Figure 3.1.3.7**). An increasing share of defaults has

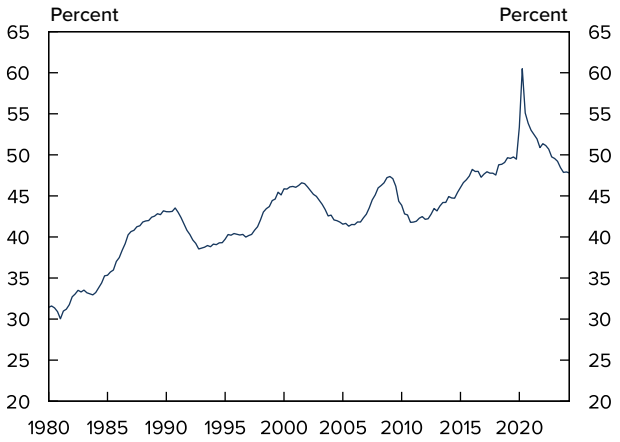
3.1.3.1 U.S. Corporate Credit Market Size



Note: Data as of March 31, 2024.

Sources: ICE Data Indices, Pitchbook LCD, LSEG, and Preqin.

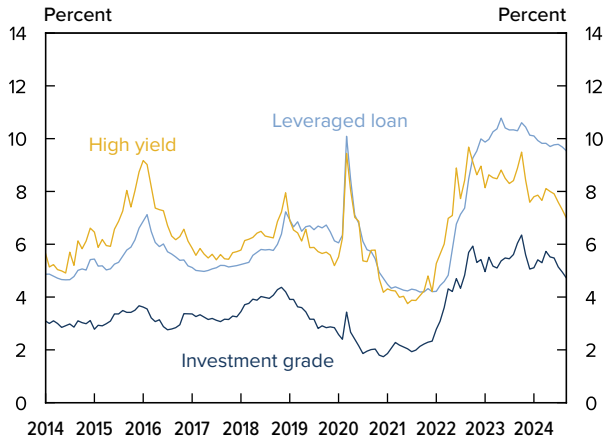
3.1.3.2 Nonfinancial Corporate Debt as a Percentage of GDP



Note: Data as of 2024:Q2.

Sources: Federal Reserve Board (FRED) and U.S. Bureau of Economic Analysis (Bloomberg).

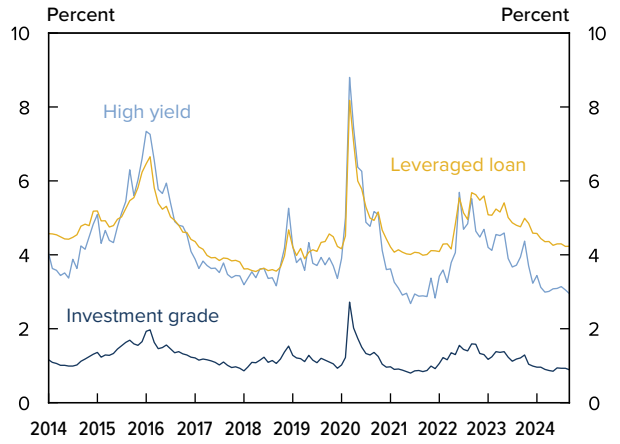
3.1.3.3 Corporate Bond and Leveraged Loan Yields



Note: Data as of September 2024.

Sources: Bloomberg and Pitchbook LCD.

3.1.3.4 Corporate Bond and Leveraged Loan Spreads



Note: Data as of September 2024.

Sources: Bloomberg and Pitchbook LCD.

been in the form of distressed exchanges in which investors are typically asked to take a small principal loss in exchange for receiving new debt. While debt exchanges allow firms to avoid bankruptcy proceedings in the short-term, many of these businesses default a second time and ultimately end up in bankruptcy.

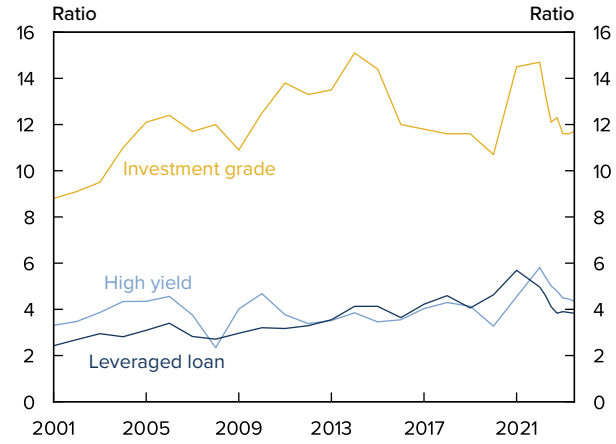
Corporate bond and leveraged loan issuance have increased relative to prior years, driven by a more constructive economic outlook, tight credit spreads, and strong investor demand (see **Figure 3.1.3.8**). Investment grade gross supply is the highest since 2020 while high yield bond and leveraged loan issuance are up 50-60 percent from 2022-2023. However, a large share of below investment grade bond issuance has been focused on refinancing activity as firms seek to address near-term maturities and extend the maturity of their debt. Merger and acquisition and leveraged buyout activity remains modest amid high borrowing costs and economic uncertainty.

Despite a modest pickup this year, the pace of net corporate bond supply, which is gross issuance less maturities and calls/tenders, has been well below the record highs reached during the pandemic period, as high borrowing costs have dampened the desire to take on additional debt.

Private Credit Markets

Global private credit funds have experienced substantial growth in recent years, with estimated AUM of $1.6 trillion as of year-end 2023, up from $750 billion in year-end 2019 (see **Figure 3.1.3.1**). Dry powder, or the amount of money

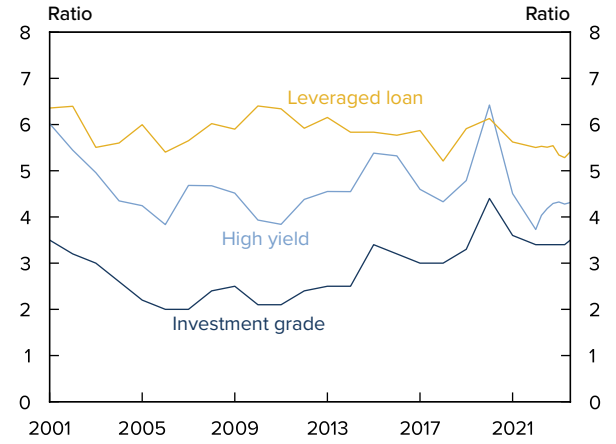
3.1.3.5 Interest Coverage Ratios



Notes: Data as of 2024:Q2. Chart shows earnings before adjustments associated with interest, tax, depreciation, and amortization (EBITDA) over interest expense in the past 12 months.

Sources: Barclays, Bank of America, and LCD Pitchbook.

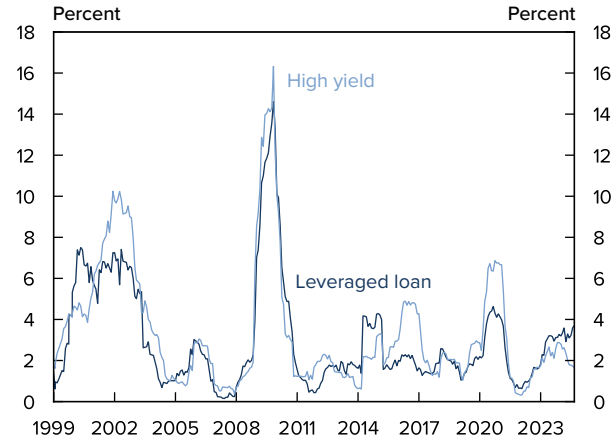
3.1.3.6 Leverage Ratios



Notes: Data as of 2024:Q2. Chart shows total debt over all earnings before adjustments associated with interest, tax, depreciation, and amortization (EBITDA) in the past 12 months.

Sources: Barclays, Bank of America, and LCD Pitchbook.

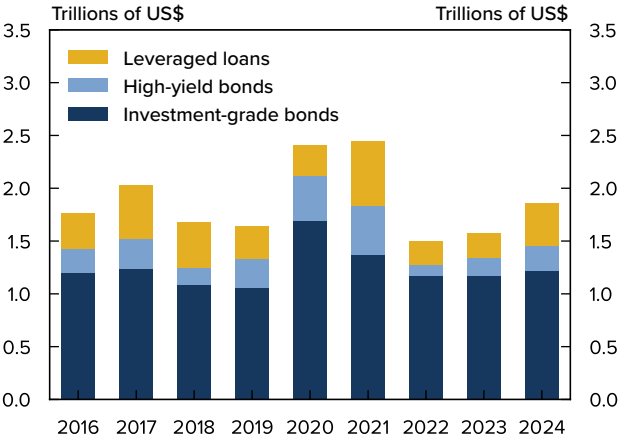
3.1.3.7 Par-Weighted Default Rate



Notes: Data as of September 2024. Includes distressed exchanges.

Source: J.P. Morgan.

3.1.3.8 Year-to-Date Gross Issuance



Note: Data as of September 2024.

Source: Pitchbook LCD.

committed to private credit funds that has yet to be invested or "called" by investment managers, has also grown rapidly, making up $416 billion of the $1.6 trillion market. The private credit market has become an increasingly important source of funding for small and mid-size firms, and growth in private debt has been driven in part by tighter bank lending standards. Investor demand for private credit has been strong, driven in part by the market's historically high risk-adjusted returns relative to other fixed income asset classes; investors typically receive higher yields to compensate for higher credit risk and lower liquidity as private credit loans are typically not traded. From the borrower's perspective, private credit offers a relationship with one or a club of private credit lenders, more flexibility, greater ease and speed of execution, and fewer disclosure requirements relative to bank lending and the public markets.

Private credit is a relatively opaque segment of the broader financial market that warrants continued monitoring. While the extent of financial stability risk posed by private credit remains uncertain, concerns about the potential risks are centered on opacity, credit risk, liquidity risk, and increasing interconnectedness with banks, insurance companies, and other institutions. See **Box E: Private Credit: Financial Stability Considerations** that follows for a more in-depth discussion of financial stability considerations related to private credit.

BOX E: Private Credit: Financial Stability Considerations

The market for private credit, defined for the purposes of this report as direct lending by nonbank institutions to businesses, carries distinct risks, and the lack of transparency can make it challenging for regulators to assess the buildup of risks in the sector. While private credit still represents a relatively small portion of the U.S. economy, concerns around potential financial stability risks largely focus on opacity, credit risk, liquidity risk, and increasing interconnectedness with banks, insurance companies, and other institutions.

Opacity. Private credit funds form the largest class of lenders in the space, followed by business development companies (BDCs), a type of pooled investment vehicle that invests primarily in small and developing companies. Information regarding private credit funds is generally limited. BDCs, however, are required to report quarterly investment schedules. BDCs offer a lens through which investors can evaluate the performance and health of the market but only represent a portion of the total private credit market. Overall, regulators and the public generally have limited information on borrower fundamentals, risk management practices, and industry standards.

The absence of a substantial secondary trading market and limited transparency around private credit valuation practices have also raised concerns about stale valuations. Private credit lenders determine valuation and nonaccrual loan status based on a range of unobservable inputs. These fair value estimates can be complex and require a high degree of judgment, which may result in BDCs and private funds holding the same or similar private credit loans at different valuations and accrual statuses. Fund managers may be incentivized to maintain high valuations and delay the recognition of losses. In a period of extended market stress, this could lead to a widespread realization of deferred losses and an elevated number of defaults.

Credit Risk. Most private credit loans are floating-rate loans, and the underlying borrowers

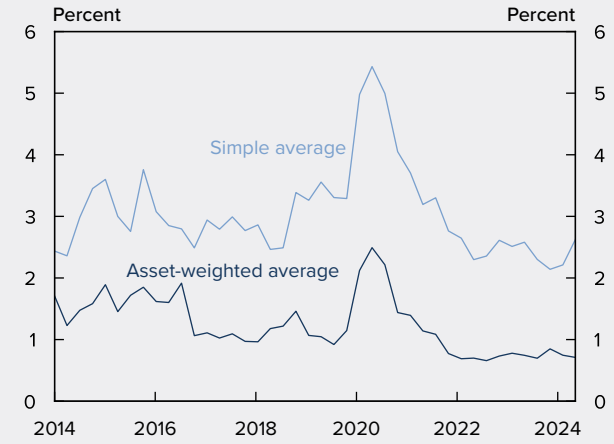
BOX E: Private Credit: Financial Stability Considerations (continued)

tend to be smaller and more highly leveraged than those in public credit markets. As such, the current higher interest rate environment has exerted greater fundamental pressure on some private credit borrowers and could lead to a deterioration in credit quality more broadly. There are also concerns that the rapid growth in dry powder and continued inflows to BDCs could compromise underwriting standards, as private credit managers may be under pressure to deploy capital within a fixed timeframe in order to deliver high returns. Further, during periods of limited deal activity, the accumulation of dry powder and the incentive to quickly deploy investors' capital may spur more managers to compete for deals and offer more relaxed structural terms, including covenant-lite loans, or choose riskier deals. While private credit borrowers' fundamentals do not appear to have worsened appreciably relative to borrowers in public credit markets, there has been some evidence that default rates for the smallest cohort of borrowers, with less than $30 million in earnings before interest, taxes, depreciation and amortization (EBITDA) are in the double digits.[50]

Aggregate BDC data has shown that nonaccrual loan rates, which indicate that payment in full of principal or interest is not expected to be received by the lender, have increased modestly over the last year, but remain well below recessionary levels (see **Figure E.1**). However, it is possible that the rise in payment-in-kind (PIK) elections by borrowers is masking some of the observed credit stress to date. PIK elections generally allow issuers to defer cash interest payments on a liability and instead accrue more principal on the outstanding loan. The share of PIK interest in BDCs has increased significantly since 2019 (see **Figure E.2**).[51] While PIK agreements offer borrowers interest payment flexibility and can help preserve liquidity temporarily, it can mask underlying credit problems and delay recognition of loss.

Liquidity Risks. Liquidity and maturity transformation risk in this space appears 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. However, semi-liquid perpetual and private BDCs do offer limited redemptions that could contribute to liquidity risks in a sustained period of stress.[52] While BDCs only represent a portion of the total private credit markets, these vehicles have experienced rapid growth over the last three years (see **Figure E.3**), particularly semi-liquid perpetual BDCs, which have more than tripled in size since the end of 2021. Perpetual BDCs are marketed to a

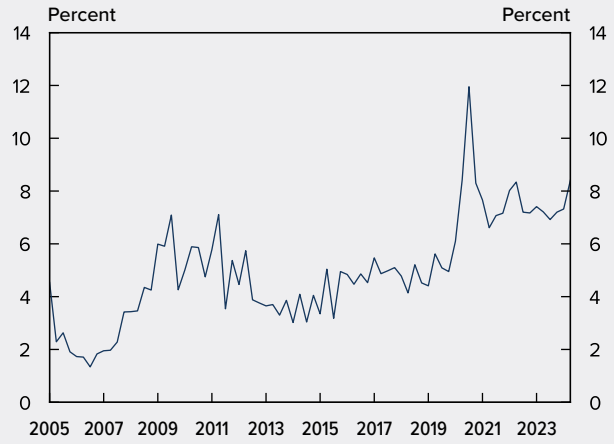
E.1 BDC Nonaccrual Rate (Share of Cost)



Note: Data as of 2024:Q2.

Source: LSEG BDC Collateral.

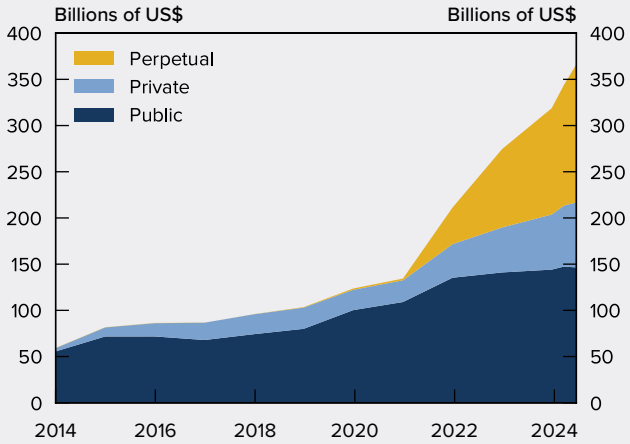
E.2 PIK Income as a Share of Total BDC Income



Note: Data as of 2024:Q2.

Source: Cliffwater Direct Lending Index.

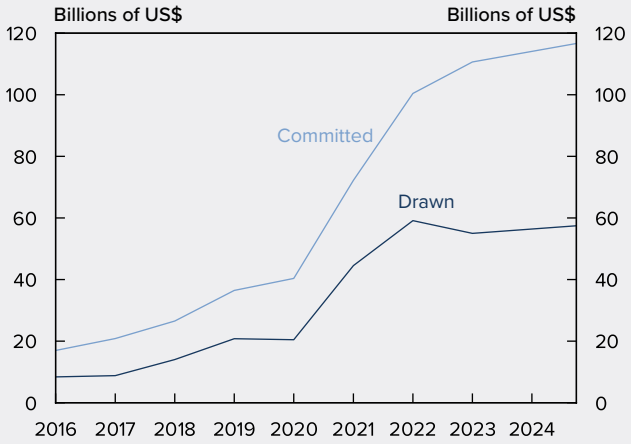
E.3 Total Assets of BDCs by Type



Note: Data as of 2024:Q2.

Source: LSEG BDC Collateral.

E.4 Revolving Credit Facilities to BDCs



Note: Data as of 2024:Q3.

Source: S&P Capital IQ.

wider investor base, including retail investors, and the periodic redemptions allowed in these products have raised additional concerns about the potential to increase liquidity and maturity transformation risk within the industry.

To manage potential redemptions, perpetual BDCs hold a sleeve of assets that can be sold into secondary markets, including broadly syndicated leveraged loans. However, sales of leveraged loans during a stress event could amplify risks in broader credit markets, depending on the magnitude of sales. While a perpetual BDC can suspend redemptions at its discretion, a practice known as "gating," liquidity management at perpetual BDCs has not been tested in a severe stress scenario.[53] A period of sustained outflows could prompt some to lower or entirely suspend their redemption limits, which could further incentivize investors to initiate redemptions at the onset of stress and create a further negative feedback loop with other funds. Similar to perpetual BDCs, some private BDCs are structured to allow for regular repurchases and need to maintain some level of liquid assets to meet redemptions.

Rising interconnectedness with banks. While banks have somewhat curtailed direct lending to smaller and riskier companies following the global financial crisis (GFC), they have been active in extending credit to private credit funds and BDCs. Private credit funds and BDCs generally use two main types of credit facilities: capital call facilities backed by uncalled capital call pledges from investors, also called subscription lines, and net asset-based borrowings, such as revolving credit lines, backed by the underlying fund investments. In addition to bank borrowings, BDCs often issue debt securities as a means of financing, and some obtain financing via issuances of collateralized loan obligations (CLOs). Granular data on the size of banks' exposure to private credit funds and BDCs is challenging to obtain. One estimate of bank committed credit facilities to BDCs shows they have grown from $42 billion in 2020 to almost $117 billion at the end of the third quarter of 2024, as banks have provided more facilities to perpetual BDCs (see **Figure E.4**). It appears that banks manage their asset-based lending credit facilities conservatively such that it would take a severe decline in asset values to result in credit losses for banks. However, bank lending to private credit funds is hard to accurately measure due to a lack of data availability.

Notwithstanding the conservative risk management of bank credit facilities as described above, a large and sustained increase in private credit default rates stemming, for example, from a severe and/or sustained recession, could create

BOX E: Private Credit: Financial Stability Considerations (continued)

financial instability through a number of channels that interact with each other. First, portfolio companies seeking liquidity to service their debt may tap the undrawn portion of their revolving credit facilities provided by direct lenders, which would then potentially draw on their own revolving facilities from banks, creating a dash for liquidity. At the same time, a sharp drop in private credit loan valuations, which are inherently not transparent and subject to uncertainty, could result in banks demanding margin calls from private credit funds and BDCs, which would further exacerbate liquidity pressures.

Besides the extension of credit by banks to private credit funds, other connections between the two exist. For example, private credit funds are among investors in synthetic risk transfers that allow banks to manage risk-weighted assets. The role and structure of these risk transfers are evolving although some contractual features may mitigate risk. For example, risk transfers tend to be collateralized or prefunded. It will be appropriate for regulators to continue to monitor this market as it develops.

Rising interconnectedness with insurers. Life insurers are increasingly adopting alternative investment strategies that utilize private credit to achieve portfolio yield enhancement. They hold private credit loans on their balance sheets, invest in funds as limited partners, and are involved in providing credit facilities to private credit funds. While the overall exposure of insurers to below investment grade private loans appears modest, risks remain. The larger exposure to private credit may result in increased investment risk and liquidity risk to insurers, and uncertain valuations could reduce confidence in the adequacy of capital insurers hold. Rating arbitrage of privately rated securities and potentially favorable rating designations by smaller rating agencies could prompt more risk taking by insurers and lead to a build-up of underappreciated risks. There is increasing complexity stemming from the presence of private-equity owned insurance companies that have acquired blocks of life insurance and annuity businesses through their offshore reinsurers. This limits the ability of regulators to provide oversight and address evolving risks at the firm or holding company system level and could increase U.S. insurers' counterparty risk and possibly open an avenue for contagion risk in times of stress. See **Section 3.2.4: Insurance Sector** for more details.

Recommendations

The Council recommends that member agencies continue to monitor levels of nonfinancial business leverage and credit fundamentals, trends in asset valuations, and implications of the potential for an economic downturn to cause stress to businesses and credit markets. The Council encourages financial entities exposed to corporate credit risk to review their risk-rating methods and, if applicable, assess the adequacy of their allowance for credit losses. The Council also supports enhanced data collection on private credit to provide additional insight into the potential risks associated with the rise in private credit. This could include consideration of potential improvements in the reporting by banks and insurance companies on their exposures to private credit and improved reporting on Form PF.

3.1.4 Short-Term Funding Markets

Short-term funding markets provide essential financing for financial institutions, businesses, 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. At the same time, institutions that are reliant on short-term funding

markets are subject to substantial rollover risks, and their ability to refinance maturing debt is dependent on market conditions and investors' risk appetite. These features contribute to fragilities in the short-term funding markets that can affect financial stability.

Commercial Paper Market

Commercial paper is an important source of unsecured short-term funding used by both nonfinancial and financial firms. As investors tend to buy and hold commercial paper to maturity, demand for secondary-market liquidity in these instruments is usually low, and dealers face little incentive to intermediate and support secondary markets.[54] Therefore, when demand for liquidity rises sharply, as happened during the "dash for cash" in March 2020, these markets cannot accommodate a surge in sales requests. At the same time, institutions that depend on the commercial paper market may be unable to obtain new funding as their short-term borrowings mature. Consequently, liquidity shortfalls in the commercial paper market can contribute to stress in other market sectors, cause dislocations in the real economy, and impact economic growth. Amid the market disruptions in March 2020, as investor demand for commercial paper 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 commercial paper. This episode illustrated the fragility in the commercial paper market, including the acute refinancing risks inherent in this market. The episode also highlighted the importance of ensuring that the commercial paper market functions properly during market stress.

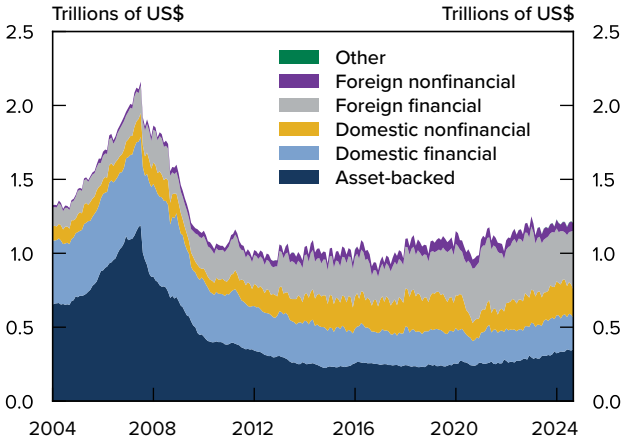
The amount of commercial paper outstanding has been relatively stable over the past year and remains well below levels observed in 2007 and 2008 (see **Figure 3.1.4.1**). Foreign financial firms and asset-backed commercial paper issuers are the most active issuers in the commercial paper market, accounting for 31 percent and 29 percent of commercial paper outstanding as of September 2024, respectively. Commercial paper spreads typically widen in market stress events, especially for lower-rated issuers (see **Figure 3.1.4.2**). Commercial paper spreads remained stable over the past year, well below levels observed in the global financial crisis (GFC) and the COVID-19 lockdown of March 2020.

Repo Market

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. Additionally, overnight Treasury repo rates form the basis of the Secured Overnight Financing Rate (SOFR). Repos are a form of secured lending in which one firm sells 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.

Large bank-affiliated securities dealers and custody banks serve as significant intermediaries in

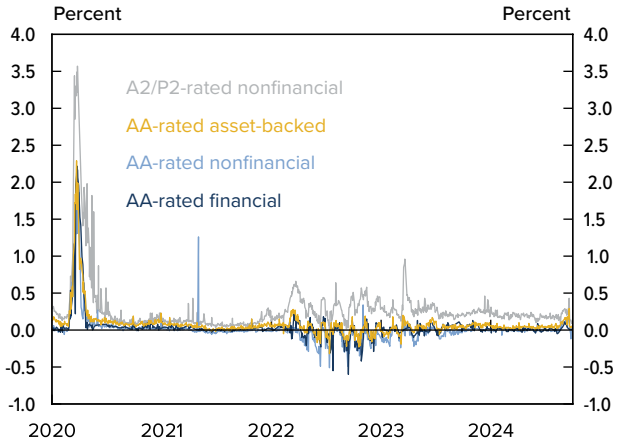
3.1.4.1 Commercial Paper Outstanding by Issuer Type



Notes: Data as of September 2024. Not seasonally adjusted. "Domestic" includes commercial paper issued in the United States by entities with foreign parents.

Source: Federal Reserve Board (Haver Analytics).

3.1.4.2 One-Month Commercial Paper Interest Rate Spreads



Notes: Data as of September 30, 2024. Spread to one-month overnight index swap (OIS) rate.

Source: Federal Reserve Board (Haver Analytics).

the repo market by borrowing from cash lenders, such as money market funds (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, and bank affiliates of the larger dealers may lend cash into the repo market. As part of its monetary policy framework, the Federal Reserve also operates the Overnight Reserve Repurchase Agreement Facility (ON RRP), which places a floor under overnight interest rates by providing an investment alternative to private-sector repo for eligible MMFs and other eligible counterparties.[55]

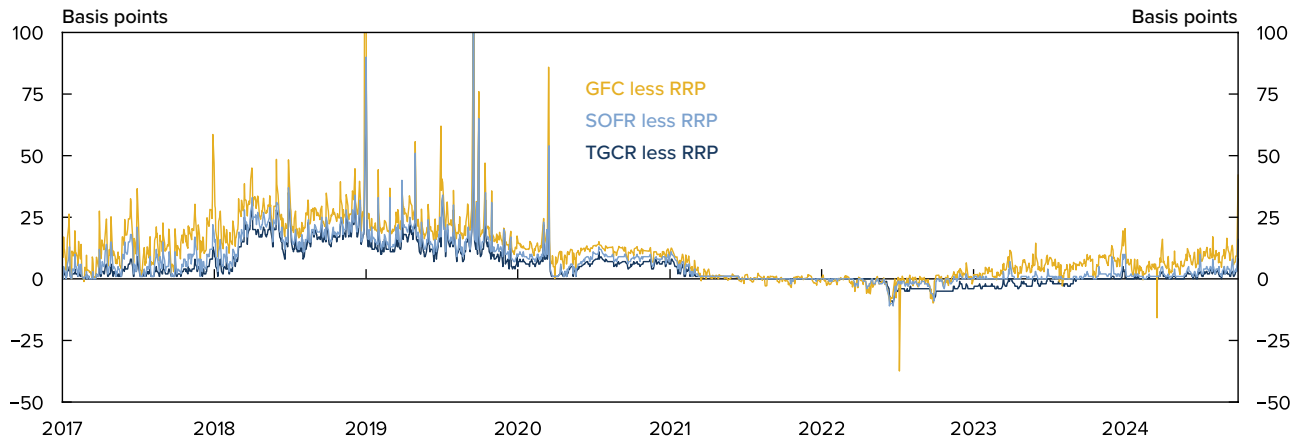
Stress in repo markets may affect financial stability, given their size, their importance in providing financing to the cash Treasury and agency mortgage-backed security (MBS) markets, as well as the prominent roles played by large financial institutions. Firms reliant on overnight or short-term repo 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, other short-term investment vehicles (STIVs), and open-end funds are cash lenders in the repo market, and these lenders may reduce their repo lending activities or tighten repo terms during periods of market stress to preserve cash to meet redemptions.[56] If these funds withdraw from the market, leveraged intermediaries, such as hedge funds and mortgage real estate investment trusts (REITs), may face higher repo borrowing costs. Adverse market conditions may also cause a significant increase in margin or collateral haircut levels, which could potentially cause distressed asset sales by leveraged firms. This dynamic can depress asset prices, lead to a further tightening in financing terms, and force further deleveraging. Stress in repo markets in March 2020 highlighted how imbalances in the repo market can quickly transmit and amplify stress in the financial system.[57]

In general, repo market rates move closely with changes in the Federal Reserve's target range for its policy rate. As demand for repo financing has grown over the last year, benchmark rates on overnight Treasury repo—the SOFR and the Tri-Party General Collateral Rate (TGCR)—have traded above the rate on the Federal Reserve's ON RRP (see **Figure 3.1.4.3**).

As of June 30, 2024, aggregate repo borrowing totaled $6.2 trillion, of which non–Federal Reserve borrowing represented $5.1 trillion (see **Figure 3.1.4.4**).[58] Treasury securities are the most common form of collateral used in repo transactions, accounting for approximately 80 percent of repo borrowing outstanding according to the Federal Reserve Bank of New York's (FRBNY's) primary dealer statistics. Repo collateralized by agency MBS accounts for approximately 15 percent of outstanding with corporate bonds, equities, with other asset classes accounting for the remaining 5 percent of total repo outstanding.

Private-sector Treasury repo trading volumes have grown over the past year, as measured by volumes used to compute SOFR (see **Figure 3.1.4.5**). These increased volumes are consistent

3.1.4.3 Overnight Repo Spreads



Note: Data as of September 30, 2024.

Sources: Federal Reserve Bank of New York and Wall Street Journal. All sources accessed through Haver Analytics.

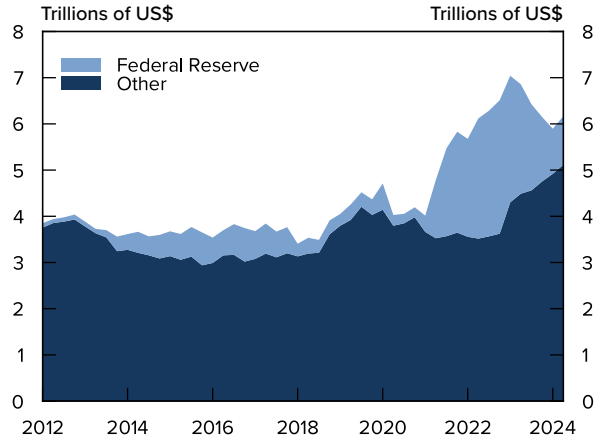
with rising hedge fund repo demand, which may reflect the cash-futures basis trade (see **Section 3.3.2: Investment Funds**), a decline in MMFs' use of the Federal Reserve's ON RRP facility as private sector repo rates are trading above the ON RRP rate (see **Figures 3.1.4.3** and **3.1.4.6**), and an increase in the supply of Treasury securities to the private sector.

The repo market includes transactions centrally cleared through the Fixed Income Clearing Corporation (FICC), transactions not cleared through FICC but settled on the Bank of New York Mellon's triparty settlement system, and transactions that are not centrally cleared but are bilaterally settled. Less is generally known about the non-centrally cleared bilateral repo (NCCBR) market segment, and this opacity has hindered regulators' ability to identify and monitor vulnerabilities in the NCCBR market. In June 2024, the OFR published a final rulemaking to establish an ongoing collection of NCCBR transaction-level data, which will, for the first time, provide regulators with timely insight into this market.

Cash lenders can mitigate counterparty credit risk on repo transactions by requiring borrowers to post extra collateral, known as a haircut. A sufficient haircut protects lenders from the risk that the value of collateral posted declines and would be insufficient if a counterparty were to default. FICC similarly sets margin requirements on the transactions it clears to mitigate its exposure to credit risk. However, the OFR's 2022 pilot study showed that for NCCBR, dealers frequently require very low or even zero haircuts.[59] While the pilot study found that zero haircut transactions may be a function of position netting, counterparty credit risk is a potentially significant issue in the NCCBR market.

In December 2023, the SEC adopted rule changes to enhance risk management practices for central counterparties in the Treasury market and facilitate additional clearing of Treasury securities transactions.[60] These rule changes, among other things, require direct participants in FICC, or other Central Counterparties (CCPs) that may offer Treasury clearing services, to centrally clear most Treasury repo and certain cash transactions to which they are counterparties. These rule changes, which will be fully implemented in June 2026, should result in a

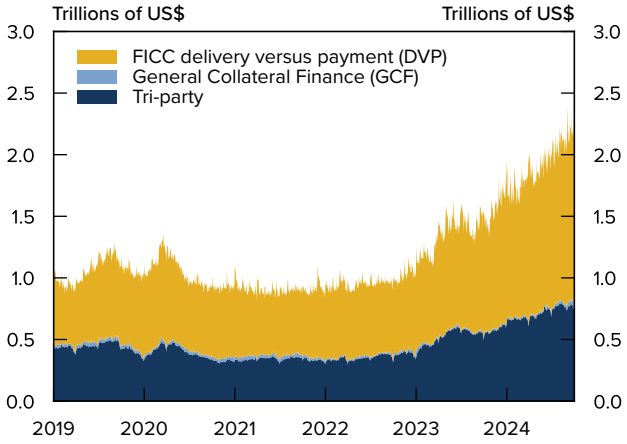
3.1.4.4 Repo Borrowing Outstanding



Notes: Data as of 2024:Q2. Federal Reserve repo borrowing primarily consists of ON RRP facility.

Source: Federal Reserve Board (Haver Analytics).

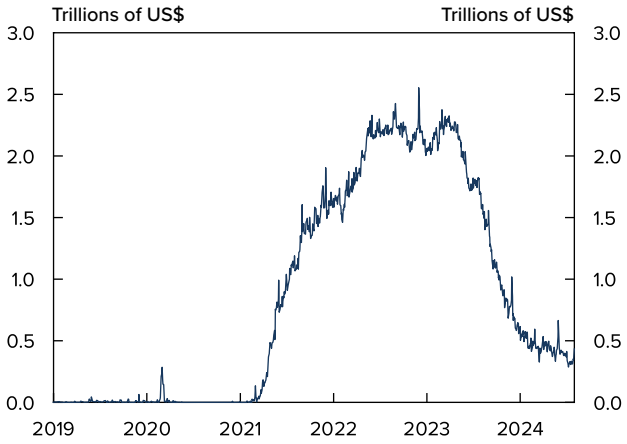
3.1.4.5 Treasury Repo Volumes



Notes: Data as of September 30, 2024. Includes Treasury repo transactions that are included in the SOFR rate. SOFR transactions include BGCR transactions (Tri-Party General Collateral and GCF Repo transactions) plus bilateral Treasury repo transactions cleared through the FICC's DVP service, which is filtered to remove "specials."

Source: Federal Reserve Bank of New York (Haver Analytics).

3.1.4.6 ON RRP Balance



Note: Data as of August 30, 2024.

Source: Federal Reserve Bank of New York (Haver Analytics).

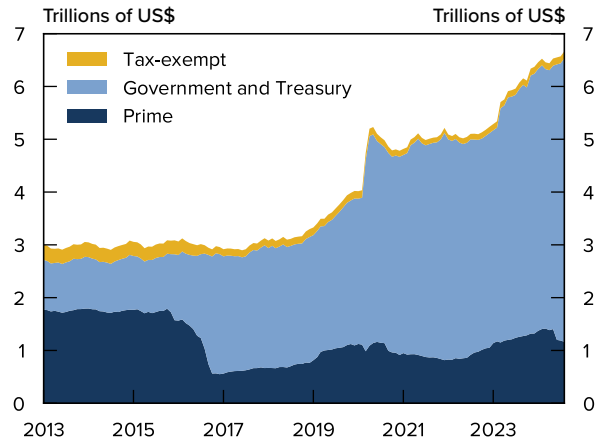
smaller NCCBR market and should subject more Treasury repo transactions to FICC margining practices. These changes could also have the effect of reducing the degree of leverage that hedge funds can take on in the basis trade, although the amount of leverage that hedge funds are able to take will depend on FICC's margin rules, any cross-margining agreements with other CCPs, and whether funds migrate toward other secured financing structures not eligible for clearing or toward non-FICC member counterparties.

Money Market Funds

MMFs are major cash lenders in the short-term funding markets. These funds serve as intermediaries between investors seeking daily liquidity with limited principal volatility and entities with short-term funding needs. There are three main types of MMFs: government, prime, and tax-exempt funds. Government MMFs invest almost exclusively in government securities and repurchase agreements backed by government securities. Prime MMFs are permitted to invest in credit-sensitive products such as commercial paper, negotiable certificates of deposits (NCDs), and other private debt securities while also investing in government securities and repo. Tax-exempt MMFs primarily invest in short-term municipal obligations that are exempt from federal income tax.[61] All three types can be further categorized as either retail or institutional depending on the client bases served.

As of August 2024, U.S. MMF assets totaled $6.7 trillion, up 9.8 percent from a year earlier (see **Figure 3.1.4.7**). The continued growth of the MMF industry is partially driven by the attractive yields offered by MMFs relative to bank deposit rates.[62] The recent growth in MMF assets has been concentrated in government and Treasury MMFs, which account for 81 percent of total MMF assets as of August 2024. In contrast, total assets at prime institutional MMFs have declined meaningfully over the past year, which can largely be attributed to certain prime institutional funds liquidating or converting to government MMFs in anticipation of the SEC's MMF reform implementation. Despite the decline in prime institutional MMF assets under management (AUM), prime retail MMF continue to receive inflows; total assets in prime retail MMFs stood at a record $813 billion in August 2024 while prime institutional AUM fell to a seven-year low of $350 billion.

3.1.4.7 MMF Total Net Assets by Type



Note: Data as of August 2024.

Sources: SEC and OFR.

MMFs contribute to funding market vulnerabilities in part because they perform liquidity and maturity transformation by offering redeemable shares to investors while investing in short-term funding instruments that can be difficult to sell during periods of market stress. This liquidity mismatch can incentivize investors to be the first to redeem during periods of market stress. In both 2008 and 2020, prime institutional 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.[63]

In August 2023, the SEC finalized amendments to the rules for MMFs that were designed to improve their resilience during periods of market stress. The amendments removed the ability of MMFs to temporarily suspend redemptions, eliminated the tie between liquidity fees and weekly liquid asset thresholds, increased the minimum liquidity requirements for MMFs, and required institutional prime and institutional tax-exempt MMFs to impose liquidity fees when daily net redemptions exceed 5 percent of net assets. These amendments went fully into effect in October 2024.

Other Short-Term Investment Vehicles in Short-Term Funding Markets

In addition to SEC-registered MMFs, other STIVs also operate as cash lenders in the short-term funding markets. These include local government investment pools (LGIPs), dollar-denominated MMFs domiciled outside of the U.S. (offshore USD MMFs), private liquidity funds, bank-sponsored short-term investment funds (STIFs), and ultra-short bond funds.

In 2024, the Council conducted a review to assess potential financial stability risks posed by STIVs, summarized in **Box F: Short-Term Investment Vehicles**.

Local Government Investment Pools

LGIPs pool and manage the cash of state and municipal government entities. LGIPs are the largest category of STIVs, with estimates of AUM ranging from approximately $880 billion to $1.2 trillion as of year-end 2023. Of this amount, approximately two-thirds of assets are invested in LGIPs that take credit risk ('prime-like') while also operating with a stable net asset value (NAV). LGIPs are overseen by relevant state and local authorities, with significant heterogeneity of standards. Some stable-NAV LGIPs voluntarily adhere to Statement 79 of the Governmental Accounting Standards Board (GASB), or GASB 79 standards, which align with the 2010 MMF reforms on maturity, liquidity, and credit risk limits. GASB 79 standards have since diverged from the MMF regulatory framework following the implementation of the SEC's 2014 and 2023 MMF reforms.

Offshore Money Market Funds

Offshore USD MMFs invest in dollar-denominated short-term financial instruments but are domiciled outside the United States and are not subject to SEC regulation. Offshore MMFs are primarily domiciled in the European Union (EU) and are the second largest category of STIVs, with AUM totaling approximately $650 billion at year-end 2023. There are three main types of EU-domiciled offshore MMFs: public debt constant net asset value (CNAV), low volatility net asset value (LVNAV), and variable net asset value (VNAV) MMFs. LVNAV funds, which are permitted to operate with a stable NAV, are the largest category of offshore MMFs, with AUM totaling approximately $430 billion.

In addition, LVNAV funds are permitted to invest in credit sensitive assets and have a significant proportion of investments in commercial paper and Certificates of Deposit (CD) products. The major offshore USD MMFs are domiciled in Ireland and Luxembourg and are subject to regulations set by the European Parliament.

Private Liquidity Funds

Private liquidity funds are structurally similar to MMFs but are only open to certain qualified investors and are permitted to take greater risks than institutional prime MMFs. Additionally, private liquidity funds offer fewer investor protections and are highly opaque to non-investors. Private liquidity fund AUM totaled approximately $360 billion as of year-end 2023. The advisers of private liquidity funds are subject to SEC oversight and provide confidential fund-level reporting through Form PF. However, these funds are exempt from the Investment Company Act and are not subject to associated SEC investment fund regulations.

Short-Term Investment Funds

STIFs are a kind of investment vehicle sponsored by banks or trusts to pool and invest assets for eligible clients with whom the bank has a fiduciary relationship. Specifically, STIFs are collective investment funds (CIFs) that invest in short-term debt instruments with the primary objective of maintaining a stable NAV (see **Section 3.2.2: Investment Funds** for additional CIF discussion). STIFs sponsored by banks regulated by the OCC or Federal Reserve had approximately $330 billion in AUM as of year-end 2023; STIFs sponsored by uninsured state-chartered trust companies have additional assets, but comprehensive data on these are not available. Like other CIFs, the rules governing STIFs are generally set by the regulator of the sponsoring bank or trust.

Ultrashort Bond Funds

Ultrashort bond funds are SEC-regulated mutual funds and exchange-traded funds (ETFs), which invest primarily in debt instruments with maturities of less than one year. Ultrashort bond fund AUM totaled approximately $320 billion as of year-end 2023, of which approximately 60 percent was in ETFs and 40 percent was in mutual funds. Ultrashort bond funds are subject to the Investment Company Act and associated SEC

regulations for mutual funds and ETFs. In contrast to most other STIVs, ultrashort bond funds operate with a floating, or market-based, NAV.

BOX F: Short-Term Investment Vehicles

In 2024, staff of Council member agencies analyzed potential financial stability risks posed by short-term investment vehicles (STIVs), covering offshore money market funds (MMFs), local government investment pools (LGIPs), private liquidity funds, bank-sponsored short-term investment funds (STIFs), and ultrashort bond funds. The staff gathered key facts for each STIV type: size, investment types, regulatory standards and oversight, liquidity risk management practices, net asset value (NAV) structure, investor composition, and experience during periods of market stress. The staff then used the Analytic Framework for Financial Stability Risk Identification, Assessment, and Response (Analytic Framework) to identify and analyze risks to financial stability related to STIVs. A more detailed discussion of potential financial stability risks can be found in **Section 3.1.4: Short-Term Funding Markets.**

The review found that a broad set of STIVs share features that can contribute to financial stability risk. This is particularly true of vehicles that invest in assets with credit risk ("prime-like" vehicles), which account for the majority of STIV assets under management (AUM).

STIVs have structural characteristics that may amplify first mover-advantage dynamics and can incentivize redemptions in stress. Most importantly, STIVs have liquidity mismatch, with ownership interests redeemable faster than many assets can be liquidated. Relatedly, most STIVs are permitted to invest in credit-sensitive assets while operating with a stable NAV. However, there is significant heterogeneity among STIV structures, investment strategies, regulations, and investor bases, with varying propensity of investors to withdraw during periods of stress, all of which may reduce some vulnerabilities and the likelihood of contagion.

STIVs are large and important investors in critical U.S. markets. Prime-like STIVs, which had more than $1.7 trillion in assets as of year-end 2023, are significantly larger than prime institutional MMFs, which had total AUM of $350 billion as of August 2024.[64] Additionally, STIVs are significant funding providers in markets that have experienced stress during prior financial crises. Most notably, STIVs now hold more than 40 percent of outstanding U.S commercial paper, a key funding market that required emergency interventions by the Federal Reserve and Treasury.

All five types of STIVs reviewed in this exercise have faced large-scale investor withdrawals, stressed asset liquidations, or warnings of such outcomes during prior periods of stress. The resulting withdrawals from U.S. funding markets can contribute to financial instability, as demonstrated by prime MMFs.

Finally, there are data gaps and limitations that challenge the Council's monitoring of STIVs and the risks they pose to U.S. financial stability.

Recommendations

The Council supports efforts to continue to examine vulnerabilities from leverage in the NCCBR market, given the reported prevalence of zero haircuts on Treasury securities and other collateral, and to consider ways to address these vulnerabilities. Additional information and data on dealers' margining practices could also improve the Council's ability to monitor risks and evaluate options, such as minimum haircuts on repo collateral, in these markets.

The Council recommends continued monitoring and, where appropriate, actions 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's reforms for MMFs have made the funds more resilient, liquid, and transparent. The SEC and the Council should monitor the efficacy of these reforms to address the financial stability vulnerabilities created by MMFs. The Council should also continue to assess and monitor the vulnerabilities from other STIVs, considering what actions may be appropriate to address potential vulnerabilities. Where lack of data prevents effective monitoring of financial stability risks, Council members should consider where it may be appropriate to collect the necessary data regarding STIVs and primary and secondary market transactions for short-term funding instruments.

3.1.5 Digital Assets

The Council continues to monitor risks related to crypto-assets.[65] Previously, the Council noted that the crypto-asset market could pose a risk to the financial system if interconnections grew or if its size became significant. The total market value of the crypto-asset ecosystem is still much smaller than the value of the traditional financial markets. The total market value of crypto-assets is $2.35 trillion.[66] By comparison, the Standard & Poor's (S&P) 500's market cap as of July 31 was $48 trillion.[67]

Despite its small size, previously identified points of interconnections, such as stablecoins, remain. This year also saw the launch of new crypto-asset exchange traded products, which create new linkages between the crypto-asset ecosystem and traditional financial markets.

Stablecoins

From the limited information that is available, the Council has previously identified stablecoins linked to traditional assets as an interconnection point between the traditional financial system and developments in crypto-asset markets.[68] Some stablecoin issuers offer redeemability on demand to account holders, while other holders purchase and sell stablecoins in secondary crypto-asset trading markets. If a stablecoin's holders are concerned about redemption or the value of the stablecoin's reserve assets, or secondary market price movements, the stablecoin may experience a run. [69] The structure of stablecoin arrangements, both in reserve holdings and corporate structure, poses concentration risks, as well as opacity and complexity risks.

Concentration Risks. The current allocation of market value within the stablecoin market may pose concentration risks. Tether's (USDT) total market value is approximately $120 billion, which represents around 70 percent of the $179 billion global stablecoin market.[70] The next largest stablecoin by total market value, USD Coin (USDC), is only $34 billion. Research indicates that one of the primary use cases for USDT is trading within the crypto-asset ecosystem.[71] Given Tether's size and use in crypto-asset trading, its failure could result in disruption within crypto-asset markets that may have knock-on effects for the traditional financial system as traditional financial firms and consumers continue to invest in crypto-asset markets.

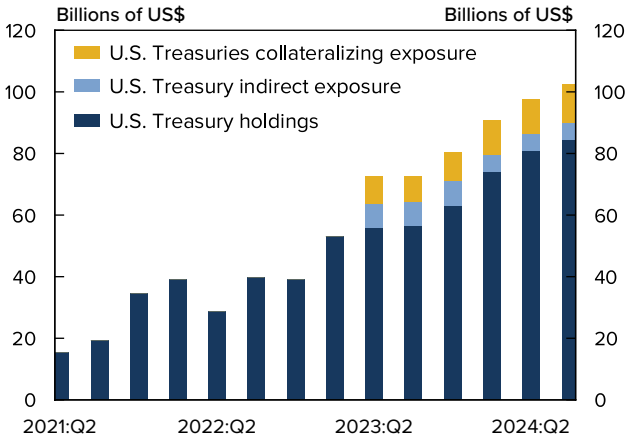
Opacity/Complexity Risks. Many stablecoin issuers remain outside of a prudential regulatory framework. Some state regulators, however, have developed regimes for crypto-asset firms and issuers. For example, the New York Department of Financial Services (NYDFS) regulates crypto-asset issuers, including stablecoin issuers, through its BitLicense and trust company charters. NYDFS licensees and charter holders are required to maintain 100 percent reserves in cash and other specified high-quality, liquid assets and must publish regular reserve attestations verifying the market value of the stablecoin's reserve at a specific time and date. Few stablecoin issuers, however, are subject to regulation by states with reporting regimes.[72] Of the five largest stablecoins by total market value, only USDC's issuer, Circle, is licensed with the NYDFS.[73] Other large stablecoin issuers, such as Tether[74] and First Digital Labs (issuer of First Digital USD), voluntarily publish attestations created by third parties that include limited or no information on their custodians, counterparties, or bank account providers. Attestations, both voluntary and required, differ in what they disclose, making period-to-period and issuer-to-issuer comparisons difficult. There is also no assurance that these types of attestations comply with auditing standards.[7576]

Stablecoins holding non-cash traditional assets in their reserves present additional risks if an issuer needs to rapidly liquidate large amounts of assets to meet redemptions during a run.[77] Such liquidation could affect prices of those assets more widely. As

an example, since the first appearance of U.S. Treasuries on Tether's attestations in 2021[78], its direct and indirect holdings have allegedly increased by over 571.57 percent to $102.61 billion (see **Figure 3.1.5.1**). If Tether continues its alleged current rate of Treasury purchases, it could become a significant holder of U.S. Treasuries and could present risks to the stability of the Treasury market if it experienced a run. Contagion risks between stablecoins suggest that potential fire sale risk should also be considered in aggregate across all stablecoins.[79]

A lack of trustworthy information about stablecoin issuers' holdings and reserve management practices poses not only risks to holders of the stablecoin, but also fraud risks if the extent or nature of the stablecoin's reserves are misrepresented.[80] A lack of trustworthy information also poses a challenge for accurate market analysis of the impact of a stablecoin issuer's holdings. A lack of information on reserves can contribute to outsized market reactions to news about an issuer or other relevant market developments, which can manifest in similarly outsized volatility and potential losses. In addition, a stablecoin holder may have no right of redemption against the stablecoin issuer or any reserve, and reserve assets may not be held in a bankruptcy-remote way. Thus, stablecoin holders may not be protected against losses. Regulatory requirements for reserves, capitalization, rights of redemption, and reporting may mitigate some of these risks.[81]

3.1.5.1 Tether U.S. Treasury Holdings



Notes: Data as of 2024:Q3. Chart reflects the fair value of U.S. Treasuries provided as collateral for ON RRP activity and the value of U.S. Treasuries in which Tether's MMFs are invested.

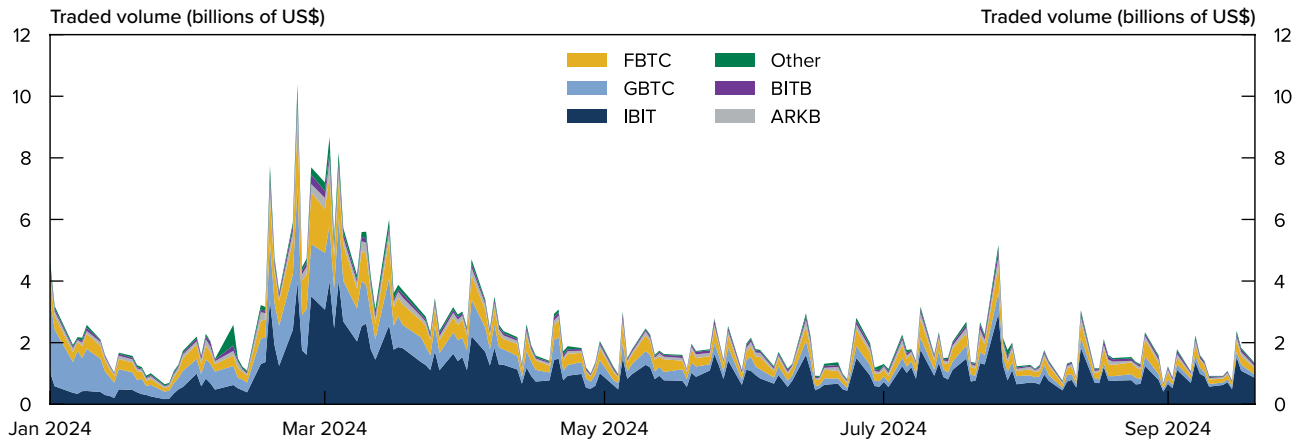
Source: Tether.

Stablecoin issuers may be part of complicated corporate structures, increasing the risk of regulatory arbitrage across legal entities and jurisdictions. As noted in the Council's 2022 digital asset report, a crypto-asset firm may operate under different regulatory regimes depending on the activities in which it engages.[82] While a stablecoin issuer may be licensed in the United States at the state level as a money service business or trust company, in many cases, no single regulator has visibility across all of an issuer's affiliates. Regulatory arbitrage may have a wide range of financial stability implications if an issuer can operate in a manner that prevents regulators from assessing the totality of an issuer's risks.

Crypto-Asset Exchange Traded Products

In January, the SEC approved the listing and trading of 11 spot bitcoin exchange traded products (ETPs)[83] in the U.S. Following the spot bitcoin ETP

3.1.5.2 Spot Bitcoin ETP Daily Volume



Note: Data as of September 30, 2024.

Source: Bloomberg.

approval, the SEC also approved nine spot ether ETPs for listing and trading. The daily trading volume for spot bitcoin ETPs reached just under $10 billion in March 2024 (see **Figure 3.1.5.2**).[84]

The Council, as noted in its Analytic Framework for Financial Stability Risk Identification, Assessment, and Response (Analytic Framework), recognizes that direct and indirect exposures of market participants to particular asset types could impair those market participants if there is a reduction in the value of the underlying assets. As a result, the Council is monitoring the impact of spot bitcoin and ether ETPs. The assets underlying the spot crypto-asset ETPs are highly volatile. As of November 1, 2024, the 30 day annualized volatility of bitcoin was approximately 37 percent. Additionally, some crypto-asset market firms and issuers remain outside of, or in noncompliance with, the U.S. financial regulatory framework. As such, the crypto-asset spot market may continue to experience significant fraud and manipulation.[85]

Despite concerns, spot crypto-asset ETPs could help to alleviate some of the risks related to direct exposure to crypto-asset markets. Federal Reserve Bank of New York (FRBNY) analysts have noted that spot bitcoin ETPs demonstrate some potential for greater liquidity and price efficiency than bitcoin futures exchange-traded funds (ETFs).[86] Further, although ETPs do not alleviate the market risks associated with the underlying crypto-assets, investors that are actively seeking crypto-asset market exposure through these ETPs are less directly exposed to other risks typically associated with the crypto-asset markets, including settlement risk and operational risks. Spot crypto-asset ETPs allow investors to achieve novel market exposure through traditional instruments, benefitting from the regularization of settlement considerations and avoiding some of the operational risks typically associated with crypto-asset investing.

Tokenized Products

Tokenized products, including tokenized assets and liabilities, are limited in their size and impact.[87] A tokenized product arises from the creation of a digital representation of the ownership record of an existing asset on a shared electronic database or the issuance of a digitally native asset directly in the shared electronic database. The market for tokenized products remains small, though interest in certain tokenized assets, such as tokenized money market funds (T-MMFs), has grown. This year, the market value of tokenized money market products increased from $767.9 million to $2.37 billion as more firms launched tokenized money market products, particularly T-MMFs.[88]

Tokenized products present novel legal and regulatory considerations. A token holder's ownership rights to an asset or to the issuer's assets may not be clearly defined, including in the event of a breach of contract or bankruptcy. As the crypto-asset industry and traditional financial firms continue to explore tokenizing other assets, firms and regulators will need to evaluate how the tokenization structures interact with U.S. law.[89] Tokenized products may also expose investors and the traditional financial system to risks. Although not all tokenized assets are issued on permissionless blockchains, deploying an asset on a permissionless blockchain exposes investors to unique operational risks that may be harder to manage in a permissionless environment and increases the interconnectedness between traditional financial markets and the crypto-asset market.[90] The potential use of tokenized money market products for payments and collateral could also exacerbate destabilizing spillover effects if the underlying issuer experiences stress or a run. Further, to the extent that the rise of T-MMFs results in greater flows to MMFs overall, it may increase competition for regulated bank deposits without being subject to the same prudential bank regulatory safeguards.

Crypto-Asset Ecosystem Banking and Custody

Banking and custodial arrangements in the crypto-asset ecosystem are currently concentrated in a relatively small number of entities, which may pose financial stability risks. Because a limited number of financial institutions currently offer banking services to crypto-asset companies, the risk of operational disruptions to crypto-asset markets via the traditional banking system is amplified by concentration.[91] In addition, to function effectively, the crypto-asset ecosystem needs custodians that properly safekeep crypto-assets. The crypto-asset custodial space is currently dominated by a relatively small number of bank and non-bank financial institutions. Reliance on a limited number of entities by asset managers and other firms for crypto-asset custody could create concentration risk, as well as investor protection risks, as some

institutions may be acting outside of or in noncompliance with regulatory frameworks. There is additional concern the public may view these products as having implied federal deposit or share insurance coverage when they in fact do not. Such a perception has the potential to erode confidence in the banking, credit union, and broader financial system during periods of financial and economic stress.

Investor and Consumer Protection

As the Council and its member agencies have noted, many crypto-asset firms lack sufficient risk governance and control frameworks, and may be acting outside of, or in noncompliance with laws and regulations, increasing the potential for contagion within crypto-asset markets. Many crypto-asset firms are structured as centralized entities that comingle multiple types of services that are usually separated in the traditional financial industry (e.g., trading, asset management, custody, and exchange, broker, dealer, and clearing agency services). Such vertically integrated entities are often in noncompliance with applicable laws and regulations and their offering of vertically integrated products and services creates conflicts of interest. Potential vulnerabilities arising out of vertical integration include lack of transparency on corporate structure and key function holders, inappropriate use of clients' funds, and market manipulation, among other things. Investor losses due to a decline of crypto-asset markets could be perceived as a regulatory failure and result in loss of confidence in regulatory outcomes in other markets.

Crypto-assets continue to be used to facilitate illicit activity. The *Federal Bureau of Investigation (FBI) 2023 Cryptocurrency Fraud Report* (released September 9, 2024) indicates that estimated losses with a nexus to crypto-assets totaled more than $5.6 billion in 2023, with almost 71 percent of those losses stemming from investment scams.[92] In the case of stablecoins, Treasury noted in its *2024 National Terrorist Financing Risk Assessment* that terrorist groups are increasingly turning to stablecoins to solicit donations of crypto-assets and to move or store funds.[93]

To address these issues, Council members continue to monitor crypto-asset market developments individually and collectively. This year, the Federal Reserve Banks convened public events to assess risks posed by the crypto-asset markets.[94] The Federal Reserve and the SEC continue to assess on-chain and other data for insights into the crypto-asset market and distributed ledger technology (DLT).[95] The CFTC, in partnership with the Department of Justice (DOJ), convened the first interagency fraud disruption conference to combat retail crypto-asset schemes known as "pig butchering."[96] Conference participants included Treasury, the Federal Reserve, the OCC, and the SEC, as well as agencies not represented on the Council.

Council member agencies have also brought actions against entities and persons violating applicable federal and state laws. In August, the Federal Reserve brought an enforcement action against a member bank due to deficiencies in the bank's risk management practices with respect to its digital asset strategy.[97] The CFTC, SEC, and state securities regulators have continued to bring actions this year charging a wide range of violations, including fraud, manipulation, failure to register, and lack of adequate know your customer and anti-money laundering controls.[98] Both federal and state agencies have also continued to secure penalties and settlements in relation to the 2022-23 crypto-asset sector bankruptcies.[99]

Recommendations

Given the continued growth of the stablecoin market, the Council recommends that Congress pass legislation that would create a comprehensive federal prudential framework for stablecoin issuers. Such legislation should address run risk, payment system risks, market integrity, and investor and consumer protections, including for entities that perform services critical to the functioning of the stablecoin arrangement. Council members should continue to educate the public about the risks of cryptocurrencies, stablecoins, and other digital assets, such as issues related to fraud, run risk, operational risk, and money laundering, among others.

Congress should also pass legislation that provides federal financial regulators with explicit rulemaking authority over the spot market for crypto-assets that are not securities. The launch of crypto-asset ETPs has the potential to increase interconnections between the traditional financial system and the crypto-asset ecosystem. To mitigate the risk of

transmission from crypto-asset markets to traditional financial markets, the Council reiterates that the rule-making authority should cover a range of subjects including but not limited to conflicts of interest; abusive trading practices; recordkeeping; transparency; any further anti-fraud authorities that may be necessary; investor protection; dispute resolution; operating norms; and a general authority to address unanticipated additional issues that may arise. As previously stated in its 2022 *Report on Digital Asset Financial Stability Risks and Regulation*, the Council recommends that its member agencies consider the general principles laid out in that report, including technological neutrality and leveraging existing authorities where appropriate.

Finally, the Council reiterates its recommendation that Congress develop legislation that would create authority for regulators to have visibility into, and otherwise supervise, the activities of crypto-asset entities and their subsidiaries, in cases in which regulators do not already possess such authority. Such legislation should include authority for regulators to address regulatory arbitrage in a coordinated manner.

3.1.6 Climate-Related Financial Risks

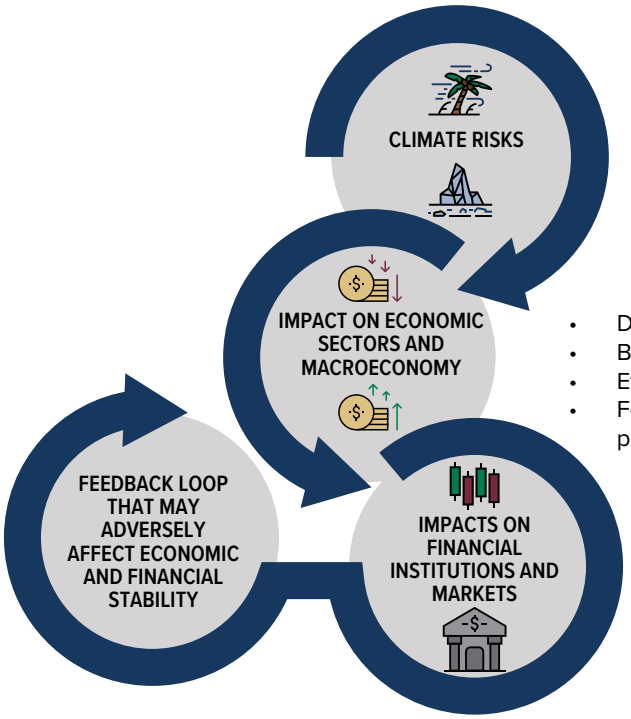
In October 2021, the Council first identified climate change as an emerging and increasing threat to U.S. financial stability.[100] Broadly speaking, there are two categories of climate-related financial risks: physical risks and transition risks.

Physical risks can be acute or chronic. Acute physical risks generally refer to the possibility of harm to people and property that can arise from individual 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. Chronic physical risks are from persistent 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 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 losses 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 sudden 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.[101] Climate-related financial risks may be occurring simultaneously with other stresses, such as financial crises or pandemics, and may also compound nonlinearly with other climate risks. For example, the joint impact of a physical climate shock and pandemic occurring simultaneously could be 50 percent larger than the sum of the impacts of the individual shocks.[102] Also, sea level rise can compound with heavy precipitation, increasing the likelihood of flooding events.[103] Given the Council's focus on the stability of the U.S. financial system as a whole, it is important to consider a systemwide approach that combines 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. Additional analysis is needed to gain an understanding of the transmission channels through which climate risk may affect the U.S. financial system (see **Figure 3.1.6.1**).

The Council is working to better understand and quantify the potential effects of climate risks on financial institutions and markets, given the wide variety of transmission channels through which climate-related financial risk could potentially manifest, the possibility that climate-related financial risk could amplify traditional risks, and the potential for the interconnections and spillovers between physical risks and transition risks to create systemic risks. 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

3.1.6.1 Transmission Channels Linking Climate Risks to Financial Stability



Transition risks
- Technological changes
- Policy shifts
- Changes in consumer preference

Physical risks
- Chronic (e.g., sea level rise)
- Acute (e.g., hurricanes)

- Damages to property
- Business interruption
- Effects on household and business income
- Feedback across economy through product and labor markets

- Credit and market risks
- Liquidity risks
- Operational risks
- Legal risks
- Amplification through interconnections and correlated exposures

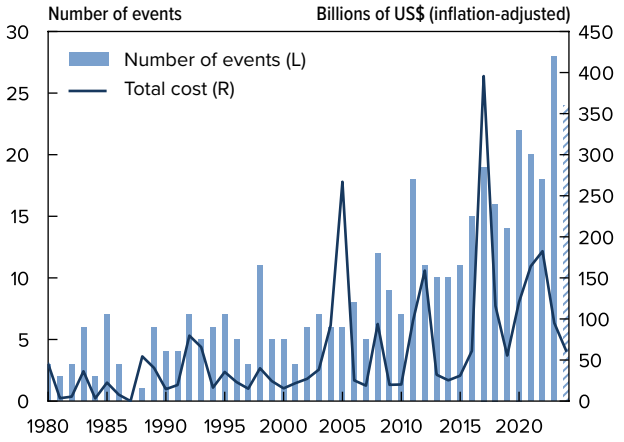
Source: Figure created by FSOC.

Climate-related Financial Risk Committee (CFRC) continues to work to build capacity, address data gaps, and improve methodological approaches to risk monitoring (see Climate-related Financial Risk: 2023 Staff Progress Report[104] and **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 prior annual reports, climate-related impacts and events are imposing significant costs on the public and the economy.[105] From January through early November 2024, the United States experienced 24 confirmed weather and climate disaster events in which losses exceeded $1 billion, up from an annual average of 8.5 events per year between 1980 and 2023 and also up from a recent five-year annual average of 20.4 events from 2019 to 2023 (see **Figure 3.1.6.2**). This increase in events with losses exceeding $1 billion is driven by a combination of factors, including rising exposure values and replacement costs, natural variability, and the effects of climate change.[106] The costs of some of these events greatly exceed $1 billion. In the fall of 2024, the United States experienced two strong late-season storms, which resulted in the deaths of over 200 people and

3.1.6.2 Billion-Dollar Weather and Climate Events



Notes: Data as of November 1, 2024. Data does not reflect damage from Hurricanes Helene and Milton. Dashed bar indicates YTD.

Source: NOAA National Centers for Environmental Information (NCEI).

caused significant damage to property and infrastructure.[107] Hurricane Helene caused an estimated total flood and wind loss between $30.5 and $47.5 billion, of which between $10.5 and $17.5 billion are estimated to be insured.[108] Hurricane Milton, which made landfall as a Category 3 hurricane, is estimated to have caused between $30 and $50 billion in insured losses.[109]

The exposure of the financial system to the effects of physical risk on real estate remains a primary transmission channel of interest. Acute climate-related events and chronic physical climate risks may reduce the value of real estate, which could affect homeowners and owners of commercial real estate (CRE), and such events can also increase the probability of default and associated loss.[110] As markets factor these risks into pricing, real estate (and real estate investment products) exposed to physical risk could lose market value.[111] Higher current physical risks are associated with lower household incomes, lower labor market participation rates, and lower education attainment.[112] The unequal distributions of climate risks[113] could further aggravate the disparities in certain housing values, eroding household 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.

Research suggests that Americans have made various responses to climate risks in their housing decisions. Recent analysis suggests that even as many Americans continue to move to areas of high climate risk, American homeowners may be increasingly informed of and responding to these risks, particularly in areas where climate risk has affected the availability and affordability of homeowners' insurance.[114] Additionally, where property-level climate risk information has become more widely available, evidence suggests that potential homebuyers are considering climate risk in their housing decisions.[115] Furthermore, there is also evidence that within the high climate risk areas, populations are shifting locally toward locations with relatively lower climate risk.[116]

Role of Property Insurance

Property insurers play an important role in the financial system by helping financial institutions and households manage physical risks by absorbing losses from physical risk events.[117] However, the increasing frequency and severity of extreme weather has affected the profitability of some 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] On average nationwide, homeowners saw double-digit percentage rate increases in their insurance premiums in 2023, with several states experiencing effective rate increases of over 20 percent.[120] Recent analysis found that premium increases are highly unevenly distributed across the country, but concentrated in areas with higher climate risk, and that these premium increases are likely to continue in the future.[121]

In some cases, government-sponsored programs, such as the National Flood Insurance Program (NFIP),[122] or residual market insurance alternatives[123] have stepped in where private insurance coverage is insufficient. However, some residual insurance alternatives may incur losses and expenses that exceed earned premiums, potentially affecting the availability and affordability of insurance. The continued viability of these programs may require rate increases, assessments, or public intervention. Ultimately, an increasing number of properties may become uninsurable due to the increasing frequency and severity of climate-related events and the associated changes in insurance policies' structure, pricing, and availability. In 2023, an estimated 12 percent of homeowners have forgone home insurance due to high costs and lack of coverage availability, including some homeowners who were unable to find private market policies after their policies were cancelled.[124]

The first half of 2024 saw continued trends from last year's high-profile developments in the insurance sector, including property and casualty (P&C) insurers withdrawing from certain high-risk markets. In 2023, U.S. home insurers suffered $15.2 billion in underwriting losses, which more than doubled the losses seen in the previous year.[125] Even as some evidence suggested insurers' profitability may have stabilized early in 2024,[126] P&C insurer withdrawals continued in 2024.[127] As of May 2024, 11 Florida home insurers were insolvent and in liquidation while 7 of California's 12 largest home

insurers have stopped writing or placed significant restrictions on new policies.[128] Additionally, there is recent evidence from a case study in Florida that new insurers, filling the gaps of insurance companies that have exited in the riskiest areas, are less diversified and hold less capital.[129]

In states where private insurance is becoming unaffordable and residual market insurance alternatives exist, homeowners are increasingly reliant on such residual plans, which generally provide some basic coverage for eligible properties but may offer more limited coverage than the policies being replaced. The number of policies and dollar amounts of premiums in residual markets have increased in recent years.[130] For example, the count of policies in force on California's Fair Access to Insurance Requirements (FAIR) plan increased 106 percent from 155,667 as of September 30, 2019, to 320,592 as of September 30, 2023. To put this increase in context, since 2019, California's FAIR plan has increased from about 0.91 percent to about 2.53 percent of the residential insurance market.[131] The residual insurer in Florida, Citizens Property Insurance Corp. (Citizens), experienced a 229 percent increase in the count of policies in force from 469,399 in 2019 to 1,542,316 in 2023. The Florida Office of Insurance Regulation has approved additional companies to assume policies from Citizens as part of the state's plan to take out policies from Citizens. The residual insurer in Louisiana experienced a 328 percent increase in the count of policies in force from 43,067 in 2019 to 184,169 in 2023. The growth in the residual market was accompanied by unprofitability, with the residual market insurers in all three states operating at a cumulative underwriting loss from 2017 to 2022.[132,133]

Higher insurance costs could drive homeowners to underinsure against growing climate-related financial risks. Some homeowners without mortgages may even choose to forgo coverage completely. For flood risk, there could also be risk from homes that are underinsured because they fall outside of the Federal Emergency Management Agency's (FEMA's) special flood hazard areas. A 2024 study on Hurricane Debby by First Street found that 78 percent of the properties impacted fell outside of FEMA special flood hazard areas, potentially exposing owners and banks to a significant insurance gap and raising concerns about how to account for ongoing changes in risk in designated flood zones or other disaster areas.[134] 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,[135] 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 if damages diminish the property's value below the outstanding debt. Any resulting defaults could push losses into other parts of the financial system, generating losses to 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 of neighboring properties.[136]

There are government programs that may help households or businesses that lack insurance to cover their losses. These funds, however, are typically limited and may be insufficient to return the property to its pre-disaster condition.[137] 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 regarding the 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**).

Recommendations

The Council welcomes continuing actions to improve the quality and availability of data for assessing financial firms' climate-related financial risks, such as FIO and NAIC's joint data collection

from large writers of homeowners insurance on their underwriting metrics and related insurance policy information. The Council recommends state and federal agencies continue to coordinate to identify, prioritize, and procure data necessary for monitoring climate-related financial risk, including via the Council's working groups.

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

Financial regulators, as consistent with their mandates, should continue to consider 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 the final rule from the SEC to enhance and standardize climate-related disclosures for investors[138] and the updated Climate Risk Disclosure Survey from the NAIC.

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 how the intersection of physical risk, real estate, and insurance may affect financial stability.

3.2 Financial Institutions

3.2.1 Depository Institutions

Depository institutions play an essential role in the U.S. financial system by providing credit to retail and commercial borrowers, helping firms raise capital or hedge risk, providing asset management and custody services, and facilitating payments. U.S. depository institutions are diverse, including global systemically important banks (G-SIBs) and other large banks, regional banks, community banks, and credit unions. The resilience of the U.S. banking system is critical to the U.S. economy and the global financial system.

Overall, the U.S. banking system remains resilient, supported by sound levels of regulatory capital, adequate liquidity buffers, and healthy levels of profitability. However, some potential vulnerabilities warrant continued monitoring. With short-term interest rates above levels that prevailed prior to 2022, increased bank funding costs put pressure on net interest margins (NIMs). Compressed NIMs have contributed to a modest easing in bank profitability in the first half of 2024 compared with the same period in 2023. Market-adjusted capital ratios remain low, and there are still concerns that the strong reliance of some banks on non-deposit and uninsured deposit funding could make them more vulnerable to runs. In addition, weakening credit conditions in commercial real estate (CRE)—especially in the office sector and segments of the multifamily sector—have led to concerns among market participants about regional banks with large CRE concentrations (see **3.1.1: Commercial Real Estate**). Nonperforming loans (NPLs) and charge-off rates in consumer credit have risen to exceed their pre-pandemic levels. Also, during the course of the year, several incidents related to cybersecurity and third-party risk underscored the need for vigilance and the potential costs associated with operational risk.

Credit unions do not typically present a threat to financial stability given their relatively small sizes and limited risk-taking. Nevertheless, severe and widespread distress in the sector could have negative and spillover effects on the broader economy. The growing concentration of system assets in a relatively few large and complex credit unions have the potential to threaten the health and viability of the National Credit Union Share Insurance Fund (SIF) should a failure of one of these large institutions occur. However, the credit union system remains generally resilient against economic disruptions.

G-SIBs and Large Non-G-SIBs

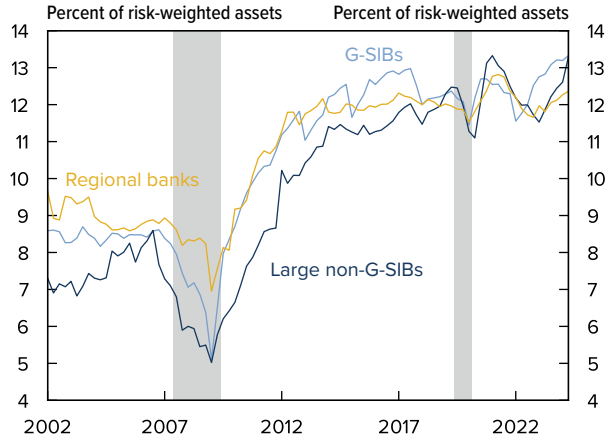
Banks with greater than $250 billion in assets account for more than 60 percent of U.S. banking

assets and play a critical role in providing banking services to retail and commercial clients. Moreover, these banks have a central function in the global financial system by performing payments on a global scale and clearing large volumes of transactions in repurchase agreement (repo) markets. As such, their resilience and stability are of paramount importance for both the United States and global economies.

G-SIBs and other large banks maintain risk-based capital positions within the range observed in the last decade.[139] An upward trend in the Common Equity Tier 1 Capital (CET1) ratio continued over the past year, with average capital ratios remaining on par with higher levels observed in the past 20 years (see **Figure 3.2.1.1**). Current levels reflect a higher G-SIB capital surcharge in some cases, as well as the results of the 2023 Federal Reserve Stress Tests that informed the stress capital buffer.

Profitability metrics for G-SIBs and other large banks remain in line with trends observed over the past decade even as they are slightly below the levels observed in the first half of last year (see **Figure 3.2.1.2**). Net interest income weakened over the first half of 2024 as funding costs continued to catch up to asset yields. An increase in noninterest expense also dampened net income in the first half of 2024. Growth in noninterest income and investment banking revenues helped support the results of large banks.

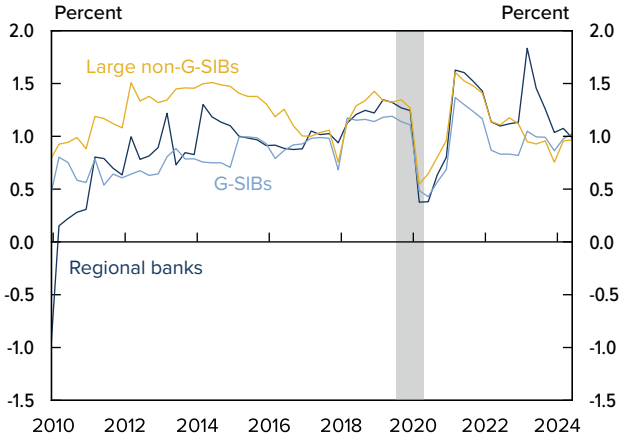
3.2.1.1 Common Equity Tier 1 Ratios



Notes: Data as of 2024:Q2. 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. Gray bars signify NBER recessions.

Sources: Federal Reserve Bank of New York and National Bureau of Economic Research.

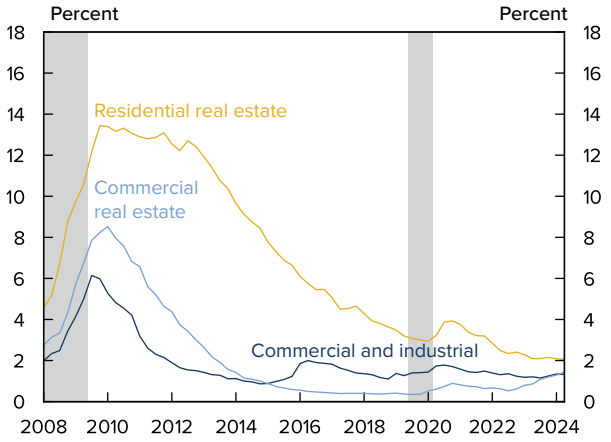
3.2.1.2 Return on Assets



Notes: Data as of 2024:Q2. Gray bar signifies NBER recession.

Sources: Federal Reserve Bank of New York and NBER. All sources accessed through Office of Financial Research.

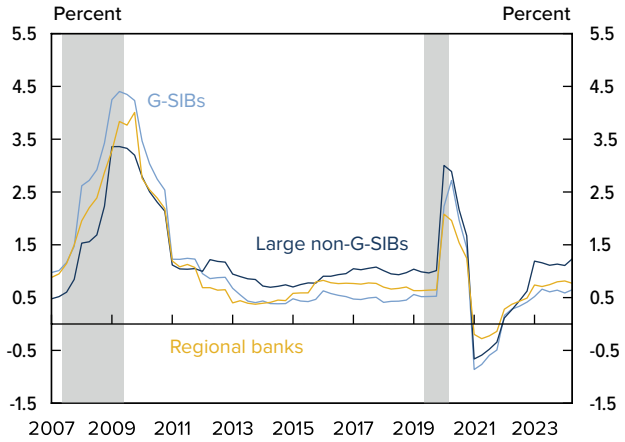
3.2.1.3 Delinquency Rates by Portfolio



Notes: Data as of 2024:Q2. Gray bars signify NBER recessions.

Sources: FFIEC and NBER. All data accessed through Office of Financial Research.

3.2.1.4 Ratios of Allowance for Credit Losses



Notes: Data as of 2024:Q2. Ratios are annualized. Gray bars signify NBER recessions.

Sources: Federal Reserve Bank of New York and NBER.

Overall, credit quality has remained solid among G-SIBs and other large banks in the second quarter of 2024 despite an uptick in NPL ratios and charge-offs (see **Figure 3.2.1.3**). Recent levels of loan provisioning suggest that large banks do not expect credit quality to deteriorate materially in the near future, though credit quality has weakened for credit cards, auto loans, and CRE (see **Figure 3.2.1.4**). Moreover, the largest banks do not have high concentrations in CRE.

According to the July 2024 Senior Loan Officer Opinion Survey (SLOOS), most large banks reported keeping business lending standards near the midpoint of their historical ranges.[140] However, large banks also reported that, on balance, lending standards are currently on the tighter end of their historical range for CRE and consumer loans. This tightening is prudential given the softening credit quality of these loans.

G-SIBs and other large banks continue to hold significant amounts of liquid assets despite some modest declines over the past year.

Regional Banks

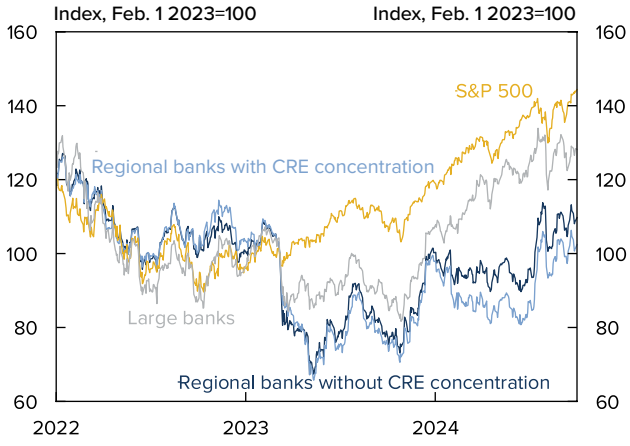
Although smaller than large banks and G-SIBs, regional banks[141] play a critical role in the U.S. financial system by providing deposits, mortgages, CRE loans, commercial and industrial loans, and a host of other traditional banking functions. As a result, the resilience and stability of these banks are of paramount importance to the structure and functioning of the U.S. economy.

In early 2024, an earnings announcement by a regional bank briefly led to concerns about renewed turmoil in the banking sector. Market participants' attention centered on a set of banks with similarities to the regional bank, some of which experienced sizable declines in stock prices as investors revised their earnings outlook for the banks. This market volatility subsided relatively quickly but highlighted the importance of strong liquidity and credit risk management (see **Figure 3.2.1.5**).

CET1 ratios at regional banks are near the upper end of their range over the last decade. Increased funding costs put downward pressure on profitability for regional banks, much as they did for large banks. Unlike large banks, however, regional banks do not generally provide market-making, sales and trading, or corporate finance services. Regional banks thus have comparatively lower noninterest income to offset declines in net interest income. The level of interest rates, which has been higher than market participants expected coming into 2024, continues to weigh on the market value of banks' securities portfolios. As a result, market-adjusted capital ratios remain low and continue to be vulnerable to the path of interest rates going forward.

Liquidity metrics remain generally sound for regional banks even as competition for deposits has created funding cost pressures (as reflected in NIMs) (see **Figure 3.2.1.6**). One of the lessons learned from the Spring 2023 turmoil is the importance of banks having diverse sources of funding that they are operationally ready to

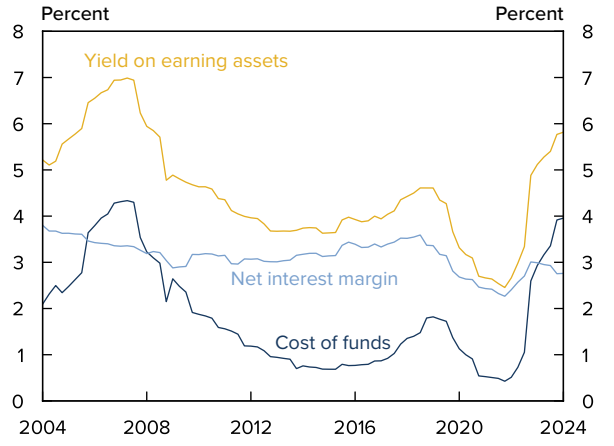
3.2.1.5 Bank Stock Price Performance



Notes: Data as of September 30, 2024. Data are daily weighted averages.

Source: Bloomberg.

3.2.1.6 Net Interest Margin



Note: Data as of 2024:Q2.

Source: Federal Reserve Board.

access when needed. Collectively, U.S. banks have pledged more than $1 trillion in new collateral at the discount window, and more banks have gained access to the window, bolstering banks' ability to access liquidity. Regional banks that have large concentrations, particularly of uninsured deposits, or a reliance on credit-sensitive funding sources, could create funding pressures if market and economic conditions were to weaken.

Runs on uninsured deposits contributed to the failures of three regional banks in Spring 2023. These runs were exacerbated by each bank's high reliance on uninsured deposit funding and concentrations in the depositor base, among other important factors. The failures of these institutions and subsequent events renewed focus on deposit insurance, funding concentrations, and reliance on uninsured deposits. These failures highlighted the need for additional data that would allow agencies to closely monitor not only uninsured deposit levels but also the composition and stability of those deposits, and the need to further enhance resolution planning and preparedness capabilities to mitigate similar crises in the future.

Regional banks generally have less exposure to consumer credit risk and greater exposure to corporate and CRE credit risk than their larger peers. Over the past year, NPLs across the system have remained below pre-pandemic averages; however, NPLs in select categories, such as credit cards and nonfarm nonresidential CRE, have approached or exceeded pre-pandemic averages.[142] Regional bank exposure to CRE loans may translate into greater losses for these banks compared to their larger peers should CRE valuations in their markets continue to fall. The level of interest rates, which remains elevated relative to the period before 2022, has also put pressure on borrowers' ability to service debt.

According to the July 2024 SLOOS, banks with assets below $100 billion reported that, on balance, lending standards are currently on the tighter end of their historical range for CRE and subprime consumer loans. Although standards were unchanged from previous SLOOS for residential real estate and auto loans, standards remain tight relative to historical patterns. Moreover, delinquency rates in consumer loan portfolios have increased, driven by vulnerable segments of consumers with higher leverage and lower incomes. Continued monitoring of consumer portfolios is warranted especially if the labor market softens further.

Resiliency and Resolution Preparedness

Market volatility in the first quarter of 2024 and operational events throughout the year have underscored the need for banks to be financially and operationally resilient through appropriate risk management and contingency planning. This risk management includes the ability to access diverse funding sources when needed, as well as the ability to recover from operational and third-party servicer outages. Several episodes throughout the past year have demonstrated the importance of operational resiliency. In late November 2023, the Industrial and Commercial Bank of China's (ICBC) U.S. broker-dealer experienced a ransomware attack. The bankruptcy of fintech intermediary Synapse in May 2024 highlighted the operational risks involved in banks' partnerships with fintechs. In July 2024, a faulty update from CrowdStrike, a cybersecurity technology provider, caused widespread operational outages across multiple industries.

In June 2024, the FDIC approved a final rule to strengthen resolution planning for insured depository institutions (IDIs) with at least $50 billion in total assets. Under the rule, large banks with total assets of at least $100 billion will be required to submit comprehensive resolution plans that meet enhanced standards to support the FDIC's ability to undertake an efficient and effective resolution under the Federal Deposit Insurance Act should such an institution fail. The rule will require IDIs with total assets of at least $50 billion but less than $100 billion to submit more limited informational filings to assist in their potential resolution.

The FDIC's new rule strengthens the existing IDI resolution planning framework by requiring a full resolution submission from most covered IDIs every three years with limited supplements filed in the off years. Covered IDIs affiliated with U.S. G-SIBs must file a full resolution submission every two years. The final rule also bolsters engagement between the FDIC and covered IDIs on resolution matters. It requires periodic testing to validate key capabilities and processes needed in a resolution, such as continuation of critical banking services and potential marketing of the

institution's franchise or its components. Additionally, the rule enhances the criteria to assess the credibility of IDIs' resolution submissions and the FDIC's approach to providing feedback.

In July 2024, the FDIC and the Federal Reserve approved final joint guidance to certain large domestic and foreign banking organizations to further develop their resolution plans under Title I of the Dodd-Frank Act, which these organizations file every three years. The final guidance generally applies to large domestic and foreign banking organizations that are not the largest and most complex banking organizations (i.e., G-SIBs), for which guidance is already in place. The guidance is the first that has generally become available for domestic entities that must submit resolution plans every three years and is an update to guidance released in 2020 for foreign banking organizations that must submit resolution plans every three years. The resolution plans, also known as living wills, describe a banking organization's strategy for rapid and orderly resolution under bankruptcy in the event of material financial distress or failure.[143]

In October 2024, the OCC finalized amendments to its enforceable recovery planning guidelines. Under the guidelines, each insured national bank, federal savings association, and federal branch with average total consolidated assets of $100 billion or more will have a recovery plan for responding to a wide range of severe internal and external stress scenarios. These recovery plans will help the institutions to restore it to financial strength and viability in a timely manner. The amendments also incorporate a testing standard and clarify the role of nonfinancial (including operational and strategic) risk in recovery planning.

Credit Unions

Similar to other depository institutions, credit unions have faced headwinds from challenging economic conditions, such as an extended period of higher interest rates, the lingering impact of elevated inflation rates and some softening in labor markets. Performance in the credit union system has been largely stable, as illustrated by modest growth in loan and share balances, as well as NIMs in line with pre-pandemic trends. The SIF and Central Liquidity Facility, which acts as a shock absorber to contain or avert liquidity crises before they escalate, helps protect the credit union system and members' financial security. However, credit union balance sheets are showing increasing signs of financial strain, reflecting stress in household finances. In recent quarters, the overall delinquency and charge-off rates of federally insured credit unions have been some of the highest observed since 2015 primarily due to higher delinquencies in credit card and auto loan portfolios.

As of the second quarter of 2024, year-on-year total loan growth in the credit union system was 3.6 percent, consistent with a moderation in consumer spending and home buying activity. Meanwhile, credit quality weakened. Specifically, the delinquency rate on credit card loans has been hovering around 200 basis points through mid-2024, close to levels last seen during the global financial crisis (GFC). The delinquency rate on auto loans was 83 basis points as of mid-year, nearly double the level from two years prior.

Total deposit growth increased just 2.6 percent at credit unions over the four quarters ending in the second quarter of 2024, led by an increase in higher-yielding share certificates (which are similar to certificates of deposit at banks). Although this helped boost the median average cost of funds for credit unions to a 15-year high of 100 basis points, the NIM for credit unions has remained steady at roughly 3.0 percent.

Credit unions in the aggregate remain resilient and well capitalized. As of the second quarter of 2024, the system's net worth ratio stood at 10.84 percent and over 98 percent of federally insured credit unions have a capital ratio above the statutory requirement of 7 percent. Disaggregated data reveal some pockets of concern, however. For larger, relatively complex credit unions, those with assets above $500 million, there has been a material rise in the number of institutions with some degree of supervisory concern. Among the very largest credit unions ($10 billion or more in assets), none had a composite CAMELS rating of 3 or worse, a rating indicating some degree of supervisory concern, in 2022 and 2023. Yet, in the second quarter of 2024, 19 percent of credit unions had a composite CAMELS rating of 3.

Credit unions differ from banks in terms of the risk posed by certain loan concentrations,

particularly for commercial real estate. Credit unions overall have much less exposure to the CRE market than small community banks. For instance, credit union loans collateralized by nonowner occupied, nonfarm, non-residential CRE, which would be the most vulnerable to performance issues because this category includes office buildings, accounted for just 4.5 percent of all loans outstanding in the second quarter of 2024. Moreover, the credit union system has a much lower share of uninsured deposits than the banking system, which mitigates the overall risk of a material deposit flight during times of economic and financial stress.

As of the second quarter of 2024, the SIF has retained earnings of $4.1 billion and a balance of $21.6 billion; at the same time, 21 federally insured credit unions have assets exceeding $10 billion, and two have assets exceeding $50 billion. The failure of any one of these credit unions may exhaust the SIF's retained earnings and significantly impair credit unions' 1 percent contributed capital deposit. These events could destabilize the credit union system and erode public trust as credit union capital falls below statutorily required levels. The credit union system faced significant stresses after the GFC and narrowly averted a destabilizing write-down of their 1 percent contributed capital deposits due only to special legislation that enabled the establishment of the Temporary Corporate Credit Union Stabilization Fund.

Even without a devaluation of the 1 percent contributed capital deposit, various sources of stress within the credit union industry could shake confidence in the system or more directly threaten financial stability. Excessive costs or complications associated with resolving a large credit union failure, declines in SIF equity exceeding the very limited buffer currently permitted under law, and challenges at third-party service providers all have the potential to affect the financial system directly or indirectly.

Recommendations

The Council encourages efforts to complete the Basel III reforms to further enhance the resilience of the banking system. The Council also encourages the banking agencies to finalize a proposal to improve the resilience and resolvability of certain large banking organizations by requiring them to maintain outstanding long-term debt that can provide additional loss protection for depositors, the Deposit Insurance Fund (DIF), and general unsecured creditors, among others, in resolution. The Council also encourages the regulators jointly to implement section 956 of the Dodd-Frank Act regarding incentive compensation practices.

Banks should continue to ensure they have sound risk management practices. Sound risk management includes planning for funding and liquidity events through contingency planning. Well thought-out planning, including testing, of potential funding and liquidity sources, is essential to ensuring financial stability. Banks should also be mindful of operational risks as they implement new technologies and work with service providers. They should conduct proper due diligence and testing of technologies and service provider relationships. The Council supports banking agencies' efforts to increase bank recordkeeping requirements for custodial deposit accounts with transactional features.

The Council recommends that supervisors encourage institutions to engage in effective liquidity management and planning, including by making sure they can access contingent liquidity facilities. To ensure that improvements to liquidity risk management practices are maintained, the Council supports the banking agencies' consideration of adjustments to the scope and calibration of the current bank liquidity regulatory framework to address lessons learned from the spring of 2023. The Council also supports efforts by the FDIC to collect information on the characteristics of different types of deposits and their stability, including to inform options for reform of the deposit insurance system.

The Council encourages the NCUA to continue efforts to mitigate the risk of a significant credit union failure. If the NCUA is unprepared for significant failures, including of the largest credit unions or highly interconnected credit unions, or third-party service providers, then the SIF may be unable to withstand the resulting losses. The Council encourages the NCUA to explore the drivers of and preventative measures around large institution failures and strengthen supervisory policies and procedures that reduce the likelihood of such a failure occurring. The Council also

advises the NCUA to closely examine procedures for failed institution resolution, identify deficiencies and implement strategies to mitigate loss and risk to the SIF.

The Council recommends that the NCUA use its existing powers in managing the SIF to increase the reserves and normal operating level—the target equity ratio—to better safeguard against losses and adopt a countercyclical approach. The Council further recommends that Congress pass legislation that would increase NCUA's flexibility in administering the SIF and provide greater parity with the FDIC's statutory powers in managing the DIF. Removing the ceiling for the SIF's equity ratio would strengthen the resiliency of the credit union system and better enable the NCUA Board to proactively manage the SIF, ensuring its ability to support financial stability.

BOX G: FHLBanks' Role as a Stable and Reliable Source of Liquidity

Congress created the Federal Home Loan Bank (FHLBank) System in 1932 to revive a housing market devastated by the Great Depression and provide a stable and reliable source of funding for mortgage lenders. Today, the System consists of eleven regional FHLBanks, each of which is a separate, member-owned cooperative that provides liquidity to member institutions, such as commercial banks, credit unions, and insurance companies, within its district to support housing and community development. The Office of Finance is also part of the System and operates as the FHLBanks' fiscal agent. As regulator of the FHLBank System, the FHFA has responsibility for ensuring the FHLBanks operate in a financially safe and sound fashion that is consistent with their housing finance mission.

In 2022, FHFA initiated a comprehensive review of the FHLBank System to identify areas where the System functions well and to identify areas for improvement.[144] The review involved significant stakeholder outreach and internal analysis and culminated in publication of the *FHLBank System at 100: Focusing on the Future Report* (*System at 100 Report*) in November 2023. The report found that over the years, the FHLBanks have successfully fulfilled the key function of providing low-cost, stable, and reliable funding to creditworthy members. It also recommended actions to strengthen the FHLBanks' ability to perform their liquidity function going forward, including recommendations for FHLBanks' activities during times of market stress and ways to improve access to capital markets for smaller, community-based organizations.

FHLBanks Must Coordinate with Other Lending Facilities

The *System at 100 Report* emphasizes that the role of the FHLBanks in providing secured advances (loans) to members must not be solely relied on by members in periods of broad stress. In particular, the FHLBanks do not have the functional capacity to meet the needs of multiple large members that can have significant borrowing needs over a short period of time. During the 2023 banking stress events, it became apparent that several large banks relied on the FHLBanks to provide significant funding to them late in the day when debt markets had slowed or closed. Further, they were not operationally ready to borrow from the Federal Reserve's discount window. The *System at 100 Report* includes a recommendation for the FHLBanks, their members, and the members' primary federal regulators to work together to ensure large depository members have procedures in place to borrow from the discount window.

Improve Member Risk Management

The market disruptions in March 2023 exposed weaknesses in certain FHLBanks' member credit evaluations, including undue reliance on collateral protection to make or extend advances. The *System at 100 Report* includes a recommendation for the FHLBanks to revisit their policies, procedures, and systems for assessing members' credit risk, and use a holistic risk-based framework that considers a member's financial condition and its capacity and willingness to repay its credit obligations. The report also encourages the FHLBanks to work with their

BOX G: FHLBanks' Role as a Stable and Reliable Source of Liquidity (continued)

members' primary regulators to ensure timely communication when a member's financial condition weakens in order to inform decisions to renew outstanding advances or grant additional credit to members.

The *System at 100 Report* commits FHFA to study advance prepayment requirements, giving special consideration to situations where a borrowing member fails shortly after receiving a long-term advance. The FHLBanks are required by regulation to charge their members prepayment fees on most advances with a term of more than six months, even in the event of a member failure. This requirement may increase the cost of the failure either directly when the fee is paid by the FDIC or NCUA, or indirectly when an acquiring institution pays a lower acquisition amount for a failed institution to offset the prepayment fees.

The report also affirms a longstanding regulatory prohibition on an FHLBank making new advances or renewing outstanding advances for a term greater than 30 days to members without positive tangible capital, unless specifically requested by the member's prudential regulator.

Strengthen FHLBank Capital Management

Each FHLBank has a retained earnings policy that provides for the assessment of the risk of losses under various financial and economic scenarios and the establishment of a minimum amount of retained earnings sufficient to absorb such losses. Retained earnings have grown over the past 20 years, and the FHLBanks currently satisfy all statutory and regulatory capital requirements. To preserve this strong capital position, the *System at 100 Report* includes a recommendation for the FHLBanks to regularly revisit and update their retained earnings policies. The report also calls for enhanced FHLBank stress testing and public disclosure of stress test results.

Preserve Debt Issuance Benefits

A key driver of the FHLBanks' ability to provide low-cost capital is their ability to issue debt at rates only slightly higher than rates on comparable Treasury instruments. The FHLBanks' low debt issuance cost is passed on to members in the form of favorable advance pricing. The *System at 100 Report* includes a recommendation to ensure that FHLBanks issue debt in a manner that accounts for the negative effects that a single large borrower could have on the activity of all members. FHFA plans to take steps to limit large debt issuances that unduly raise debt clearing costs or debt issuance activity. Based on past experience, such issuances can negatively affect all members by temporarily raising debt clearing costs or debt issuance activity and, as a result, could lead to suboptimal pricing of advances and may even increase advance pricing at one or more FHLBanks.

System at 100 Report Implementation

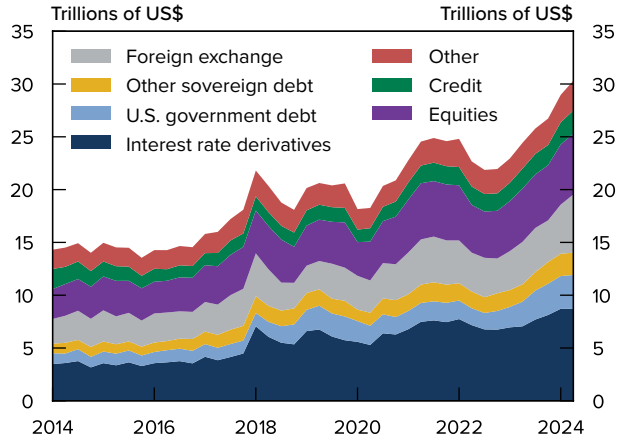
Since issuing the report last year, FHFA has been implementing these and other recommendations through a multi-year, collaborative effort. The FHFA has taken initial steps to better position the FHLBanks to perform their liquidity mission. These steps include issuing guidance on FHFA's expectations for member credit risk management[145] and issuing a notice of proposed rulemaking to provide greater flexibility for the FHLBanks' to meet short-term liquidity needs through interest-bearing deposit accounts and similar overnight investments.[146]

3.2.2 Investment Funds

Hedge Funds

The hedge fund sector is a large and growing sector of the financial services industry, and funds play a prominent role in providing liquidity to a variety of financial markets. However, hedge funds' market investments can be procyclical given their heavy use of financial leverage and their sensitivity to market downturns. Rapid deleveraging can lead to market dislocations and create disruptions that can spread to other market participants. During the past five years, the hedge fund industry has grown by $2.9 trillion, with gross assets totaling $9.6 trillion as of the second quarter of 2024.[147] As of the second quarter of 2024, hedge fund gross notional exposures totaled $30.3 trillion, which reflects a 24 percent year-over-year growth (see **Figure 3.2.2.1**). Hedge fund trading strategies vary widely, and funds invest in a wide range of asset classes. Hedge fund exposures to interest rate derivatives, foreign exchange products, and equities account for 29 percent, 18 percent, and 19 percent of funds' total gross notional exposures, respectively. Funds have material exposures to other asset classes including U.S. government debt, G10 sovereign debt, and credit products. While exposures increased for every asset class over this period, the growth in U.S. government debt exposures was particularly pronounced and reflected a 37 percent year-over-year increase and twice the level from two years prior.

3.2.2.1 Hedge Fund Gross Notional Exposures by Asset Class



Notes: Data as of 2024:Q2. Gross notional exposure is the sum of the absolute value of long and short exposures, including those on and off the balance sheet, and is based on SEC Form PF.

Sources: OFR and SEC.

Leverage can be a useful component of funds' investment strategies, and its use can imply varying levels of risk depending on strategies of the investment vehicle and the volatility of funds' investments. At the same time, leverage can magnify the impact of asset price movements on a fund's net asset value and performance. During periods of stress, leverage can incentivize or require funds to liquidate positions as it multiplies losses, increases the probability of margin calls, and subjects the position to the risk that counterparties reduce or suspend financing. A disorderly liquidation of positions could lead to an impairment of market functioning, potentially impacting previously unaffected market participants. Additionally, the exposures created by leverage establish interconnections to other market participants through which financial stress could be transmitted to the broader financial system.

Hedge fund leverage varies depending on strategy, and certain relative value and macro-focused funds use significant leverage to achieve their investment objectives (see **Figure 3.2.2.2**). Leverage levels for macro and multi-strategy focused funds have risen considerably over the past several years; macro funds' balance sheet leverage, as measured by gross assets divided by net assets, increased from 4.1x in the second quarter of 2019 to 6.7x in the second quarter of 2024, while multi-strategy funds' balance sheet leverage increased from 2.6x to 4.2x over the same

3.2.2.2 Leverage Ratios by Strategy

	Macro	Relative value	Multi-strategy	Credit	Equity	Event-driven	Other
Gross assets / net assets	6.7x	6.4x	4.2x	1.7x	1.6x	1.2x	1.4x
Gross exposures / net assets	43.6x	21.0x	15.9x	2.6x	2.9x	1.5x	3.0x
Borrowing / net assets	4.4x	4.4x	3.1x	0.4x	0.9x	0.2x	0.3x
Net assets ($ billions)	171	164	669	334	1,180	242	1,364

Notes: Data as of 2024:Q2. Net asset-weighted. "Other" includes managed futures, fund of funds, and other strategies. "Gross assets / net assets" reflects on-balance-sheet leverage. "Gross exposures / net assets" also includes off-balance-sheet exposures.

Sources: OFR and SEC.

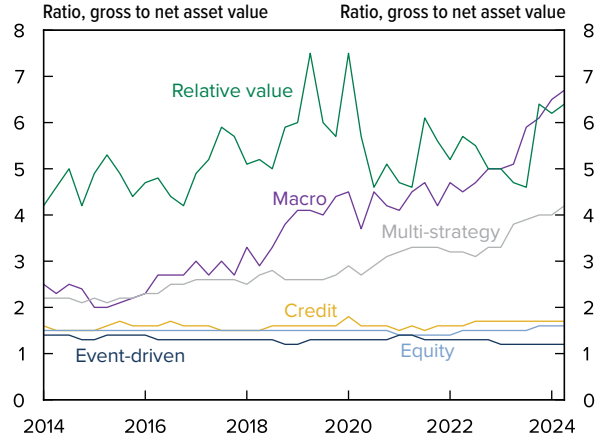
time period (see **Figure 3.2.2.3**). Macro and multi-strategy funds have seen a similar increase in their off-balance sheet leverage levels, as measured by gross notional exposures divided by net assets. Macro funds' gross notional exposures to net assets leverage ratios increased from 23.3x in the second quarter of 2019 to 43.6x in the second quarter of 2024, while multi-strategy funds gross notional exposures to net assets leverage ratios increased from 9.2x to 15.9x.

Leveraged funds are highly interconnected with the broader financial system. Hedge funds typically obtain leverage through secured financing transactions, such as repurchase agreements (repo) and securities lending, or synthetically through derivatives transactions, which may be either centrally or bilaterally cleared. The aggregate level of hedge fund borrowing has increased significantly in recent quarters (see **Figure 3.2.2.4**). As of the second quarter of 2024, hedge fund borrowing totaled $5.1 trillion, reflecting a 54 percent increase in hedge fund borrowing since the third quarter of 2022. Both prime brokerage and repo borrowing increased significantly over this period, with prime brokerage borrowing increasing by approximately $740 billion and repo borrowing increasing by $1.1 trillion. The increase in repo borrowing is likely attributed, in part, to the continued growth of the cash-futures basis trade, which is described further below. At the same time, concentration risks appear to have increased, as the growth in repo borrowing among the largest hedge funds has outpaced that of the broader hedge fund industry. Repo borrowing for the ten largest funds has more than doubled from $588 billion in the third quarter of 2022 to $1.3 trillion in the second quarter of 2024, and a disorderly unwind by these funds could impair market functioning.[148]

The continued growth of the cash-futures basis trade has increased the amount of leverage in the Treasury market and represents a financial stability vulnerability. Over the past two years, asset managers have increased their holdings of long Treasury futures, which has caused futures to trade at a premium to cash Treasury securities. Hedge funds can arbitrage this spread by taking a short position in a Treasury futures contract and an offsetting position in a cash Treasury security financed by repo. This trading strategy translates demand for Treasury futures contracts into demand for Treasury securities, improving Treasury market liquidity, reducing segmentation between cash and futures markets, and contributing to Treasury markets' efficient functioning under normal market conditions. When cash and futures prices obey historical correlations and financing conditions are stable, the basis trade is a low-volatility trading strategy. However, for the trade to be profitable, hedge funds use significant amounts of leverage, exposing them to the risks related to a breakdown in historical correlations or adverse funding shocks. As seen in March 2020, a rapid unwind of the basis trade could pose a financial stability risk if fund liquidations disrupt market functioning.[149]

While the full size of the basis trade is difficult to quantify, evidence of the basis trade can be observed through a variety of public data sources.

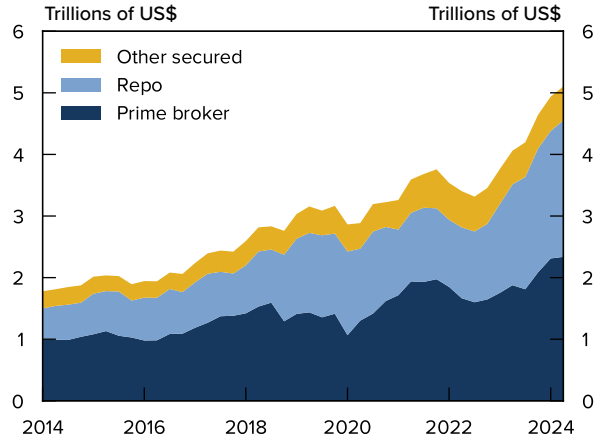
3.2.2.3 Hedge Fund Leverage by Strategy



Note: Data as of 2024:Q2.

Sources: OFR and SEC.

3.2.2.4 Hedge Fund Borrowing



Notes: Data as of June 2024. Data from SEC Form PF excludes unsecured borrowing, which is less than 1 percent of overall borrowing.

Sources: OFR and SEC.

As of September 2024, leveraged funds' net short Treasury futures contracts had a notional value of $1.1 trillion, nearly double the peak observed in the leadup to the COVID-19 pandemic (see **Figure 3.2.2.5**). At the same time, repo volumes have surged, and primary dealers' inventories of Treasury securities are at historically high levels, which may indicate that dealers are warehousing the increased issuance of Treasury securities in the repo market and facilitating the basis trade (see **Figure 3.2.2.6**). Form PF data, which are reported with a longer lag, show a similar increase in funds' Treasury exposures and repo borrowing.

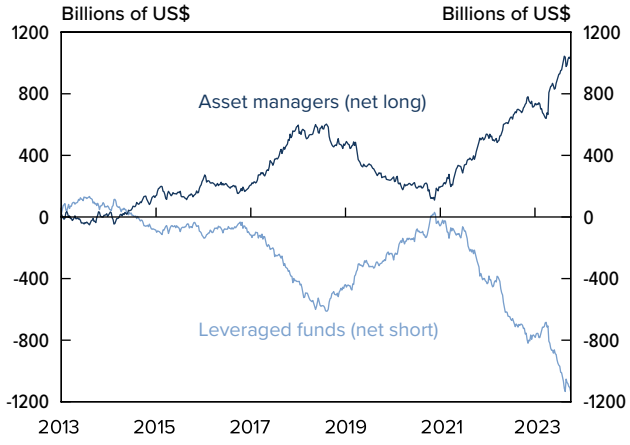
Hedge funds performed well through the first nine months of 2024, with the HFRI Fund Weighted Composite Index gaining 8.2 percent year-to-date. However, some hedge fund strategies were negatively impacted by the volatility event in August 2024, including momentum trading, digital asset, tech-focused equity, and Japan-focused equity funds. While certain funds likely experienced sizeable losses, all large hedge funds were able to meet margin calls without issues. The recently implemented Form PF Current Report (Form PF-CR) filing requirement, whereby funds are required to file Form PF-CRs within 72 hours of triggering certain thresholds that could indicate significant stress at a fund, has enhanced the Council's ability to dynamically monitor signs of hedge fund stress.

The Council's Hedge Fund Working Group (HFWG) has continued analyzing the potential vulnerabilities associated with repo haircutting practices as low or zero haircut transactions are common in the non-centrally cleared bilateral repo (NCCBR) market and may represent a structural vulnerability during periods of market stress. The continued growth of the basis trade and hedge fund repo borrowing have increased scrutiny of NCCBR transactions. Agencies have been considering how the SEC's recently approved central clearing rule, supervisors' work with banks to remediate deficiencies in counterparty credit risk management practices, and other steps may address these vulnerabilities.

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 if such investments represent a large percentage of the assets in the fund. 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 secure cash in times of uncertainty, and to seek out a potential first-mover advantage to avoid 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 distressed asset sales.

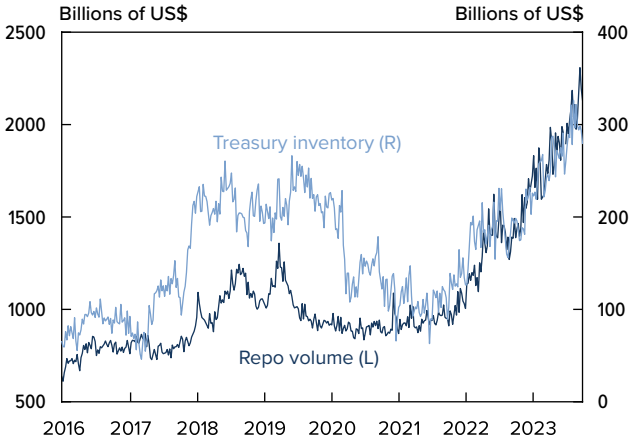
3.2.2.5 Treasury Futures Positioning



Note: Data as of September 30, 2024.

Source: CFTC (Haver Analytics).

3.2.2.6 Repo Volumes and Primary Dealer Treasury Inventory



Notes: Data as of September 30, 2024. Overnight Treasury repo volume includes published volumes for SOFR; Treasury inventory excludes FRNs and TIPs.

Source: Federal Reserve Bank of New York (Haver Analytics).

Mutual funds continue to be prominent investors in equity and fixed-income markets, with assets totaling $21.2 trillion as of March 2024 (see **Figure 3.2.2.7**).[150] Although mutual funds saw net outflows of approximately $591 billion for the twelve months ended March 31, 2024, these funds remain important in U.S. markets. Equity-focused mutual funds continue to experience sizable outflows, recording $536 billion in net outflows during this period (see **Figure 3.2.2.8**). Multi-asset funds experienced net outflows totaling $105 billion, while bond mutual funds saw net inflows of $50 billion for the twelve months ended March 31, 2024.

Exchange-traded funds (ETFs) have continued to experience rapid growth, partly reflecting investors' interest to shift assets from mutual funds to ETFs, which typically have lower costs and improved liquidity. ETF assets totaled $8.6 trillion as of March 2024, compared with $6.7 trillion a year prior (see **Figure 3.2.2.9**). Net inflows into ETFs totaled $708 billion for the twelve months ended March 31, 2024 (see **Figure 3.2.2.10**). In particular, net inflows for ETFs focusing on U.S. and global equities totaled $506 billion, and net inflows for ETFs focusing on bond investments totaled $184 billion for the twelve months ended March 31, 2024. Leveraged, inverse, and volatility or options-focused ETFs had total assets of $161 billion as of July 2023, which accounted for less than 2 percent of total ETF assets under management (AUM).

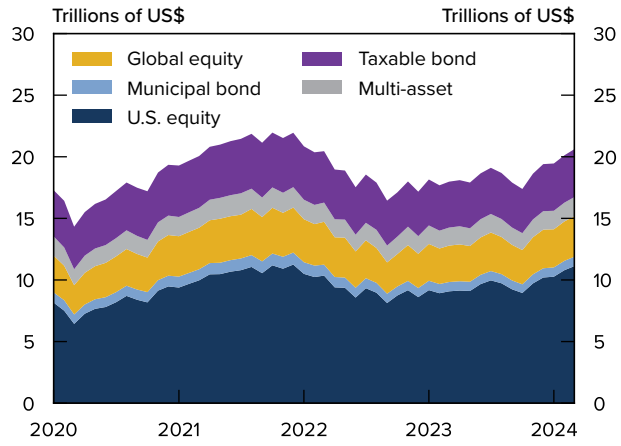
Over the twelve-month period that ended March 31, 2024, index funds (generally, those mutual funds and ETFs that are passively managed) had net inflows of $609 billion while non-index funds (generally, those mutual funds and ETFs that are actively managed) had net outflows of $490 billion.

To enhance open-end fund resilience in periods of market stress, in December 2022, the SEC proposed amendments designed to better prepare open-end funds for stressed conditions and to mitigate the dilution of shareholders' interests. In September 2024, the SEC adopted amendments to reporting requirements on Form N-PORT to provide the SEC and investors with more timely information about funds' portfolio investments.

Collective Investment Funds (CIFs)

Collective investment funds (CIFs) are bank administered and trust company administered

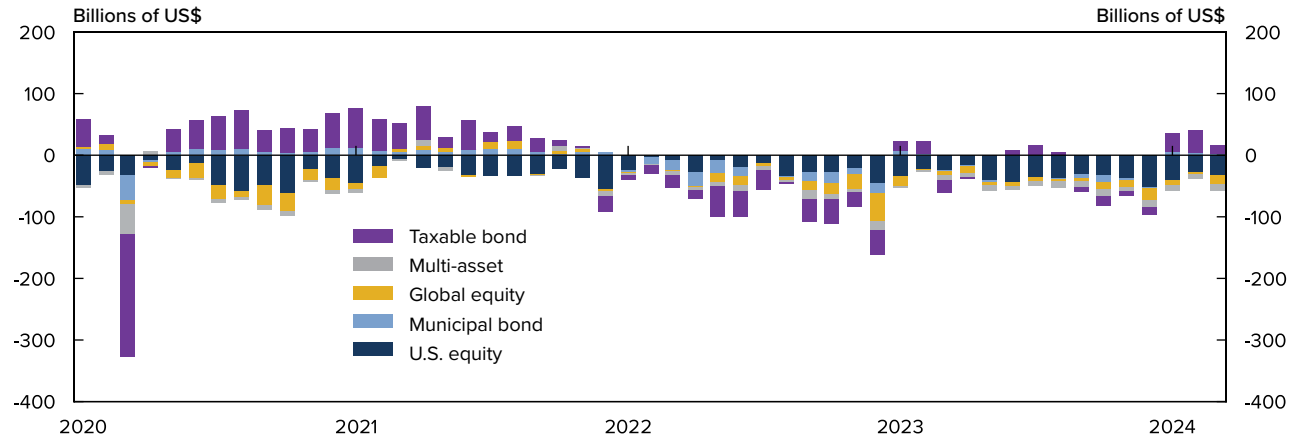
3.2.2.7 Mutual Fund AUM



Note: Data as of March 2024.

Source: SEC.

3.2.2.8 Mutual Fund Net Flows



Note: Data as of March 2024.

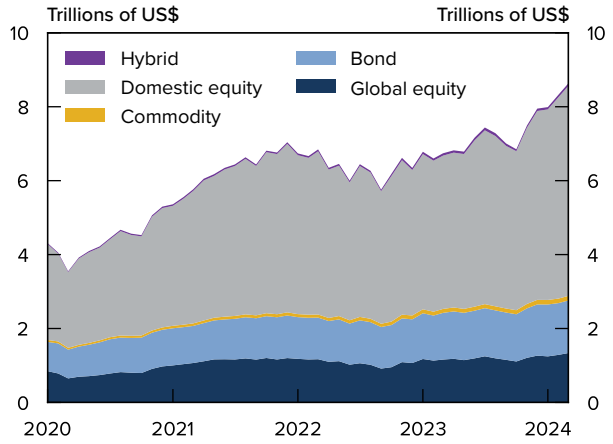
Source: SEC.

funds that hold pooled assets of eligible fiduciary accounts. CIFs generally comprise common trust funds for accounts for which the bank acts as trustee and collective investment trusts offered to tax-exempt qualified retirement plans. Short-term investment funds (STIFs), a subset of CIFs that invest in high-quality, short-term debt instruments and seek to maintain a stable net asset value (NAV), are discussed further in **Box F: Short-Term Investment Vehicles**.

CIFs are pooled investment vehicles that are managed collectively in accordance with a specified 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 present financial stability risks. By statute, CIFs are not required to be registered under the federal securities laws. Compared to open-end funds, CIFs face fewer explicit restrictions on illiquid assets and the use of leverage and have more limited requirements to make disclosures to their investors. However, 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 trust law and, to the extent that they hold applicable retirement plan investments, Employee Retirement Income Security Act (ERISA) obligations. These obligations impose a fiduciary duty of prudence on investments, which is generally applicable to illiquid assets and use of leverage.

While individual federal and state regulators collect varying degrees of data on the CIF activities of the banks and trust companies they supervise, not all of these data are publicly available. Therefore, the Council has limited data on the size and holdings of the entire CIF industry. Banks and trust companies filing Call Reports reported almost $5.0 trillion in CIF AUM as of year-end 2023 (see **Figure 3.2.2.11**).[151] Qualified retirement plans, especially 401(k)s and other participant-directed plans, have expanded their investments in CIFs.[152] The growth in CIFs is in part due to their lower operating expenses and more flexible fee structure, which is based on their different regulatory requirements. Such differences may continue to affect investment decisions and market trends in the investment fund sector.

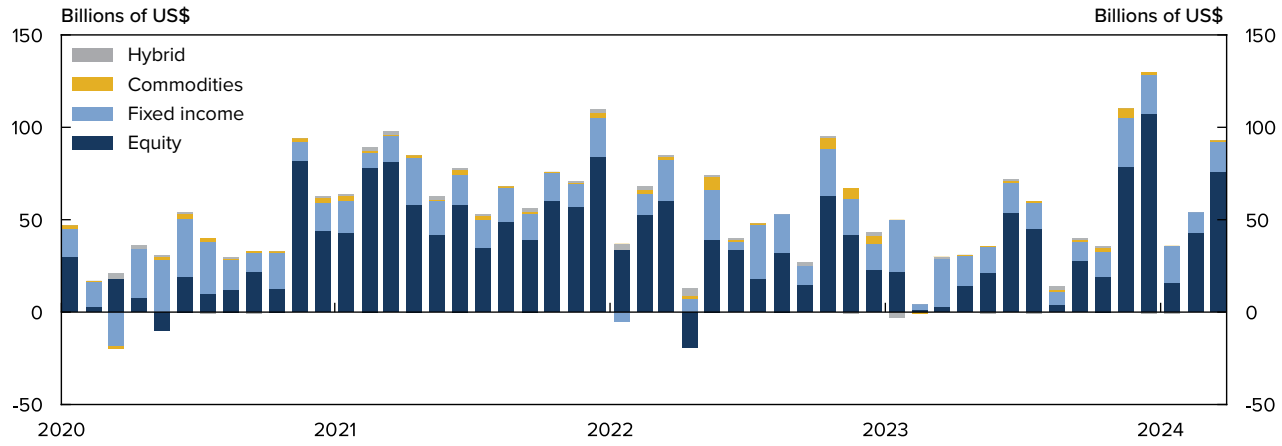
3.2.2.9 ETF AUM



Note: Data as of March 2024.

Source: SEC.

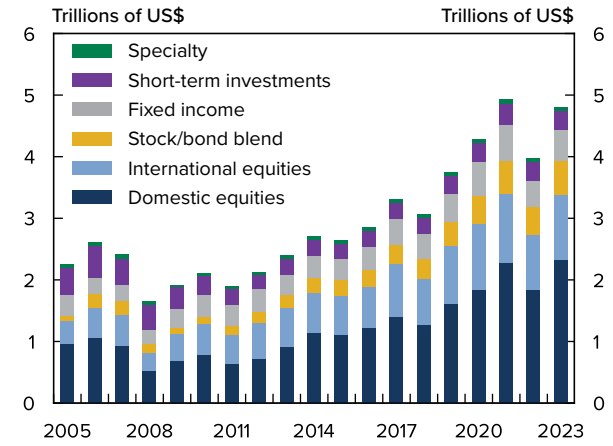
3.2.2.10 ETF Net Flows



Note: Data as of March 2024.

Source: SEC.

3.2.2.11 Collective Investment Funds AUM by Sector



Notes: Data as of 2023. Chart shows only funds managed by institutions reporting CIF and CIT assets on Call Report Form RC-T.

Source: FFIEC.

Recommendations

The Council supports the initiatives by the SEC and other agencies to establish greater transparency 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, banking regulators, and market regulators should continue reviewing the findings of the HFWG and consider whether additional steps should be taken to address identified vulnerabilities.

The Council supports the SEC's continued engagement regarding open-end funds, including the SEC's adoption of amendments to require more frequent and timely reporting of funds' portfolio information to the SEC and the public. The Council recommends that both state and federal regulators continue to 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. Finally, the Council and state and federal regulators should consider what steps are needed to address financial stability risks from open-end funds and CIFs.

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

Central Counterparties (CCPs) act as key nodes within the global financial framework through their provision of central clearing services. 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 buyer to the seller and seller to the buyer. The CCP requires collateralization of outstanding exposures to the counterparties to secure the fulfillment of outstanding agreements. End user clients can access clearing services at a CCP through clearing members that are required to satisfy certain membership criteria, including capital requirements. While central clearing serves as a safeguard against potential defaults among counterparties that might jeopardize financial stability, it may also create vulnerabilities in the financial system through risk concentration in the CCPs.

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 credit 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 procedures are the mark-to-market of all cleared positions and the exchange of variation margin, which represents the change in value of a cleared portfolio and 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.

For each contract that is cleared, CCPs replace bilateral risk between CCP members with a direct exposure between each of those members and the CCP, and that exposure is collateralized by requiring them to provide cash and eligible securities. Consequently, CCPs mitigate credit risk in the financial system but create liquidity and operational risk, with potentially procyclical effects. Following the global financial crisis (GFC), there has been a notable increase in CCP volumes and products. Regulatory bodies overseeing clearing members should continue to monitor the liquidity risk management practices and capabilities of these firms.

There are eight financial market utilities (FMUs) designated by the Council (DFMUs), as described in **Figure 3.2.3.1**. Clearing House Interbank Payments System (CHIPS), Continuous Linked Settlement (CLS) Bank International, and The Depository Trust Company (DTC) are DFMUs that are not CCPs, and, for that reason, they are outside of the scope of this chapter of the report.

3.2.3.1 The Eight DFMUs

Primary supervisor	FMU	Type of FMU	Primary financial transactions processed
FRB	Clearing House Interbank Payments System	Payment system	Large value payments
	CLS Bank International	Payment system	FX settlement
SEC	The Depository Trust Company	Central securities depository and settlement system	Equities, corporate, and municipal debt
	National Securities Clearing Corporation	Central counterparty	Equities, corporate, and municipal debt
	Fixed Income Clearing Corporation	Central counterparty	U.S. Treasuries and mortgage-backed securities
	The Options Clearing Corporation	Central counterparty	Options, futures, and options on futures
CFTC	Chicago Mercantile Exchange, Inc.	Central counterparty	Futures, options on futures, and swaps
	ICE Clear Credit L.L.C.	Central counterparty	Credit default swaps

Source: Federal Reserve Board.

When conducting reviews of DFMU activities to evaluate whether the designation remains appropriate, the Council reviewed the considerations for designation under the Dodd-Frank Act, including: (a) the aggregate monetary value of transactions processed; (b) the aggregate exposure to counterparties; (c) the relationships, interdependencies or interactions with other FMUs; and (d) the effect that a failure or disruption of the FMU would have on critical markets, financial institutions, or the broader financial system. Key themes across DFMUs emerging from the most recent review include increased volumes and liquidity exposures; high market concentration; and expansion of services, such as increased product offerings. The FMU Committee continues to monitor new risks and new market developments.

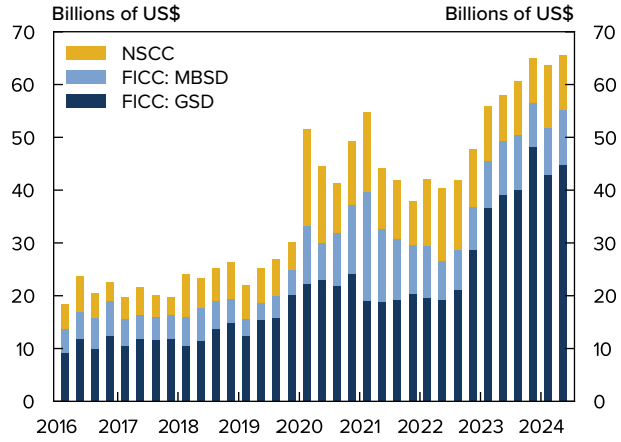
CCP-Related Market Developments

This section provides a snapshot of recent data regarding CCPs' clearing of cash securities, exchange-traded derivatives (futures and options), and cleared over-the-counter (OTC) derivatives (swaps).

Cash Securities. In the United States, the Fixed Income Clearing Corporation (FICC)[153] and the National Securities Clearing Corporation (NSCC), which are subsidiaries of the Depository Trust & Clearing Corporation (DTCC), are the providers of clearing services for cash securities. Both FICC and NSCC continue to be designated by the Council as systemically important FMUs. 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 first quarter of 2024 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 volatility has increased. As of June 30, 2024, clearing fund requirements across DTCC's three clearing services totaled $65.6 billion, up $7.7 billion from June 30, 2023 (see **Figure 3.2.3.2**).

Exchange Traded Derivatives: Futures and Options. Most exchange-traded derivatives in U.S. markets 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. CME and the Options Clearing Corporation continue to be designated by the Council as systemically important FMUs. The initial margin posted against exchange-traded derivatives remains elevated relative to pre-pandemic levels, with the margin at Options Clearing Corporation, CME, and ICE Clear U.S. totaling $321 billion as of the third quarter of 2024, down $3.4 billion from its post-pandemic high of $327 billion in the first quarter of 2022 (see **Figure 3.2.3.3**).

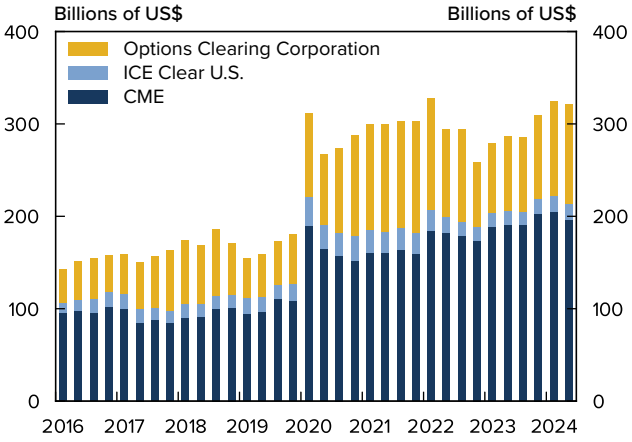
3.2.3.2 DTCC Clearing Fund Requirements



Note: Data as of 2024:Q2.

Source: PFMI Quantitative Disclosures (Clarus Financial Technology, 4.1.4).

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



Notes: Data as of 2024:Q2. Initial margin required as reported in quantitative disclosures; includes house and client accounts.

Source: PFMI Quantitative Disclosures (Clarus Financial Technology, 6.1.1).

Cleared OTC Derivatives: Interest Rate Swaps and Credit Default Swaps (CDS). Within the cleared swaps markets, most U.S. dollar interest rate swaps are cleared through London-based LCH Ltd. or CME, while most CDS are cleared through ICE Clear Credit or Paris-based LCH SA. The required initial margin for interest-rate swaps and CDS's totaled $314 billion as of June 28, 2024, down $11 billion from the prior June (see **Figure 3.2.3.4**). Interest-rate swap instruments are also cleared at Eurex, a Germany-based CCP registered with the CFTC, and at Japan Securities Clearing Corporation (JSCC), a Japan-based CCP exempt from registration with the CFTC. As in 2023, initial margin levels for interest-rate swaps remained elevated in 2024 compared with prior years, with most of the increase attributable to increased interest rate volatility, as central banks maintained target rates at levels higher than in prior years. Initial margin account breach likelihoods decreased at interest-rate swap CCPs, which indicates that the initial margin held by the CCPs appears to be sufficient. Initial margin account breaches occur where the variation margin payment in a day is greater than the initial margin held against the account (see **Figure 3.2.3.5**).

Key CCP-Related Market Developments: Concentration of CCPs and Clearing Members

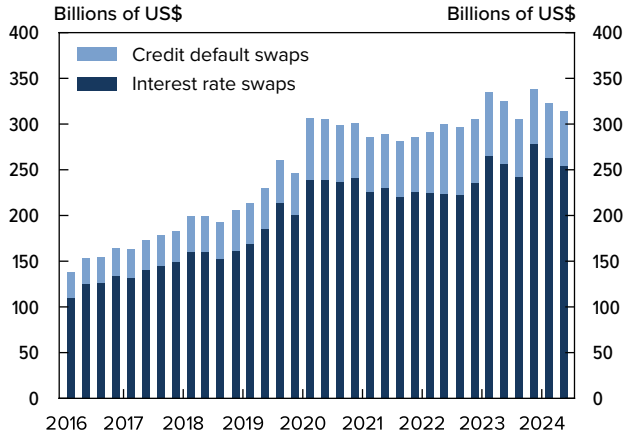
Of the eight DFMUs, five are CCPs, one is a securities depository, and two are payment systems. Efficiencies from portfolio compression and portfolio margining within the same CCP provide incentives for the concentration of clearing services for similar product types. The aggregation of risk within central nodes in the system brings to the fore the importance of ensuring that vulnerabilities in those nodes are adequately managed, with respect to liquidity risk, credit risk and operational risk.

Clearing members are also highly concentrated. The same 10 globally systemically important banks (G-SIBs) are clearing members at the same global DFMUs. As a result of this interconnectedness, the failure of one large clearing member could result in simultaneous default processes and portfolio auctions at several clearing houses, with potential impact on market values and liquidity demands.

CCP Resolution

The Council has designated five CCPs: CME, FICC, NSCC, ICE Clear Credit, and Options Clearing Corporation as systemically important FMUs, due to the potential impact on 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. While historical instances of CCP failures

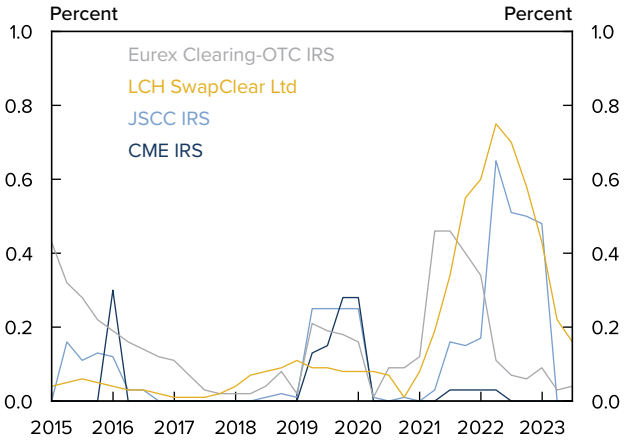
3.2.3.4 Initial Margin: Centrally Cleared OTC Derivatives



Notes: Data as of 2024:Q2. Bars show initial margin required as reported in quantitative disclosures, including house and client accounts. Interest rate swaps margin includes LCH Ltd. and CME. Credit default swaps margin includes ICE Clear Credit (ICC), ICE Clear Europe (ICEU), and LCH SA. ICEU ceased clearing CDS in October 2023.

Source: PFMI Quantitative Disclosures (Clarus Financial Technology, 6.1.1).

3.2.3.5 Daily Breach Rate at Interest-Rate Swap CCPs



Notes: Data as of 2024:Q2. Breach indicates the required variation margin on an account is greater than the initial margin held against the account.

Source: PFMI Quantitative Disclosures (Clarus Financial Technology, 6.5.3).

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.

Additionally, 13 CCPs from 10 different jurisdictions, including three from the United States—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 to enhance these SI>1 CCPs' preparedness for a potential resolution event, such as setting up crisis management groups with cooperation agreements to support resolution planning and resolvability assessments. Regulators contributed to the development of an international standard, adopted by the Financial Stability Board (FSB) in April 2024, that sets the expectation that resolution authorities should have access to dedicated resources and tools for CCP resolution.[154]

The SEC has adopted, and the CFTC has 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.[155] These measures and further engagement between regulators on information sharing will enhance readiness for a potential CCP resolution event.

To enable regulators to better assess concentration risks, it is particularly important for them to have a more complete picture of clearing members' exposures among different CCPs. 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.

Expansion of Clearing of U.S. Treasuries

In December 2023, the SEC approved its final rule providing for the expansion of mandatory clearing for cash Treasuries[156] by December 2025 and Treasury repurchase agreement (repo) and reverse repo[157] by June 30, 2026. While a number of CCPs have announced their intention to provide clearing services for U.S. Treasuries, currently FICC is the sole provider of clearing services for Treasury transactions.[158] The average daily value cleared on FICC is $7.5 trillion, as of June 2024. This figure is expected to increase to $11 trillion as a result of these changes.[159]

The OFR gathers data on centrally cleared and bilaterally cleared repo. In May 2024, the OFR adopted a rule to establish an ongoing data collection of non-centrally cleared bilateral transactions in the U.S. repo market. It is important for regulatory agencies to have the tools to monitor developments in cleared and uncleared markets, in particular with respect to potential liquidity demands at CCPs. Market participants are engaging with FICC and with regulators on access to clearing models for end users.

Operational Risk and Critical Third-Party Service Providers

Recent operational failures, either due to cyber attacks or due to operational disruptions, have re-emphasized the importance of operational resilience across the financial services sector. This theme is particularly relevant for CCPs. CCPs are central nodes within the Financial Services Sector, which has been identified by the Cybersecurity & Infrastructure Security Agency as a Critical Infrastructure Sector.[160] International standards, such as the *Principles for Financial Market Infrastructures*,[161] state that CCPs and other financial market infrastructures should "identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls." These principles have been implemented by national regulators through rulemaking designed to introduce operational resilience standards. Market participants are involved in several initiatives to test for and address operational resilience. Some of these are led by the private sector, and some are joint private sector and public sector initiatives, such as the Hamilton exercises.[162]

While each CCP has a well-established rulebook for allocating default losses, more work remains to be done with respect to the allocation of non-default losses (NDLs). A Committee on Payments and Market Infrastructure International Organization of Securities Commission Organization Report on current central counterparty

practices to address non-default losses states that there is limited common understanding of CCPs' current practices to address NDLs.[163]

Supervisory stress testing of CCPs has been primarily focused on default losses, although some authorities are starting to test for cyber events as part of their stress tests exercises. Stress testing could be expanded to evaluate the impact of a failure by a critical third-party service provider.

Information Sharing and Market Monitoring between Agencies, National and International Coordination:

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. Coordination also requires access to timely information with respect to market developments in cleared and uncleared markets.

Procyclicality of Margin

CCPs require collateralization of clearing member and client exposures by calling for margin from clearing members and clients. Collateralization of exposures has a positive impact on the stability of the financial system, as it reduces counterparty risk. Collateral requirements from CCPs to market participants typically increase as volatility increases. As a consequence, management of financial risks by CCPs can have a procyclical effect during crises. There is an active discussion at the national and international levels on what policy measures can be adopted to address the potentially procyclical impact of CCP margin requirements, including, by way of example, implementing a robust margin model, transparency of margin practices, and adding margin buffers where appropriate.

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 standard-setting bodies. The Council supports the CFTC, Federal Reserve, and SEC's continued efforts to enhance their oversight of the five 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 CCPs, it is crucial for supervisory agencies to work alongside and strengthen information sharing with the FDIC to facilitate resolution planning and work to improve resolvability for these institutions. The Council supports the adoption of final CFTC rules for CCP recovery and wind-down planning to help achieve this objective.[164]

In December of 2023, the SEC approved its final rule providing for the expansion of mandatory clearing for cash Treasuries[165] by December 2025 and Treasury repo and reverse repo[166] by June 30, 2026. Expanded clearing will result in a need for market participants to manage liquidity resources associated with centrally cleared trades in addition to having robust operational infrastructures to support increased clearing activity. The Council encourages the SEC, the CFTC, the Federal Reserve, and Treasury to continue working with the private sector and with other agencies to anticipate liquidity demands of CCPs clearing U.S. cash Treasuries, Treasury repo, and Treasury futures. In addition, regulatory bodies overseeing clearing members should continue to monitor the liquidity risk management practices and capabilities of these firms in addition to firms' operational readiness.

The Council supports continued monitoring, sharing of information, and assessment of interconnections among CCPs, their clearing members, and other financial institutions between the CFTC, FDIC, Federal Reserve, and SEC. CCPs need to be fully capable of managing risks stemming from abrupt market 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. The Council supports continued focus by the agencies on operational resilience of CCPs, including the introduction of stress testing for non-default losses in addition to stress testing for default losses.

Council member agencies should continue to collaborate with international counterparts and standard-setting bodies regarding potential threats or risks to financial stability that could be related to 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 interagency approach should extend to consideration of how to regulate systemically important CCPs and determining resources for resilience, recovery, and resolution for such institutions, including considering adoption of resolution-specific resources to protect U.S. financial stability, consistent with the international standard. Coordination in designing and executing supervisory stress tests for these entities should also remain a priority.

BOX H: Implementation of T+1 Settlement

On May 28, 2024, the U.S. securities markets completed the conversion from T+2 settlement to a T+1 standard settlement cycle, reducing from two days to one day the time it takes to complete settlement of a securities transaction, including transactions in equities, corporate and municipal bonds, unit investment trusts, exchange-traded funds, American Depositary Receipts, and exercises and assignments of exchange-traded options.[167] Implementation of T+1 settlement brings these transaction types into alignment with transactions in Treasury securities and repurchase agreements, agency mortgage-backed securities, equity options, mutual funds, and money market instruments.

The SEC adopted final rules to implement a T+1 settlement cycle in February 2023.[168] In addition, industry-led efforts to prepare for the T+1 conversion, first conceived in the 1990s,[169] began in earnest following industry experience with market volatility in January 2021.[170] The effort included a wide range of market participants, market infrastructure providers, and technology providers—including broker-dealers, investment advisers, custodian banks, exchanges, clearinghouses, and service bureaus—as well as authorities across multiple jurisdictions. While the SEC and other relevant authorities continue to monitor trading and settlement data following the conversion to T+1, data suggests that the planning for and implementation of the T+1 conversion has been successful.

First, the Depository Trust & Clearing Corporation (DTCC), the holding company for the National Securities Clearing Corporation (NSCC) and the Depository Trust Company (DTC),[171] reported a lower-than-average rate of settlement fails following the conversion when compared to historical averages for each entity.[172] Specifically, on May 29, the double settlement day where market participants settled transactions submitted on May 24 for T+2 settlement and on May 28 for T+1 settlement, NSCC reported a fails rate of 1.90 percent, lower than the monthly average of 2.01 percent, and DTC reported a

fails rate of 2.92 percent, lower than the monthly average of 3.24 percent.[173] As of July 2024, fail rates continue to remain low. In July, NSCC reported a fail rate of 2.12 percent and DTC reported a fail rate of 3.31 percent. These rates are consistent with T+2 settlement rates.[174]

Second, DTCC also published data indicating that market participants had significantly improved the rate of trade affirmations completed by the end of the trade date. Recent data from the DTCC continues to reflect this improvement. Nearly 95 percent of transactions are meeting the affirmation criteria by the 9:00 PM ET cutoff on the trade date, as set by DTCC. This marks a notable improvement from the 73 percent affirmation rate recorded at the end of January 2024. Among prime brokers, DTCC reported a rate on May 29 of 98.6 percent and on July 31 of 98 percent (up from 81 percent in January 2024). Among investment managers completing affirmations via central matching, DTCC reported a rate on May 29 of 97.5 percent and on July 31 of 96 percent (up from 92 percent in January). For parties completing affirmations via a custodian or third party, DTCC reported a rate on May 29 of 84.29 percent and on July 31 of 88 percent (up from 51 percent in January).

Markets in Argentina, Canada, Jamaica, and Mexico also converted to T+1 settlement for corporate equities alongside U.S. markets in May, as did the settlement cycle for certain U.S. and Canadian securities cross-listed in Peru. Markets in India completed a conversion to T+1 settlement in January 2023. Following successful implementation of T+1 in the United States and other markets, additional jurisdictions have announced that they are considering plans for conversions to T+1 in the coming years, including the United Kingdom, the European Union (EU), Pakistan, and a joint effort by markets across Chile, Colombia, and Peru.

3.2.4 Insurance Sector

The United States is the world's largest single-country insurance market, accounting for 45 percent of global direct insurance premiums written as of year-end 2023.[175] Combined direct premiums written for the three U.S. insurance sectors—life, property and casualty (P&C), and health—in 2023 were approximately $3.0 trillion.

Industry trends that began in the period following the global financial crisis (GFC) have continued during the last year. As noted in last year's Annual Report, the life insurance sector has experienced the most structural change, including the adoption of alternative investment strategies, shifts in the composition of liabilities, growth in the use of offshore reinsurers, and an influx of private equity firms and other asset managers into the sector. Several factors have driven these changes, including differences in regulatory requirements across jurisdictions, more limited risk appetite in other parts of the U.S. financial sector, and a sustained period of low interest rates.

These changes in the life insurance sector may carry at least two potential financial stability implications. First, life insurers have been accumulating balance sheet risks that have added to their credit, counterparty, market, and liquidity risk profiles. More complex investment vehicles, esoteric collateral, smaller and more highly levered borrowers, and new private asset classes in areas such as asset-backed finance have all become evident in life insurer investment portfolios. These assets tend to be more illiquid, with uncertain values that depend on mark-to-model as opposed to mark-to-market accounting. Additionally, life insurers' growing use of nontraditional liabilities, such as greater borrowing from capital markets and Federal Home Loan Banks (FHLBanks), could raise concerns about their ability to manage cash flows in times of stress, as well as concerns about their growing dependency on such credit facilities to sustain spread-based product lines.

Second, the sector has become more interconnected, both internally and with the rest of the financial system, while increasingly relying on offshore reinsurers. For example, the use of offshore reinsurers—particularly, Bermuda-based

reinsurers that are wholly owned by the same insurance group—has grown substantially. Offshore jurisdictions typically have less stringent regulatory requirements, tax policies, and accounting conventions than the United States. Additionally, offshore reinsurers may be required to hold fewer reserves than U.S. insurers and reinsurers, introducing a potential regulatory arbitrage incentive that could potentially erode policyholder protections.[176]

Life Insurers Shift Portfolios Toward Complex and Illiquid Assets

Life insurers' holdings of nontraditional assets, such as private credit, structured credit, and alternative investments, have been growing steadily since at least 2016 (see **Figure 3.2.4.1**). In part, life insurers' appetite for these assets, which offer higher yields than traditional fixed-income investments, has been driven by the sustained period of low interest rates that followed the 2007-09 financial crisis. Another factor has been the consumer demand for products that help address retirement savings gaps.

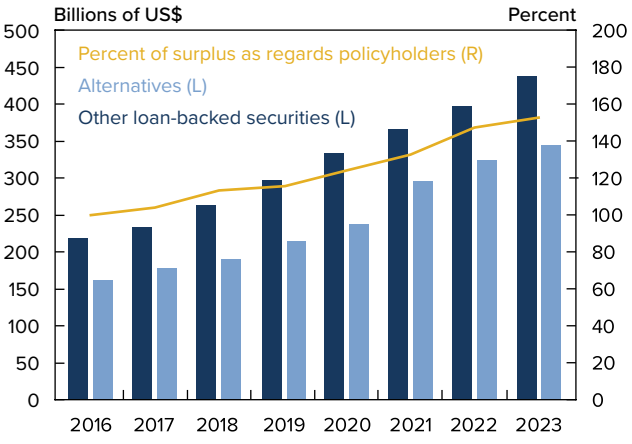
Today, insurers hold private credit loans and asset-backed securities (including middle market collateralized loan obligation (CLO) tranches) on their balance sheets, invest in private equity and private credit funds as limited partners, and provide credit facilities to private funds. Recent innovations to private credit and private equity platforms and secondary markets have sought to expand availability of these assets to institutional investors such as life insurers**.** See **Section 3.1.3: Corporate Credit** and **Box E: Private Credit: Financial Stability Considerations** for more details.

These complex investment strategies require specialized investment management skills. By partnering with private equity firms and other asset managers, life insurers gain access to these skills. In return, private equity firms and asset managers benefit by using life insurers' relatively stable and low-cost funding platforms to scale up their own businesses. In addition, asset managers benefit from the opportunity to enter riskier credit markets, partly as a replacement for banks that exited in response to stricter capital requirements.

Expanding Presence of Private Equity firms and Other Asset Managers

From 2009 to 2024, private equity firms have steadily expanded their presence in the life insurance industry. This growth has accelerated over the last five years (2018–23), during which time total investments for private-equity-owned U.S. domiciled life insurers have increased by 93 percent. By the end of 2023, life insurance companies constituted 95 percent of private-equity-owned insurers' total cash and invested assets, P&C insurance companies constituted 4 percent, and health insurance companies constituted 1 percent.[177] Private-equity-owned life insurers currently control approximately $1 trillion of investments, almost 20 percent of the sector's total assets under management (see **Figure 3.2.4.2**).

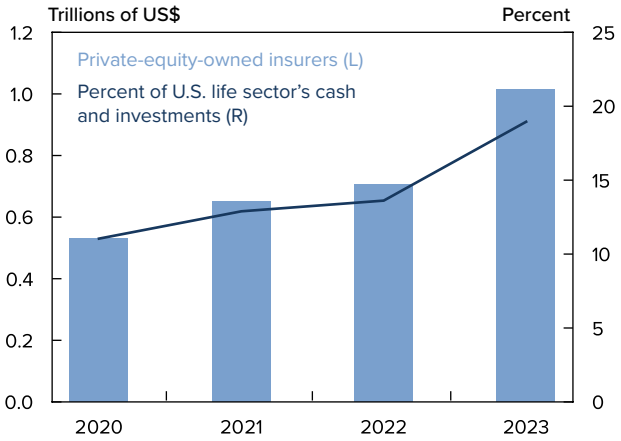
3.2.4.1 Life Insurers' Changing Investment Portfolios



Note: Data as of 2023.

Source: S&P Global Market Intelligence.

3.2.4.2 Private-Equity-Owned Insurers' Total Cash and Investments



Note: Data as of 2023.

Source: S&P Capital IQ.

In addition, an increasing number of insurers are relying on outside asset managers to handle at least a portion of their investment portfolios. Even larger traditional life insurers have begun using unaffiliated asset managers to source nontraditional investment opportunities. According to AM Best, life insurers of all sizes are outsourcing more than 10 percent of their investment portfolios to asset managers.[178]

Growing Fixed Annuity and Nontraditional Liabilities

The sector's increasing use of asset managers has led to changes in the fixed annuity market. According to LIMRA, total annuity sales reached a record-high $385.4 billion in 2023, jumping 23 percent year-over-year (see **Figure 3.2.4.3**). This increase in annuity sales has been driven by increased demand for both fixed indexed annuities (due to product innovation) and fixed annuities (due to higher interest rates). Asset-manager-backed firms have played a key role in this growth: about half of the 20 firms with the highest market share of fixed annuity sales in 2023 were life insurers backed by asset managers.[179]

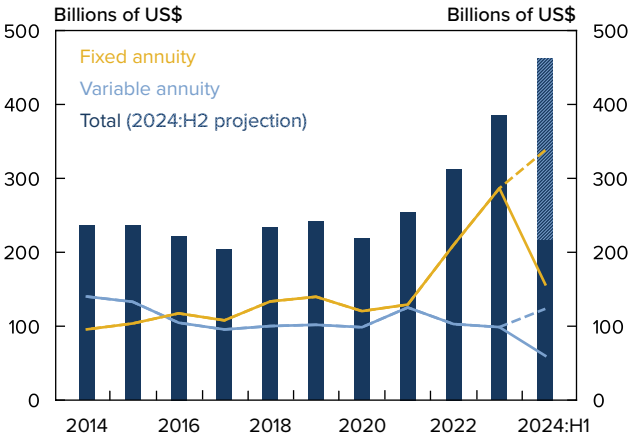
Life insurers backed by asset managers have also played a key role in the post-GFC growth of nontraditional liabilities such as funding agreement-backed securities and FHLBank advances. These liabilities are typically used to increase the size of life insurers' general accounts and earn a spread over the cost of funding. Some nontraditional liabilities offer their institutional investors opportunities to withdraw, often with short notice. Thus, life insurers with nontraditional liabilities could experience unexpected withdrawals, including investors' refusing to roll over funding, if they are thinly capitalized and their assets are relatively illiquid. Even well-capitalized insurers may struggle to cope with unexpected withdrawals if they do not have sufficient liquidity.

FHLBank advances to life insurers reached an all-time high of over $150 billion in 2024 (see **Figure 3.2.4.4**). These advances offer insurers several benefits, including favorable treatment from credit rating agencies and a source of low-cost funding. In addition, FHLBank advances can serve as an important source of short-term funding in times of need. Life insurers lack a lender of last resort and, accordingly, have turned to FHLBanks during recent episodes of stress.

Increasing Interconnections with Offshore Reinsurers

Life insurers are increasingly using offshore reinsurers, particularly reinsurers that are wholly owned by the same insurance group and are domiciled in offshore jurisdictions, such as Bermuda. U.S.-domiciled carriers claimed a record general and separate accounts reserve credits of $2.26 trillion on life and annuity cessions in 2023, with year-over-year growth of 17.3 percent.[180] Life insurance and annuity reserves transferred offshore rose to $1.2 trillion at year-end 2023, amounting to about 45 percent of the $2.6 trillion in total reserves ceded (see **Figure 3.2.4.5**). In addition, life insurers held approximately $924 billion in general account reserves related to modified coinsurance, in which the ceding entity does not transfer cash or investments to cover future benefit liabilities.[181]

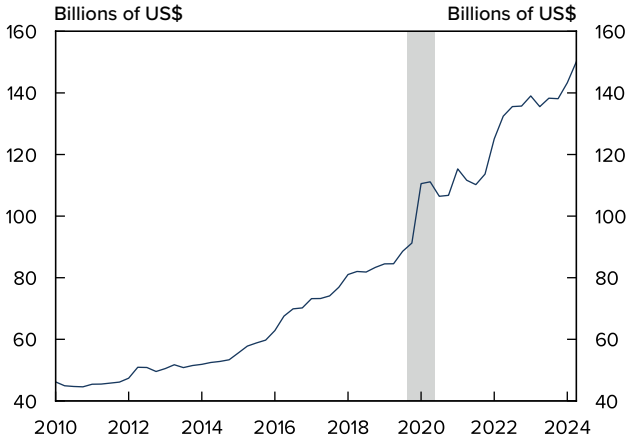
3.2.4.3 Trends in Annuity Sales



Notes: Data as of 2024:H1. Dashed lines include projected values for 2024:H2.

Source: LIMRA.

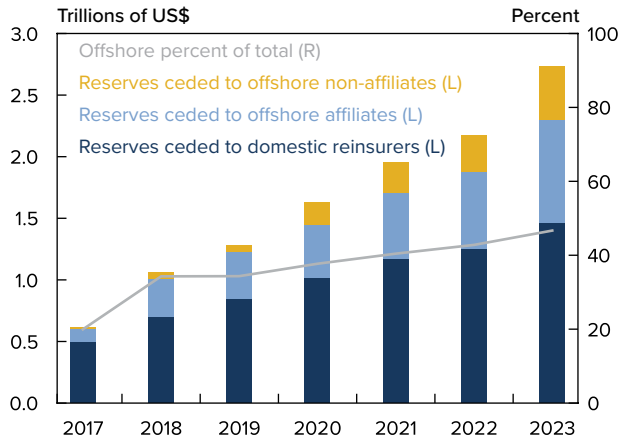
3.2.4.4 FHLB Advances to Life Insurers



Notes: Data as of 2024:Q2. Gray bar signifies NBER recession.

Sources: FRED and NBER.

3.2.4.5 More Life Insurance Reserves Are Moving Offshore



Notes: Data as of 2023. Reserves ceded to domestic reinsurers includes U.S. affiliated and unaffiliated.

Source: S&P Capital IQ.

According to Standard & Poor's (S&P) Global, Bermuda-based reinsurers accounted for more than one-third of the general and separate accounts reserve credits and modified coinsurance reserves associated with reinsurance transactions that took effect in 2023. Several motivating factors for offshore reinsurance have been reported, including less stringent regulatory requirements, tax policies, and accounting conventions than in the United States.[182]

Similar to other trends in the industry, growth in the use of offshore reinsurance has been spearheaded by asset manager-backed life insurers. 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.[183,184]

Efforts of State Insurance Authorities to Address Trends

In response to both the increase in private-equity-owned insurers and associated life insurance business trends, the NAIC and state insurance authorities recently developed 13 primary regulatory "considerations" applicable to private-equity-owned insurers.[185] Though not exclusive to private-equity-owned insurers, the considerations are intended to aid regulators in examining affiliated investment arrangements, including the use of offshore reinsurers.[186] Furthermore, to address trends in the growth of private and structured credits, such as CLOs, the NAIC and state insurance authorities are reviewing the regulatory framework for insurer investments and considering a wide range of new disclosure requirements and policy actions.[187] This review of the regulatory framework extends to bond definitions, the processes enabling the NAIC Securities Valuation Office (SVO) to effectively review and challenge existing principles and frameworks behind risk-based capital charges of CLOs, and the tools and manuals addressing asset and product types. Furthermore, the SVO is enhancing its due diligence and investments designation framework to address the potential overreliance on credit rating providers for certain private credit, structured credit, and alternative investment designations.

In light of the growing use of offshore reinsurance, the NAIC and state insurance authorities are considering a proposal to require asset adequacy testing for offshore assets supporting ceded reinsurance transactions. This proposal also includes disclosure enhancements intended to address monitoring of potential sources of credit, counterparty, liquidity and market risks from such activities. Additionally, the NAIC adopted a reinsurance comparison worksheet in June 2023, which is intended as an optional disclosure form for insurers to provide state insurance authorities with greater visibility into the economic effects of offshore reinsurance transactions. The NAIC is conducting a holistic review for potential enhancements to existing processes, tools, and functions supervisors can use to monitor the growth of offshore reinsurance. These efforts could improve the supervision of entities ceding business to firms operating in offshore jurisdictions. Moreover, these efforts to close supervisory gaps may improve confidence in the suitability of the expanded use of offshore reinsurance.

The industry trends described above have continued even as the period of sustained low interest rates has ended. Higher interest rates are generally good for insurance companies, particularly life insurers that have longer-term assets and liabilities. Premiums have expanded as life insurers take advantage of opportunities to grow their annuity lines and to advance pension risk transfer deals.[188] These business improvements appear to have more than offset significant policyholder surrender activity during 2023, with the sector experiencing an increase in surplus, reversing the contraction reported in the year before.

Property and Casualty

Higher interest rates have also affected the P&C sector. In recent years, P&C insurers have pulled back somewhat from riskier assets and implemented rate increases that resulted in strong premium growth. P&C insurers' holdings of U.S. government bonds continued to climb in 2023 and remained the third-largest bond exposure, while private bond allocations have edged down over the last two years.[189] While higher new money yields have boosted P&C companies' investment income and earnings, the effects of rising reinsurance costs and widening natural catastrophe exposures have continuing impacts on reserve adequacy.

See **Section 3.1.2: Residential Real Estate, Property Insurance** for a discussion of how changes in P&C insurance market coverage may 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 Council recommends that FIO, the NAIC, and state insurance authorities work with member agencies to further evaluate the potential impact of the identified structural changes within the insurance industry on systemic risk and associated financial stability considerations.

The Council encourages the NAIC and state insurance authorities to continue enhancing supervisory, credit analysis, risk management, and capital and liquidity testing frameworks in consideration of liquidity stress, counterparty risk, credit risk, and ratings migration that could arise in a period of economic stress or market dislocations, or from the failure of one or more offshore reinsurers. Additionally, the Council encourages state insurance authorities and the NAIC to consider concentrations of risk and counterparty exposure to affiliated offshore entities.

The Council supports continued work by the NAIC and state insurance authorities to address the supervisory implications of the growing use of offshore reinsurance, including asset adequacy testing to assess asset-intensive reinsurance and reduce potential incentives for regulatory arbitrage.

The Council encourages state insurance authorities and the NAIC to work toward greater disclosure of private market investments and offshore reinsurance in statutory financial reporting, and to consider whether enhancements in supervisory tools and processes related to ratings assessment of, and risk-based capital charges for, such assets should be required. Finally, the Council encourages the NAIC, state insurance authorities, and FIO to continue monitoring the growth of private credit in the life insurance sector.

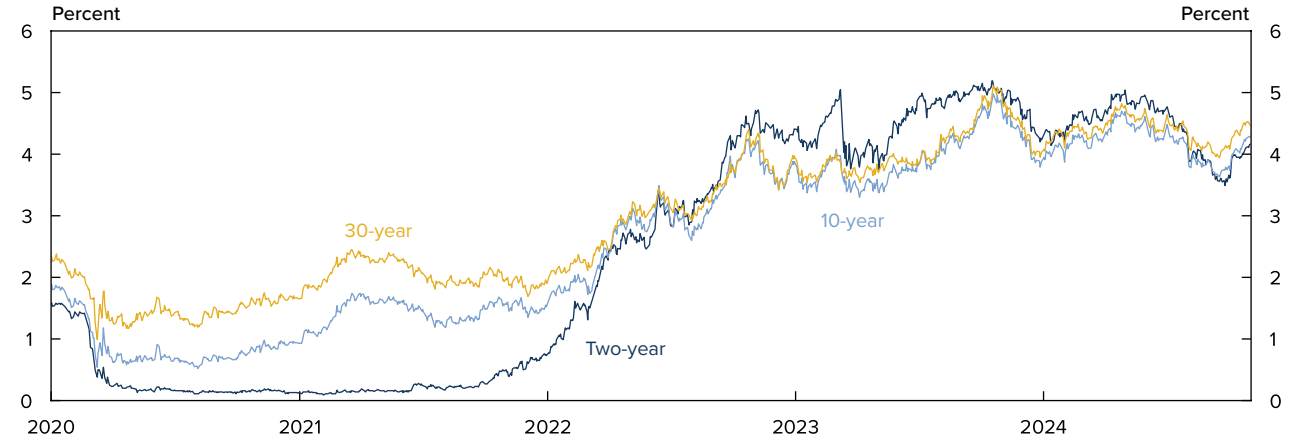
3.3 Financial Market Structure, Operational Risk, and Technological Risk

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. However, the Treasury market has also experienced several episodes of abrupt deterioration in market functioning in the past decade, most notably the dash-for-cash episode in 2020 during the COVID-19 pandemic. These episodes highlight how important it is for the Treasury market to remain resilient.

During 2024, nominal Treasury yields were driven by the evolving economic outlook and expectations for monetary policy. After rising in the first part of the year amid robust economic data, lower-than-expected inflation prints and looser labor conditions drove yields lower, reflecting expectations for larger Federal Reserve policy rate cuts, with the Federal Open Markets Committee (FOMC) eventually reducing its policy target range by 50 basis points at its September meeting. However, following a strong-than-expected September employment situation report, yields meaningfully reversed upwards during the month of October. As of the end of October, two-year nominal Treasury yields decreased around 10 basis points over the course of the year and 10-year and 30-year nominal Treasury yields increased around 40 and 50 basis points, respectively (see **Figure 3.3.1.1**). As a result, the spread between the two- and 30-year nominal Treasury yields increased from negative levels to positive (see **Figure 3.3.1.2**).

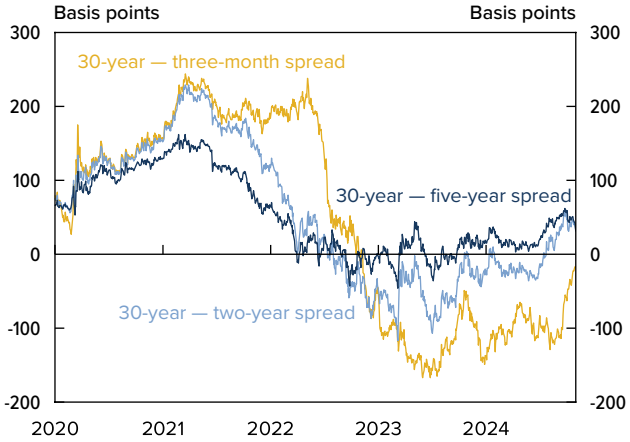
3.3.1.1 U.S. Treasury Yields



Note: Data as of October 31, 2024.

Source: U.S. Department of the Treasury.

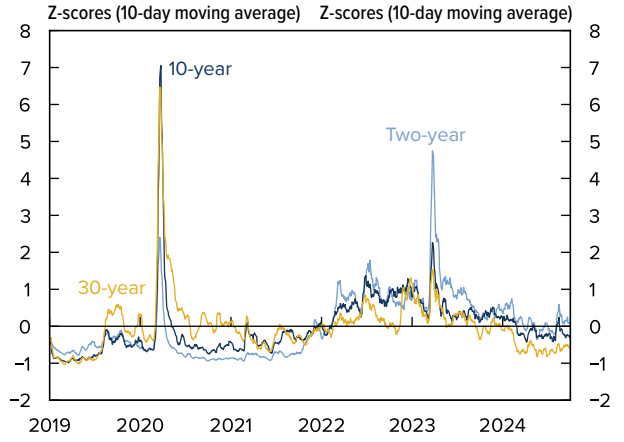
3.3.1.2 U.S. Treasury Yield Spreads



Note: Data as of October 31, 2024.

Source: U.S. Department of the Treasury.

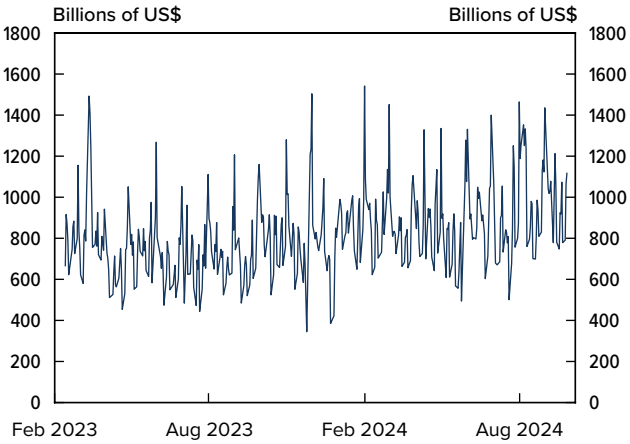
3.3.1.3 U.S. Treasury Market Liquidity Indexes



Notes: Data as of September 30, 2024. Index inputs are bid-ask, inverted depth, and price impact calculated for each security as the simple average of z-scores for each input. The two-year bid-ask/depth is reduced by half to account for the reductions in the minimum price increment.

Source: U.S. Department of the Treasury.

3.3.1.4 Total TRACE U.S. Treasury Daily Volume



Note: Data as of September 30, 2024.

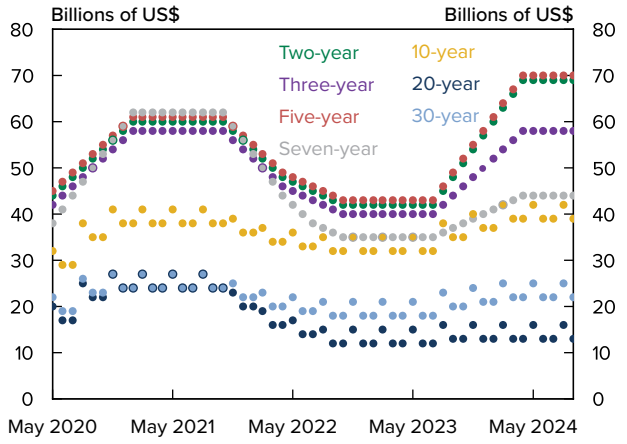
Source: Bloomberg.

Despite periodic bouts of heightened interest rate volatility this year, the Treasury market has remained resilient. Liquidity measures, such as Treasury market depth, bid-ask spreads, and price impact, generally improved over the course of the year, indicating relatively strong liquidity compared to previous years (see **Figure 3.3.1.3**). In addition, secondary market trading volumes were robust in 2024, with daily volume averaging just over $900 billion (see **Figure 3.3.1.4**). Trading volumes trended higher over the course of the year, potentially reflecting increased Treasury issuance. Moreover, Treasury was able to effectively implement sizable increases in nominal coupon and floating-rate note (FRN) auction sizes as investor demand at auction has been strong. Treasury bill issuance has also been well absorbed as the elevated level of front-end rates and the inversion

in the yield curve generated investor demand for shorter maturity Treasury securities.

While the majority of the growth in Treasury securities outstanding in 2023 occurred in Treasury bills following the resolution of the debt limit impasse, net issuance of Treasury securities in 2024 occurred mostly in nominal coupon securities. Based on expected medium- to long-term borrowing needs, Treasury significantly increased auction sizes for nominal coupon and FRN securities over three consecutive quarters between August 2023 and April 2024. Treasury has since held nominal coupon auction sizes stable at the new higher levels, generating significant financing capacity and positioning Treasury well to address any changes to borrowing needs going forward (see **Figure 3.3.1.5**).

3.3.1.5 U.S. Treasury Nominal Coupon Auction Sizes by Month



Note: Data as of September 2024.

Source: U.S. Department of the Treasury (FINRA).

Looking ahead, projections for Treasury's borrowing needs over fiscal years (FYs) 2025 through 2026 have increased by approximately $300 billion in aggregate since October 2023, per the median primary dealer estimate from Treasury's October 2024 quarterly refunding survey.[190] Uncertainty regarding privately-held marketable borrowing needs in FY2025 and FY2026 remains relatively high, reflecting a variety of views on the path of fiscal policy, Federal Reserve balance sheet normalization, and the outlook for the economy.

Finally, the debt limit suspension is scheduled to expire in January 2025. History has shown that debt limit impasses can be disruptive to financial markets, raise short-term borrowing costs for taxpayers, and negatively impact the credit rating of the United States.

Treasury Market Resilience

While the Treasury market did not experience any significant disruptions in 2024, it is important to continue to focus on ways to improve Treasury market resilience, given the critical role of the Treasury market. In September 2024, the Inter-Agency 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 fourth staff progress report in as many years, highlighting the important progress that has been made on enhancing Treasury market resilience.[191] The IAWG has organized its efforts around five workstreams:

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

Key highlights of progress from 2024 include:

- The SEC finalized a rule aimed at expanding central clearing of Treasury securities and repurchase agreement (repo) transactions.
- The SEC finalized a rule requiring firms to register as dealers if their activity meets either of two qualitative standards related to liquidity provision.
- The Financial Industry Regulatory Authority, or FINRA, began public release of transaction data for trading activity in on-the-run nominal coupon Treasury securities at the end of each day, with trade size caps on large transactions and a historical file with a six-month lag that includes uncapped trade sizes. The transactions included typically represent more than half of all volume in the Treasury security market, representing a substantial expansion in Treasury market transparency.
- The OFR finalized a rule to establish a data collection of non-centrally cleared bilateral repo (NCCBR) transactions.

In addition, Treasury launched a regular buyback program in May 2024 designed to bolster

liquidity in off-the-run Treasury securities and improve its cash management. Though the program is still quite new, initial feedback from market participants has indicated that buyback operations have supported liquidity in off-the-run Treasury securities.

Recommendations

While the Treasury market showed resilience to stress in 2024, the history of 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. Continued growth of Treasury debt outstanding makes it important that liquidity provision is sufficient in meeting liquidity demand during periods of market stress. The Council supports the work of the IAWG and recommends that member agencies continue studying and implementing policies to improve the resilience of the Treasury market, including by improving data quality and availability.

3.3.2 Cybersecurity

Cyber incidents,[192] if not properly managed, can cause harm to both firms and their customers, including disruptions, exposure of confidential information, loss of assets, financial losses and regulatory fines, and overall distrust in the financial services sector. A strong operational resilience program can help reduce the risk and overall impact of cyber incidents and other disruptions. It may include functions such as cybersecurity, business continuity management, incident response, patch management, change management, end-of-life management, third-party risk management, and testing.

Financial Stability Implications

Although cyber incidents have thus far not had a systemic impact, given the high complexity and interconnectedness of global financial institutions and their systems, severe cyber incidents could pose an acute threat to financial stability. They could result in disruptions of significant operations or services, challenges with accessing liquidity, bank failures or a loss of confidence, and market dysfunction and turmoil. Actions taken in response to a cyber incident could also have systemic impacts, such as firms drawing on the same contingency resources during a disruption or terminating a third-party's services believing it has experienced a disruption.[193] The possibility of a destabilizing cyber incident continues to play a large role in discussions among federal agencies and private sector groups.

Cyber Incidents and Losses. Cyber incidents have become much more frequent over the past two decades.[194] The rise in cyber incidents can be attributed to growing digital connectivity (accelerated by the COVID-19 pandemic), reliance on technology (including third-party service providers), innovations in the threat landscape, and geopolitical tensions. Within cyber incidents, the number of global cyber attacks (cyber incidents resulting from malicious activity) has almost doubled since before the COVID-19 pandemic. Financial institutions are a prime target, since they manage substantial funds and hold sensitive customer data.[195] Financial institutions report significant direct losses from cyber attacks, totaling almost $12 billion since 2004. The risk of much larger losses from cyber attacks—as large as $2.5 billion per incident—has increased. Such large losses could result in liquidity or even solvency challenges for firms.[196]

Potential Systemic Risks. A significant compromise of the confidentiality, integrity, or availability of critical financial systems or data could threaten financial stability. Such a cyber incident may also have privacy implications for consumers and lead to identity theft and fraud. A cyber incident that causes a loss of customer confidence in the confidentiality or accuracy of their data, assets, and transactions could lead to significant withdrawals of assets. Corrupted and unreliable data could impact the accuracy of financial transactions, decision-making, regulatory compliance, fraud prevention, and general operational efficiency. A cyber incident that impacts some data's integrity could lead market participants and customers to question the overall security of data stored by financial institutions and lead to a cessation of trading activities.

A disruption in the availability of significant operations or services could propagate the effect of a cyber incident across the financial system. The financial system is highly interconnected through technological linkages (such as multiple firms using the same software or service providers) and financial linkages (such as common asset holdings). Disruptions to certain operations (such as those of

global systemically important banks (G-SIBs), domestic and international exchanges, central banks, or payment-clearing and settlement systems) could have direct short-term contagion effects. It can also cause reputational damage if customers are unable to access their account or services. Disruptions at certain service providers (such as data providers, specialty software providers, or cloud service providers) or at public utilities (such as electricity grids) that are not easily substitutable can have impacts across firms given their common reliance on such entities or infrastructure.

Geopolitical Risks

The financial services sector is vulnerable to risks due to ongoing foreign conflicts and the activities of nation-state actors, as cyberwarfare is likely to remain a dimension of major conflicts moving forward. The health of the domestic financial services sector depends on the resiliency of domestic institutions and international partners. The ongoing war in Ukraine has seen the financial services sectors of at least 27 countries targeted in cyber attacks, including that of the United States. These attacks include countries targeted in retaliation for perceived actions related to the conflict. In June 2023, the hacker group Anonymous Sudan, in apparent collaboration with Russian-affiliated hacker group KillNet and cybercriminal group REvil, announced an imminent cyber attack against U.S. and European financial institutions. A list of targeted Western financial institutions was revealed on Anonymous Sudan's Telegram channel, although these institutions remained operational. On June 19, 2023, the European Investment Bank confirmed that they had suffered a distributed denial of service (DDoS) attack for which Anonymous Sudan claimed responsibility. Overall, the observed incidents have had a negligible impact on the U.S. financial services sector.[197]

In the Israel-Hamas conflict, regional actors including Iran and proxies have routinely engaged in cyber attacks against the United States. While the U.S. financial services sector has not yet directly been targeted, it remains a possibility.

China has routinely targeted the U.S. financial services sector as an avenue for cyber espionage and intelligence gathering. In February 2024, the Cybersecurity and Infrastructure Security Agency (CISA) released an advisory warning that the state-sponsored Advance Persistent Threat (APT) actor Volt Typhoon had compromised the information technology (IT) systems of multiple critical infrastructure sectors.[198] The advisory indicated that the group was pre-positioning themselves in IT networks to engage in lateral operations in the event of a major conflict between the United States and China.

In recent years, North Korea has engaged in global cyber operations predominantly against the United States. The United Nations Security Council investigated 58 suspected Democratic People's Republic of Korea (DPRK) cyber attacks valued at $3 billion between 2017 and 2023, with proceeds likely to help fund DPRK military and nuclear programs.[199] The Federal Bureau of Investigation (FBI) has warned that North Korea is conducting highly tailored, difficult-to-detect social engineering campaigns targeted at decentralized finance, cryptocurrency, and similar businesses.[200] In September 2023, the FBI identified the Lazarus Group, an APT umbrella group comprised of numerous DPRK cyber actors, as responsible for the theft of more than $200 million in virtual currency.[201]

Forms of Cyber Incidents

The types of cyber incidents prominent in the financial services sector continue to be ransomware, denial-of-service, and insider threats, including via use of social engineering. There has also been a rise in the use of technology to spread misinformation.

Ransomware. Ransomware and related forms of cyber extortion continue to be prominent threats in today's cyber landscape and have grown and evolved in recent years. Malvertising has become a significant vector for exploitation. It uses malicious or hijacked website advertisements to spread malware. It bypasses built-in browser protections against pop-ups and forced redirects and inserts malicious ads into legitimate ad networks. In some cases, for this type of attack to work, the user does not even need to click on a link for the system to become infected. To mitigate risks from malvertising, organizations can standardize and secure web browsers, deploy advertising blocking software, consider isolating web browsers from operating systems, and implement protective domain name system technologies.[202]

Many threat actors use ransomware attacks, malvertising, and other access mechanisms as an easy way to obtain money and to spread fear through organizations. Ransomware as a Service (RaaS) are off-the-shelf offerings that require minimal technical expertise to operate, allowing cybercriminals to specialize in different attacks because they can buy the exact tools needed to solve a specific task.[203] RaaS continues to be a widespread operating model that many cyber gangs have implemented to streamline the attack process, make it more accessible to novices, and provide revenue-sharing and anonymity.

Insider Threats. Insider threats continue to pose a significant risk to financial institutions. These threats can come from current or former employees, contractors, or business partners with inside information about the organization's practices, data, and computer systems. Insider threats can be intentional, such as due to financial or ideological motives or grievance, or unintentional, such as due to insider error or negligence.

These risks have risen alongside the increase in remote work, particularly when the hiring and onboarding process is conducted remotely.[204] The cybersecurity company KnowBe4 unknowingly hired a North Korean threat actor after several rounds of interviews, background checks, and reference verifications in July 2024. Once the employee received his work device, it immediately started to load malware. Fortunately, no illegal access was gained, and no data was compromised or exfiltrated.[205]

To mitigate risks from insider threats, organizations can implement robust security measures, including strict access controls, rotation of duties, continuous monitoring of user activities, and security training programs. Additionally, they can emphasize security awareness and encourage employees to report suspicious behavior.

Misinformation. Threat actors have increasingly been using technology to spread misinformation or disinformation, which is persistent false information (deliberate or otherwise) widely spread through media networks, shifting public opinion in a significant way. Such information can impact confidence in the financial system until proven otherwise and is perceived as a top current risk and one with severe impacts over the next two years.[206] One recent example of disinformation is the LockBit ransomware group claiming to have stolen several terabytes worth of information from the Federal Reserve. It was later revealed that the information that had been compromised was from a U.S. bank and not the Federal Reserve.[207]

Emerging Developments

Developments in technology can provide new types of vectors for cyber incidents, with advancements in digital assets (see **Section 3.1.5: Digital Assets**), artificial intelligence (AI) (see **Section 3.3.3: The Use of Artificial Intelligence in Financial Services**), and quantum computing. Cyber insurance can help reduce losses, though there are challenges with the availability of coverage, particularly for catastrophic cyber incidents.

Quantum Computing. Although private investment in quantum technology decreased globally,[208] most of these investments are now in more established startups with a focus on scaling, which may indicate that these technologies are maturing. Public investments also continue to grow with the European Union (EU) leading, followed by China and the United States.

A large-scale practical quantum computer, when available, is theoretically capable of breaking the security of much of the modern public-key cryptography used on digital systems and in digital assets to protect information.[209] As a result, any communication or information protected by public-key cryptographic technology is subject to exposure or undetected modification. Information might be stolen today in the hope of decrypting it with quantum computers in the future. Quantum computing research activities of highest concern are those that are not yet publicly known and may be associated with adversarial intelligence programs.

Quantum computing technology is developing rapidly, and production-level capabilities could appear within a decade. Last summer, the National Institute of Standards and Technology (NIST) finalized its selection of cryptographic algorithms that are secure against both quantum and conventional computers (post-quantum).[210] This summer, NIST published the principal set of post-quantum encryption algorithms. NIST encourages firms to start integrating the post-quantum standards into their systems immediately, because full integration will take

time.[211] Historically, a full implementation of a classical cryptographic algorithm takes, in the best case, 5 to 15 or more years.[212] For a post-quantum standard, this migration might be even more challenging, particularly for smaller institutions. This fall, the Group of Seven (G7) Cyber Expert Group (CEG) released a public statement recommending action to begin planning for potential risks posed by advancements in quantum computing.[213] For a more efficient migration, financial institutions could develop migration plans guided by NIST's and Department of Homeland Security's (DHS's) suggested roadmap,[214] as well as ask their third-party service providers of their own migration plans and timelines.

Cyber Insurance. The U.S. cyber insurance market is growing, though still small, accounting for less than 1 percent of property & casualty insurance by premium volume.[215] The cyber insurance market is concentrated, with the top 20 admitted insurance groups constituting approximately 75 percent of the market.[216] Providers find writing policies challenging given a limited loss history, the unreliability of past data when predicting future events, and the possibility of a large-scale cyber attack where losses are highly correlated across companies and/or industries.[217] Private insurers have taken steps to limit such losses, such as by excluding coverage for losses from cyber warfare and infrastructure outages.[218] Treasury's FIO is exploring the appropriate form of a federal insurance response for catastrophic cyber incidents.[219]

Recommendations

It is critical for all financial sector participants to stay updated on the latest cybersecurity developments within the financial sector. Financial institutions must maintain awareness and develop robust cyber hygiene practices and training to enhance security. Additionally, mature threat intelligence programs can help prepare for and prevent cyber incidents. The Council recommends the Financial and Banking Information Infrastructure Committee (FBIIC), Financial Services Sector Coordinating Council (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 encourages FBIIC to continue working closely with federal and state agencies, CISA, law enforcement, and industry partners to conduct regular cybersecurity exercises that consider interdependencies with nonfinancial 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 continues to support the 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 CEG'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. Moreover, the Council supports NIST's efforts and the G7 CEG's call to action to bolster a transition to quantum-resilient cryptography standards and recommends additional work to assess and mitigate related financial stability risks.

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 continues to increase. Recent advancements in generative AI technology, which is capable of creating new content, have increased interest in exploring possible use cases among financial services sector firms, but have also raised new concerns about the impact of AI on financial services. Generative AI relies on extensive data for training and operations. However, some datasets may contain inaccurate, biased, or misleading information. For accurate analysis, it is critical to use high-quality, relevant data. Utilizing generative AI can degrade the quality of analysis if the underlying data are fake, incorrect, or irrelevant. Even if the underlying data is free of defects, large language models can still produce "hallucinations."

The Council's 2023 Annual Report emphasized the importance of monitoring the rapid development of AI and its use in the financial services

sector. Since then, Treasury released a report on AI-specific cybersecurity risk,[220] the Council held a multi-day conference on AI risks,[221] and Treasury published a request for information on uses of AI in the financial sector,[222] among other AI work. The agencies supporting the Council continue to monitor AI developments in financial services, from a microprudential perspective and from the broader view of financial stability. Over the past year, the Council's AI Working Group, as a part of its continuing work in monitoring AI risk in the financial services sector, has identified potential risks and assessed their potential impact on the sector.

There is no uniform agreement in the financial services sector on the definition of "artificial intelligence." The Council follows the definition in Executive Order 14110, *Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence*, which states that the term "artificial intelligence" or "AI" has the meaning set forth in 15 U.S.C. 9401(3): a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments. Artificial intelligence systems use machine- and human-based inputs to perceive real and virtual environments; abstract such perceptions into models through analysis in an automated manner; and use model inference to formulate options for information or action.[223] It is generally necessary to understand the details of specific applications of AI in the financial sector to fully understand the attendant risks and how to manage them.[224]

As outlined in the Council's 2023 Annual Report, AI can offer benefits in the financial services sector for institutions, businesses, and consumers. These include enhancing efficiencies, reducing costs, identifying more complex relationships, and improving performance and accuracy of analysis. For example, financial institutions report that when AI systems are used for fraud detection to monitor transactions in real time, these tools helped them prevent fraud and decrease the number of false positives. Similarly, AI can be used for cybersecurity to identify potential cyber-related anomalies, specifically when incorporated into endpoint protection, intrusion detection/prevention, data-loss prevention, and firewall tools.[225]

Potential Risks

The use of AI, however, can introduce certain risks. In last year's annual report, the Council highlighted certain key risk factors that remain salient as financial institutions continue to explore AI use cases. Such risk factors include:

- **Explainability Challenges**. Some AI systems may operate as "black boxes" whereby it can be difficult to determine how the AI system processes inputs into outputs. Explainability challenges can increase uncertainty about an AI system's suitability and reliability.
- **Data.** AI systems often involve higher volume of data or data flows, and the types of data used may be more varied and less structured than with traditional analytical approaches. In such circumstances, executing sound data governance and management may be more difficult. Utilizing AI systems that are trained on fake, irrelevant, or otherwise low-quality data can degrade the quality of analysis.
- **Assessing Performance**. AI systems may not always function well in new conditions or with new data (which impacts the AI system's robustness, or its ability to operate under a variety of circumstances).[226] Also, depending on the AI approach and the intended use, assessing performance can be challenging, such as if it is generating a block of text or an image that needs to be carefully evaluated.
- **Third-Party Risks**. Financial institutions may employ various third-party AI vendor products, warranting proper due diligence, ongoing monitoring, and other risk management steps to confirm that the third-party approach remains suitable and reliable.
- **Model Biases**. Models can raise concerns related to bias and discrimination, including challenges with explainability and ensuring compliance with fair lending requirements, an area highlighted in Treasury's Request for Information on Uses, Opportunities, and Risks of Artificial Intelligence in the Financial Services Sector.[227]

These risk factors may contribute to risks to safety-and-soundness, investor protection, and market integrity, which could lead to potential financial stability risks.

With respect to AI and cyber risks, Treasury's AI report on AI-specific cybersecurity risk and other agency efforts have identified risks and gaps in financial institutions' cyber risk management practices for AI systems. Some of these identified gaps are not unique to AI, but AI's data intensity and higher complexity, as well as increased reliance on third-party vendors of AI technology, can complicate the ability to fend off attacks. AI systems usually rely heavily on vast amounts of data, raising concerns around data privacy, consent, and protection. Ensuring the security of this data, particularly given existing regulations on the topic, can be challenging, especially when dealing with unstructured data that spans multiple jurisdictions. Developing and testing incident response plans that specifically address potential AI system vulnerabilities or failures is crucial. Importantly, cyber risk is an area that can have repercussions beyond individual institutions, which could possibly lead to broader financial stability concerns.

Cyberthreat actors may also be able to use AI tools, such as generative AI, to aid their attacks on the financial services sector, particularly through the use of social engineering, malware generation, vulnerability discovery, and disinformation. While these types of cyber attacks are neither new nor unique to AI, AI tools may make these attacks much easier for a less sophisticated adversary.[228] AI allows bad actors to impersonate individuals in ways that were previously much more difficult. Fraudsters may use AI deepfakes to steal an identity, create a synthetic identity, or bypass factors that financial institutions use to verify a customer's identity. Bad actors could also use AI technology to create realistic looking fake information, possibly mimicking public figures, that could cause market movements or otherwise enable fraud.

There are other areas where the use of AI in financial services could present financial stability concerns. For example, interconnection among financial services actors using AI can contribute to financial instability. Another concern is the reliance of several financial institutions on the same vendor, similar data, common assumptions, or methodologies.[229] Potential adverse outcomes from these factors could include correlation in certain outputs (such as credit risk assessments) and herding behavior (such as with trading positions), which could amplify volatility and exacerbate funding and liquidity pressures during crisis periods.

Lack of explainability coupled with the high complexity within AI systems could lead to heightened financial instability, beyond effects on individual financial actors. Higher complexity in AI systems can make detection of weaknesses or misbehavior among financial sector actors difficult. It may also be difficult to determine how AI systems are interconnected or correlated. Additionally, some AI systems (such as generative AI) may have consequences that have yet to be tested or observed in certain environments or under certain conditions, raising some uncertainty about their suitability and reliability.

AI systems' dependence on data can also heighten financial stability concerns. For instance, financial sector actors might rely on the same or similar datasets. Data poisoning, data leakage, and data integrity attacks can occur at any stage of AI development and data supply chain[230] and can occur at multiple financial sector actors at the same time (i.e., may not be idiosyncratic[231]).[232] AI systems may be more vulnerable to these concerns than traditional software systems because of the dependency of an AI system on the data used to train and test it. Data ingested by an AI system in training or even in testing can directly inform the production processing of the AI system, making the security of data throughout the development and production cycle as important as protecting production data. Again, there is the potential for attacks on data systems or even unintentional errors in those systems to affect multiple parties at the same time.

The concentration of AI vendors also has financial stability implications. If multiple financial sector parties use the same few vendors or third parties, key assumptions, limitations, errors, or other factors could propagate throughout the financial system. This potential scenario is more likely to occur in smaller institutions, such as banks and credit unions, that lack the resources for proper due diligence or the technical expertise to understand the methodology and systems utilized by their vendors. Moreover, vendor concentration for important AI services that are not easily substitutable can limit financial institutions' ability to mitigate operational risks associated with service provider failures or impairments.[233] These risks

could include known concentration risks for AI systems, as well as risks related to data used for pre-trained large language models (LLMs). Detecting or assessing concentration can be difficult, especially with the use of complex systems whose sources are not always transparent.

Recommendations

Financial institutions have rapidly adopted innovative technologies in recent years, and the use of AI in financial services has increased. The Council recommends member agencies continue to monitor the rapid development of the usage of AI technologies in financial services to ensure policies are updated to address emerging risks to the financial system while facilitating efficiency.

The Council supports interagency development of expertise to analyze and monitor potential systemic risks associated with the use of AI in the financial services sector, as well as further interagency discussions on developments in AI and associated financial stability risks. The Council supports efforts led by Treasury, the Financial and Banking Information Infrastructure Committee (FBIIC), and the Financial Services Sector Coordinating Council (FSSCC) to continue cooperation in this area.

The U.S. financial system is part of a global network and could potentially be vulnerable to shocks that originate abroad. The Council supports continued engagement with international counterparts on the risks and benefits of AI in financial services.

3.3.4 Third-Party Service Providers

Third parties can provide a range of services and benefits to financial institutions, such as increasing revenues, reducing costs, improving operational resilience, and enabling the faster development and scaling of a firm's products and services. Financial institutions are increasingly using third party services for a range of use cases, including using cloud service providers (CSPs) for fraud prevention and other artificial intelligence (AI) use cases. Financial institutions' relationships with service providers may introduce new risks or amplify existing ones, in part because reliance on a third party may reduce an institution's access to, and its direct control and oversight of, its data or systems.

Smaller firms, such as community banks and credit unions, may have lesser negotiating power to obtain certain contractual rights, fewer resources and ability to conduct due diligence on and monitor a service provider's practices (e.g., information security, internal controls, assurance testing), and lesser ability to terminate and substitute services in case of operational challenges. And yet, due to their relatively small size, these institutions are increasingly relying on third parties for essential lending, compliance, technology, and operational-related matters. Regulators and market participants alike can have low visibility into the use of common third-party service providers by financial institutions, or even the geographic location for the delivery of services. This opacity can make it difficult to prepare for, and rapidly evaluate the impact of, a cyber incident or other disruption at a third-party service provider or in a geographic location (such as a regional outage).

Domestic Landscape

A Treasury report analyzed the types of cloud services adopted by financial institutions,[234] approaches to and best practices for cloud adoption, and regulatory frameworks. It identified the following key challenges in greater adoption of such services:

1. Exposure to potential operational incidents
2. Insufficient transparency to support due diligence and monitoring
3. Gaps in human capital and tools to securely deploy cloud services
4. Potential impact of market concentration
5. Dynamics in contract negotiation given market concentration
6. International landscape and regulatory fragmentation

In May 2023, Treasury formed the Cloud Executive Steering Group (CESG), a public-private partnership to collaboratively address the issues identified in the report. The CESG consists of leaders from the Financial and Banking Information Infrastructure Committee (FBIIC)[235] and the Financial Services Sector Coordinating Council (FSSCC).[236] In June 2024, Treasury published the Cloud Lexicon[237] to improve sector communications and the ability to

identify critical service dependencies and sector risk. Some FBIIC agencies are also working on an Information Sharing and Coordination Initiative to enhance coordination around examinations of the services and risks of CSPs. The FSSCC published the Cyber Risk Institute's refined Cloud Profile 2.0,[238] cloud outsourcing best practices and key considerations for contractual provisions,[239] and resources for establishing a "secure by default" deployment of cloud infrastructure.[240] The CESG continues to work on cloud-related cyber incident response and cloud concentration risk.

The OCC, the Federal Reserve, and the FDIC also issued final guidance in 2023 for banking organizations on managing risks associated with third-party relationships, [241] as well as a guide in 2024 intended to assist community banks in implementing such risk management practices.[242]

International Landscape

As the co-Chair of the Group of Seven (G7) Cyber Experts Group (CEG), Treasury has collaborated with other agencies to address cybersecurity and third-party risks to the financial services sector.[243] In 2024, the CEG commenced the G7 Cloud Usage and Security working group to evaluate potential concentration risks and systemic issues, transparency, contingency measures and exit plans, security frameworks, and operational resilience. This effort will establish best practices, identify gaps, and coordinate international approaches for secure cloud adoption. Treasury and the Federal Reserve have engaged since 2022 in a multilateral dialogue on regulatory approaches to critical third-party service providers, adoption of certain cloud use cases, and areas for cooperation. The European Union's Digital Operational Resilience Act (DORA) will be applied in January 2025 with requirements for certain critical third-party services for financial institutions, impacting many large U.S.-based firms in the region.

The OCC is co-leading the Basel Committee on Banking Supervision's development of "Principles for the sound management of third-party risk," which would establish a common baseline for banks and supervisors on risk management. A consultative document was issued in 2024 in close collaboration with the Federal Reserve and the FDIC.[244] Treasury contributed to the Financial Stability Board's (FSB's) toolkit on third-party risk management and oversight for financial institutions and authorities issued in 2023.[245] In addition, Treasury's FIO contributed to the 2023 International Association of Insurance Supervisors Issues Paper on Insurance Sector Operational Resilience, which addresses risks associated with third-party service providers.[246]

Emerging Developments

Nonbank Payment Services. Noncash payments, particularly digital payments, have been growing as a share of total payment transaction volume in recent years. This shift in payment preferences has driven changes in the market for payments services and in the firms that provide these services, including an increase in nonbank companies. These nonbank payment companies adopt a variety of business models and relationships with third parties, including banks. The complexity of these relationships and the variation in products and services across firms create challenges in understanding the specific risks posed by the interconnected relationships, particularly when there may be multiple layers of service providers involved.

Nonbank Payment Processors. Nonbank payment processors typically provide back-end support for payment transactions and often rely on partnerships with banks. For example, some nonbank payment firms administer bank accounts and related payment services on behalf of banks. Others serve as "middleware" to facilitate payments between a bank and customer-facing firm. Processors are generally not liable to consumers, and, as such, third-party oversight by bank partners or traditional payment rails currently serves as the de facto (and in many cases only) regulatory framework for such entities.

Nonbank Money Transmitters. Many nonbank payments companies that provide services to customers are regulated at the state level as money transmitters. Increasingly, customers may hold balances with these nonbank money transmitters, which, as nonbanks, are not themselves eligible for deposit insurance. Therefore, if a nonbank money transmitter has not partnered with a bank, customers could lose their funds in the event of the money transmitter's failure. Some nonbank money transmitters may also offer lending or

other products directly to merchants or consumers, which introduces additional risks, including credit risk, that warrant heightened monitoring.

Supply Chain. This past year was marked by a few instances of supply chain incidents, the most notable being the CrowdStrike one on July 19. The cybersecurity company distributed a faulty software update, causing 8.5 million Microsoft Windows computers globally to crash with a blue screen of death, halting business operations in sectors like aviation.[247] Impacts across the financial services sector varied, with firms reporting disruptions to website and mobile banking applications, automated teller machines (ATMs), trading software, payments, and other services.[248] While some financial institutions were directly impacted by the faulty software on their systems, many reported disruptions through their third parties utilizing Windows (fourth-party risks). This outage highlights systemic vulnerabilities with increasing reliance by firms on single points of failure in the supply chain (nth-party risks) and limited visibility into systems provided by third parties. Financial institutions may be able to mitigate these risks by vetting their supply chains and assessing the criticality and risks posed by third and fourth parties, particularly those that may not have historically been considered critical, such as cybersecurity service providers. They can also invest in sound third-party risk management and cybersecurity practices, such as testing software updates prior to implementation and ensuring systems and data are backed-up on systems that are not part of the software update.

Recommendations

The Council supports the continued work of the Cloud Executive Steering Group (CESG) in its effort to analyze and address the risks posed by third-party services to the financial system. The Council supports the use of the resources published by the Financial Services Sector Coordinating Council (FSSCC) and Financial and Banking Information Instructure Committee (FBIIC) member agencies and encourages continued iteration on the documents as the risk landscape continues to evolve.

The Council 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.

The Council also supports the ongoing work of the CESG and its focus on addressing the risks to the financial services sector from the use of AI for cybersecurity identified in Treasury's 2024 report *Managing Artificial Intelligence-Specific Cybersecurity Risks in the Financial Services Sector*.[249]

The authority to supervise third-party service providers varies among financial regulators. To 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. The Council has made this recommendation annually since 2015, and the risks posed by such vendors have only grown during the last nine years. As third-party service providers play an ever-greater role in managing critical functions, it is important for these agencies to have the tools necessary to identify and mitigate risks posed by third-party service providers to the safety and soundness of regulated entities.

BOX I: Third-Party Delivery of Bank Products and Services

Over the past several years, there has been an increase in the number and complexity of banks' arrangements with non-bank entities, such as financial technology companies (fintechs), that provide access to, or facilitate the provision of, banking products and services to end users (bank-fintech arrangements). Bank-fintech arrangements have the potential to increase competition and efficiency by enabling banks (including community banks) to meet evolving customer expectations, deploy products and services to the market more effectively, and access new or expanded customers and resources. Weaknesses in such arrangements may also pose risks to financial stability,[250] including potentially by causing consumer confusion that may erode the public's confidence in the banking system.[251]

The Federal Reserve, the FDIC, and the OCC (collectively, the agencies) have observed a range of safety and soundness, compliance, and consumer protection-related concerns with these arrangements. The agencies support responsible innovation and support banking organizations in pursuing arrangements with third parties in a manner that is safe, sound, and compliant with applicable laws and regulations.

The agencies issued a request for information (RFI) in July 2024 on bank-fintech arrangements.[252] The RFI seeks information on a broad range of such arrangements, including with respect to deposit, payment, and lending products and services. It also describes several types of such arrangements and discusses safety and soundness and compliance-related implications. It seeks input on the implications of such arrangements and effective risk management practices.

In July 2024, the agencies also published a joint statement on a set of arrangements with third parties to deliver bank deposit products and services (statement).[253] The statement (1) details potential risks related to such arrangements, (2) provides examples of effective risk management practices for these arrangements, (3) reminds banks of relevant existing legal requirements, guidance, and related resources, and (4) provides insights that the agencies have gained through their supervision.

In September 2024, the FDIC proposed requirements that would strengthen recordkeeping for custodial deposit accounts in a standardized format, including through an arrangement with a third party.[254] This would promote the FDIC's ability to promptly pay deposit insurance claims in the event of a bank's failure, as well as enable timely access by consumers to their funds even in the absence of the bank's failure. Over the last several years, the FDIC and the CFPB have also taken actions relating to deceptive representations about the availability of FDIC insurance.[255]

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 Systemic Risk Committee

The Systemic Risk Committee (SRC) supports the Council's efforts in identifying risks and responding to emerging threats to the stability of the U.S. financial system. The committee serves as a forum for staff of all member agencies to convene, facilitate information sharing on recent market events, and monitor developments within financial markets. The SRC coordinates with other Council committees in monitoring and analyzing potential risks and reports findings to the Deputies Committee at least once per quarter.

This year, the SRC has been using the recently approved Analytic Framework for Financial Stability Risk Identification, Assessment, and Response (Analytic Framework) to identify and evaluate vulnerabilities and build consensus regarding risk priorities among the member agencies. To monitor developments that extend beyond an individual agency's jurisdiction, the SRC has also created additional staff-level workstreams, when appropriate, that report back to the SRC and Deputies Committee.

Artificial Intelligence

The Council identified the increased use of artificial intelligence (AI) in financial services as a vulnerability last year. The SRC convened a staff-level Artificial Intelligence Working Group (AIWG) to monitor the rapid developments in AI and to understand whether oversight structures are keeping up with emerging risks to the financial system. The AIWG explored potential financial stability risks with key AI use cases, including by participating in a scenario-based exploratory discussion. The AIWG continues to serve as an active forum for interagency information sharing, analysis, and capacity building.

The Council also hosted a Conference on Artificial Intelligence & Financial Stability with the Brookings Institution,[256] which convened experts with a broad array of perspectives on potential systemic risks arising from AI usage. Participants from over 75 organizations from the public and private sectors joined the event, many of whom noted the need to balance the benefits of innovation with proportionate risk management.[257]

Mortgage Servicing

On May 10, 2024, the Council released its *Report on Nonbank Mortgage Servicing*.[258] The report documents the growth of the nonbank mortgage servicing sector and the critical roles that nonbank mortgage servicers play in the mortgage market. It identifies certain key vulnerabilities that can impair servicers' ability to carry out these critical functions and describes how these vulnerabilities could amplify shocks to the mortgage market and pose risks to financial stability. The report includes the Council's recommendations to enhance the resilience of the nonbank mortgage servicing sector, drawing on existing authorities of state and federal regulators, and encourages Congress to act to address the identified risks. The report was drafted by Council member agencies in coordination with the Government National Mortgage Association (Ginnie Mae) (see **Box C: Nonbank Mortgage Servicing Report**).

Financial Market Utilities

The Dodd-Frank Act authorizes the Council to designate a financial market utility (FMU) as "systemically important" if the Council determines that the failure of or a disruption to the functioning of the FMU could create, or increase, the risk

of significant liquidity or credit problems spreading among financial institutions or markets and thereby threaten the stability of the U.S. financial system. In 2012, eight FMUs were designated by the Council as systemically important.[259] Through its FMU Committee, which was formalized in 2012, the Council began conducting periodic reviews of the designated financial market utilities (DFMUs). The FMU Committee was dormant from 2017 to 2022 and relaunched in 2023. During the 2024 periodic review, the FMU Committee evaluated whether, based on the designation considerations set forth in the Dodd-Frank Act, the designation of the eight DFMUs remains appropriate. As part of the evaluation, staff reviewed the considerations for designation under the Dodd-Frank Act: the aggregate monetary value of transactions processed by the FMU; aggregate exposure of the FMU to its counterparties; relationships, interdependencies, or other interactions of the FMU with other FMUs; and the effect that the failure of or a disruption to the FMU would have on critical markets, financial institutions, or the broader financial system. The Council concluded that the designation of the DFMUs remains appropriate.

In addition to reviewing the DFMUs, the FMU Committee continues to identify and monitor potential threats or risks to U.S. financial stability that could be related to or mitigated through FMUs or payment, clearing, and settlement activities and undertake other duties under its charter.

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. Among its efforts, the CFRC is developing a framework to identify and assess climate-related financial risk, and it is also continuing to iterate on a preliminary set of risk indicators to identify vulnerabilities in the financial system through an assessment of the impact on the financial system of physical and transition risk drivers. In addition, the CFRC continues to focus on the intersection of physical risk, real estate, and insurance as a particular priority for 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. In the first six meetings, CFRAC members presented on a range of topics, including how climate risk drivers could ultimately affect financial stability, how vulnerable communities could be affected by policies that seek to price in climate risks, and methodologies and metrics for assessing transition risks.

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 evaluate 10 specific considerations and any other risk-related factors that the Council deems appropriate when evaluating those companies.

In November 2023, the Council finalized a new analytic framework for financial stability risks and updated interpretative guidance on the Council's procedures for designating nonbank financial companies for Federal Reserve supervision and enhanced prudential standards. These documents improve the Council's ability to address risks to

financial stability and to provide greater public transparency. The Council's new Analytic Framework provides 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) 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 five meetings in 2024, including at least one 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 two of its meetings in 2024. 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 other staff-level committees. As noted in **Section 4.1.1: Risk Monitoring and Regulatory Coordination**, the Council also established its first advisory committee, the CFRAC, in 2022. The Council adopted its Fiscal Year (FY) 2025 budget in September 2024.

4.2 Safety and Soundness

4.2.1 Enhanced Capital and Prudential Standards and Supervision

On July 18, 2024, the OCC, FDIC, FHFA, and NCUA requested comment on a proposed rule to implement section 956 of the Dodd-Frank Act. The statute requires that the appropriate federal regulators jointly issue regulations or guidelines: (1) prohibiting incentive-based compensation arrangements at covered financial institutions that encourage inappropriate risks by providing excessive compensation or that could lead to material financial loss; and (2) requiring those covered financial institutions to disclose information concerning incentive-based compensation arrangements to the appropriate federal regulator.

On July 25, 2024, the Federal Reserve, FDIC, and OCC issued a statement reminding banks of potential risks associated with third-party arrangements to deliver bank deposit products and services. The statement details the potential risks of such arrangements and provides examples of effective risk management practices for these arrangements. In addition, the statement reminds banks of relevant existing legal requirements, guidance, and related resources, and provides insights that the agencies had gained through their supervision. The statement does not establish new supervisory expectations.

On July 25, 2024, the NCUA issued a proposed rule addressing succession planning. On February 3, 2022, the NCUA had published a proposed rule to require federal credit union (FCU) boards of directors to establish processes for succession planning for key positions. Based on the public comments received in response to the proposal, and upon further consideration of the issues involved, the NCUA published a second proposed rule addressing succession planning. The new proposal was based on the earlier proposed rule, but included several changes that the NCUA believes would further strengthen succession planning efforts for both consumer FCUs and consumer federally insured, state-chartered credit unions.

On August 12, 2024, the FDIC sought comment on proposed amendments to its regulation governing parent companies of industrial banks and industrial loan companies. This regulation, which was adopted in December 2020, requires certain conditions and written commitments in situations that would result in an industrial bank or industrial loan company becoming a subsidiary of a company that is not subject to consolidated supervision by the Federal Reserve. The proposed amendments would revise the definition of "Covered Company" to include conversions involving a proposed industrial bank or industrial loan company under section 5 of the Home Owners' Loan Act, or other transactions as determined by the FDIC; ensure that a parent company of an industrial bank subject to a change of control, or a parent company of an industrial bank subject to a merger in which it is the resultant entity, would be subject to the FDIC's regulation; and provide the FDIC the regulatory authority to apply the regulation to other situations where an industrial bank would become a subsidiary of a company that is not subject to federal consolidated supervision. Additionally, the proposed amendments would clarify the relationship between written commitments and the FDIC's evaluation of the relevant statutory factors. The proposed amendments would also set forth additional criteria that the FDIC would consider when assessing the risks presented to an industrial bank or industrial loan company by its parent company and any affiliates and when evaluating the institution's ability to function independently of the parent company and any affiliates.

On August 19, 2024, the FDIC issued a proposal to amend its filing requirements and processing procedures for notices filed under the Change in Bank Control Act (CBCA) by removing the exemption from the notice requirement for acquisitions of voting securities of a depository institution holding company with an FDIC-supervised subsidiary institution for which the Federal Reserve reviews a notice under the CBCA and by making conforming definitional changes. The FDIC also sought information and comment regarding its approach to change in control notices under the CBCA with regard to persons who may be directly or indirectly exercising control over an FDIC-supervised institution. The FDIC indicated its commitment to developing an interagency approach to change in control notices with the Federal Reserve and the OCC.

On August 23, 2024, the FDIC sought comment on proposed revisions to its regulations relating to the brokered deposits restrictions that apply to less than well-capitalized insured depository institutions. The proposed rule would revise the "deposit broker" definition and would amend the analysis of the "primary purpose" exception to the "deposit broker" definition. The proposed rule would also amend two of the designated business relationships under the primary purpose exception and make changes to the notice and application process for the primary purpose exception. In addition, the proposed rule would clarify when an insured depository institution can regain status as an "agent institution" under the limited exception for a capped amount of reciprocal deposits.

On September 17, 2024, the FDIC approved a proposed rulemaking that would strengthen FDIC-insured depository institutions' (IDI) recordkeeping for custodial deposit accounts with transactional features and preserve beneficial owners' and depositors' entitlement to the protections afforded by federal deposit insurance. The proposal is intended to promote the FDIC's ability to promptly make deposit insurance determinations and, if necessary, pay deposit insurance claims "as soon as possible" in the event of the failure of an IDI holding custodial accounts with transactional features. The proposed requirements are also expected to result in depositor and consumer protection benefits, such as promoting timely access by consumers to their funds, even in the absence of the failure of an IDI. The proposed requirements would only apply to IDIs offering custodial accounts with transactional features and that are not specifically exempted as provided in the proposal.

On September 17, 2024, the FDIC issued a final Statement of Policy on Bank Merger Transactions to provide transparency on how the FDIC administers its responsibilities under the Bank Merger Act (BMA). The final statement took into consideration comments received in response to the FDIC's request for comment on a Proposed Statement of Policy on Bank Merger Transactions, and reflected certain changes made in response to comments received. The final statement focuses on the scope of transactions subject to FDIC

approval, the FDIC's process for evaluating merger applications, and the principles that guide the FDIC's consideration of the applicable statutory factors as set forth in the BMA.

On September 25, 2024, the OCC issued its final rule to increase the transparency of the standards that apply to the agency's review of business combinations involving national banks and Federal savings associations. In particular, the final rule amends the procedures and adds, as an appendix, a policy statement that summarizes the principles the OCC uses when it reviews proposed bank merger transactions under the BMA.

4.2.2 Dodd-Frank Act Stress Tests

On June 26, 2024, the Federal Reserve released the results of its annual supervisory stress test. The results showed that while large banks would endure greater losses than estimated under last year's test, they are well positioned to weather a severe recession and stay above minimum capital requirements. Additionally, the Federal Reserve published aggregate results from its first exploratory analysis, which will not affect bank capital requirements. All 31 banks tested remained above their minimum common equity tier 1 (CET1) capital requirements during the hypothetical recession after absorbing total projected hypothetical losses of nearly $685 billion. Under stress, the aggregate CET1 capital ratio—which provides a cushion against losses—is projected to decline by 2.8 percentage points, from 12.7 percent to 9.9 percent. The Federal Reserve indicated that while this is a greater decline than estimated during the previous year's supervisory stress test, it is within the range of hypothetical losses calculated in recent stress tests. The Federal Reserve also conducted an exploratory analysis, including two funding stresses to all banks tested and two trading book stresses to only the largest and most complex banks. The exploratory analysis is distinct from the stress test, exploring additional hypothetical risks to the broader banking system. The exploratory analysis also does not affect bank capital requirements.

4.2.3 Resolution Planning and Orderly Liquidation

On June 21, 2024, the FDIC and Federal Reserve announced that, following their joint review of the July 2023 resolution plan submissions of the eight largest and most complex bank holding companies, they identified a weakness in the plans from four such firms. The agencies did not identify any weaknesses in the plans from the other firms. Resolution plans, also known as living wills, must describe a firm's strategy for orderly resolution in bankruptcy in the event of its material financial distress or failure. The agencies jointly determined that each weakness identified in the 2023 plans from three firms is a "shortcoming." A shortcoming is a weakness that raises questions about the feasibility of the plan.

The agencies jointly identified a weakness in the 2023 plan submitted by the fourth firm but reached different conclusions on its severity. The FDIC determined that the bank plan was not credible or would not facilitate an orderly resolution under the U.S. Bankruptcy Code and considers the weakness to be a "deficiency." A deficiency is a weakness that could undermine the feasibility of the plan. The Federal Reserve concluded that the weakness was only a shortcoming. Under the resolution planning rule of the agencies, when one agency finds a shortcoming in a resolution plan and the other agency finds a deficiency, the plan is deemed to have a shortcoming. As a result, the firm's 2023 plan was considered to have a shortcoming. The agencies also previously identified a shortcoming in the firm's 2021 plan related to data quality and data management, and that shortcoming remains outstanding.

The agencies provided feedback letters to each of the eight firms that identify areas for continued development of banks' resolution strategies and capabilities. For the four banks with an identified shortcoming, the letters described the specific weaknesses resulting in the shortcoming and the remedial actions required by the agencies. The shortcomings are to be addressed in the next resolution plans due by July 1, 2025. The feedback letters also specified that each firm, in its 2025 resolution plan submission, should address the topics of contingency planning and obtaining foreign government actions necessary to execute the resolution strategy.

On July 9, 2024, the FDIC issued a final rule to require the submission of resolution plans by IDIs with $100 billion or more in total assets and informational filings by IDIs with at least $50 billion but

less than $100 billion in total assets. The final rule modifies the previous rule requirements regarding the content and timing of full resolution submissions, as well as interim supplements to those submissions provided to the FDIC, in order to support the FDIC's resolution readiness in the event of material distress and failure of these large IDIs. The final rule also enhances how the credibility of full resolution submissions will be assessed, expands expectations regarding engagement and capabilities testing, and explains expectations regarding the FDIC's review, feedback, and enforcement of IDIs' compliance with the rule.

On August 15, 2024, the Federal Reserve and FDIC issued final joint guidance to help certain large banks further develop their resolution plans. The guidance generally applies to domestic and foreign banking organizations with more than $250 billion in total assets but that are not the largest and most complex banking organizations, for which guidance is already in place. The guidance is organized around key areas of potential vulnerability, such as capital, liquidity, and operational capabilities that could be needed in resolution. Distinct from the guidance to the largest and most complex banking organizations, the guidance provides agency expectations for both single point of entry and multiple point of entry resolution strategies, which are different strategies banking organizations have adopted for their rapid and orderly resolution. It also recognizes that the preferred resolution outcome for foreign banking organizations is often a successful home country-led resolution and guides foreign banking organizations on how to address the global resolution plan in their U.S. plan. The agencies also announced that they are extending the resolution plan submission deadline for the banking organizations to which the guidance applies. Banking organizations are required to submit their resolution plans by October 1, 2025, instead of March 31, 2025. The purpose of the extension was to provide reasonable time for banking organizations to consider the final guidance as they develop their plan submissions.

On Oct. 22, 2024, the OCC issued a final rule to apply its enforceable recovery planning guidelines to insured national banks, federal savings associations, and federal branches with average total consolidated assets of $100 billion or more; incorporate a testing standard; and clarify the role of nonfinancial (including operational and strategic) risk in recovery planning.

4.2.4 Insurance

On November 27, 2023, the Federal Reserve issued a final rule adopting risk-based capital requirements for depository institution holding companies that are significantly engaged in insurance activities. This risk-based capital framework, termed the Building Block Approach, adjusts and aggregates existing legal entity capital requirements to determine enterprise-wide capital requirements. The final rule also contains a risk-based capital requirement excluding insurance activities, in compliance with section 171 of the Dodd-Frank Act. The Federal Reserve also adopted a reporting form FR Q-1 related to the Building Block Approach. The capital requirements and associated reporting form meet statutory mandates and are intended to help prevent the economic and consumer impacts resulting from the failure of organizations engaged in banking and insurance.

FIO assists the Secretary of the Treasury in administering the Terrorism Risk Insurance Program (TRIP), created under the Terrorism Risk Insurance Act of 2022, as amended. In June 2024, Treasury published a Report on the Effectiveness of the Terrorism Risk Insurance Program. In the report, Treasury concluded that TRIP has remained effective in making terrorism risk insurance available and affordable in the insurance marketplace, although it observed that the hardening of the property and casualty (P&C) insurance and reinsurance market over the past few years has had a corresponding impact on the market for terrorism risk insurance, resulting in some decline in terrorism risk insurance take-up and associated reductions in extended limits. These impacts are the likely result of general changes in the P&C insurance and reinsurance market that are not specific to terrorism risk insurance, which continues to be priced at a relatively low and consistent percentage of total P&C premium.

The National Association of Insurance Commissioners (NAIC) adopted a *Model Bulletin on the Use of Artificial Intelligence Systems by Insurers* in December 2023, which provides a template for regulators to consider. Regulators can use the template to inform insurance carriers that any

decisions affecting consumers that are made or supported by advanced analytical and computational technologies, including AI, must comply with all applicable insurance laws and regulations, including those addressing unfair trade practices. The Model Bulletin also sets forth guidance to state insurance regulators on expectations on how insurers should oversee the use of such technologies by or on behalf of an insurer to make or support such decisions, including the creation and implementation of a written Accounting Information System (AIS) Program, commensurate with an assessment of the risk in accordance with the guidelines established by the NAIC's 2020 Principles of Artificial Intelligence, and to ensure that decisions impacting consumers made or supported by AI are accurate and do not violate unfair trade practice laws or other applicable legal standards. The Model Bulletin also provides language for regulators to consider adopting and using to advise insurers of documentation that a state Department of Insurance may request during an investigation or examination.

In December 2023, the NAIC adopted the Liquidity Stress Testing Framework used for year-end 2023, which along with Asset Adequacy Testing, is designed to assist regulators to evaluate the risks arising from interest rate changes and other variables.

In March 2024, the NAIC finalized improvements to statutory accounting rules for residual investment tranches of securities, in an effort to better account for the additional risk that life insurers have undertaken in their investment portfolios, in the form of private credit and alternative investments. In August 2024, targeted reporting and risk-based capital (RBC) guidance for collateral loans was also adopted.

In addition, in August 2024, the NAIC introduced revisions to the reporting of asset-backed securities, mortgages and other invested assets. The NAIC adopted changes to its *Financial Analysis Handbook* to provide additional guidance to regulators reviewing affiliated investment management agreements, and guidance on bonds that have obtained a private letter rating from a credit rating agency provider. The NAIC also introduced changes in August 2024 to clarify that directly held digital assets are treated as non-admitted assets for RBC purposes.

Further, in August 2024, changes were made to the Purposes and Procedures Manual of the NAIC Investment Analysis Office to clarify that NAIC securities designations can consider investment risks other than credit risk. This change allows the NAIC Securities Valuation Office to account for a variety of the risks that may be present in both traditional and more complex securities.

In the area of resolution and recovery, changes were made in December 2023 to the NAIC Troubled Insurance Company Handbook related to continuation of essential services by affiliates in receivership; recovery and resolution planning and crisis management preparedness; and early coordination with guaranty funds.

On July 11, 2024, the New York Department of Financial Services (NYDFS) issued a Circular Letter to identify the Department's expectations that all insurers authorized to write insurance in New York State, Article 43 corporations, health maintenance organizations, licensed fraternal benefit societies, and the New York State Insurance Fund (collectively, "insurers") develop and manage their use of AIS, Electronic Chart Display and Information System (ECDIS), and other predictive models in underwriting and pricing insurance policies and annuity contracts. The Department presented its expectation that insurers' use of emerging technologies, such as AIS and ECDIS, will be conducted in a manner that complies with all applicable federal and state laws and regulations.

4.3 Financial Infrastructure, Markets, and Oversight

4.3.1 Climate-Related Financial Risks

The NAIC continued to update its solvency framework in the area of climate risk scenario analysis. Specifically, year-end 2024 risk-based capital (RBC) filings will require property insurers to disclose their exposure to climate risk through a Representative Concentration Pathway 4.5 climate scenario analysis for 2040 and 2050 on hurricane and wildfire risk, or through a comparable methodology. The RBC filing was also updated in March 2024 to include disclosure of probable maximum losses arising from a severe convective storm, and the structure of an insurer's property

reinsurance program. In a related effort, changes were made to the NAIC's Financial Condition Examiners Handbook in December 2023 within the Investments, Reinsurance and Underwriting Repositories to require consideration of climate risks during the financial examination of an insurer.

In March 2024, FIO, the state insurance regulators, and the NAIC agreed to launch a first-of-its kind collaboration through the Property and Casualty Market Intelligence Data Call to gather ZIP Code level data on property insurance from over 330 insurers representing the majority of the U.S. homeowner's market. The data call required participating insurers to submit ZIP Code-level data on premiums, policies, claims, losses, limits, deductibles, non-renewals, and coverage types for the ZIP Codes in which they operate nationwide. State insurance regulators sought more than 70 data points. An anonymized subset of the data was shared with FIO.

On December 21, 2023, the NYDFS issued Guidance for New York State Regulated Banking and Mortgage Institutions Relating to Management of Material Financial and Operational Risks from Climate Change. The Guidance covers New York State-regulated banking organizations, New York State-licensed branches and agencies of foreign banking organizations, and New York State-regulated mortgage bankers and mortgage servicers.

4.3.2 Digital Assets, Payment Systems, and Technological Innovation

On July 31, 2024, the OCC, Federal Reserve, and FDIC issued a request for information on bank-fintech arrangements involving banking products and services distributed to consumers and businesses. In the request for information, the agencies stated that during the preceding years, they had observed and reviewed arrangements between banks and financial technology (fintech) companies. The agencies expressed their support for responsible innovation and banks pursuing bank-fintech arrangements in a manner consistent with safe and sound banking practices and with applicable laws and regulations, including consumer protection requirements and those addressing financial crimes. The request noted that bank-fintech arrangements can provide benefits; however, supervisory experience has highlighted a range of potential risks with these bank-fintech arrangements. The request solicited input on the nature of bank-fintech arrangements, effective risk management practices regarding bank-fintech arrangements, and the implications of such arrangements, including whether enhancements to existing supervisory guidance may be helpful in addressing risks associated with these arrangements.

On October 15, 2024, state bank regulators, in partnership with the United States Secret Service and the Bankers Electronic Crimes Task Force, released an updated Ransomware Self-Assessment Tool (R-SAT 2.0) to help banks and nonbank financial institutions assess their efforts to mitigate risks associated with ransomware and identify security gaps. The self-assessment provides executive management and the board of directors with an overview of their institution's preparedness toward identifying, protecting, detecting, responding to, and recovering from a ransomware attack.

In 2024, Connecticut, Illinois, Kansas, New Hampshire, Maine, Missouri, South Carolina, Vermont, and Wisconsin signed into law legislation based on the Conference of State Bank Supervisors (CSBS) Money Transmission Modernization Act (MTMA). The MTMA enhances prudential standards for money transmitters, including requirements related to tangible net worth, surety bonds, and the types and maintenance of permissible investments. At the end of the second quarter of 2024, companies subject to the MTMA facilitated 99 percent of money transmission activity reported through the Nationwide Multistate Licensing System Money Services Businesses Call Report, or $334.8 billion of the total $335.8 billion. Additionally, companies subject to the MTMA's capital and safeguarding requirements include, but are not limited to, the top 50 money services businesses.

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

On March 15, 2024, the Federal Reserve issued a final rule amending the requirements relating to operational risk management in the Federal Reserve's Regulation HH, which applies to certain FMUs that have been designated as systemically important by the Council under Title VIII of

the Dodd-Frank Act. The amendments update, refine, and add specificity to the operational risk management requirements in Regulation HH to reflect changes in the operational risk, technology, and regulatory landscape in which designated FMUs operate. The final rule also adopts specific incident-notification requirements.

4.3.4 Securities and Asset Management

On January 16, 2024, the SEC issued a final rule under the Securities Exchange Act of 1934 (Exchange Act) to amend the standards applicable to covered clearing agencies for Treasury securities. The final rule requires that such covered clearing agencies have written policies and procedures reasonably designed to require that every direct participant of the covered clearing agency submit for clearance and settlement all eligible secondary market transactions in Treasury securities to which it is a counterparty. In addition, the SEC adopted additional amendments to the Covered Clearing Agency Standards with respect to risk management. These requirements are designed to protect investors, reduce risk, and increase operational efficiency. Finally, the SEC amended the broker-dealer customer protection rule to permit margin required and on deposit with covered clearing agencies for Treasury securities to be included as a debit in the reserve formulas for accounts of customers and proprietary accounts of broker-dealers, subject to certain conditions.

On February 29, 2024, the SEC issued a final rule to further define the phrase "as a part of a regular business" as used in the statutory definitions of "dealer" and "government securities dealer" under sections 3(a)(5) and 3(a)(44), respectively, of the Exchange Act.

On March 12, 2024, the CFTC and SEC adopted amendments to Form PF, the confidential reporting form for certain SEC-registered investment advisers to private funds, including those that also are registered with the CFTC as a commodity pool operator or commodity trading advisor. The amendments are designed to enhance the Council's ability to monitor systemic risk as well as bolster the SEC's regulatory oversight of private fund advisers and investor protection efforts. In connection with the amendments to Form PF, the SEC amended a rule under the Advisers Act to revise instructions for requesting a temporary hardship exemption.

On June 3, 2024, the SEC adopted amendments to Regulation S-P to modernize and enhance the rules that govern the treatment of consumers' nonpublic personal information by certain financial institutions. The amendments require broker-dealers (including funding portals), investment companies, registered investment advisers, and transfer agents to develop, implement, and maintain written policies and procedures for an incident response program that is reasonably designed to detect, respond to, and recover from unauthorized access to or use of customer information. The amendments also require that the response program includes procedures for, with certain limited exceptions, these covered institutions to provide notice to individuals whose sensitive customer information was or is reasonably likely to have been accessed or used without authorization.

On September 11, 2024, the SEC adopted amendments to Form N-PORT, the form for reporting portfolio holdings of many registered investment companies. The amendments require more frequent reporting of monthly portfolio holdings and related information to the SEC and the public. The amendments will improve transparency and facilitate better monitoring of a large segment of registered funds.

4.3.5 Accounting Standards

On December 13, 2023, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2023-08 to address the accounting and disclosure requirements for certain crypto-assets as outlined in ASC 350-60-15-1. The ASU applies to all entities that hold certain crypto-assets, including private companies and not-for-profit entities and is effective in the first quarter of 2025 for calendar year entities with early adoption option permitted. The ASU requires subsequent measurement of certain crypto-assets at fair value with changes in fair value separately reported in net income in each reporting period and enhanced disclosure requirements on crypto-asset holdings.

On December 14, 2023, the FASB issued ASU 2023-09 to improve income tax disclosures. The ASU applies to all entities subject to income taxes

and is effective the first quarter of 2025 for public calendar year and the first quarter of 2026 for entities other than public business entities with early adoption option permitted. The standard requires disaggregated information about a reporting entity's effective tax rate reconciliation as well as information on income taxes paid to provide more detailed income tax disclosures that would be useful in making capital allocation decisions.

4.3.6 Bank Secrecy Act/Anti–Money Laundering Regulatory Reform

The Corporate Transparency Act

On November 8, 2023, the Financial Crimes Enforcement Network (FinCEN) issued a final rule that specifies when and how entities required to report beneficial ownership information to FinCEN may use a FinCEN identifier to report the beneficial ownership information of certain related entities. These regulations amend FinCEN's Beneficial Ownership Information Reporting Requirements Rule (BOI Reporting Rule), which implements Section 6403 of the Corporate Transparency Act (CTA). The CTA was enacted into law as part of the Anti-Money Laundering Act of 2020 (AML Act), which is itself part of the National Defense Authorization Act for Fiscal Year 2021. The final rule incorporates changes to clarify the circumstances in which an entity FinCEN identifier could be used. These changes, are: (1) to consistently refer to the entity whose FinCEN identifier the reporting company may use as "another entity" or "the other entity" rather than simply "the entity," in order to avoid confusion with the reporting company itself; and (2) to make clear that it is an individual's ownership interest in another entity that allows the reporting company to report the other entity's FinCEN identifier in lieu of the individual's information.

On November 22, 2023, FinCEN issued a final rule in accordance with the requirements of the Privacy Act of 1974 (Privacy Act) that exempts a new system of records, entitled "FinCEN .004—Beneficial Ownership Information (BOI) System," from certain Privacy Act provisions. The exemptions are intended to increase the value of the system for law enforcement purposes while complying with the CTA's disclosure. The Privacy Act contains certain requirements regarding the maintenance and disclosure of records contained in a system of records. The final rule explained that those requirements may differ from, or conflict with, the requirements for maintaining and disclosing BOI specified in the CTA. To the extent those Privacy Act requirements may apply, however, FinCEN exempted the BOI system or records because it is (1) maintained by a component of an agency (i.e., FinCEN) that performs as its principal function any activity pertaining to criminal law enforcement; and (2) is investigatory material compiled for law enforcement purposes.

On November 30, 2023, FinCEN issued a final rule to amend the BOI Reporting Rule to extend the filing deadline for certain BOI reports. Under the BOI 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. The amendment extended the 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, have 30 days to file their BOI reports with FinCEN, as required under the BOI Reporting Rule.

On December 22, 2023, FinCEN issued a final rule concerning access by authorized recipients to BOI. The regulations implement strict protocols required by the CTA to protect sensitive personally identifiable information reported to FinCEN and establish the circumstances in which specified recipients have access to BOI, along with data protection protocols and oversight mechanisms applicable to each recipient category. This 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.

Residential Real Estate and Investment Adviser Rulemakings

On May 21, 2024, FinCEN and the SEC jointly issued a proposed rule intended to implement the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and

Obstruct Terrorism Act of 2001 with regard to certain investment advisers. If, as proposed in a separate rulemaking, certain investment advisers are included in the definition of "financial institution" under the Bank Secrecy Act (BSA), the Secretary of the Treasury and the SEC would be required to jointly prescribe a regulation that, among other things, requires investment advisers to implement reasonable procedures to verify the identities of their customers.

On August 29, 2024, FinCEN issued a final rule to require certain persons involved in real estate closings and settlements to submit reports and keep records on certain non-financed transfers of residential real property to specified legal entities and trusts on a nationwide basis. Transfers made directly to an individual are not covered by this rule. This rule describes the circumstances in which a report must be filed, who must file a report, what information must be provided, and when a report is due. These reports are expected to assist Treasury, law enforcement, and national security agencies in addressing illicit finance vulnerabilities in the U.S. residential real estate sector and to curtail the ability of illicit actors to anonymously launder illicit proceeds through transfers of residential real property, which threatens U.S. economic and national security.

On September 4, 2024, FinCEN issued a final rule to include certain investment advisers in the definition of "financial institution" under BSA, prescribe minimum standards for anti-money laundering/countering the financing of terrorism (AML/CFT) programs to be established by certain investment advisers, require certain investment advisers to report suspicious activity to FinCEN pursuant to the BSA, and make several other related changes to FinCEN regulations. These regulations apply to certain investment advisers who may be at risk for misuse by money launderers, terrorist financers, or other actors who seek access to the U.S. financial system for illicit purposes and who threaten U.S. national security.

Customer Identification Program Requirements

On March 29, 2024, FinCEN, in consultation with staff at the OCC, FDIC, NCUA, and the Federal Reserve, issued a request for information (RFI) to understand the potential risks and benefits, as well as safeguards that could be established, if banks were permitted to collect partial Social Security Number (SSN) information directly from the customer for U.S. individuals and subsequently use reputable third-party sources to obtain the full SSN prior to account opening. FinCEN sought this information to assist in its efforts to evaluate and enhance its understanding of current industry practices and perspectives related to the Customer Identification Program (CIP) Rule's Taxpayer Identification Number collection requirement, and to assess the potential risks and benefits associated with a change to that requirement. This notice also serves as a reminder from FinCEN and staff at the agencies that banks must continue to comply with the current CIP Rule requirement to collect a full SSN for U.S. individuals from the customer prior to opening an account.

The Anti-Money Laundering Act of 2020

On July 3, 2024, FinCEN issued a proposed rule, pursuant to Section 6101(b) of the AML Act, that proposes amendments to AML/CFT program requirements for all financial institutions subject to the BSA with AML/CFT program obligations. The proposed rule would require financial institutions to establish, implement, and maintain effective, risk-based, and reasonably designed AML/CFT programs with certain minimum components, including a mandatory risk assessment process. The proposed rule also would require financial institutions to review government-wide AML/CFT priorities and incorporate them, as appropriate, into risk-based programs, and would provide for certain technical changes to program requirements. This proposal also further articulates certain broader considerations for an effective and risk-based AML/CFT framework as envisioned by the AML Act. In addition to these changes, FinCEN proposed regulatory amendments to promote clarity and consistency across FinCEN's program rules for different types of financial institutions.

On August 9, 2024, the OCC, Federal Reserve, FDIC, and NCUA issued a proposed rulemaking that would amend the requirements that each agency has issued for its supervised banks (currently referred to as BSA compliance programs) to establish, implement, and maintain effective, risk-based, and reasonably designed AML/CFT programs. The amendments are intended to align with changes that are being concurrently proposed by FinCEN as a result of the AML Act. The

proposed rule incorporates a risk assessment process in the AML/CFT program rules that requires, among other things, consideration of the national AML/CFT Priorities published by FinCEN. The proposed rule would also add customer due diligence requirements to reflect prior amendments to FinCEN's rule and, concurrently with FinCEN, proposes clarifying and other amendments to codify longstanding supervisory expectations and conform to AML Act changes.

The Financial Action Task Force

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 October 2023, the FATF adopted revisions to its asset recovery standards to strengthen the tools available to law enforcement, asset recovery agencies, and criminal justice system to target and recover criminal proceeds and improve mutual legal assistance. FATF members also adopted a report on how terrorist groups like Hamas use crowdfunding techniques to raise money for their attacks. Further, as part of enhancing FATF's efforts to counter corruption, the FATF adopted a report on the misuse of citizenship and residency by investment programs, highlighting how corrupt actors, tax evaders, and other criminals have exploited these programs.

In February 2024, the FATF agreed to upgrade the United States to 'largely compliant' with the FATF Recommendation 24, which relates to beneficial ownership transparency of legal persons. Following this decision, in March, FATF published the updated rating in the Seventh Enhanced Follow-Up Report of the United States, recognizing Treasury's historic efforts to increase beneficial ownership transparency and address key vulnerabilities in the U.S. AML/CFT framework through the ongoing implementation of the CTA (as discussed above).

Also in February 2024, the FATF launched a public consultation on potential revisions to the FATF Recommendation on payment transparency (Recommendation 16). These revisions are necessary to account for changes in the payments landscape, ensure the standard remains technology neutral, and reflect changes to industry standards like International Organization for Standardization (ISO) 20022 in particular. Work on the potential revisions will be ongoing through 2024 and 2025 with another public consultation tentatively scheduled for February 2025. In addition, the FATF adopted and published updated guidance related to Recommendation 25 on beneficial ownership transparency of legal arrangements. This guidance complements existing guidance on Recommendation 24 on legal persons and aims to help stakeholders from the public and private sectors that are involved in trusts or similar legal arrangements to assess and mitigate money laundering and terrorist financing risks.

In June 2024, the FATF also adopted a statement warning all countries about the Democratic People's Republic of Korea (DPRK)'s increasing financial connectivity with the international financial system. The FATF also agreed to continue efforts to urge countries to implement the FATF AML/CFT standards for virtual assets and virtual asset service providers (VASPs) including by taking steps to help countries access the necessary support and expertise. In July 2024, the FATF also published a report on nonfinancial gatekeeper facilitation of corruption as its final project under its renewed efforts to counter corruption.

4.4 Mortgages and Consumer Protection

4.4.1 Mortgages and Housing Finance

On April 10, 2024, Iowa signed into law legislation based on the CSBS Model State Regulatory Prudential Standards for Nonbank Mortgage Servicers. These standards 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. Given the multistate operations of most nonbank mortgage firms, the states that have adopted the prudential standards effectively

cover 99 percent of the nonbank mortgage market by loan count, including, but not limited to, the 50 largest nonbank mortgage servicers.

On May 16, 2024, the FHFA issued a final rule that addressed barriers to sustainable housing opportunities for underserved communities by codifying existing FHFA practices in regulation and adding new requirements related to fair lending, fair housing, unfair or deceptive acts or practices, and Equitable Housing Finance Plans. The final rule was intended to advance FHFA's fulfillment of its statutory purposes and its oversight of Federal National Mortgage Association (Fannie Mae), Federal Home Loan Mortgage Corporation (Freddie Mac), and the Federal Home Loan Banks, and their fulfillment of their statutory purposes.

On May 16, 2024, the FHFA issued a RFI on the mission of the Federal Home Loan Bank (FHLBank) System as the agency considers next steps for related rulemakings. The RFI provided an opportunity for the public to provide feedback on a core recommendation of FHFA's *Federal Home Loan Bank System at 100: Focusing on the Future* report. Recognizing the importance of government-sponsored enterprises serving a clear public purpose, the report recommended clarifying the mission of the FHLBank System and updating how the FHFA evaluates the FHLBanks' achievement of that mission.

On July 26, 2024, the Federal Reserve, CFPB, FDIC, NCUA, and OCC issued final guidance that highlights risks associated with deficient residential real estate valuations and describes how financial institutions may incorporate reconsiderations of value processes and controls into established risk management functions. The final guidance also provides examples of policies and procedures that a financial institution may choose to implement to help identify, address, and mitigate the risk of discrimination impacting residential real estate valuations.

On August 7, 2024, the OCC, Federal Reserve, FDIC, NCUA, CFPB, and FHFA adopted a final rule 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 final rule, institutions that engage in certain credit decisions or securitization determinations must adopt policies, practices, procedures, and control systems to ensure that AVMs used in these transactions to determine the value of mortgage collateral adhere to quality control standards designed to 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 comply with applicable nondiscrimination laws.

On August 29, 2024, the FHFA issued a proposed rule and requested comments on the housing goals for Fannie Mae and Freddie Mac for 2025 through 2027 as required by the Federal Housing Enterprises Financial Safety and Soundness Act of 1992. The housing goals and subgoals include separate categories for single-family and multifamily mortgages on housing affordable to low-income and very low-income families, among others. The proposed rule also includes criteria for when housing plans would be required for 2025–2027 and makes several technical changes to enhance clarity and conform the regulation to existing practice.

4.4.2 Consumer Protection

On February 23, 2024, the CFPB issued a proposed rule and request for comment to amend Regulations E and Z to update regulatory exceptions for overdraft credit provided by very large financial institutions, thereby ensuring that extensions of overdraft credit adhere to consumer protections required of similarly situated products, unless the overdraft fee is a small amount that only recovers applicable costs and losses. The proposal would allow consumers to better comparison shop across credit products and provide substantive protections that apply to other consumer credit.

On March 15, 2024, the CFPB issued a final rule amending Regulation Z, which implements the Truth in Lending Act (TILA), to address late fees charged by card issuers that together with their affiliates have one million or more open credit card accounts. The final rule adopts a late fee safe harbor threshold of $8 for those issuers and provides that the annual adjustments to reflect changes in the Consumer Price Index (CPI) do not apply to this $8 amount.

On May 31, 2024, the CFPB issued an interpretive rule to address the applicability of subpart B of Regulation Z to lenders that issue digital user accounts used to access credit, including to those lenders that market loans as "Buy Now, Pay Later." The interpretive rule describes how these lenders meet the criteria for being "card issuers" for purposes of Regulation Z. Such lenders that extend credit are also "creditors" subject to subpart B of Regulation Z, including those provisions governing periodic statements and billing disputes.

On July 8, 2024, the CFPB issued a final rule to require certain types of nonbank covered persons subject to certain final public orders obtained or issued by a government agency in connection with the offering or provision of a consumer financial product or service to report the existence of the orders and related information to a CFPB registry. The CFPB also required certain supervised nonbanks to file annual reports regarding compliance with registered orders.

4.5 Data Scope, Quality, and Accessibility

On May 6, 2024, the OFR issued a final rule establishing a data collection for certain non-centrally cleared bilateral transactions in the U.S. repurchase agreement market. This collection requires daily reporting to the OFR by certain brokers, dealers, and other financial companies with large exposures to non-centrally cleared bilateral repo. The collected data will 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, 2024, more than 2.6 million LEIs have been issued worldwide, with approximately 12 percent having been issued to U.S. entities. The total number of LEIs issued represents a year-to-date increase of 7 percent, which follows a 10 percent increase in 2023. 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 Part 3 of the LEI standard (ISO 17442), which was published on October 1, 2024, under Technical Committee 68 of the ISO. Part 3 of this standard is what the GLEIF defines as "verifiable LEIs", 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 2024, the OFR continued to provide Secretariat services to the ROC. As Secretariat, the OFR provides organizational management and communication for the 70+ global regulatory authorities that compose the ROC's membership. This included facilitating the first in-person plenary meeting in three years and two executive committee meetings. Additionally, the OFR partnered with other Council member agencies to establish new strategies for the ROC, especially in recommending adoption of the LEI.

As members of the ROC's Executive Committee, representatives from the OFR helped establish a new leadership team at the GLEIF in 2024. In conducting secretariat duties for the ROC, OFR staff worked closely with the new GLEIF leadership

team to help ensure a smooth transition and also assisted the ROC's Committee on Derivative Identifiers and Data Elements (CDIDE) in standing up a new subcommittee to address identification of underlying referential instruments. These instruments are important to derivatives regulators and market participants by improving market transparency and efficiency.

Financial Data Transparency Act

Under the Financial Data Transparency Act (FDTA), which was enacted in 2022 as part of the National Defense Authorization Act, nine federal financial regulatory agencies must establish data standards through a joint rulemaking. On August 22, 2024, the nine agencies issued a proposed rulemaking regarding the data standards. If finalized, the rulemaking will establish data standards for collections of information reported to financial regulators and data collected on behalf of the Council, which should create efficiencies of standardization for both government and industry. The agencies expect the data standards to 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.

4.5.3 Data Accessibility

Joint Analysis Data Environment

The OFR's Joint Analysis Data Environment (JADE)[260] provides Council member agencies access to collaboration spaces, data, software, and computing power for financial stability related research in a secure, cloud-based environment. In FY24, OFR's JADE supported financial stability-related research projects from the Federal Reserve, OCC, and FDIC.

5 Select Council Member Agency Publications on Financial and Regulatory Developments

FDIC. *Quarterly Banking Profile – Second Quarter 2024.* Washington: FDIC, 2024. https://www.fdic.gov/quarterly-banking-profile/fdic-quarterly-banking-profile-second-quarter-2024.

FDIC. *2024 Risk Review.* Washington: FDIC, 2024. https://www.fdic.gov/analysis/2024-risk-review.

FDIC. *Overview of Resolution Under Title II of the Dodd-Frank Act.* Washington: FDIC, 2024. https://www.fdic.gov/sites/default/files/2024-04/spapr1024b_0.pdf.

FHFA. *2023 Annual Report to Congress.* Washington: FHFA, 2024. https://www.fhfa.gov/sites/default/files/2024-07/FHFA-2023-Annual-Report-to-Congress.pdf.

FHFA. *Annual Performance Plan for Fiscal Year 2025. Washington*: FHFA, 2024. https://www.fhfa.gov/sites/default/files/2024-10/FY2025_APP.pdf.

FHFA. *Foreclosure Prevention, Refinance, and Federal Property Manager's Report.* Washington: FHFA, 2024. https://www.fhfa.gov/sites/default/files/2024-10/FPR-FPM-Report-July-2024.pdf.

FHFA. *Annual Housing Report.* Washington: FHFA, 2024. https://www.fhfa.gov/sites/default/files/2024-10/Annual-Housing-Report_2024.pdf.

FIO, U.S. Department of the Treasury. *Annual Report on the Insurance Industry 2024.* Washington: FIO, 2024. https://home.treasury.gov/system/files/311/2024-09-30%20Clean%20FIO%20AR%20508_2.pdf.

FIO, U.S. Department of the Treasury. *Report on the Effectiveness of the Terrorism Risk Insurance Program.* Washington: FIO, 2024. https://home.treasury.gov/system/s/311/2024ProgramEffectivenessReportFINAL6.28.2024508.pdf

NAIC. *U.S. Insurance Industry's Cash and Invested Assets Rise to $8.5 Trillion at Year-End 2023.* Washington: NAIC, 2024. https://content.naic.org/sites/default/files/capital-markets-special-reports-asset-mix-ye2023.pdf.

NAIC. *Number of Private Equity-Owned U.S. Insurers Remains Constant, But Total Investments Increase by Double Digits in 2023.* Washington: NAIC, 2024. https://content.naic.org/sites/default/files/capital-markets-pe-owned-ye2023.pdf.

NAIC. *U.S. Insurance Industry's Commercial Real Estate Investments Near $1 Trillion as of Year-End 2023, Led by Mortgage Loans*: Washington. NAIC, 2024. https://content.naic.org/sites/default/files/capital-markets-special-reports-cre-mortgage-loans-ye2023.pdf.

NCUA. *Cybersecurity and Credit Union System Resilience Report.* Washington: NCUA, 2024. https://ncua.gov/news/publication-search/cybersecurity/cybersecurity-and-credit-union-system-resilience-annual-report-congress-2.

NCUA. *2024 Annual Performance Plan.* Washington: NCUA, 2024. https://ncua.gov/files/agenda-items/2024-annual-performance-plan-20240118.pdf.

OCC. *Spring 2024 Semiannual Risk Perspective. Washington*: OCC, 2024. https://www.occ.gov/publications-and-resources/publications/semiannual-risk-perspective/files/pub-semiannual-risk-perspective-spring-2024.pdf.

OCC. *Fall 2024 Interest Rate Risk Statistics Report*. Washington: OCC, 2024. https://www.occ.treas.gov/publications-and-resources/publications/interest-rate-risk-statistics-reports/files/interest-rate-risk-statistics-report-fall-2024.html.

OCC. *2024 Cybersecurity and Financial System Resilience Report*. Washington: OCC, 2024. https://www.occ.treas.gov/publications-and-resources/publications/cybersecurity-and-financial-system-resilience/files/2024-cybersecurity-report.html.

OFR. *2024 Annual Report to Congress.* Washington, D.C: OFR, 2024. https://www.financialresearch.gov/annual-reports/files/OFR-AR-2024_web.pdf.

SEC. *Money Market Fund Statistics.* Washington: SEC, 2024. https://www.sec.gov/data-research/data-visualizations/money-market-fund-statistics.

SEC. *Private Fund Statistics.* Washington: SEC, 2024. https://www.sec.gov/data-research/data-visualizations/private-fund-statistics.

SEC. *Registered Fund Statistics*. Washington: SEC, 2024. https://www.sec.gov/data-research/data-visualizations/registered-fund-statistics.

SEC. *Report on Security Based Swaps*. Washington: SEC, 2024. https://www.sec.gov/files/report-security-based-swaps-062024.pdf.

6 Abbreviations

AFE	Advanced Foreign Economies
AI	Artificial Intelligence
AIS	Accounting Information System
AIWG	Artificial Intelligence Working Group
AML Act	Anti-Money Laundering Act of 2020
AML/CFT	Anti-Money Laundering/Countering the Financing of Terrorism
Analytic Framework	Analytic Framework for Financial Stability Risks Identification, Assessment, and Response
APT	Advanced Persistent Threat
ASU	Accounting Standards Update
ATM	Automated Teller Machines
AUM	Assets Under Management
AVM	Automated Valuation Model
BDC	Business Development Company
BHC	Bank Holding Company
BMA	Bank Merger Act
BOI	Beneficial Ownership Information
BSA	Bank Secrecy Act
CBCA	Change in Bank Control Act
CCP	Central Counterparty
CD	Certificate of Deposit
CDIDE	Committee on Derivative Identifiers and Data Elements
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
CHIPS	Clearing House Interbank Payments System
CIF	Collective Investment Fund
CIP	Customer Identification Program
CISA	Cybersecurity and Infrastructure Security Agency
Citizens	Citizens Property Insurance Corporation
CLO	Collateralized Loan Obligation
CLS	Continuous Linked Settlement
CMBS	Commercial Mortgage-Backed Security
CME	Chicago Mercantile Exchange Inc.
CNAV	Constant Net Asset Value
Council	Financial Stability Oversight Council
CPI	Consumer Price Index
CRE	Commercial Real Estate
CSBS	Conference of State Bank Supervisors
CSP	Cloud Service Provider
CTA	Corporate Transparency Act
DDoS	Distributed Denial of Service
DFMU	Designated Financial Market Utility
DHS	Department of Homeland Security
DIF	Deposit Insurance Fund
DLT	Distributed Ledger Technology
Dodd-Frank Act	Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010
DOJ	Department of Justice
DORA	European Union's Digital Operational Resilience Act
DPRK	Democratic People's Republic of Korea
DTC	Depository Trust Company
DTCC	Depository Trust & Clearing Corporation
EBITDA	Earnings before interest, taxes, depreciation and amortization
ECDIS	Electronic Chart Display and Information System

ERISA	Employee Retirement Income Security Act of 1974
ETF	Exchange-Traded Fund
ETP	Exchange Traded Product
EU	European Union
Exchange Act	Securities Exchange Act of 1934
FAIR	Fair Access to Insurance Requirements
Fannie Mae	Federal National Mortgage Association
FASB	Financial Accounting Standards Board
FATF	Financial Action Task Force
FBI	Federal Bureau of Investigation
FBIIC	Financial and Banking Information Infrastructure Committee
FCU	Federal Credit Union
FDIC	Federal Deposit Insurance Corporation
FDTA	Financial Data Transparency Act of 2022
Federal Reserve	Board of Governors of the Federal Reserve System
FEMA	Federal Emergency Management Agency
FFIEC	Federal Financial Institutions Examination Council
FHA	Federal Housing Administration
FHFA	Federal Housing Finance Agency
FHLBank	Federal Home Loan Bank
FICC	Fixed Income Clearing Corporation
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
Form PF-CR	Form PF Current Report
FRBNY	Federal Reserve Bank of New York
Freddie Mac	Federal Home Loan Mortgage Corporation
FRN	Floating-rate Note

FSB	Financial Stability Board
FS-ISAC	Financial Services Information Sharing and Analysis Center
FSSCC	Financial Services Sector Coordinating Council
FX	Foreign Exchange
FY	Fiscal Year
G7	Group of Seven
GAO	Government Accounting Office
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GHG	Greenhouse Gas
Ginnie Mae	Government National Mortgage Association
GLEIF	Global LEI Foundation
GSD	Government Securities Division
G-SIB	Global Systemically Important Bank
HFWG	Hedge Fund Working Group
IAWG	Inter-Agency Working Group for Treasury Market Surveillance
IDI	Insured Depository Institution
IMF	International Monetary Fund
ISO	International Organization for Standardization
IT	Information Technology
JADE	Joint Analysis Data Environment
JSCC	Japan Securities Clearing Corporation
LEI	Legal Entity Identifier
LGIP	Large Group Investment Pool
LLM	Large Language Model
LVNAV	Low Volatility Net Asset Value
MBS	Mortgage-Backed Security
MBSD	Mortgage-Backed Securities Division
MMF	Money Market Fund
MTMA	Money Transmission Modernization Act
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
NDLs	Non-Default Losses
NFIP	National Flood Insurance Program
NIM	Net Interest Margin
NIST	National Institute of Standards and Technology
NMC	Nonbank Mortgage Company
NOI	Net Operating Income
NPL	Nonperforming Loan
NSCC	National Securities Clearing Corporation
NYDFS	New York Department of Financial Services
OCC	Office of the Comptroller of the Currency
OFR	Office of Financial Research
OIR	Office of Insurance Regulation
ON RRP	Overnight Reverse Repurchase Agreement Facility
OTC	Over-the-Counter
P&C	Property and Casualty
PIK	Payment-in-Kind
Privacy Act	Privacy Act of 1974
RaaS	Ransomware as a Service
RBC	Risk-Based Capital
REIT	Real Estate Investment Trust
Repo	Repurchase Agreement
RFI	Request for Information
ROC	Regulatory Oversight Committee
S&P	Standard & Poor's
SASB	Single-Asset/Single-Borrower
SEC	Securities and Exchange Commission

SI>1 CCPs	CCPs Considered Systemically Important in More than One Jurisdiction
SIF	Share Insurance Fund
SLOOS	Senior Loan Officer Opinion Survey
SOFR	Secured Overnight Financing Rate
SRC	Systemic Risk Committee
SSN	Social Security Number
STIF	Short-Term Investment Fund
STIV	Short-Term Investment Vehicle
SVB	Silicon Valley Bank
SVO	Securities Valuation Office
System At 100 Report	*FHLBank System at 100: Focusing on the Future Report*
TGCR	Tri-Party General Collateral Rate
TILA	Truth in Lending Act
T-MMF	Tokenized Money Market Fund
TRACE	Trade Reporting and Compliance Engine
Treasury	U.S. Department of the Treasury
TRIP	Terrorism Risk Insurance Program
USD	U.S. Dollar
USDC	USD Coin
USDT	Tether
VNAV	Variable Net Asset Value

7 Glossary

Advanced Foreign Economies (AFE)

Advanced foreign economies (AFEs) are countries with developed economies, high standards of living, and advanced technological infrastructure.

Advanced Persistent Threat (APT)

An advanced persistent threat (APT) is a prolonged, stealthy cyber attack where an unauthorized user gains access to a network and remains undetected for an extended period. The goal of an APT is to steal data, rather than cause a network outage or infect systems with malware.

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.

Assets Under Management (AUM)

Assets under management (AUM) is the total market value of investments that an entity manages on behalf of clients. AUM can be a measure of a firm's economic health and success.

Automated Valuation Model

An automated valuation model is a system for the valuation of real estate that provides a value of a specified property at a specified date, using mathematical modelling techniques in an automated manner.

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.

Business Development Company (BDC)

A business development company is a form of unregistered closed-end investment company in the United States that invests in small and mid-sized businesses. This form of company was created by the US Congress in 1980 in the amendments to the Investment Company Act of 1940.

CAMELS

The CAMELS rating system is based upon an evaluation of six critical elements of a credit union's operations: Capital adequacy, Asset quality, Management, Earnings, Liquidity and Sensitivity to Market Risk. CAMELS is designed to consider and reflect all significant financial, operational, and management factors examiners assess in their evaluation of a depository institution's performance and risk profile.

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 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.

Cloud Service Provider (CSP)

A cloud service provider (CSP) is a third-party company that offers scalable computing resources to businesses over the internet. These resources can include data storage, computing power, applications, and platforms.

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.

Collective Investment Fund (CIF)

A collective investment fund (CIF) is a pooled investment vehicle that combines money from multiple investors into a single portfolio. A bank or trust company manages the fund, which holds assets that meet specific criteria.

Commercial Mortgage-Backed Security (CMBS)

Commercial mortgage-backed securities (CMBS) are fixed-income investment products that are backed by mortgages on commercial properties rather than residential real estate.

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.

Community Bank

A community bank is a depository institution that is typically locally owned and operated. Community banks tend to focus on the needs of the businesses and families where the bank holds branches and offices.

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.

Constant Net Asset Value (CNAV)

Constant net asset value refers to funds which use amortized cost accounting to value all of their assets.

Continuous Linked Settlement

Continuous Linked Settlement (CLS) is a multi-currency payment system that settles foreign exchange (FX) transactions in real time. CLS was created by the banking industry to reduce settlement risk, which is the risk that one party to a foreign exchange transaction will pay for a currency but not receive it.

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.

Designated Financial Market Utility (DFMU)

A designated financial market utility (DFMU) is a financial institution that operates a multilateral system for clearing, settling, or transferring financial transactions, securities, or payments.

Digital Assets

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

Distributed Ledger Technology (DLT)

Distributed ledger technology (DLT) is the technological infrastructure and protocols that allow simultaneous access, validation, and record updating across a networked database. DLT is the technology blockchains are created from, and the infrastructure allows users to view any changes and who made them, reduces the need to audit data, ensures data is reliable, and only provides access to those that need it.

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.

EBITDA

EBITDA is an acronym for earnings before interest, taxes, depreciation, and amortization. It's a metric used to measure a company's financial health and profitability. EBITDA is a key indicator of a company's ability to generate cash and add debt.

Exchange-Traded Fund (ETF)

An exchange-traded fund (ETF) is a security that pools money from investors to buy a variety of assets, such as stocks, bonds, or commodities. ETFs are similar to mutual funds, but they can be traded throughout the day like stocks, and they are listed on an exchange.

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 Federal Reserve Bank of New York (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.

Global Systemically Important Bank (G-SIB)

A Global Systemically Important Bank (G-SIB) is a bank that regulators have identified as being so important to the global financial system that its failure could trigger a wider financial crisis.

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.

High Yield Bond

High-yield bonds are bonds that pay higher interest rates because they have lower credit ratings than investment-grade bonds.

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.

Investment Company Act of 1940

The Investment Company Act of 1940 is an act of Congress that regulates the organization of investment companies and the activities they engage in. It sets standards for the investment company industry. A primary purpose of the Act is to protect investors by ensuring that they're aware of the risks associated with buying and owning securities.

Large Group Investment Pool (LGIP)

A large group investment pool is a large investment fund that combines money from many investors to buy securities or assets.

Large Language Model (LLM)

Large language model (LLM) is a subset of machine learning that use algorithms trained on large amounts of data to recognize patterns and respond to user requests in natural language.

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.

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.

Low Volatility Net Asset Value (LVNAV)

Low volatility net asset value (LVNAV) is a type of short-term money market fund (MMF) where units can be purchased or redeemed at a constant price. This is possible as long as the value of the fund's assets doesn't deviate by more than 0.2 percent (20 basis points) from par.

Margin

In the context of clearing activity, collateral that is collected to protect against current or poten-

tial 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.

Negotiable Certificates of Deposit

A negotiable certificate of deposit (NCD) is a bank-issued money-market instrument that can be traded between parties through money brokers. NCDs are also known as jumbo CDs.

Net Asset Value (NAV)

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

Net Interest Margin (NIM)

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

Net Operating Income (NOI)

Net operating income (NOI) is a metric that measures the profitability of an investment or asset by subtracting operating expenses from income. It's often used in commercial real estate to evaluate the profitability of properties like warehouses, apartment complexes, and office buildings.

Notional Exposure

Notional exposure, also known as face value, is a value that investors use to hedge against asset exposure.

Nonbank Financial Institution (NBFI)

A nonbank financial institution (NBFI) is a financial institution that does not have a full banking license and cannot accept deposits from the public. However, NBFIs do facilitate alternative financial services, such as investment (both collective and individual), risk pooling, financial consulting, brokering, money transmission, and check cashing. NBFIs are a source of consumer credit (along with licensed banks). Examples of nonbank financial institutions include insurance firms, venture capitalists, currency exchanges, some microloan organizations, and pawn shops. These non-bank financial institutions provide services that are not necessarily suited to banks, serve as competition to banks, and specialize in sectors or groups.

Nonbank Mortgage Company (NMC)

A nonbank mortgage company is a financial institution that offers mortgage lending services but is not a traditional bank. Nonbank mortgage companies offer a variety of services, including first-time home loans, refinancing, and more. Nonbank mortgage companies are not subject to the same regulations as traditional banks.

Non-Centrally Cleared Bilateral Repo (NCCBR)

A non-centrally cleared bilateral repo (NCCBR) is a transaction between two parties that involves the sale of securities in exchange for cash, with an agreement to repurchase the securities at a later date.

Non-Default Loss (NDL)

A non-default loss (NDL) is a loss that occurs at a central counterparty (CCP) as a result of an event other than a clearing member defaulting. NDLs can include losses from: cash and securities collateral provided to the CCP by its members, the CCP's own resources, operational risks, custody risks, and investment risks.

Nonperforming Loan (NPL)

A nonperforming loan (NPL) is a bank loan that is unlikely to be repaid by the borrower or is subject to late repayment.

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.

Offshore Reinsurance

Offshore reinsurance is a reinsurance arrangement between an insurance company and a reinsurer that is not licensed in the United States.

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.

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 over-the-counter (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).

Payment-In-Kind (PIK)

Payment-in-kind refers to a financial instrument that pays interest or dividends to investors of bonds, notes, or preferred stock with additional securities or equity instead of cash.

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.

Ransomware As A Service (RaaS)

Ransomware as a service is a cybercrime business model where ransomware operators write software and affiliates pay to launch attacks using said software. Affiliates do not need to have technical skills of their own but rely on the technical skills of the operators.

Real Estate Investment Trust (REIT)

An operating company that manages income-producing real estate or real estate-related assets. Certain real estate investment trusts (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 bank holding companies (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 risk-weighted assets (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.

Short-term Investment Vehicle (STIV)

A short-term investment vehicle can be converted to cash or sold within a short period of time, typically daily. STIVs include SEC registered 2a-7 MMFs and other non-2-a7 STIVs. For the purposes of this report, non-2a-7 STIVs include local government investment pools (LGIPs), offshore USD MMFs, private liquidity funds, bank-sponsored short-term investment funds (STIFs), and ultrashort bond funds.

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, commercial paper, Federal Home Loan Bank borrowings, and repos.

Single Asset /Single Borrower (SASB)

Single asset/single borrower (SASB) is a type of commercial loan where a single borrower takes out a large loan to purchase a single property or group of properties.

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.

Tokenized Money Market Fund (T-MMF)

A tokenized money market fund is a digital representation of a traditional MMF's shares, stored on a blockchain. Tokenized MMFs combine the stability of traditional MMFs with the benefits of blockchain technology.

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.

Variable Net Asset Value (VNAV)

Variable net asset value (VNAV) is a method of accounting for money market funds that uses mark-to-market accounting to value some of its assets. This method results in a variable investment value because the market values of the underlying investments change.

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.

Yield Spread

A yield spread is the net difference between two interest bearing instruments, expressed in terms of percent or basis points.

8 List of Charts

9 Endnotes

1 FSOC. 2023. "Analytic Framework for Financial Stability Risk Identification, Assessment, and Response." Financial Stability Oversight Council (FSOC). Federal Register, vol. 88, no. 218, pp. 78027. Available at https://home.treasury.gov/system/files/261/Analytic-Framework-for-Financial%20Stability-Risk-Identification-Assessment-and-Response.pdf

2 Office of Financial Research (OFR). Gross assets, net assets, and gross notional exposure (U.S. dollars). Hedge Fund Monitor. Accessed November 1, 2024. Available at https://www.financialresearch.gov/hedge-fund-monitor/categories/size/chart-3/

3 While there is considerable overlap between third-party service providers and fintechs, not all third-party service providers are fintechs and vice versa.

4 U.S. Department of the Treasury. 2024. "2024 Conference on Artificial Intelligence & Financial Stability." Available at https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/financial-stability-oversight-council/2024-conference-on-artificial-intelligence-financial-stability

5 Klein, Aaron, and Sandra Lee. 2024. "AI and Financial Stability: Mitigating Risks, Harnessing Benefits." Brookings. July 5. Available at https://www.brookings.edu/articles/ai-and-financial-stability-mitigating-risks-harnessing-benefits/

6 International Monetary Fund (IMF). 2024. Disruption Monitor: Trade Disruptions in the Red Sea. Available at https://portwatch.imf.org/pages/573013af3b6545deaeb50ed1cbaf9444

7 Federal Reserve Bank of New York. 2024. "Global Supply Chain Pressure Index." Available at https://www.newyorkfed.org/research/policy/gscpi

8 International Monetary Fund (IMF). 2024. "World Economic Outlook, October 2024: Policy Pivot, Rising Threats." October 22. Available at https://www.imf.org/en/Publications/WEO/Issues/2024/10/22/world-economic-outlook-october-2024

9 National Bureau of Statistics of China. 2024. Available at www.stats.gov.cn

10 S&P Global. 2024. "S&P Global Mexico Manufacturing PMI: Mexico's Manufacturing Downturn Deepens in September." October 2. Available at https://www.pmi.spglobal.com/Public/Home/PressRelease/5cbff538ec56483b8e9a77ce7c1c252e

11 Board of Governors of the Federal Reserve. 2024. "The Fed – Financial Accounts of the United States – Z.1 – Current Release." September 12. Available at https://www.federalreserve.gov/releases/z1/

12 While it is difficult to get comprehensive data on loan maturities by property type across lenders, CoStar estimates suggest that over 50 percent of bank CRE loans and over 54 percent of CMBS loans mature before the end of 2026.

13 Mobley, Phil. 2024. "Office Lease Exposure Risk Ramps Up." CoStar Analytics. May 23.

14 Trepp. 2024. "CMBS Losses by Vintage for Bonds with Original AAA Rating." July.

15 Berenbaum, Jeffrey, and Kevin Gibson. 2024. "CMBS Weekly – SASB: Best of Times, Worst of Times." Citibank. May.

16 Green Street Advisors. 2022. Green Street Commercial Property Price Index (CPPI). April 2022 - August 2024. Available at https://insights.greenstreet.com/hubfs/GSCPPI-20240806.pdf

17 Overby, Lea, and Anuj Jain. 2024. "U.S. CMBS: Spreads and Jams – Updated Appraisal Strats." Barclays. July.

18 Reardon, Ed, Bipul Sinha, and Rupesh Shrivastav. 2024. "CMBS 2024 Mid-year: Credit Picker's Market." Deutsche Bank. June.

19 Reardon, Ed, and Bipul Sinha. 2024. "CMBS: Remove Your Rally Caps." Deutsche Bank. May.

20 Board of Governors of the Federal Reserve System. 2024. "L.217 Total Mortgage." Available at https://www.federalreserve.gov/apps/fof/DisplayTable.aspx?t=l.217

21 Freddie Mac. 2024. Primary Mortgage Survey. October 24. Available at https://www.freddiemac.com/pmms/archive

22 ICE. 2024. Mortgage Monitor Report. August. Available at https://static.icemortgagetechnology.com/pdf/august-2024-mortgage-monitor-report.pdf

23 Calculations by the National Association of Insurance Commissioners.

24 Agency MBS include single-family mortgages securitized by Fannie Mae, Freddie Mac, and Ginnie Mae.

25 Board of Governors of the Federal Reserve System. 2024. "Bank Term Funding Program." October 11. Available at https://www.federalreserve.gov/financial-stability/bank-term-funding-program.htm

26 FSOC. 2024. "Report on Nonbank Mortgage Servicing." Available at https://home.treasury.gov/system/files/261/FSOC-2024-Nonbank-Mortgage-Servicing-Report.pdf

27 Black Knight eMBS. 2024. Share of Agency Servicing. January 2014—July 2024.

28 Equifax. 2024. "Alternative Data in Fintech: Overcoming Barriers for Market Success." Market Pulse, August 15. Available at https://assets.equifax.com/marketing/US/assets/Market-Pulse-Webinar-Deck-August-24.pdf

29 Despite consistent strong economic growth since the pandemic and associated low unemployment, the University of Michigan index of consumer sentiment remains well below pre-pandemic levels and not far above levels seen during the global financial crisis. See University of Michigan. n.d. "Table 1: The Index of Consumer Sentiment." *Surveys of Consumers*. 2008 – 2024. Available at https://data.sca.isr.umich.edu/data-archive/mine.php

30 Fulford, Scott. 2022. "Housing Inflation Is Hitting Low-Income Renters." CFPB. July. Available at https://www.consumerfinance.gov/about-us/blog/office-of-research-blog-housing-inflation-is-hitting-low-income-renters/

31 Fulford, Scott, and Christa Gibbs. 2024. "Credit Card Delinquencies Are Higher than in 2019 Because Lenders Took on More Risk." CFPB, August. Available at https://www.consumerfinance.gov/about-us/blog/credit-card-delinquencies-are-higher-than-in-2019-because-lenders-took-on-more-risk/

32 U.S. Department of Education. 2024. "Statement from U.S. Secretary of Education Miguel Cardona on the 8th Circuit Court of Appeals' Ruling on Biden-Harris Administration's Saving a Valuable Education (SAVE) Plan." Available at https://www.ed.gov/about/news/press-release/statement-from-us-secretary-of-education-miguel-cardona-on-the-8th-circuit-court-of-appeals-ruling-on-biden-harris-administrations-saving-a-valuable-education-save-plan

33 Weekly earnings in current dollars for the bottom decile of earners were $596 in the second quarter of 2024, up from $455 in 2019. When expressed in real 2022 dollars, they rose from $518 to $562.

34 Fulford, Scott, Eric Wilson, Zoe Kruse, Emma Kalish, and Isaac Cotter. 2023. "Making Ends Meet in 2023: Insights from the Making Ends Meet Survey." CFPB, December 1. Available at https://www.consumerfinance.gov/data-research/research-reports/making-ends-meet-in-2023-insights-from-the-making-ends-meet-survey/

35 Board of Governors of the Federal Reserve System. 2024. "Financial Accounts of the United States." Available at https://www.federalreserve.gov/releases/z1/

36 The outstanding balance of household mortgage debt in 2006 at approximately $10.6 trillion was lower than it is today, but it was a much higher percentage of the approximately $14.5 trillion in GDP produced at the time. Household mortgage debt was approximately $925 billion in 1980, but this represented nearly one-third of the approximately $2.8 trillion of GDP from that time.

37 Board of Governors of the Federal Reserve System. 2024. "Financial Accounts of the United States." Available at https://www.federalreserve.gov/releases/z1/

38 Martinez, Dan, and Margaret Seikel. 2024. "Interest Rate Margins at All-Time High." CFPB. February 22. Available at https://www.consumerfinance.gov/about-us/blog/credit-card-interest-rate-margins-at-all-time-high/

39 Consumer credit shows similar trends on shifts to nonbank lenders to a lesser extent.

40 FSOC. 2024. "Report on Nonbank Mortgage Servicing." Available at https://home.treasury.gov/system/files/261/FSOC-2024-Nonbank-Mortgage-Servicing-Report.pdf

41 Federal Reserve Bank of New York. 2024. "Quarterly Report on Household Debt and Credit 2024: Q2." August. Available at https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/HHDC_2024Q2

42 Federal Reserve Bank of Philadelphia. 2024. "Large Bank Consumer Credit Card Balances: Share of Accounts Making Greater Than the Minimum Payment." Available at https://fred.stlouisfed.org/series/RCCCBSHRGTMINLTMAX

43 Federal Reserve Bank of New York. 2024. "Quarterly Report on Household Debt and Credit 2024: Q2." August. Available at https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/HHDC_2024Q2

44 Fulford, Scott, and Christa Gibbs. 2024. "Credit Card Delinquencies Are Higher than in 2019 Because Lenders Took on More Risk." CFPB, August. Available at https://www.consumerfinance.gov/about-us/blog/credit-card-delinquencies-are-higher-than-in-2019-because-lenders-took-on-more-risk/

45 Federal Student Aid. 2024. "COVID-19 Emergency Relief and Federal Student Aid." Available at https://studentaid.gov/announcements-events/covid-19

46 U.S. Department of Education. 2024. "Statement from U.S. Secretary of Education Miguel Cardona on the 8th Circuit Court of Appeals' Ruling on Biden-Harris Administration's Saving a Valuable Education (SAVE) Plan." July 19. Available at https://www.ed.gov/about/news/press-release/statement-from-us-secretary-of-education-miguel-cardona-on-the-8th-circuit-court-of-appeals-ruling-on-biden-harris-administrations-saving-a-valuable-education-save-plan

47 Haughwout et al. 2024. "Delinquency Is Increasingly in the Cards for Maxed-Out Borrowers." Federal Reserve Bank of New York, *Liberty Street Economics*, May. Available at https://libertystreeteconomics.newyorkfed.org/2024/05/delinquency-is-increasingly-in-the-cards-for-maxed-out-borrowers/

48 Federal Reserve Bank of New York. 2024. "Quarterly Report on Household Debt and Credit 2024: Q2." August. Available at https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/HHDC_2024Q2

49 For example, Zillow's national Observed Rent Index has increased 34.6 percent since the end of 2019, significantly exceeding the approximate 21 percent increase in consumer prices. See Zillow. 2024. "Housing Data." Available at https://www.zillow.com/research/data/

50 Lincoln International. 2024. Q2 2024 Lincoln Senior Debt Index. Available at https://www.lincolninternational.com/publications/research-indices/q2-2024-lincoln-senior-debt-index/

51 Data on PIK income as a share of BDC income are from Cliffwater. "Cliffwater," "Cliffwater Direct Lending Index," and "CDLI" are trademarks of Cliffwater LLC. The Cliffwater Direct Lending Indexes (the "Indexes") and all information on the performance or characteristics thereof ("Index Data") are owned exclusively by Cliffwater LLC, and are referenced herein under license. Neither Cliffwater nor any of its affiliates sponsor or endorse, or are affiliated with or otherwise connected to the Council or any of its activities. All Index Data is provided for informational purposes only, on an "as available" basis, without any warranty of any kind, whether express or implied. Cliffwater and its affiliates do not accept any liability whatsoever for any errors or omissions in the Indexes or Index Data, or arising from any use of the Indexes or Index Data, and no third party may rely on any Indexes or Index Data referenced in this report. No further distribution of Index Data is permitted without the express written consent of Cliffwater. Any reference to or use of the Index or Index Data is subject to the further notices and disclaimers set forth from time to time on Cliffwater's website at https://www.cliffwaterdirectlendingindex.com/disclosures

52 There are three types of BDCs: (1) public funds that trade on an exchange, (2) private funds that are not-traded, offered to accredited investors, may offer periodic liquidity to investors, and generally will have a liquidation event, and (3) perpetual not-traded funds that raise capital from institutional and individual investors on a continuous basis and generally do not have a planned liquidity event but offer periodic liquidity to investors.

53 Although the market turmoil during the COVID-19 pandemic created uncertainty and stress in the BDC industry, perpetual BDCs were not such a significant share of the BDC market as they are now.

54 Financial Stability Board. 2024. "Enhancing the Functioning and Resilience of Commercial Paper and Negotiable Certificates of Deposit Markets." May. Available at https://www.fsb.org/uploads/P220524.pdf

55 Federal Reserve Bank of New York. 2022. "Repo and Reverse Repo Agreements." Available at https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/repo-reverse-repo-agreements For additional discussion of the Federal Reserve's standing repo and ON RRP facilities in current monetary policy implementation, see Ennis, Huberto, and Jeff Huther. 2021. "The Fed's Evolving Involvement in the Repo Markets." Economic Brief No. 21-31. Richmond, VA: Federal Reserve Bank of Richmond. September. Available at https://fraser.stlouisfed.org/title/economic-brief-6034/fed-s-evolving-involvement-repo-markets-607767

56 Baklanova, Viktoria, Isaac Kuznits, and Trevor Tatum. 2021. "Primer: Money Market Funds and the Repo Market." SEC. February. Available at https://www.sec.gov/files/mmfs-and-the-repo-market-021721.pdf

57 In July 2021, the Federal Reserve established two facilities, a Standing Repo Facility and a Foreign International Monetary Authority Repo Facility, to serve as backstops to support the smooth functioning of repo markets.

58 Board of Governors of the Federal Reserve System. 2023. Financial Accounts of the United States – Z.1. As of Q2 2023. June 8. Available at https://www.federalreserve.gov/releases/z1/20230608/z1.pdf

59 Hempel, Samuel J., R. Jay Kahn, Robert Mann, and Mark E. Paddrik. 2022. "OFR Pilot Provides Unique Window into the Non-centrally Cleared Bilateral Repo Market." Office of Financial Research. December. Available at https://www.financialresearch.gov/the-ofr-blog/2022/12/05/fr-sheds-light-on-dark-corner-of-the-repo-market/; Hempel, Samuel J., R. Jay Kahn, Robert Mann, and Mark E. Paddrik. 2023. "Why is So Much Repo Not Centrally Cleared?" OFR Brief no. 23-01. Office of Financial Research. May. Available at https://www.financialresearch.gov/briefs/2023/05/12/why-is-so-much-repo-not-centrally-cleared/; and Banegas, Ayelen, and Phillip Monin. 2023. "Hedge Fund Treasury Exposures, Repo, and Margining." Board of Governors of the Federal Reserve System, FEDS Notes, September 8. Available at https://www.federalreserve.gov/econres/notes/feds-notes/hedge-fund-treasury-exposures-repo-and-margining-accessible-20230908.htm

60 SEC. 2024. Federal Register. January 16. Available at https://www.federalregister.gov/documents/2024/01/16/2023-27860/standards-for-covered-clearing-agencies-for-us-treasury-securities-and-application-of-the

61 Some tax-exempt MMFs can also be exempt from state income taxes in certain circumstances.

62 Hiltgen, Daniel. 2024. "Charting the Course: A Systematic Exploration of Influences Shaping Money Market Fund Growth." U.S. Securities and Exchange Commission. DERA Working Paper. June 13. Available at https://www.sec.gov/files/dera_wp_will-mmfs-continue-grow.pdf

63 In 2007–08, MMF losses were often absorbed by fund sponsors who provided voluntary financial support for MMFs they managed. SEC staff have previously estimated that between August 2007 and December 31, 2008, almost 20 percent of all MMFs received some support (or staff no-action assurances concerning support) from their money managers or their affiliates. This implicit recourse to sponsors provides a channel through which stress at a MMF can be transmitted to the fund sponsor or parent company. See Cipriani, Marco, Michael Holscher, Antoine Martin, and Patrick E. McCabe. 2013. "Twenty-Eight Money Market Funds That Could Have Broken the Buck: New Data on Losses during the 2008 Crisis." Liberty Street Economics. October 9. Available at https://libertystreeteconomics.newyorkfed.org/2013/10/twenty-eight-money-market-funds-that-could-have-broken-the-buck-new-data-on-losses-during-the-2008-c/; Chairman Mary L. Schapiro. 2012. Testimony on Perspective on Money Market Reform. June 21. Available at https://www.banking.senate.gov/imo/media/doc/SchapiroTestimony62112.pdf

64 Prime institutional MMF AUM have declined by 44 percent since year-end 2023 in advance of the MMF reform implementation date; as of August 31, 2024, prime institutional MMF AUM totaled $350 billion.

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

66 CoinMarketCap. 2024. Live Cryptocurrency Charts & Market Data. As of November 1, 2024. Available at https://coinmarketcap.com/charts/

67 S&P Global. 2024. S&P DOW Jones Indices. As of August 30, 2024. Available at https://www.spglobal.com/spdji/en/indices/equity/sp-500/#overview

68 For more discussion on payment risks related to stablecoins, see President's Working Group on Financial Markets. 2021. Report on Stablecoins. Washington, D.C.: PWG. Available at https://home.treasury.gov/system/files/136/StableCoinReport_Nov1_508.pdf Hereafter, this report will be referred to as the 2021 PWG Report. For more discussion on stablecoins and illicit finance, see Department of the Treasury. 2023. Illicit Finance Risk Assessment of Decentralized Finance. Washington, D.C.: Department of the Treasury. Available at https://home.treasury.gov/system/files/136/DeFi-Risk-Full-Review.pdf

69 Note that stablecoin issuers can suspend redemptions at their discretion.

70 CoinMarketCap. 2024. Top Stablecoin Tokens by Market Capitalization. As of November 1, 2024. Available at https://coinmarketcap.com/view/stablecoin/

71 Morin, Andrew, Tyler Moore, and Eric Olson. 2023. "Testing the Market Efficiency of Tether in the Presence of Exchange Breaches as Survivability Shocks." Available at https://doi.org/10.2139/ssrn.4360093 (Noting Tether is used for derivatives settlement); Chen, Meichen, Cong Qin, and Xiaoyu Zhang. 2022. "Cryptocurrency Price Discrepancies under Uncertainty: Evidence from COVID-19 and Lockdown Nexus." Available at https://www.sciencedirect.com/science/article/pii/S0261560622000365; Morin, Andrew, Tyler Moore, and Eric Olson. 2022. "Breaking the Stablecoin Buck: Measuring the Impact of Security Breach and Liquidation Shocks." Available at https://doi.org/10.2139/ssrn.4109307 ("The large number of trade pairs involving Tether, and its nearly universal adoption among exchanges keeps [its] market demand high and, in turn, its peg close to 1 USD.")

72 State reporting regimes are not uniform. As a result, a stablecoin issuer may not be required to provide an attestation or any other evidence of its holdings.

73 As of November 1, 2024, the five largest stablecoins by total market value are USDT, USDC, DAI (which recently rebranded to USDS), Ethena USDE, and First Digital USD. CoinMarketCap. 2024. Top Stablecoin Tokens by Market Capitalization. As of November 1, 2024. Available at https://coinmarketcap.com/view/stablecoin/

74 Tether is licensed outside the United States.

75 Munter, Paul. 2023. "The Potential Pitfalls of Purported Crypto 'Assurance' Work." July 27. Available at https://www.sec.gov/newsroom/speeches-statements/munter-statement-crypto-072723

76 Typically, auditors attest to the value of the liabilities and assets on a specific day and at a "specific minute" on that day. The auditor provides no assurance for values before or after that minute on that day. See also SEC. 2023. "Exercise Caution with Crypto Asset Securities: Investor Alert." March 23. Available at https://www.sec.gov/resources-for-investors/investor-alerts-bulletins/exercise-caution-crypto-asset-securities-investor-alert (Explaining that such attestations do not typically comply with auditing standards and may not give any meaningful assurances.)

77 Similarly, the Council has noted the risks that could come from stablecoin issuers conducting fire sales of assets held by other financial institutions that may be subject to runs, such as money market funds.

78 Moore Cayman. 2021. Independent Accountant's Report. June 30. Available at https://assets.ctfassets.net/vyse88cgwfbl/VcNv0hgvQ2a3Ochjs5TqR/59e77f0c076544a88f977d1d36b76dbf/tether_assuranceconsolidated_reserves_report_2021-06-30.pdf

79 Other crypto-asset related entities also hold considerable stores of U.S. Treasuries, which may add to a possible contagion event. See Godbole, Omkar, and Amitoj Singh. 2024. "Stablecoin Issuers Now 18th Largest Holder of U.S. Debt." CoinDesk, June 20. Available at https://finance.yahoo.com/news/stablecoin-issuers-now-18th-largest-114644572.html

80 Financial Stability Oversight Council. 2022. "Report on Digital Asset Financial Stability Risks and Regulation." Available at https://home.treasury.gov/system/files/261/FSOC-Digital-Assets-Report-2022.pdf

81 As noted in the PWG Report, depending upon the facts and circumstances, existing regulatory requirements such as those under the federal securities laws may already apply to certain stablecoin arrangements.

82 Financial Stability Oversight Council. 2022. Report on Digital Asset Financial Stability Risks and Regulation, pp. 114–115. Available at https://home.treasury.gov/system/files/261/FSOC-Digital-Assets-Report-2022.pdf

83 ETPs are pooled investment vehicles that gather and invest money from a number of investors. ETFs, the largest category of ETPs, invest in securities while non-ETF ETPs invest primarily in physical commodities or derivatives.

84 Blockworks. 2024. Bitcoin ETF Tracker. As of September 6, 2024. Available at https://blockworks.co/bitcoin-etf

85 Gandal, Neil, JT Hamrick, Tyler Moore, and Tali Oberman. 2018. "Price Manipulation in the Bitcoin Ecosystem." *Journal of Monetary Economics*, vol. 95. Available at https://doi.org/10.1016/j.jmoneco.2017.12.004; Gandal, Neil, JT Hamrick, Tyler Moore, and Tali

Oberman. 2022. "Price Manipulation in the Bitcoin Ecosystem." *Journal of Financial Innovation*, vol. 95. Available at https://doi.org/10.1186/s40854-022-00364-3

86 Armstrong, Ken, Asani Sarkar, and Leslie Conner Warren. 2024. "Do Exchange-Traded Products Improve Bitcoin Trading?" Federal Reserve Bank of New York, *Liberty Street Economics,* May. Available at https://libertystreeteconomics.newyorkfed.org/2024/05/do-exchange-traded-products-improve-bitcoin-trading/

87 FSOC. 2022. *Report on Digital Asset Financial Stability Risks and Regulation.* Available at https://home.treasury.gov/system/files/261/FSOC-Digital-Assets-Report-2022.pdf

88 RWA.xyz. 2024. "Tokenized Real-World Assets." Accessed September 25. Available at https://www.rwa.xyz

89 A product or an instrument may be a security subject to the existing federal securities laws, a commodity or derivative subject to the Commodity Exchange Act (CEA), or another type of asset subject to existing federal and state laws.

90 Such risks include attacks on the blockchains on which the funds are based. See, for example, Aggarwal, Shubhani, and Neeraj Kumar. 2021. "Chapter Twenty - Attacks on Blockchain." *Advances in Computers*, vol. 121. Available at https://www.sciencedirect.com/science/article/abs/pii/S0065245820300759

91 For example, at the time of Silicon Valley Bank's (SVB) failure, the bank was holding more than $3 billion on behalf of Circle, issuer of the USDC stablecoin. These funds were uninsured and represented a sizeable share of the cash reserves backing USDC. When SVB's failure created uncertainty about USDC's ability to access its cash reserves, USDC temporarily lost its dollar peg on the open market.

92 Federal Bureau of Investigation. 2024. *Cryptocurrency Fraud Report 2023.* Sept. 9. Available at https://www.ic3.gov/AnnualReport/Reports/2023_IC3CryptocurrencyReport.pdf

93 U.S. Department of Treasury. 2024. *National Terrorist Financing Risk Assessment.* Available at https://home.treasury.gov/system/files/136/2024-National-Terrorist-Financing-Risk-Assessment.pdf

94 See, for example, Federal Reserve Bank of Boston. 2024. "Conference on the Financial Stability Implications of Stablecoins." Available at https://www.bostonfed.org/news-and-events/events/2024/0405.aspx; Federal Reserve Bank of Philadelphia. 2024. "Eighth Annual Fintech Conference." Available at https://www.philadelphiafed.org/calendar-of-events/eighth-annual-fintech-conference

95 Board of Governors of the Federal Reserve System. 2024. "Primary and Secondary Markets for Stablecoins." February 23. Available at https://www.federalreserve.gov/econres/notes/feds-notes/primary-and-secondary-markets-for-stablecoins-20240223.html; Board of Governors of the Federal Reserve System. 2024. "Governance of Permissionless Blockchain Networks." February 9. Available at https://www.federalreserve.gov/econres/notes/feds-notes/governance-of-permissionless-blockchain-networks-20240209.html

96 Commodity Futures Trading Commission. 2024. "First Interagency Fraud Disruption Conference Focuses on Combatting Crypto Schemes Commonly Known as 'Pig Butchering.'" July 11. Available at https://www.cftc.gov/PressRoom/PressReleases/8932-24

97 Written Agreement by and among Customers Bancorp, Inc., Customers Bank, and Federal Reserve Bank of Philadelphia. Available at https://www.federalreserve.gov/newsevents/pressreleases/files/enf20240808a1.pdf

98 In February 2024, the North American Securities Administrators Association announced that a taskforce of state securities regulators reached a settlement with a firm that allegedly failed to comply with state registration requirements in offering a crypto interest-earning program to U.S. retail and institutional investors. In March 2024, the CFTC took action against defendants that collectively operate a centralized digital asset exchange under the name KuCoin, who allegedly committed multiple violations of the Commodity Exchange Act and CFTC regulations, including soliciting and engaging in illegal off-exchange digital asset commodity transactions, failing to register as a futures commission merchant, failing to register as a swap execution facility or designated contract market, and failing to implement an effective customer identification program. In addition, in May 2024, the CFTC took its first action against an unregistered futures commission merchant that inappropriately facilitated access to digital asset exchanges. A list of crypto-asset related enforcement actions taken by the SEC is available at https://www.sec.gov/securities-topics/crypto-assets

99 New York State Department of Financial Services (DFS). 2024. "NYSDFS Enforcement Action - February 28, 2024: Consent Order to Gemini Trust Company, LLC." Available at https://www.dfs.ny.gov/industry_guidance/enforcement_discipline/ea20240228_co_gemini; and CFTC. 2024. Press Release 8938-24. Available at https://www.cftc.gov/PressRoom/PressReleases/8938-24 (In the largest recovery for victims and sanctions in the agency's history, the CFTC obtained a judgment against FTX and Alameda Research requiring them to pay $8.7 billion in restitution and $4 billion in disgorgement to further compensate victims for their losses.)

100 Financial Stability Oversight Council. 2021. *Report on Climate-Related Financial Risk.* Available at https://home.treasury.gov/system/files/261/FSOC-Climate-Report.pdf

101 de Bandt, Olivier, Laura-Chloé Kuntz, Nora Pankratz, et al. 2023. "The Effects of Climate-Related Risks on Banks: A Literature Review." *Basel Committee on Banking Supervision (BIS)*. Available at https://www.bis.org/bcbs/publ/wp40.pdf; Berger, Allen, Filippo Curti, Nika Lazaryan, Atanas Mihov, and Raluca Roman. 2023. "Climate Risks in the U.S. Banking Sector: Evidence from Operational Losses and Extreme Storms." Federal Reserve Bank of Philadelphia. Available at https://doi.org/10.21799/frbp.wp.2023.31

102 Ranger, Nicola, Olivier Mahul, and Irene Monasterolo. 2022. "Assessing Financial Risks from Physical Climate Shocks: A Framework for Scenario Generation." *World Bank Group*. Available at https://documents1.worldbank.org/curated/en/760481644944260441/pdf/Assessing-Financial-Risks-from-Physical-Climate-Shocks-A-Framework-for-Scenario-Generation.pdf

103 Naseri, Kasra, and Michelle A. Hummel. 2022. "A Bayesian Copula-Based Nonstationary Framework for Compound Flood Assessment Along US Coastlines." *Journal of Hydrology*, vol. 610. Available at https://doi.org/10.1016/j.jhydrol.2022.128005

104 Financial Stability Oversight Council. 2023. *Climate-Related Financial Risk: 2023 Staff Progress Report.* Available at https://home.treasury.gov/system/files/261/FSOC-2023-Staff-Report-on-Climate.pdf

105 Financial Stability Oversight Council. 2021. *Report on Climate-Related Financial Risk.* Available at https://home.treasury.gov/system/files/261/FSOC-Climate-Report.pdf; Financial Stability Oversight Council. 2022. "2022 Annual Report." Available at https://home.treasury.gov/system/files/261/FSOC2022AnnualReport.pdf; Financial Stability Oversight Council. 2023. "2023 Annual Report." Available at https://home.treasury.gov/system/files/261/FSOC2023AnnualReport.pdf

106 Verisk. 2022. "Global Modeled Catastrophe Losses." Available at https://www.air-worldwide.com/siteassets/Publications/White-Papers/documents/2022_Global_Modeled_Catastrophe_Losses.pdf

107 Schreiner, Bruce. 2024. "Death Toll from Hurricane Helene Rises to 227." *AP News*. Available at https://apnews.com/article/hurricane-helene-death-toll-asheville-north-carolina-34d1226bb31f79dfb2ff6827e40587fc Sundby, Alex, Faris Tanyos, Emily Mae Czachor, Cara Tabachinick, and Jordan Freiman. 2024. "Hurricane Milton Leaves Path of Destruction Across Florida, at Least 24 Dead." CBS News. Available at https://www.cbsnews.com/live-updates/hurricane-milton-2024/

108 Core Logic. 2024. "Core Logic: Final Estimated Damages from Hurricane Helene to be Between $30.5 billion and $47.5 Billion." Available at https://www.corelogic.com/press-releases/corelogic-final-estimated-damages-for-hurricane-helene-to-be-between-30-5-billion-and-47-5-billion/

109 Fitch Ratings. 2024. "Hurricane Milton Effect on Global (Re)Insurance Ratings Likely Limited." Available at https://www.fitchratings.com/research/insurance/hurricane-milton-effect-on-global-re-insurance-ratings-likely-limited-10-10-2024

110 Brunetti, Celso, Benjamin Dennis, Dylan Gates, et al. 2021. "Climate Change and Financial Stability." Board of Governors of the Federal Reserve System. Available at https://doi.org/10.17016/2380-7172.2893; Canalas-Cerdá, José J., and Raluca A. Roman. 2021. "Climate Change and Consumer Finance: A Very Brief Literature Review." *Federal Reserve Bank of Philadelphia.* Available at https://doi.org/10.21799/frbp.dp.2021.04; and Addoum, Jawad M., Piet Eichholtz, Eva Steiner, and Erkan Yönder. 2021. "Climate Change and Commercial Real Estate: Evidence from Hurricane Sandy." Available at http://dx.doi.org/10.2139/ssrn.3206257

111 See Gourevitch, Jesse D., Carolyn Kousky, Yanjun "Penny" Liao, et al. 2023. "Unpriced Climate Risk and the Potential Consequences of Overvaluation in U.S. Housing Markets." *Nature Climate Change,* vol. 13, pp. 250–257. Available at https://doi.org/10.1038/s41558-023-01594-8

112 Wylie, David, Natee Amornsiripanitch, John Helibron, and Kevin Zhao. 2023. "Who Bears Climate-Related Physical Risk?" Available at https://dx.doi.org/10.2139/ssrn.4641914

113 For further information, see Avtar, Ruchi, Kristian S. Blickle, Rajashri Chakrabarti, Janavi Janakiraman, and Maxim L. Pinkovskiy. 2021. "Understanding the Linkages between Climate Change and Inequality in the United States." *Federal Reserve Bank of New York Staff Reports*, no. 991. Available at https://www.newyorkfed.org/research/staff_reports/sr991.html

114 Katz, Lily, and Elijah de la Campa. 2024. "Thousands More People are Moving in Than Out of Fire- and Flood-Prone America, Fueled by Migration to Texas and Florida." Redfin. August 5. Available at https://www.redfin.com/news/climate-migration-real-estate-2024/

115 Fairweather, Daryl, Matthew E. Kahn, Robert D. Metcalfe, and Sebastian Sandoval-Olascoaga. 2023. "PRELIMINARY: The Impact of Climate Risk Disclosure on Housing Search and Buying Dynamics: Evidence from a Nationwide Field Experiment with Redfin." Available at https://conference.nber.org/conf_papers/f184841.pdf

116 Shu, Evelyn G., Jeremy R. Porter, Mathew E. Hauer, et al. 2023. "Integrating Climate Change Induced Flood Risk into Future Population Projections." *Nature Communications*, vol. 14, no. 7870. Available at https://doi.org/10.1038/s41467-023-43493-8

117 Dennis, Benjamin N. 2023. "Household, Bank, and Insurer Exposure to Miami Hurricanes: A Flow-of-Risk Analysis." Board of Governors of the Federal Reserve System. Available at https://doi.org/10.17016/FEDS.2023.013

118 Flavelle, Chrisopher, and Mira Rojanasakul. 2024. "As Insurers Around the U.S. Bleed Cash from Climate Shocks, Homeowners Lose." *The New York Times*, May 13. Available at https://www.nytimes.com/interactive/2024/05/13/climate/insurance-homes-climate-change-weather.html There is evidence that climate risk is not the only driver of insurance premium increases, and other factors, including state-level insurance price regulation and inflation have affected insurance premium rates.

119 Oh, Sangmin S., Ishita Sen, and Ana-Maria Tenekedjieva. 2022. "Pricing of Climate Risk Insurance: Regulation and Cross-Subsidies." Board of Governors of the Federal Reserve System. Available at https://doi.org/10.17016/FEDS.2022.064; and Insurance Information Institute (III). 2024. "Trends and Insights: Homeowners Insurance Rates." Available at https://www.iii.org/sites/default/files/docs/pdf/triple-i_trends_and_insights_homeowners_insurance_rates_07092024.pdf

120 Woleben, Jason. 2024. "US Homeowners Insurance Rates Jump by Double Digits in 2023." *S&P Global*, January 25. Available at https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/us-homeowners-insurance-rates-jump-by-double-digits-in-2023-80057804

121 Keys, Benjamin J., and Philip Mulder. 2024. "Property Insurance and Disaster Risk: New Evidence from Mortgage Escrow Data." National Bureau of Economic Research, no. 32579. Available at https://www.nber.org/papers/w32579

122 For example, the majority of the flood insurance in the United States is provided by the NFIP. However, the increased incidence and cost of flooding is putting increasing pressure on the NFIP to meet its obligations. While the NFIP was largely solvent until the early 2000s, its financial condition has deteriorated since that time. Changes to NFIP's risk-rating methodology in 2021 to improve its financial position

have resulted in higher premiums for policyholders, with 66 percent of policyholders expected to see their premiums increase and 9.4 percent projected to see an increase of 300 percent or more. Louisiana and nine other states are suing to block these increases. See GAO. 2023. "Flood Insurance: FEMA's New Rate-Setting Methodology Improves Actuarial Soundness but Highlights Need for Broader Program Reform." Available at https://www.gao.gov/products/gao-23-105977; and McGill, Kevin. 2023. "Louisiana, 9 Other States Ask Federal Judge to Block Changes in National Flood Insurance Program." *The Associated Press*, September 14. Available at https://apnews.com/article/louisiana-flood-insurance-lawsuit-4bb2307431db2ea4781959c99f5a0e61

123 Residual markets are established by states as "insurers of last resort" funded through a combination of premiums, assessments, reinsurance, and government support to ensure accessible insurance for all. For more information on residual markets, see Watkins, Nancy, Robert Lee, and Rehan Siddique. 2023. "A Survey of Residual Market Plan Assessment and Recoupment Mechanisms." *Milliman*. Available at https://www.milliman.com/-/media/milliman/pdfs/2023-articles/12-5-23-milliman-residual-market-survey-for-pifc.ashx

124 Insurance Information Institute (III). 2023. "Homeowners Perceptions of Weather Risks: 2023Q2 Consumer Survey." Available at https://www.iii.org/sites/default/files/docs/pdf/2023_q2_ho_perception_of_weather_risks.pdf; also see Cooley, Patrick. 2024. "Home Insurance Was Once a 'Must.' Now More Homeowners Are Going Without." *The Washington Post*, May 27. Available at https://www.washingtonpost.com/business/2024/05/27/home-insurance-dropped-coverage; and Dagher, Veronica. 2023. "Americans Are Bailing on Their Home Insurance." *The Wall Street Journal,* August 28. Available at https://www.wsj.com/personal-finance/americans-are-bailing-on-their-home-insurance-e3395515

125 Insurance Journal. 2024. "AM Best: Migration to Cat-Prone States Fuels Record HO Underwriting Losses in 2023." July 29. Available at https://www.insurancejournal.com/news/national/2024/07/29/785965.htm

126 Holzheu, Thomas, and James Finucane. 2024. "US Property & Casualty Outlook: Dog Days Are Over." *Swiss Re Institute*, June 25. Available at https://www.swissre.com/institute/research/sigma-research/Insurance-Monitoring/us-property-casualty-outlook-june-2024.html#:~:text=Chapter%20Navigation&text=The%20US%20P%26C%20insurance%20industry,a%20combined%20ratio%20of%2094%25 Also in the first half of 2024, property catastrophe reinsurers kept rates relatively flat in the United States after reaching a high in January, but are still 107 percent higher than the most recent low in 2017. See Carpenter, Guy. 2024. "U.S. Property Catastrophe Rate-On-Line Index." *Artemis.bm*. Available at https://www.artemis.bm/us-property-cat-rate-on-line-index/

127 Mohammed, Omar. 2024. "Map Shows 9 States Where Homeowners Are Losing Their Insurance." *Newsweek*, March 1. Available at https://www.newsweek.com/map-shows-9-states-where-homeowners-are-losing-their-insurance-1875252; and Lopez, Nadia. 2024. "California Sees Two More Property Insurers Exit Market." PropertyCasualty360, April 23. Available at https://www.propertycasualty360.com/2024/04/23/california-sees-two-more-property-insurers-exit-market/?slreturn=20240925194501

128 Todoroff, Natalie. 2024. "Home Insurance 'Crisis': First Florida, Now California — Is My State Next?." *Bankrate*, September 16. Available at https://www.bankrate.com/insurance/homeowners-insurance/insurance-crisis/

129 Sastry, Parinitha, Ishita Sen, and Ana-Maria Tenekedjieva. 2023. "When Insurers Exit: Climate Losses, Fragile Insurers, and Mortgage Markets." *Harvard Business School Working Paper*, no. 24-051. Available at http://dx.doi.org/10.2139/ssrn.4674279

130 FIO. 2023. "Insurance Supervision and Regulation of Climate-Related Risks." Available at https://home.treasury.gov/system/files/136/FIO-June-2023-Insurance-Supervision-and-Regulation-of-Climate-Related-Risks.pdf; Insurance Information Institute. 2023. "Archived Table: Insurance Provided by Fair Plans by State, Fiscal Year 2023." Available at https://www.iii.org/table-archive/20793

131 Property Insurance Plans Service Office. 2024. *FAIR and Beach Plan Underwriting Results and Market Penetration Report.*

132 Watkins, Nancy, Robert Lee, and Rehan Siddique. 2023. "A Survey of Residual Market Plan Assessment and Recoupment Mechanisms." *Milliman*. Available at https://www.milliman.com/-/media/milliman/pdfs/2023-articles/12-5-23-milliman-residual-market-survey-for-pifc.ashx

133 Residual markets are not always unprofitable. For example, the residual markets in Florida and Louisiana were both profitable in 2023. Florida's Citizens had a combined ratio of 59.5 percent in 2023. See Florida Office of Insurance Regulation (OIR). 2024. "OIR Issues Update on Florida's Property Insurance Market." Available at https://www.floir.com/newsroom/archives/item-details/2024/04/03/oir-issues-update-on-florida's-property-insurance-market Louisiana's Citizens had a combined ratio of 61.8. See Louisiana Citizens Property Insurance Corporation (LCPIC). 2023. "Annual Statement for the Year 2023 of the Louisiana Citizens Property Insurance Corporation." pp. 350–350.6. Available at https://www.lacitizens.com/docs/default-source/financial-reports-and-statements/2023-management-discussion-analysis.pdf?sfvrsn=a852ec03_1

134 First Street. 2024. "Review of Hurricane Debby: First Street Re-creation Finds Majority of Damaged Homes Outside of FEMA Flood Zones." Available at https://assets.riskfactor.com/media/First%20Street%20Hurricane%20Debby%202024%20(2)-1.pdf

135 A nonrecourse mortgage means that if a borrower defaults on the mortgage, the lender can only foreclose on the property used as collateral for the mortgage and cannot pursue anything additional to cover the outstanding balance.

136 Fliegelman, Arthur. 2023. "Wind, Fire, Water, Hail: What Is Going on In the Property Insurance Market and Why Does It Matter?" Office of Financial Research (OFR), December 14. Available at https://www.financialresearch.gov/the-ofr-blog/2023/12/14/property-insurance-market

137 For information on the federal disaster relief, see Webster, Elizabeth, and Bruce R. Lindsay. 2023. "CRS Report R41981: Congressional Primer on Responding to and Recovering from Major Disasters and Emergencies." *Congressional Research Service*. Available at https://sgp.fas.org/crs/homesec/R41981.pdf; and U.S. Government Accountability Office (GAO). 2016. "Federal Disaster Assistance: Federal Departments and Agencies Obligated at Least $277.6 Billion During Fiscal Years 2005 Through 2014." GAO-16-797. Available at https://www.gao.gov/products/GAO-16-797

138 The Enhancement and Standardization of Climate-Related Disclosures for Investors, Release No. 33-11275 (Mar. 6, 2024) [89 FR 21668 (Mar. 28, 2024)]. On April 4, 2024, the SEC issued an order staying the effectiveness of the final rule pending ongoing litigation. In the Matter of the Enhancement and Standardization of Climate-Related Disclosures for Investors (Order Issuing Stay), Release No. 33-11280 (Apr. 4, 2024) [89 FR 25804 (Apr. 12, 2024)].

139 In this section, we consider BHCs in categories I to III from the Federal Reserve's final tailoring rule. See https://www.federalreserve.gov/aboutthefed/boardmeetings/files/tailoring-rule-visual-20191010.pdf

140 In the SLOOS, large banks include all domestic banks with more than $100 billion in assets.

141 In this section, we consider regional banks—defined as banks with assets between $10 billion and $100 billion—and BHCs in category IV from the Federal Reserve's tailoring rule. See Board of Governors of the Federal Reserve System. 2019. "Requirements for Domestic and Foreign Banking Organizations." Available at https://www.federalreserve.gov/aboutthefed/boardmeetings/files/tailoring-rule-visual-20191010.pdf

142 The calculation of pre-pandemic averages is based on the period from 2015:Q1 to 2019:Q4.

143 The final guidance addresses the specific characteristics of, and risks posed by, this group of banks. The final guidance is organized around key areas of potential vulnerability, such as capital, liquidity, and operational capabilities that could be needed in resolution. Distinct from the G-SIB guidance, this final guidance provides agency expectations for both single point of entry and multiple point of entry resolution strategies, which are different strategies banks have adopted for their rapid and orderly resolution. The final guidance also recognizes that the preferred resolution outcome for foreign banking organizations is often a successful home country-led resolution and guides such firms on how to address the global resolution plan in their U.S. plan.

144 FHFA. 2023. *FHLBank System at 100: Focusing on the Future.* Available at https://www.fhfa.gov/programs/fhlbank-system-100

145 FHFA. 2024. "FHFA Issues Advisory Bulletin to the Federal Home Loan Banks to Ensure a Sound Credit Risk Management Framework and Member Ability to Access Liquidity." September 27. Available at https://www.fhfa.gov/news/news-release/fhfa-issues-ab-to-the-fhlb-to-ensure-a-sound-credit-risk-management-framework-and-member-ability-to-access-liquidity

146 FHFA. 2024. "FHFA Proposes Rule to Expand Access to Liquidity for the Federal Home Loan Banks." September 30. Available at https://www.fhfa.gov/news/news-release/fhfa-proposes-rule-to-expand-access-to-liquidity-for-the-federal-home-loan-banks

147 The statistics cited in this section are limited to qualifying hedge funds reporting on Form PF unless otherwise stated.

148 Ranked by gross assets.

149 Financial Stability Oversight Council. 2022. "Statement on Nonbank Financial Intermediation." February 4. Available at https://home.treasury.gov/news/press-releases/jy0587#

150 Source for mutual fund and ETF statistics in this section is: SEC. 2024. "Registered Fund Statistics: From N-PORT Data, Period Ending March 2024." Division of Investment Management, Analytics Office. August 6. Available at https://www.sec.gov/files/investment/im-registered-fund-statistics-20240806.pdf

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

152 One review of audited Form 5500 filings of private sector defined contribution plans found that, in 2021, approximately 41 percent of 401(k) assets were invested in CIFs, while 38 percent were invested in mutual funds. See BrightScope/Investment Company Institute. 2021. "The BrightScope/ICI Defined Contribution Plan Profile: A Close Look at 401(k) Plans, 2021" August. Available at https://www.ici.org/system/files/2024-08/24-ppr-dcplan-profile-401k.pdf

153 FICC consists of two divisions, the Government Securities Division (GSD) and the Mortgage-backed Securities Division (MBSD). GSD provides CCP services for its customers for the U.S. government securities market, and MBSD provides CCP services to the U.S. mortgage-backed securities market. NSCC serves as a CCP for virtually all broker-to-broker trades involving equities, corporate and municipal debt, American depositary receipts, exchange-traded products, and unit investment trusts.

154 U.S. authorities participate in a wide variety of international groups that cooperate to promote financial stability, robust supervision, and investor protection. Often, these groups develop non-binding international standards for minimum best practices that help promote a level playing field among cross-border financial market participants while safeguarding financial stability. These international standards are not self-executing and are not enforceable unless adopted by U.S. regulators using appropriate domestic rule making processes. Like the outcome of any negotiated process, not all contributions are reflected in the international standard.

155 SEC. 2024. "SEC Adopts Rule Amendments and New Rule to Improve Risk Management and Resilience of Covered Clearing Agencies." Available at https://www.sec.gov/newsroom/press-releases/2024-176

156 "All purchase and sale transactions entered into by a member of the clearing agency that is an interdealer broker; and all purchase and sale transactions entered into between a clearing agency member and either a registered broker dealer, a government securities broker, a government securities dealer." See SEC. 2023. "SEC Adopts Rules to Improve Risk Management in Clearance and Settlement and Facilitate Additional Central Clearing for the U.S. Treasury Market." Available at https://www.sec.gov/newsroom/press-releases/2023-247

157 "All repurchase and reverse repurchase agreements collateralized by U.S. Treasury securities entered into by a member of the covered clearing agency, unless the counterparty is a state or local government or another clearing organization or the repurchase agreement is

an inter-affiliate transaction." See SEC. 2023. "SEC Adopts Rules to Improve Risk Management in Clearance and Settlement and Facilitate Additional Central Clearing for the U.S. Treasury Market." Available at https://www.sec.gov/newsroom/press-releases/2023-247

158 FICC also clears mortgage-backed securities in the same CCP where it clears Treasury Securities.

159 DTCC. 2024. "Fixed Income Clearing Corporation and National Securities Clearing Corporation Public Quantitative Disclosures for Central Counterparties." August 29. Available at https://www.dtcc.com/-/media/Files/Downloads/legal/policy-and-compliance/CPMI-IOSCO-Public-Quantitative-Disclosures-Q2-2024.pdf

160 Cybersecurity and Infrastructure Security Agency. 2015. "Financial Services Sector-Specific Plan - 2015." Available at https://www.cisa.gov/sites/default/files/publications/nipp-ssp-financial-services-2015-508.pdf

161 Bank for International Settlements, International Organization of Securities Commissions. 2012. "Principles for Financial Market Infrastructures." Available at https://www.bis.org/cpmi/publ/d101a.pdf

162 These are sector-wide tabletops addressing scenarios such as critical third-party outages and cross sector outages. Participants in these exercises include members of FSSCC (private sector) and FBIIC (public sector). FSSCC = "Financial Services Sector Coordinating Council" and FBIIC = "Financial and Banking Information Infrastructure Committee"

163 International Organization of Securities Commissions. 2022. "A Discussion Paper on Central Counterparty Practices to Address Nondefault Losses." *Bank for International Settlements.* Available at https://www.bis.org/cpmi/publ/d208.pdf

164 The SEC adopted rule amendments and a new rule to improve the resilience and recovery and wind-down planning of covered clearing agencies in October 2024. See SEC. 2023. "SEC Adopts Rules to Improve Risk Management in Clearance and Settlement and Facilitate Additional Central Clearing for the U.S. Treasury Market." Available at https://www.sec.gov/newsroom/press-releases/2023-247

165 This includes "all purchase and sale transactions entered into by a member of the clearing agency that is an interdealer broker; and all purchase and sale transactions entered into between a clearing agency member and either a registered broker dealer, a government securities broker, or a government securities dealer", ibid.

166 This includes "all repurchase and reverse repurchase agreements collateralized by U.S. Treasury securities entered into by a member of the covered clearing agency, unless the counterparty is a state or local government or another clearing organization or the repurchase agreement is an inter-affiliate transaction", ibid.

167 SEC. 2023. "Shortening the Securities Transaction Settlement Cycle." Release No. 34-96930 (Feb. 15, 2023), 88 FR 13872 (Mar. 6, 2023). Available at https://www.sec.gov/files/rules/final/2023/34-96930.pdf; SEC. 2023. "Order Granting Approval of a Proposed Rule Change to Amend MSRB Rules G-12 and G-15 to Define Regular-Way Settlement for Municipal Securities Transactions as…" Release No. 34-97585 (May 25, 2023), 88FR 35961 (June 1, 2023). Available at https://www.sec.gov/files/rules/sro/msrb/2023/34-97585.pdf

168 T+1 Adopting Release, 88 FR at 13872. The SEC approved an MSRB rule change to implement a T+1 settlement cycle for municipal securities on May 24, 2023. See Release No. 34-97585 (May 25, 2023), 88FR 35961 (June 1, 2023) (File No. SR-MSRB-2023-03) (the "MSRB T+1 Approval Order").

169 Securities Industry Association. 2000. T+1 Business Case Final Report. Available at https://www.sifma.org/wp-content/uploads/2017/05/t1-business-case-final-report.pdf

170 SEC. 2021. Staff Report on Equity and Options Market Structure Conditions in Early 2021. Available at https://www.sec.gov/files/staff-report-equity-options-market-struction-conditions-early-2021.pdf

171 NSCC and DTC are securities clearing agencies registered with the SEC pursuant to section 17A of the Securities Exchange Act of 1934, 15 U.S.C. 78q-1, to provide, respectively, central counterparty and central securities depository services for transactions in equity securities. *See* Release No. 34-20221 (Sept. 23, 1983), 48 FR 45167 (Oct. 3, 1983)*; see also* 17 CFR 240.17Ad-22(a) (defining central counterparty and central securities depository).

172 DTCC. 2024. Daily Reporting Metrics. Available at https://www.dtcc.com/-/media/Files/PDFs/T2/SIFMA-UST1-Daily-Reporting-Metrics-Template-GC.pdf

173 DTCC. 2024. "DTCC Comments on Industry's T+1 Progress." Available at https://www.dtcc.com/news/2024/may/30/dtcc-comments-on-industrys-t1-progress

174 DTCC. 2024. "SIFMA, ICI, and DTCC Release T+1 After Action Report." Available at https://www.dtcc.com/news/2024/september/12/sifma-ici-and-dtcc-release-t1-after-action-report

175 Boncaldo, Germante, and others. 2024. "World Insurance: Asset-Savvy is the New Asset-Light." Swiss Re Institute. February. Available at https://www.swissre.com/institute/research/sigma-research/sigma-2024-02-life-annuity-insurance.html

176 Life Actuarial (A) Task Force. 2024. "Life Actuarial (A) Task Force – Minutes Packet." NAIC, March. Available at https://content.naic.org/sites/default/files/national_meeting/MinutesPacket-LATF-2024SpringNM_1.pdf

177 NAIC. 2024. "Capital Markets Special Report: Number of Private Equity-Owned U.S. Insurers Remains Constant, But Total Investments Increase by Double Digits in 2023." July. Available at https://content.naic.org/sites/default/files/capital-markets-pe-owned-ye2023.pdf

178 Best's News & Research Service. 2024. "Best's Special Report: Growing Number of Life/Health Insurers Outsourcing Investment Management." February 26. Available at https://news.ambest.com/newscontent.aspx?refnum=256323&altsrc=174

179 LIMRA. 2024. "Record-High 2023 Annuity Sales Driven by Extraordinary Growth in Independent Distribution." March 12. Available at https://www.limra.com/en/newsroom/news-releases/2024/limra-record-high-2023-annuity-sales-driven-by-extraordinary-growth-in-independent-distribution/

180 According to S&P Global Market Intelligence's analysis of cedant disclosures on Schedule S, Part 3, Section 1 of annual statutory statements.

181 S&P Global. 2024. "'Deep' Block Pipeline Boosts $2.3 Trillion US Life, Annuity Reinsurance Market." May.

182 Abhyankar, Heena C. 2023. "The Growing Side: The Rise of Offshore Reinsurance Vehicles in U.S. Life Insurance." S&P Global. September. Available at https://www.spglobal.com/ratings/en/research/articles/230906-the-growing-side-the-rise-of-offshore-reinsurance-vehicles-in-u-s-life-insurance-12835765

183 Zawacki, Tim. 2023. "Affiliated, Private Equity-Backed Reinsurers Fuel Life and Annuity Cession Surge." S&P Global, May. Available at https://www.spglobal.com/marketintelligence/en/news-insights/research/affiliated-private-equity-backed-reinsurers-fuel-life-and-annuity-cession-surge

184 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.

185 NAIC. 2022. "Regulatory Considerations Applicable (But Not Exclusive) to Private Equity (PE) Owned Insurers." Available at https://content.naic.org/sites/default/files/inline-files/List%20of%20MWG%20Considerations%20-%20PE%20Related%20and%20Other.pdf

186 NAIC. n.d. "Private Equity." Accessed November 1, 2024. Available at https://content.naic.org/cipr-topics/private-equity

187 NAIC. 2024. "Framework for Regulation of Insurer Investments – A Holistic Review." Available at https://content.naic.org/sites/default/files/inline-files/Investment%20Framework%20as%20Revised%20E%20Committee.pdf

188 Ross, Hailey, Kris Elaine Figuracion, and Jason Woleben. 2023. "U.S. Individual Annuity Considerations Hit Record High in 2023 after 21.5% Jump." S&P Global. Available at https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/us-individual-annuity-considerations-hit-record-high-in-2023-after-21-5-jump-81261680

189 Wong, Michele. 2023. "U.S. Insurance Industry's Cash and Invested Assets Rise to $8.5 Trillion at Year-End 2023." NAIC Capital Markets Bureau Special Report. Available at https://content.naic.org/sites/default/files/capital-markets-special-reports-asset-mix-ye2023.pdf

190 U.S. Department of the Treasury. 2024. "Treasury Presentation to TBAC: Fiscal Year 2024 Q4 Report." October. Available at https://home.treasury.gov/system/files/221/TreasuryPresentationToTBACQ42024.pdf

191 U.S. Department of the Treasury. 2024. *Enhancing the Resilience of the U.S. Treasury Market: 2024 Staff Progress Report.* September 20. Available at https://home.treasury.gov/system/files/136/2024-IAWG-report.pdf

192 The cyber-related terms in this report are drawn from the Financial Stability Board Cyber Lexicon and the National Institute of Standards and Technology Glossary. See Financial Stability Board. 2023. Cyber Lexicon. Available at https://www.fsb.org/uploads/P130423-3.pdf; National Institute of Standards and Technology. 2024. Glossary. Available at https://csrc.nist.gov/glossary

193 Adeney, Rachel, Adrian Hitchins, Claudia Lane, Harsh Mehta, and Alison Quashie. 2024. "Operational Resilience in a Macroprudential Framework: Financial Stability Paper No. 50." August 27. Available at https://www.bankofengland.co.uk/financial-stability-paper/2024/operational-resilience-in-a-macroprudential-framework

194 International Monetary Fund. 2024. "The Last Mile: Financial Vulnerabilities and Risks." *Global Financial Stability Report,* April. Available at https://www.imf.org/en/Publications/GFSR/Issues/2024/04/16/global-financial-stability-report-april-2024

195 Dembrosky, Luke, and Jordan Rae Kelly. 2024. "Ransomware in the Financial Sector." *ABA Banking Journal.* August 29. Available at https://bankingjournal.aba.com/2024/08/ransomware-in-the-financial-sector/

196 International Monetary Fund. 2024. "The Last Mile: Financial Vulnerabilities and Risks." Global Financial Stability Report, April. Available at https://www.imf.org/en/Publications/GFSR/Issues/2024/04/16/global-financial-stability-report-april-2024

197 Flashpoint Intel. 2023. "Unmasking Anonymous Sudan: Timeline of DDoS Attacks, Affiliations, and Motivations." June 20. Available at https://flashpoint.io/blog/anonymous-sudan-ddos-timeline/

198 Cybersecurity & Infrastructure Security Agency. 2024. "PRC State-Sponsored Actors Compromise and Maintain Persistent Access to U.S. Critical Infrastructure." February 7. Available at https://www.cisa.gov/news-events/cybersecurity-advisories/aa24-038a

199 Nichols, Michelle. 2024. "Exclusive: UN Experts Investigate 58 Cyberattacks Worth $3 Bln by North Korea." *Reuters.* February 8. Available at https://www.reuters.com/technology/cybersecurity/un-experts-investigate-58-cyberattacks-worth-3-bln-by-north-korea-2024-02-08/

200 FBI. 2024. "North Korea Aggressively Targeting Crypto Industry with Well-Disguised Social Engineering Attacks." September 3. Available at https://www.ic3.gov/PSA/2024/PSA240903

201 FBI. 2023. "FBI Identifies Lazarus Group Cyber Actors as Responsible for Theft of $41 Million from Stake.com." September 6. Available at https://www.fbi.gov/news/press-releases/fbi-identifies-lazarus-group-cyber-actors-as-responsible-for-theft-of-41-million-from-stakecom

202 Cybersecurity & Infrastructure Security Agency. n.d. "Capacity Enhancement Guide: Securing Web Browsers and Defending Against Malvertising for Federal Agencies." Available at https://www.cisa.gov/sites/default/files/publications/Capacity_Enhancement_Guide-Securing_Web_Browsers_and_Defending_Against_Malvertising_for_Federal_Agencies.pdf

203 Have, Christian. 2024. "The Commoditization of Ransomware-as-a-Service." ISACA. February 21. Available at https://www.isaca.org/resources/news-and-trends/newsletters/atisaca/2024/volume-4/the-commoditization-of-ransomware-as-a-service

204 Huntington. n.d. "This Cybersecurity Threat is Coming from Inside Your Organization." Accessed November 1, 2024. Available at https://www.huntington.com/Commercial/insights/cybersecurity/insider-threats

205 Sjouwerman, Stu. 2024. "Incident Report Summary: Insider Threat." *KnowBe4 Blog*, October 19. Available at https://blog.knowbe4.com/how-a-north-korean-fake-it-worker-tried-to-infiltrate-us

206 World Economic Forum. 2024. "The Global Risks Report 2024." January. Available at https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2024.pdf

207 Culafi, Alexander. 2024. "LockBIt Claim About Hacking U.S. Federal Reserve Fizzles." TechTarget, June 26. Available at https://www.techtarget.com/searchsecurity/news/366591934/LockBit-claim-about-hacking-US-Federal-Reserve-fizzles

208 McKinsey & Company. 2024. "Steady Progress in Approaching the Quantum Advantage." April 24. Available at https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/steady-progress-in-approaching-the-quantum-advantage#/

209 White House. 2022. "National Security Memorandum on Promoting United States Leadership in Quantum Computing While Mitigating Risks to Vulnerable Cryptographic Systems." May 4. Available at https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/04/national-security-memorandum-on-promoting-united-states-leadership-in-quantum-computing-while-mitigating-risks-to-vulnerable-cryptographic-systems/; and Swayne, Matt. 2024. "Blockchain and Quantum Computing are on a Collision Course, Expert Warns." September 8. Available at https://thequantuminsider.com/2024/09/08/blockchain-and-quantum-computing-are-on-a-collision-course-expert-warns/

210 NIST. n.d. "Post-Quantum Cryptography." Accessed November 1, 2024. Available at https://csrc.nist.gov/projects/post-quantum-cryptography

211 NIST. 2024. "NIST Releases First 3 Finalized Post-Quantum Encryption Standards." August 13. Available at https://www.nist.gov/news-events/news/2024/08/nist-releases-first-3-finalized-post-quantum-encryption-standards

212 Barker, William, William Polk, and Murugiah Souppaya. 2021. "Getting Ready for Post-Quantum Cryptography: Exploring Challenges Associated with Adopting and Using Post-Quantum Cryptographic Algorithms." National Institute of Standards and Technology. April 28. Available at https://doi.org/10.6028/NIST.CSWP.04282021

213 U.S. Department of the Treasury. 2024. "G7 Cyber Expert Group Statement on Planning for the Opportunities and Risks of Quantum Computing." September. Available at https://home.treasury.gov/system/files/136/G7-CYBER-EXPERT-GROUP-STATEMENT-PLANNING-OPPORTUNITIES-RISKS-QUANTUM-COMPUTING.pdf

214 DHS. n.d. Post-Quantum Cryptography. Available at https://www.dhs.gov/quantum

215 FIO. 2023. *Annual Report on the Insurance Industry.* September. Available at https://home.treasury.gov/system/files/311/FIO%20Annual%20Report%202023%209292023.pdf

216 National Association of Insurance Commissioners. 2024. *Report on the Cyber Insurance Market.* October. Available at https://content.naic.org/sites/default/files/cmte-h-cyber-wg-2024-cyber-ins-report.pdf

217 Granato, Andrew, and Andy Polacek. 2019. "The Growth and Challenges of Cyber Insurance." *Chicago Fed Letter,* no. 426. Available at https://www.chicagofed.org/publications/chicago-fed-letter/2019/426

218 GAO. 2022. "Cyber Insurance: Action Needed to Assess Potential Federal Response to Catastrophic Attacks." GAO-22-104256. Available at https://www.gao.gov/assets/gao-22-104256.pdf

219 U.S. Department of the Treasury. 2024. "Update on the Federal Insurance Office's Assessment of a Potential Federal Insurance Response to Catastrophic Cyber Incidents." February 1. Available at https://home.treasury.gov/system/files/311/Update%20FIO%20Assessment%20of%20a%20Potential%20Federal%20Insurance%20Response%20to%20Catastrophic%20Cyber%20Incidents.pdf

220 U.S. Department of the Treasury. 2024. "Managing Artificial Intelligence-Specific Cybersecurity Risks in the Financial Services Sector." March. Available at https://home.treasury.gov/system/files/136/Managing-Artificial-Intelligence-Specific-Cybersecurity-Risks-In-The-Financial-Services-Sector.pdf

221 U.S. Department of the Treasury. 2024. 2024 Conference on Artificial Intelligence & Financial Stability. June 6-7. Available at https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/financial-stability-oversight-council/2024-conference-on-artificial-intelligence-financial-stability

222 U.S. Department of the Treasury. 2024. Request for Information on Uses, Opportunities, and Risks of Artificial Intelligence in the Financial Services Sector. June 12. Available at https://www.regulations.gov/document/TREAS-DO-2024-0011-0001

223 Executive Office of the President. 2023. "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence." Federal Register, November 11. Available at https://www.federalregister.gov/documents/2023/11/01/2023-24283/safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence

224 Of course, regardless of whether something is considered AI, financial institutions should have proper governance, risk management, and controls over it.

225 U.S. Department of the Treasury. 2024. "Managing Artificial Intelligence-Specific Cybersecurity Risks in the Financial Services Sector." March. Available at https://home.treasury.gov/system/files/136/Managing-Artificial-Intelligence-Specific-Cybersecurity-Risks-In-The-Financial-Services-Sector.pdf

226 NIST. n.d. "3 AI Risks and Trustworthiness." Accessed November 1, 2024. Available at https://airc.nist.gov/AI_RMF_Knowledge_Base/AI_RMF/Foundational_Information/3-sec-characteristics

227 U.S. Department of the Treasury. 2024. Request for Information on Uses, Opportunities, and Risks of Artificial Intelligence in the Financial Services Sector. June 12. Available at https://home.treasury.gov/system/files/136/Treasury-AI-RFI-financial-sector-2024.pdf

228 U.S. Department of the Treasury. 2024. "Managing Artificial Intelligence-Specific Cybersecurity Risks in the Financial Services Sector." March. Available at https://home.treasury.gov/system/files/136/Managing-Artificial-Intelligence-Specific-Cybersecurity-Risks-In-The-Financial-Services-Sector.pdf

229 Notably, these risk factors are not unique or specific to AI, as the use of other technologies by financial sector actors can present similar concerns.

230 For example, there can be exposure and risk at various stages: raw data stage, transformation, integration, consumption, and analysis.

231 For example, if a widely used third-party dataset is poisoned, every financial institution utilizing the data set for training their AI models could be affected. Similarly, a vulnerability in a common AI framework or library could expose numerous systems across different organizations to data integrity attacks.

232 U.S. Department of the Treasury. 2024. "Managing Artificial Intelligence-Specific Cybersecurity Risks in the Financial Services Sector." March. Available at https://home.treasury.gov/system/files/136/Managing-Artificial-Intelligence-Specific-Cybersecurity-Risks-In-The-Financial-Services-Sector.pdf

233 One high-profile disruption at a key software vendor in the second half of 2024 that affected firms in a range of industries, including in financial services, demonstrated potential concerns with vendor concentrations.

234 U.S. Department of the Treasury. 2023. *The Financial Services Sector's Adoption of Cloud Services.* Available at https://home.treasury.gov/system/files/136/Treasury-Cloud-Report.pdf

235 Financial and Banking Information Infrastructure Committee. n.d. Homepage. Accessed November 1, 2024. Available at https://www.fbiic.gov/

236 Financial Services Sector Coordinating Council. n.d. Homepage. Accessed November 1, 2024. Available at https://fsscc.org/

237 U.S. Department of the Treasury. 2024. *U.S. Treasury Shared Cloud Lexicon and Terminology*. July 17. Available at https://home.treasury.gov/system/files/216/Shared-Cloud-Lexicon.pdf

238 Cyber Risk Institute. n.d. Cyber Profile. Available at https://cyberriskinstitute.org/the-profile/

239 American Bankers Association. 2024. "Cloud Outsourcing Issues and Considerations July 2024." July 16. Available at https://www.aba.com/news-research/analysis-guides/fsscc-cloud-outsourcing-issues-and-considerations-july-2024

240 Financial Services Sector Coordinating Council for Critical Infrastructure Protection and Homeland Security. 2024. "Principles for Financial Institutions' Security and Resilience in Cloud Service Environments." July. Available at https://www.fsisac.com/hubfs/Knowledge/Cloud/PrinciplesForFinancialInstitutionsSecurityAndResilienceInCloudServiceEnvironments.pdf

241 Federal Reserve System, Federal Deposit Insurance Corporation, Department of the Treasury, Office of the Comptroller of the Currency. 2023. "Interagency Guidance on Third-Party Relationships: Risk Management." Federal Register, June 9. Available at https://www.federalregister.gov/documents/2023/06/09/2023-12340/interagency-guidance-on-third-party-relationships-risk-management

242 Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency. 2024. "Third-Party Risk Management: A Guide for Community Banks." May. Available at https://www.federalreserve.gov/publications/files/third-party-risk-management-guide-20240503.pdf

243 In 2022, the group updated the G7 Fundamental Elements for Third Party Cyber Risk Management in the Financial Sector and the G7 Fundamental Elements of Ransomware Resilience for the Financial Sector. See U.S. Department of the Treasury. "G7 Cyber Expert Group." Accessed November 1, 2024. Available at https://home.treasury.gov/policy-issues/international/g-7-and-g-20/g7-cyber-expert-group

244 Bank for International Settlements. 2024. "Consultative Document: Principles for the Sound Management of Third-Party Risk. Basel Committee on Banking Supervision." July. Available at https://www.bis.org/bcbs/publ/d577.htm

245 Financial Stability Board. 2023. "Enhancing Third-Party Risk Management and Oversight: A Toolkit for Financial Institutions and Financial Authorities." December 4. Available at https://www.fsb.org/wp-content/uploads/P041223-1.pdf

246 International Association of Insurance Supervisors. 2023. "Issues Paper on Insurance Sector Operational Resilience." May. Available at https://www.iaisweb.org/uploads/2023/05/Issues-Paper-on-Insurance-Sector-Operational-Resilience.pdf

247 Weston, David. 2024. "Helping Our Customers through the CrowdStrike Outage." *The Official Microsoft Blog*. July 20. Available at https://blogs.microsoft.com/blog/2024/07/20/helping-our-customers-through-the-crowdstrike-outage/

248 Fabbro, Rocio. 2024. "The CrowdStrike Global Tech Outage Left Banks Relatively Unscathed. But It Highlights 'Systemic Risks,' Analyst Says." Quartz. July 19. Available at https://qz.com/crowdstrike-global-tech-outage-banks-systemic-risks-1851599594

249 U.S. Department of the Treasury. 2024. "Managing Artificial Intelligence-Specific Cybersecurity Risks in the Financial Services Sector." March. Available at https://home.treasury.gov/system/files/136/Managing-Artificial-Intelligence-Specific-Cybersecurity-Risks-In-The-Financial-Services-Sector.pdf

250 Financial Stability Board. 2017. Financial Stability Implications from Fintech: Supervisory and Regulatory Issues that Merit Authorities' Attention. June 27. Available at https://www.fsb.org/2017/06/financial-stability-implications-from-fintech/

251 FDIC. 2024. "Notice of Proposed Rulemaking on Custodial Deposit Accounts with Transaction Features and Prompt Payment of Deposit Insurance to Depositors." September 17. Available at https://www.fdic.gov/system/files/2024-09/fr-npr-on-requirements-for-custodial-deposit-accounts.pdf

252 Office of the Comptroller of the Currency, Federal Reserve System, Federal Deposit Insurance Corporation. 2024. "Request for Information on Bank-Fintech Arrangements Involving Banking Products and Services Distributed to Consumers and Businesses." Federal Register. July 31. Available at https://www.federalregister.gov/documents/2024/07/31/2024-16838/request-for-information-on-bank-fintech-arrangements-involving-banking-products-and-services

253 Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency. 2024. "Joint Statement on Banks' Arrangements with Third Parties to Deliver Bank Deposit Products and Services." July 25. Available at https://www.occ.treas.gov/news-issuances/news-releases/2024/nr-ia-2024-85a.pdf

254 FDIC. 2024. "Notice of Proposed Rulemaking on Custodial Deposit Accounts with Transaction Features and Prompt Payment of Deposit Insurance to Depositors." September 17. Available at https://www.fdic.gov/system/files/2024-09/fr-npr-on-requirements-for-custodial-deposit-accounts.pdf

255 CFPB. 2022. "CFPB Takes Action to Protect Depositors from False Claims About FDIC Insurance." May 17. Available at https://www.consumerfinance.gov/about-us/newsroom/cfpb-takes-action-to-protect-depositors-from-false-claims-about-fdic-insurance/; FDIC. 2022. "FDIC Issues Final Rule Relating to False Advertising, Misrepresentations About Insured Status, and Misuse of the FDIC's Name or Logo." May 17. Available at https://www.fdic.gov/news/financial-institution-letters/2022/fil22021.html

256 U.S. Department of the Treasury. 2024. "2024 Conference on Artificial Intelligence & Financial Stability." Available at https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/financial-stability-oversight-council/2024-conference-on-artificial-intelligence-financial-stability

257 Klein, Aaron, and Sandra Lee. 2024. "AI and Financial Stability: Mitigating Risks, Harnessing Benefits." Brookings. July 5. Available at https://www.brookings.edu/articles/ai-and-financial-stability-mitigating-risks-harnessing-benefits/

258 FSOC. 2024. *Report on Nonbank Mortgage Servicing.* Available at https://home.treasury.gov/system/files/261/FSOC-2024-Nonbank-Mortgage-Servicing-Report.pdf

259 U.S. Department of the Treasury. n.d. "Designation of Systemically Important Financial Market Utilities." Available at https://home.treasury.gov/system/files/261/here.pdf

260 Joint Analysis Data Environment (JADE) is an OFR-hosted platform designed for Council member agencies to analyze risks to financial stability. See OFR. Joint Analysis Data Environment (JADE). Accessed November 1, 2024. Available at https://www.financialresearch.gov/data/joint-analysis-data-environment/

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